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Contemporary Issues in Banking

Regulation, Governance and Performance

Edited by Myriam García-Olalla and Judith Clifton

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CHAPTER 1

Introduction

Myriam García-Olalla and Judith Clifton

After the recent financial crisis, an ongoing intense debate is still being continued about the relationship between regulation, corporate governance (CG), firm financing and other related issues. This debate is not confined to differences of opinions among academics; it brings in the interest and views of many more, including professionals of the banking industry, as well as individuals working across different spheres of the whole economy. This book covers a wide range of topics filling these debates, issues that continue to influence the global banking and financial system. The research offered here provides insights into the core contemporary issues in banking with a special focus on recent developments in European regulatory reforms, governance and the performance of firms.

The book brings together the most outstanding papers presented at the European Association of University Teachers of Banking and Finance Conference held in Santander, Spain, in September 2017. Each chapter is written by scholars specialized in the topic and are from prestigious universities and research centres.

The contents of this book can be classified into four main sections: Regulation; Corporate Governance and Performance; Firm Financing and Valuation; and, finally, other Contemporary Issues. All of the chapters

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contribute to the research on banking by providing new analyses and research on the changing way in which banking works today but also requires society to develop, in a more efficient, transparent and ethical way, the important role that this sector plays in the economic activity.

In Chap. 2, *The impact of Recent Regulatory Reform on the use of Supply Chain Finance: The Case of Reverse Factoring*, Viktor Elliot and Ted Lindblom aim to deepen our understanding about how banks use trade finance compared to other forms of lending in the light of the new Basel III requirements on trade finance instruments. The authors explore the increasing use by banks of supply chain finance in the form of reverse factoring (RF) and its impact on overall value creation in supply chains. In particular, they analyse the motives for implementing RF schemes, how such schemes compare with traditional factoring and other trade finance arrangements, and whether their regulatory treatment provides further motives for banks to expand this line of business.

As Ewa Miklaszewska and Jan Pys point out in Chap. 3, *The Bank Resolution Framework in the EU: Preliminary Evidence from Specialised and Regional Banks,* post-crisis bank regulations have recognized the need for the creation of a formalized resolution framework which will enable the efficient resolution of troubled banks with no or limited use of public funds. However, resolution schemes are based on complex procedures which aim to balance out the interests of different stakeholders. The purpose of this chapter is to identify the key elements of a resolution framework under the Single Resolution Mechanism and the Bank Recovery and Resolution Directive and to assess its impact based on preliminary empirical evidence. In particular, the evidence on specialized (mortgage) and regional banks will be analysed, with a special focus on Italy and the Netherlands. The study aims to demonstrate that the new European resolution framework addresses the issues identified during the crisis and contains sufficient instruments and arrangements to enable the efficient resolution of large banks, as illustrated by the SNS Reaal case. However, there are a number of serious economic and social issues when it is applied to smaller banks or bank networks, as illustrated by the Italian banks.

Enzo Scannella focuses in Chap. 4, *Market Risk Disclosure in Banks' Balance Sheets and the Pillar 3 Report: The Case of Italian Banks*, on the growing importance that market risk has taken in banking in recent years and the pivotal role of risk disclosure in strengthening market discipline and building trust in stakeholder relationships. The author employs con-

tent analysis to conduct an empirical study on a sample of the ten largest Italian banks. The study provides evidence that banks differ in their market risk reporting, even though they are subject to similar regulatory requirements and accounting standards. It also shows that there is room to improve various aspects of risk disclosure and provides some useful insights into this issue for further research.

Chapter 5, *Central Banks' Communication Strategies: Just Words?* by Vincenzo Farina, Giuseppe Galloppo and Daniele A. Previati, assesses the communication strategies of the Federal Reserve (FED) and the European Central Bank (ECB), as well as their respective effectiveness. They explore the multidimensional aspects of the information embedded in more than 800 statements released by the heads of the EU and US central banks. Using tools from computational linguistic, they analyse the information released by these central banks on the state of economic conditions, as well as the guidance they provide about future monetary policy decisions. The main difference between this study and most previous papers written on the topic is that this work looks at a broader set of reactions of central bank communication to evolving the macroeconomic scenario, whereas previous scholars mostly focused on the response of returns and volatility in interest rate markets to central bank communications. The results confirm that there is no significant difference between the communication strategy of the FED or the ECB, whether or not there is an improvement in the economic variables under consideration. They found, among other results, that changes in communication strategy are mainly linked to changes in the health of the financial system, especially for the state of health of European banking sector, and residually, though only for the FED, to GDP change.

In Chap. 6, *Complaining in Consumer Credit: Evidences from the Italian Financial System,* S. Cosma, F. Pancotto and P. Vezzani point out that many banking authorities have adopted an alternative dispute resolution (ADR) procedure in order to manage complaints that customers and financial intermediaries cannot solve by themselves. As a consequence, banks have had to implement complaint management systems in order to answer the requests of the customer. The chapter analyses the characteristics of complaints submitted directly to financial intermediaries by consumers regarding credit services. Subsequently, the analysis is extended to the characteristics of complaints received at the banking financial arbitrator (BFA) and related to consumer credit. The authors highlight how the

behaviour of consumers submitting a complaint to a bank or an appeal to the BFA has changed over the years and to highlight the role of the current ADR approach and its main critical issues with specific concerns to consumer protection.

Chapter 7, *Bank Boards in Europe: Trade-offs in Size, Composition and Turnover* by Eleuterio Vallelado and Myriam García-Olalla, is a survey on papers reporting different results regarding the importance of bank boards for Corporate Governance in a highly regulated industry. The analysis focuses on three variables related to bank boards, namely their size, composition and the trade-offs effected within them. Furthermore, a descriptive analysis is carried out of boards of directors in European banks with regard to these variables and their evolution at two specific times, before and after the financial crisis.

Chapter 8, *The Impact of Internal Corporate Governance Mechanisms on Corporate Social Performance in the Banking Industry* by Jose Luis Fernández, María Odriozola and Manuel Luna, explores the relationship between CG and corporate social responsibility (CSR) by analysing the effect of internal governance and monitoring mechanisms on the corporate social performance of banks. From a sample of 118 banks located in 19 countries, they analyse the existence of a structural change with different impacts on the CG-CSR relationship between two different sub-periods before and after the financial crisis: Period 1 (2002–2007) and Period 2 (2008–2014).The results show that some internal governance and monitoring mechanisms, namely those related to controlling ownership and the structure of the board of directors, have an important influence on the social performance of banks, although these mechanisms were only relevant during the second period.

In Chap. 9, *Bank Ownership and Firm-Level Performance: An Empirical Assessment of State-Owned Development Banks,* Marco Frigerio and Daniela Vandone investigate the state-owned development banks in addition to analysing their performance compared to other state-owned and privately owned banks. These banks are typically the largest type of state-owned financial institutions and are relevant players both in developed and developing countries, but despite their relevance, little is known about them. The chapter uses firm-level evidence from Europe to analyse the performance of state-owned development banks and their differences compared to other banks. The results point to clear differences between development and commercial state-owned banks, with the former performing better than the latter in terms of efficiency. They show that state-owned

banks are not a monolithic group and that development banks have specific features and operate in a way not completely examined in the existing literature.

Helen Chiappini and Gianfranco Vento contribute in Chap. 10, *Non-Financial Rating and Social Responsible Investment Reaction to financial turmoil*, to the academic debate regarding the ability of socially responsible investments to outperform traditional investments. They investigate whether the environmental, social and governance (ESG) rating can be a proxy of companies resilient during financial turmoil from a sample of 250 European socially responsible companies. This study contributes to the literature by showing that higher ESG ratings can be an expression of more resilient companies, especially during severe financial shocks. This finding is also useful for practitioners involved in portfolio investment selection.

In Chap. 11, *What Determines Interest Margins? The Case of Chinese Banks*, Ming Qi and Jiawei Zhang investigate the interest margins of China's banking industry. The results indicate that the credit risk is the major factor in enhancing the profitability of the Chinese domestic banks. On the other hand, the banks require high interest margins to compensate for the liquid, default and credit risk exposures. Following the liberalization of the banking industry, domestic banks do not hold as many liquid assets and loan loss provisions as before.

In Chap. 12, *How Do Banks and Investment Funds Affect Family Risk-Taking? Evidence from the Financial Crisis* by David Blanco-Alcántara, Jorge Bento, Mauricio Jara-Bertín, Oscar López-de-Foronda and Marcos Santamaría-Mariscal study the risk-return relationship for an international sample of family and non-family firms and the role played by banks. According to prior studies and following prospect theory, they obtain a non-linear risk-return relationship and a target level of profitability for family firms in order not to assume an excessive level of corporate risk-taking. This relationship is more prominent in companies from countries with lower protection of creditors and less aversion to uncertainty. They also find evidence that institutional investors exert pressure on family firms to increase corporate risk-taking, even when the return is lower than the target, with the negative consequence of reducing profitability and going to bankruptcy, as occurred during the years of financial crisis. Furthermore, as major shareholders, banks reduce risk as a result of trying to maintain their financial relationship with family firms. This conservative role has a positive influence on the profitability of the firm for values lower than the return target.

Chapter 13, *Does Bank Regulation Spill-Over to Firm Financing? SME Financing, Bank Monitoring and the Efficiency of the Bank Lending Channel* by Viktor Elliot and Magnus Willesson, analyses spill-over between banks and firms when required bank capital is regulated. The chapter contributes to the growing literature addressing the unintended consequences of regulatory policy development. The study empirically compares the regulatory responses of Swedish banks and how these responses affect lending to Swedish small and medium enterprises (SMEs). The theoretical framework and methodology employed make it possible to study theories related to bank monitoring, regulatory arbitrage opportunities and the risk-return trade-off. The main results indicate that banks' regulatory responses are associated with increasing lending margins, either by (1) increasing the margin on the loan portfolios, spilling over the regulatory costs through higher prices, (2) lower acceptance of lower return customers or (3) regulatory arbitrage through balance sheet adjustments.

Josanco Floreani, Maurizio Polat and Maurizio Massaro investigate in Chap. 14 a topic of particular relevance to the more general issue of troubled debt restructuring and option pricing methodologies, *Earn-Outs in Debt Restructuring Plans: Economics and Valuation*. This chapter first aims to provide insight into the rationale behind earn-out provisions for financially distressed firms that agree upon debt restructuring plans with creditors. Moreover, the study investigates the basic principles of the economic valuation of earn-outs. After discussing the main implications of earn-out value estimation in the light of the existing literature on corporate restructuring and option pricing-related issues, the authors propose a valuation methodology based on a Monte Carlo simulation approach, which allows the representation of a variety of projections of a few relevant financial variables, along with the related probability distribution. Besides obtaining an assessment of economic values, the model enables a probabilistic representation (not necessarily under a risk-neutral environment) of the wide spectrum of the restructured debt pay-offs, for both the company and the bank.

In Chap. 15, *Book and Market Values of European Banks: Country, Size and Business mix Effects,* Ricardo Ferretti, Andrea Landi and Valeria Venturelli highlight that financial markets have persistently reduced the market value of European banks as a consequence of macroeconomic, regulatory and structural factors, since the outbreak of the crisis. Even though these factors have affected the European banking industry as a whole, the market valuation of banks have shown differences across

country, size and business mix profiles. This study tests for the difference between the market-to-book ratios of the large European banks using a variety of indicators typically affecting bank market value. The results point out the relevance of the country context for the consequences on bank performance and stability.

As Beatriz Fernández Muñiz, José Manuel Montes Peón and Camilo José Vázquez Ordás explain in Chap. 16, *Assessing and Measuring Banking Culture*, the crisis has shown that it is necessary to analyse the soundness of an entity including aspects related to banking culture as a fundamental driver of excessive risk-taking, misconduct and compliance risks. The pre-crisis banking culture was characterized by very poor standards of conduct, which not only led to putting the solvency of financial institutions at risk but also to manipulating the market and improperly marketing banking products and services, resulting in economic harm to clients and serious risk to the stability of the financial system as a whole. Having learnt from this lesson, post-crisis banking regulation and supervision now promotes new practices and methods of forward-looking prudential supervision to identify at an early stage the risks that may arise from corporate behaviour and culture and take appropriate measures to prevent these risks from materializing. This chapter reviews the evolution and current state of the issue, paying special attention to the possible methods that may be applied to the assessment and measurement of banking culture.

In recent years, the number of equity crowdfunding platforms has been on the increase and policymakers and regulators have been paying greater attention to this new topic. Elisabetta Gualandri, Ulpiana Kocollari, Alessia Pedrazzoli and Valeria Venturelli explore, in Chap. 17, *A Multidimensional Approach to Equity Crowdfunding: Bridging the Equity Gap and Boosting Social Capital*, the characteristics of equity crowdfunding campaigns launched by different European platforms and analyse the relationship between social capital created online and the number of investors sustaining the campaign. Given the web context in which it develops, the role of online social capital in a project's success should be considered from a broad perspective that involves both the founder's and the project's social networks. These two levels of analysis represent different networks that mobilize different resources and frame different types of crowds. Their results are relevant for the field of equity crowdfunding research, as they shed light on a flourishing tool for bridging the equity gap of start-ups and innovative SMEs at the same time as proposing a new perspective on the online social capital framework.

In Chap. 18, *Structure and Risks of the Chinese Shadow Banking System: The Next Challenge for the Global Economy?*, Piotr Łasak analyses shadow banking as a topic of key importance in contemporary finance. It still remains the unregulated part of the financial market and may generate a major systemic risk in the future. An example of such a rapidly growing shadow banking system in the wake of the last financial crisis is that of China. It is hence necessary to attach greater importance to its development. The system differs vastly from its counterparts in Western countries. This chapter describes the structure of Chinese shadow banking and the mechanisms of its development, along with the main differences between the system in China and in Western countries. It also presents the main inherited risks present in the system and their potential impact on other sectors of the Chinese economy and financial market, and hence on the global economy.

Finally, Giusy Chesini and Elisa Giaretta investigate in Chap. 19, *Analysis of the Main Trends in European and US banks and Their Impact on Performance*, how the new trends affecting banking business impact bank profitability using a sample of EU and US banks.

The authors analyse how the two major drivers of the evolution of bank activities, that is, technological advances (digital banking) and the need to comply with increasingly stronger prudential regulation, have changed the ways banks operate and are able to be profitable. The main results suggest that the size of banks affects bank profitability and that investments in technology and capital requirements have different effects on profitability. These findings have strategic implications for bank managers, regulators and supervisors due to the impact of these drivers on banking business and bank profitability, and the new challenges they entail.

PART I

Regulation

CHAPTER 2

The Impact of Recent Regulatory Reform on the Use of Supply Chain Finance: The Case of Reverse Factoring

Viktor Elliot and Ted Lindblom

1 Introduction

Analysis of the implications of Basel III has increased substantially since the new framework was first presented in 2008. From a macro-perspective, analyses indicate that GDP growth in Europe will be moderately affected by the new regulations. From a micro-perspective, banking business models are expected to change quite considerably and there are several empirical studies showing that this process has already started. One area which has received comparatively scant attention comprises the implications of the new regulatory framework on short-term bank credit, such as loan commitments and trade finance. This chapter focuses on the implications on the increasing use of the short-term trade finance form: reverse factoring (RF).

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Short-term structured trade finance has traditionally received preferential capital treatment by regulators and financial agencies based on the premises that it was one of the safest, most collateralized, and self-liquidating forms of bank assets (Auboin and Blengini 2014). This treatment is also present in the revised Basel III framework (the first version of Basel III included stricter criteria on trade finance which were later revised), where self-liquidating trade finance instruments, including letters of credit (L/Cs), are exempt from the one-year maturity floor and the sovereign floor. In addition, the credit conversion factor (used to capture the likelihood of this off-balance sheet position becoming an on-balance sheet exposure) under the standardized approach is only 20 per cent for L/Cs. As to the leverage ratio, the Basel Committee decided to apply a 20 per cent credit conversion factor to short-term contingent trade finance assets (BCBS 2014). The revised liquidity regulations likewise suggest a low outflow rate (0–5 per cent) on contingent trade finance exposures (see Committee on the Global Financial System (CGFS) 2014, for an extended discussion).

In recent literature, concerns have been raised over the potential impact of the Basel III requirements on other trade finance instruments (see Auboin 2010; Auboin and Blengini 2014; CGFS 2014; Lasaga 2016; Michalski et al. 2016, among others). A key conclusion from several studies is that banks' margins on traditional trade finance instruments are shrinking as a consequence of increasing regulatory costs. One way for banks to maintain a profitable trade finance unit is to extend their business into the area of supply chain finance (SCF). SCF has grown rapidly over the past decade primarily through RF schemes provided by banks and other financial institutions to large creditworthy business firms. While SCF is frequently cited as a new and profitable trade finance business for banks (see Klapper 2006; van der Vliet et al. 2015),[1] it is not clear what SCF is or how RF differs from traditional bank products. We address SCF in the form of RF from a risk-return perspective by benchmarking such financing against other traditional bank products (traditional factoring, bank loans, L/Cs, and loan commitments). We also explore whether RF is exempt from certain regulatory requirements applicable to other traditional bank products and if such exemptions provide further motives for banks to expand this line of business.

[1] In the CGFS (2014, p. 20) study, industry experts reported "margins for supply chain finance as attractive, as it is a more differentiated and higher value added, and likely 'stickier' business, both for the banks, and for the firms within a supply chain network" and characterized supply chain finance (SCF) as "an area of non-price competition".

The chapter is organized as follows. First, we introduce the role of banks in international supply chains and discuss SCF and RF from both a bank and a customer perspective. Then, we illustrate a series of bank products with similar characteristics to RF, discuss the motives behind RF, and analytically quantify the costs and benefits of RF. In the following sections, we elaborate on the status of SCF and particularly RF in Scandinavian banks in Sect. 3 and discuss how RF could be extended into the pre-shipment phase of SCF in Sect. 4. The final section concludes the chapter by discussing our key contributions.

2 The Role of Banks in International Supply Chains

Silvestro and Lustrato (2014, p. 306) argue that "the need for SCF is due to time lags that can arise in making payment for goods and services along the supply chain that affect the buyers' and suppliers' working capital and cash liquidity". These time lags can be met either through inter-firm trade credit or intermediated trade finance. In inter-firm trade credit, funds in terms of payments are transferred directly between the trading firms either after ("open account") or before ("cash in advance") delivery of the goods purchased. Intermediated trade finance involves a third party, that is, a financial intermediary, which is often a bank offering a "letter of credit" to facilitate their trading by reducing information asymmetry.[2]

Schmidt-Eisenlohr (2013) formally shows how the allocation of payment-related financial risk exposures between importers and exporters depends on the chosen payment arrangements. This suggests that there is a trade-off between risk and expected return. For example, in an inter-firm trade credit arrangement reliant on open account, the exporter accepts an exposure to credit risk in order to export more goods at a premium price. While the price premiums are partly dependent on market conditions, the exporter will not be able to create value if there is no compensation for the additional risk.[3] At some point, however, the price premiums will be large enough to attract only the lemons (i.e. the riskiest importers). Furthermore, as noted by Schmidt-Eisenlohr (2013), this is particularly evident if the exporter adjusts prices to compensate for uncertainty caused by information

[2] See Ahn (2011) for an extended discussion.

[3] This implies a lower price on goods sold when instead it is the importer who extends a trade credit by paying in advance.

asymmetry. Accordingly, when the information-asymmetric transaction costs grow larger, there is a threshold above which it is rational to switch from trade credit to trade finance. The size of the threshold is dependent on the fees charged by financial intermediaries to offset information asymmetry and the opportunity cost of adverse selection (including contract enforcement costs) and moral hazard. There is a trade-off between the opportunity costs of information asymmetry and the fees charged by the intermediaries, suggesting that reduced information asymmetry will lead to lower intermediation fees.

2.1 Trade Credit, Traditional, and Reverse Factoring

Prior to the recent financial crisis, selling and buying firms had relatively easy access to various forms of financing for their trade agreements. The liquidity crunch caused by the financial crisis made many large firms reconsider their working capital positions and payment terms to upstream suppliers, which were primarily small and medium-sized enterprises (SMEs). As noted by More and Basu (2013), among others, the extension of trade credits from SMEs had adverse effects on buyer/supplier relationships leading to increased overall supply chain risk (see also Wuttke et al. 2013; de Goeij et al. 2016). This is because a supply chain is no stronger than its "weakest" link, which in international supply chains typically consists of an upstream financially constrained SME.

Various trade-financing solutions have been developed to mitigate the adverse effects of over-aggressive trade credit extensions in the supply chain. RF is one of the more prominent and well-developed "post-shipment" financial arrangements under the SCF umbrella (see Klapper 2006; Liebl et al. 2016; Lekkakos and Serrano 2016). The basic idea of RF (also known as "approved payables finance") is to utilize the "strongest link" in the supply chain. As implied by its name, RF is the opposite of traditional factoring. Whereas the latter is initiated by the selling firm (supplier) and rests on the underlying assets of the firm's accounts receivables, RF originates from the accounts payables of a buying firm with high creditworthiness and a leading (core) position in the supply chain.[4]

In traditional factoring arrangements, the factor (which can be a bank or another financial institution) purchases the supplier's invoices at a discount. This is done on either a "non-recourse" (i.e. the factor assumes most of the

[4] See Klapper (2006) for an extended discussion.

default risk) or "recourse" basis (i.e. the factor has a claim against the supplier for payment deficiencies of the buyer). Factoring arrangements without recourse are more common in developed countries, whereas those with recourse are more widespread in countries in which credit quality assessments are more problematic (see Bakker et al. 2004). Moreover, in some factoring arrangements, the buyer is notified and in others not.[5]

RF schemes are designed without recourse on the supplier should the buyer be unable to settle the debt to the factor. In such financial arrangements, the buyer extends its payment terms at the same time as the supplier receives the offer to be paid by the factor after the buyer has confirmed delivery of the goods. The process (physical, informational, and financial) flows of RF are illustrated in Fig. 2.1.

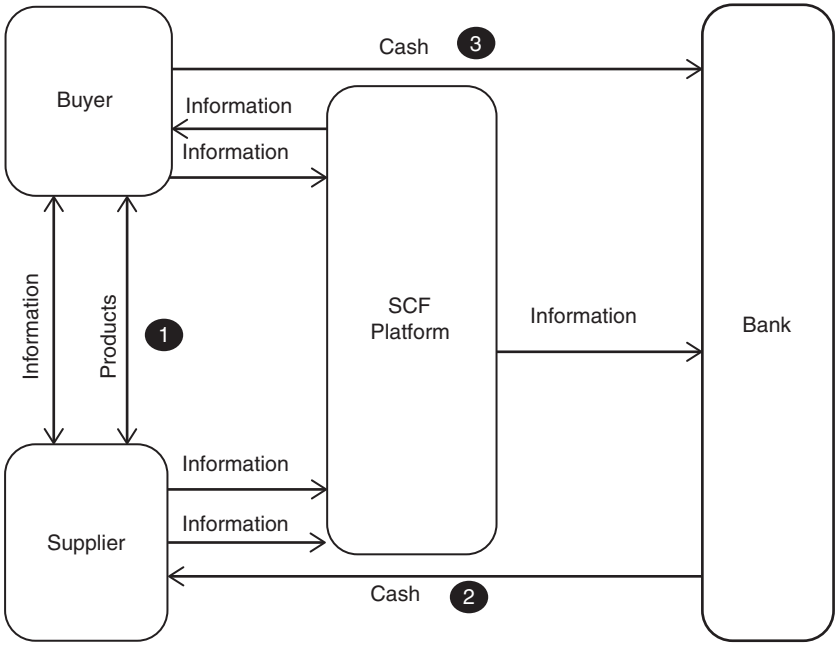

Fig. 2.1 Process flows of RF. (Source: Adapted from Camerinelli 2014, p. 17)

[5] According to Factor Chain International (FCI) 2016 Global Factoring Statistics, factoring volumes amounted to € 2376 billion globally in 2016, the vast majority being domestic factoring (cross-border factoring is estimated to account for approximately 20 per cent of total factoring).

The invoice is submitted from the supplier to the buyer, allowing the buyer to receive it into its enterprise resource planning system, a process supported through an SCF platform. When the invoice/accounts payable is approved by the buyer, it is communicated via the platform, thereby making invoice approval visible to the supplier. After delivery (1) is confirmed, the supplier can then choose to either wait until the payment term expires (i.e. the buyer pays) or request money from the factor. The factor receives the request via the platform and makes the payment (2) to the supplier (withholding a pre-agreed discount, typically 100–200 bps over a period of 30 or 60 days). When the payment term expires, the buyer pays (3) the invoiced amount to the bank (see Camerinelli 2014, for an in-depth discussion of the flows).

While data on the use of RF is extremely scarce, anecdotal evidence suggest that it currently accounts for 4–8 per cent of the global receivables market (see the Association of Chartered Certified Accountants (ACCA) 2014; World Supply Chain Finance Report, WSCF 2017) or funds in use (financed outstanding) of € 37–€ 49 billion (WSCF 2015). There are, however, large differences between industry sectors, where RF may be used in some industries (such as chemicals and telecom) for more than 20 per cent of all receivables (Camerinelli 2014) and countries, such as in Spain, where almost 40 per cent of total factoring is done on an RF basis (EUF 2016).

2.2 Motives Behind Reverse Factoring

One important reason why a buyer approaches a financial intermediary (factor) to initiate an RF arrangement with its supplier(s) is to reduce the buyer's own working capital costs (van der Vliet et al. 2015). RF creates an opportunity for the buyer to extend the time until payment is due without causing liquidity problems for the counterparty (Wuttke et al. 2013). Seifert and Seifert (2011) report that implemented RF schemes resulted in an average net working capital reduction of 17 per cent for buyers. The supplier(s) can benefit from the RF scheme as well. This requires that the actual short-term financing costs of the buyer and the supplier, respectively, differ more than what is motivated from a risk perspective. If interest rates on efficient capital markets reflect the "real" opportunity costs of the firms' short-term financing, RF would just seem to be a zero-sum game between the two. "Capital markets in reality are not perfect, however, and firms face financial constraints and barriers when raising external funds. In particular, capital financial market frictions may create a significant

gap between the costs of internal and external funds, especially, for small and medium-sized enterprises (SMEs)" (Tanrisever et al. 2015, pp. 1–2). This creates a window of opportunity for the creditworthy buyer to utilize credit arbitrage with the help of the approached factor, which "becomes an essential partner in the supply chain" (Lekkakos and Serrano 2016, p. 368). Through the factor, the buyer's supplier(s) can be offered interest rates based on the buyer's superior credit rating. Iacono, Reindorp, and Dellaert (2015, p. 288) explain that "By explicitly approving a supplier's invoice and confirming to pay it, a buyer mitigates the information asymmetry that otherwise reduces the collateral value of the corresponding account receivable". In this way, RF "serves to mitigate the informational asymmetries (between the SME supplier and the financial market)" (Tanrisever et al. 2015, p. 4).

Klapper (2006) discusses the potential benefits of RF compared to traditional factoring, in which the buyer is not a contractual party to the factor. This author highlights the fact that, in RF schemes, high-risk suppliers can transfer their credit risk to high-quality buyers, as the latter are a contractual party obliged to pay the invoice to the factor in due time. The chapter shows that the suppliers' informational opacity can be mitigated as only receivables of high-quality buyers are factored. It further points to the importance of legal and technological barriers, which are far less limiting in RF schemes because these primarily rely on buyers in developed countries with developed legal structures and mature technological solutions. Klapper thus concludes that RF can be seen "as an alternative factoring technology in countries with poor credit information" (ibid, p. 3129).

As pointed out by Lekkakos and Serrano (2016), among others, the RF scheme should also provide benefits for the third party, that is, the factor. From the perspective of the factor, which is often a large bank, RF provides revenue not only through the charging of RF-related interest and fees but also creates opportunities for cross-selling other banking products and services. "In addition, financing against the buyer's credit rating results in decreased portfolio risk which means banks need less capital reserves in order to meet central bank solvency requirements" (ibid, p. 368).

Despite the appealing features of RF, its rate of adoption seems to be rather slow. It is not clear to the firms in the supply chain or to potential factors (financial intermediaries) how to appropriately implement an RF scheme (Iacono et al. 2015). In this respect, the dispersion of RF is similar to the introduction and growth of the use of SCF reported by Wuttke

et al. (2016). Referring to the process of adopting an SCF scheme launched by a large firm downstream in the supply chain of a company belonging to the German automation industry, they conclude that the implementation of the schemes (ibid, p. 72) "clearly resembles the so called Bass curve (Bass 1969). Initially, the number of suppliers using SCF grows slowly, than the growth accelerates before it eventually declines". It takes time for suppliers to comprehend and reach an internal understanding of the routines and procedures related to SCF before they can be persuaded to sign up for the schemes. Moreover, it is important to consider their internal governance and incentive structures.

Liebl et al. (2016) explore the objectives, antecedents, and barriers of the implementation of RF schemes in supply chains by conducting multiple case studies: four buyers, three suppliers, and four banks. In all, they interviewed 28 respondents identified as key personnel engaged in the RF schemes of the organization they worked for. The objective "extension of days payable outstanding (DPO)" was mentioned by all respondents, leading the authors to conclude that this is the buyers' main objective. All supplier representatives also mentioned "exploitation of accounting effects", which was likewise emphasized by most bank representatives and at least one of the buyers. None of the suppliers stressed "strengthening of the supplier relationship", while "process simplification" was barely mentioned by the buyer representatives. The latter was, however, mentioned by all representatives of the banks and the suppliers, with the exception of one supplier. The antecedent "supplier track record" was mentioned by all the respondents of the suppliers and all except two buyers but only by a few bank representatives. Neither was a "trustful supplier relationship" emphasized by the respondents representing the banks. This implies that suppliers are carefully screened by buyers in their selection process, leading to less information asymmetry. All the bank respondents mentioned the importance of "transaction volume", "credit rating", and "country-specific know-how of banks", however. Regarding barriers, "availability of historical credit information" was mentioned by only three respondents: one buyer and two bank representatives. "Tax and regulations" were more widely emphasized as important barriers, followed by "lack of experience/incentive structures".

2.3 *Quantifying the Benefits and/or Costs of Reverse Factoring*

In prior efforts to calculate the financial effects of RF schemes, it is commonly assumed—explicitly or implicitly—that the supplier has access to external financing at a higher interest rate than is motivated by its risk profile. Furthermore, it is assumed that short-term trade credits, and extensions or reductions of such credits, do not have any impact on the buyer's credit rating. Other (long-term) financing costs remain the same. This simplifies the calculation of benefits for the three different parties of participating in an RF scheme. In principle, the benefit (π_j) for each party j (j = buyer (b), supplier (s), and factor (f)) is equal to the change in its net interest costs. Iacono et al. (2015) illustrate this by comparing the supplier's financing of its trade credit under the following three different scenarios:

Case 1: The supplier offers the buyer a trade credit (V) due in $T_s = T_b\,(30)$ days financed at the supplier's current interest rate (r_s). The buyer's rate is r_b.
Case 2: The initial trade credit to the buyer is extended by $E_b\,(30)$ days to T_b= 60 days without using RF. Financed at r_s.
Case 3: Using RF, the supplier offers the buyer a trade credit due in 60 days ($T_{s,\,SCF}$) financed at the RF rate (r_{SCF}). The supplier receives the invoice amount from the factor at a discount on day $T_{s,\,SCF}\,(10)$, that is, a payment term reduction (R_s) of 50 days. The factor's funding cost is r_f.

The payment flows under the different scenarios are shown in Fig. 2.2.

The benefit of the extended trade credit by E_b days for the buyer (π_{b,E_b}) is now calculated by comparing Case 2 to Case 1 using Eq. 2.1:

$$\pi_{b,E_b} = V \times \left(\frac{E_b}{365}\right) \times r_b. \tag{2.1}$$

Accordingly, Iacono et al. (2015) then show how to calculate the benefits of financing a reduction of R_s days for the supplier (π_{s,R_s}) and the factor (π_{f,R_s}) by comparing Case 2 to Case 3 and Case 3 to Case 2 using Eqs. 2.2 and 2.3, respectively:

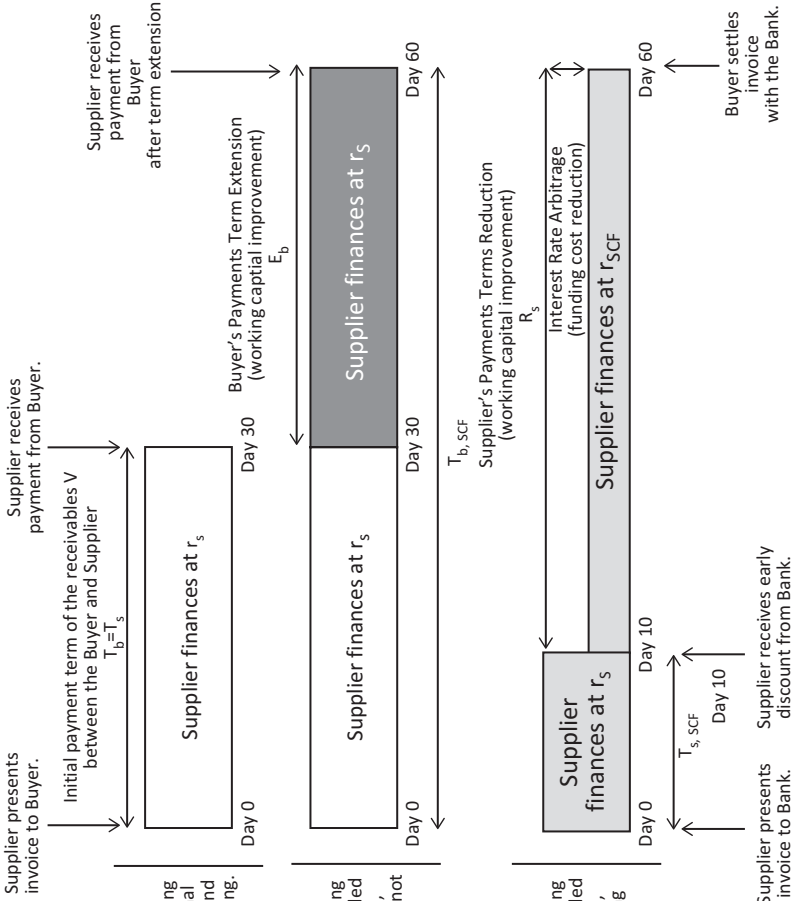

Fig. 2.2 Three alternative cases of a supplier's financing of trade credit. (Source: Iacono et al. 2015, p. 291)

$$\pi_{s,R_s} = V \times \left(\frac{R_s}{365} \right) \times \left(r_s - r_{SCF} \right). \tag{2.2}$$

$$\pi_{f,R_s} = V \times \left(\frac{R_s}{365} \right) \times \left(r_{SCF} - r_f \right). \tag{2.3}$$

In this illustration, it appears as if RF is a "win-win-win" game as long as $r_s > r_{SCF} > r_f$ and the factor would not otherwise have extended a loan to the supplier or purchased its invoice through a traditional factoring arrangement. However, if the supplier has the option to not extend its trade credit to the buyer by E_b days, the benefit for the supplier (π_{s,E_b}) of participating in the RF scheme and extending the trade credit to the buyer by E_b days should instead be calculated by comparing Case 3 to Case 1 using Eq. 2.4:

$$\pi_{s,E_b} = V \times \left(\frac{T_s - T_{s,SCF}}{365} \right) \times \left(r_s - r_{SCF} \right) - V \times \left(\frac{E_b}{365} \right) \times r_{SCF}. \tag{2.4}$$

Clearly, the supplier will benefit from participating in the RF scheme if the reduction in its financing cost from receiving the invoice amount earlier $\left(V \times \left(\frac{T_s - T_{s,SCF}}{365} \right) \times \left(r_s - r_{SCF} \right) \right)$ is greater than its financing cost of the extended trade credit to the buyer $\left(V \times \left(\frac{E_b}{365} \right) \times r_{SCF} \right)$. This gives rise to Eq. 2.5:

$$\left(\frac{T_s - T_{s,SCF}}{365} \right) \times \left(r_s - r_{SCF} \right) > \left(\frac{E_b}{365} \right) \times r_{SCF} \left\langle = \right\rangle \frac{r_s - r_{SCF}}{r_{SCF}} > \frac{E_b}{T_s - T_{s,SCF}}. \tag{2.5}$$

As $R_s = T_s - T_{s,SCF} + E_b$, Eq. 2.5 collapses into Eq. 2.6:

$$\frac{r_s}{r_{SCF}} > \frac{R_s}{T_s - T_{s,SCF}}. \tag{2.6}$$

Hence, the ratio of the supplier's current interest rate (r_s) and the RF rate (r_{SCF}) must be greater than the ratio of the time period the RF rate is used (R_s) and the actual time reduction in invoice payment $(T_s - T_{s,SCF})$ to the supplier. In the earlier example, r_s must thus be 2.5 times greater than r_{SCF}.

If the buyer's current interest rate (r_b) equals r_{SCF} and $r_{SCF} < r_s$, the overall total benefit of the RF scheme ($\pi_{RF} = \pi_{b,E_b} + \pi_{s,E_b} + \pi_{f,R_s}$) is positive irrespective of whether it is beneficial for the supplier. This is because $\neq_{f,R_s}$ is always positive and $\pi_{b,E_b} + \pi_{s,E_b} = V \times \left(\frac{T_s - T_{s,SCF}}{365} \right) \times \left(r_s - r_{SCF} \right) > 0$. However, it is reasonable to expect that $r_{SCF} > r_b$. It is also commonly assumed that $r_{SCF} = r_b + \beta$, where β is the extra (banking) fee (hence $\beta > 0$). This means that the overall total benefit of the RF scheme (π_{RF}) can be calculated using Eq. 2.7:

$$\begin{aligned}
\pi_{RF} &= V \times \left[\begin{array}{l} \left(\frac{T_s - T_{s,SCF}}{365} \right) \times \left(r_s - \left(r_b + \beta \right) \right) - \left(\frac{E_b}{365} \right) \\ \qquad \times \beta + \left(\frac{R_s}{365} \right) \times \left(r_b + \beta - r_f \right) \end{array} \right] \\
&= V \times \left[\begin{array}{l} \left(\frac{T_s - T_{s,SCF}}{365} \right) \times \left(r_s - \left(r_b + \beta \right) \right) + \left(\frac{T_s - T_{s,SCF}}{365} \right) \times \left(r_b + \beta - r_f \right) \\ \qquad + \left(\frac{E_b}{365} \right) \times \left(r_b - r_f \right) \end{array} \right] \\
&= V \times \left[\left(\frac{T_s - T_{s,SCF}}{365} \right) \times \left(r_s - r_f \right) + \left(\frac{E_b}{365} \right) \times \left(r_b - r_f \right) \right]
\end{aligned} \tag{2.7}$$

In a world without information asymmetry and market imperfection, both r_s and r_b would reflect the true opportunity financing costs of the supplier and the buyer, respectively. The difference in the funding cost of the factor would then be motivated from a credit risk perspective, which suggests that there exists no "real" benefit (value creation) in extending the trade credit to the buyer by E_b days. However, the earlier invoice payment by the factor to the supplier is value creating to a certain extent, as the risk is transferred to the buyer (see Klapper 2006). The extent of value creation is dependent on the difference between r_s and r_b. Let $r_s = \alpha + r_b$ ($\alpha > 0$), then the value creation is $\alpha \times V \times \left(\frac{T_s - T_{s,SCF}}{365} \right)$.

In a world with information asymmetry, r_b might still mirror the true opportunity financing cost of the buyer to a large extent. However, the true opportunity cost of the supplier would be likely to deviate signifi-

cantly from r_s, implying that the current α is too high and will decline as more information is released about the supplier. This does not change the overall value creation of the RF scheme, but as the "true" α is approached, the ratio between r_s and r_{SCF} decreases, making it less attractive for the supplier to remain in the scheme.[6] To further examine and elaborate on the dynamics of how RF schemes are used in practice, the following sections discuss the status of RF in Scandinavian banks and how RF can be extended into lower-tier suppliers in the value chain.

3 The Status of Reverse Factoring in Scandinavian Banks

This field of research is still at an early stage and ongoing. As stated previously, data on SCF and RF are therefore scarce at best and mostly anecdotal. The empirical part of our analysis relies on a narrow sample of European and, in particular, Scandinavian banks, which we have identified as having large SCF schemes based on the rapidly growing number of industry reports and white papers that commonly cite influential intermediaries in the RF field. These banks are listed in Table 2.1. Furthermore, we interviewed representatives from three of the largest banks in Scandinavia.[7] Later in the chapter, we refer to the latter banks as Alpha, Beta, and Gamma. In all, six interviews were undertaken, three with Alpha, two with Beta, and one with Gamma.

At present, confusion still exists regarding how to account for RF schemes within banks and there seems to be a lack of industry standards related to both the regulatory and accounting treatment of RF. Existing issues include: what maturity buckets these schemes fit into; whether they should be treated as trade finance instruments or traditional lending for

[6] The outcome of this deterministic analysis is more or less in line with the more advanced stochastic analyses conducted by Tanrisever et al. (2015), van der Vliet et al. (2015), Wuttke et al. (2016), and Lekkakos and Serrano (2016), among others. In their study of reverse factoring (RF) contracts involving SMEs to larger corporations (buyers), for example, Tanrisever et al. (2015, pp. 26–27) concludes the following: "Our analysis of reserve factoring contracts links their potential for value creation to (1) the spread of external financing costs between the corporation and the SME, (2) the payment period extension, (3) the operational characteristics of the SME (in particular, demand volatility and the implied working capital policy) and (4) the risk-free interest rate".

[7] According to our interviews, there are seven banks in all in Scandinavia that offer some kind of RF scheme (see Table 2.1).

Table 2.1 Banks in Europe and Scandinavia with large RF schemes

	European banks		*Scandinavian banks*
1	Deutsche Bank	9	Nordea
2	ING	10	Danske Bank
3	UniCredit	11	Svenska Handelsbanken
4	BNP	12	Skandinaviska Enskilda Banken
5	Royal Bank of Scotland	13	Swedbank
6	BBVA	14	DNB
7	Santander Bank	15	OP
8	Standard Chartered Bank		

capital requirement purposes; and the extent to which they should be treated as on- or off-balance sheet items. Based on our interviews, it would appear that different banks have different interpretations regarding these issues.

Alpha and Beta have been working with RF for some years, while Gamma is still at an early stage. All of the interviewed bank representatives jointly agreed that they are currently working on a demand basis in which large corporate clients ask them to provide tailor-made solutions on a client-by-client basis. This is particularly true in Gamma, whose organizational structure means that if a corporate client asks for a quote on a particular trade finance arrangement, the sales organization places an order to the back-office that then suggests a suitable set-up.

The rather reactive approach adopted by the three banks means that they primarily offer RF schemes to very large corporate clients on a post-shipment basis. These schemes are based on strict contractual arrangements in which limits are imposed both on volumes and number of suppliers. In traditional RF schemes, banks only allow a limited number of large and stable suppliers to enter into the scheme. This means major advantages for the banks, as it allows them to carefully screen suppliers, limit administration costs, and gain access to new potential customers through which they can cross-sell.

However, Alpha has recently made several steps to become more proactive in its SCF sales offer. The bank has reorganized its trade finance department and recruited new staff to better meet customer demand for integrated working capital management in which RF is a key product. While still at an early stage, Alpha is moving towards being able to offer complete working capital solutions for a broader set of buyer/supplier relationships. This means, for example, offering Tier 1 suppliers access to

pre-shipment financing. Perhaps even more interesting, it would allow banks to move further up the supply chain and introduce financing solutions for Tier 2, 3, n suppliers.

From a supply chain perspective, such RF schemes could produce major benefits. Figure 2.3 shows a stylized supply chain with four different firms. If one of these four firms is a credit-constrained SME with low bargaining power, it would seem reasonable to assume that the other firms will try to optimize their own cash-to-cash cycles by extending the days of payment to the SME. By doing so, however, the cost of capital for the supply chain cash-to-cash cycle will increase and, as emphasized by one of the respondents, such effects tend to materialize throughout the network over time in the form of price increases.

4 Expanding Reverse Factoring into the Pre-shipment Phase

The literature highlights two rather different types of RF schemes: one is based on substantial bank due diligence for supplier onboarding (see Liebl et al. 2016), while the other is based on electronic platform solutions with minimum screening of suppliers (see Lekkakos and Serrano 2016). The former is rather exclusive and allows for a limited number of selected suppliers that already have strong cooperative relationships with the buyer. The interviewed bank representatives also stated that these are the type of trade finance solutions currently offered by their banks. From the banks' perspective, these solutions also make sense, as even though transaction costs for supplier screening might be higher, other administrative costs are significantly lower. Moreover, cross-selling is made easier by the screening process and the direct relationship between the banks and the suppliers.

From a buyer perspective, RF is similar to a loan. As noted by Alpha, RF differs in that there is no collateral assigned and that processing costs are much lower for a loan. This latter feature is also closely linked to information asymmetry, because, with a traditional loan, information about the creditor is usually collected at the point of issuance, whereas in an RF scheme, information is consistently being gathered about payment times, flows, and so on. Moreover, as observed by Elliot and Lindblom (2016), the Basel III liquidity requirements incentivize banks to develop short-term products that mirror traditional long-term bank products. RF fits well into this description, allowing banks to avoid net stable funding ratio (NSFR) requirements.

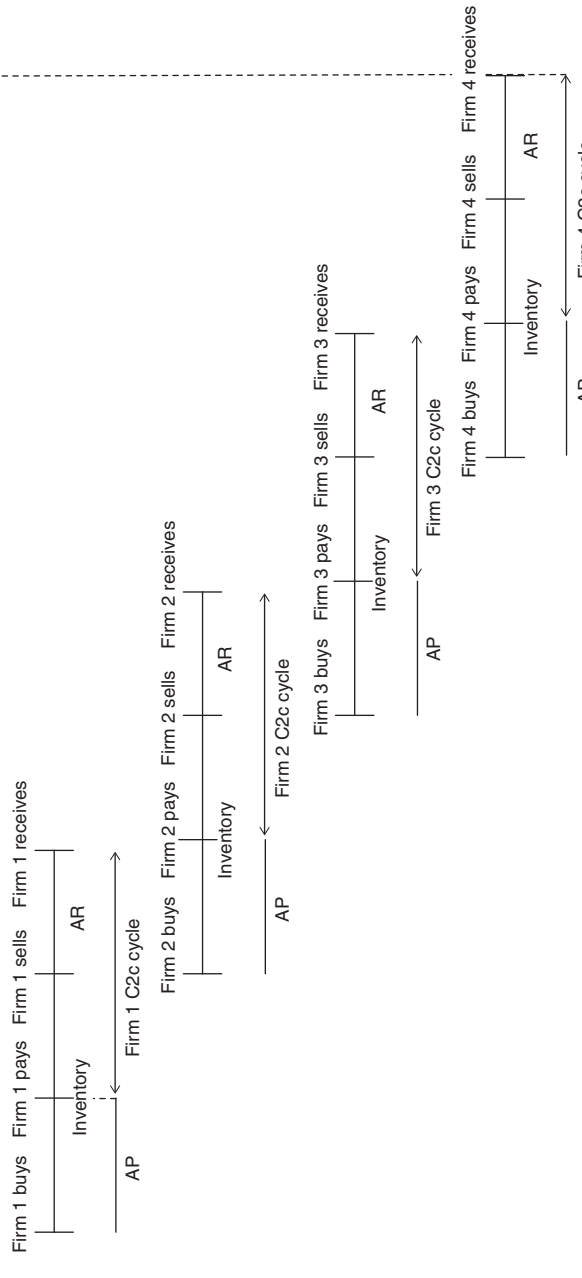

Fig. 2.3 The supply chain C2c cycle. (Source: Based on Hofmann and Kotzab 2006, p. x)

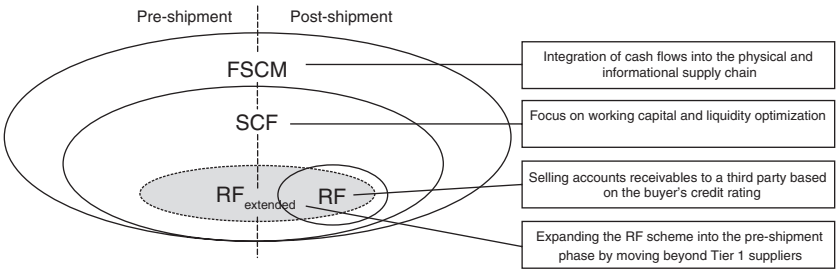

Fig. 2.4 Extending RF into the pre-shipment phase. (Source: Based on Liebl et al. 2016, p. 395)

From a supplier perspective, as discussed extensively earlier, RF is more easily compared to traditional factoring. However, because there is no recourse on the supplier, the factor banks can enjoy significantly lower risk weights in their capital adequacy requirements. This means that the more creditworthy buyer is the responsible party. For the supplier, access to RF financing can also be viewed as a revolving credit commitment and, as such, be used as relatively inexpensive emergency funding.

While exclusive RF schemes can offer advantages for all involved players (the buyer, the supplier, and the bank), it still does not account for the potential supply chain suboptimization that may occur if extension of payment terms is passed upstream in the supply chain. Referring back to Fig. 2.3, this means that an RF scheme is more likely to exist between Firm 4 (buyer) and Firm 3 (supplier), while payment terms may still be extended to Firms 1 and 2. This is also consistent with the findings of previous literature and our empirical findings. It suggests that RF is only available for post-shipment financing (as illustrated by Liebl et al. 2016). However, if a more inclusive RF scheme based on less extensive supplier screening is implemented, opportunities might arise for banks to expand upstream the supply chain. As information asymmetry is lowered, the risk for banks to start offering RF to Firms 1 and 2 will likewise be lowered. This is illustrated in Fig. 2.4, where $RF_{extended}$ indicates a more inclusive RF scheme.

5 Concluding Remarks

As our study of Scandinavian banks' adoption of RF schemes is still at an early stage, we can offer only preliminary conclusions. First, with respect to RF from a risk-return perspective, there is some evidence to support the

proposition that RF can increase returns if information asymmetry is reduced without increasing systematic risk. In particular, if the interest rate difference between the supplier and the buyer is sufficiently large, partly due to information asymmetry, taking over the trade credit from the risky supplier via an RF scheme may be beneficial for all parties involved. The extension of the trade credit to buyers in such schemes seems to be a zero-sum game, however. The motivation for such extensions in an RF scheme is probably linked to accounting issues rather than to real risk reduction. As reported by Kelly (2015, p. 37), "if the company ends up with payment terms that are far longer than is common in its market, a company's accountants may agree the outstanding bills are payables, but rating agencies might argue for treating them as debt based on the argument that under normal trade conditions suppliers would not agree to such nonstandard payable terms, and hence this is a loan given by the supplier".

The typical RF scheme is currently targeting the final (post-shipment) phase in the supply chain and may therefore lead to supply chain suboptimization. To reach the "weakest link" in the chain, we propose that banks should move their RF schemes up the value chain and into the pre-shipment phase. As the information technology supporting RF electronic platforms evolves, it is likely that banks and other platform providers (FinTech-firms) will face greater competition. Under such competition, banks may leverage their experience in risk management and cross-selling abilities to develop better monitoring tools for trade finance, a scenario that could ultimately bring additional (and less expensive) financing to credit-constrained SMEs in the lower levels of the supply chain.

Our second aim has been to explore whether RF is exempt from certain regulatory requirements applicable to other traditional bank products and if such exemptions provide further motives for banks to expand this line of business. Once again, our conclusions are preliminary and only indicative. There is some evidence (such as the different approach adopted by the banks in our sample) to support the idea that regulating RF schemes is not straightforward. This means that there is room for interpretation by banks and, thus, regulatory arbitrage. In addition, our results indicate that, in comparison to other bank products, RF may in fact enjoy some preferential regulatory treatment both with respect to capital adequacy requirements and liquidity regulations.

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CHAPTER 3

The Bank Resolution Framework in the European Union: Preliminary Evidence from Specialized and Regional Banks

Ewa Miklaszewska and Jan Pys

1 Introduction

The 2007–2009 financial crisis revealed many weaknesses of the banking industry, including the low loss-absorption capacity of capital instruments, inadequate risk management practices regarding liquidity and funding, the 'too-little-to-late' recognition of credit losses, and excessive complexity. These were only a few of the issues related to banks that required post-crisis assistance from regulators. The crisis has also shown how the wider economy was exposed to the banking crisis due to the high interconnectedness of institutions and the existence of banks which had outgrown the economy of their home country, effectively becoming 'too big to fail'. In the midst of the crisis, the governments of many European countries realized that the failure of the country's largest banks would have

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catastrophic consequences for their economies and had no other choice than to bail-out the failing banks. Before the crisis, there was a lack of a consistent bank resolution framework, both in the European Union (EU) as a whole and in its respective Member States. The crisis has proven that the actual resolution actions were limited to bail-outs of large banks and to providing these with guarantees and loans from governments of the host Member States. These rescue actions were not coordinated and the involvement of EU institutions was very limited. Cooperation between Member States has proven to be a very difficult task. Post-crisis bank regulations recognized the need for the creation of a formalized resolution framework that would enable the efficient resolution of large banks with limited use of public funds.

There are a limited number of research papers on the consequences of the new EU resolution framework and on resolution costs. This chapter focuses on the preliminary empirical evidence of applying resolution tools in the EU. Agreement between the European Parliament and the Council regarding the bank recovery and resolution directive (BRRD) was only reached in December 2013. However, many European countries implemented the resolution tools and some of the principles ahead of the BRRD. Table 3.1 lists the resolution instances in the EU before the resolution regulation came fully in force in 2016.

The purpose of this chapter is to identify the key elements of the resolution framework under the single resolution mechanism (SRM) and the BRRD and to assess its impact based on preliminary empirical evidence. In particular, the evidence on specialized (mortgage) banks and small and regional banks is analysed, with a special focus on Italy and the Netherlands. The study seeks to demonstrate that the new European resolution framework addresses the issues identified during the crisis and contains sufficient instruments and arrangements to enable the efficient resolution of large banks, as illustrated by the SNS Reaal case. However, there are a number of serious political and social issues when it is applied to small or regional banks or bank networks, such as the cooperative sectors, the Italian banking market being a case in point.

The chapter is organized as follows. Sections 2 and 3 provide a theoretical analysis of the European bank resolution framework. Section 4 focuses on non-fiscal bank resolution costs. Section 5 describes the application of the bail-in tool in the Netherlands, based on the case of the SNS Reaal bank. Section 6 describes the problem of applying resolution rules to regional banks, based on the Italian case, while Sect. 7 presents our conclusions.

Table 3.1 European banks involved in a resolution process during the period 2009–2016

Bank in resolution	*Country*	*Year*	*Resolution tools*
Anglo Irish Bank	UK	2009	B-I, B-O
Hypo Real Estate	AU	2009–2010	B-I
Amagerbanken	DE	2011	B-B, B-O
Bankia	ES	2012	B-I, A-S
Dexia	BE	2009–2012	B-O
SNS Reaal Group	NL	2013	B-I, N
Cyprus Popular Bank ('Laiki')	CY	2013	P-R, B-I
Alpha Bank	GR	2012	P-R, B-I
Andelskassen	DE	2016	B-B, B-I
Banco Espírito Santo	PT	2016	B-B, B-O
ATE-Bank	GR	2012	A-S
Popolare	IT	2015	B-O
Banca Romagna Cooperativa (BRC)	IT	2015	B-O
Banca delle Marche	IT	2015	B-I, B-B, R-F
Banca dell'Etruria e del Lazio	IT	2015	B-I, B-B, R-F
Cassa di Risparmio di Chieti	IT	2015	B-I, B-B, R-F
Cassa di Risparmio di Ferrara	IT	2015	B-I, B-B, R-F
DSB Bank	NL	2009	B-I, L
Banca Popolare di Vicenza	IT	2015	B-O
Nova Ljubljanska Banka	SL	2013	B-I, B-O
Nova Kreditna Banka Maribor	SL	2013	B-I, B-O
Abanka Vipa	SL	2013	B-I, B-O

Note: *B-I* Bail-in, *B-O* Bail-out, *B-B* Bridge Bank, *R-F* Resolution Fund, *A-S* Asset Separation, *N* Nationalization, *L* Liquidation

Source: Compiled by the authors based on World Bank (2016a, b) and Dübel (2013a)

2 Motivation and Literature Review

Before the crisis, there was a lack of sufficient cooperation in regulating, supervising, and resolving problems of large pan-European banks. The financial crisis has revealed a number of issues related to the resolution of financial institutions. Cihák and Nier (2012) describe such cooperation difficulties related to the case of the Fortis Group. Fortis has been active in the Benelux countries and, up until the crisis, had a complex binational holding structure, with ownership ultimately resting with Fortis SA/NV, based in Belgium. Despite the initial joint measures taken by the governments of Belgium, the Netherlands, and Luxemburg, market

institutions and depositors continued to withdraw their funds during the crisis, leading to liquidity problems. Following the ruling of a Belgian court, which required submitting the sale of the business, which had been agreed on by the three states, for shareholder approval, the resolution was delayed, resulting in failure of the burden-sharing agreement reached between the three governments. The Fortis case is a good example of a conflict of interests between the governments of different Member States.

Claessens et al. (2010) describe resolution conflict of interests as the 'Financial Trilemma', in which there are three simultaneous policy objectives, namely to maintain global financial stability, foster cross-border financial integration, and preserve national resolution authority. Achievement of any two of these goals is feasible; however, achieving all three can prove to be difficult. Experience from the last crisis in Europe showed that the national authorities focus their efforts on preserving national interests and the resolution of a cross-border bank was not coordinated and could not have been effective, as illustrated by the Fortis case. Kudrna (2012) sees this situation as being analogous to a 'prisoner's dilemma', when multilateral resolution of a banking group as a whole is likely to be the least costly overall, although unilateral resolution may allow some Member States to avoid resolution costs at the expense of others.

In response to the crisis, the two main international bodies promoting global financial stability, the Basel Committee on Bank Supervision (BCBS) and the Financial Stability Board (FSB), developed new regulatory policy proposals for globally active banks. Both the BCBS (2010) and the FSB (2011) published international standards and recommendations outlining the changes needed to improve the resolution of financial institutions and cross-border cooperation. One of the areas of focus in these proposals was the role of the resolution authority within the resolution framework and the powers it requires in order to be able to execute effective resolution. The overarching objectives set for the authority were to preserve the stability of the financial system, protect the insured depositors, and avoid unnecessary destruction of value. Cross-border cooperation of authorities on crisis management was stressed as a fundamental attribute for the effective resolution of internationally active banks. The two proposals defined the broad range of resolution tools that should be given to the resolution authority in order to enable execution of the assigned task.

Kudrna (2012) defines three basic components required for an effective cross-border bank resolution regime: regulations that reinforce the communication and cooperation between all national resolution authorities involved; governance agreements that enable decision-making and implementation of the selected resolution strategy in all relevant jurisdictions; and financing arrangements including fiscal backing.

Bank resolution is a complex and multistage process. Dewatripont and Freixas (2011) differentiate three stages where bank resolution requires a policy:

- before the crisis takes place: the design of the regulatory rules related to the resolution regime;
- at the time when a bank is in distress, but liquidation can be avoided by means of resolution tools which enable the continuation of the institution's key activities and functions; and
- when bankruptcy has become inevitable and the resolution focuses on allocation of losses based on proceeds from assets.

In order to be effective, the resolution framework must properly address the challenges involved, which range from its design through to the execution stage (Philippon and Salord 2017). The institutional diversity of European banking markets adds to the implementation difficulty (Schoenmaker 2016).

3 The Bank Resolution Framework in the European Union

Following the financial crisis, the EU has changed the way banks are supervised and resolved in Europe via the creation of the Banking union, obligatory for the Eurozone members, which is currently built on two pillars: the Single Supervisory Mechanism (SSM) and the Single Resolution Mechanism (SRM), with a third pillar in the form of the European Deposit Insurance Scheme (EDIS), yet to be implemented. From a legal perspective, SRM is based on BRRD and SRM Regulation (SRMR).[1] BRRD explains that *an effective resolution regime should mini-*

[1] The bank recovery and resolution directive (BRRD), as a European Directive, must be transposed by each Member State into a local law, however, the single resolution mechanism (SRMR), as a European Regulation, is directly binding in all Member States.

mise the costs of the resolution of a failing institution borne by the taxpayers (EP 2014). One of the other key objectives of resolution is to ensure continuation of the critical functions of institutions, defined as *activities, services or operations the discontinuance of which is likely in one or more Member States, to lead to the disruption of services that are essential to the real economy or to disrupt financial stability due to the size, market share, external and internal interconnectedness, complexity or cross-border activities of an institution or group.*

In order to enable effective resolution, the European Commission needed to develop a comprehensive framework able to effectively deal with failing banks. The BRRD provided for the creation of a separate governance body focused on resolution—the resolution authority—entrusted with administrative powers to manage resolution activities. In the Banking union, the role of the resolution authority was assigned to the Single Resolution Board (SRB), which was created in 2015 and became operational under SRMR in 2016. The SRB is responsible for drawing up resolution plans for significant and cross-border eurozone institutions which are under the supervision of the European Central Bank (ECB). The SRB is also in charge of adopting resolution schemes and drawing up resolution plans, which are formal documents in which resolution strategy, actions, and tools are predetermined for banking union parent or group entities in participating Member States. It is the SRB that is responsible for triggering resolution plans for a failing bank. The ECB, acting as a supervisor within the Banking union, decides whether a particular bank is considered 'Failing or Likely to Fail' (FOLTF) and has a non-voting representation on the SRB.

In addition, the SRB owns and decides on usage of the Single Resolution Fund (SRF), which is financed by the banking industry. The purpose of the SRF is not to absorb losses of investors by providing new capital to failing banks but rather to provide short- to medium-term financial aid in the form of loans or guarantees. Such financial assistance will preserve value and ensure the maintenance of the critical functions of banks undergoing the resolution process. The SRF became operational at the beginning of 2016 and will be gradually built up based on contributions from banks via national compartments until 2024. The SRB is also responsible for other tasks, such as setting the minimum requirement for own funds and eligible liabilities (MREL), which aims to increase the bail-inability of liabilities and hence increase loss absorption by investors and thus limit the need for bail-outs, funded by the taxpayers. The BRRD also requires each Member State to designate their respective national resolution authorities, indicating that such a role can be assigned to national central banks,

competent ministries, or other public administrative authorities or authorities entrusted with public administrative powers.

The following element needed is a set of resolution tools and powers, which will provide the resolution authorities with essential instruments to resolve troubled banks. The main tools available to resolution authorities under the BRRD include the sale of business tool, bridge institution tool, asset separation tool, and bail-in tool. The sale of business tool gives resolution authorities the power to sell the bank, or part of the bank, to a buyer or group of buyers in a relatively swift process. This tool is put in place to enable the resolution authority to take timely action in order to protect bank value and therefore curb losses. There are number of requirements that must be met by the resolution authority when using this tool. For example, the price for the business sold must be fair and should reflect the valuation of assets and liabilities. The sale process should be open, transparent, and non-discriminatory. The bridge institution tool aims to create a temporary structure within which the key and critical functions of the failing bank are transferred in order to preserve this part of the business until a structural solution is found. The bridge bank is wholly or partially owned by one or more public authorities, which may include the resolution authority and can be in place for a maximum period of two years. The asset separation tool aims to separate problem assets in order to preserve the remaining healthier part of the bank balance sheet and allow the maintenance of key functions. When transferred into a separate vehicle, problem assets can be wound-down in order to maximize recovery value. The asset separation tool is therefore only a first step in resolution proceedings, as the sale of the business tool may subsequently be used.

The bail-in tool underlines one of the key principles and reasons for the resolution framework, that is, the use of public funds should be limited to a minimum. During the crisis, banks were bailed-out by governments, which means that taxpayers' money was used to save banks from bankruptcy, thereby absorbing bank losses. The aim of the bail-in tool is for the bank investors and creditors to absorb part of the losses. This tool enables the resolution authorities to convert banks liabilities into loss-absorbing common equity instruments or even completely write-off such eligible liabilities. Bail-in can be explained as the statutory imposition of losses on a bank's liabilities even if there are no provisions in the legal terms of these liabilities that allow for absorption of such losses outside of an insolvency procedure. The BRRD explains that the bail-in tool achieves the objective of effective resolution by ensuring that the shareholders and creditors of

the failing institution suffer appropriate losses and bear an appropriate part of the costs arising from the failure of the institution.

4 Sources of Resolution Costs

The regulatory improvements in the field of bank resolution were aimed at limiting the costs of bank failure to the taxpayers. Cihák and Nier (2012) states that a special bank resolution framework can result in a net efficiency improvement in terms of the trade-off between fiscal costs and financial stability impact. This does not mean that the costs of a 'disorderly bankruptcy' would be low but rather that the fiscal cost of containing the systemic impact of disorderly bankruptcy could be large. The fiscal costs of resolution are influenced by the resolution strategies of the governments and designated authorities. Honohan and Klingebiel (2000) found that the factors increasing resolution costs include open-ended liquidity support, unlimited deposit guarantees, debtor bail-outs, regulatory forbearance, and repeated recapitalizations. Resolution costs may increase significantly in the case of cross-border institutions.

There are a number of papers exploring the different ways that resolution costs can be calculated. James (1991) measures losses as the difference between the book value and recovery value of assets net of the direct expenses associated with the failure. Bennett and Unal (2015) define total bank resolution cost (TRC) as the difference between the liabilities of the bank at the time of failure and the liquidation value of its assets net of expenses incurred by the receivership, adjusted for any explicit premium received in the process. Bovenzi and Murton (1988) recognize that there is a difference between costs to the resolution authority and the loss on assets, with the former including considerations such as the difference between the book values of assets and book values of liabilities (book value of capital) of the bank, the levels of insured versus uninsured liabilities, the premium or discount to an acquirer, results on contingent claims, and the value recovered by the resolution authorities from assets in liquidation.

The majority of the costs associated with bank resolution during the 2008 crisis were related to the bail-out tool and were borne by the taxpayers. The aim of the post-crisis regulations was to limit the costs to the taxpayers. However, Grimaldi et al. (2016) state that, regardless of the

method of resolution, someone has to suffer the costs of bank failures. The new resolution tools, including the bail-in mechanism, do not eliminate these costs but instead transfer a certain degree of them from the taxpayers to the creditors. Avgouleas and Goodhart (2015) explain that the penalty in bank resolution will essentially be paid by bank managers, bank staff, bank creditors, or borrowers and that the real question becomes: which of these parties will absorb the bulk of the costs? Cariboni et al. (2016) estimated that the change from a bail-out to a bail-in approach may result in a shift of around 62% of the financing needs from the government to the bank bondholders and other bail-inable creditors. Consequently, it is important to stress that the financial costs of resolution do not disappear but instead are only shifted from the taxpayers to bail-inable creditors, including large deponents.

The financing of the resolution process is an integral part of resolution planning. The key principle of the BRRD is to limit the use of taxpayers' funds in bail-outs of failing institutions. Based on this perspective, the first source of funds used in the resolution of banks should be the shareholders and creditors of the bank. Even though the bail-out of failing banks was widely criticized during the last crisis, the new resolution framework does not prohibit public support. The use of public funds is possible, but, in contrary to the last financial crisis, it should only be a last resort and not the first choice. There are a number of conditions that must be met before the resolution authority, acting in cooperation with a Member State, can use the government financial stabilization tool to help the failing bank. The tool can only be used in the case of a systemic crisis and when the other resolution tools have already been used to the maximum possible extent. This means that at least 8% bail-in of total liabilities including equity must take place prior to employment of public support, ensuring minimum private loss absorption. The hierarchy of loss bearing should start with the shareholders, who are to incur losses first as in normal insolvency proceedings. The next group to suffer losses are creditors based on their claim class and taking into account the overarching principle *no creditor worse off than under normal insolvency proceedings'*. In addition, the BRRD confirms that the insured deposits fall outside the scope of the bail-in.

The BRRD was intended to reduce the risk of passing the costs of bank failures to the State or local communities. The costs of a bank crisis must be borne by the bank's shareholders and debt providers, giving them a

strong incentive to control the risks that the bank assumes, once the implicit state guarantee for their liabilities is removed. The need to safeguard financial stability has resulted in the exclusion of some kind of liabilities from the bail-ins, such as:

- deposits protected under the deposit guarantee scheme (DGS), up to € 100,000;
- secured liabilities, including covered bonds and other guaranteed instruments;
- liabilities resulting from the holding of customers' goods, for example, the contents of safe deposit boxes or securities held in a special account;
- interbank liabilities (except those within the same banking group) with an original maturity of less than seven days;
- liabilities deriving from participation in payment systems with a residual maturity of less than seven days; and
- debts to employees, commercial payables, and tax liabilities, if these are privileged under bankruptcy law.

Losses that have not been absorbed by the creditors can be transferred, at the discretion of the authorities, to the Resolution Fund, which can intervene up to a ceiling of 5% of total liabilities, provided that a minimum bail-in of 8% of total liabilities has been applied.

5 The Resolution of SNS Reaal in the Netherlands

The large banks in the Netherlands were severely affected by the crisis and State aid to the banking industry in the period 2007–2011, including state guarantees, was ranked eighth in Europe (fifth when including only bank recapitalization). In consequence, public debt increased from 43% of Gross Domestic Product (GDP) in 2007 to 70% in 2014 (DNB 2014). The restructuring was also very painful for the banks: the assets of the six largest Dutch banks decreased € 220 billion (10%) between 2011 and 2014, in addition to changing their balance sheet structure and reducing risky assets and wholesale funding (KPMG 2017). The devastating impact of the crisis on the SNS Reaal Bank was particularly striking when analysing the condition of the four largest banks, classified as domestic systemically

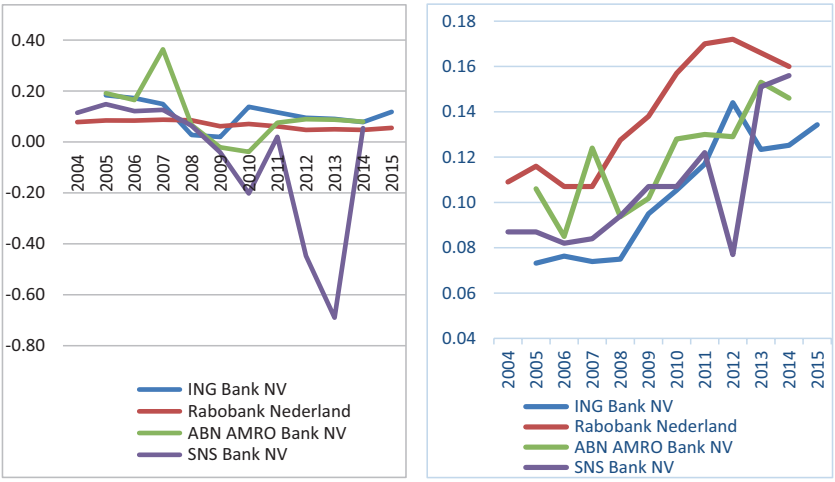

Fig. 3.1 Financial performance of D-SIBs in the Netherlands: Return on Equity (ROE, left) and Core Equity Tier 1 capital (CET1, right). (Source: Bankscope database)

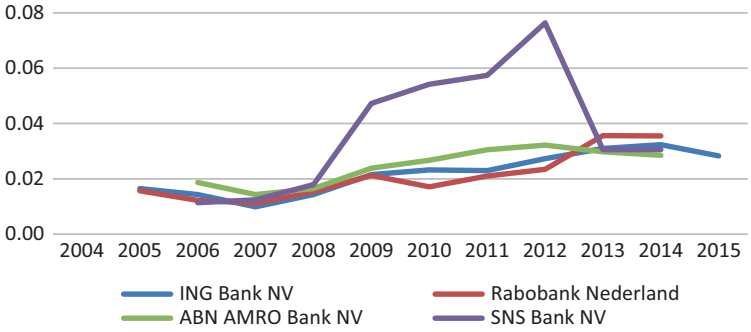

Fig. 3.2 Non-Performing Loans (NPLs) of D-SIBs in the Netherlands. (Source: Bankscope database)

important banks (D-SIBs), which held 80% of the banking industry's assets (Figs. 3.1 and 3.2).

SNS Reaal N.V. was a leading financial conglomerate, operating banking and insurance activities via subsidiaries in the Netherlands. In 2007, the total assets of SNS Reaal amounted to nearly € 124 billion, with a net profit of € 465 million. The shareholding structure of SNS at the time

included Stichting Beheer SNS REAAL, an independent foundation, which was a majority shareholder with around 54.3% of the ordinary shares, the remaining shares being listed on the New York Stock Exchange (NYSE) Euronext Amsterdam stock exchange. In its 2008 Annual Report, SNS Reaal stated that it had commissioned a study into the distribution of its free-float investors. SNS estimated that 85% of the free float was in the possession of institutional shareholders, with the remaining 15% being owned by private investors. The conglomerate structure of SNS resulted in 'double counting' of capital, also referred to as double leverage. In 2008, SNS Reaal stated that it applied a 115% ceiling for its double leverage (SNS Reaal 2008 Annual Report). This target ratio was put in place to limit the degree to which debt obtained by the SNS Reaal Group could be reallocated to its subsidiaries as equity.

The problems of SNS Reaal started during the 2007–2009 global financial crisis, when its solvency ratio had fallen below the minimum required level and its share price had fallen by 56%, indicating declining market confidence. In its letter to the Netherlands, the European Commission (2008) explained that in order to prevent a further loss of market confidence and to safeguard trust in the entire Dutch financial sector, State aid was to be granted to SNS. The Dutch State had to bail-out SNS by injecting € 750 million of capital using hybrid securities, while € 500 million of hybrids were to be additionally issued by SNS itself. Dubel (2013a) explains this capital injection by the State as a 'precautionary' measure and states that it is the reason why there was no bail-in of existing securities. In November 2009, SNS Reaal managed to pay back € 185 million to the Dutch State and had plans to repay the total outstanding amount of public support of € 848 million (including a premium of 50%) by year-end 2013.

In 2012, SNS Reaal's share in the banking and insurance industry was significant, with SNS Bank being ranked the fourth biggest bank in the Netherlands, while Reaal Leven and Zwitserleven was ranked the second largest life insurer. SNS had a substantial property finance portfolio of around 10% of total assets (Dutch Ministry of Finance 2012) which was much higher than the average exposure to property finance of its competitors. During the year, SNS suffered significant losses due to write-downs in its real estate portfolio and reported a total loss of € 972 million as compared to a profit of € 114 million in 2011. The € 813 million loss on the property finance portfolio was the main contributor to the overall loss

for the year. The institution's double leverage, which is the ratio between the book value of the subsidiaries and SNS Reaal's equity, increased from 115% in 2011 to 130% in 2012, which was above the maximum target level set by SNS at 115%. The Ministry of Finance and the Dutch Central Bank (DNB) viewed SNS Bank as a systemically important institution whose failure would have unacceptably burdensome and detrimental consequences for financial stability, the Dutch economy, and taxpayers. SNS had a substantial share of around € 33 billion in the local retail deposits market insured under the DGS. At that time, DGS in the Netherlands was operating as an ex post insurance scheme with no pre-funding. Under this scheme, in the case of a bank failure, other banks participating in the DGS had to contribute the required funds for the scheme to pay out to the affected depositors. Bankruptcy of SNS would therefore be very costly to the Dutch banks and both the Ministry of Finance and DNB wished to avoid such a situation. Moreover, due to their significant size, the estimated time needed to pay out the insured deposits was expected to be relatively long, which could lead to social unrest. Taking all the above into account, neither bankruptcy nor liquidation was considered a viable option.

The powers and tools defined under the Dutch Intervention Act[2] (*Interventiewet*), published on 12 June 2012, were used by the Ministry of Finance (Janssen and Tegelaar 2016). Both the Dutch Intervention Act and the BRRD are similar and provide the authorities with a comparable bail-in tool, although some differences exist, for example, the basis for compensation for holders of bailed-in instruments. In this context, the BRRD assumes a gone-concern scenario, while the Intervention Act also considers the going-concern prospects of the institution. On 1 February 2013, by decree of the Dutch Minister of Finance (2013), the ordinary shareholders and holders of subordinated debt were expropriated. In his letter, the Minister explained that *there was a grave and imminent threat to the stability of the financial system*. According to Dutch law, the State is obliged to offer compensation to an expropriated person which should be equal to the value that such a holder would obtain in the case of the expropriation not taking place. The offer made by the Minister to the expropriated holders of SNS instruments amounted to € 0. The decision regarding

[2] An unofficial translation dated 11 July 2013 of the Act on Special Measures for Financial Corporations (Intervention Act) can be accessed at: http://www.toezicht.dnb.nl/en/binaries/51-228545.PDF

the lack of compensation was supported by the fact that in the case of bankruptcy or liquidation, which in the view of the State was unavoidable, there would be no resources which could be distributed to the subordinated creditors and shareholders. The nationalization decision taken by the Ministry of Finance became irrevocable after a ruling from the highest Dutch administrative court on 25 February 2013. The shareholders and subordinated debt holders were bailed-in and the bank was nationalized which meant that the government obtained full ownership of a book equity of € 4.75 billion (Dubel 2013a).

The expropriation eliminated all shareholder value and all subordinated debt-holder value, resulting in losses of around € 240 million and € 1.67 billion, respectively (FSB 2014). In their press release, Fitch Ratings stated *The expropriation and apparent full loss of value of SNS Bank dated subordinated debt in the nationalisation of SNS REAAL by the Dutch state is the harshest burden-sharing on this asset class at a rated bank since the onset of the eurozone crisis.*[3] However, Dubel (2013b) points out that the hybrid instruments of the insurance arm of SNS Reaal, which rank below subordinated debt, were spared any losses. The bail-in of ordinary shares and junior bonds was not sufficient to save SNS; therefore the Dutch State had to use additional public funds. In his letter to the Second Chamber of Parliament, the Minister of Finance explained that capital injection totalling € 2.2 billion was needed, split into € 1.9 billion for SNS Bank and € 300 million for SNS Reaal. The State paid-in the € 2.2 billion on 11 March 2013. In addition to the new capital, the previous State aid of € 0.8 billion was written-off and loans of € 1.1 billion and guarantees of € 5 billion were granted by the Dutch government.

The example of SNS shows that even if shareholders and subordinated debt holders absorb losses of failing bank, the use of public funds is not precluded. However, it should be noted that, in this case, the overall amount of State aid was undoubtedly lower than it would have been in the case of no bail-in. Moreover, Schäfer et al. (2016) state that the bail-in of SNS had highly significant effects on other European banks, with a sharp and highly significant abnormal increase in CDS spreads. Their results suggest a significant reduction in bail-out expectations in response to the bail-in of SNS.

[3] https://www.fitchratings.com/gws/en/fitchwire/fitchwirearticle/Dutch-SNS-Subdebt? pr_id=782263

6 Resolution Challenges for Small Banks: The Case of Local and Regional Banks in Italy

Post-crisis European regulations provided a strong incentive to centralize the European cooperative banking networks, either by forming institutional protection schemes (IPS), or by giving new powers to the central institution in the network (Groeneveld 2017). In decentralized cooperative systems, the post-crisis restructuring was based either on the centralization of the network, such as in the case of Italy's Banche Popolari (BP) in 2015 and Banche di Credito Cooperativo (BCC)—Casse Rurali in 2016, or on the implementation of IPS. Judging from the efficiency ratios, centralization pays: cooperative groups in Finland, France, and the Netherlands had a much higher Total Capital Requirements (TCR) ratio in the period 2013–2015 than the decentralized networks; furthermore, the leverage ratio was lower in most cases (Table 3.2). As for profitability Return on Equity (ROE), the ratio varies, with negative values being recorded by the Italian BCC group.

There are two cooperative networks in Italy, BP and BCC. The former has a complex governance structure, allowing BP banks to float part of their capital on the exchange, directed towards non-voting members. The reform of the BP group commenced in 2015, with the aim of converting the largest BP banks into classical joint stock companies (MEF 2017). According to Italian Law No. 3/2015, the 10 largest BP, with assets of over € 8 billion, had to demutualize within 18 months. These banks represented 90% of loans, employment, and branches in the group (The Economist 2015). The reform, intended as a remedy for the poor financial condition of these banks, was partially aborted after the 2016 referendum. However, most of the largest BP banks demutualized and the group was consolidated. The reform of the second cooperative network, BCC, commenced in 2016 with the aim of centralizing its 367 banks and creating an IPS-type of arrangement (Banca d'Italia 2016) (Table 3.3).

Table 3.2 Stability ratios for centralized and decentralized cooperative networks, averages for the period 2013–2015 (%)

	Centralized networks			*Decentralized networks*				
	Finland	*France*	*The Netherlands*	*Austria*	*Germany*	*Italy*	*Poland*	*Spain*
TCR	18.2	15.6	21.3	11.1	15.2	14.2	12.8	11.7
Leverage	6.9	5.4	4.9	5.9	7.3	12.5	9.8	8.0

Source: EACB (2017). http://www.eacb.coop/en/cooperative-banks/key-figures.html

Table 3.3 Largest BP (assets, € bn)

Banco Popolare	126.0
UBI Banca	123.2
Banca Popolare dell'Emilia Romagna	60.9
Banca Popolare di Milano (BPM)	48.8
Banca Popolare di Vicenza (BPVI)	46.1
Veneto Banca	37.9
Banca Popolare di Sondrio	33.0
Credito Valtellinese	26.9
Banca Popolare dell'Etruria e del Lazio	12.5
Banca Popolare di Bari	10.4

Source: Scope ratings, 26/01/2015, www.scoperatings.com

In Italy, overall bank performance is poor and the unresolved issue is that of non-performing loans (NPLs), which comprise 16% of the loan portfolio, compared to the EU average of 5.4% in 2016 (Garrido et al. 2016). NPLs are very high in some banks: 23% in Banco Popolare, 35.5% in Monte Dei Paschi, and around 15% in Intesa and Unicredit in the third quarter of 2016 (Businessinsider 2016). GDP growth is also very low: below 1% for the period 2016–2018, according to Moody's forecasts. European Banking Authority (EBA) reports point to low growth and a high NPL ratio as the major threats for the European banks, both characteristic of Italy (EBA 2016).

The SRM became fully operational in Italy on 1 January 2016. The Bank of Italy has been designated the National Resolution Authority. The Bank of Italy unsuccessfully voiced its opposition, in a consultation procedure on the bail-in tool, in the form of a paper to the European Council submitted in March 2013. In the paper, it called for a three-year transition period (till 2018) to allow banks to gradually build up the cushion of liabilities (the MREL) needed to absorb bail-in losses, to be offered to knowledgeable investors. According to the 2016 BRRD rules, the possible future problems with some Italian banks will have to be solved by bail-in, which may be politically difficult as many Italian small investors possess bank bonds, and the members of cooperatives are not interested in participating in bank governance. The Italian government tried to avoid resolution rules as long as possible. In July 2015, during the liquidation process of Banca Romagna Cooperativa, a small Italian mutual bank, shareholders and junior bondholders were 'bailed-in' but did not suffer any loss as the Italian mutual sector's Institutional Guarantee Fund decided to reimburse them to preserve the sector's reputation.

In November 2015, there was a resolution of four small banks: Banca delle Marche, Banca dell'Etruria e del Lazio, Cassa di Risparmio di Chieti, and Cassa di Risparmio di Ferrara, which held a total market share of only about 1% of total deposits. The resolution of these banks was aimed at ensuring business continuity and financial recovery in the interests of the local economies. It fully protected the savings of households and local firms in the form of deposits, current accounts, and ordinary bonds; preserved the jobs of banks' employees; and required no public funding. The banks' cumulative losses were absorbed by the riskiest investment instruments: shares and subordinated bonds. In the resolution process, Italy decided to postpone the entry into force of the bail-in provision until 2016; hence, it was possible to apply only the burden-sharing system. Consequently, only shareholders and subordinated bondholders had to absorb the losses: full bail-in would have required absorption of losses on the part of senior bondholders and unprotected depositors. Each of the four banks was split into 'good or bridge banks' and a single 'bad bank' containing the bad debt of all four banks. The capital of the 'good banks' was reconstituted by the Resolution Fund to the amount of approximately 9% of total risk-weighted assets. The Resolution Fund is administered by the Bank of Italy and is financed by contributions from the entire Italian banking system. A 'bad bank' (not a licensed bank) took possession of all the bad debts remaining after the absorption of the losses. The Resolution Fund also supplied the 'bad bank' with the requisite capital endowment.

Consequently, the Resolution Fund's financial outlays of € 3.6 billion were injected to 'good banks' and € 1.7 billion were used to write down the banks' bad debt and set up the 'bad bank'. The liquidity required for the rescue was advanced by three major banks: Intesa, Unicredit, and UBI. The rescued banks voluntarily set up a fund that will be attached to the national deposit insurance scheme to compensate a large number of retail investors that were bailed-in and the State sustained no direct cost in the process. The entire cost was initially borne by the four banks' shares and subordinated bonds but ultimately by the Italian banking system as a whole through its contributions to the Resolution Fund (Morello 2016).

To resolve rescue issues applicable to larger banks, a special fund was created in 2016: the *Guarantee on Securitization of Bank Non-Performing Loans* (GACS) provided with governmental guarantees and supported by the Atlante (Atlas) bank-finance fund. So far, the fund has recapitalized two large banks belonging to the BP network (Banco Popolare di Vicenza (BPVI) and Veneto Banca), which were unable to recapitalize from private

sources. The Veneto banks had been operating in the Veneto region in Northeast Italy and both have been directly supervised by the ECB since 2014. As of the end of 2016, they were Italy's 10th and 11th largest banks by assets. As a result of 2015 law, the banks demutualized. Veneto Banca S.p.A. changed from a cooperative society to a limited company. Following a failed stock market listing in June 2016, it was taken over by the Atlante bail-out fund, which has prevented its resolution. Both BPVI and Veneto Banca became insolvent again in 2017, having lost 44% of their deposit base between June 2015 and March 2017 (The Economist 2017). On 23 June 2017, the ECB and the SRB determined that both BPVI and Veneto Banca were insolvent, but they did not fulfil the criteria to put them in resolution. Consequently, they have been liquidated under Italian insolvency law, at an estimated cost of € 17 billion. These banks have a serious impact on the real economy in their region; hence, the Italian government informed the EU Commission of its plans to grant State aid to wind down BPVI and Veneto Banca, that is, to sell parts of the two banks to Intesa, including the transfer of employees. Specifically, the Italian State has granted cash injections of about € 4.8 billion and state guarantees to a maximum of around € 12 billion, mostly on Intesa's financing of the liquidation mass. The European Commission approved the State aid to Intesa, and the good assets of the failing banks (performing loans, financial assets, deposits, and senior debt) were sold to Intesa Sanpaolo for € 1, the rest being put into a 'bad bank' with the bail-in of equity and subordinated shareholders. As part of the 'bail-in' rule, the Atlante fund (with Intesa San Paolo and Unicredit as the two main shareholders) and other shareholders and subordinated bondholders would receive nothing. Moreover, Intesa has announced that, together with Unicredit, it will jointly set up a fund to repay the bonds that were held by small investors (EP 2017).

To conclude, the Italian banking system had spent over € 4 billion in mandatory contributions to the resolution of 4 small banks between 2015 and 2017 and 'invested' over € 4 billion in the Atlante rescue fund to deal with the bad debt of the Veneto banks. Both cases have raised the question of how to deal with retail bondholders. The two Venetian banks were supposed to be healthy after Atlante recapitalized them in 2016, but they were not. If the resolution procedures had been applied, it would have required bailing in senior bondholders, which in the Italian case includes a large number of retail clients. Intesa San Paolo solved the problem by buying the 'good' parts of the two Veneto banks for a symbolic sum of

€ 1. All the NPLs, equity, and junior debt were bailed-in. Equity was mostly held by the Atlante fund, junior bondholders—around 200 million—were bailed-in but will be reimbursed (Merler 2017).

7 Conclusions

The 2007–2009 financial crisis has revealed a number of issues related to failing banks such as the absence of resolution strategies and plans, the lack of designated authorities capable of dealing with failing banks, and the absence of cross-border coordination. In response to the identified problems and following recommendations from global regulatory bodies, the EU has undertaken a number of initiatives aimed at creating a comprehensive resolution framework. The new laws provide the EU with a strong foundation for effective resolution. The framework is built on resolution authorities that received the mandate and tools to execute resolution strategy and plans. Resolution mechanisms ensure proper funding and should in theory result in no or minimum use of taxpayers' funds. However, a number of challenges have emerged, as the resolution process is a result of cost-benefit optimization and resolution decisions must balance the interests of various stakeholders (Dermine 2017; Dewatripont and Freixas 2011).

The resolution process based on the bail-in tool was applied in the case of SNS Reaal Bank in the Netherlands—under domestic law—before the European procedures based on the BRRD were accepted. The example of SNS demonstrates that even if stakeholders absorbed some of the failing bank's losses, the need to draw on public funds was not eliminated.

Table 3.4 Deposits and bonds issued by Italian banks: (a) billions of euro, (b) % of household wealth

	Bank debt instruments		*Subject to bail-in*				*Not subject to bail-in*					
			Subordinated bonds		*Senior unsec. Bonds*		*Dep. above € 100,000*		*Dep. below € 100,000*		*Senior covered bonds*	
	a	*b*	*a*	*b*	*a*	*b*	*a*	*b*	*a*	*b*	*a*	*b*
2008	994	**26.4**	27	**0.7**	330	**8.7**	183	**4.9**	454	**12.0**	0.0	–
2011	1017	**28.6**	25	**1.0**	341	**9.6**	184	**5.2**	457	**12.9**	0.4	–
2015	921	**22.9**	29	**0.7**	173	**4.3**	225	**5.6**	493	**12.3**	0.1	–

Source: Bank of Italy, FSR, 2016/1

However, the total State aid was undoubtedly lower than it would have been in the case of not implementing the bail-in mechanism. In Italy, about one-third of bank bonds are held by households, so even a limited bail-in can have painful consequences (Jassaud and Kang 2015). Investors that suffer as a result of bail-in, who, in the case of Italy largely correspond to households (Table 3.4), find little comfort in the fact that they are protected as taxpayers.

As the Italian case demonstrates, inventing ways to limit the social costs of resolution may lead to a systemic risk. To safeguard economic and social stability in Italy, privately owned funds, mostly owned by banks, were created to compensate bailed-in stakeholders and protect some small Italian banks from full application of resolution procedures. However, the possible consequence is the creation of a systemic risk of transmitting the risk to the industry as a whole. Hence, there are voices calling for greater flexibility in applying the resolution tools, particularly the bail-in rule (Micossi et al. 2014). The BRRD was designed for large, systematically important banks and extending all tools and procedures in a rigid manner to the banking industry as a whole, including local and regional banks and their networks, may create a number of unresolved political and social issues.

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CHAPTER 4

Market Risk Disclosure in Banks' Balance Sheets and the Pillar 3 Report: The Case of Italian Banks

Enzo Scannella

1 Introduction

The topic of this chapter is market risk reporting in banking. Market risk is the risk of losses in on- and off-balance sheet positions arising from movements in market prices. In recent years, market risk has become increasingly important in banking. The role of market risk disclosure in today's banking business is enormous and has been accentuated during the ongoing financial crisis.

The main purpose of this chapter is to provide a methodology to assess the qualitative and quantitative profiles of market risk disclosure in banking. A hybrid scoring model based on analytical grids is used to assess the ability of banks to provide an adequate market risk disclosure. This chapter presents an empirical study on market risk disclosure on a sample

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of Italian banks. The study investigates market risk disclosure in banking with reference to the International Accounting Standards/International Financial Reporting Standards (IAS/IFRS), the Pillar 3 disclosure requirements of the New Basel Capital Accord, and the national regulatory framework for banks' annual financial statements.

Bank risk disclosure plays a pivotal role in strengthening market discipline and building trust in stakeholder relationships. Providing an adequate risk disclosure statement is indispensable for stakeholders to be able to assess potential risk and return linked to investment opportunities and evaluate the ability of the bank's management to create value in the banking business. In order to do so, an adequate flow of information on bank risk exposures cannot remain within the boundaries of a banking firm or a financial authority but should be made available to all stakeholders and, to a broader extent, to the financial markets. Bank stakeholders use risk report information when making decisions that affect financial stability. The proper functioning of financial markets relies on well-distributed information, and the bank's risk disclosure statement may be considered to be the instrument that regulates this setting.

The growing complexity of banking—especially that of larger, multibusiness, and multinational banks—reduces the ability of stakeholders to assess and evaluate prudent, safe, and sound banking practices. The presence of hugely asymmetric information makes it difficult for stakeholders to monitor and evaluate the levels of risk assumed by bank managers. Today's investors are more sensitive to the complexity and opacity of banks' risk profiles. In this respect, investors and other stakeholders are demanding improved access to information on risk exposures in the banking industry. Banks are subject to stricter market discipline and the enhancement of bank risk disclosure statements will contribute to broader-ranging financial stability. Adequate and effective transparency of banks' risk profiles also strengthens confidence in the banking industry by reducing uncertainty in the assessment of banks. The risk disclosure statement has strategic importance for the efficiency of financial markets and overall financial stability. This explains the outstanding role of risk disclosure in capital market mechanisms.

The structure of this chapter is as follows. Section 2 provides the theoretical foundations of risk disclosure in banking, providing a brief discussion of the theories that examine notable aspects of risk disclosure. Section 3 introduces market risk disclosure in banking. It aims to provide

a framework for the specific nature of market risk, as well as a regulatory and accounting perspective of market risk in banking. Section 4 presents a hybrid scoring model based on analytical grids of risk disclosure parameters to assess market risk disclosure in banking. The study is conducted on a sample of the ten largest Italian banks. Section 5 analyses the main results of the empirical research on market risk disclosure in banking and discusses the research findings, as well as the potential implications, while Sect. 6 presents the conclusions drawn.

2 Theoretical Foundations of Risk Disclosure in Banking

Risk disclosure in banking is a complex issue that has significant implications at both the microeconomic and macroeconomic level and with respect to the economics and management of the bank, the economics of financial markets, the competitive dynamics and structure of the banking industry, the purpose of banking supervision and regulation, the regulators' policy of bailing out banks, and the content of accounting rules. For the purpose of this chapter, the main theoretical foundations of risk disclosure in banking are examined next.

2.1 Asymmetric Information Theory

The *Asymmetric Information Theory* sets the fundamental theoretical basis of risk reporting in banking and the functioning of the markets. It is a starting point for a comprehensive theory of disclosure. Asymmetric distribution of information can lead to the disappearance of a market due to Akerlof's description of "lemon markets" (Akerlof 1970). Almost all kinds of markets are characterized by different degrees of information asymmetries. Asymmetric information exists when some—or all—of the participants in an economic exchange do not have perfect knowledge or where knowledge is asymmetric. This means that the market participants are not able to correctly evaluate goods, services, financial instruments, or, in a wider perspective, firms. Within the context of banking firms, the existence of asymmetric information causes a number of problems: adverse selection, moral hazards, and market failure.

The asymmetric information theory has highlighted the strategic importance of accurate and effective risk reporting in banking for the effi-

ciency of financial markets and overall financial stability. As a result of the existence of asymmetric information, stakeholders suffer from important limitations and distortions in bank risk assessment, which also affect investors' willingness to fund banks' assets. Investor's uncertainty regarding the situation of the bank could lead to misallocation of financial resources, a reduction in financing activities, and, in the worst case scenario, the disappearance of the market.

Information asymmetries can be observed in the context of inside and outside stakeholders, who do not have the same amount of information. From this perspective, bank managers (inside stakeholders) have deeper knowledge about the risks that might affect future results in comparison to depositors, investors, and other outside stakeholders. Consequently, disclosing more about banking risks will result in a reduction in information asymmetry. An accurate assessment of a bank is facilitated through disclosure of information on risk positions. The final goal of risk reporting should be that of disclosing a satisfactory amount of qualitative and quantitative information to stakeholders. Disclosure to the market of this kind of information allows stakeholders to properly assess the bank's risk exposure profiles. The underlying assumption of information asymmetry implies there is a significant relationship between the market valuation and the risk assessment of a bank and its disclosure quality. Within this interpretation, the primary role of risk disclosure in banking is to provide accurate information to market participants on a timely basis.

The existence of asymmetric information is a structural condition of any financial market or firm. From this perspective of analysis, the voluntary and mandatory disclosure of information among market participants will reduce information asymmetry and its negative impact on markets. Information asymmetry reduction is a vehicle to integrate the efficiency of markets. Nevertheless, as pointed out by Grossman and Stiglitz (1980), such information asymmetry can only be reduced, though not entirely eliminated.

2.2 Agency Cost Theory

Another theoretical perspective on risk reporting in banking is offered by the *Agency Cost Theory* (Fama 1980; Fama and Jensen 1983; Jensen and Meckling 1976; Ross 1973), which proposes methods to improve the relationship between principal and agent in a context of asymmetric distribution of information. Jensen and Meckling's corporate governance

model is based on the principal-agent problem and the control of agency costs. It can be traced back to the seminal paper by Berle and Means (1932) that assigned a pivotal role to agency problems in corporate finance.

The agency problem arises due to the difference in interest between a principal and an agent. Applied at a corporate level, the negative potential consequences of the agent's actions can be reduced by improving the principal's knowledge. Risk disclosure on a voluntary and mandatory basis offers an opportunity to reduce information asymmetry and the divergence of interests (principal-agent problems). From this perspective, risk disclosure in banking is an incentive device (Milgrom and Roberts 1992) to align divergent interests and offers an opportunity to improve the functions of screening, selection, and monitoring (Diamond 1984) performed by depositors, investors, and other stakeholders. Disclosed information can be taken into account in their decision-making process. Risk disclosure also provides the opportunity to signal the quality and attractiveness of a banking firm, compared to other competitors in the industry. In other words, risk disclosure performs a signalling function for the market (Leland and Pyle 1977; Ross 1977).

In order to achieve this purpose, the agents (bank management) have to publish reliable information about banking activities and their risk profiles. Consequently, a minimum level of risk disclosure has to be established; otherwise, the quality and content of risk disclosure are affected by the "firm-specific" principal-agent problem and the dynamics of the demand and supply of disclosure in the economics of the banking firm.

2.3 Transaction Cost Economics

A third stream of research that sheds light on risk disclosure is that of *Transaction Cost Economics*, which can be traced back to Williamson (1975, 1985), who developed the concept of "transaction cost" originally formulated by Coase (1937). The literature has identified different types of transaction costs: search costs, selection costs, performance costs, and monitoring and auditing costs. Transaction costs are the 'cost of using' market mechanisms and are linked to the following drivers: uncertainty, bounded rationality, frequency, and information asymmetry. Higher uncertainty, bounded rationality, and information asymmetry increase transaction costs and opportunistic behaviour, which can lead to the disappearance of a market. From this perspective of analysis, risk disclosure can reduce the

transaction costs of using the market by reducing information asymmetry and uncertainty. By satisfying the disclosure demand of stakeholders, banks can reduce the transaction costs that arise from information asymmetry and uncertainty (linked to a lack or poor level of information disclosure).

2.4 Information Cost Theory

The *Information Cost Theory* likewise provides a valid perspective of analysis of disclosure in banking. This theory focuses attention on the balance between the costs and benefits of information disclosure. Cost-benefit analysis of information disclosure contributes to explaining the bank's strategy with respect to collecting and publishing information on banking activities. Cost-benefit analysis can be applied to voluntary and obligatory information disclosure (Dye 1986; Verrecchia 1990, 2001). Several factors influence the relationship between the costs and benefits of information disclosure. Costs may be direct or indirect: direct costs are linked to the process of collecting and publishing information, while indirect costs are related to the potential change in the behaviour of market participants with regard to the availability of information about the bank. These costs vary with the characteristics of banking activity; the size and complexity of the bank organization; economies of scale; the nature of the data; the available technology to collect, process, and publish information; the internal and external auditing processes that support the publication of credible information; and regulatory and legal constraints. The benefits of information disclosure are linked to the different objectives that banks pursue through the publication of information. These benefits can be listed as follows: improving the bank's reputation and corporate image; increasing and ensuring public confidence in the banking firm; meeting legal and regulatory requirements; reducing uncertainty and information asymmetry among investors, depositors, and other stakeholders; increasing the market value and attractiveness of the bank at the investor level; decreasing financing costs and the cost of equity capital; increasing corporate social responsibility; and obtaining a desired rating from rating agencies.

The theoretical framework assumes that a bank performs a cost-benefit analysis in order to decide on an appropriate level of information disclosure. This is a simplistic assumption, as the corporate decision on information disclosure is more complex and cannot be viewed solely from the information cost perspective. However, the information cost theory sheds

light on the various drivers that affect the cost-benefit trade-off of the information disclosure and, ultimately, on the private incentives of banks to disclose information. In brief, the theory contributes to establishing a private incentive scheme to explain voluntary and obligatory disclosure in banking.

2.5 Resource and Knowledge-Based Theory

Another useful theoretical framework is the *Resource and Knowledge-based Theory of the Firm* (Barney 1991; Grant 1991, 1996; Nelson and Winter 1982), which focuses on those factors that enable firms to gain a competitive advantage. It provides useful insights to analyse information disclosure behaviour in banking. Information disclosure can be interpreted within the broader-ranging processes of knowledge acquisition, combination, and creation that are the reasons why a firm exists. From this perspective, information disclosure can be seen as a strategic factor of competitiveness, that is, a competitive advantage that is difficult to imitate. This strategic approach emphasizes the ability of a bank to meet stakeholder demand for disclosure. The fulfilment of these expectations can be interpreted as an invisible asset (Itami 1987) and a durable competitive advantage in the economics and management of a banking firm.

2.6 Stakeholder Theory

Following Freeman's *Stakeholder Theory* (1984), risk disclosure in banking can be interpreted as a means to satisfy the expectations of different stakeholders, both internal and external. Several stakeholders act in banking, having different roles, interests, influence, and relevance for the banking business. They are not homogenous groups with a full alignment of interests. From the stakeholder theory perspective, risk disclosure in banking can be analysed in terms of the degree to which a bank meets the demands of multiple stakeholders. It implicitly recognizes the fact that the interests of the various stakeholders can hardly be satisfied with the same intensity. As previously pointed out by Amaduzzi (1957), a normal "conflict" exists among the several stakeholders' expectations. From this perspective, information disclosure has the function of reconciling the non-homogeneous interests of different stakeholders. It legitimizes not only voluntary disclosure and the differentiation of the ways of communicating with stakeholders but also the implementation of regulatory minimum requirements

regarding information disclosures, particularly risk disclosure. Regulation and the legal environment have a significant influence on the disclosure of voluntary information.

The combination of the stakeholder theory and the resource and knowledge-based theory provides a strategic approach to the analysis of risk disclosure: the different demands of stakeholder groups are relevant and the fulfilment of their expectations can give rise to competitive advantages.

2.7 Communication Perspective

From a *communication perspective* of analysis, information disclosure can be interpreted as a "system of symbols" that aims to show the company's situation and performance. This perspective can be originally traced back to the seminal paper by Ceccherelli (1939). Analysing information disclosure from this perspective implies the recognition of a relevant communication purpose. It highlights the importance of the ways in which the information content has to be communicated to stakeholders. Nowadays, the recent literature recognizes and interprets information disclosure as an essential instrument of economic and financial communication to a wide variety of stakeholders. The combination of the communication and strategic perspectives of analysis highlights the importance of corporate disclosure not only as an instrument of corporate value communication but also of corporate value creation.

2.8 Efficient Market Theory and Financial Stability

Another theoretical approach that plays a crucial role in the comprehensive understanding of risk disclosure in banking is the *Efficient Market Theory* (Fama 1970; Fama and Laffer 1971). Although the efficient market hypothesis is a question of debate in the economic and financial literature, this perspective clarifies the effects of company disclosure on financial market informational efficiency. It provides a theoretical approach to examine how financial market mechanisms are linked to corporate disclosure and how market participants deal with available information. According to Fama's hypothesis of weak, semi-strong, and strong efficiency, the availability of information influences market prices. The application of this approach leads to the conclusion that the risk assessment of investors

(and other stakeholders) is affected by corporate disclosure and risk disclosure in particular. Limited disclosure regarding banks' risk exposures contributes to the mispricing of risk and misallocation of capital. Financial markets function efficiently when participants have information that facilitates the accurate pricing of assets and risk, which will consequently be reflected in share prices, funding costs, and investors' decisions.

From a macroeconomic point of view, corporate disclosure reduces asymmetric information in the financial markets and contributes to removing obstacles that prevent market discipline. A logical consequence of this assumption is that the market should exercise a reasonable degree of discipline over bank management. Market discipline addresses issues of corporate transparency. The imperfect observability of bank risk profiles means that market discipline cannot perform well. This could be crucial for allowing potential investors to take rational and conscious economic decisions. Regularly publishing credible corporate information, on a voluntary and obligatory basis, reduces information asymmetries between corporate entities and their stakeholders, contributes to increasing the efficiency of market discipline, and, from a wider viewpoint, to increasing the allocative efficiency of the market. The quality of disclosure in banking is central to the efficacy of market discipline and non-market mechanisms in limiting banks' development of debt and risk overhangs and in mitigating the adverse consequences for the stability of the financial system (Acharya and Richardson 2009). Frankly, there is no consensus among researchers. An ongoing debate exists in the literature regarding whether bank opacity increases financial instability. The traditional view is that financial stability is positively affected by increasing publicly available information about banks' exposures and relevant economic conditions. Risk disclosures contribute to financial stability by providing investors and other market participants with a better understanding of banks' risk exposures and risk management practices (Acharya and Ryan 2016; Nier and Baumann 2006). Risk disclosure enables stakeholders to make informed decisions about the bank and such informed decisions discipline the bank's activities. Furthermore, high-quality risk disclosures should be viewed as a collective public good, given the systemic importance of banks (Financial Stability Board 2012). From the opposing viewpoint, bank opacity may be necessary to reduce the probability of bank runs that destabilize the bank and compromise financial stability.

The various research papers briefly examined earlier provide the main theoretical approaches to study and examine risk disclosure in banking. However, the complexity of corporate disclosure behaviour and the various potential determinants that might influence corporate disclosure cannot be fully explained within a single Conceptual Framework. Individual studies cannot fully describe and interpret such a complex issue. This complexity prompted the preceding outline of the most significant theoretical approaches that should be considered for research in the field of risk disclosure. The knowledge to be gained from the theories summarized earlier is presupposed in the context of this study. In the subsequent sections, I discuss market risk disclosure in banking in greater detail and describe the research design employed.

3 Market Risk Disclosure in Banking: Definition and Regulatory Framework

Market risk is one of the most important risks in the economics of banking. It is defined by the Basel Committee on Banking Supervision (1996) as "the risk of losses in on- and off-balance sheet positions arising from movements in market prices". This definition has been incorporated into the New Bank Capital Accord (Basel Committee on Banking Supervision 2006). Market risk thus indicates the market value fluctuation of an instrument or portfolio of financial instruments. It includes the risk associated with trading and non-trading portfolios. Hence, market risk is the result of changes in market factors that affect the value of banks' positions, such as interest rates, foreign exchange rates, share prices, commodity prices, and credit spreads. This empirical study adopts this broad definition of market risk.

Market risk in banking has taken on a great deal of importance in recent decades. It has become increasingly important to measure, manage, assess, and disclose the impact of market risk in the economics and management of banks. The growing securitization of financial systems, volatility of financial markets, internationalization of banking activity, financial uncertainty, size of banks and their trading portfolios, and the evolution of trading and risk management practices are increasingly important factors to be reflected in market risk disclosure. The ongoing financial crisis and the recent adoption of a bail-in regime in the European bank resolution regulation have enhanced the importance of overall risk disclosure in banking.

Market risk disclosure can be defined as the publication issued by the bank of reliable, meaningful, understandable, and timely qualitative and quantitative information that enables users to make an accurate assessment of its market risk exposures, risk management practices, and the impacts of these factors on the bank's performance. The disclosure of reliable, updated information on the bank's market risk exposures is the prerequisite to trigger the sequence of conditions that allows financial markets to fulfil their role of discipline effectively, in the sense that the market prices the risks of the bank more efficiently.

From this perspective of analysis, there is essentially a trade-off problem to be considered in dealing with market risk disclosure in banking: the trade-off between transparency and opacity. This implies that there are some pieces of information that are kept confidential within the boundary of a bank to preserve proprietary information and avoid speculative attacks or predatory behaviour on the part of stakeholders. In other words, it is the trade-off between the right of stakeholders to know whether the market risks their bank is exposed to are tolerable or not and the interest of a bank in avoiding disclosing details on market risk exposures in order not to undermine its competitive position, as some information might give competitors an advantage. From the economic efficiency point of view, all the information about market risk in banking should be publicly available, but from the bank's competitiveness point of view, there might be a need to keep certain information confidential.

This is the main reason why financial regulation imposes a number of minimum disclosure standards and transparency constraints in an attempt to balance this trade-off. The problem is complicated even more by the fact that banks' managers may have incentives to avoid regulatory constraints and accounting rules. Due to their more extensive power and information, bank regulators are generally in a better position than other stakeholders to overcome these difficulties.

The regulatory framework concerning market risk reporting in banking can be split up into three main parts: the requirements of the IAS/IFRS, the national regulatory framework for banks' annual financial statements, and the requirements of the Basel Capital Adequacy regulation. Most European banks have to draw up their financial statements in accordance with IAS/IFRS. Their main role is to enhance the comparability of banks' financial statements across space and over time. Unfortunately, the level of comparability across space is affected by national regulations, which differ slightly from one country to another.

Banks disclose many useful pieces of information about market risk in their financial statements, particularly in their Notes to the account. It is important to clarify that Notes to the account are characterized by a quantitative and qualitative approach that aims to integrate and complete the bank's balance sheet and income statement. The part which discloses the most valuable pieces of information about market risk is "part E". This part provides information on the different risk categories (credit risk, market risk, liquidity risk, and operational risk), the methodologies and models used to measure banks' risk exposures, and the hedging practices related to these exposures.

The Basel Capital Adequacy regulation provides a set of requirements for banks. Its main objective is to make the event of a bank bankruptcy less likely. In order to pursue this aim, the Basel Committee for Banking Supervision (2006) created a three-pillar regulatory framework. In particular, Pillar 3 represents a very important piece of regulation for market risk reporting. It aims to remove obstacles that prevent market discipline and inform the market about a bank's market risk exposures. In fact, the main aspect of this pillar is the requirement for banks to disclose better information about the risks they face and the ways they allocate the capital necessary to deal with stressed market conditions. The market discipline of Pillar 3 addresses the issues of transparency in banking.[1]

It should be noted that the time horizon of the present study runs from 2012 to 2015. This is the reason why the recently revised Pillar 3 disclosure requirements that have taken effect from year-end 2016[2] are not taken into account here. The next section presents the research design employed in the study.

[1] This pillar requires banks to prepare a Pillar 3 disclosure report. It gives banks the possibility to disclose a wide range of information on market risk, from both a quantitative and a qualitative point of view. Compared to the past, the new financial regulation requires banks to meet further disclosure standards, but this might not be sufficient to achieve the objective for which the greater disclosure has been requested, that is, the drive for an effective market discipline.

[2] The most significant revisions, with respect to the previous Pillar 3 disclosure requirements, relate to the use of templates for quantitative disclosure accompanied by definitions, some of which have a fixed format. The Basel Committee on Banking Supervision expanded risk disclosure requirements in order to promote consistency of reporting and comparability across banks and enhance market discipline. These requirements may increase the transparency of the information available to market participants and thus market discipline.

4 An Empirical Study on Market Risk Disclosure in Banking: Research Design

This section aims to examine the sample, time horizon, and methodology proposed here to evaluate market risk disclosure in banking. The *sample* of this research is made up of the ten largest Italian banks as regards book value of total assets (Table 4.1), most of which are listed on the Italian stock exchange. The sample represents approximately 60% of the Italian banking industry in terms of total assets (year 2015). This country-specific sample will reduce the difficulties in generalizing the findings obtained by analysing data that are affected by homogenous regulatory and accounting frameworks and facilitate comparability across banks. The *time horizon* of this research runs from 2012 to 2015. The aim is to understand whether a bank is characterized by a good level of comparability over time (for the same bank over different years) and across space (between different banks in the same year). Therefore, the analysis takes into account both cross-sectional data and time series data. This methodology enables capturing a much higher degree of information than a purely historical or cross-sectional approach. Qualitative and quantitative *data collection* derive from the meticulous analysis and evaluation of the three most important risk disclosure reports: the *Notes to the account* and *Management Commentary* from the Annual Report and the Basel Capital Accord's *Pillar 3 report*. These reports, all of which are available to the public, were

Table 4.1 Sample description

Bank	*Total assets (2015) (in million euro)*
Unicredit	860,433
Intesa Sanpaolo	676,496
Monte dei Paschi di Siena	169,011
Banco Popolare[a]	120,509
UBI Banca	117,200
Banca Nazionale del Lavoro	77,494
Mediobanca	70,710
BPER Banca	61,261
Banca Popolare di Milano[a]	50,203
Banca Popolare di Vicenza	39,783

[a]On 1 January 2017, the two former groups Banco Popolare and Banca Popolare di Milano merged to become Banco BPM Group

downloaded from the banks' official websites. In particular, the main focus regarding the *Notes to the account* is on "Part E". Nevertheless, other parts are also taken into account whenever they disclose useful information about market risk. This study analyses the text of the narrative and not narrative risk disclosure.

Data were collected via the application of qualitative and quantitative *content analysis* on the published disclosure reports. I reviewed market risk disclosure in the annual reports and *Pillar 3 reports* of the ten banks from 2012 to 2015 and, subsequently, constructed a disclosure quality index. A scoring model based on analytical grids was used for this purpose. In order to attenuate the subjectivity that affects this kind of analysis, I split the scoring model into two parts: the first is based on an objective evaluation and the second on a judgemental approach. The final result is a hybrid scoring methodology that incorporates the evaluation of key qualitative and quantitative information using an objective and subjective evaluation approach. This supports the adequateness of the scoring model used to this end.

4.1 The Scoring Model

In greater detail, the first part of the scoring model is not influenced by any subjective evaluation. The analytical grid used for this purpose was developed by focusing on twenty meaningful market risk disclosure indicators (Table 4.2). These are key disclosure parameters, measures of market risk exposures (both backward looking and forward looking), and key information on market risk methodologies that have been used by banks. Those indicators that are mandatory to disclose have been excluded. In fact, the mandatory information is bound to be disclosed in one of the bank's documents and almost every parameter would get a score of 1 in this aspect; therefore, it would be useless doing something like this now. Obviously, this way of reasoning will be reversed in the second part of the scoring model, in which certain pieces of mandatory information will also be analysed from a qualitative point of view. The risk disclosure indicators were evaluated via the application of a binary scheme. Each indicator is assigned a score of "1" or "0": 1 means that the bank is disclosing the information; 0 means that the information is not disclosed.

The second part of the scoring model is based on a judgemental approach. The analytical grid used for this purpose was developed by focusing on several key disclosure parameters that drive the quality of

Table 4.2 First part of the scoring model: the analytical grid of market risk disclosure indicators (score 0, 1)

Market risk definition
VAR (*value at risk*) definition
ES (*expected shortfall*) definition
Back testing definition
Average VAR[a]
Average ES
VAR at the end of the year[a]
Limitations of VAR
Limitations of ES
Explanation of VAR models used
Explanation of back testing models used
Presence of graphs about annual VAR fluctuations
Stress testing explanations
Stress testing results
Market risk level of aggregation reported[b]
Risk-adjusted performance indicators
Market risk exposure limits
Market risk tolerance
Scenario analysis
Expected value fluctuations of assets and liabilities

[a]The disclosure of this information is mandatory only for banks that use internal models to measure market risk, in accordance with the Bank of Italy (2006), *Nuove disposizioni di vigilanza prudenziale per le banche. Circular n. 263*, p. 631. This is the reason for including these two indicators in the first part of the scoring model

[b]This indicator will return a score of "1" if at least two of the following market risk levels of aggregation are reported: aggregation for type of financial instrument, aggregation at the portfolio level, aggregation at the country level, aggregation for type of market risk factor, and aggregation for each company of the group

market risk disclosure in banking (Table 4.3). Different determinants of corporate disclosure are used to explain the reporting activities. As shown in Table 4.3, these parameters are grouped into the following subcategories: key aspects of market risk disclosure, market risk management decision disclosure, market risk types disclosure, securities portfolios disclosure, specific disclosure issues, and general disclosure issues. As to the evaluation of these key information parameters, they are assigned a score from "0" to "5", according to the following scheme:

- severe lack of information disclosure: score 0;
- very poor information disclosure: score 1;
- unsatisfactory information disclosure: score 2;

- satisfactory information disclosure: score 3;
- good information disclosure: score 4; and
- excellent information disclosure: score 5.

The detailed examination and evaluation of the different disclosure parameters (and the subsequent assignment of a score) will be carried out taking into account the following qualitative features: comprehensibility, relevance, comparability, reliability, and materiality. The score is assigned to each key disclosure parameter after having analysed and evaluated the

Table 4.3 Second part of the scoring model: the analytical grid of market risk disclosure indicators (score 0–5)

SECTION A: Key aspects of market risk disclosure
Explanation of market risk management strategies
Explanation of market risk management goals, procedures, processes, and policies
Explanation of market risk measurements
Explanation of market risk control systems
SECTION B: Market risk management decision disclosure
Information on market risk assumption and retention
Information on market risk prevention and protection
Information on market risk transfer
Information on market risk elimination and avoidance
SECTION C: Market risk types disclosure
Exposure to interest rate risk (*entire balance sheet*)
Exposure to interest rate risk of trading and banking book
Exposure to currency risk
Exposure to price risk (bonds, shares, and derivatives portfolios)
Model risk
Interdependence among different types of risks
Market risk aggregation and methodologies
SECTION D: Securities portfolios disclosure
Segmentation of securities portfolios
Derivatives: instruments, measurements, and strategy
Volatility measures for portfolios of securities
SECTION E: Specific disclosure issues
Organizational aspects of market risk management
Capital adequacy for market risk (*regulatory perspective*)
Economic capital for market risk (*internal and managerial perspective*)
Accuracy of VAR models
SECTION F: General disclosure issues
Backward-looking information (disclosure)
Forward-looking information (disclosure)
Provision of an integrated perspective on market risk

information published in the risk disclosure reports, with particular reference to the aforementioned qualitative features. This will improve the scoring model significantly. These qualitative characteristics are outlined in the Conceptual Framework for IAS/IFRS by the International Accounting Standard Board and the Financial Accounting Standards Board (2010). These qualitative features of banks' financial statements are extremely important for market risk reporting purposes. I assume that an appropriate balance among such qualitative characteristics of information is crucial to provide a faithful and effective market risk disclosure to stakeholders.

In order to provide an in-depth explanation of the methodology, the aforementioned qualitative characteristics must first be defined and illustrated. *Comprehensibility* refers to the fact that the information should be presented as clearly as possible, so as to make it easy to understand, with an appropriate balance between qualitative and quantitative information. It refers to the capability of the reader to comprehend the appropriate meaning of the text. However, *readability* refers to the ease of understanding of a text and was considered as an indicator of comprehensibility. A narrative explanation of the main implications of a bank's market risk profiles is necessary in order to benefit not only sophisticated users but also less specialized ones. Descriptions and terms should represent the substance of a bank's activities, operations, processes, and procedures fairly and how a bank identifies, measures, and manages market risk. Market risk reporting should be well organized, so that key information is prioritized and easy to find, and should be supplemented by the main underlying assumptions and a sensitivity or scenario analysis so as to demonstrate the effect on selected risk exposures or metrics of variations in these main underlying assumptions. Such information comprehensiveness enables stakeholders to gain an understanding of a bank's market risk position and market risk management operations.

The information is *relevant* to the decision-making process of stakeholders when it helps them to assess the expected risks of and returns on investments. It also has to show sufficient details to enable stakeholders to understand the nature and extent of a bank's market risk exposures, its risk appetite, the manner in which it manages its market risks, including stress conditions, and the changes in the bank's risk profile that have occurred from one reporting period to another. It is not always the case that the more information a bank discloses, the better off the potential investor will be. Sometimes, certain pieces of information confuse users. This is the reason why it is necessary to disclose all the necessary information for users

to take their decisions, not just superfluous information. What is important is the significance of the information for a proper assessment of risk profiles inherent in various banking activities.

Comparability over time and space is a crucial condition to provide meaningful comparisons of market risk profiles between different banks. The comparability of bank disclosures, both across banks and over time, has been recently enhanced by the process of harmonization of the accounting languages that has commenced with the IAS/IFRS and the worldwide spread of basic measures of market risk, such as Value at Risk. Financial analysts and investors can use Value-at-Risk disclosures, for instance, to compare the risk profiles of banks' trading portfolios. Comparability is affected by the fulfilment of the consistency principle. Changes in risk practices, measurement methodologies, accounting, and regulatory requirements may noticeably attenuate information comparability over time and across space.

Information is reliable (*reliability*) in the sense that it reflects the economic substance of events and transactions, and not merely their legal form, and is verifiable, neutral, prudent, and complete in all material respects. In some instances, mainly for forward-looking information, banks may balance relevance and reliability. Moreover, given the fact that banks rapidly change their market risk profiles, timelines are critical for reliability.

Information is material (*materiality*) if its omission or misstatement could change or influence the decision or assessment of a stakeholder relying on that information. Accordingly, banks should avoid disclosing immaterial or redundant information that does not add value to existing information or reduce uncertainty among users.

A crucial consideration of the content analysis based on a hybrid scoring model is that both qualitative and quantitative data are examined. The first part of the methodology deals with just a small subset of quantitative and qualitative data (such as the definition of market risk, the definition of VAR, etc.), whereas the second part deals with both qualitative and quantitative data that are not analysed in the first part and evaluates such data using a judgement-based scoring model linked to some qualitative features of risk reporting. Consequently, the evaluation process is much more complex in the second part of the methodology.

As to the first part of the scoring model, the maximum score a bank can obtain is 20. In the second part of the scoring model, the maximum score is 125. A weighting scheme is used to give different weights to the two

parts of the scoring model, assigning a weight of 0.4 to the first part and a weight of 0.6 to the second part. Within the second part of the scoring model, every section has equal weight. Lastly, the summed weighting scores were rescaled in order to express the final score (disclosure quality index) on a 0–100-point scale. These normalized scores equate raw scoring gathered via different measurement techniques. The use of a common scale makes more sense when interpreting the sum of scores in a scoring model.

4.2 A Comparison to Other Methodologies

In order to better appreciate the methodology proposed here to evaluate risk disclosure, it is useful to compare it to other methodologies proposed by other researchers. The relevant literature on evaluating risk reporting in banking can be divided into two major categories: academic research (Beattie and Liao 2014; Core 2001; Dowd et al. 2008; Healy and Palepu 2001; Kissing 2016; Linsley and Shrives 2005; Linsley et al. 2006; Ryan 2012; Verrecchia 1990, 2001; Woods et al. 2009) and research conducted by audit firms, standard setters, and financial policymakers.[3] Furthermore, academic research is mainly characterized by two methodological approaches. According to the first, a purely objective approach is sufficient. Certain indicators are identified that should be able to capture all the information necessary to evaluate the risk reporting. In particular, this approach uses a binary evaluation scheme: a score of 0 or 1 (a score of 0 means that the information is not disclosed, whereas a score of 1 means that the information is disclosed). This is the main limit of this kind of methodology. In fact, it does not provide any evaluation about the degree of completeness and comprehensibility of the information disclosed by the bank. For this reason, a purely objective approach was discarded in the present empirical analysis. The second research approach is based on a qualitative method that is able to consider many qualitative characteristics of the information provided by banks' financial statements, such as their relevance, degree of completeness, comprehensibility, and so forth. Moreover, qualitative approaches are also able to take quantitative data into account. Unfortunately, qualitative approaches are characterized by a

[3] These studies usually aim to evaluate the level of user satisfaction of the bank's risk disclosure and are based on users' perspectives on the usefulness of risk disclosure, employing interview and survey techniques.

severe drawback: the evaluation is influenced by the subjectivity of the researcher. Nevertheless, this approach has certain advantages and, with some adjustments, could become a useful tool for market risk reporting evaluation purposes. In short, different approaches can be used for measuring risk disclosures.

The preceding considerations are fundamental for the hybrid scoring methodology proposed here. This empirical study provides insights for both levels of analysis: qualitative and quantitative. Several parameters have been compiled to investigate the quality of market risk disclosure. In order to attenuate the subjectivity of the evaluation process, I propose assigning a score (from 0 to 5) to each determinant or parameter that drives disclosure quality, with reference to a combination of qualitative features of disclosure. The appropriateness of these qualitative elements has been affirmed in the IAS Board's Conceptual Framework for IAS/IFRS. Additionally, it should be noted that subjectivity may be reduced but not entirely eliminated. It is essentially a necessary feature of any judgement-based scoring model. Notwithstanding, the results of this empirical research provide a comprehensive overview of market risk reporting in banking. A more detailed discussion of the research findings and their implications is provided in the following section.

5 Research Findings: Discussion and Implications

This section aims to analyse and discuss the research findings of the empirical study and draw meaningful conclusions about risk disclosure in banking. As stated previously, the overall objective of this study is to link qualitative and quantitative data through a scoring model in order to assess market risk disclosure in banking with the aim of adding new academic insights and providing practical implications. A scoring model is applied to investigate several key risk parameters that affect the overall market risk disclosure.

Primarily, market risk disclosure reflects institutional and firm-specific characteristics, such as regulatory and accounting constraints, changing economic conditions across the cycle, financial market fluctuations, bank size, the structure and composition of the bank's balance sheet, ownership structure, governance, and reporting strategy. The qualitative and quantitative content of the market risk disclosure implies a comprehensive analysis of banking risks, which are related to the characteristics of banking activities, corporate decisions, and pursued aims (competitive, commercial,

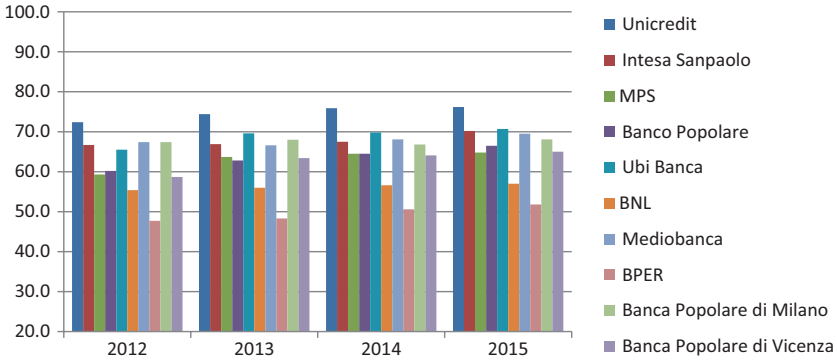

Fig. 4.1 An overview of the disclosure quality index

economic, financial, etc.). Bank performance cannot be fully analysed through traditional accounting results; it is necessary to examine it with reference to the risk profiles that characterize banking activities, strategies, and policies (Bastianini et al. 2005; Bisoni et al. 2012; Rutigliano 2012, 2016; Tutino 2009, 2013).

A description of the research findings follows. Despite the fact that Italian banks are subject to similar regulatory requirements and accounting standards, this empirical study found several differences in market risk disclosure across banks. As a whole, the research findings show that market risk disclosure improved from 2012 to 2015 for all banks in the sample (Fig. 4.1), and that there is a high comparability of disclosure, both over time and across banks. It is unusual to observe radical enhancements between two subsequent years. However, if we consider the entire time horizon of the research study, it can be seen that there have been substantial improvements, both qualitative and quantitative. At the same time, the research findings show that there is room to improve several aspects of market risk disclosures. The information content and its presentation in banks' risk reporting show room for significant improvements.

5.1 Key Aspects of Market Risk Disclosure

The changing financial and regulatory conditions in the banking and financial industry urge placing much more emphasis on risk disclosure, and market risk disclosure in particular, as regards the following crucial

aspects of disclosure: bank risk strategies, bank risk management, bank risk measurements, and bank risk control systems. Although banks have increased the quality and quantity of market risk disclosure in recent years, the present research findings suggest that banks need to improve such crucial dimensions of market risk disclosure.

More precisely, the explanation of the banks' market risk strategies implies the disclosure of expected management scenarios, expected economic and financial conditions, risk propensity, and greater emphasis on prospective analysis. In short, how significant bank management decisions and economic or financial developments would affect bank performance and how significant risks can affect the bank's business. In contrast, the explanation of the bank's market risk management implies the disclosure of the goals, procedures, processes, and policies of risk management; a description of the business operating processes; an analysis of the funding and investing decisions and their impacts on bank results; an examination of critical business units; a description of the main results of the market risk management; details of hedging strategies; details of hedged and unhedged risk exposures; and the nature and purpose of derivative instruments used. Risk hedging policies are crucial for assessing whether a bank is really protected against market risk and for evaluating the effectiveness of the chosen hedging strategies. There should be disclosure of the integration of market risk exposures and risk management policies. This strategic and management approach recognizes the relevant importance of the disclosure of the following risk management decisions: assumption and retention, prevention and protection, risk transfer, and risk elimination and avoidance.

Compared to the first two crucial aspects of market risk disclosure, the third aspect (risk measurement) is mainly quantitative and implies the disclosure of market risk exposures, the measurement of current market risks, the expected and unexpected losses, and the economic value of bank capital. It also implies the disclosure of the interrelations between different types of market risks, the underlying assumptions and methodologies used to quantify market risks, the bank's risk tolerance and risk propensity, and an illustration of how the market risk measures impacted on corporate and business decisions, performance, and current and expected bank capital.

The last crucial aspect of market risk disclosure (bank risk control systems) is mainly based on internal reports used for management purposes. It implies the disclosure of the internal activities and control procedures that are managed by a bank with regard to legal and regulatory constraints,

the aims and results of the internal control systems and the units that show high level of criticality, the measures implemented by the management to monitor and control risks, and the link between the performance of the internal control systems and the overall corporate performance of the bank.

The research findings of this study indicate that poor or insufficient market risk disclosure is particularly predominant with respect to a number of critical dimensions of bank risk strategy and risk management, derivatives used and hedging strategies, quantity and quality of internal controls, and expected results. It is not possible to gain any perception of the bank's acceptability of further risks. Without a full disclosure of a bank's risk strategies and the effectiveness of its risk management policies and practices, stakeholders will be unable to evaluate the bank's potential risks and its expected future outcomes.

5.2 Backward Looking Versus Forward Looking

As a whole, the research findings show that market risk disclosure is much more backward looking than forward looking. There are just a few key pieces of information that are related to future and expected market risk exposures and bank risk management. Consequently, it is not possible to forecast future market risk exposures or gain knowledge of the real capacity of the bank to assume and absorb further market risks or its risk propensity level with respect to the available economic, financial, capital, and human resources. It is widely agreed that risk disclosure is fundamental to drive investors' decision-making, enabling them to make a more informed decision. Bank stakeholders' understanding of market risk is influenced by the overall quality of the risk disclosure. By disclosing reliable, forward-looking information, stakeholders could be able to assess potential losses and bank capital adequacy to absorb not only current losses but also expected and unexpected future losses. In a broader sense, considering several scenarios that could arise from recent economic developments would improve the ability of stakeholders to identify the bank's strengths and weaknesses, especially with respect to market risk exposures.

The predominant narrative nature of the market risk disclosure statement, devoid of in-depth analysis, does not allow the strategic aims and expected performances of banks to be linked to their capital needs and capacity to absorb further risks. Rarely do bank business and risk projections offer an adequate understanding of future management dynamics.

The relationships between internal control activities, risk management, risk governance frameworks, business strategy, and strategic management are not well disclosed, making it challenging for external users to evaluate the bank's overall market risk profiles. These aspects could be enhanced by additional disclosures.

5.3 Qualitative Versus Quantitative Data

Sometimes, the qualitative disclosed data are excessively general to the point that they seem useless and uninformative for a full understanding of the underlying activities described and of the bank's current and future performance. There are also certain limitations in the quantitative data section. In some cases, this section merely contains calculations based on accounting results, while in others it provides estimates and measures that have been carried out for bank supervisory purposes. The combination of qualitative and quantitative risk disclosure is not sufficiently informative. Often, risk measures are very difficult for users to understand and incorporate into their decision-making process due to a lack of a complete, comprehensible definition and explanation of underlying methodologies. This is especially true for market risk disclosure, as it is inherently complex to understand for a general audience. In this respect, qualitative disclosure could be essential to shed light on quantitative disclosure and explain risk measurements.

5.4 Fragmentary Presentation

On analysing the research findings of this empirical study, market risk disclosure in banking seems partially disorganized and subdivided into different published documents that are neither fully nor adequately integrated nor cross-referenced. This is due to its fragmentary presentation. Sometimes these statements are not adequately comparable because they have been drawn up with differing depths of analysis. Banking regulatory and accounting frameworks, at both national and international levels, have developed over time and have assigned growing contents and scopes to risk disclosure.

Moreover, the representation and measurement of market risk mainly adopt a building-block approach (based on risk types). The interconnectedness which exists between different market risk factors and the interaction of different risk types (market risk, credit risk, liquidity risk, operational

risk, etc.) are often not well disclosed. Consequently, risk disclosure lacks an integrated and unified point of view on bank market risks. In other words, it does not offer a picture of the bank's overall risk position or risk management, nor does it convey the correlation and diversification effect on gains or losses due to the interaction of different risk factors. This fragmentary representation and inadequate integration increase the difficulties for stakeholders to correctly evaluate entity-wide risk exposures and how effectively these exposures are managed by the bank.

Furthermore, an information overlap was found among risk disclosure statements. The Basel Capital Accord's *Pillar 3 report* is part of a bank's financial reporting and is published at the same time as its financial report for the corresponding period. It is mainly a narrative report with reference to the bank's balance sheet and presents a number of repetitions and information overlap, as briefly described below:

- *Pillar 3 report* and *Management Commentary*: information on policies and goals of risk management, risk assumption, and risk hedging;
- *Pillar 3 report* and *Notes to the account*: information published in section "E" of the Notes to the account. Disclosure areas covered by the Pillar 3 report coincide to some extent with disclosure required under the Notes to the account. It seems that the Pillar 3 report's information content is a subset of section "E" of the Notes to the account, with the exception of the "glossary" that is usually added to the Pillar 3 report; and
- *Pillar 3 report* and Balance sheet: book value and fair value of financial instruments, losses and gains of financial trading, and so on.

5.5 Market Risk Factors, Model Risk, and Economic Capital

The research findings also show that the market risk factor that is primarily analysed and described in the risk disclosure statement is the interest rate, in comparison to exchange rates, share prices, and commodity prices. Banks generally do not describe their market risk modelling in detail in their reports and often do not describe it at all. The model risk is not well analysed or disclosed by banks. Most of the information relating to model risk is disclosed in the fair value hierarchy section, although often not adequately. This disclosure is often limited to a list of financial pricing models that are used to evaluate derivative instruments. It lacks sufficient information on the characteristics and methodology of these financial

pricing models. Consequently, external users are not able to appreciate the robustness, adequateness, or impacts of these pricing models on market risk management, bank accounting, and performance.

Banks do not adequately disclose information on the internal estimate of the economic value of bank capital for market risk. Most banks pay close attention to the regulatory capital requirements, instead of value-based measurement of bank capital. As a result, it is often difficult for investors and external users to assess the banks' economic capital adequacy to support all the risks in their business, its measurement or use for market risk management purposes.

5.6 Policy Implications: Forward-Looking Disclosure

As noted previously, despite the widespread use of regulatory and accounting disclosure requirements, market risk disclosure is often inadequate. A number of policy implications for practitioners, bank regulators, and accounting standard setters emerge from the analysis of the research findings of this empirical study. First, I propose improving and developing the forward-looking information on market risk through a higher quality disclosure of the following:

- perspective scenarios of bank management and business;
- integrated and dynamic analysis of the undertaken and expected corporate and business decisions;
- scenario analyses and simulations to assess the impacts of risks on banks' aggregate exposures and expected performance results that are related to changing business, environmental, competitive, and strategic conditions;
- variation of key market risk factors and its impact on the profit and loss statement;
- potential loss of securities portfolios from adverse market moves (value at risk measures);
- stress test results[4];
- market risk sensitivity analysis;

[4] Goldstein and Sapra (2014) show that disclosure of banks' stress test results to the market has both advantages and drawbacks.

- risk exposure limits and remedial actions that are necessary when these limits are violated;
- expected decisions to ensure a bank capital adequacy over time;
- capacity of bank capital to absorb further risks;
- banks' willingness to tolerate higher market risk exposures and its effects on banks' regulatory capital ratios;
- interdependence among different market risk factors and other risk categories;
- key risk-adjusted performance indicators;
- forecasts of future gains and losses based on factors such as risk management decisions, financial markets fluctuations, and management's evaluation of the economic cycle;
- potential losses (expected and unexpected) of derivative exposures;
- expected market risk exposures related to off-balance sheet positions;
- sufficient and meaningful disaggregation of current and expected market risk exposures;
- description of short-term and long-term market risk exposures; and
- description of hedged and unhedged market risk exposures.

I assume that forward-looking disclosure requirements enable a superior market risk disclosure in banking that is positively associated with banks' understanding of their market risks. This is particularly challenging for market risk exposure, which banks need to incorporate into risk reporting in a timely manner. Furthermore, more forward-looking information might help investors to focus on a longer-term rather than a short-term perspective.

5.7 Policy Implications: Management Commentary

The aim of enhancing forward-looking information on market risk disclosure could be pursued by the Management Commentary. The Italian Management Commentary is a mandatory report intended to complement and supplement annual financial statements. It might overcome the shortcomings that affect the bank balance sheet. This report is mainly narrative, as it should display the objectives and strategies of the banks, in addition to providing outlook information. It outlines some qualitative aspects that the Notes to the account do not and cannot take into account because of their different purposes.

The communicative effectiveness of the risk disclosure in the Management Commentary has a high potential, for both qualitative and quantitative data. Nonetheless, the findings of this empirical study provide evidence that banks do not exploit all the relevant disclosures potentiality of the Management Commentary. I argue that most banks do not use its "predictable management dynamics" section appropriately. They disclose a poor level of information, with few comments on market risk. Furthermore, many banks make a lot of cross-references to section "E" of the Notes to the account without adding any new current or future perspectives on market risk. Briefly, banks do not exploit the full potential of the Management Commentary for their risk disclosure.

The Management Commentary can offer the opportunity to enhance the strategic and management perspectives on market risk disclosure, particularly with regard to the expected risk dynamics, their impact on the development and implementation of bank strategies, bank business opportunities, bank performances, and the expected value fluctuation of assets and liabilities. It may provide meaningful information to comprehend the main business trends, the specific factors affecting them, the future evolution of bank strategies and their consequences on risk dynamics and performance, for both positive and negative scenarios, and risk exposures and risk management policies in the context of the bank's business models. The forward-looking disclosure perspective that could be provided by the Management Commentary, for both short- and long-time horizon, is evident. Moreover, the management discussion that is provided in this report could be essential to shed light on qualitative and quantitative risk disclosure and overall risk management strategies and policies.

The Management Commentary also covers bank risks that are different from those that it is mandatory to analyse in the Notes to the account (e.g. strategic risk, commercial risk, operational risk, reputational risk, etc.). Consequently, it can illustrate not only the interdependence between different market risk types but also the relationships with other bank risk categories. Potentially speaking, it may offer an integrated disclosure perspective on bank risk strategies, risk management, risk measurement, and internal risk controls. This, in turn, is likely to enhance the quality of market risk disclosure.

However, the Management Commentary is affected by a lack of information standardization with potential negative consequences in terms of comparability—both across banks and over time—and latent semantic dimensions of the texts. I found many differences in communication and

writing styles of the Management Commentary among the analysed banks. Current accounting rules impose a minimum content for the document but do not provide any specific configuration or structure. Despite the continuous raising of requirements for the preparation of the Management Commentary, the regulation is still not detailed.[5] Most notably, the information to provide has to be relevant for the investor's assessment of future bank performance and objectives. Thus, the bank's management has a certain degree of discretion in terms of presentation and the level of detail of the information to provide. Consequently, the market risk disclosure in the Management Commentary might not be adequately comparable and may also purposely suffer from a lack of depth.

It is essential to ensure the appropriate use of the report and avoid a misrepresented disclosure of bank performances and bank market risks. By using textual complexity, broad and vague definitions, generic descriptions of risk management, in addition to the discretion employed in deciding the issues to be provided to the external users, the Management Commentary may obfuscate the bank's poor performance, to the extent that it might not represent a faithful and accurate statement of the bank's risk exposures and risk management. It is likely to exacerbate bank opacity and foster misperceptions of the bank's relevant economic conditions. This means that more information is not always better and does not necessarily imply an increase in risk transparency provided to external stakeholders. Disclosure is not always a synonym for transparency.[6]

5.8 Policy Implications: The Adoption of a Holistic View

In order to enhance the capacity of the risk disclosure to represent the overall risk position of the bank, an integration of different risk reports (the Pillar 3 report, Management Commentary, and Notes to the account) is advisable. An integration of the different risk disclosure reports can provide an overall view on bank market risk. This highlights the need for a

[5] It should be noted that International Accounting Standards Board (IASB) published the Practice Statement Management Commentary in 2010 to assist management in presenting a useful Management Commentary that relates to financial statements that have been prepared in accordance with International Financial Reporting Standards (IFRS). This framework is not an IFRS. Consequently, banks applying IFRS are not required to comply with the Practice Statement.

[6] See Beretta and Bozzolan (2004, 2008) for a discussion of the idea that the amount of disclosure is a sound proxy for the quality of disclosure.

more holistic approach that encourages banks to prepare and publish an integrated risk report within their financial reporting. This integration could lead to the provision of a single risk report that conveys a coherent and global portrayal of risk in banking. The adoption of a unified view on risk disclosure might also provide the opportunity to integrate accounting and management-based information on banking risks. The regulation of banks still regularly employs accounting measures of their capitalization and risk exposures.

Accordingly, the adoption of a more holistic view on risk disclosure could eliminate the information overlap and redundancy between risk disclosure documents, as well as improve the quality of risk disclosure by reducing disclosure volume, increasing its desirable attributes (comprehensibility, relevance, and materiality), and providing a parsimonious presentation. It would be advisable to provide overview sections that contain all the important information, comments to enable external users to correctly understand quantitative data and risk measurements, and key risk indicators to synthesize the bank's market risk exposures and their impacts on bank performance. It will thus make the market risk disclosure less burdensome for investors and other users.

As to the analysis of the existing interconnectedness between different market risk factors, it is worthwhile to consider differentiating the distinctive risk factors, their interdependencies, and their correlations. A risk disclosure statement that outlines this kind of breakdown could facilitate the understanding of the interaction of different market risk factors, the potential impact of change in market risk variables, the effectiveness of risk management policies and instruments, the provision of more specific information and details on sensitivity analysis, market risk exposures, risk management policies, and risk exposures matched to hedging instruments. It is thus likely to enhance the informational value of the market risk disclosure statement.

5.9 Policy Implications: Sophisticated Financial Products

Derivative use and hedging strategies are two critical dimensions of market risk disclosure that are not sufficiently or adequately analysed or conveyed by banks. The growing complexity of derivative instruments, other sophisticated financial products, and trading and hedging strategies require a well-structured and well-presented disclosure statement that should be integrated with other risk disclosures. This statement should include

details on the following aspects: the nature and purpose of the derivatives and other sophisticated financial products used; the risk exposure of derivative instruments, including embedded derivatives; disaggregation of the portfolio of derivatives and sophisticated products; underlying risk factors; hedged and unhedged risk exposures; linkages between market risk exposures, and hedging instruments and strategies; trading derivatives and hedging activities, objectives, costs, and benefits; the distinction between speculative derivative trading and hedging activities; macro-hedging and micro-hedging strategies; gains or losses related to derivative activities; the disaggregation of gains or losses due to different types of hedging strategies; potential losses of portfolios of derivatives; derivatives counterparty credit risk; an explanation of the effectiveness or ineffectiveness of hedging strategies; the impacts of derivative activities on current and future income and cash flow statements; an explanation of the inherently complex methodologies used to evaluate derivatives; a distinction between mark-to-market and mark-to-model valuation approaches; the impacts of either temporarily or persistently illiquid derivative markets on derivative valuation and bank performance; the impacts of derivative activities on the overall current and future bank's risk profiles; and an explanation of risk management policy and hedging strategies. An integrated and faithful presentation of qualitative and quantitative data on these operating, accounting, and strategic aspects of derivatives and other sophisticated financial products improves the overall quality of risk disclosure.

Despite the significant increase in derivative disclosure requirements under IFRS and the complexity of hedging strategies, the present empirical study provides evidence that there is still room for significant further enhancements, at both the voluntary and mandatory disclosure level.[7] In particular, voluntary disclosure of useful information can integrate and complete mandatory disclosure, increase transparency, and reduce bank opacity. The quality and reliability of derivatives and financial innovation disclosure are essential to avoid or minimize the likelihood of a mispricing of banking risks and an underestimation of risk exposures; discern the use of derivative instruments, their risk exposures, and the relationships with

[7] It is worth noting that IFRS 9 (Financial Instruments), which is to come into effect in January 2018, will enhance derivative disclosure with better information about risk management, derivative instruments and hedging strategies, and the effect of hedging activities on financial statements. It will enable banks to better reflect derivative instruments and strategies in their financial statements, with enhanced disclosures about risk management activity.

other types of risks (mainly liquidity and credit risk); link derivative instruments to the underlying risk exposures and assess the extent of hedging activities; predict the future impact of hedging on the bank's performance; evaluate the hidden loss potential of derivative instruments and the overall loss absorption capacity of the bank; provide a full understanding of market risk exposures, hedged and unhedged balance sheet amounts, and the effectiveness of risk management strategies to stakeholders; and increase investor trust in banking.

5.10 Policy Implications: A Summary

A detailed examination of the different parameters of the total disclosure score leads to some interesting insights that should be mentioned to enhance the quality of the provided market risk disclosure information. First, the excessive degree of subjectivity in risk reporting may provide a non-comparable and incomplete risk disclosure statement. Second, the description and analysis of the market risks should be linked to the bank's core business, market segments where the bank operates, the business growth perspective, and the value creation process. Third, market risk reporting should be linked to the bank's strategic and operating goals in order to increase the comprehensiveness of risk management decisions (e.g. hedging, risk transfer, and securitization) as well as the effects of banking risks on corporate strategic decisions and organizational structures. The assessment of bank market risks requires a preliminary goal setting and a measurement of bank performance. The disclosure of the effects of hedging strategies on financial statements should be enhanced. Fourth, the risk disclosure should have a forward-looking perspective for external users. Qualitative and quantitative data and indicators can be used to represent future bank management decisions, future dynamics of banking risks, current and future risk exposure limits, corrective actions to be implemented when these limits are violated, and expected risk mitigation policies that aim to avoid excessive risk exposures. Fifth, the standardization of the content of market risk disclosure statement and their presentation is a critical aspect for accurate comparability across banks and over time. Standardized disclosure statements are required to improve comparability. Sixth, the disclosure of underlying assumptions and limitations of market risk measurements are really important to evaluate their reliability and robustness. Seventh, the complexity of the text and the nature of the narrative of risk reporting, as well as the discretion of bank management

may induce banks to window dress their financial and economic conditions and performance. Eighth, an integrated messaging on the bank's overall risk exposures and risk management is required. There is scope to improve the integration of disclosure of market risk factors, risk categories, risk exposures, and hedging policies. Ninth, a disclosure statement related to derivative exposures and activities, risk exposures arising from derivative instruments, and their impacts on bank performance is crucial to be able to evaluate the effectiveness of a bank's risk management strategies and market risk exposures meaningfully. Market risk disclosure in banking should cover all financial instruments, including all derivative instruments and other sophisticated financial products. Notwithstanding the variety, complexity, and importance of derivatives in banking, this study shows that the disclosure on derivatives and financial innovation is often inadequate. Lastly, banking and supervisory authorities that regulate the degree of disclosure obligations might improve requirements in order to provide an informative and integrated perspective on market risk and achieve a higher level of market efficiency, seeing as risk disclosure is used by stakeholders as part of their valuation and risk analysis process.

In conclusion, the regulatory and accounting constraints of risk disclosure in banking can be transformed into opportunities to create value, at both the firm and industry level. In order to achieve this goal, I believe it is essential to adopt a holistic perspective on risk disclosure that focuses on communication and not just on mere compliance. The incomplete, opaque, and fragmentary nature of a risk disclosure statement may restrict the stakeholders' ability to make analytical assessments of a bank's market risks. By appropriately combining mandatory and voluntary disclosure, banks should provide reliable risk information to stakeholders to facilitate a complete and holistic understanding of various quality and quantity profiles of market risk exposures and risk management strategies, policies, measurements, and controls.

In brief, the market risk disclosure statement cannot be assessed in isolation. It should be considered in conjunction with the regulatory environment, accounting rules, bank's strategies and policies, and other prominent factors. This empirical study contributes to the literature, as well as provides a relevant contribution for practitioners, accounting standard setters, and policymakers. I have discussed the main research findings and their implications that could lead to enhancing the quality of market risk disclosure in banking.

6 Conclusion

The banking industry has made significant progress in recent years in identifying, measuring, and disclosing market risk. Banking regulation, international accounting standards, and financial market constraints have been putting pressure on banks to increase the quality and quantity of market risk disclosure to stakeholders. This empirical study focuses on Italian banks and outlines some important aspects related to market risk reporting. Even though banks are subject to similar regulatory requirements and accounting standards, they still present some differences in their market risk reporting. I argue that Italian banks are still in search of a more holistic way to disclose information on risk exposures and risk management. These research findings provide an opportunity for banks to move towards comprehensive and holistic market risk disclosure.

The objective of this study was to investigate market risk disclosures. This research supports the development of a comprehensive understanding of market risk disclosure in the Italian banking industry. It contributes to the development of a hybrid scoring methodology in the field of risk reporting that covers qualitative as well as quantitative factors. In brief, this methodology was found to work well and provide comprehensive results regarding the analysed disclosure. This research extends the boundaries of the existing literature on market risk disclosure in banking and provides relevant contributions for practitioners, accounting standard setters, and financial policymakers.

Nevertheless, it is important to underline the fact that this empirical study suffers from certain limitations that need mentioning. First of all, the length of time interval of the study is quite short. Some changes in the reporting models were observed, but it would be interesting to extend the evaluation period in order to understand whether or not the changes observed during these few years are representative of the changes that have occurred over a larger period of time. It is not unlikely that some improvements could disappear from one year to another. Moreover, it would be difficult to generalize findings obtained in changing economic conditions across the cycle. In addition, the sample may be criticized as it consists of a group of the ten largest Italian banks. The sample size might also be enlarged, taking into account small and medium-sized banks.

Another potential limitation of this empirical study could be the subjectivity of the content analysis. However, the methodology used in the context of this research is split into two parts. This mitigates any concerns

regarding the subjective evaluation that affects the content analysis. In fact, the first part of the methodology is objective, but it is unable to capture a number of quantitative and qualitative aspects disclosed by banks. The second part of the methodology is judgement based and is very useful in capturing those elements that are not considered by the first part. Consequently, the drawbacks of a purely quantitative or qualitative analysis are diminished in the hybrid methodology proposed in this research study. Furthermore, it should be noted that a major issue exists related to the difficulties in combining the qualitative features (comprehensibility, relevance, comparability, reliability, and materiality) used to evaluate the risk disclosure. In addition, further research may extend the research design by increasing the number of market risk disclosure parameters and their measurability.

In conclusion, this empirical study is important to understand how the largest Italian banks address market risk reporting. These findings could stimulate further research in this field. To continue along this line of research, increasing the sample size and the time interval would constitute good ways to improve the analysis. Risk reporting regulation and risk reporting itself are an ongoing process. The Basel Committee recently expanded risk disclosure requirements under Pillar 3 to strengthen market discipline. The recently issued IFRS 9 will improve the reporting of financial instruments. Also for these reasons, the evolution over time of the hybrid scoring model could likewise be an ongoing process. This aspect represents a promising area for future research and poses a number of questions that researchers may develop with further empirical analysis.

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CHAPTER 5

Central Banks' Communication Strategies: Just Words?

Vincenzo Farina, Giuseppe Galloppo, and Daniele A. Previati

1 Introduction

The past decade has witnessed a change in paradigm in the way central banks conduct monetary policy. This paradigm shift has meant a change not only in the strategy pursued, particularly the growing implementation of unconventional measures, but also in how central banks have implemented their respective communication strategies.

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According to Blinder et al. (2008), prior to the 1990s, central banks believed they should be shrouded in mystery; in fact, conventional wisdom in central banking rooms made monetary policymakers say as little as possible and be cryptic. Karl Brunner (1981) stated, "Central Banking… thrives on a pervasive impression that [it]… is an esoteric art. Access to this art and its proper execution is confined to the initiated elite. The esoteric nature of the art is moreover revealed by an inherent impossibility to articulate its insights in explicit and intelligible words and sentences". Fifteen years later, in his 1996 Robbins lectures at the London School of Economics, Alan Blinder (1998, pp. 70–72) proposed a profound change in this viewpoint, stating that "Greater openness might actually improve the efficiency of monetary policy… [because] expectations about future central bank behaviour provide the essential link between short rates and long rates. A more open central bank… naturally conditions expectations by providing the markets with more information about its own view of the fundamental factors guiding monetary policy…, thereby creating a virtuous circle". More information addressed to market participants regarding central bank policy should increase the degree to which central bank policy decisions can actually affect market agent expectations and improve the effectiveness of monetary and financial stability policy. Thus, the public's understanding refers not only to what the central bank is currently doing but also to what is expected to be done in the near future and what is critical for the effectiveness of its policy. By becoming more predictable for the markets, the central bank makes market reactions to monetary policy more predictable. It thus makes it possible to manage the economy better. Five years later, Michael Woodford (2001) stated that, "successful monetary policy is not so much a matter of effective control of overnight interest rates… as of affecting… the evolution of market expectations".

An important open field of study in monetary policy is the issue of the optimal communication strategy to optimize central banks' policy outcomes (Reis 2013). A central bank's capability to manage economic agent expectations relies on its ability to communicate intentions in an intelligible manner. Hence, a good communication strategy improves transparency the most and aims to raise the effectiveness of monetary policy action hugely (Issing 2005; Winkler 2000). In this respect, good communication is an indispensable element of transparency. According to the ECB website,[1] a central bank is transparent when "[it] provides the general

[1] http://www.ecb.int/ecb/orga/transparency/html/index.en.html (last accessed on 29 June 2017).

public and the markets with all relevant information on its strategy, assessments and policy decisions as well as its procedures in an open, clear and timely manner". The importance of clarity and transparency has been emphasized by Woodford (2005), who argues that good communication could replace policy action itself. In fact, central banks have made great efforts to increase their transparency and accountability to the public (Eijffinger and Geraats 2006; Dincer and Eichengreen 2007). Moreover, in recent times, when many advanced economies face the zero-nominal lower bound, central bank communication has arguably become an even more important instrument. To this end, several major central banks have actively used their communications to exert additional stimulus at a time in which conventional policy tools have been severely constrained. According to Bulir et al. (2013), central banks provide a greater volume of information and communicate through a wider range of channels, including inflation reports, press releases, and press conferences. Moreover, information becomes available to wider audiences faster and more frequently than ever before. These documents are of particular interest because financial market participants pay close attention to their content, and changes in their wording elicit significant reactions in financial markets. While statements and press conferences contain crucial information regarding the central banks' monetary policy decisions, their assessment of the economic situation and important information is also provided via speeches and interviews. This entire set of information contributes to higher predictability in situations under uncertainty and, according to this view, there is substantial evidence that central bank communication has been effective in providing the public with relevant information on monetary policy. Rosa and Verga (2007), for example, show that market expectations react to information distributed by the European Central Bank (ECB) in its monthly press conferences. Hayo et al. (2010) assert that Federal Reserve communication contributes to understanding federal funds target rate decisions. Ehrmann and Fratzscher (2007) analyse the effects of comments by the Federal Reserve, the ECB, and the Bank of England (BOE), highlighting the fact that press conferences are able to move markets to a larger extent than the decision itself (Ehrmann and Fratzscher 2009).

Despite there being a huge number of scientific papers showing that central bank communication has proven to be effective, other questions arise. In particular, what constitutes sound communication policies and how can their clarity be measured? Greater disclosure and clarity of policy

may in fact lead to better predictability of central bank actions, which, in turn, reduces uncertainty in the financial markets. A few studies suggest that central banks have not always provided a clear message. In a sample of developed and emerging market countries, Bulíř et al. (2008) find that central banks were clear, on average, between 60% and 95% of the time. In this literature stream, Geraats (2002) shows that communication may be undesirable if it is of poor quality or sufficiently noisy so as to raise market volatility. Based on these findings, a further analysis of clarity of communication would seem to be necessary.

Although theoretical contributions to the analysis of information and communication have been significant in the economic literature, empirical research currently pays particular attention to quantitatively evaluating flows of verbal information in a way that is at the same time objective, intuitive, and replicable. The present study belongs to this research stream, advancing a class of automated measures of monetary policy communication and applying these measures to speeches by the heads of central banks. Communication with the public via the communication channel tends to be rather flexible in timing and content. Typically, speeches and interviews take place during monetary policy committee meetings, which are held relatively frequently. The information released via interviews and speeches goes beyond the information provided in statements and press conferences. It creates an added value, as its flexibility in timing allows the decision-maker to react to unforeseen circumstances, thereby enhancing predictability and reducing uncertainty. Especially in turbulent times for financial markets, policymakers can calm down the markets by communicating to the public via this channel, conveying information that might contain unexpected signals. For instance, if the central bank expresses a rather optimistic view about the prospects for financial stability, this view is heard in financial markets and hence a rise in stock prices for the financial sector would be expected.

Text and words are not readily quantifiable in terms of their intensity and direction of meaning. The interpretation of non-quantitative information is naturally subjective, while the same set of words can have a very different meaning and intensity depending on the context of use and the reader. The major econometric effort for analysing central bank communication is that of converting the raw wording of the communication into meaningful quantities ready for systematic analysis. Some approaches focus only on quantitative communication, while others take into account some pre-selected keywords—as in Rosa and Verga (2008)—

to measure the content. Our research objectives are to analyse central bank communication strategies and assess their effectiveness for two of the world's major central banks: the Federal Reserve and the ECB. Moreover, we aim to achieve a better understanding of the clarity of central bank communications. We focus on two central issues. First, do the communication strategies of the Federal Reserve and the ECB differ? If so, how do they differ? To what extent has the clarity of central bank communication fluctuated over the years? Second, we assess the effectiveness of communication by asking whether communication helps the financial and real markets to go in the desired direction. From the perspective of this second research theme, we use our extracted measures of communication to understand whether central bank communication depends on the context. Particularly, does communication change with the dynamics of macroeconomic scenarios? Our hypothesis is the following: if the communication does not change significantly, central banks do not help financial and real markets to go in the desired directions in a significant way. We cannot assess central bank communication as clear if it is not dynamic and does not follow the continuous changes in macroeconomic scenarios. The main novel contribution of this study with respect to the existing literature consists in testing the feedback effect on central bankers' communication strategies due to changes in the current economic scenario.

To conduct the empirical analysis, we construct a unique and novel database on communication comprising more than 800 releases of speeches/interviews given by the heads of the central bank under study over the past 11 years. We compile the wording format of speeches/interviews by extracting text from HTML version as reported in the Media Section of both the ECB and FED websites. We not only identify the precise timing of these communications but also determine their content. By doing so, we reveal significant and persistent differences in clarity over time and across central banks. The empirical approach taken here is to use techniques from computational linguistics applied to the speeches by the heads of the central bank, specifically designed to address our measurement issues. This allows us to focus on multi-dimensional monetary policy and contribute answers to the major questions we introduce in our analysis. The main difference between our study and most previous papers is that we look at a broader set of reactions of central bank communication to evolving macroeconomic scenarios, whereas previous scholars have mostly focussed on the response of returns and volatility in interest rate markets to central bank communications. We focus our attention on the

problem upstream of the capacity of central bank communication strategies to influence expectations and the behaviour of actors in the financial and real economy. Clarity is not only about words; it is also about different words for different macroeconomic scenarios. Therefore, words—if they are different and correct—can influence expectations and behaviour in the desired (and correct) directions. Of course, words are not deeds, and deeds must follow on from words.

The rest of the chapter is organized as follows. In the next section, we present the details of our study. Section 3 describes the data and methodology used in the analysis. Section 4 lays out the empirical results. Finally, Section 5 concludes our analysis.

2 Literature

In recent years, monetary policy is increasingly becoming the art of managing expectations (Jansen and de Haan 2009); communication has become a key instrument in the central bankers' toolbox. It is therefore no surprise that various papers on central bank communication have been published recently. The key empirical question is whether communication aims to enhance the effectiveness of monetary policy by achieving market expectations in a desired way and improving market stabilization. There are two main strands in the literature. The first line of research focuses on the impacts of central bank communications on financial markets. The second seeks to relate differences in communication strategies across central banks and/or across time. This chapter belongs to the second research stream, focusing on the characteristics of the speeches by the heads of the central banks.

A number of scholars have attempted to provide a measure of communication in order to assess monetary policy effectiveness in terms of the direction and magnitude of its effects on asset prices and macroeconomic variables. For this purpose, all statements must be classified, namely, by coding the real or likely intention of their content on a numeric scale. Different types of communications have been studied in the literature: statements on monetary policy and communication about the exchange rate (see Jansen and De Haan 2005, for speeches and interviews by members of the ECB Governing Council); policy inclinations and the economic outlook (see Ehrmann and Fratzscher 2007, for communications by committee members at the Federal Reserve, the Bank of England, and the ECB); price stability, the real economy, and monetary indicators (see

Berger et al. 2006; Gerlach 2007, for the editorial in the ECB's Monthly Bulletin). Jansen and De Haan (2009) employ an indicator based on Bloomberg news reports. These studies assign negative (positive) values to statements that are intended to be dovish (hawkish), and zero to those appearing as neutral. Whereas some researchers restrict the coding to directional indications (e.g. Jansen and De Haan 2005; Ehrmann and Fratzscher 2007), others assign a finer grid that is at least suggestive of magnitude (Rosa and Verga 2007; Marie Musard-Gies 2006).

Heinemann and Ullrich (2007) and Rosa and Verga (2007) use communication indicators based on the introductory statement of the ECB's President at the press conference following the ECB policy meeting. Rosa and Verga (2007) convert the qualitative information of the ECB press conferences into an ordered scale, testing the market expectation reaction to the information released by the ECB. They find that the public both understands and believes in signals sent by the European monetary authority. Heinemann and Ullrich (2007) also use the introductory statements by the ECB's President at the monthly press conference to construct a wording indicator reflecting the "hawkishness" of monetary rhetoric, integrating this indicator into a standard Taylor-type model for the interest rate. They find that the wording indicator can improve the model's fit when added to the standard explanatory variables.

Jan-Egbert Sturm and Jakob De Haan (2011) test five different communication indicators based on the ECB President's introductory statement at the press conference following the ECB policy meeting. Their main finding is that ECB communication turns out to be significant in a Taylor Rule model. Hernandez-Murillo and Shell (2014) find that the detail and complexity of the Federal Open Market Committee (FOMC) statement has risen substantially since the financial crisis and especially since the deployment of unconventional monetary policy.

Rozkrut et al. (2007) examine communication strategies of monetary authorities in Czech Republic, Hungary, and Poland (CEC3) countries, finding that policymakers' words often do not correspond with their deeds and that there are major differences in communication strategy across CEC3 countries. Moreover, these authors provide evidence that central bank "talk" influences market expectations of future policy decisions. The power and significance of this effect vary according to the horizon of potential interest rate movements. In addition, the analysis provides mixed results in terms of predictability of monetary policy decisions in CEC3 countries when it is based on central bank communication.

Rosa and Verga (2007) find that by looking at the verbatim content of the ECB President's monthly press conferences, it is possible to predict the European monetary authority's interest rate setting fairly well. Besides, the information contained in ECB rhetoric does not disappear once they control for Taylor-type macroeconomic variables.

Hansen and McMahon (2016) use Latent Dirichlet Allocation (LDA) and dictionary methods to extract the content of official interest rate communications (statements) by the Federal Reserve. Fligstein et al. (2014) likewise apply LDA to FOMC transcripts to examine the "sense-making" attitude of the Federal Open Market Committee. Hansen et al. (2014) aim to examine the effect of transparency on the deliberation of the FOMC using LDA applied to FOMC transcripts. Hendry and Madeley (2010) and Hendry (2012) use text-mining tools to understand how central bank communication affects markets.

Born et al. (2014) find that Financial Stability Reports (FSRs) tend to reduce market volatility. These effects are particularly strong if the FSR contains an optimistic assessment of the risks to financial stability. Speeches and interviews, in contrast, cannot reduce market volatility. Analysing the same type of communication, that is, FSRs, Born et al. (2010) found that their tone had continuously become more positive after 2000, reaching a peak by early 2006 in terms of optimism, and becoming more critical afterwards. Scholars suggest that FSRs do not only comment on the current market environment but also contain forward-looking assessments of risks and vulnerabilities.

Hansen and McMahon (2016) show that forward guidance communication on future interest rates in the last 18 years by the US central bank seems to have been much more important than the US central bank's communication of existing economic conditions.

Knütter et al. (2011) reviewed 13 empirical studies, analysing the effects of speeches and interviews that appeared in the period between 2004 and 2010. The empirical methods used most frequently in these studies were exponential generalized autoregressive conditional heteroscedastic model ((E)GARCH) and Ordinary least squares (OLS). Regarding the country samples, eight of them analyse the US economy, three studies investigate communication effects in the euro area, four refer to the UK, and two describe Canada. One is a cross-country study covering 35 mainly advanced countries. Most of the studies conclude that, in general, communication instruments have a positive influence on asset prices. Seven out of the 13 studies considered find a significant effect on the volatility of various asset prices, 3 out of the 13 studies find no significant impact on

asset prices at all, and 2 out of 7 studies show a negative influence on the volatility of asset prices. For a detailed analysis of the most relevant literature cited here, see Table 5.7 in the Appendix.

3 Methods

Our sample includes all the speeches given by the heads of the ECB and the FED for the period 2007–2017. To ensure the stability, reproducibility, and accuracy of the measures of communication for a large number of speeches, we apply text analysis (Stone 1966) using a classical "bag-of-words" methodology to define some institution-level indexes.

This is a common and consistent way of measuring language, in which word lists are chosen to reflect certain specific characteristics of the texts, as demonstrated by some recent finance applications: Antweiler and Murray (2004), Tetlock (2007), Tetlock et al. (2008), Loughran and McDonald (2011), Apel and Blix Grimaldi (2012), Loughran and McDonald (2014), Carretta et al. (2015), and Hansen and McMahon (2016).

In order to proceed with our analysis, we identify all sentences in each speech matching the economic situation topic. To this end, we consider all the sentences matching the term "econ*"—using only these relevant sentences, we thus create our time-series measures using dictionary methods or, more simply, word counting.

First, the LIWC2007 Dictionary (English Version) is the heart of the text analysis strategy. This is a text analysis dictionary which classifies words into psychologically meaningful categories (Tausczik and Pennebaker 2010). Specifically, to examine the information content of the speeches by the heads of the ECB and the FED, we use the following categories:

- Positive emotion words—category 126. Examples include the following words: good, nice, sweet.
- Negative emotion words—category 127. Examples include the following words: hurt, ugly, nasty.
- Anxiety words—category 128. Examples include the following words: worried, fearful, nervous.
- Discrepancy words—category 134. Examples include the following words: should, could, would, expect.
- Tentative words—category 135. Examples include the following words: generally, guess, hope, maybe, perhaps.
- Certainty words—category 136. Examples include the following words: absolutely, always, indeed, must, never.

Specifically, for each speech, we define "tone" as follows:

$$\frac{\textit{Positive emotion words} - \textit{Negative emotion words}}{\textit{Total words}}$$

Second, to measure the tone of the sentences on the economic situation, we use "directional" word lists measuring words associated with expansion and contraction as used in Apel and Blix Grimaldi (2012) and Hansen and McMahon (2016) (Tables 5.1 and 5.2).

For each speech, we define "growth" as follows:

$$\frac{\textit{Expansion words} - \textit{Contraction words}}{\textit{Total words}}$$

Third, to measure central bank uncertainty regarding monetary policy issues, we refer to a modified word list based on Loughran and McDonald (2011) "ambiguity" category (Table 5.3).

Like other papers using text analysis, we calculate a score for the other language dimensions by determining the number of times the words contained in each specific set of the pre-identified dictionaries that occur in the speeches of the heads of the ECB and the FED, using percentages to measure category emphasis. For example, if the estimate for the Anxiety dimension is equal to 3, this means that words contained in the category Anxiety of our dictionary represent 3% of the words used in the entire speech.

Finally, we aggregate all the values obtained from the text analysis into quarters (i.e. three-monthly periods).

Table 5.1 Expansion words (roots)

*Improv**
*Foster**
*Increas**
*Expand**
*Rise**
*Higher**
*Gain**
*Strong**
*Acceler**
*Faster**
*Strength**

Table 5.2 Contraction words (roots)

*Moder**
*Slow**
*Low**
*Weak**
*Subdu**
*Lower**
*Fall**
*Slower**
*Weaker**
*Decreas**
*Weaken**
*Contract**
*Soften**
*Deceler**
*Cool**

Table 5.3 Ambiguity words (roots)

*Condit**
*Anticip**
*Believ**
*Risk**
*May**
*Appear**
*Conting**
*Suggest**
*Seem**
*Somewhat**
*Uncertaint**
*Uncertain**
*Possibl**
*Destabil**
*Volatil**
*Tent**
*Unusu**
*Might**
*Alter**

4 Results

4.1 *Communication Strategies Time Dynamic Analysis*

Table 5.4 shows the average values of the length and the dictionary category representation for speeches by the heads of the ECB and the FED during the period of analysis (divided into quarters).

Figure 5.1 shows the trend of the tone used in ECB governor speeches since February 2007 as regards the economic situation.

Figure 5.2 shows the trend of the expansion-contraction and ambiguity categories for speeches given by the head of the ECB since February 2007.

Figure 5.3 shows the other dimensions of the language referring to anxiety, certainty, tentative, and discrepancy words in speeches by the head of the ECB, grouped in quarters.

Figure 5.4 describes the trend of the tone used in speeches by the head of the FED since February 2007 regarding the economic situation.

Figure 5.5 shows the trend of the growth (expansion-contraction) and ambiguity categories for speeches by the head of the FED since February 2007. Looking both at the ECB (Fig. 5.2) and FED dynamics of the expansion vs contraction tone, the main evidence is essentially in line with the findings by Born et al. (2010). These authors reported that FSRs had continuously become more positive after 2000, reaching a peak by early 2006 in terms of optimism, and becoming more critical afterwards. Figures 5.2 and 5.5 in our sample clearly show the mainly upward trend of the expansionary tone of both central banks.

Figure 5.6 presents the other dimensions of the language referring to anxiety, certainty, tentative, and discrepancy words in the speeches, grouped in quarters, given by the head of the FED.

4.2 *The FED and the ECB: Communication Strategies and Macroeconomic Scenario*

The purpose of this section is to answer the following research questions: is there any difference between the communication strategies of the FED and the ECB? Do these two central banks adjust their communication strategy in response to the dynamics of the macroeconomic scenario? A set of scenarios comes into play (*up* and *down*) that refer to a series of macroeconomic variables widely known as primary targets of the socio-economic functions of the aforementioned central banks and which are outlined in their statutes.

Table 5.4 Descriptive statistics (all speeches)

(a) Word count and dictionaries representation

	Word count	*Expansion*	*Contraction*	*Ambiguity*	*Posemo*	*Negemo*	*Anxiety*	*Discrepancy*	*Tentative*	*Certainty*
ECB	6789.275	44.275	25.125	54.7	121.825	60.025	24.825	46.5	53.8	58.1
FED	5117.525	40.875	31.45	57.475	101.75	60.975	18.875	40.9	66.35	34.6

(b) Relative weights

	Expansion (%)	*Contraction (%)*	*Ambiguity (%)*	*Posemo (%)*	*Negemo (%)*	*Anxiety (%)*	*Discrepancy (%)*	*Tentative (%)*	*Certainty (%)*
ECB	0.7	0.4	0.8	1.8	0.9	0.4	0.7	0.8	0.9
FED	0.8	0.6	1.1	2.0	1.2	0.4	0.8	1.3	0.7

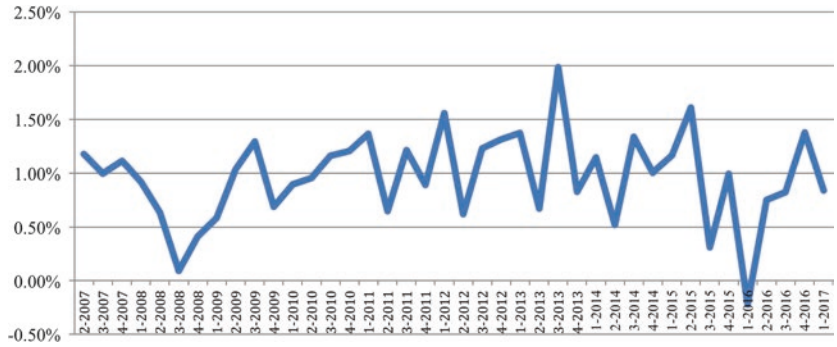

Fig. 5.1 ECB: tone

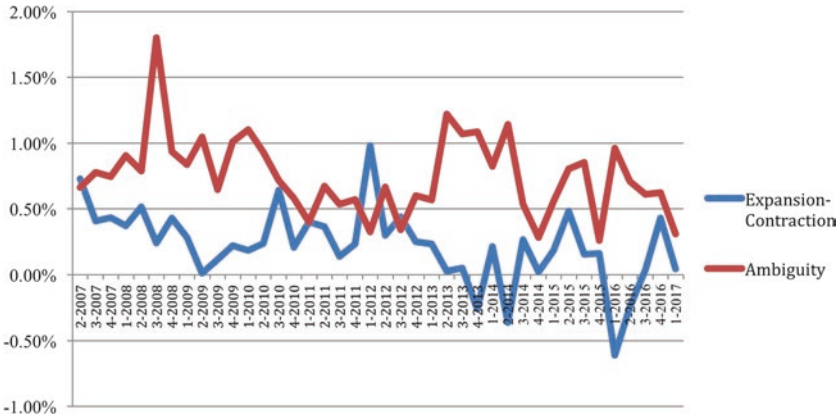

Fig. 5.2 ECB: growth and ambiguity

To be specific, we focused on major drivers to be supervised by the two monetary policy institutions.

The FED and the ECB have similar objectives. The third paragraph of Article 3 of the Treaty of the European Union states that the Union "shall work for the sustainable development of Europe based on balanced economic growth and price stability, a highly competitive social market economy, aiming at full employment and social progress…".

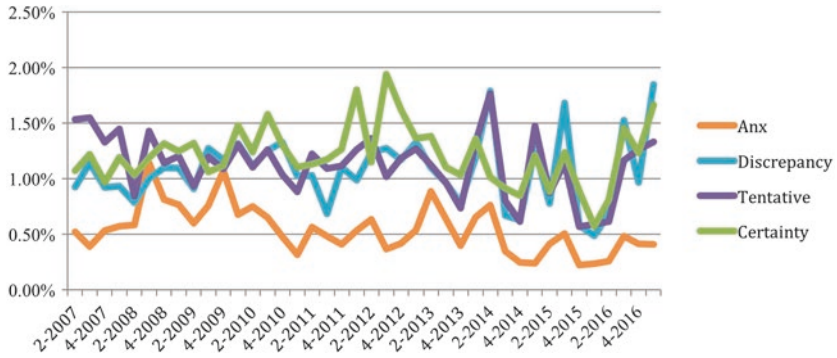

Fig. 5.3 ECB: anxiety, certainty, tentative, and discrepancy words

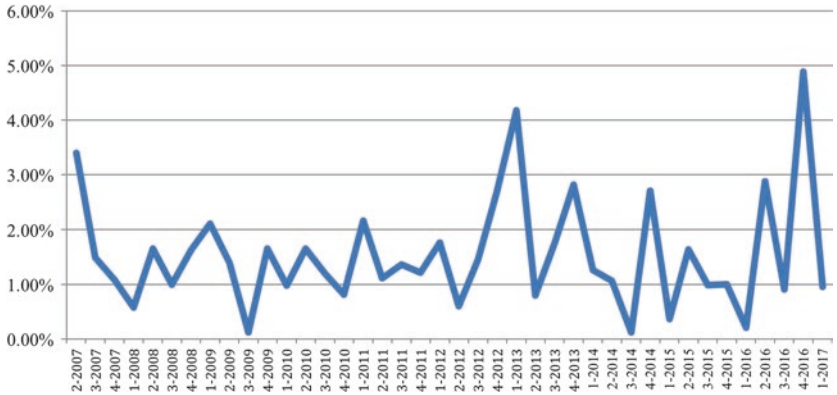

Fig. 5.4 FED: tone

Moreover, the FED and ECB statutes establish a clear hierarchy of objectives, stating that price stability is the most important contribution that monetary policy should aim to achieve, together with a favourable economic environment and a high level of employment.

In addition, both of these monetary policy institutions aim to carry out prudential supervisory policies on credit institutions by targeting their actions at the stability of their respective financial systems.

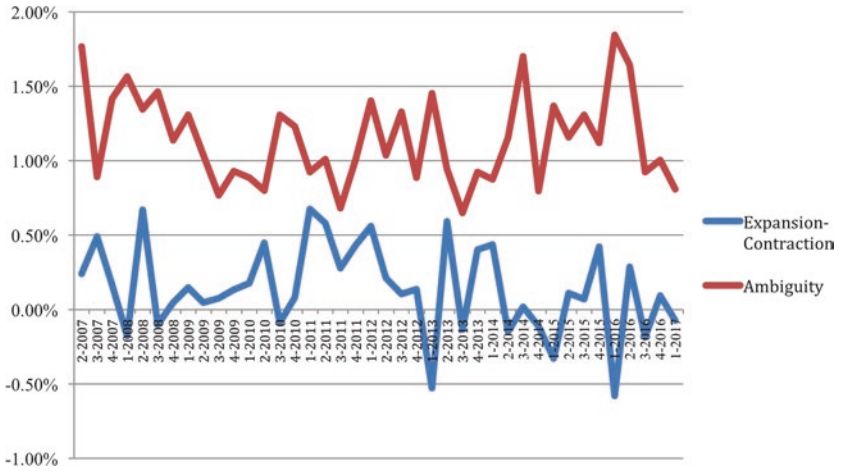

Fig. 5.5 FED: growth and ambiguity

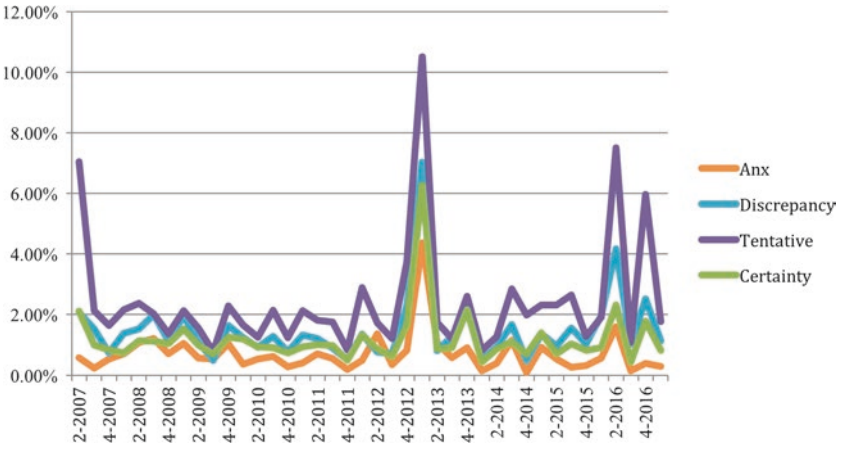

Fig. 5.6 FED: anxiety, certainty, tentative, and discrepancy words

Considering all the above, the final choice of the variables subject to the present analysis is the following: inflation Consumer Price Index (CPI Index), economic growth measured in terms of GDP trend, employment, financial system stability, and development and stability of the financial

markets. The general stock market index (proxied by EX600 and SPX500) and banking sector stock index (MSCI Bank Index) must also be taken into account. We extract macroeconomic and financial data from different sources. Macroeconomic variables are drawn from the OECD data collection system, checking the consistency of these variables by comparing time observations with Datastream. Stock market returns are taken from Bloomberg news reports. All variables are consistent with what is analysed via text analysis in the previous section and are intended to be quarterly observations. The two scenarios, *up* and *down*, are defined, depending on whether there is, in each subsequent quarter (in a rolling window scheme), growth (*up*) or decrease (*down*) in the trend of the single macroeconomic variable under study. We subsequently used text analysis to compile a quarterly observation cluster according to the global scenario (*up* and *down*). Specifically, we considered three wording indexes, expressing the tone, level of ambiguity, and state of anxiety of the central bank's communication strategy as reported in the speeches given by the head of the institution.

Thus, mean pairwise tests were used to verify the research hypothesis: whether there is a significant difference in the central bank communication strategy due to the current macroeconomic scenario. The results are shown in Tables 5.4 and 5.5.

First of all, it seems very interesting to note that the choice of our title was not casual. In fact, most of the time, there is no significant difference between the communication strategy of both the FED and the ECB, whether or not there is an improvement in the economic variables under consideration. We thus obtained a very negative answer to two research questions regarding any difference between the communication strategies of the FED and the ECB and whether the communication strategy is affected by the change in the macroeconomic scenario. Generally speaking, no significant changes are observed in the communication strategy, measured by indexes of the number of a certain set of words in a vocabulary accounting for tone, ambiguity, and anxiety level, in response to the dynamics of the global scenario. This is true for both the communication strategy of FED and that of the ECB. It is worth noting that the only statistically significant evidence, albeit with a low level of statistical significance, emerges when there are changes in the state of health of the financial markets. It is also quite interesting to note that above all for the ECB, the fall in stock market prices is the only

Table 5.5 USA: communication strategies analysis under the macroeconomic scenario

	Up scenario			*Down scenario*			*Diff*		
	Tone (%)	*Ambiguity (%)*	*Anxiety (%)*	*Tone (%)*	*Ambiguity (%)*	*Anxiety (%)*	*Tone (%)*	*Ambiguity (%)*	*Anxiety (%)*
	GDP								
Mean	0.15	1.14	0.73	0.08	1.12	0.67	0.07	0.02	0.06
St. dev	0.32	0.30	0.73	0.04	0.12	0.24			
	Inflation								
Mean	0.14	1.15	0.76	0.14	1.09	0.60	0.00	0.05	0.16
St. dev	0.31	0.31	0.75	0.27	0.19	0.36			
	Employment								
Mean	0.16	1.12	0.59	0.13	1.16	0.90	0.03	−0.04	−0.30
St. dev	0.32	0.33	0.41	0.28	0.24	0.91			
	Stock market								
Mean	0.14	1.07	0.67	0.15	1.24	0.81	−0.01	−0.17*	−0.14
St. dev	0.31	0.25	0.85	0.29	0.31	0.36			
	Stock market—banking sector								
Mean	0.13	1.08	0.69	0.16	1.22	0.79	−0.03	−0.13	−0.10
St. dev	0.29	0.26	0.84	0.32	0.32	0.37			

phenomenon that can increase the level of anxiety in the ECB's communication strategy and that it also increases the level of ambiguity. This evidence also supports the findings reported by some previous studies. In fact, it should be considered, on the whole, that the state of the economy in Europe and especially in the USA for the period analysed here is steadily increasing in terms of the level of GDP, and constant or decreasing in terms of inflation. As to the level of employment, historical trends have shown a fairly regular trend in overall levels of employment over time. Regarding the stock markets, during the period under review, drawdown periods can be observed with stock prices falling by more than 50% for both the Eurostoxx index and the SP500 index. However, both indexes showed a positive yield to maturity in the period under review, with the performance of the SP500 more than doubling the levels of early 2007. There is no doubt that the serious crisis of European banks, which began in 2008 and still persists in several countries, albeit with less intensity, should be considered the event that has created more anxiety and concern for the heads of central banks who have followed the ECB guidance. Even now, the European bank index is at the level of one-third of what it showed in the pre-crisis period at the end of 2006. Such a destruction of value under the effect of communication strategy can lead to the advent of wording full of connotations of fear and anxiety.

Table 5.5 shows the mean pairwise test of the wording indicators (tone, ambiguity, and anxiety) under the macroeconomic scenario (*up* and *down*). The wording indicators are based on specific word counting of speeches and interviews given by the Federal Reserve Bank Chair in the time sample: Q2 2007 to Q4 2016. We analysed more than 800 releases of speeches/interviews. The wording indicators are defined in Section 3. The *up* and *down* scenarios are defined, depending on whether there is, in each subsequent quarter (in a rolling window scheme), growth (*up*) or decrease (*down*) in the trend of the single macroeconomic variable under review (*GDP*, *Inflation*, *Employment*, *Stock Market*, and *Stock Market—banking sector*). ***, **, and * denote that estimates are statistically significant at the 1%, 5%, and 10% levels (*t*-test).

Table 5.6 shows the mean pairwise test of the wording indicator (tone, ambiguity, and anxiety) under the macroeconomic scenario (*up* and

Table 5.6 ECB: communication strategies analysis under the macroeconomic scenario

	Up scenario			*Down scenario*			*Diff*		
	Tone (%)	*Ambiguity (%)*	*Anxiety (%)*	*Tone (%)*	*Ambiguity (%)*	*Anxiety (%)*	*Tone (%)*	*Ambiguity (%)*	*Anxiety (%)*
	GDP								
Mean	0.20	0.73	0.52	0.33	0.96	0.71	−0.13	−0.22	−0.19*
St. dev	0.29	0.26	0.19	0.09	0.44	0.27			
	Inflation								
Mean	0.24	0.80	0.58	0.11	0.65	0.46	0.13	0.15	0.12
St. dev	0.27	0.31	0.20	0.28	0.25	0.24			
	Employment								
Mean	0.16	0.80	0.53	0.28	0.73	0.56	−0.12	0.07	−0.03
St. dev	0.29	0.33	0.26	0.25	0.25	0.15			
	Stock market								
Mean	0.21	0.68	0.52	0.22	0.86	0.58	−0.01	−0.18*	−0.06
St. dev	0.28	0.28	0.20	0.28	0.28	0.23			
	Stock market—banking sector								
Mean	0.16	1.03	0.50	0.13	1.21	0.88	0.02	−0.18**	−0.38**
St. dev	0.28	0.22	0.23	0.32	0.31	0.85			

down). The wording indicators are based on specific word counting of speeches and interviews given by the ECB President in the time sample: Q2 2007 to Q4 2016. We analysed more than 800 releases of speeches/interviews. The wording indicators are defined in Section 3. The *up* and *down* scenarios are defined, depending on whether there is, in each subsequent quarter (in a rolling window scheme), growth (*up*) or decrease (*down*) in the trend of the single macroeconomic variable under review (*GDP*, *Inflation*, *Employment*, *Stock Market*, and *Stock market—banking sector*). ***, **, and * denote that estimates are statistically significant at the 1%, 5%, and 10% levels (*t*-test).

5 Concluding Remarks and Research Perspectives

Combining text analysis, through wording indicators, and macroeconomic variables is quite unusual in central banking research, particularly if we consider the determinants of the communication strategies of central banks.

The aim of this chapter has been to assess differences between ECB and FED communication strategies, with special regard to reactions to quarterly changes in some macroeconomic variables (real and financial).

From this point of view, we found that the main changes in communication are linked (albeit at a low level of statistical significance) to quarter-by-quarter changes in the health of the financial system (stock market indexes, especially for banking and in Europe). Only in the case of the ECB did we find a change in communication linked to GDP change (likewise at a low level of statistical significance).

These results are only partly surprising: if we consider the mission of central banks, they are mainly concerned about financial markets and institutions. Hansen et al. (2017) similarly establish that, in the last 18 years, central bank forward guidance communication in the USA on future interest rates seems to have been much more important than its communication of current economic conditions. Shocks to forward guidance are more important than the FOMC communication of current economic conditions in terms of their effects on market and real variables. Only recently, following the 2007 crisis, were unconventional measures introduced in the USA and then in Europe to sustain the development of real variables (GDP, employment) and, in Europe,

to defeat deflation. Generally speaking, the low level of flexibility of communication strategies may be interpreted as a tool to keep markets and economic actors calm. From an emotional point of view, it can be positive to communicate stability in unstable times; but is this strategy useful and effective for the health of the financial system and the development of the real economy?

Of course, further research is needed to obtain better answers to our questions. From our point of view, we can refine our research in the near future along the following lines of analysis. We could test:

1. the variations in the wording of the speeches quarter-by-quarter as influenced by the outlook (forward-looking variables) instead of by past data;
2. the variations in the wording of the speeches quarter-by-quarter as influenced by relevant changes in macroeconomic variables, instead of any change;
3. the variations in the wording of the speeches following a persistent trend (two quarters, one year), as the communication strategies were an output of a "learning by observing" process within the central banks.

Lastly, we should like to stress that the research issues addressed in this chapter can be analysed with a different methodological approach, through a mix of quantitative (as here) and qualitative tools, less from a distance and more from within the organization itself of central banks. If possible, it might be useful to mix data from statistical analysis with interviews and surveys to explore the "learning-by-observing" process, with the aim of better understanding both the sense-making process in action within central banks and the way this process is testified by the speeches given by those who head them. This methodological openness may help us to develop a number of policy implications and organizational suggestions for better communication strategies by central banks.

Appendix

Table 5.7 Relevant literature

Author(s)	*Sample*	*Method*	*Main findings*
Berger et al. (2006)	ECB Monthly Bulletin and ECB President's introductory statement	Taylor Rule model and five indicators of ECB communication that are all based on the ECB President's introductory statement at the press conference following an ECB policy meeting	The results suggest that even though the indicators are sometimes quite different from one another, they add information that helps predict the ECB's next policy decision. Furthermore, when the interbank rate is included in our Taylor Rule model, the ECB communication indicators remain significant
Born et al. (2010)	This research creates a novel database comprising more than 1000 FSRs	Indicators based on semantic features of the communication that grade these along optimism and activity dimensions	FSRs had continuously become more positive after 2000, reaching a peak by early 2006 in terms of optimism and becoming more critical afterwards
Born et al. (2014)	FSRs	DICTION 5.0,4 computerized textual-analysis software, which searches textfor different semantic features using a corpus of several thousand words, and scores thetext along an optimism dimension	FSRs tend to reduce market volatility in response to FSRs
Bulíř et al. (2008)	Central banks' communications in a sample of developed and emerging market countries	Readability statistics and content analysis	Central banks were clear, on average, between 60% and 95% of the time

(*continued*)

Table 5.7 (continued)

Author(s)	*Sample*	*Method*	*Main findings*
Dincer and Eichengreen (2007)	100 countries up to 2006	Estimates of central bank transparency in an integrated econometric framework	The authors establish that there has been significant movement in the direction of greater central bank transparency in recent years. Transparent monetary policy arrangements are more likely to be found in countries with strong and stable political institutions. They are more likely to be found in democracies, with their culture of transparency. Moreover more transparency in monetary policy operating procedures is associated with less inflation variability, though not also with less inflation persistence
Ehrmann and Fratzscher (2007)	Communications by committee members at the FED, the BOE, and the ECB	Method of classifying the inter-meeting statements into those that give an inclination of tighter monetary policy versus no change or lower interest rates and hence of the economic outlook	This chapter shows that the Federal Reserve has been pursuing a highly individualistic communication strategy amid a collegial approach to decision-making, while the Bank of England has been employing a collegial communication strategy and highly individualistic decision-making. The ECB has chosen a collegial approach both in its communication strategy and in its decision-making. Assessing these strategies, we find that the predictability of policy decisions and the responsiveness of the financial markets to communications are equally good for the Federal Reserve and the ECB
Ehrmann and Fratzscher (2009)	Press conferences given by the FED, the ECB, and the BOE	Real-time analysis	The empirical findings show that ECB press conferences provide substantial additional information to financial markets beyond that contained in the monetary policy decisions and that the information content is closely linked to the characteristics of the decisions taken. Press conferences have actually had larger effects on financial markets on average than even the corresponding policy decisions, and with lower effects on volatility

Eijffinger and Geraats (2006)	Nine major central banks	A comprehensive index for central bank transparency comprising the political, economic, procedural, policy, and operational aspects of central banking. It is based on an analysis of information disclosure practices	The index reveals a rich variety in the degree of central bank transparency
Geraats (2002)	A structured review of the theoretical literature	A structured review of the theoretical literature on the consequences of transparency in monetary policy, proposing a distinction between uncertainty and incentive effects of transparency	Poor-quality communication raises market volatility
Hansen et al. (2017)	Speeches/interviews by the heads of central banks across 36 countries	LDA and dictionary methods	In the last 18 years, forward guidance communication on future interest rates in the US central bank seems to have been much more important than its communication of current economic conditions. Shocks to forward guidance are more important than the FOMC communication on current economic conditions in terms of their effects on market and real variables. Nonetheless, neither communication has particularly strong effects on real economic variables
Hayo et al. (2010)	FOMC communications	Glossary analysis and regression models	Federal Reserve communications contribute to understanding federal funds target rate decisions. Moreover, the effects of US target rate changes and FOMC communications on European and Pacific equity market returns are both found to have a significant impact. European markets are influenced by a greater variety of communications than Pacific markets

(*continued*)

Table 5.7 (continued)

Author(s)	*Sample*	*Method*	*Main findings*
Heinemann and Ullrich (2007)	Introductory statement by the ECB President	Communication indicators and the Taylor Rule	Wording indicators can improve the model's fit when added to the standard explanatory variables. However, a model based solely on these indicators performs worse than the baseline. The results are confirmed by an out-of-sample analysis, in which the determination of the wording indicators' weights is based on the early ECB period, which is subsequently excluded from the tests. The conclusion is that linguistic analysis can improve, but not substitute more rigorous forecasting techniques based on hard economic data
Hendry (2012)	Bank of Canada communication statements (FAD)	Text-mining tools	Bank FAD press release themes emphasizing the balance of risks, effects on GDP, labour, investment, the CPI, the terrorist attacks of 2001, and the economic effects of Severe Acute Respiratory Sindrome (SARS), Bovine Spongiform Encephalopathy (BSE), blackouts, and other shocks all tended to reduce short-term Canadian Bankers' Acceptance futures (BAX) market volatility significantly
Hendry and Madeley (2010)	Bank of Canada communication statements	Latent semantic analysis to extract information and investigate what type of information affects returns and volatility in short-term and long-term interest rate markets over the period 2002–2008	Discussions about geopolitical risk and other external shocks, major domestic shocks (SARS and BSE), the balance of risks to the economic projection, and various forward-looking statements are found to affect market returns and volatility significantly, especially for short-term markets. This effect is over and above that from the information contained in any policy interest rate surprise
Jansen and De Haan (2009)	Bloomberg news reports	Ordered probit models based on the Taylor Rule	Statements on the main refinancing rate and future inflation are significantly related to interest rate decisions. At the same time, an out-of-sample evaluation shows that communication-based models do not outperform models based on macroeconomic data in predicting decisions. Both types of models have difficulty in predicting changes in the main refinancing rate

Jansen and De Haan, (2005)	Speeches and interviews by members of the ECB Governing Council	EGARCH model proposed by Nelson (1991)	The authors find that the Bundesbank has dominated the news coverage. They conclude that ECB statements have mainly influenced conditional volatility. In some cases, there are effects of statements on the conditional mean of the euro-dollar exchange rate. Efforts to talk up the euro have generally not been successful. There is also evidence of asymmetric reactions to news
Knütter et al. (2011)	Review of 13 empirical studies, analysing the effects of speeches and interviews that appeared in the period between 2004 and 2010. Regarding the country samples, eight of them analyse the US economy, three investigate communication effects in the euro area, four refer to the UK, and two describe Canada. One is a cross-country study covering 35 mainly advanced countries	The empirical methods used most frequently are (E) GARCH and OLS	Most of these studies conclude that, in general, there is a positive influence of communication instruments on asset prices. Seven out of the 13 studies considered find a significant effect on the volatility of various asset prices, while 3 out of the 13 studies find no significant impact on asset prices at all, and 2 out of 7 studies show a negative influence on the volatility of asset prices
Rosa and Verga (2007)	Introductory statement by the ECB President	Glossary that translates the qualitative information of the press conferences into an ordered scale	Market expectations react to information distributed by the ECB

(*continued*)

Table 5.7 (continued)

Author(s)	*Sample*	*Method*	*Main findings*
Rosa and Verga (2007)	Introductory statement by the ECB President	Communication indicators	The predictive ability of statements is similar to that implied by market-based measures of monetary policy expectations. Moreover, ECB words provide complementary, rather than substitutable, information with respect to macroeconomic variables. Finally, market expectations react to the unexpected component of the information released by the ECB, after controlling for the monetary policy shock
Rosa and Verga (2008)	Euribor futures market using a new tick-by-tick data set	Real-time analysis	Two pieces of news systematically hit financial markets on Governing Council meeting days: the ECB policy rate decision and the explanation of its monetary policy stance. Second, the authors find that the unexpected component of ECB explanations has a significant and sizable impact on futures prices. Third, the authors investigate how communication interacts with learning by the public about the credibility of the central bank: financial market participants needed around 3 years, from 1999 through 2001, to learn how to interpret and believe ECB announcements. Finally, the results suggest that the Euribor futures market is efficient
Rozkrut et al. (2007)	Central bank communications in CEC3 countries	Communication indicators	Policymakers' words often do not correspond with their deeds and that there are large differences in communication strategy across CEC3 countries
Sturm et al. (2011)	Introductory statement by the ECB President	Communication indicators	ECB communication is found to be significant in a Taylor Rule model
Woodford (2005)	FOMC transcripts	Model of Morris and Shin (2002)	Good communication replaces policy action itself

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CHAPTER 6

Complaining in Consumer Credit: Evidence from the Italian Financial System

S. Cosma, F. Pancotto, and P. Vezzani

1 Introduction

Today, banks are fully aware that the global financial crisis has had a negative impact on consumer trust in financial intermediaries. In the present scenario, successful companies gain a competitive advantage through increased efficiency, high quality of service, and improved customer relations.

Several arguments are currently encouraging banks to increasingly adopt strategies of customer retention and customer loyalty. These arguments are based on a very simple fact: the costs incurred in avoiding the loss of old customers are clearly much lower than those required to acquire new customers. Moreover, keeping customers satisfied is currently both

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really critical and important, since losing customers in one business may also mean losing them in other business areas.

As regards service quality in particular, bank stakeholders are paying greater attention to the real value of financial products and services and their delivery processes as a parameter for the sustainability of trust-based relationships between banks and their customers.

The issues of the transparency and fairness standards of financial intermediaries and trust-based relationships with customers are of great significance. Banking initiatives must deal with the correct progress of the dynamics of contractual balances, in which any conduct based on the abuse of a dominant position by strong counterparts must be avoided. Within banking contracts, there is a natural imbalance between the two parties. The weaker counterpart, the customer, is in a position of net disadvantage compared to the bank.

Furthermore, the existence of a quick and direct procedure for communicating and managing any dissatisfaction or disservice is a way of protecting consumers. In fact, customers may not be able to apply to the civil courts due to reasons of cost and complex procedures. This point may, on the one hand, lead to difficulties in ensuring consumer rights and, on the other, result in unfair conduct on the part of lenders.

As a consequence, in many developed countries, banks have adopted complaint management systems in order to provide instruments to protect the weaker counterpart, namely, the customer.

For this reason, Alternative Dispute Resolution (ADR) systems have become a topical issue in the attempt to facilitate access to justice for consumers. These systems have developed extensively in the financial services sector and are viewed as an inexpensive way to manage dispute resolution in consumer matters.

The presence of an effective dispute resolution mechanism gives financial intermediaries an incentive to act in accordance with principles of transparency and fairness in customer relations, in addition to enhancing the public's trust in such intermediaries. Moreover, it helps the monitoring of operational, legal, and reputational risks.

Numerous studies (the marketing and management stream of literature) focus on complaint management as a useful mechanism in customer retention and to improve the quality of the provided services.

Many academic studies (the regulatory and banking stream of literature) investigate the consequences of ADR decisions on customer behaviour or the interactions between regulation and individual behaviour.

The number of customer complaints has been gradually increasing, having doubled in the last two years. This does not seem to be related

solely to the quality of financial services or the lack of compliance of banking output. Another reason can be found in the characteristics of the procedures involved, these being very simple and free of charge (without any sanctions, costs, or penalties for incorrect use or behaviour). Moreover, the ADR mechanism produces a relevant effect for the bank because all procedures are monitored by the Banking Authorities.

The aim of our study is to analyse the effects of ADR on the behaviour of consumers and financial intermediaries.

Our study analyses the complaints submitted directly to financial intermediaries by consumers regarding credit services. Subsequently, the analysis is extended to the characteristics of complaints received by Italy's Banking Financial Arbitrator (BFA) related to consumer credit. The analysis covers the period 2010–2016 and uses confidential data collected by the Italian Association of Consumer and Real Estate Credit (Assofin) as well as public data collected by the BFA.

The aims of the study are to analyse how the behaviour of consumers submitting a complaint to a bank or an appeal to the BFA has changed over the years and to highlight the main changes on the supply side of the consumer credit market. The chapter thus aims to highlight the role of the current ADR approach and its main critical issues, with specific concerns related to consumer protection.

The chapter is structured as follows.

Section 1, the Introduction, briefly introduces the topic and explains the structure of the study. In Sect. 2, we review the main strands of the research literature on the topic. Section 3 describes the process of managing complaints by banks via the different existing steps and the main features of the Italian ADR system (BFA). Section 4 provides statistical information on the appeals submitted to the BFA and on complaints received by financial institutions regarding consumer credit. This is followed by some concluding remarks and managerial implications in Sect. 5.

2 Literature Review

2.1 Complaining in the Managerial and Marketing Stream

Increasing interest in consumer complaint behaviour (CCB) arose during the 1960s. At that time, consumer satisfaction, consumer dissatisfaction, and CCB were three different—yet at the same time highly correlated—themes investigated by marketing and consumer studies.

Real and concrete marketing problems may be considered to be at the origin of these studies. For example, the importance given to quality, performance, and satisfaction and the emphasis afforded to customers are all factors that lead researchers to inquire into the complex mechanisms determining customer satisfaction or dissatisfaction, and into what constitutes consequent behaviour.

At the same time, the findings of studies are aimed at identifying and suggesting managerial and practical solutions which can be applied to markets or services.

CCB is an area of research dealing with the identification and analysis of all the aspects involved in the consumer reaction to a product or a service failure and the ensuing perceived dissatisfaction.

In fact, CCB consists of all the potential responses that customers use to express their dissatisfaction.

More specifically, CCB is the behaviour that people show and includes expressing negative opinions about the product and services to the producing company, to the supplier of products and services, or to third-party organizations. Thus, the study of CCB seems essential to explain and predict the customer's intention to continue doing business with and to remain loyal to the firm in question.

Recognizing the causes and consequences of customer complaint behaviour is of great importance within the environment of competition between products and services, as well as among financial intermediaries.

Especially for banks, this area is critical for identifying and managing operational, legal, and reputational risks: great attention paid to customer complaints may reduce these kinds of risks. The recent financial crises have shown to what extent reputational risk can influence the performance of banks and financial institutions.

Within the managerial and marketing stream of literature, many empirical and theoretical studies have analysed complaints and the importance of different variables within customer experience dissatisfaction.

The truly seminal work on the alternatives available to dissatisfied people is the paper by Hirschman (1970), which is based on three possible options: exit, voice, and loyalty.

Researchers suggest various taxonomies to understand the numerous CCB responses in which consumers can engage (Singh 1988; Maute and Forrester 1993; Broadbridge and Marshall 1995).

Customers can complain in various ways: seeking redress, boycotting suppliers, telling family and friends about the experience, or doing noth-

ing at all (Blodgett et al. 1995). Consumer complaints can be used not only to obtain redress but also to increase the firm's efficiency. Sellers receive important feedback on their products/services, leading to improved and increased consumer satisfaction. Complaints in fact disclose problems that, in many cases, are significant (Landon 1980).

Complaints can inform firms about the existing needs of consumers and provide the opportunity for discussion about future needs. Sanes (1993) stated that 'understanding complaints is equivalent to mining gold'.

From this perspective, complaining may help in discovering and correcting product issues, increasing consumer satisfaction, retaining the consumer as an active purchaser, rather than simply as a comfort consumer, or providing an excuse and/or fair redress (Hogarth and English 2002).

In many studies, a specific aspect is underlined: the existence of relevant differences if the customer uses a service or, instead, buys a product. More specifically, consumers seem to experience greater dissatisfaction with services compared to products (Best and Andreasen 1977); the reasons most frequently mentioned seem to be careless and unprofessional conducts. The same authors find that complaints are more frequent when the problem is perceived as obvious rather than subjective.

Hirschman (1970) and Tronvoll (2007) reported different consumer behaviour according to the market situation. Consumer reaction towards a product's or a service's decline can vary enormously if alternatives are really and easily available. In a competitive market, the 'exit' solution is easy to adopt because competitors are known and available. In a monopolistic situation, however, the most likely reaction to product or service failure is to remain silently loyal or to engage in negative word of mouth.

Different studies have sought to profile customers according to various aspects: age, sex, education, income, nationality, and personality. However, the findings of many studies on this aspect of CCB have shown very limited consistency and low significance.

As can be seen in the main managerial- and marketing-related stream of literature, many studies highlight the value of customer complaints and underline the fact that these should be welcomed.

A great deal of this research assumes that customers do not knowingly complain without a good reason. In fact, the focus within the service failure literature on service recovery is primarily rooted on the assumption that services have genuinely failed and the reasons which drive customers' complaints are essentially legitimate.

In contrast, as far as research is concerned, little attention has been paid to the behaviour (and hidden reasons) of those consumers who knowingly voice 'fake complaints', which represent the dishonest and unjustified aspect of CCB.

In fact, counter to the aforementioned main body of the managerial and marketing stream of literature (where customers' complaints originate from true dissatisfaction), this minor strand of literature argues that complaint episodes may occur without customers experiencing real service failure or dissatisfaction.

Jacoby and Jaccard (1981) acknowledge the existence of complaints from *satisfied users* who may *deliberately fabricate* problems.

Reynolds and Harris (2005) explore the reasons for and forms of deliberately illegitimate complaints, professed while reporting not sincere service failures. Using the critical incident technique, they analysed 104 interviews with customers who had knowingly made an illegitimate complaint six months prior to the interview. Interesting insights and four distinct forms of customer complainants emerged from their study. They labelled these as follows: one-off complainants, opportunistic complainants, conditioned complainants, and professional complainants.

Ro and Wong (2012) investigate how service employees in hotels and restaurants handle opportunistic customer complaints.

Huang and Miao (2016) explore frontline employees' perceptions and responses given to illegitimate customer complaint behaviour in the hospitality industry. In their study, the analysis of data revealed different types of illegitimate complainants: opportunistic plotters, repetitive grumblers, and occasional tyrants.

Customers with legitimate complaints could also become opportunistic complainants by taking advantage of the service failure in order to obtain extra financial benefits when complaining (Wirtz and McColl-Kennedy 2010).

These are only some of the research studies related to this specific, yet at the same time, important approach. All these studies contradict the mantra that 'the customer is always right'. This mantra in fact gives certain types of customers an unfair advantage.

For our analysis, this stream highlights a key issue within the literature.

2.2 Complaining in the Financial Sector

Services and products in the financial sector are very similar; even when there are innovations, they are quite easy to copy. Hence, when it comes to supplying services and products, banks can differentiate themselves

only in terms of price and quality. In this industry, satisfaction becomes a key variable, allowing differentiation from competitors.

Complaint management is a relatively recent research field, integrated within the larger perspective of customer relationship management.

It is well known that the scenario in which financial institutions operate has altered in recent years. With increased competition, the global market, growing product portfolios, and diminishing margins, the behaviour of bank customers has also changed.

Customer dissatisfaction is often affected by the relationship established with front office human resources. The main motives for consumer complaint behaviour in banks are rude staff behaviour, delays in services, hidden costs, long queues, and misinformation. The psychological aspect that influences the relationship between bank employees on the one hand and customers on the other is analysed in Khartabiel and Saydam (2014). Many items are considered in the study: banking functions, training programmes, wages, communication related to bank organization, teamwork, job satisfaction, career opportunities, customer loyalty, and the provision of high-quality services to customers who meet their needs. The authors found that when bank acts to improve job satisfaction, customer satisfaction and loyalty are raised at the same time. In other words, job satisfaction has a significant influence on staff behaviour towards costumers, and this strengthens the important hypothesis that satisfied employees produce better results.

Moving on from the consequences of service quality to its underlying causes, there is consensus in the academic literature on banks and financial institutions regarding the importance of behavioural and process indicators such as attentiveness, responsiveness, care, and assurance as the main variables influencing banking service quality (Bloemer et al. 1998). These variables can be measured via customer satisfaction analysis, loyalty indicators, and complaint handling systems.

Other authors (Wang et al. 2003) show that, in the banking industry, the higher the quality of services perceived by customers, the lower the reputational risk exposure, whereas the lower the quality of services perceived by customers, the higher the reputational risk exposure.

The paradox of complaint management lies in the hypothesis according to which, following a negative event, dissatisfied customers may be more satisfied and more loyal than customers who did not experience such an event, provided that the firm proposes an adequate management of their complaints. Negative interactions are often more useful than positive interactions. Lok and Matthews (2007) found that the satisfactory

resolution of a complaint makes customers happier and less likely to leave the bank.

In the event of a complaint, the bank may reduce its losses and hence the risk of losing the customer by referring the customer to its own customer service department. If the department is able to provide a reasonable solution for the customer, the bank may reduce its losses, and the customer will be entitled to obtain a refund for the loss suffered (Uppal 2010).

Complaint management is a very crucial tool for enhancing customer loyalty, risk minimization, and CRM (Shalini and Munjal 2014). These authors found that complaints and risk have a significant relationship and that risk can be reduced through complaint management.

The possibility of gaining a competitive advantage from complaint management implies that the organizational structure is able to propose an efficient system of complaint management (Hakiri 2012). If the bank makes an effort to solve the problem promptly and tries to figure out the origin of the issue perceived by the customer, with this information being properly filed and stored, the bank can manage to improve the quality of the supplied service.

Unpleasant banking experiences have likewise been investigated (generally via surveys and questionnaires) in different national banking systems in order to ascertain the determinants of complaining. Poor and unsatisfactory employee behaviour determines unpleasant customer experiences, while misinformation from banking staff generally lead to an increase in unpleasant customer experiences (Jugenissova et al. 2014).

One of the crucial drivers of unpleasant experiences is the time spent during the carrying out of banking services (Srijumpa et al. 2007).

Ramachandran and Chidambaram (2012) compiled an almost complete review of the literature on these themes. These authors summarize the results of their literature review on customer satisfaction towards the services of a bank from five different perspectives: service encounters, customer waiting time to obtain the service, the role of intermediaries, the quality of the service provided, and customer complaints towards the bank. They state that the service process performance of an organization should be measured continuously in order to achieve a competitive advantage and that this is possible by providing excellent service.

Few studies have analysed the Italian banking industry in this respect, especially when we shift to analyses conducted using actual complaint databases.

One reason (but not the only one) for this is that, since 2010, the Bank of Italy has legally obliged banks to publish a report on their websites regarding their complaint management activities. This mandatory disclosure refers not only to the number of complaints but also to the type of services or products which generated them.

Malinconico et al. (2013) examined the content of these actual customer complaints within Italian retail banks using the complaint data available on all the bank websites mentioned above. Their study aims to discover the behaviour of different types of banks (by legal form, size, etc.). The underlying hypothesis of their paper is that the number of complaints received by a bank is a good proxy of customer dissatisfaction. The larger the bank and the number of services it offers, the higher the number of complaints it receives. In order to avoid problems of scale (i.e. comparing large and small banks), the total number of complaints is divided by appropriate scale variables. The study examined the year 2011 and a total of more than 66,500 complaints concerning 47 Italian banks, covering about 60% of transactions on the Italian banking market. From their initial results, conducted with three analysis of variance (ANOVA) tests, it emerges that small banks and local banks have a greater ability to prevent retail customer dissatisfaction.

D'Apolito and Labini (2014) analysed the level of disclosure in handling complaints in a sample of Italian banks. The study covered the period 2010–2012. These authors built a measure of disclosure based on the information that banks provide on their websites and in corporate documents, and estimated the relationship between disclosure levels and financial and organizational variables. The following results of their study may be highlighted:

- The level of disclosure increased both qualitatively and quantitatively during the three-year period, even with differences among banks.
- This level of disclosure was still low at that time.
- Size and efficiency variables were significant, as well as the internal organizational arrangements for handling complaints (internal management vs. outsourcing).

We could continue to analyse other studies, but frankly, the majority of the research within the financial sector covers and deals with the mainstream quite similarly to the ways described previously in this chapter.

Albeit with different depths, these studies—only a few of which are cited, for the sake of brevity—address the fact that the bank pursues a duality of interests: to preserve future benefits-related customers and to improve the quality of its services. Accordingly, this literature provides a common framework that is almost always related to the topic of dis/satisfaction. Briefly speaking, the main key messages are:

- Complaints are a manifested expression of dissatisfaction; for this reason, a careful analysis of complaints—which are very rich sources of information—allows banks to detect situations of customer dissatisfaction and their underlying motivations.
- Complaints are key indicators that are useful for measuring the actual level of performance of customer services.
- Complaint management is a suitable tool for enhancing the quality perceived by customers and the bank's relationship with them.
- Efficient complaint management systems should allow banks to limit legal and reputational risks via the reduction of conflict with customers and hence reduce litigation costs for banks.

2.3 Complaining and ADR Schemes

Most of the interest in ADR worldwide is based on the simple and true fact that the civil courts of justice are overwhelmed, and legal costs are very high.

The literature on ADR can be divided into three relevant clusters:

- Studies concerned with the regulatory analysis of the main features of different ADR systems. A large number of the research studies we examined are related to the Italian BFA (Bank of Italy 2014, 2015, 2016b, c, 2017; Caggiano 2015; Consolo and Stella 2011; De Carolis 2011; Frosini 2011; Maimeri 2012; Perassi 2011).
- Studies concerned with the comparative analysis of ADR schemes in various countries. The comparison of consumer ADR schemes shows a wide range of different approaches, including arbitration, ombudsmen, mediation, and conciliation schemes, as well as various determinants related to the choice of referring to the ADR procedure instead of to civil courts (Boccuzzi 2010; Valsecchi 2011; Gilad 2008a, b; Thomas and Frizon 2011).

- Studies concerned with the empirical analysis of the nature and trend of BFA appeals in terms of types and/or their correlation with other aspects such as the effects of the disclosure of verdicts on the frequency of new complaints (Malinconico et al. 2011; Malinconico and Fuccio 2016; Filotto et al. 2016).

For the present analysis, we are mainly interested in the third cluster of studies, which provides empirical analysis based on the statistics on bank disputes in the retail banking service, in order to assess to what extent ADR has been used by financial consumers and what the ensuing effects produced on banks' behaviour towards customers are.

Malinconico et al. (2011) focused specifically on the effect of ADR systems on customer protection. These authors provide an explorative analysis (covering the period 2009–2010) designed to understand the preliminary features of ADR in Italy.

The assumption that complaints are an expression of negative customer sentiment and that the way complaints are managed influences the perception the customer has regarding the quality of services has been studied by Malinconico and Fuccio (2016). In their study, the number of BFA appeals is treated as a reliable indicator of deep dissatisfaction that arises not only from the poor quality of the provided services but also from the speed with which the bank is able to manage customer complaints. The data used cover the period 2012–2014 and comprise appeals filed before the BFA related to a sample of 74 Italian banks. The results show that small banks and cooperative banks are presumably more inclined to closely monitor their customers, due to the fact that their organizational structures allow them to resolve customer problems.

An interesting study is that carried out by Filotto et al. (2016). These authors examined the behaviour of consumers appealing to the BFA, with the aim of understanding the effect of 'attracting' other complaints, obviously later in time. They started out from the observation that, if certain decisions are mostly in favour of the appellants, this encourages consumers to take actions, as the minimum cost of submitting a complaint does not represent a disincentive for non-valid claims. They studied the link between the number of new complaints submitted and the number of valid claims. Their main results show that a sort of 'attraction effect' exists for many banking products, and this effect is almost immediate, as it occurs within a two-year span. Considering that the BFA's decisions are publicly disclosed, but still not widely known among unsophisticated customers, it is

difficult to understand how such a large number of consumers could become aware of these outcomes and decide to complain. One possible reasonable answer is that lawyers and professionals (the so-called facilitators) play today a significant role in seeking out potential complainants who are encouraged to submit a complaint to the BFA.

3 Italian ADR

Complaint management systems are related to the process of receiving, investigating, and resolving controversies originating from customers who complain about a procedure or financial product.

The debate on ADRs as instruments that facilitate access to justice has recently become more widespread in the European Union, as these mechanisms have proved to be particularly useful for consumer-related disputes concerning small monetary claims. The low value of the majority of these disputes often makes courts of justice an unsuitable place to obtain individual redress. For this reason, courts are seen as the last resort, and, when available, consumers increasingly opt for more informal ADR schemes.

Furthermore, the financial crisis has given rise to a renewed focus on consumer protection, resulting in the adoption of new guidelines for complaint management in the finance industry.[1]

In many developed economies, Banking Authorities have adopted an ADR procedure—in Italy, the so-called BFA—in order to manage complaints that customers and financial intermediaries cannot solve by themselves.

In Italy,[2] all customers can use this procedure after a first stage in which they submit their claims to financial intermediaries or banks through a specific system of complaint management.[3] After 30 days, if they have not

[1] See Bank of Italy (2014, 2016b).

[2] We need to stress the fact that the main consumer ADR schemes adopted among different countries will not be analysed here. See, for instance, Boccuzzi (2010), Valsecchi (2011), and Bank of Italy (2017).

[3] Specifically related to the organization and operation of complaint offices, a recent analysis conducted by the Bank of Italy examines good practices and criticalities in the handling of complaints. More precisely, the Bank of Italy has stated that complaint management guidelines—issued by the Joint European Banking Authority-European Securities and Markets Authority-European Insurance and Occupational Pensions Authority (EBA-ESMA-EIOPA) Committee in May 2014—require the competent authorities to ensure that companies (and banks, authors' note) adopt a complaint management policy and provide themselves with a business function and procedures that will enable them to manage complaints in a fair way.

received a reply or they are not satisfied with the bank's reply, they can apply for a ruling from the BFA or a civil court of justice.

In 2009, the Bank of Italy instituted the BFA, implementing Article 128-bis of the Consolidated Law on Banking, a provision introduced by Law 262/2005 (Investor Protection Law). The Investor Protection Law stipulates that the banking and finance industries must have systems in place for the out-of-court settlement of disputes, and the law itself states the principles to which these systems should conform: timeliness, cost-effectiveness, and effective legal protection; a deciding body that is impartial and representative; and protection of the legal right to seek remedy through the other means made available by the legal system.

The BFA's rulings 'are not legal judgments: they are not legally binding on the customer or the intermediary and they do not affect the possibility of submitting the dispute to the civil courts. The relevance of BFA's decisions lies in their authoritative quality and impartiality. If an intermediary refuses to comply with a decision, notice of its non-compliance is published on the BFA's website.'[4]

It is important to stress the fact that the BFA cannot decide on issues related to investment products, services, or activities (securities trading or placement, investment advice, asset management, or matters relating to bonds issued or settled by banks). The Arbitrator of Financial Disputes (AFD), a new out-of-court dispute resolution body established by CONSOB, the Italian Companies and Stock Exchange Commission, was created in January 2017 to deal with these issues.

Procedures should include the identification of a manager and/or an office independent from business functions. The compliance function—or, in its absence, an Internal Audit—must report to the corporate bodies on the overall situation of the complaints received and the adequacy of the procedures and organizational solutions in place at least annually.

During 2015, inspections were carried out on the operations of these complaint offices. The audits identified a number of good organizational practices capable of providing quick, exhaustive, and satisfactory customer responses, as well as effective use of information obtained from complaints. In some cases, the controls highlighted the existence of areas of improvement. The Bank of Italy has therefore sent a communication to illustrate good practices throughout the banking and financial system, asking each operator to conduct an in-depth examination of its handling of complaints and to take initiatives aimed at raising the quality of the service. See Bank of Italy (2016a) for further details.

[4] 'The BFA must not be confused with arbitration, a legal instrument whose purpose is to enable parties, under an agreement that may precede or follow the rise of the dispute, to have their case settled by one or more arbiters whose decisions are binding. Nor can the BFA be likened to mediation. The two procedures differ in legal basis, scope, prerequisites to access them and also the outcomes are very different'. See Bank of Italy (2014, 2016b).

Participation in the BFA system is mandatory for banks, being a condition for the exercise of banking and financial activities. Non-compliance is punishable with a fine.

All intermediaries are included in the registers kept by the Bank of Italy. Banks, finance companies, payment institutions, electronic money institutions, loan guarantee consortia, and BancoPosta must adhere to the system, as must foreign intermediaries operating in Italy which are not part of Fin-Net, the European out-of-court settlement system endorsed by the European Commission.[5]

The Bank of Italy 'checks banks' compliance with the rules on transparency and fairness with off-site prudential controls and on-site inspections at branches and headquarters. In the case of irregularities, anomalies or misconduct, the Bank intervenes and takes appropriate measures with respect to the system or individual banks, depending on the seriousness of the issues.'[6]

The outcomes of the BFA's proceedings constitute a significant contribution to supervisory activity: the BFA's decisions 'become part of the broader pool of information at the Bank's disposal for its regulatory and control function.'[7]

Intermediaries are under no obligation in their customer relations to follow every interpretation made or endorsed by the BFA. Nevertheless, pursuant to its Directives, banks and other financial intermediaries

> must ensure, through appropriate internal procedures, that their complaints departments are familiar with the BFA's guidelines, are updated to the most recent positions and assess customer complaints on this basis. In particular, the complaints departments are required to determine whether the point raised by the customer has a precedent in earlier cases decided by the panels.[8]

[5] Fin-Net is a network promoted by the European Commission in order to assist the development and cooperation of ADR schemes in Europe. It enables consumers who have a dispute with an intermediary in another member state to turn to their own national ADR scheme, which, through Fin-Net, will put them in touch with the equivalent scheme in the intermediary's country. Fin-Net currently has 60 member ADR schemes from EU countries plus Iceland, Liechtenstein, and Norway. Italy's Banking and Financial Ombudsman has been a member since 2011. See Bank of Italy (2017).

[6] See Bank of Italy (2014).

[7] See Bank of Italy (2016c), Section 1.

[8] See Bank of Italy (2014).

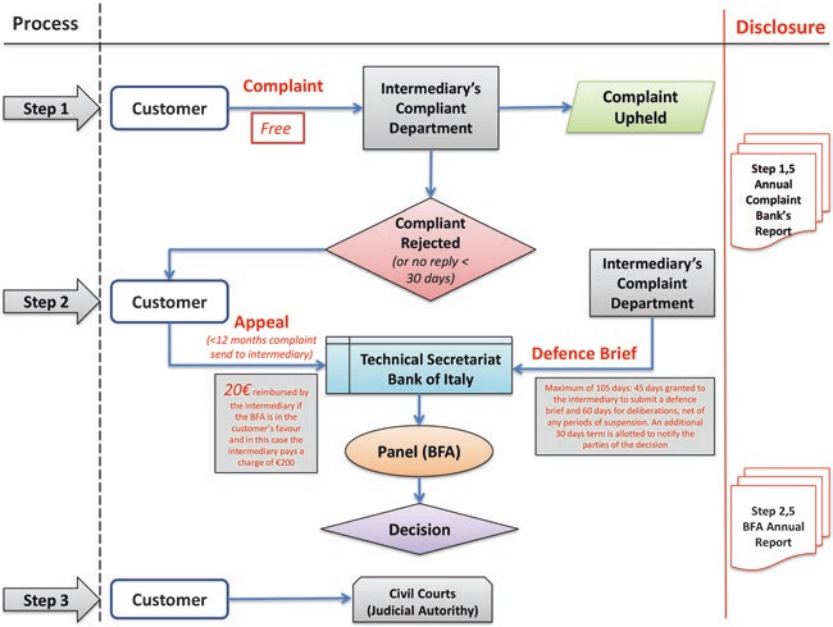

Fig. 6.1 The steps of the complaint handling process in Italy. (Source: Adapted from Bank of Italy 2014)

Figure 6.1 describes the steps of the process and the mandatory duties as regards the disclosures involved.

A complaint against a bank is first submitted by the complainant to the bank for its consideration ('Step 1').

A complainant who is dissatisfied with the bank's decision may then request its review by the BFA ('Step 2').

The BFA's decisions are legally binding upon firms, whereas consumers are free to pursue their case anew in the civil courts ('Step 3'). They are free to file a complaint before a civil court at any time (i.e. 'Step 3' does not necessarily come at the end). In Italy, it is well known that the standard expenses and duration of legal procedures are not competitive compared with ADR systems.

At the same time, banks disclose a report every year on their website containing a qualitative and quantitative analysis of all complaints received (aggregated data) during the year, and any changes with respect to the

previous year. We call this disclosure moment 'Step 1.5', even though we know that it does not happen exactly between 'Step 1' and 'Step 2'.

Moreover, the Banking Financial Arbitrator publishes a very detailed report every year including data on appeals and operations (matters under dispute, types of intermediary, outcomes, etc.). We call this additional disclosure moment 'Step 2.5' (with the same caveat as above).

4 Analysis of Disputes Between Financial Intermediaries and Consumers

Within the literature, most studies analyse the phenomenon of consumer complaints related to using credit services employing data from the BFA Annual Report. Such data describe the evolution of BFA appeals, their motivations, and their outcomes.

In the present study, consumer behaviour is also analysed in the first step of the ADR process, that is, complaints to financial intermediaries. Data from Assofin's Annual Report on Consumer Credit Complaints are used to this end. This source records a sample of intermediaries representing approximately 93% of the outstanding credit.

The joint analysis of complaints and appeals allows us to examine the whole ADR process and identify important features related to consumer use of ADR.

Complaints and BFA appeals have grown sharply in Italy. During 2016, the number of BFA appeals reached the figure of 21,652 (Table 6.1) with a Cumulative Average Growth Rate (CAGR)—in the period 2010–2016—of 32.3%. The total number of complaints registered in the Italian financial system during 2016 is over 250,000. Of these, 100,000 refer to consumer credit, the CAGR being equal to 17.1% in this case.

Table 6.1 BFA appeals and consumer credit complaints (annual data and % variation)

	2010	*2011*	*2012*	*2013*	*2014*	*2015*	*2016*
BFA appeals	3409	3578	5653	7862	11,229	13,578	21,652
Variation (%)		5.0	58.0	39.1	42.8	20.9	59.5
Consumer credit complaints		35,230	36,572	38,207	51,186	70,429	90,866
Variation (%)			3.8	4.5	34.0	37.6	29.0

Source: BFA, Banking and Financial Ombudsman Annual Report (various years), Assofin, Annual Report on Consumer Credit Complaints (various years)

The strong growth originates mainly from appeals related to loans secured by pledge of salary (LSPS), a typical kind of personal loan with wage assignment and where the payments are withdrawn directly from employees' pay. During 2016, these complaints accounted for 71% of the total. The same growth takes place on the complaints side, something which is a mandatory step in order to be admitted to BFA, where complaints related to LSPS represented 64% of the total in 2016. These disputes are mainly due to non-repayment to consumers of a part of the commissions not collected in the case of early repayment of LSPS.

The geographical distribution shows a greater number of complaints and appeals in the southern areas of the country, where employee incomes are more widespread and, last but not least, where the average salary is lower (Table 6.2). In fact, a positive relationship is found between the geographical origin of the appeals and the risk of poverty (Bank of Italy 2017). Not surprisingly, households living in the South represent the most evident customer target of LSPS and, realistically, they are more likely to have repaid in advance and renegotiated the LSPS more than once. In all geographical areas, over 67% of appeals originate from male consumers.

The trend in appeals by type of financial intermediary reflects the role of individuals in the supply of LSPS (Table 6.3). During 2016, these appeals

Table 6.2 BFA appeals per million inhabitants (annual data)

	2011	*2012*	*2013*	*2014*	*2015*	*2016*
Northern Italy	40.3	72.8	107.5	135.0	147.0	241.6
Italy	47.4	80.2	114.6	165.2	206.5	341.1
Central Italy	66.7	98.2	124.7	176.9	239.4	353.4
Southern Italy and the Islands	42.2	76.9	117.3	202.2	271.2	485.4

Source: BFA, Banking and Financial Ombudsman Annual Report (various years)

Table 6.3 BFA appeals by type of financial intermediary (annual data and CAGR 2010–2016)

	2010	*2011*	*2012*	*2013*	*2014*	*2015*	*2016*	*CAGR (%)*
Domestic banks	2546	2213	2776	3541	4755	5742	10,002	23.3
Foreign banks	188	195	319	529	1083	1805	2894	55.0
Other financial intermediaries	654	1131	2479	3674	5238	5865	8228	35.8

Source: BFA, Banking and Financial Ombudsman Annual Report (various years)

amount to 87% of the total for foreign banks and 94% for financial intermediaries. Large banks are also affected by LSPS appeals, though to a lesser extent, whereas small banks and mutual banks more frequently receive claims related to topics like checking accounts, mortgages, and debit cards.

Banks however show a lower growth rate in terms of appeals. As we will see later, this reflects a different approach to complaint management that avoids exacerbating the conflict and preserves the relationship with customers, often characterized by a greater variety of products compared to other, more specialized intermediaries. Banks are more likely to be inclined to manage the situation at the time the complaint is made (Step 1) and to avoid unnecessarily pursuing a dispute with the customer.

The percentage of appeals resolved and concluded by the BFA (with an agreement between the customer and the financial intermediary) is increasing and represents 87% of the results of the appeals of 2016 (Table 6.4).

The analysis of resolved appeals shows a high share of favourable outcomes for the complainant: 91% for LSPS; while for other loans, the share is roughly 50% of the submitted appeals (Table 6.5).

Table 6.4 Outcomes of submitted appeals (%)

	2012	*2013*	*2014*	*2015*	*2016*
Resolved	48	37	33	43	51
Settled	20	36	36	28	26
Dismissed	32	27	31	30	23
Total	100	100	100	100	100

Source: BFA, Banking and Financial Ombudsman Annual Report (various years)

Table 6.5 Outcomes of submitted appeals by product (%)

	Resolved and settled	*Dismissed*
Central credit register	37	63
Mortgage	39	61
Other loans	41	59
Consumer credit	42	58
Bank transfer	45	55
Deposit	49	51
Cheque	50	50
Debit card	60	40
Credit card	62	38
LSPS	91	9

Source: BFA, Banking and Financial Ombudsman Annual Report (various years)

From this point of view, the establishment of ADR is a really positive procedure for solving disputes between the customer and the financial intermediary. It decides the issues for many cases of unfair behaviour and strengthens the ability to protect the system. An increasing number of consumers are using ADR to resolve their disputes with financial intermediaries. During 2017, the BFA had to increase its staff in order to cope with the high number of appeals and reduce response times.

The BFA, whose due time for responding should be within 105 days, currently has an average response time of 314 days, and there are still a significant number of appeals in arrears.

An appeal to the BFA, just like a complaint to an intermediary, does not require any form of mandatory legal assistance. However, it is observed that consumers are supported by a legal advisor in over 60% of complaints, while this percentage rises to above 86% in the case of BFA appeals (Table 6.6).

It is interesting to investigate this phenomenon in order to understand whether there are specific reasons related to the ADR framework that prevent individual consumers from using this procedure independently.

The analysis of the appeals shows a positive relationship between the number of lawyers in a region and the number of appeals assisted by a lawyer (Bank of Italy 2017). At the same time, the sample analysis of complaints and appeals allows us to verify that the number of associations and legal advisors specializing in these disputes is not so high.

In fact, the presence of associations and legal advisors is not a negative phenomenon if it helps to improve the functioning of the ADR and allows the broadening of consumer protection. The final opinion becomes less

Table 6.6 Consumer credit complaints and BFA appeals by origin (%)

	2015	*2016*
Consumer credit complaints		
Lawyer/other professionals	55	59
Consumer association	5	7
Individual consumer	40	34
Appeals to the BFA		
Lawyer/other professionals	60	61
Consumer association	4	10
Other associations	14	15
Individual consumer	22	14

Source: BFA, Banking and Financial Ombudsman Annual Report (various years), Assofin, Annual Report on Consumer Credit Complaints (various years)

positive in the case of professionals who do not really improve the process, whose intervention is not regulated, and whose fees, paid by consumers, reduce, de facto, their protection and, above all, fair compensation for the damage incurred.

Along with the absence of disincentives to present unacceptable complaints, this aspect could contribute to the increase in appeals submitted for purposes other than actual consumer protection.

The second part of the analysis deals with complaints towards financial intermediaries (Step 1), delving further into the dynamics of the relationship and consumer behaviour. Step 1 complaints presented by consumers during 2016 were around 250,000 at the system level, about 100,000 of which were related to consumer credit.

If we exclude complaints related to LSPS, there has been a reduction over the last two years (Table 6.7). This trend also originates from the behaviour of intermediaries due to the fact that they tried to remove reasons for dissatisfaction and complaint as far as possible in order to prevent future complaints.

These efforts have also arisen, to a certain extent, due to the establishment of ADR, which makes any opportunistic behaviour by financial intermediaries more expensive and produces incentives to change non-compliant operational and commercial practices.

This is evidenced by the decrease in complaints, in the three-year period from 2014 to 2016 compared to the previous three-year period, in all types of complaints made by customers (Table 6.8). This trend is generated by the learning effect of financial intermediaries, which enhances all the information acquired within the management of disputes with customers.

It is equally worth noting that the number of employees in complaint handling offices has increased by more than 50% since 2012. This has

Table 6.7 Consumer credit complaints without early repayment LSPS (annual data and % variation)

	2011	*2012*	*2013*	*2014*	*2015*	*2016*
Consumer credit complaints (without early repayment of loans secured by pledge of salary)	35,230	36,572	38,207	38,441	36,326	33,063
Variation (%)		3.8	4.5	0.6	−5.5	−9.0

Source: Assofin, Annual Report on Consumer Credit Complaints (various years)

Table 6.8 Consumer credit complaints by reason (% variation)

	Var. % 2011–2013	*Var. % 2014–2016*
Early repayment of loans secured by pledge of salary	n.a.	354
Insurance policies/accessory (financial services)	54	−13
Administrative/organizational aspects	39	−17
Disclosure	38	−19
Privacy/central credit register	−28	1
Credit standing	1	−2
Loan recovery	117	−33
Product and service anomalies	−44	−20
Disclaimers/fraud	−47	−3

Source: Assofin, Annual Report on Consumer Credit Complaints (various years)

Table 6.9 Consumer credit complaints' management

	2012	*2016*
No. of complaint office employees	100	156
Complaints per employee	366	582
Average no. of days for a response	17	17

Source: Assofin, Annual Report on Consumer Credit Complaints (various years)

occurred in order to ensure fast and due answers within 30 days (required by law) upon receipt of the complaint.

Specialization and acquired expertise have made it possible to improve employee productivity (from 366 to 582 practices), testifying to the efforts made by intermediaries in the management of consumer complaints (Table 6.9).

5 Conclusions

The parallel analysis of bank complaints and appeals to Italy's BFA underlines the positive value of the establishment of ADR in the market of credit and banking services to consumers.

ADR is an irreplaceable tool for direct consumer protection and contributes to improving the functioning of markets. As highlighted in this study, it represents a way to become aware of customer satisfaction and an instrument for improving the ability to respond to customer needs.

At the same time, it has likewise become a tool to improve the overall compliance of financial intermediaries and to pursue operational efficiency.

Undeniably, as suggested by law, ADR is also a monitoring tool for authorities and should contribute to improving the information framework available to credit authorities for their control and regulation activities.

The significant growth of complaints and BFA appeals confirms the need for the establishment of this dispute management system between consumers and financial intermediaries.

ADR intercepts a tiny dispute that would not have other results and that is of great importance both for the consumer's satisfaction and for financial intermediaries in terms of costs, risks, reputation, and so on.

Financial intermediaries and banks in particular have altered their behaviour and operating practices, valuing what they have learned from the management of complaints and the rulings of the BFA. This is confirmed by the decrease in disputes and consumer outcomes for many banking services, a sign that banks are trying to improve their ability to generate relational value.

However, there are areas for improvement both in terms of consumer protection and market efficiency. It is necessary to reflect on the distorting effects generated by the high incidence of professionals who support consumers, their cost, and the lack of disincentives (of an economic or other nature) with respect to the propensity to resort to ADR without the required positive assumptions.

We can currently see the main effects of this by considering certain key points: the increase in response times well beyond the number of days envisaged by the law; the unregulated distribution of compensation between the consumer and the legal advisor; and the growth of costs for financial intermediaries in the process of managing complaints and BFA appeals.

The increase in costs and operational risks for lenders is significant and could lead to an increase in average credit costs or, even worse, lower credit supply, especially for those products characterized by more regulatory uncertainty and greater litigation risk, which are, however, usually addressed to specific customer targets.

The managerial implications highlighted by the study include a need for the management of banks to analyse customer complaints better. Managers have to enforce mechanisms via which customer complaints are monitored and tracked in order to identify and challenge fraudulent complainants.

The policy implications are quite significant, as they suggest that the authorities should review these mechanisms, given that they can lead to opportunistic behaviour by consumers, consulting firms, law firms, and associations for business and profit reasons.

Credit authorities should consider and introduce appropriate mechanisms able to steer customers towards fair and honest behaviour, as well as penalties and disincentives able to make unfair and unjustified claim attempts very expensive.

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PART II

Corporate Governance and Performance

CHAPTER 7

Bank Boards in Europe: Trade-Offs in Size, Composition, and Turnover

Eleuterio Vallelado and Myriam García-Olalla

1 Introduction

The Basel Committee on Banking Supervision (BCBS) believes that corporate governance is necessary to guarantee a sound financial system, arguing that good corporate governance increases monitoring efficiency (Enhancing Corporate Governance for Banking Organizations, September 1999 and February 2006). Following the crisis, efficient monitoring of banks appeared more relevant than ever. Currently, however, there still remains an unresolved debate, both within and beyond academy, regarding the relationships between corporate governance, risk, and performance

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in banks. Anecdotal evidence shows that the financial crisis has hit banks just when they were improving their compliance with the codes of good governance.[1] Codes of good governance were already in place during the financial crisis; however, the institutions that have complied with these codes have suffered the consequences of the crisis with at least the same intensity as those who have not applied the guidelines contained in the codes (Armour et al. 2016). It is therefore of interest to analyse to what extent banks' corporate governance or more precisely the differences in banks' corporate governance lie at the root of the crisis.

The financial crisis has shown that the governance best practices of non-financial firms are not directly applicable to banks. Good governance prescriptions for banks are different from the recommendations for non-financial firms (Kose et al. 2016). The complexity of the banking business increases the asymmetry of information and diminishes the capacity of stakeholders to monitor bank managers' decisions. Banks are a key element in the payment system and play a major role in the functioning of economic systems. They are also highly leveraged firms, largely due to the deposits taken from customers and the fact that they are insured by public deposit insurance schemes. For all these reasons, banks are subject to stricter regulation than other firms, as they are responsible for safeguarding depositors' rights, guaranteeing the stability of the payment system, and reducing systemic risk. Hence, the corporate governance practices of banks are quite different to those of non-financial companies (Kose et al. 2016). The crisis has made it possible to identify failures in the corporate governance of banks, even in some banks that were ranked high in terms of complying with best practice guidelines.

Several authors have argued that banks in which their governance has promoted excessive risk-taking are the culprits of financial instability and the subsequent contagion effects in the economy (Kirkpatrick 2009; Laeven and Levine 2009; Pathan 2009). Since then, international institutions have been discussing and proposing prudential regulation to address and, whenever possible, prevent the next financial crisis. The special nature of banks means that the alignment of the interests of executives and shareholders[2] could end up becoming an incentive for banks to assume excessive risk. When banks fail to manage their risk efficiently, there is a negative impact on the economy as a whole in the form of what is known as systemic

[1] For instance, Banco Popular (Spain) improved its corporate governance between 2011 and 2016 according to the Monitor Empresarial Reputacion Corporativa (MERCO) ranking, just before it was resolved by Single Resolution Board (SRB) in 2017.

[2] For instance, via the remuneration policy.

risk. However, not all banks contribute in the same way to systemic risk. Large, global banks are particularly important in the triggering of systemic risk because of their wider connections with other economic agents. Therefore, the corporate governance of banks should be designed to align executives' interests with not only those of shareholders but also with those of debtholders (including depositors) and other stakeholders such as the regulator (Acharya et al. 2009; De Haan and Vlahu 2016). Furthermore, the corporate governance of banks is complex and diverse because there is not one single corporate governance structure that fits all banks.

This chapter provides a survey of papers that provide different, sometimes contradictory results on the importance of bank boards for corporate governance in a highly regulated industry. Following this introduction, the second section is devoted to the importance of the board for the corporate governance of banks. Section 3 analyses bank board size. Section 4 covers the arguments regarding board composition, while Section 5 deals with board turnover. The last section provides some concluding remarks in the never-ending debate on the corporate governance of banks.

2 Bank Boards

There is some agreement with respect to considering the board to be more important, as a governance mechanism, in banks than in non-financial companies (Caprio and Levine 2002). Besides the existence of banking regulation that could have shifted the need for board governance (Pathan et al. 2013), bank governance—via its board of directors—is mandatory, because neither dispersed shareholders/debtholders nor the market for corporate control can impose effective governance. Bank boards play a unique role in balancing the interest of the bank's stakeholders: shareholders, debtholders, and the regulator.

The financial literature identifies two main roles for bank boards: monitoring and advising. The board's duty is to supervise bank executives so that they make decisions in line with the best interests of shareholders (the principal-agent problem) but also bearing in mind that risk-taking is in consonance with the bank's risk appetite and its long-term stability (the principal-regulator problem). To accomplish both tasks and deal with banking issues, banks require a suitable board size and a suitable balance between outside and inside board members so as to contribute to the efficient monitoring of executives. The board size of banks is thus found to be larger than that of non-financial companies. Due to the complexity of

the banking business, inside board members are key to facilitating the necessary information for monitoring and to fostering a fluent relationship between the board and the bank's executives. On the other hand, outside board members can complement inside expertise by bringing their knowledge of best practices to the boardroom.

Boards are also responsible for advising bank executives. Bank boards participate in setting goals and implementing strategies. Information and business knowledge are key elements when advising. Hence, board members should be selected from among those who have the skills, education, and expertise to enhance the already existing capabilities of the board.

The monitoring and advising roles of the board should thus be related to board size and composition. A better alignment of the interests of shareholders, debtholders, and the regulator will provide for a more effective bank board (Mehran and Mollineaux 2012). Following this argument, Mehran et al. (2011) consider that it is in the best interest of shareholders to have optimal size boards with a balanced composition.

3 Bank Board Size

More board members should contribute to an increase in the monitoring and/or advising capacity of the board. It thus follows that more complex firms should require larger boards to cope with the said complexity. Dalton et al. (1999) shows that large boards mean more resources, more information, and more expertise. Not by chance, the empirical studies on board size have evidenced the larger size of bank boards in comparison with non-financial firm boards, justified by the complexity and opacity of the banking business and its special regulation (Andres de and Vallelado 2008; Adams and Mehran 2012). However, there are limits to the size of boards to provide for efficient monitoring and valuable advising. Excessively large boards are not only expensive but also more difficult to coordinate and control; they also have higher agency problems, as the free-rider problem becomes more accentuated.

Knyazeva et al. (2013) identify several reasons to explain the increase in board size: overseeing management and serving on key committees, performing an advisory role or providing expertise, increasing social connections, gaining access to networks so as to access outside resources, facilitating knowledge transfer, or enhancing firm reputation. The market reaction to new board members should thus be conditioned by the reasons for such appointments.

The empirical evidence shows that excessively large boards do not work in the shareholders' best interests because of the free-rider problem that results in a loss of value for shareholders (Mehran et al. 2011). Small boards, on the other hand, are easier to manage and coordinate, they are less expensive, and their members can more easily interact with one another, thereby fostering enhanced cohesion in their decision-making. Board size is thus a trade-off that each bank needs to look at in order to optimize its size.

Adams (2012), Adams and Mehran (2012), and Aebi et al. (2012) find a positive relationship between board size and performance for samples of US banks. They demonstrate that there are advantages for banks to have large boards. Other authors, such as Pathan (2009), Wang et al. (2012), and Pathan et al. (2013), find the opposite, however, that is, a negative relationship between board size and bank performance. These conflicting results could be compatible if such a relationship is non-linear, as Andres de and Vallelado (2008) and Grove et al. (2011) show. These authors find a non-linear inverted U which indicates that increasing the size of bank boards in pursuit of efficiency has a threshold, above which further increases in board size penalize bank value. Pathan and Faff (2013) argues that bank boards affect performance only in banks with low market power and that market power is a by-product of banking regulation. Finally, Berger et al. (2012a) and Erkens et al. (2012) find no relationship between board size and the bank's probability of default (see Table 7.1 for further details).

Thus, the empirical evidence points to a balance between the advantages of larger boards for supervising complex and opaque banks and the drawbacks of managing, coordinating, and controlling large boards. In other words, overly large boards result in noise and a waste of resources. Each bank should identify the optimal size for its board, that which provides efficient supervision and quality advising while avoiding the inconvenience of large, sclerotic boards.

Using BoardEx and SNL data, we show in Figs. 7.1 and 7.2 the relationship between bank size, calculated using banks' total assets, and bank board size for a sample of 57 banks from 20 European countries, before and after the financial crisis. The years 2006 and 2007 were chosen to represent the banks' situation before the crisis, whereas the years 2014 and 2015 represent the banks' situation after the crisis.

The average bank board size was 17.5 directors before the financial crisis, although this figure has decreased to 15 (14%) after the financial crisis, almost one decade later. The behaviour is not homogenous across

Table 7.1 Recent studies on bank board size and performance

Authors	*Sample*	*Measure of size*	*Dependent variables*	*Result*
Adams (2012)	89 US banks	Number of directors	Probability of receiving TARP money	Positive
Adams and Mehran (2012)	35 US BHCs	(Log of) number of directors	Tobin's Q	Positive
Aebi et al. (2012)	372 US banks	Log of number of directors	Buy-and-hold returns and ROE	Positive
Berger et al. (2012a)	85 default and 243 non-default US commercial banks	Log of board size	Probability of default	Not significant
Andres de and Vallelado (2008)	69 large banks from 6 countries	Number of directors	Tobin's Q, ROA, shareholder market return	Inverted U-shaped relationship
Grove et al. (2011)	236 US banks	Different variables covering size	ROA, future exc. return	Inverted U-shaped relationship
Erkens et al. (2012)	296 large financial firms across 30 countries	(Log of) number of directors	Buy-and-hold returns	Not significant
Pathan (2009)	212 large US BHCs	Number of directors	Total risk, idiosyncratic risk, systematic risk, assets, return risk, Z-score	Negative
Pathan and Faff (2013)	212 US bank holdings	Number of directors Composition: % independents Gender: % women	ROA, ROE, Tobin's Q, operating income, stock returns	Negative for size Negative for independence Positive for women, though weak
Wang et al. (2012)	68 US banks	Number of directors	Efficiency index based on CAMEL indicators	Negative

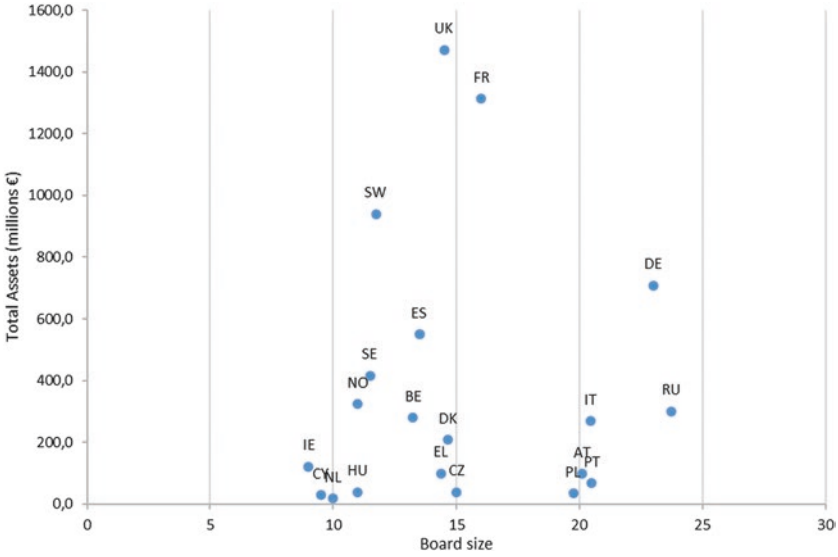

Fig. 7.1 Banks' assets vs board size after the financial crisis in European countries. (Source: BoardEx and SNL data, compiled by the authors)

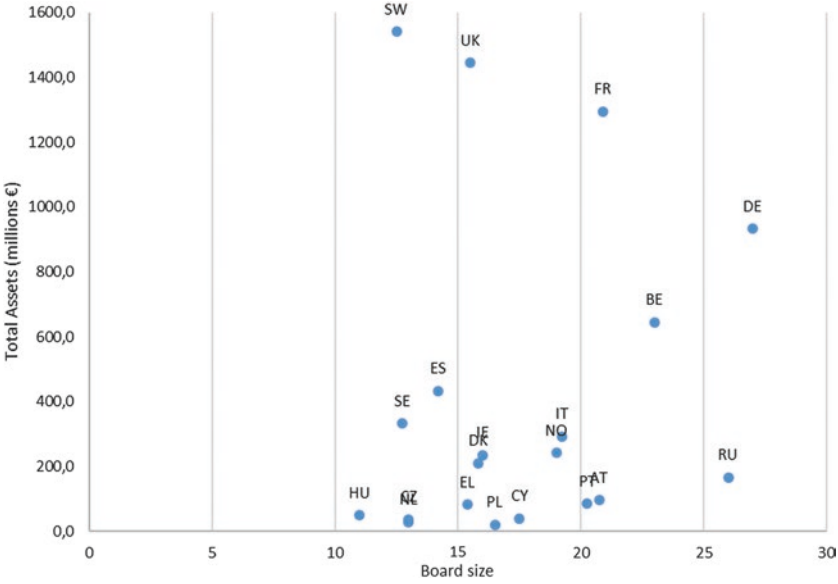

Fig. 7.2 Banks' assets vs board size before the financial crisis in European countries. (Source: BoardEx and SNL data, compiled by the authors)

the sample, which reinforces our idea that one size does not fit all the banks (Figs. 7.1 and 7.2). Something similar happens with bank size. After the financial crisis, the average volume of banks' total assets is 10.7% smaller than before the financial crisis. The largest banks that we have found in the UK, France, and Switzerland have average or below average board sizes, whereas banks in Germany, Russia, Italy, Austria, Portugal, and Poland have the largest boards, with more than 20 members, even though they are not the largest banks. Thus, it is not always the largest banks, that is, those who will need more monitoring and advising capacity, that are the ones with the largest boards. Our data indicates that a linear relationship between board size and bank size is not the most plausible explanation.

Bank profitability has suffered as a result of the financial crisis. The average return on equity (ROE) for the banks in our sample has fallen from almost 20% before the financial crisis to 4% after the crisis. The list of more profitable banks has also changed. After the crisis, the banks with the highest ROE are those in Norway, Sweden, Czech Republic, and Poland, with a ROE of 15% (Fig. 7.3). The most profitable banks before the crisis were located in Cyprus, Russia, Poland, and Hungary. Only the Polish banks figure in both lists, before and after the crisis, as being among those with the highest returns. However, before the financial crisis, most of the banks in our sample had ROEs above the 15% threshold (Fig. 7.4). We do not find a linear relationship between board size and profitability either before or after the crisis. After the financial crisis, the banks with the highest ROE are those in Norway and Sweden, with board sizes well below the average. Before the financial crisis, the most profitable banks, located in Cyprus and Russia, had large boards well above the average. Thus, it seems that banks with large boards before the crisis did not perform better during the crisis. The size of the board is not in itself the main variable to deal with a financial crisis. As the literature has shown, there is a trade-off in bank board size.

4 Bank Board Composition

Board composition is a complement of board size in bank corporate governance. The board's monitoring and advising roles require a suitable number of members to comply with the task and also a suitable combination of expertise and information between outside (non-executive or independent) and inside (executive) members. The literature has maintained that outside board members improve the board's monitoring and advising

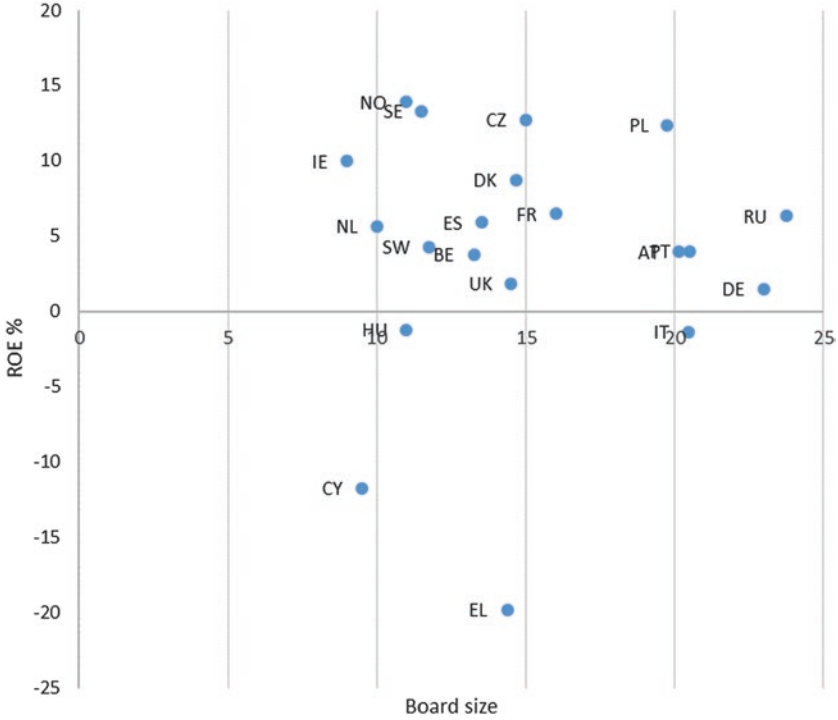

Fig. 7.3 Board size vs return on equity after the financial crisis. (Source: BoardEx and SNL data, compiled by the authors)

capabilities and play a key role in reducing agency conflicts, that is, principal-agent and principal-regulator problems. Inside board members, on the other hand, bring their insider information to the boardroom, along with their expertise. Therefore, complex firms, such as banks, need a large enough board not only to have sufficient resources for monitoring and advising but also to find the right combination of inside and outside board members that enrich discussions and arguments within the board.

Outside board members are on the board to look after the interests of the shareholders. However, in the case of outside members of bank boards, these not only require the vote of shareholders but also the approval of the regulator to become board members. Therefore, they have to deliver to both. They have the duty to supervise bank executives' decision-making, at

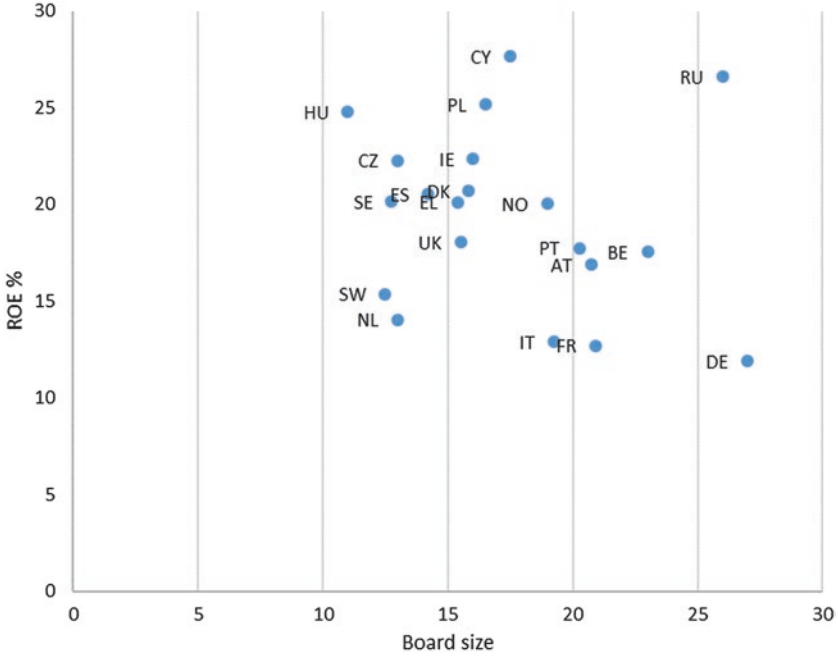

Fig. 7.4 Board size vs return on equity before the financial crisis. (Source: BoardEx and SNL data, compiled by the authors)

the same time as providing advice and networking to help the latter deliver results without compromising the bank's long-term solvency or stability. Nowadays, the regulator and the legislator, both in the EU and the USA, have to push for the presence of a higher proportion of outside board members under the assumption that more outside members will improve bank governance (Andrés de et al. 2017). Moreover, the market seems to favour heterogeneity in the boardroom, as investors place valuation premiums on board heterogeneity in complex firms (Anderson et al. 2011).

Adams and Mehran (2012) argue that outside board members are able to supervise executives without restrictions because they have no ties with management. They also contribute to broadening board decision-making by bringing new methods and expertise to bear. However, if a board increases its number of outside members, but the new directors do not contribute to improving board talent or if they are too busy serving on several boards, then a higher proportion of outside members on the bank's board does not help to improve its monitoring or advising capabilities.

Linck et al. (2008) find that boards tend to add independent directors by means of expansion rather than replacement. Furthermore, although outside board members have better incentives than inside members to efficiently monitor the bank, inside board members have better information and a better understanding of the bank itself than outside members. Therefore, there is a trade-off in bank board composition, as in the case of board size. Each bank has to work out a solution to determine the optimal proportion of outside and inside board member to fulfil its monitoring and advising duties and hence contribute to bank value creation.

So far, the empirical evidence is not conclusive. For instance, Minton et al. (2010), Fernandes and Fich (2009), and Adams and Mehran (2012) do not find a linear positive relationship between the proportion of outside board members and bank performance. However, Aebi et al. (2012) and Erkens et al. (2012) show a negative linear relationship, although one that is not highly significant. Andres de and Vallelado (2008) have analysed a non-linear relationship, finding an inverted U-shaped relationship that justifies the existence of a trade-off in board composition. Masulis and Mobbs (2015) and Sila et al. (2015) report that boards on which independent directors are incentivized to protect their reputation are associated with better governance. The scrutiny of board member reputation is more important in environments with strong investor protection and which require higher information disclosure. These inconclusive results suggest that improving corporate governance requires something more than just varying the proportion of outside board members. Adams and Ferreira (2007) find that reputation incentives for directors are linked to stock price informativeness, because independent directors require firm-specific information to perform their monitoring and advising duties effectively. Thus, independent directors that care about their reputation will prevent managers from withholding firm-specific information to capture private benefits. Given the right incentives, independent directors will enhance firm transparency and foster a higher level of disclosure. We can hence state that independent directors are more effective at monitoring when working in firms that provide them with higher visibility (Masulis and Mobbs 2014). In the same vein, Adams and Ferreira (2007) argue that prestige, reputation, and career concerns are what motivate directors to perform their board duties, rather than financial remuneration (see Table 7.2 for further details).

New outside board members will have different backgrounds and will assume different duties on a bank board. Knyazeva et al. (2013) find that administrative academics are the busiest directors, while specialized academics are the most focused less busy directors. The question of outside

Table 7.2 Recent studies on bank board structure and performance

Authors	*Sample*	*Independent variables*	*Dependent variables*	*Result*
Aebi et al. (2012)	372 US banks	Percentage of outside directors	Buy-and-hold returns and ROE Tobin's Q	Negative, but mostly insignificant
Andres de and Vallelado (2008)	69 large banks from 6 countries	Number of non-executive directors out of the total number of directors	Tobin's Q, ROA, shareholder market return	Inverted U-shaped relationship
Berger et al. (2012a)	85 default and 243 no default US commercial banks	Number of outside directors on the board	Probability of default	Not significant
Cornett et al. (2010)	All US publicly traded BHCs	Inverse of board size times the ratio of the number of outside directors to the number of affiliated and inside directors	Buy-and-hold abnormal stock returns (BHAR) and accounting-based performance measures	Before the crisis not significantly related to BHAR, but positive during the crisis
Erkens et al. (2012)	296 large (total assets greater than US$ 10 billion) financial firms (including non-banks) across 30 countries	Percentage of directors with a background in finance	Buy-and-hold returns	Insignificant
Fernandes and Fich (2009)	398 US banks	Percentage of independent directors on the board and financial expertise of outside directors	Stock performance likelihood of bank failure Amount of TARP money	Not significant with independence Positive for expertise (only during crisis and not before)

(*continued*)

Table 7.2 (continued)

Authors	*Sample*	*Independent variables*	*Dependent variables*	*Result*
Hau and Thum (2009)	29 largest German banks	Management and financial expertise	Bank losses	Higher losses in banks with boards with less financial expertise
Hagendorff, et al. (2015)	165 US banks and 1578 bank executives	Bank and managerial characteristics	10 bank policy variables	Bank manager styles are an important factor explaining the heterogeneity of bank policy choices
King et al. (2016)	149 large listed US banks	6 education variables CEO educational index	ROA	Positive between educational level and performance Moderating role of education
Mamatzakis and Bermpei (2015)	23 listed US investment banks	Board structure: size, composition, and gender CEO power, CEO compensation, CEO ownership, board members	ROAA, ROAE, pre-tax operating income, profit efficiency	Negative relationship between board size and CEO ownership and performance. Positive relationship between CEO power and performance
Minton et al. (2014)	182 commercial banks, S&Ls, and investment banks 2003–2008	The fraction of reported independent directors that are classified as financial experts, executive, academic, and professional investor positions.	Performance: stock returns (Tobin's Q) Risk: market- and balance sheet-based measures	Financial expertise among independent members. Positive relationship with risk. Weakly associated with better performance before the crisis and strongly associated with lower performance after the crisis

(*continued*)

Table 7.2 (continued)

Authors	*Sample*	*Independent variables*	*Dependent variables*	*Result*
Nguyen et al. (2014)	533 US banks and 244 enforcement actions 2000–2013	Board monitoring Monitoring quality Advising quality	Bank misconduct Shareholder wealth	Monitoring and advising are effective in reducing the probability that banks receive enforcement actions from regulators
Pathan and Faff (2013)	212 US bank holdings	Number of directors Composition: % independent members Gender: % women	ROA, ROE, Tobin's Q, operating income, stock returns	Negative for size Negative for independence Positive for women, but weakly so
Wang et al. (2012)	68 US BHCs	Number of outside directors over total number of directors	Efficiency index based on CAMEL indicators	Negative

directors who sit on several boards has also been analysed by Masulis and Mobbs (2014). These authors argue that directors who sit on various boards are more attentive and allocate a higher proportion of their time and effort to those boards that are more prestigious or more visible. This argument is in agreement with the proposal by Fama (1980) that independent directors need to signal, in the market for directors, that they are good monitors in order to increase the value of their human capital and their chances of being nominated for additional directorships.

Furthermore, additional outside board members should bring expertise to their new position, particularly in turbulent times. Minton et al. (2014) find that financial expertise is weakly associated with better performance before the crisis but is strongly related to lower performance during the crisis. Financial experts that join bank boards should be aware of the explicit and implicit government guarantees given to banks and might encourage managers to pursue risk-taking activities to increase the residual claims of the bank's shareholders (Acharya et al. 2010; Merton 1977).

There are other characteristics of new board members that could help to improve board efficiency in terms of monitoring and advising. The literature

has analysed gender, age, diversity, and educational background, among other factors. Pathan and Faff (2013) finds a weak effect of gender diversity on bank performance. The upper echelons theory proposed in Hambrick and Mason (1984) and Hambrick (2007) suggests that individual characteristics matter. Individual differences are more salient when decision-making situations are complex and ambiguous.

Berger et al. (2014) investigate how demographic characteristics of executive teams affect corporate governance. As these authors state, a team perspective is crucial in the decision-making process. Heterogeneity in the top management team plays a significant role in the decision-making of corporate boards. Corporate outcomes reflect consensus decisions reached among top executives who may have different opinions because of their demographic background. Berger et al. (2014) find that a decrease in average board age strongly increases bank portfolio risk. They also find that an increase in board gender diversity increases risk and that the presence of executives with a PhD degree is associated with a decrease in portfolio risk. However, not all is good news as regards heterogeneity among directors. The findings of Knyazeva et al. (2013) indicate that the cost of coordinating the board can outweigh the benefits of increased director heterogeneity at high levels of board heterogeneity.

Bernile et al. (2018) likewise examine the effects of diversity on the board of directors on corporate policies and risk. These authors use a multidimensional measure based on six dimensions including both demographic and cognitive factors that are observable and widely available. These include gender, age, ethnicity, educational background, financial expertise, and breadth of board experience. They conclude that greater board diversity leads to lower volatility and better performance. The lower risk levels are largely due to diverse boards adopting more persistent and less risky financial policies. Furthermore, firms with greater board diversity also invest persistently more in research and development and have more efficient innovation processes.

Nguyen et al. (2015) find that shareholder market returns are higher when the board appointee is older, has prior experience as executive director, or holds an Ivy League degree. In contrast, the appointment of an executive who holds multiple non-executive directorships results in negative returns. In addition, gender and experience in non-banking industries do not affect stock market returns around the announcement of a new executive. Wealth effects are enhanced when the appointee joins as a CEO. Along the same lines, King et al. (2016) and Srivastav and Hagendorff (2016) show that educational background conditions firm investment and general

decision-making. However, not all forms of education produce a homogenous effect on firm performance, because of selection effects.

Bank CEOs with higher MBA education factor scores exhibit better firm performance. In general, CEOs with higher MBA education factor scores who follow riskier or innovative business models achieve significantly higher levels of bank profitability. Furthermore, education moderates the responsiveness of CEOs to incentives embedded in their compensation contracts. CEOs with higher management education scores are more likely to improve bank performance in response to higher risk-taking incentives and receiving a higher fraction of equity compensation.

However, the contributions of outside board members to the board are in the hands of the CEO. Thus, CEO power (the entrenchment hypothesis) conditions how the characteristic of the new board members contribute to efficient monitoring and advising. Nguyen et al. (2014) argue that a bank's board of directors should play a key role in mitigating the risk of misconduct. Hence, when the CEO holds too much authority within the firm, misconduct is a potential outcome. Board independence can thus be undermined if CEOs exert an intangible influence over the other board directors. CEOs may not always possess the necessary knowledge and skills to make decisions that lower incidences of wrongdoing. They may be prone to missteps in the absence of technical expertise, hence the importance of a balanced composition of the board. Effective boards mitigate the risk of bank misconduct and reinforce the ongoing regulatory initiatives related to the role of bank boards in preventing misconduct.

We analyse the evolution of bank board composition in the period before and after the financial crisis using a sample of 57 European banks from 20 different countries that have survived the crisis. We find that the proportion of non-executive directors (NED) have remained constant (76%) on average before and after the financial crisis. As before, this behaviour is not homogenous across countries. In most of the countries in our sample, we observe an increase in the proportion of NED on bank boards. However, this proportion has decreased following the financial crisis in the banks in Belgium, Cyprus, Czech Republic, Denmark, and Germany. The German and Russian banks have the largest boards both before and after the crisis, but low proportions of non-executive directors. In fact, Russian banks have large boards with the smallest proportion of non-executive directors (48% before the crisis and 50% after). These data shows that there is not a linear relationship between the size of the board and the importance of outside directors (Figs. 7.5, 7.6, 7.7, and 7.8).

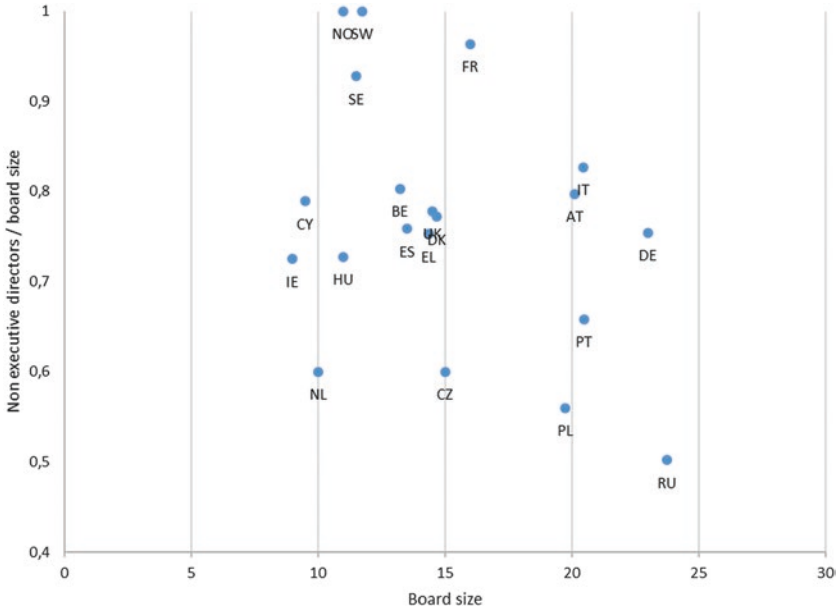

Fig. 7.5 Board size and composition after the financial crisis in European countries. (Source: BoardEx and SNL data, compiled by the authors)

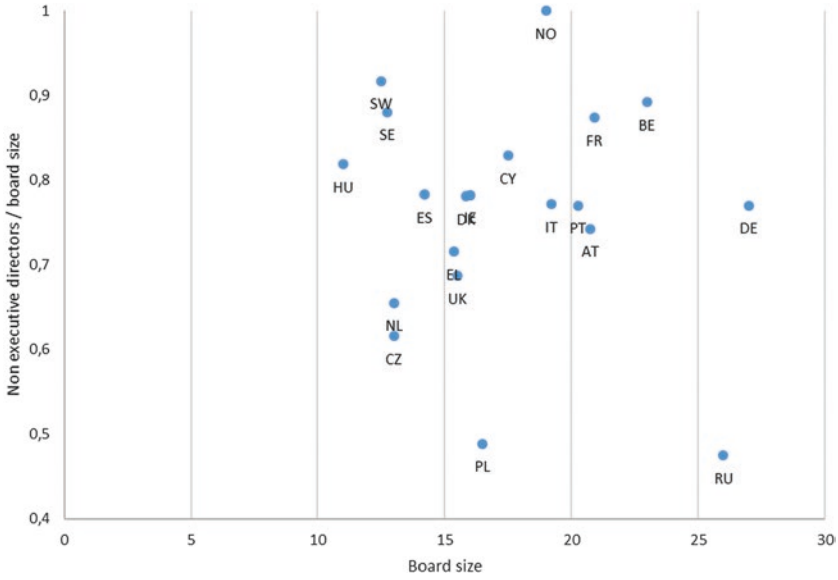

Fig. 7.6 Board size and composition before the financial crisis in European countries. (Source: BoardEx and SNL data, compiled by the authors)

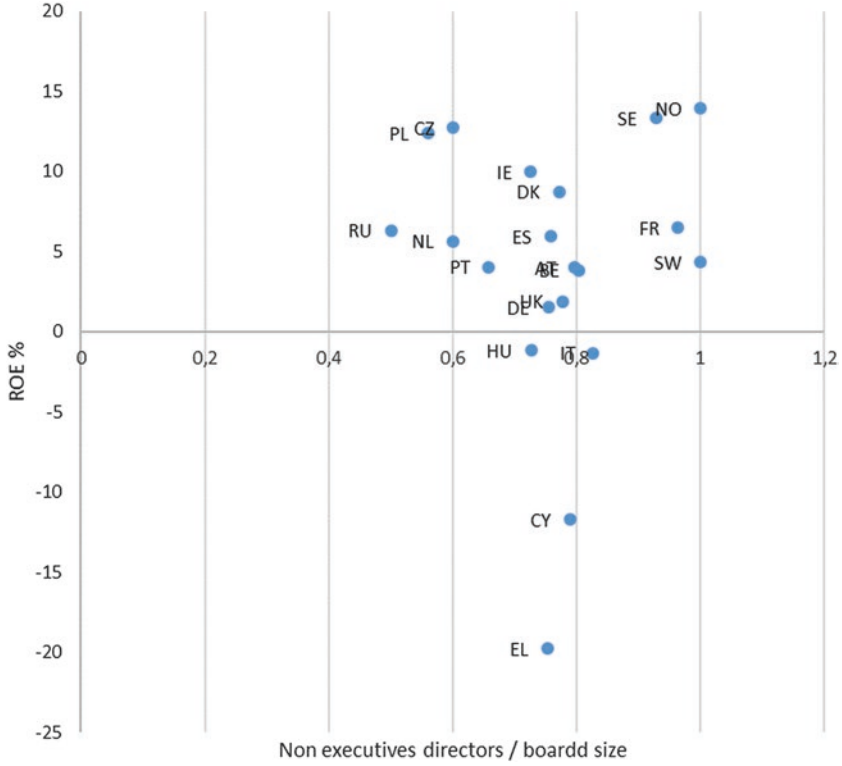

Fig. 7.7 Board composition and bank return on equity after the financial crisis in European countries. (Source: BoardEx and SNL data, compiled by the authors)

We find important differences between board composition and bank return on equity (ROE) before and after the financial crisis. Before the financial crisis, the banks in Cyprus and Russia had the highest ROE, but low proportions of non-executive directors. For instance, Russia banks had the lowest proportions of outside directors in our sample. After the financial crisis, the banks in Norway and Sweden have high ROE and a large proportion of non-executive directors on their boards. The banks in France and Switzerland have high proportions of outside directors, but medium or low ROE both before and after the financial crisis.

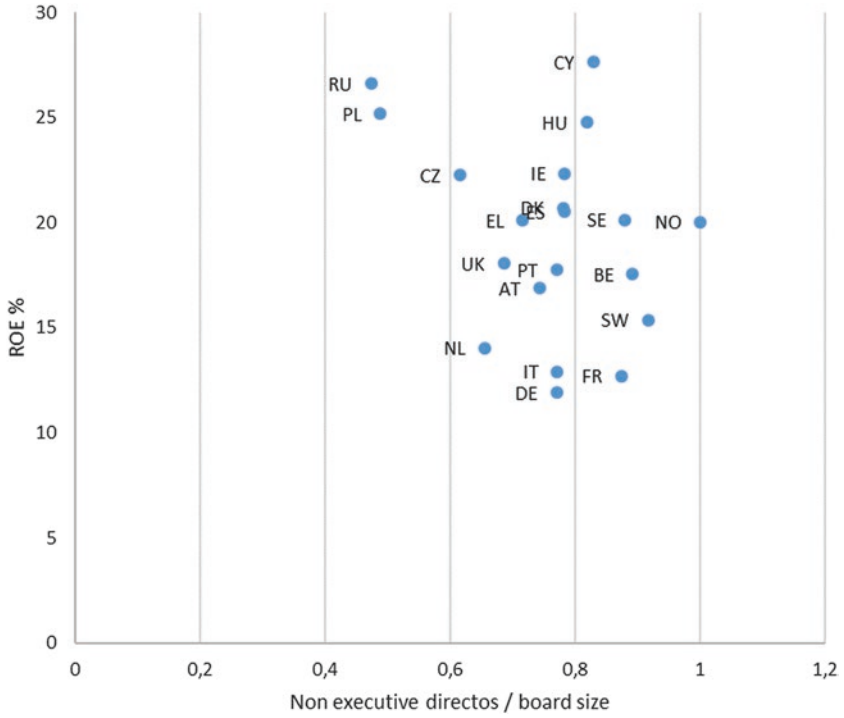

Fig. 7.8 Board composition and bank return on equity before the financial crisis in European countries. (Source: BoardEx and SNL data, compiled by the authors)

5 Bank Board Turnover

One can also wonder what the reasons are for changes in the board, whether in size or composition. There could be reasons associated with the end of the director's term of office, incentives to remain on the board, or the need to deal with bank difficulties. A change in the bank's chairmanship could be the signal for a change in the bank's leadership. When a bank is not fulfilling its expectations, it is the time to think about changing its leadership. A bank should change its leadership to improve its results, unless the change is mandatory either for legal or regulatory reasons, or because its former top executive has passed away. This begs the question as to what extent board turnover has any relationship with performance.

Fiordelisi and Ricci (2014) study the effect of corporate culture on the relationship between firm performance and CEO turnover for a large sample of US-listed firms. To be considered a valuable corporate governance mechanism, CEO change must be credible in the sense that the CEO turnover is negatively related to firm performance. This relationship is neither simple nor direct and there are no studies assessing the reason for this link. The aforementioned authors conclude that corporate culture plays a moderating role in the relationship between CEO turnover and previous performance. They find a strong negative relationship between performance (ROA) and the probability of a CEO turnover; however, different cultures have different impacts on the probability of changing CEOs.

Borokhovich et al. (2014) study unexpected executive and board chair turnover to provide the first evidence on the incentives of grey directors. They analyse the stock market reaction to the death of a top executive or board chair on a sample of 364 US-listed firms, finding that the dominant incentive of grey directors depends on whether the firm has a succession plan or not. The relationship between grey director's ownership and the stock price reaction to unexpected deaths is sensitive to the presence of a succession plan. Firms without an heir apparent show a significantly positive relationship, although these authors find no relationship in the case of firms with an heir apparent. Presumably, the death frees grey directors from their allegiance to management with the main objective of keeping their business tied to the company.

Bereskin and Smith (2014) investigate board turnover within backdating companies for a sample of 102 US companies implicated in stock options backdating. Their paper examines the relationship between backdating and board turnover, the relationship between turnover and board independence, and the relationship with the reputation of the director in the labour market. They conclude that most of the turnover of inside directors occurs through resignation, but the turnover of independent directors largely occurs when they fail to be re-nominated.

Andres et al. (2014) analyse the advantages or drawbacks of having a former CEO on the supervisory board, in particular the effect on firm value, operating performance, and the level of executive compensation, for a sample of 150 German-listed firms. The transition of a former CEO to the supervisory board, which is common in Germany, has been a controversial topic of discussion. On the one hand, the former CEO has firm and industry expertise, but on the other, there exists a conflict of interest, a leniency bias, which can result in negative consequences, for example, higher executive compensation. The study finds evidence that executive

compensation increases when a former CEO becomes a member or the chair of the supervisory board. The stock market considers the announcement of CEO transition as good news, but the authors do not find a significant relationship with operating performance.

In one of the few papers on bank board turnover, Berger et al. (2012b) find that a bank's decision to appoint an executive director could be driven by endogenous factors such as the fact that a bank is not performing well and it faces shareholder pressure to improve its performance. Nguyen et al. (2015) find that the age and busyness of new appointees produce a positive and significant market reaction in the banks included in their sample (see Table 7.3 for further details). However, new appointees could be the result of CEO entrenchment. Zhu and Chen (2015) argue that CEOs favour the appointment of new directors who are similar to them, obeying a narcissistic tendency, or ones who have been working on another board with a similarly narcissistic CEO. CEO power is thus positively associated with the appointment of new directors because the new directors favoured by CEOs are supportive of CEO decision-making and risk-taking spending.

Table 7.3 Recent studies on bank board turnover and performance

Authors	*Sample*	*Independent variables*	*Dependent variables*	*Result*
Bereskin and Smith (2014)	German banks that experience changes in board composition without altering its size	Board changes in age, gender, and education dummy	Risk: risk-weighted assets/total assets Herfindahl index	Strong negative relationship between age and education and risk Positive relationship (in three years) between female representation and risk
Nguyen et al. (2015)	700 US banks 252 single appointments of externally hired executive directors	Appointment announcements of ED according to seven director characteristics	Stock market returns	Positive and significant reactions to age and busyness. No significant relationship to gender

Changes in bank boards are quite important because each bank board is the reflection of the unique background and personalities of its top executives. New directors on the board can significantly influence the board's subsequent evaluation of the CEO. CEOs are concerned that the new directors may not appreciate their capabilities and hence will favour new directors that will be supportive of their leadership. Efforts to increase board independence often fail to improve board control over excessively risky decisions taken by the CEO if the CEO has selected the new appointees. According to the similarity-attraction literature, people favour interactions with a like-minded person as a way to reinforce their opinions, values, and beliefs. The new director's prior experience is a signal to evaluate the director's social acceptability on the new board by the CEO. CEOs have a greater influence over director selection decisions when they have long tenures and greater ownership of the firm. A powerful CEO is able to reduce the frequency of nomination committee meetings and increase the frequency of other board meetings. Independent board control over major managerial decisions has accordingly not been substantially improved, even though board independence has improved significantly in terms of the representation of outside directors. It is not only a question of size and/or composition but also of turnover.

One might hence wonder why the board has appointed the new director and whether the market reacts to new appointees. White et al. (2014) find that academic directors tend to be appointed by small and mid-cap firms expanding their boards. The market reacts favourably when the new board member comes from science, medicine, or engineering academia. Technical professionals tend to be appointed for their expertise. Academic administrators (presidents, vice-chancellors, deans), however, tend to be appointed for their networks. The market reacts favourably if the academic comes from a business school but negatively when the academic is not from a close geographic proximity. Business professors are appointed for general expertise and reputation. However, White et al. (2014) find no significant reaction in the market when business professors are appointed.

Hauser (2018) studies whether director appointments to various boards have an impact on firm performance. To overcome endogeneity, the paper analyses the variation produced by mergers that terminate entire boards and thus trigger the appointments of these directors. When two companies with two boards merge to form one single company, the vast majority of directorships in the acquired firm are terminated. However, the study examines the performance of the other firms, which continue to employ

the affected directors, finding that their performance improves. Reductions in board appointments are associated with higher profitability, a higher market-to-book ratio, and the likelihood of directors joining board committees. The conclusion is that board appointments are important for the functioning of the board. Finally, in such a heavily regulated industry as banking, the timing of the new appointments could be driven by external variables. For instance, Bereskin and Smith (2014) argue that director turnover occurs primarily before elections.

In our sample of 57 European banks, we find that the boards' turnover ratio with respect to non-executive directors (NED) has changed because of the crisis. Before the crisis, the turnover was lower than 20%, whereas after the crisis, the turnover ratio has increased to almost 25% on average for our sample. Our data do not reveal a clear relationship between the size of the board and the turnover of non-executive directors on the board. Following the financial crisis, the boards of Russian and German banks are the largest, but they present quite different turnovers among their NED. The turnover of German banks with respect to NED is among the lowest within the sample, whereas the turnover in Russian banks is the highest. On the other hand, Irish banks have one of the highest turnover ratios among their NED, together with the smallest board size. Cyprus shows the highest turnover and a small board size after the crisis in what looks like a consequence of the financial rescue the country needed (Fig. 7.9). Before and after the crisis, Russian and Irish banks have the highest turnover ratio, but they exhibit quite different board sizes (Fig. 7.10).

Before the crisis, high board turnover banks such as those in Russia show a high return on equity. However Cypriot, Polish, and Irish banks also show a high ROE, but with a low board turnover (Fig. 7.12). After the crisis, all of the most profitable banks, namely, those in Norway, Sweden, Czech Republic, and Poland, show a low board turnover (Fig. 7.11). Thus, even though the turnover ratio has increased after the crisis, those banks with a lower turnover after the crisis appear to be the most profitable. Hence, a linear relationship is not found between turnover and profitability.

6 Concluding Remarks

Good bank corporate governance increases monitoring efficiency and quality advising, particularly necessary in troubled times like the financial crisis. However, the codes of good governance conceived to help banks—and companies in general—to find the best corporate governance practices

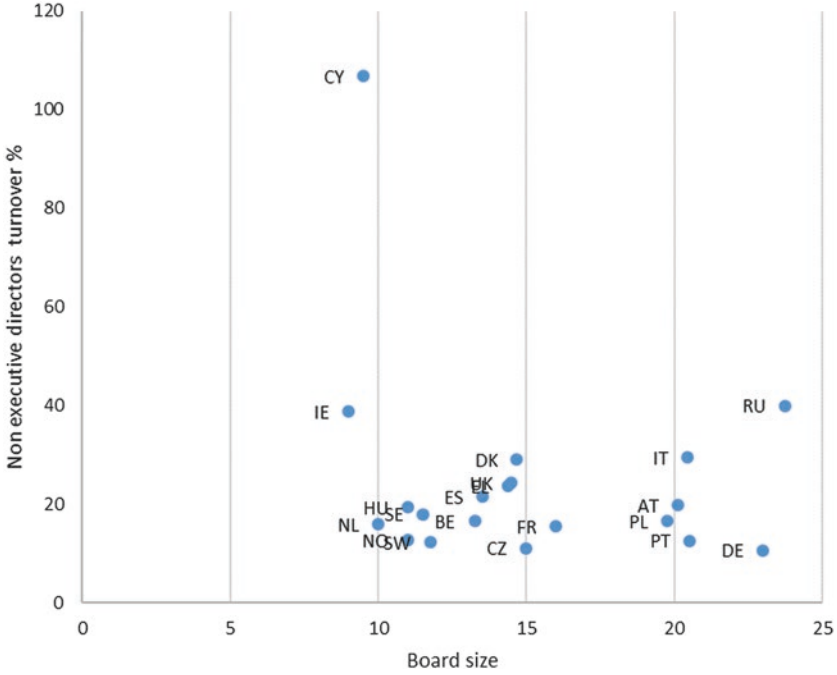

Fig. 7.9 Bank board size and board NED turnover after the financial crisis in European countries. (Source: BoardEx and SNL data, compiled by the authors)

have not delivered the expected results. Banks that have complied with the codes have suffered the consequences of the crisis with at least the same intensity than those institutions not applying the recommendations of the codes (Armour et al. 2016). Hence, the analysis of the differences in bank corporate governance requires further study.

Banks boards are crucial to understand bank governance due to the complexity and the opacity of the banking business, along with the need to deal with the double agency problem (principal-agent and principal-regulator) and to secure the long-term stability of banks. The importance of boards for effective bank governance becomes more evident when the market for corporate control is weak and dispersed shareholders and debt-holders are unable to control bank managers.

Larger boards should have a higher capacity to monitor and advise bank executives. However, as the size of the board increases, the problems of

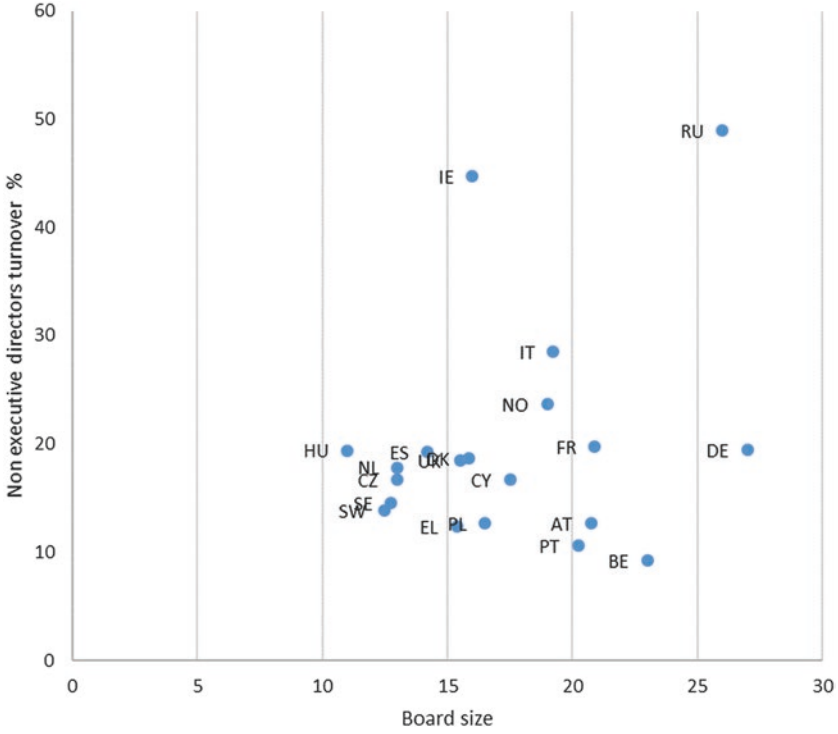

Fig. 7.10 Bank board size and board NED turnover before the financial crisis in European countries. (Source: BoardEx and SNL data, compiled by the authors)

coordination and control weaken the functioning of the board at the same time as its expenses become a heavy burden. A similar trade-off emerges in the composition of the board. Outside or non-executive directors improve board monitoring and advising capabilities and help to reduce principal-agent and principal-regulator conflicts. For these reasons, regulators favour a higher proportion of outside members on bank boards. Nevertheless, outsiders need the collaboration of bank insiders to gather inside information and understand the culture and functioning of the institution.

Bank boards are in a state of continuous change, in which new directors contribute either to increasing the size of the board or replacing directors that step down. On the one hand, the selection of the new appointees

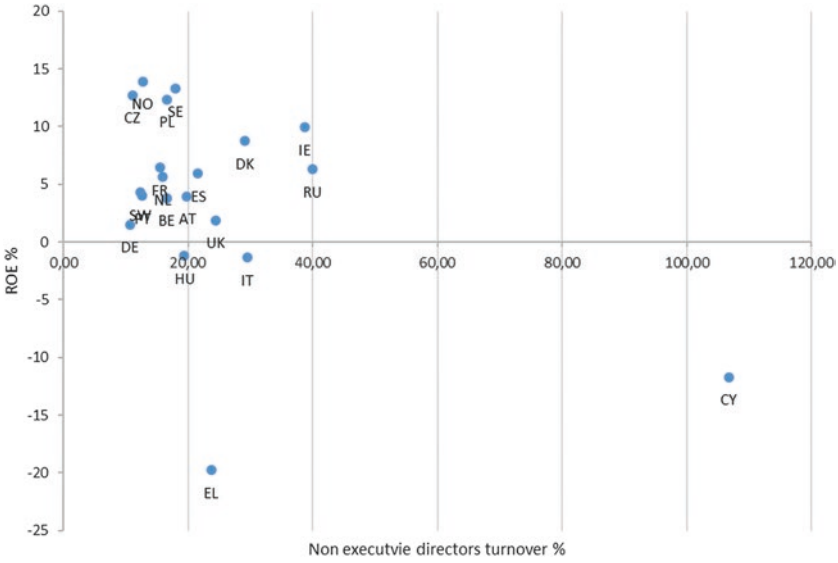

Fig. 7.11 Bank board turnover in terms of NED and ROE after the financial crisis in European countries. (Source: BoardEx and SNL data, compiled by the authors)

should contribute to improving the capabilities of the board, but on the other, CEOs will prefer to choose those new directors that will contribute to reinforcing their opinions, values, and beliefs. The ideal situation would be for the new appointees to bring excellence to the board and, at the same time, be aligned with CEO preferences. However, it could be that the fact of new appointees being friendly towards the CEO may not have the capabilities needed by the board or that those who have these capabilities may be unable to join forces with the CEO, thereby generating disputes and disagreement in board decision-making.

Therefore, banks face a number of intertwined trade-offs: the board size trade-off, the outside vs inside board members trade-off, and the trade-off between homogenous vs heterogeneous characteristics of the new board appointees. Furthermore, the trade-offs in board design should not be considered a static problem but rather one of a dynamic nature. Thus, board size should be periodically revised and adjusted to the needs of each bank, as should the composition and characteristics of the board.

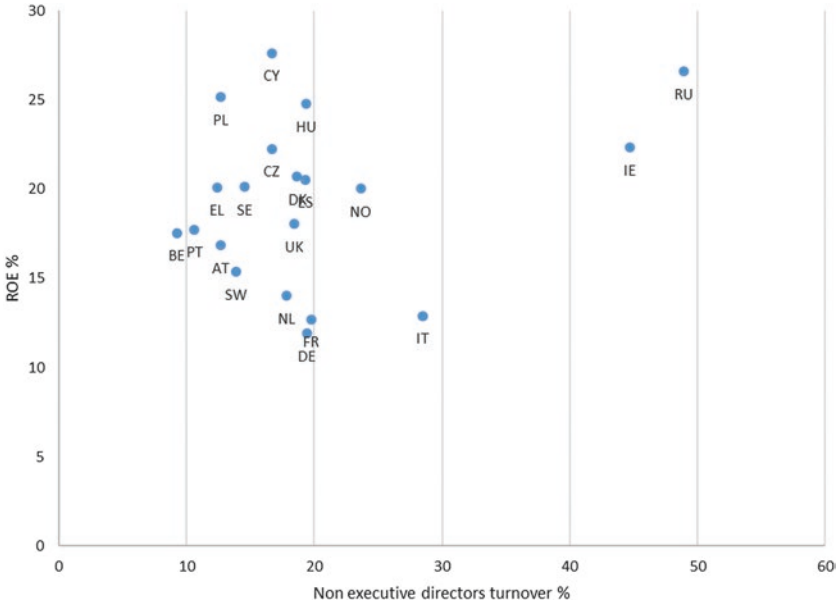

Fig. 7.12 Bank board turnover in terms of NED and ROE before the financial crisis in European countries. (Source: BoardEx and SNL data, compiled by the authors)

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CHAPTER 8

The Impact of Internal Corporate Governance Mechanisms on Corporate Social Performance in the Banking Industry

José L. Fernández Sánchez, María D. Odriozola, and Manuel Luna

1 Introduction

In 2007, the sub-prime mortgage crisis in the USA spread to Europe and the rest of the world, leading to a global financial crisis without precedent since the 1930s that meant that banks stopped trusting each other and pushing the world's economy into the deepest recession of the post-war era (Fassin and Gosselin 2011). This financial crisis has had dramatic consequences for economies and societies, and hence a number of questions have emerged regarding the responsibility of the banking industry in this financial crisis. Accordingly, financial institutions—in particular banks—have come under increasing pressure since 2007 to take a more long-term view of their investors' business interests and to acknowledge and respond to their obligations to society (Grove et al.

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2011). During this period of time, many companies have emphasized the importance of corporate social capital, driven by its investments in corporate social responsibility (CSR), in rebuilding stakeholder trust (Lins et al. 2017).

Moreover, rising incidents of corporate fraud and scandals in recent years have broadened the concept of corporate governance (CG) beyond merely dealing with agency conflicts towards adopting an ethical, accountable, and socially responsible agenda (Elkington 2006). It is essential to have effective governance practices in order to gain and maintain public trust and confidence in the banking system. In fact, poor governance systems can lead to a loss of confidence that could have negative consequences for financial systems and the economy as a whole (Jamali et al. 2008). This change in the way of perceiving CG has led to redefining it as a structure of rights and responsibilities among the parties with a stake in the firm (stakeholders), as well as a configuration of organizational processes via which different governance and monitoring mechanisms interact and affect both financial and social outcomes (Aguilera et al. 2015). Whereas the relationship between CG and financial performance has received a great deal of academic attention to date, the relationship between CG and CSR has largely gone unexplored. Only a few recent studies have investigated the effects of various governance factors on CSR. However, the empirical evidence on this subject is still inconclusive and consequently further research in this area is needed (Chintrakarn et al. 2016; Jain and Jamali 2016).

Hence, the purpose of this study is to analyse the impact of CG mechanisms, specifically internal mechanisms, on CSP in the banking industry. We have focused our research on this sector because banks, in general, have been obliged to build up social capital to recover the public trust they lost as a result of the global financial crisis this industry suffered in recent years. The rest of the chapter is organized as follows. The first section sets out the theory explaining the relationship between CG and CSR. The second section describes the mechanisms of CG, both internal and external, that might have an impact on CSR and outlines the research hypotheses. The third section explains the methodology employed for this research, while the fourth section describes the data used and reports the empirical results. Finally, the fifth section presents our conclusions and highlights the implications of our results.

2 The Relationship Between CG And CSR

The traditional economic perspective on CG emphasizes the shareholder value approach for maximizing corporate financial performance (Jain and Jamali 2016). In the achieving of this goal, the purpose of CG is to specify the rules that shape the relations among boards of directors, shareholders, and managers to resolve assumed agency conflicts (Berle and Means 1932). However, a growing literature on conflict resolution based on stakeholder theory (e.g. Jensen 2002; Harjoto and Jo 2011) considers that the role of the corporation is to serve the interests of other non-investing stakeholders as well. Under this conception, managers are not only accountable to shareholders but also to other stakeholders such as employees, suppliers, customers, and communities (Jamali et al. 2008).

Moreover, CSR is a management concept whereby companies integrate social and environmental concerns in their business operations and interactions with their stakeholders. Likewise, corporate social performance (CSP) can be defined as a composite or multidimensional construct capturing "a business organization's configuration of principles of social responsibility, processes of social responsiveness, and policies, programs, and observable outcomes as they relate to the firm's social relationships" (Wood 1991, p. 693). For our study, we have chosen to use CSP to measure the CSR of banks because it constitutes the social performance outcome of a firm's undertaking of CSR activities as a response to expectations and demands of social responsibility by different stakeholders (Deckop et al. 2006; Ioannou and Serafeim 2012).

Theoretically, there are two alternative explanations to explain the CG-CSR relationship:

– *The over-investment/agency cost hypothesis.* According to this view, which is based on agency theory, managers engage in CSR activities in order to enhance their own private benefits of building a reputation as good social citizens at a cost to shareholders (Barnea and Rubin 2010). Hence, CSR investments are considered a wasteful deployment of corporate resources that increases managers' private benefits but does not maximize shareholders' welfare. Thus, firms with more effective governance systems will be less socially responsible because higher governance control and monitoring should reduce managers' incentive to overinvest in CSR.

– *The conflict-resolution hypothesis.* This other approach, which is based on stakeholder theory, argues that the adoption of CSR practices can be used as a mechanism to resolve conflicts among stakeholders, so that well-designed governance systems should align managers' incentives with those of stakeholders (Jamali et al. 2008; Jo and Harjoto 2011). Good CG is expected to ensure that firms take into account the interests of a wide range of constituencies as well as those of the communities within which they operate (Jizi et al. 2014). Therefore, to the extent that managers use effective governance and monitoring mechanisms to resolve conflicts among stakeholders, CSR activities and hence their social outcomes should be directly related to CG mechanisms.

In the next section, we analyse different governance and monitoring mechanisms and how they influence corporate social activities and corporate social performance.

3 CG Mechanisms Affecting CSR

Different governance or monitoring mechanisms might have an effect on CSR policies and activities and hence on corporate social performance. Below, we set out the external and internal mechanisms of CG and how they can influence CSR (Aguilera et al. 2015; Jain and Jamali 2016):

3.1 External (Institutional-Level) Factors

According to institutional theory, formal institutions such as legal and political systems are known to shape the nature of corporate-stakeholder relationships, whereas informal institutions—particularly cultural beliefs and norms—can influence both the form (explicit or implicit) and scope of CSR practices (Matten and Moon 2008). Thus, institutional theory holds that firms embedded in shareholder-centric governance contexts (e.g. the USA) will tend to emphasize shareholder primacy over other stakeholder interests. However, firms entrenched in pro-stakeholder governance settings (e.g. Continental Europe) are more likely to adopt society-oriented strategies that align with norms and laws intended to protect the interest of multiple stakeholder entities (Aguilera and Jackson 2003; Matten and Moon 2008; Jain and Jamali 2016). Consequently, pro-shareholder laws that reduce managerial discretion tend to diminish CSR investments and hence social performance (Ioannou and Serafeim

2012), while laws that increase managerial discretion improve social performance (Jo and Harjoto 2011; Jain and Jamali 2016).

3.2 Internal (Firm- and Group-Level) Factors

When external governance systems fail, internal corporate governance mechanisms—in particular, boards of directors—are expected to play a key role in supervising managers and holding them to account (Fama 1980; Guest 2009). Thus, the following firm- and group-level governance and monitoring mechanisms could have an effect on CSR:

- *Controlling ownership.* This factor takes into account how concentrated block owners and their different identities such as families, state, institutions, and corporate insiders can influence corporate social activities and outcomes (Jain and Jamali 2016). The majority of studies suggest that block owners typically tend to discourage proactive social activities, while complying with minimum required CSR standards to potentially avoid legitimacy risks (Jain and Jamali 2016). Large or specific (e.g. state) shareholders quite often seek protection against the broad powers normally vested in directors or other stockholders (e.g. institutional shareholders) to determine corporate policy and make decisions by simple majority vote and hence wish to have power to veto some or all corporate policies and decisions.
- *Board of directors.* Stakeholder theory predicts that large boards are representative of diverse interests and can help garner CSR investments. Hence, larger boards imply better social capital and balanced decision-making that can result in improved social performance. In contrast, smaller boards are able to draw on a less diversified range of expertise than larger boards, which can have an impact on the quality of the advice and monitoring offered (Guest 2009). Hence, we expect larger boards to be better able to instruct management to engage in CSR activities and effectively communicate their social performance to the bank's stakeholders. Moreover, from an agency perspective, CEO duality leads to a concentration of managerial power (Surroca and Tribo 2008), enabling managers to suspend CSR investments, if considered wasteful. In contrast, the separation of management and control enhances the board's monitoring power (Fama and Jensen 1983). In line with stakeholder theory, boards with a separation between management and control can improve

their social capital and stakeholder representation on the board to positively influence CSR (Jain and Jamali 2016). Agency theory, on the other hand, suggests that managers' private interests are likely to influence the degree to which managers engage in CSR activities. Hence, CEO duality can be seen both as a sign and an instrument of managerial power (Jizi et al. 2014; Hong et al. 2016).

– *Managerial incentives.* Executive compensation is a bundle of fixed compensation in the form of a salary, short-term financial incentives in the form of bonuses, and long-term incentives such as equity-based pay. Furthermore, the proportions of these constituents in the overall CEO compensation package are determinants of agency conflicts (Deckop et al. 2006; Jain and Jamali 2016). Traditionally, fixed pay structures are based on retrospective short-term financial goals that discourage proactive CSR. Similarly, agency theory also predicts that a higher proportion of bonus payments may drive executives to focus on short-term bottom-line considerations, leading to diminished CSR. In contrast, Deckop et al. (2006) point out that a long-term pay focus provides an incentive for CEOs to engage in CSR because a pay plan that emphasizes long-term performance reduces the pressure to maximize short-term earnings and provides a longer-term time frame within which the effects of CSP are more likely to occur (Jain and Jamali 2016).

In this chapter, we analyse specifically the effect of internal (firm- and group-level) governance mechanisms on CSR, measured by the social performance of banks. Hence, our study considers the following hypotheses to test:

H1: There exists a relationship between the existence of a veto power for specific shareholders in companies and their corporate social performance (CSP).

H2: There exists a relationship between the size of company boards and their corporate social performance (CSP).

H3: There exists a relationship between the existence of CEO duality in companies and their corporate social performance (CSP).

H4: There exists a relationship between the existence of long-term compensation plans for CEOs in companies and their corporate social performance (CSP).

Given that there are two opposing approaches (the overinvestment and the conflict-resolution hypotheses) to predict the sign of the CG-CSR rela-

tionship (a negative sign when the former approach is taken into account and a positive sign in the latter case), a priori we cannot suggest a specific sign for this relationship. Moreover, the results of previous empirical studies have not been consistent. Some of these studies, in line with the conflict-resolution hypothesis, show that the likelihood of opting for CSR is positively related to some internal governance variables (e.g. board size, board independence, or long-term compensation for executives) after controlling for other firm characteristics such as firm size, leverage, profitability, or risk (Deckop et al. 2006; Jo and Harjoto 2011, 2012; Jizi et al. 2014), whereas others have presented results supporting the overinvestment hypothesis (Walls et al. 2012; Fabrizi et al. 2014; Chintrakarn et al. 2016).

4 Methodology

To carry out our analysis, we employ an unbalanced panel composed of 118 banks from 19 countries (see Table 8.1). The overall period of analysis runs from 2002 to 2014, although it has been divided into two different sub-periods before and after the banking system crisis: period 1 (2002–2007) and period 2 (2008–2014), in order to analyse the existence of a structural change with different impacts on the CG-CSR relationship.

To test the hypotheses of this study, we propose to regress two of the most widely employed models in panel analysis: a fixed-effects and a random-effects model. According to Jain and Jamali (2016), conventional empirical methods such as linear regression models, which assume independence between the explanatory factors, do not appropriately capture

Table 8.1 Number of banks in the sample by country

Country	*# of banks*	*Country*	*# of banks*
Australia	7	Japan	26
Austria	2	The Netherlands	1
Belgium	2	Norway	1
Canada	7	Portugal	4
Denmark	3	Spain	7
France	5	Sweden	4
Germany	3	Switzerland	7
Greece	5	UK	5
Ireland	3	USA	15
Italy	11	**Total**	**118**

complex interactive relationships and will provide biased estimates. Thus, several firm-level governance structures are not exogenously determined but rather are affected by unobserved firm characteristics (unobserved heterogeneity) that might be controlled employing panel data procedures. The fixed-effects model proposed for this study is the following:

$$CSP_{it} = \beta_0 + \mu_i + \beta_1 VETO_{it} + \beta_2 BOARD_{it} + \beta_3 DUAL_{it} + \beta_4 EXCOM_{it} + \beta_5 SIZE_{it} + \beta_6 PROFIT_{it} + \varepsilon_{it}$$

while the random-effects model is:

$$CSP_{it} = \beta_0 + \beta_1 VETO_{it} + \beta_2 BOARD_{it} + \beta_3 DUAL_{it} + \beta_4 EXCOM_{it} + \beta_5 SIZE_{it} + \beta_6 PROFIT_{it} + u_i + \varepsilon_{it}$$

where β_0 is the intercept; $\beta_1 \ldots \beta_n$, the regression coefficients; μ_1, the bank fixed effect; u_i, the bank random error; and ε_{it}, the normal random error term.

The dependent variable used in both models is the CSP of banks. CSP_{it} is the corporate social performance of bank i in the year t measured by the Thomson Reuters ASSET4 social score. This social score, which ranges from 0 to 100, measures a company's capacity to generate trust and loyalty within its workforce, customers, and society through its use of best management practices.

As set out in the previous section, we hypothesize that different internal governance mechanisms could be related to CSP and hence include several internal governance variables into both models to test the research hypotheses. $VETO_{it}$ is a dummy variable to control for the veto rights of specific shareholders: it takes the value of 1 if there are shareholders with this right and 0 otherwise. $BOARD_{it}$ is the board size of bank i in year t measured by the number of board members. $DUAL_{it}$ is a dummy variable to control for CEO/chair duality: it takes the value of 1 if bank executives are acting as the chairs of the board of directors and 0 otherwise. Finally, $EXCOM_{it}$ is a dummy variable to monitor for CEO long-term compensation: it takes the value of 1 if bank executives are receiving a long-term compensation plan and 0 otherwise. Data on all these variables were also obtained from the ASSET4 database.

To avoid model misspecification, we control for additional variables that might also influence CSP. Large firms have a greater impact on communities than smaller firms (Barnea and Rubin 2010). Consequently, large firms tend to be more exposed to the influence of powerful stakeholder groups repre-

senting employees, customers, investors, public authorities, and so on; they are likely to face tighter regulatory requirements, and they tend to be subject to greater public scrutiny (Barnea and Rubin 2010). Therefore, firm size is likely to influence the amount of CSR needed to address the concerns of various stakeholder groups and hence influence corporate social performance (Jizi et al. 2014). In this study, bank size ($SIZE_{it}$) is measured by the number of employees. Furthermore, the managers of firms performing well financially might have spare resources under their control, which can be used to engage more actively in CSR and thus satisfy the social demands of stakeholders or, to the contrary, to pursue managerial interests. Hence, it is essential for the analysis to monitor firms' profitability ($PROFIT_{it}$), which is measured here by the bank's return on equity (ROE). We obtained data for these two variables from the *Datastream* database.

5 Analysis of Results

5.1 Descriptive Statistics

Summary statistics (mean, standard deviation, etc.) and Pearson correlation coefficients of the variables used in this research are presented in Table 8.2. The descriptive statistics show that CSP scores range from 3.48 to 98.96, with a mean of 62.43. The average size of the banks in our sample is 41,142 employees, and the mean value of profitability of these banks is 3.23%.

Table 8.2 Summary statistics and correlation coefficients

Variable	*1*	*2*	*3*	*4*	*5*	*6*	*7*
1. CSP (0–100 score)	1						
2. VETO (dummy)	0.03	1					
3. BOARD (# of board directors)	0.23	0.01	1				
4. DUAL (dummy)	−0.03	−0.16	−0.08	1			
5. EXCOM (dummy)	0.33	−0.03	−0.07	0.24	1		
6. SIZE (# of employees)	0.37	−0.03	0.14	0.16	0.42	1	
7. PROFIT (% of ROE)	0.08	−0.17	−0.05	−0.01	0.08	0.03	1
Observations	1284	1071	1280	1176	1279	1394	1405
Mean	62.43	0.08	14.11	0.74	0.37	41,142	3.23
Standard deviation	32.20	0.28	4.94	0.44	0.48	58,763	125.89
Minimum value	3.48	0	1	0	0	211	−4298.47
Maximum value	98.96	1	44	1	1	387,000	135.29

Our sample also shows that the board size of banks varies between 1 and 44 directors, 14.1 members being the average board size for the entire period of analysis. Around 74% of the banks in our sample have, at least, a CEO on the board of directors, while 37% of the banks provide a long-term compensation plan for their executives. Finally, only 8% of the banks in the sample have a specific shareholder with power to veto the company's board decisions.

5.2 Regression Results

Tables 8.3 and 8.4 report the regression estimates of the fixed-effects and random-effects models, respectively, to examine whether the CSP of banks is influenced by certain internal governance variables. First, we present the results obtained with the regression of both models for the entire period of analysis (2002–2014). We then present the results obtained for each sub-period: period 1 from 2002 to 2007 (i.e. the period of time before the financial crisis) and period 2 from 2008 to 2014 (i.e. the period of time during and after the financial crisis). In addition, we performed a Hausman test for all the regressions to determine which model is more appropriate to explain the variations in the banks' CSP. All the values obtained using

Table 8.3 Regression estimates of the fixed-effects model (dependent variable: CSP)

Independent variables	*Entire period (2002–2014)*	*Period 1 (2002–2007)*	*Period 2 (2008–2014)*
INTERCEPT	62.3794[a]	59.4415[a]	61.9222[a]
VETO (dummy)	2.6156	13.0893	−11.6239[a]
BOARD (# of board directors)	−0.0440	−0.4527	0.3225[b]
DUAL (dummy)	−2.6570	−0.7168	−2.4383
EXECOM (dummy)	3.2255[c]	3.3949	3.0178
SIZE (# of employees)	0.0001[a]	0.0002[a]	0.0001
PROFIT (% of ROE)	0.0473[a]	0.2566[b]	0.0287[a]
Number of observations	947	422	525
Number of firms	106	93	102
Goodness-of-fit (F test)	6.19[a]	4.01[a]	8.09[a]
Overall R-square	0.1676	0.1779	0.1396

[a]Significant at the 1% level
[b]Significant at the 5% level
[c]Significant at the 10% level

Table 8.4 Regression estimates of the random-effects model (dependent variable: CSP)

Independent variables	*Entire period (2002–2014)*	*Period 1 (2002–2007)*	*Period 2 (2008–2014)*
INTERCEPT	53.1201[a]	46.7349[a]	54.4019[a]
VETO (dummy)	2.9211	14.3512	−9.1462[a]
BOARD (# board directors)	0.1630	0.0458	0.4768[a]
DUAL (dummy)	−3.6249[c]	−1.3576	−4.4151[c]
EXECOM (dummy)	4.8214[a]	6.7922[b]	4.4662[b]
SIZE (# employees)	0.0001[a]	0.0002[a]	0.0001[a]
PROFIT (% ROE)	0.0478[a]	0.3068[b]	0.0294[a]
Number of observations	947	422	525
Number of firms	106	93	102
Goodness-of-fit (Wald Chi2)	70.63[a]	57.65[a]	71.84[a]
Overall R-square	0.1860	0.2194	0.1877

[a]Significant at the 1% level
[b]Significant at the 5% level
[c]Significant at the 10% level

the Hausman test were highly significant at the 1% level. Hence, we have to reject the null hypothesis and thus accept the fixed-effects rather than the random-effects model ($\chi^2 = 41.67$ for the entire period, $\chi^2 = 29.81$ for period 1, and $\chi^2 = 36.09$ for period 2). So, hereafter, all our comments in this section will refer to the results obtained using the fixed-effects model (see Table 8.3).

As regards the entire period of analysis (2002–2014), we observe that none of the internal governance variables were statistically significant, except for the variable *EXCOM*, which was statistically significant at the 10% level with a positive sign. However, if we analyse each of the two subperiods in which we have divided the overall period of study, we can observe a structural change in the relationship between the internal CG mechanisms and the CSP of banks from period 1 (2002–2007) to period 2 (2008–2014), which might be motivated by the change in the world economic environment that has occurred since 2007.

The results for period 1 are very similar to those obtained for the entire period, although, in this case, none of the governance variables were statistically significant. In period 2, on the other hand, the governance variables *VETO* and *BOARD* both present a significant impact on the CSP of banks, whereas the variables *DUAL* and *EXCOM* are not found to be statistically

significant. In this case, we can accept Hypotheses 1 and 2, whereas we have to reject Hypotheses 3 and 4. For period 2, our results suggest a statistically significant positive relationship between board size (*BOARD*) with the CSP of banks, which supports the conflict-resolution hypothesis and is in line with the findings of other studies (Deckop et al. 2006; Walls et al. 2012; Jizi et al. 2014), whereas shareholders' veto (*VETO*) is negatively related to the CSP of banks, thus supporting, to the contrary, the overinvestment hypothesis. However, Hypothesis 3, which predicts that firms with executives sitting on bank boards (*DUAL*) are likely to have less CSP, and Hypothesis 4, which predicts a positive relationship between long-term compensation for executives and banks' CSP, are not supported in our analysis. Hence, we have to reject both these hypotheses. These findings thus suggest that internal CG mechanisms (those related to controlling ownership and the structure of the board of directors) have somehow influenced the social performance of banks, although the effect of each mechanism on CSP has been the opposite.

Finally, with regard to the control variables, our analysis indicates that the variables *SIZE* and *PROFIT* are both statistically and positively related to the CSP of banks, a finding which is in line with those of other previous studies (Deckop et al. 2006; Jo and Harjoto 2011, 2012; Jizi et al. 2014). This result suggests that large firms with a better financial performance are more able to invest in social activities than small firms suffering from poor returns.

6 Conclusions

The purpose of this study has been to explore the CG-CSR relationship, analysing the effect of internal governance and monitoring mechanisms on the social performance of banks. The motivation for this research lies in the problem of lost trust suffered by the banking industry since the financial crash in 2007, the growing importance of CSP as a valued organizational outcome for companies, and how internal CG mechanisms have influenced the CSP of banks.

Our research shows that board size can positively influence the CSP of banks: boards with more directors are more likely to promote CSR investments on social activities and be more responsible to their stakeholders' demands, which would impact positively on the social performance of banks. This finding supports the conflict-resolution hypothesis proposed to explain the CG-CSR relationship. On the other hand, the existence in banks

of shareholders with power to veto business decisions will reduce those investments in CSR, which will in turn reduce their social performance. Consequently, this finding agrees with the postulates of agency theory.

This study thus shows that certain internal governance and monitoring mechanisms related to controlling ownership and the structure of the board of directors exert an important influence on the social performance of banks, although these mechanisms were only relevant during the crisis period (2008–2014). For the period before the crisis, however, the study has not found a significant effect of any of the explanatory variables. Hence, the CG-CSR relationship will depend on the external economic and social conditions that firms have to face (moderator factor). A likely explanation for this fact is that, in the period 2002–2007, CSR issues were not so important for bank executives or owners as they have been during and following the financial crisis.

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CHAPTER 9

Bank Ownership and Firm-Level Performance: An Empirical Assessment of State-Owned Development Banks

Marco Frigerio and Daniela Vandone

1 Introduction

The goal of this chapter is to investigate state-owned development banks, in addition to analysing their performance compared to other state-owned and privately owned banks.

Development banks—also referred to as development financial institutions, state investment banks, or promotional banks—are public-sector or government-invested legal entities with an explicit policy mandate to promote socio-economic goals in a region, sector, or specific market segment. They are typically the largest type of state-owned financial institutions and are relevant players both in developed and developing countries. In term of size, for example, the German bank KfW has an asset-to-GDP ratio higher than 15%; for the Brazilian Development Bank (BNDES), the same ratio is close to 14% (Musacchio et al. 2016). They are also growing in

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size. Data from Orbis Bank Focus (Bureau van Dijk) report that the total assets managed by European development banks in 2014 was 2630 billion euro, three times higher than their total assets in 2005 (866 billion euro). In the same period, their aggregate loan portfolio exceeded 1000 billion euro, 65% higher than 2008 (616 billion euro) when development banks started playing a relevant countercyclical role during the Great Recession by increasing the supply of credit or equity investment to the private sector, while private banks experienced temporary difficulties.

Development banks have been receiving growing attention due to the role they are currently playing in the economy. In the middle of the last century, their activity focused on reconstruction, urbanization, and development of public infrastructure. In more recent years, however, it has been reoriented towards private companies, especially SMEs, and the support of innovation and long-term global societal challenges, such as climate change, renewable and environmental-friendly energy, and food security (World Bank 2011, 2012; OECD 2012; EIB 2014).

Despite their relevance, little is known about development banks. In fact, apart from theoretical contributions discussing the role and existence of development banks (see Sect. 2.2), empirical studies on their firm-level characteristics and the impact of their activities are scant and mainly focused on a single institution (Clifton et al. 2014; Griffith-Jones and Tyson 2012; Griffith-Jones et al. 2011; Tuijnman 2009, for the European Investment Bank; Musacchio and Lazzarini 2014; Lazzarini et al. 2015; Ottaviano and Sousa 2007, for the Brazilian BNDES). Some further qualitative and quantitative information can be found in reports (OECD 2012; World Bank 2011).

In this study, we use firm-level evidence from Europe to analyse the performance of state-owned development banks and their differences compared to state-owned commercial banks and private banks. Analysing the performance of development banks is a relevant issue for the following reasons.

First, assessing development banks' performance is important to determine their financial sustainability. In fact, although development banks have goals that go beyond profitability, there are many reasons why they are expected to be efficient and profitable. In order to stand 'on their own feet', that is, to support the economy while not losing money, covering operating costs, self-financing growth, and securing a reasonable level of financial strength and stability, development banks have to operate following sound banking principles and applying the best banking standards and practices, combining both social and economic considerations (Diamond 1957; Gutierrez et al. 2011).

Second, the existing empirical literature on bank ownership and performance has always considered state-owned banks as belonging to one and the same type of institution, whereas actually they do not. In fact, state-owned financial institutions include a wide variety of financial intermediaries, such as development banks, commercial banks, postal banks, insurance companies, credit guarantee funds, and so on. Among the different types of state-owned banks, commercial banks and development financial institutions comprise the two main categories, although they differ significantly in terms of mission, business model, type of activity, and targeted market segment. Our analysis thus contributes to better framing the bank ownership and performance issue, recognizing the fact that development banks may operate in a way not fully examined in the existing literature.

Our results point to clear differences between development and commercial state-owned banks, with the former performing better than the latter in terms of efficiency. They show that state-owned banks are not a monolithic group and that development banks have specific features and operate in a way not completely examined in the existing literature.

The remainder of this chapter is organized as follows. Section 2 discusses the motivation for our research and presents an overview of the earlier literature on state-owned banks' performance. Section 3 describes our dataset. Section 4 highlights the research methodology, while the main results are presented in Sect. 5. In Sect. 6, we present our conclusions.

2 Development Financial Institutions

2.1 Mission and Activity

As stated in their statutes, DFIs are state-owned banks with the broad mission of promoting development.[1] According to their ownership, DFIs can

[1] For example: 'The task of the EIB shall be to contribute, by having recourse to the capital market and utilizing its own resources, to the balanced and steady development of the internal market in the interest of the Union…' (European Investment Bank (EIB), Art. 2 of the Statute refers to Art. 309 of the Treaty on the Functioning of the European Union). 'In contributing to economic progress and reconstruction, the purpose of the EBRD shall be to foster the transition towards open market-oriented economies and to promote private and entrepreneurial initiative in the Central and Eastern European countries …' (European Bank for Reconstruction and Development (EBRD), Art. 1 of the Statue). 'The purpose of the Nordic Investment Bank is to make loans and issue guarantees in accordance with sound banking principles and taking into account socio-economic considerations, to carry into effect investment projects of interest to the Member countries and other countries which receive such loans and guarantees' (Nordic Investment Bank (NIB), Art. 1 of the Statute).

be divided into supranational institutions set up by a group of sovereign states which are their shareholders (e.g. the European Investment Bank (EIB),[2] the European Bank for Reconstruction and Development (EBRD),[3] the Black Sea Trade and Development Bank (BSTDB),[4] and the Nordic Investment Bank (NIB)[5], and national/regional promotional institutions (e.g. among the largest in Europe, the KfW in Germany, the Cassa Depositi e Prestiti in Italy, the Caisse des dépôts et consignations in France, the Netherlands Development Finance Company in the Netherlands, and the Instituto de Credito Oficial in Spain).

Although they mainly invest inside the establishing country, or member countries if supranational—they may also promote development in developing and emerging countries, especially where there are existing economic relationships. For example, a network of national DFIs constitutes the European Development Financial Institutions (EDFI), an association of export credit agencies mainly focused on the development of private enterprises in developing and emerging economies with the mandate to foster growth in sustainable business. Another group of national DFIs forms part of the Network of European Financial Institutions for Small

'KfW has the function of performing promotional tasks, in particular financings, pursuant to a state mandate in the following areas: small and medium-sized enterprises, liberal professions and business start-ups, risk capital, housing, environmental protection, infrastructure, technical progress and innovations, internationally agreed promotional programmes, development cooperation …' (Kreditanstalt für Wiederaufbau (KfW), Art. 2 of the Statute).

[2] Governments of Germany, France, Italy, the United Kingdom, Spain, Belgium, the Netherlands, Sweden, Denmark, Austria, Poland, Finland, Greece, Portugal, Czech Republic, Hungary, Ireland, Romania, Croatia, Slovakia, Slovenia, Bulgaria, Lithuania, Luxembourg, Cyprus, Latvia, Estonia, and Malta.

[3] Governments of Albania, Armenia, Australia, Austria, Azerbaijan, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Canada, China, Croatia, Cyprus, Czech Republic, Denmark, Egypt, Estonia, European Investment Bank, European Union, Finland, FYR Macedonia, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Jordan, Kazakhstan, Republic of Korea, Kosovo, Kyrgyz Republic, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Mexico, Moldova, Mongolia, Montenegro, Morocco, the Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Russian Federation, Serbia, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Tajikistan, Tunisia, Turkey, Turkmenistan, Ukraine, the United Kingdom, the United States of America, and Uzbekistan.

[4] Governments of Albania, Armenia, Azerbaijan, Bulgaria, Georgia, Greece, Moldova, Romania, Russia, Turkey, and Ukraine.

[5] Governments of Denmark, Estonia, Finland, Iceland, Latvia, Lithuania, Norway, and Sweden.

and Medium-Sized Enterprises (NEFI), whose public mission is to facilitate access to finance growth and internationalization of SMEs by offering them financial services and expertise.

The range of financial products they offer has increased over the years and nowadays generally comprises loans (mainly long-term), equity stakes (also acting as private equity/venture capital), trade finance (import/export), and guarantees. DFIs also offer non-financial services such as technical and administrative assistance, advisory services, and training programmes.

In accordance with their business model, they may directly finance end-customers (individuals and households, start-ups, micro, small and medium-sized enterprises, large private corporations, other financial institutions, through to other state-owned enterprises), as well as financial intermediaries that in turn on-lend to end-customers. Investments are mainly targeted to the environment, education, research, transport, living conditions, social housing, and international trade. A growing number of DFIs focus more explicitly on innovation in the fields of strategic infrastructure (including digital infrastructure), renewable energy, resource efficiency, and food security. The target sectors typically depend on whether the mandate of the DFI is narrow or formulated without reference to any particular activity. Generally, multilateral and large DFIs have broad and more flexible mandates.

On the liability side, different options can fund the activity of DFIs, including capital markets via the issuing of bonds (particularly for large institutions), budget transfer from the government or European programmes, and loans from other financial institutions or DFIs.

2.2 Theoretical Framework

The theoretical framework addressing the existence of development banks is the theory of market failure, developed in the middle of the last century. In his seminal paper, Bator (1958) defines market failure as 'the failure of a more or less idealized system of price-market institutions to sustain 'desirable' activities or to stop "undesirable" activities'. In the economic literature, 'market failure' is used to refer to situations where markets are inefficient and supply less than a Pareto-optimum level of services and goods (Arrow-Debreu). Such inefficiencies may originate from several sources, such as imperfect or incomplete information (Akerlof 1970), the existence of externalities (Coase 1960; Greenwald and Stiglitz 1986), or managers' desire for a 'quiet life' (Hicks 1935; Leibenstein 1966). More

recently, a debate has emerged regarding the superior role of contemporary DFIs in stimulating innovation paths and improving the institutional set-up, rather than just ensuring the functioning of existing markets (Bleda and Del Rio 2013; Foray et al. 2012; Mazzuccato and Penna 2016; Eslava and Freixas 2016).

Within this framework, the rationale for the existence of development banks is that they may compensate for different kinds of market failures, as well as stimulate and support a response to new global challenges which are broader in nature and require actions from both private and government players.

In fact, development banks typically fund high-risk projects that private banks are not willing to finance, especially if information asymmetries exist in the understanding of the business and the innovation process, expected returns are difficult to evaluate, or there is a lack of guarantees and collaterals or a lack of a track record of profitable investments (De Olloqui 2013; Luna-Martinez and De Vicente 2012; Eslava and Freixas 2016). This is frequently the case of high-tech or new industry, start-up, and R&D investments. Typically, development banks step in to provide direct or indirect loans, credit guarantees, and, more frequently, equity tools such as venture capital, private equity, seed capital financing, or mezzanine financing.

Development banks also provide 'patient' capital to promote strategic investments for economic development (e.g. infrastructure projects, export, housing, etc.) or for socially challenging projects (e.g. climate finance, renewable and environmental-friendly energy, and food security initiatives). In this case, market failure arises from the fact that social returns may be higher than private returns, at least in the short run, and the private sector may not provide funding because of short-termism or the high opportunity costs of allocating capital to certain industries or businesses.

Furthermore, development banks play the role of 'risk absorber of last resort' (De la Torre and Ize 2009; Caballero 2009) by sustaining growth and employment during periods of recession, when banks typically disintermediate their credit activity because of deteriorating asset quality, capital shortages, deleveraging, and higher risk aversion. In recent years, this countercyclical role has come to light in response to the global financial crisis (Gutierrez et al. 2011; Levy Yeiati et al. 2007; Luna-Martinez and De Vicente 2012).

Although there is a general consensus on the role of DFIs in correcting market failures, the issue historically raised is whether it is convenient for these market failures to be fixed via government intervention, or whether there may be other, different ways to fix them.

This issue falls within the traditional debate about the pros and cons of government intervention in the economy, which can be synthesized in the 'development view'[6] versus the 'political view' and 'agency view' debate.[7]

Within this framework, state-owned banks are traditionally said to be less efficient and less profitable than privately owned banks, either because they pursue social objectives or because they are run by political bureaucrats. However, as underlined in the Introduction, previous empirical literature on bank ownership and performance has often considered state-owned banks as if they belonged to a single type, whereas they do not. They deeply differ in terms of mission, business models, type of activity, and targeted market segments, as commercial state-owned banks typically do not have an explicit public policy mandate. They also operate like private banks offering a wide variety of banking and financial services targeted to retail as well as corporate customers and covering deposits and accounts, credit cards, loans, stock market services, insurance, asset management, and so on, while development banks have specialized competencies and a clear mandate to provide long-term capital to promote new industries and firms.

Development banks are a peculiar and understudied type of lender. To what extent are previous findings on government ownership and performance relevant for contemporary development banks?

3 Earlier Literature on Government Ownership and Performance

In this section we summarize the empirical evidence from the strand of literature published in the last decade that analyses the issue of the relationship between government ownership and bank performance. Findings are mixed and vary substantially across economies.

A body of evidence highlights that state-owned banks are inherently less efficient than private banks, especially in developing countries. Using

[6] According to the development view, also referred to as the social view or benign view, government-owned banks contribute to economic development and improve general welfare by providing capital and guarantees necessary for infrastructure and entrepreneurial activities in the presence of market constraints, and by addressing specific social issues, such as unemployment, education, and the lack of housing (Gerschenkron 1962; Atkinson and Stiglitz 1980).

[7] The more sceptical political view and the asymmetric information view support the idea that state-owned banks and enterprises are inefficient in the way they fix market failures because they distort market mechanisms, crowd out private investment, misallocate resources for pursuing the individual goals of politicians, and are more prone to agency cost issues such as conflict of interests or bribery (Kornai 1979; Shleifer and Vishny 1994, 1997; Hart et al. 1997).

data from Argentina in the 1990s, Berger et al. (2005) find that state-owned banks tend to have poorer performance compared to other banks, particularly in terms of very high non-performing loan ratios. Similar findings are reported by Iannotta et al. (2007) using a sample of 181 large banks from 15 European countries over the period 1999–2004. These authors find that government banks have lower profitability and loan quality and higher insolvency risk than private banks. Chen and Liu (2013) also report that government-owned financial institutions in Taiwan have a return on assets that is lower than that of the average private institution. Examining the static effect of ownership and the dynamic effect of privatization on bank performances in China over the period 1995–2010, Jiang et al. (2013) find that the ownership structure influences bank performance and that state-owned banks are associated with lower efficiency, results which are in line with Chen et al. (2008).

Another body of evidence reports different or less clear-cut findings. Cornett et al. (2009) use pooled cross-section and time-series regressions to investigate the effect of state ownership on bank accounting performance in 16 Far Eastern countries from 1989 to 2004. They find that the performance of state-owned banks is inferior to that of privately owned banks, but that the differences decrease over time, probably because of the increasing globalization of financial services competition, which may have the salutary effect of disciplining inefficient regulators and improving the performance of state-owned banks. Micco et al. (2007) analyse the relationship between bank ownership and performance for a sample of banks ranging from 5465 in 1995 to 6677 in 2002, from 179 countries across the world, using standard indicators of bank profitability and efficiency. They find that state-owned banks located in developing countries have much lower returns on assets than their private counterparts; however, those located in industrialized countries are not significantly different from their private counterparts. The latter results are in line with Altunbas and Marques (2008), who, focusing on the German banking system, find little evidence that privately owned banks are more efficient than state-owned banks, while the latter have slight cost and profit advantages. Little difference in the performance of state-owned banks and privately owned banks is also found by Figuera et al. (2009) using cross-sectional data covering 20 countries, while Poczter (2017) finds that a reduction in political connectedness following democratization positively influences the performance of Indonesian state-owned banks. More generally, this latter body of evidence relates findings to recent changes that affected contemporary state-owned banks and enterprises in the last two decades, in

corporate governance rules and regulatory frameworks, greater transparency and accountability, and better compliance with ethical and deontological requirements (OECD 2012; Musacchio and Lazzarini 2014). See also Cull et al. (2017) for a review of recent trends in bank ownership and implications for bank performance.

Surprisingly, while the empirical literature on the performance of state-owned banks is vast, there are no papers that specifically focus on development banks. This is the focus of the present study.

4 The Dataset

4.1 Ownership and Type of Bank

The dataset mainly draws on information from bank balance sheet and income statement data from the Orbis Bank Focus database, integrated, where necessary, with additional data available in Orbis, managed by Bureau van Dijk (BvD). Moreover, as the Orbis Bank Focus dataset is currently restricted to only three to five years of data, we also downloaded historical financial data from Bankscope, which is the dataset with information on banks published by BvD up until December 2016.[8] By accessing previous versions of Bankscope, financial data have been recovered since 1987. Nevertheless, available observations significantly increase over time. Data availability in 2002 is still around 50% with respect to the last available years. Our empirical analysis will focus on the time interval 2000–2015.

BvD also compiled an Ownership Database which provides information on the ownership of each firm. This makes it possible to define (albeit with some approximation) the private or public nature of each selected bank. The database also provides information on bank specialization, which is exactly what we need in order to individuate development banks within the sample.

The first step of our empirical research consists simply in defining our sample and distinguishing between the different types of banks. Orbis Bank Focus contains observations on around 34,000 active banks, just over 7000 of which are based in Europe. For the purposes of our study, we excluded those with very peculiar specializations (e.g. central banks, Islamic banks, and securities firms) hardly comparable to commercial and development banks.

[8] https://www.bvdinfo.com/en-gb/our-products/company-information/international-products/bankscope

We then move on to the identification of the DFIs within our sample. Sixty-eight European DFIs are detected among those institutions classified as *Multi-lateral governmental banks* or *Specialized governmental credit institutions*. Other DFIs are identified thanks to the available information on bank characteristics and their textual descriptions in Orbis Bank Focus. We further refine the initial selection through manual inspection, online research looking at websites, and public available information. For example, we also include in the DFI cluster all those institutions found to be members of European associations such as the EDFI and the NEFI (see Sect. 2.1). This further search led us to also include in the sample some entities that are not in the Orbis Bank Focus dataset, but which can still be retrieved from the Orbis dataset.[9] Our final sample includes 132 European DFIs. These include very large multilateral development banks operating at a supranational level (e.g. the European Investment Bank, European Bank for Reconstruction and Development, and Nordic Investment Bank), national DFIs (e.g. the German KfW Group, the Italian Cassa Depositi e Prestiti, and the French Caisse des Dépôts et Consignations) but also smaller regional promotional banks (e.g. Hamburgische Investitions- und Foerderbank, Institut Català de Finances, Finlombarda Spa, etc.)

We also distinguish the remaining banks in the sample with respect to their ownership, that is, state-owned versus private banks. We denote as *state-owned* those banks whose Global Ultimate Owner (GUO) is a public authority (or state or government). To be precise, to identify the ultimate owner of a corporate group, we fixed the minimum percentage that must characterize the path from a subject bank up to its ultimate owner (usually regarded as granting control or at least a large influence in decision-making, see Christiansen and Kim 2014) at 25.01%. When the GUO is not available, we base our classification on the type of entity corresponding to the top shareholder of each bank.

After all these steps, the final sample includes 5577 entities that are classified as shown in Table 9.1.

Development banks account for only 2.4% of our sample. However, Table 9.2 shows that they account for more than 5% in terms of total assets and more than 2% in terms of the number of employees. Moreover, in terms of total assets, public entities (development banks and other public banks) account for a total of more than 18%. To obtain these weights, the

[9] While Orbis Bank Focus is specifically dedicated to banks, Orbis contains information on companies associated with all the possible types of industries and activities.

Table 9.1 Bank classification within the sample

Cluster	*Freq.*	*Percent*	*Cum.*
Development banks	132	2.37	2.37
Commercial state-owned banks	269	4.82	7.19
Commercial private banks	5176	92.81	100.00
Total	5577	100.00	

Table 9.2 Cluster weights by total assets and by number of employees across sub-periods

Cluster weights (%) by:	*Development banks*	*Commercial state-owned banks*	*Commercial private banks*
Total assets	5.02	13.72	81.26
Number of employees	2.12	17.04	80.85

median value of total assets is taken separately for each bank in the sample. Then, total assets are aggregated within each cluster and weighted against the total amount of total assets within the time interval 2000–2015.

4.2 Characteristics of the Banks

We next report some descriptive statistics for the most relevant financial ratios available in our sample. For each ratio and within each year, we applied a winsorizing procedure that, respectively, replaces values above the 99th percentile and below the 1st percentile with the 99th percentile and the 1st percentile.

We use two accounting measures of operating performance: a measure of profitability and a measure of efficiency (Hannan and Pilloff 2009; Hernando et al. 2009). Efficiency is measured via the cost-to-income ratio, defined as operating costs divided by operating income: as is well-known, the higher the ratio, the lower the level of cost-efficiency. Profitability is measured via the return on assets (ROA), that is, the ratio of profit before tax to total assets[10]: the higher the ratio, the higher the bank's overall

[10] We use the return on assets (ROA), instead of the return on equity (ROE), as our sample is global and ROA is better equipped for a cross-country analysis of banks with different levels of capitalization and leverage (Rivard and Thomas 1997; Athanasoglou et al. 2008).

Table 9.3 Descriptive characteristics of the sample

	Development banks		*Commercial state-owned banks*		*Commercial private banks*	
Ratios (%)	*Mean*	*Median*	*Mean*	*Median*	*Mean*	*Median*
ROAA	1.11	0.54	0.66	0.55	0.58	0.39
Cost-to-income ratio	50.49	41.77	69.80	65.87	73.07	73.44
Equity/total assets	35.11	20.38	14.21	10.25	12.36	8.81
Net interest margin	2.47	1.66	3.42	2.67	3.23	2.57
Impaired loans / gross loans	8.03	5.23	10.05	4.94	5.28	3.14
Loan loss provisions/ net int. rev.	21.48	14.19	20.17	14.10	16.17	12.66
Customer deposits/ total funding	25.81	11.90	55.77	61.47	69.75	77.62
Net loans/customer deposits	1959.49	887.97	382.94	125.99	659.73	93.23
Total assets (euro mld)	20.70	1.43	25.98	1.41	8.03	0.29
Number of employees	1163.22	132.50	4410.75	440.50	1231.77	115.00

returns given its size. We also computed a few other ratios to describe the activity and characteristics of the banks.

Table 9.3 shows the mean and median values of the banks' characteristics by cluster.

There are some differences within our sample, suggesting that ownership matters. Development banks are on average more efficient and more profitable than commercial state-owned banks; their average performance is also better than that of private banks. In fact, the mean value of the ROA of development banks (1.11%) is on average higher than the ROA of state-owned commercial banks (0.66%) and of private commercial banks (0.58%). The evidence is even stronger for the cost-to-income measure of efficiency, which is equal to 50.49% for development banks, much lower than state-owned commercial banks (69.80%) and private commercial banks (73.07%). Median values highlight a degree of heterogeneity among development banks, with some institutions that are much more performing than others.

Development banks also show a solvency ratio (35.11%), measured by the equity to total asset ratio, three times higher than those of commercial state-owned banks (14.21%) and commercial private banks (12.36%).

In line with the typical funding activity of development banks, which is mainly based on securities issued on international capital markets, the

relative weight of retail funding in the overall funding activity is much lower for development banks (25.81%), while it is equal to 55.7% for commercial state-owned and 69.7% for private banks.

The data for development banks reveal poorer loan portfolio quality, measured by the impaired loans to gross loans ratio. The average value of the ratio is 8.03% for development banks and 5.28% for commercial private banks. This is coherent with the formers' role in fixing market failures.

As far as commercial state-owned banks are concerned, inspection of individual data suggests that the low quality of their loan portfolios is probably burdened by non-performing loans of private banks rescued during the crisis, such as Dexia Credit Local, Royal Bank of Scotland, Piraeus Bank, and CaixaBank.

We now move on from the descriptive statistics to focus on the econometric testing of our null hypothesis. Our null hypothesis is that state-owned banks are a single entity and development banks are similar to commercial state-owned banks. In the case of rejecting the null hypothesis, it becomes interesting to evaluate the sign and magnitude of the coefficient so as to shed light on the different characteristics of development banks and commercial state-owned banks in terms of efficiency and profitability.

5 The Empirical Research Methodology and Results

In order to test our null hypothesis, we introduce a baseline regression model with the aim of measuring the relevance of the different bank clusters (development banks, commercial private banks, and commercial state-owned banks) on bank performances. This procedure permits us to compare bank performance across the different clusters after controlling for other potential determinants that may be affecting the dependent variables.

First of all, we include two sets of dummies in our regressions to control for country-specific and time-specific effects. We then turn to the existing literature (e.g. Molyneux and Thornton 1992) in order to include other potential determinants of bank performance. To be precise, we introduce bank-specific variables for size, capitalization, type of activity, and asset quality. The proxies for bank size is the log of total assets (*log_TotalAssets*) and its quadratic form (*log_TotalAssets_2*), which is useful in order to take into account potential non-linearity in the relationship with bank performance.

Capitalization is measured by the equity to total assets ratio, which reflects the level of a bank's protection against asset malfunctions. Although bank leverage and capitalization have been analysed in depth in the previous literature, the empirical results vary significantly.

Two additional ratios are introduced to proxy the type of banking activity: the Customer Deposits to Total Funding ratio and the Net Loans to Customer Deposits ratio. The former captures the relative importance of traditional intermediation activity, while the latter captures the degree of liquidity of the bank.

Finally, asset quality is proxied by the impaired loans to gross loans ratio: the higher the ratio, the poorer the quality of the loan portfolio. The effect of credit risk on profitability is usually negative: the greater the exposure to high-risk loans, the greater the accumulation of loan losses.

Table 9.4 contains the results obtained from our baseline estimations, based on the time interval 2000–2015. Three columns are shown for each dependent variable. In column 1, estimates are applied to the extended sample (more than 60,000 observations), which is unfortunately characterized by a high number of missing data with respect to the last three control variables. In columns 2 and 3, estimates are applied to a smaller sample (about 30,000 observations), with available information for all the control variables considered in our study. The difference between column 2 and column 3 lies simply in the inclusion of the last three control variables.

The coefficients on the development banks cluster are null because this is the omitted cluster.

The coefficients on the state-owned and private banks thus represent the difference in performance of these two clusters with respect to development banks.

The coefficients on the control variables are broadly in line with the previous literature on the determinants of bank performance. The coefficients on log_TotalAssets signal that an increase in bank size is positively related to profitability. This may be due to better diversification opportunities and the lower cost of funding of larger banks compared to smaller banks (Demirgüç-Kunt and Huizinga 2000; Bikker and Hu 2002; Goddard et al. 2004). At the same time, the inverted sign of the quadratic form signals the existence of a non-linear relationship between the two variables and, in particular, a decreasing marginal effect of bank size on relative performance (see, e.g. Athanasoglou et al. 2008).

The effect of bank capitalization is positive. An increase in capital reduces the expected costs of bankruptcy: the lower likelihood of financial distress

Table 9.4 Baseline regressions

	ROAA			*Cost-to-income ratio*		
	(1)	*(2)*	*(3)*	*(1)*	*(2)*	*(3)*
Development banks	0.00	0.00	0.00	0.00	0.00	0.00
	[.]	[.]	[.]	[.]	[.]	[.]
Commercial state-owned banks	−0.14**	0.14	0.15*	9.39***	10.96***	12.04***
	[0.07]	[0.09]	[0.09]	[1.08]	[1.50]	[1.55]
Commercial private banks	0.10	0.41***	0.33***	7.83***	11.01***	12.57***
	[0.06]	[0.08]	[0.08]	[0.98]	[1.40]	[1.46]
log_TotalAssets	0.15***	0.28***	0.30***	−9.31***	−11.73***	−11.44***
	[0.03]	[0.04]	[0.04]	[0.43]	[0.57]	[0.58]
log_TotalAssets_2	−0.00***	−0.01***	−0.01***	0.24***	0.32***	0.31***
	[0.00]	[0.00]	[0.00]	[0.02]	[0.02]	[0.02]
Equity/total assets	0.03***	0.03***	0.04***	−0.13***	−0.23***	−0.24***
	[0.00]	[0.00]	[0.00]	[0.01]	[0.02]	[0.02]
Customer dep./total fund			0.00			−0.04***
			[0.00]			[0.01]
Net loans/customer deposits			0.00			−0.00
			[0.00]			[0.00]
Impaired loans/gross loans			−0.04***			0.11***
			[0.00]			[0.02]
Country effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Year effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Observations	65,570	30,316	30,316	63,213	30,229	30,229
r2	0.15	0.18	0.22	0.13	0.19	0.19

Standard errors in brackets
*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$

results in a lower cost of funding, leading to a positive impact on bank profitability. Moreover, banks with relatively low capital respond to moral hazard incentives by increasing the riskiness of their loan portfolio, resulting in higher non-performing loans on average in the future (Dermirgüç-Kunt and Huizinga 2000; Goddard et al. 2004; Mehran and Thakor 2011).

As expected, the effect of credit risk on profitability is negative, while the two variables on the type of banking activity are not found to be statistically or economically relevant.

Let us now focus our attention on the null hypothesis and, specifically, on the significance of the coefficients related to commercial state-owned and private banks. Coefficients significantly different from zero signal that development banks (the omitted cluster in the regression) have a different efficiency and financial performance with respect to these two clusters.

When looking at the cost-to-income ratio as the dependent variable, our results point to clear differences between development and commercial state-owned banks, with the former performing better than the latter. These results show that state-owned banks are not a monolithic group and that development banks have specific features and operate in a way not fully examined in the existing literature. The difference is also highly significant with respect to commercial private banks.

When looking at the ROA, on the other hand, the difference between development banks and state-owned banks is not highly significant, while private banks are found to be significantly more profitable than their state-owned counterparts. Interestingly, however, development banks are found to be significantly more profitable than commercial state-owned banks when we look at the results obtained in our extended sample (column 1). This better performance in the extended sample is even more evident when restricting our estimations to the post-crisis period 2008–2015 (see additional tables for pre-crisis and post-crisis years in the Appendix). In this case, the performance of development banks is as high as that of private banks. The results change when considering the restricted sample with available information on the additional control variables.

Our results also suggest that commercial state-owned banks are not less efficient than their private benchmarks. These findings are in line with recent literature on state-owned enterprises, mainly focused on highlighting differences and similarities with private enterprises, suggesting that modern government-led enterprises, especially in developed countries, are different from those of the last century. They are more financial- and market-oriented and provide services in a more business-like manner, facing similar issues and challenges to private enterprises (Aivazian et al. 2005; Bozec and Breton 2003; Levesque 2003; Florio 2014).

6 Concluding Remarks

The empirical findings of our study shed light on specificities related to development banks, an understudied type of financial institution. The study also contributes to better framing the bank ownership and performance debate, recognizing the fact that state-owned banks are not a single

entity and that major differences exist between development banks and commercial banks.

Furthermore, the empirical findings regarding the performance of the different types of development banks and regarding their comparison with commercial state-owned and private banks raise a number of questions. Is the better performance of development versus commercial private and state-owned banks a good sign in itself? For example, an excessively high level of profitability may be inconsistent with the non-profit goals of development banks, given that the purpose of a development state-owned bank should not be to maximize profits but rather to support the economy while not losing money, covering operating costs, self-financing growth (to a certain extent), and securing a reasonable level of financial strength and stability. Similarly, an excessively low impairment ratio may simply mean excessive risk aversion inconsistent with the policy objective of providing risk-taking capacity to the economy in order to overcome its shortage by privately owned banks. This may have important implications in terms of policy actions in order to support development banks and, at the same time, foster the pursuit of their mandate.

Beyond performance issues, further research on development banks is needed in order to understand the impact of development banks' allocation activity, or spillovers resulting from firm-level investments, their role—if any—in fostering innovation, and to determine which metrics better reflect the activity of these institutions, given that their mission goes beyond profitability.

Appendix

Pre-crisis Regressions (Period 2000–2007)

	ROAA			*Cost-to-income ratio*		
	(1)	*(2)*	*(3)*	*(1)*	*(2)*	*(3)*
Development banks	0.00	0.00	0.00	0.00	0.00	0.00
	[.]	[.]	[.]	[.]	[.]	[.]
Commercial state-owned banks	0.08	0.50***	0.38**	10.47***	9.53***	7.90***
	[0.09]	[0.15]	[0.16]	[1.35]	[2.48]	[2.49]

(*continued*)

(continued)

	ROAA			*Cost-to-income ratio*		
	(1)	*(2)*	*(3)*	*(1)*	*(2)*	*(3)*
Commercial private banks	0.20**	0.45***	0.30*	10.67***	11.16***	9.72***
	[0.08]	[0.14]	[0.16]	[1.25]	[2.38]	[2.40]
log_TotalAssets	0.25***	0.22***	0.19***	−8.32***	−9.09***	−9.42***
	[0.04]	[0.06]	[0.06]	[0.51]	[0.70]	[0.71]
log_TotalAssets_2	−0.01***	−0.01***	−0.00**	0.23***	0.26***	0.27***
	[0.00]	[0.00]	[0.00]	[0.02]	[0.02]	[0.02]
Equity/total assets	0.04***	0.04***	0.04***	−0.24***	−0.31***	−0.31***
	[0.00]	[0.00]	[0.00]	[0.02]	[0.04]	[0.04]
Customer dep./ total fund			0.00***			0.02*
			[0.00]			[0.01]
Net loans/ customer deposits			−0.00			−0.00**
			[0.00]			[0.00]
Impaired loans/ gross loans			−0.02***			0.25***
			[0.00]			[0.06]
Country effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Year effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Observations	25,401	6943	6943	24,803	6922	6922
r2	0.31	0.32	0.33	0.16	0.17	0.18

Standard errors in brackets
*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$

Post-crisis Regressions (Period 2008–2015)

	ROAA			*Cost-to-income ratio*		
	(1)	*(2)*	*(3)*	*(1)*	*(2)*	*(3)*
Development banks	0.00	0.00	0.00	0.00	0.00	0.00
	[.]	[.]	[.]	[.]	[.]	[.]
Commercial state-owned banks	−0.31***	−0.02	0.03	8.96***	10.92***	12.60***
	[0.10]	[0.10]	[0.10]	[1.54]	[1.85]	[1.92]

(*continued*)

(continued)

	ROAA			*Cost-to-income ratio*		
	(1)	*(2)*	*(3)*	*(1)*	*(2)*	*(3)*
Commercial private banks	0.06	0.37***	0.32***	5.96***	10.34***	12.75***
	[0.09]	[0.09]	[0.09]	[1.37]	[1.71]	[1.80]
log_TotalAssets	0.13***	0.26***	0.33***	−10.74***	−13.43***	−13.12***
	[0.05]	[0.05]	[0.05]	[0.63]	[0.78]	[0.79]
log_TotalAssets_2	−0.00**	−0.01***	−0.01***	0.28***	0.37***	0.36***
	[0.00]	[0.00]	[0.00]	[0.02]	[0.03]	[0.03]
Equity/total assets	0.02***	0.03***	0.04***	−0.10***	−0.24***	−0.25***
	[0.00]	[0.00]	[0.00]	[0.02]	[0.02]	[0.02]
Customer deposits/ total funding			−0.00*			−0.07***
			[0.00]			[0.01]
Net loans/customer deposits			0.00			−0.00***
			[0.00]			[0.00]
Impaired loans/gross loans			−0.04***			0.11***
			[0.00]			[0.03]
Country effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Year effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Observations	40,169	23,373	23,373	38,410	23,307	23,307
r2	0.12	0.15	0.19	0.13	0.19	0.19

Standard errors in brackets
*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$

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CHAPTER 10

Non-financial Rating and Socially Responsible Investment Reaction to Financial Turmoil

Helen Chiappini and Gianfranco A. Vento

1 Introduction

Unlike traditional investments, socially responsible investments (SRIs) use non-financial criteria to screen investments. Thus, the investment strategy is based on the exclusion of companies that do not meet some fixed ecological, social, corporate governance and ethical criteria (negative screening) or on the inclusion of companies that meet some corporate social responsibility (CSR) criteria (positive screening) (Renneboog et al. 2008). Companies that are selected through positive screening can be ranked according to their CSR scores, and only companies with the highest scores can be included in

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a SRI portfolio (best-in-class approach). When companies are screened via both positive and negative non-financial criteria, the approach is known as the third generation of screens (Renneboog et al. 2008).

Another type of screening includes shareholder activism, considered the fourth generation of screening. This includes shareholder dialogues with company management or the influence of company strategies by tanking the vote in annual meetings.

According to the European Investment Forum (Eurosif 2016), SRI strategies include the selection of companies that have a measurable positive social impact. Although this strategy can be considered a fifth generation of screening to some, for many others (e.g. Freireich and Fulton 2009; Social Impact Investment Taskforce 2014; Höchstädter and Scheck 2015), this investment approach can be labelled social impact investment (SII) and falls outside the framework of SRIs.

Currently the global market for SRIs accounts for $22.89 trillion, with a 25% increase from 2014, while in Europe it accounts for $12.04 trillion (Global Sustainable Investment Alliance GSIA 2017).

Instead of the market growth, the academic and practitioner debate on SRI performance has not yet been concluded. According to some academics, SRI limitation in investment decision-making can reduce investment opportunities and diversification (Miralles-Quirós and Miralles-Quirós 2017), while others support the idea that high CSR standards improve performance (e.g. Waddock and Graves 1997; Orlitzky et al. 2003; Brammer et al. 2006; Cellier and Chollet 2016).

Findings appear to be highly influenced by investments (funds or stocks), timing (market boom or collapse), type of markets (European versus the United States), and typology of financial performance (corporate ratio or market performance) (Wu et al. 2017; Revelli and Viviani 2015).

Thus, the heterogeneity of results and the frequency of market shocks have driven the development of a specific sub-stream of literature that investigates whether SRIs outperform traditional counterparties during market turmoil (e.g. Gangi and Trotta 2015; Becchetti et al. 2015; Wu et al. 2017; Chiappini and Vento 2018). Like the main stream, this sub-stream is affected by the plurality of results. Moreover, to the best of our knowledge, few and geographically limited studies (e.g. Ducassy 2013) have investigated whether SR companies with the highest ESG ratings are more resilient during market stress.

The aim of this chapter is thus to contribute to the academic debate investigating whether the ESG rating can serve as a proxy of companies

(and stocks) that react better to financial turmoil. In other words, are companies recognized by independent evaluators as being more responsible also recognized by investors as being the most attractive during market shocks?

The methodology applied is the event study. Following the approach of Chiappini and Vento (2018), the considered events are the recent Brexit announcement and the bankruptcy of Lehman Brothers. The sample consists of 250 European socially responsible (SR) companies, while non-financial ratings are taken from the Thomson Reuters ESG rating. Accordingly, this study refers to SRI and SR companies as being synonymous.

This research contributes to the literature by showing that, during severe financial turmoil, the ESG rating can be considered a proxy of more resilient investments. Therefore, the inclusion of SR stocks with the highest ESG rating, for instance, can allow fund managers to obtain an abnormal return during market downturns, thus positively contributing to portfolio performance.

This chapter is organized as follows. Section 2 presents the theoretical background and the hypothesis developed here. Section 3 describes the methodology and data, while Sect. 4 shows the results. Finally, Sect. 5 presents our conclusions.

2 Theoretical Background and Hypothesis Development

We analyse two streams of literature in order to develop a hypothesis on whether the ESG rating can serve as a proxy of SR companies that react better to financial turmoil. We thus analyse SRI performance during market shocks and the relationship between the ESG rating and financial performance.

2.1 SRI and Market Turmoil

The literature on SRI performance during market turmoil has mostly shown the anticyclical power of SRI. Wu et al. (2017) compared the SRI portfolio of companies included in the FTSE GOOD Index with the portfolio of traditional companies listed on the FTSE 350 from 2004 to 2009. They show that the SRI portfolio was “more resilient” (p. 238) to the 2007–2009 financial crisis. Nofsinger and Varma (2014) show that SRIs outperformed non-SRI funds during the dot-com and the global financial

crisis. However, these results are only driven by funds that apply a positive screening investment strategy. Becchetti et al. (2015) analysed more than 22,000 funds from January 1992 to April 2012. These authors noted many "switches in dominance" (p. 2558) between SRI and non-SRI funds during the observed period and a substantial outperformance of SRI funds during the global financial crisis. They thus conclude that "SRI may be conceived as an insurance which protects against an ethical risk factor whose risk accumulated in market booms (where ethical investors pay a premium in terms of lower returns) and produces its negative consequences in financial crises where ethical investors cash their insurance indemnity (i.e. earn a portfolio return which is superior to that of none-ethical investors)" (Becchetti et al. 2015, p. 2560).

Gangi and Trotta (2015) analysed whether the global financial crisis and the sovereign debt crisis affected European SRI funds. SRI funds proved to be refuge funds for investors, because they perform better with less volatility than traditional funds.

Other studies have focused on more restricted geographical areas and have analysed SRI performance during the global financial crisis. Nikai et al. (2016) focused on the Japanese market, using the bankruptcy of Lehman Brothers as a momentum event of the event study. SRI funds prove to react better than traditional funds to the global financial crisis. Tripathi and Bhandari (2016) focused on the Indian market, comparing SRI and non-SRI stock portfolios and showing the outperformance of the former. This analysis reinforced the previous findings of Tripathi and Bhandari (2012) when they conducted studies on green companies. These companies outperformed traditional companies during the global financial crisis, but underperformed in the pre-crisis period (2004–2007).

Lesser et al. (2016) partially supported the thesis according to which SRIs have anticyclical power. They found that only the funds located in North America outperformed traditional funds during market turmoil. This may be due to the stock-picking managerial capability of North American fund managers. Worldwide SRI funds do not seem to represent a refuge investment in time of crisis.

Other studies reject the hypothesis that SRIs outperform non-SRIs during market crises. Specifically, Branch et al. (2014) compared the performance of a social fund of funds created ad hoc with a traditional fund of funds. The social fund of funds created by the academics was less volatile than the traditional fund of funds, although it underperformed the fund

of funds made up of only traditional investments and market indexes during the global financial crisis. Amenc and Sourd (2010) investigated SRI funds available for French investors versus traditional funds, showing that SRIs do not outperform the contrasting sample.

Leite and Cortez (2015) focused on French funds investing in Europe during the dot-com, global financial, and sovereign debt crises, demonstrating substantial invariance between SRI and non-SRI performance. Likewise, Muñoz et al. (2014) analysed US and European green funds during market turmoil, reporting similar performance. US SRI funds outperform non-SRI in non-crisis periods, however.

As to Brexit, Chiappini and Vento et al. found that SRIs show a significant positive abnormal return during severe shocks—like the Lehman bankruptcy—while they show a significant negative abnormal return during Brexit. Thus, their anticyclical power is demonstrated during severe financial turmoil. This finding supports the results obtained by Gangi and Trotta (2015) showing that European SRI funds appeared like "refuge funds" especially when "the effects of the crisis are very broad and strongly negative" (p. 391). This happened during the Lehman crisis, whereas SRIs did not show any refuge power during the sovereign debt crisis.

2.2 ESG Rating, Performance, and Market Turmoil

The link between CSR (sometimes expressed as corporate social performance, CSP) and financial performance (FP) has been extensively investigated in the literature (Alexander and Buchholz 1978; McWilliams and Siegel 2000; Waddock and Graves 1997; Orlitzky et al. 2003; Brammer et al. 2006; Soana 2011; Mănescu 2011; Cellier and Chollet 2016). Many different indicators have been used as a proxy of CSP and FP. For instance, Waddock and Graves (1997) demonstrate a bidirectional positive relationship between CSP and FP using the Kinder, Lydenberg, and Domini (KLD) rating as a proxy of CSP and some ratios, like return on assets, as a proxy of FP. The results of this study were recently questioned by Zhao and Murrel (2016) when analysing a larger sample of firms over a longer time period. In fact, they demonstrate that Waddock and Graves' conclusions cannot be considered generalizable (Zhao and Murrel 2016).

Cellier and Chollet (2016) recognized that few studies have focused on SRI ratings and the market value of firms. Moreover, they found that the announcement of a publication of a social rating—with either a high or a

low score—positively increases the market value of firms. Other studies (Galema et al. 2008; Brammer et al. 2006) suggest that the different components of the rating should be analysed separately in order to assess their contribution to stock prices. The relevance of these components is assessed differently depending on the samples and times (Cellier and Chollet 2016). For instance, Mănescu (2011), when analysing a sample of publicly traded US firms from July 1992 to June 2008, found that only the category of the ESG rating identified as community relations had a positive effect on stock returns. Moreover, Scholtens and Zhou (2008) reported that good employee relations, diversity, and human rights do not positively affect stock returns. However, others have found a positive relationship (e.g. Dimson et al. 2015; Edmans 2011; Fatemi et al. 2015; Ge and Liu 2015; Krüger 2015).

To the best of our knowledge, few studies have analysed the link between the score on the ESG rating and the reaction of SRIs to financial turmoil. Ducassy (2013) analysed 44 French-listed companies rated by the French Corporate Information Center (CFIE). This author found that firms showing a higher CSR rating obtained better FP during the beginning of the global financial crisis. However, these firms lost the financial advantage in the long period: in fact, 6 months after the beginning of the financial crisis, no particular correlation was found between FP and the CSR rating. Jones et al. (2000) assessed the effect of the 1987 and 1989 Wall Street collapses on corporate FP. The discriminant variable used to represent CSP was the level of the firm's reputation. Findings showed neutrality of performance in 1987 and outperformance of SRI in 1989. Another study (Schnietz and Epstein 2005) assessed the link between specific exogenous events, like the failure of the World Trade Organization (WTO) trade negotiations in Seattle in 1999 and FP. Negotiations focused on and failed due to a discordant view on labour and environmental standards. Traditional companies underperformed SRIs.

2.3 Hypothesis Development

Following the theoretical background, we pose the hypothesis set out below:

H1: During severe financial turmoil, SR companies with a higher ESG rating are more resilient than SR companies showing a lower ESG rating.

3 Methodology and Data

3.1 Methodology

The methodology applied is the event study. Since the Fama et al. model published in 1969, event study has been employed to test security price reactions to some specific announcements or events. The underlying hypothesis is that markets are efficient and incorporate all relevant public information (Fama 1991).

For the purpose of this chapter and as in Chiappini and Vento (2018), the events ($t = 0$) are (1) the Brexit announcement made on 24 June 2016 following the vote held on 23 June 2016 and (2) the bankruptcy of Lehman Brothers on 15 September 2008.

To assess the stock reaction to the selected events, we used the event windows [0;0] and [0;1].

We estimated the abnormal return (AR) by adopting the market model. Thus, the AR for any company i at time t is calculated as follows:

$$AR_{it} = R_{it} - \hat{R}_{it} \tag{10.1}$$

where:

R_{it} represents the return of company i at time t

$\hat{R}_{it}$ represents the expected return of company i at time t given the market model (10.2)

$$\hat{R}_{it} = \alpha_i + \beta R_{mt} + \varepsilon_{it} \tag{10.2}$$

where:

α_i is the intercept of stock i

β_i is the systematic risk of stock i

R_{mt} is the average return of the proxy market, represented by the Index Morgan Stanley Capital International (MSCI) Europe

α and β were determined over an estimation period of 120 trading days prior to the event period.

AR is estimated for any day in the event window. The cumulative abnormal return (CARi) estimates the cumulative effect within the event window, for any company i.

$$\mathrm{CAR}i = \sum_{t=0}^{t=n} \mathrm{AR}_{it} \tag{10.3}$$

where $t = n$ is the last day of the event window.

The cumulative average abnormal return (CAAR) is used to test the Brexit and Lehman Brothers effect on the selected sample of companies. Thus, CAAR is calculated as follows:

$$\mathrm{CAAR} = \frac{\sum_{i=1}^{i=N} \mathrm{CAR}_i}{N} \tag{10.4}$$

where N is the number of companies.

The significance of CAAR is estimated via the cross-sectional *t-test*, while the average cumulative return (ACR) is used to quantify the return within the event window.

$$\mathrm{ACR} = \frac{\sum_{i=1}^{i=N} \bar{\mathrm{R}}_l}{N} \tag{10.5}$$

$$\bar{\mathrm{R}}_i = \sum_{t=0}^{t=n} \mathrm{R}_{it} \tag{10.6}$$

where:

$\bar{\mathrm{R}}_i$ identifies the cumulative return in the selected event window for firm i.

3.2 Data

In order to identify European SR companies, we used the constituents of the MSCI Europe ESG Leaders Index.[1] This Index uses the best-in-class selection process (MSCI 2017).

In order to screen for the best and the worst companies, we used the Thomson Reuters ESG rating obtained by each company at the time of financial shock. Thus, for Brexit shock, we consider the 2016 rating, while for Lehman we consider the 2008 rating.

[1] MSCI Europe constituents are publicly available at: http://msci.com/constituents

Table 10.1 Score range of Thomson Reuters ESG rating

Score range	*Grade*
0.0 <= score <= 0.083333	D−
0.083333 < score <= 0.166666	D
0.166666 < score <= 0.250000	D+
0.250000 < score <= 0.333333	C−
0.333333 < score <= 0.416666	C
0.416666 < score <= 0.500000	C+
0.500000 < score <= 0.583333	B−
0.583333 < score <= 0.66666	B
0.666666 < score <= 0.750000	B+
0.750000 < score <= 0.833333	A−
0.833333 < score <= 0.916666	A
0.916666 < score <= 1	A+

Source: Thomson Reuters Eikon (2017)

The Thomson Reuters ESG rating scores companies from D- to A+. Each letter corresponds to a numeric score (Table 10.1). The Thomson Reuters ESG rating is based on three pillars: Environmental, Social, and Governance. Each pillar is composed of different categories of indicators. The Environmental score is based on resource use, emissions, and innovation. The Social score focuses on workforce, human rights, community, and product responsibility. The Governance score emphasizes management, shareholders, and CSR strategy. Each of these categories is made up of many different indicators weighted appropriately (Table 10.2).

We group companies in four quartiles: the first quartile with the highest ESG rating, and the fourth with the lowest. This allows us to obtain four homogeneous groups in terms of number of companies. Figure 10.1 shows the distribution of ESG scores for companies involved in the Brexit event study, while Fig. 10.2 shows the distribution of ESG scores for companies involved in the Lehman Brothers test.

4 Main Findings

This research posed the following hypothesis:

H1: *During severe financial turmoil, SR companies with a higher ESG rating are more resilient than SR companies showing a lower ESG rating.*

This section presents the results of our analysis.

Table 10.2 Thomson Reuters ESG score

Pillar	*Category*	*Indicators in scoring*	*Weights (%)*
Environmental	Resource use	20	11
	Emissions	22	12
	Innovation	19	11
Social	Workforce	29	16
	Human rights	8	4.5
	Community	14	8
	Product responsibility	12	7
Governance	Management	34	19
	Shareholders	12	7
	CSR strategy	8	4.50
Total		178	100

Source: Thomson Reuters Eikon (2017)

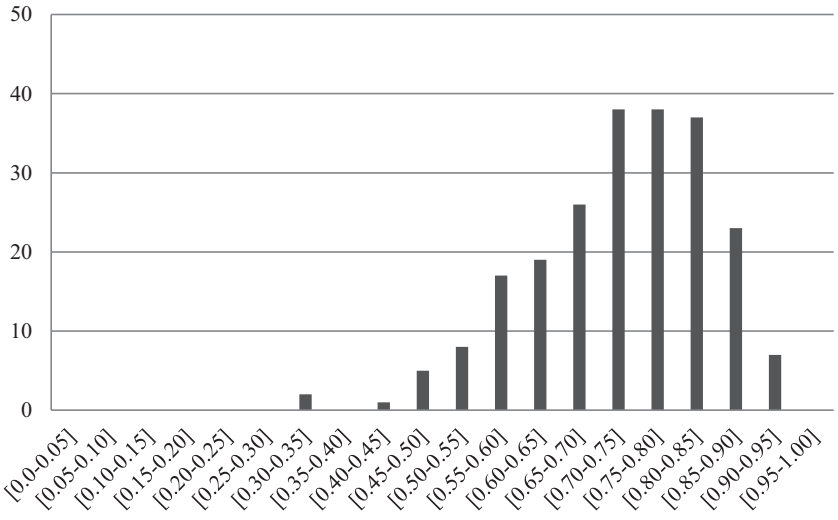

Fig. 10.1 Distribution of ESG scores. Brexit event

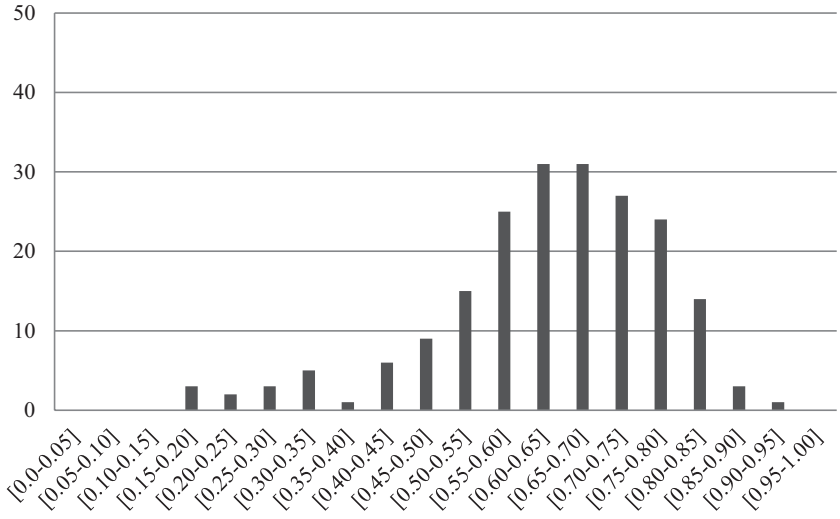

Fig. 10.2 Distribution of ESG scores. Lehman Brothers bankruptcy

SR companies obtained negative CAAR during the Brexit crisis. In particular, companies with the highest ESG scores (first quartile) obtained similar and significant CAAR to companies with the lowest ESG score (fourth quartile) in the event window [0;1]. The CAAR of firms in the fourth quartile accounted for −2.54% at a significance level of 99%, while the CAAR of firms in the first quartile accounted for −2.31% at a significance level of 95% (Table 10.3). Companies in the third quartile showed the worst results, with a CAAR of −4.06%. However, we found on average a less negative CAAR for companies with higher ESG ratings (first and second quartiles versus the third and fourth quartiles) in the event window [0;1], where the CAARs are also significant.

At the time of the Lehman Brothers shock, SR companies with a higher ESG rating obtained a positive and significant CAAR at a significance level of 99%. However, companies in the second quartile obtained a higher CAAR than companies in the first quartile. In the event window [0;0], the differences were not particularly relevant: companies in the first quartile obtained a CAAR of 1.072 and companies in the second, 1.32%. However, in the event window [0;1], companies in the second quartile obtained a CAAR of 3.03% and companies in the first quartile, 1.79% (Table 10.4). Companies in the first and second quartiles obtained a higher CAAR than companies in the third and fourth quartiles. The CAARs of companies in the third and fourth quartiles were not significant (Table 10.4).

Table 10.3 Brexit effects on SR companies, by ESG ratings and by event windows

		Event window		*Event window*	
		[0;0]		*[0;1]*	
	n.	*ACR*	*CAAR*	*ACR*	*CAAR*
		%	*%*	*%*	*%*
First quartile	55	−6.067	−0.88	−10.71	−2.31**
t-value			−1.219		−2.21
Second quartile	55	−4.932	−0.11	−9.595	−1.804***
t-value			−0.195		−2.436
Third quartile	55	−7.212	−1.961**	−12.564	−4.064***
t-value			−2.220		−3.44
Fourth quartile	56	−4.270	0.265	−9.880	−2.542***
t-value			0.400		−2.413

Significance code: ***0.01, **0.05, *0.1

Table 10.4 Lehman Brothers effect on SR companies, by ESG ratings and by event windows

		Event window		*Event window*	
		[0;0]		*[0;1]*	
	n.	*ACR*	*CAAR*	*ACR*	*CAAR*
		%	*%*	*%*	*%*
First quartile	50	−3.042	1.072***	−5.098	1.792***
t-value			2.865		2.609
Second quartile	50	−2.888	1.32***	−4.018	3.033***
t-value			3.49		5.279
Third quartile	50	−3.4	0.63	−5.126	1.63
t-value			1.874		2.431
Fourth quartile	49	−2.586	1.097	−4.548	1.622
t-value			3.147		2.293

Significance code: ***0.01, **0.05, *0.1

Table 10.5 Brexit effect on SR non-financial companies, by ESG ratings and event windows

		Event window		*Event window*	
		[0;0]		*[0;1]*	
	n.	*ACR*	*CAAR*	*ACR*	*CAAR*
		%	*%*	*%*	*%*
First quartile	45	−4.275	0.253	−8.171	−0.847
t-value			0.379		−0.786
Second quartile	46	−4.75	−0.222	−9.162	−1.848***
t-value			−0.362		−2.465
Third quartile	45	−6.129	−1.265*	−10.938	−3.071***
t-value			−1.393		−2.342
Fourth quartile	46	−4.179	0.095	−9.526	−2.612**
t-value			0.124		−2.075

Significance code: ***0.01, **0.05, *0.1

Table 10.6 Lehman Brothers effect on SR non-financial companies, by ESG ratings and event windows

		Event window		*Event window*	
		[0;0]		*[0;1]*	
	n.	*ACR*	*CAAR*	*ACR*	*CAAR*
		%	*%*	*%*	*%*
First quartile	40	−2.129	1.619***	−3.4	2.879***
t-value			4.149		4.294
Second quartile	41	−6.001	1.631***	−9.435	3.353***
t-value			4.026		5.061
Third quartile	40	−6.139	1.129***	−9.414	2.769***
t-value			3.528		5.591
Fourth quartile	40	−6.121	1.002***	−10.109	1.82***
t-value			2.361		2.585

Significance code: ***0.01, **0.05, *0.1

As regards the differences between the sample of SR companies including or excluding financial companies, no particular differences in terms of CAAR were found in the Brexit turmoil between the two samples, although the sample of non-financial companies shows a less negative CAAR than the full sample. In terms of ACR, the sample including financial companies underperforms the contrasting sample (Tables 10.3 and 10.5).

During the Lehman Brothers shock, SR companies operating in non-financial sectors obtained better returns on average than the full sample, including financial and non-financial companies (Tables 10.4 and 10.6). The best SR companies (first and second quartiles) not operating in the financial sector obtained a better CAAR than the full sample.

5 Conclusions

The aim of this study was to test whether SR companies with the highest ESG rating perform better than SR firms with lower ratings during financial turmoil. In order to achieve this goal, we analysed both the recent Brexit turmoil and the Lehman Brothers crisis.

ESG ratings can contribute to the identification of SR companies better able to react to financial turmoil; however this is especially true if the shock is consistent. The analysis of the SRI conditioned in the industry confirmed that the anticyclical power of SRI increases with the severity of shocks.

These findings thus contribute to the academic debate and provide interesting indications for practitioners involved in portfolio design. In fact, the ESG rating can be used to screen the most resilient firms from a sample of SR companies. The study thus supports and furthers the findings of Chiappini and Vento (2018) and Gangi and Trotta (2015).

Further research might enlarge the sample of SR companies, comparing more markets (e.g. the American market versus the European market), and extend the perimeter of the analysis to other turmoils (e.g. the sovereign debt crisis of 2011 and the oil shock of 2015) to assess whether the results of this study are evident in other crises. Future research may hence contribute to the generalization of these findings, currently documented for the European market. The testing of a single market (the European one) may, in fact, be viewed as a limitation of this study.

Moreover, given the findings of previous studies that show significant relationships between specific components of ESG ratings and SRI performance (e.g. Brammer et al. 2006; Galema et al. 2008), further research

might investigate the separate role that Environmental, Social, and Governance components of ratings have on SRI performance during market shocks. Strong governance could limit downturn effects especially when market shocks are jointly caused by governance troubles, like in the Lehman Brothers shock. In contrast, environmental turmoil may mostly affect companies with a lower environmental rating.

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CHAPTER 11

What Determines Interest Margins? The Case of Chinese Banks

Ming Qi and Jiawei Zhang

1 Introduction

The basic function of financial intermediation is based on taking deposits and granting loans, and the main measure of performance of banks in such traditional intermediation activities is the net interest margin (NIM). The NIM is defined as the ratio of net interest spread to total assets. The lower interest margin means more people prefer to borrow from banks, hence the lower social cost of financial institutes (Demirguc-Kunt and Huizinga 1999; Maudos and Guevara 2004). The increasing annual bank interest margins obtained during the period of 2000–2009 were accompanied by increased market competition. The Chinese banks had many limits when China established a market economy in the 1990s. However, in compliance with the (World Trade Organization) WTO accession agreement, China began to deregulate its banks. This reform took place after 2001 and included the joint-stock system restructuring of SOBs. The stock of banks was gradually made available to the public, including foreign companies

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and individuals. China fulfilled the promise to open its domestic banking market in November 2006, which resulted in major changes in the Chinese banking system. Foreign capital purchased shares of Chinese banks, increasing both the scale and competitiveness of the market. There were more chances for Chinese banks to develop and enter the international financial system. Figure 11.1 shows that the NIM of four types of banks increased, in general, following the deregulation. This reflected the fact that the profitability of banks rose gradually during this time. The financial crisis in 2008 led to a sharp decline in NIM. Meanwhile, it can be seen that the CCBs and JSBs had a larger range of growth. However, the profitability of Chinese domestic banks has been facing pressure in recent years. According to the Moody's Investors Service report, the banks' capitalization and liquidity positions remained stable overall, but weakened among the smaller entities due to their faster rate of asset growth. SOBs and JSBs reported average loan growth in 2016, at a faster rate than in 2015. JSB loans continued to grow their loans faster than the major SOBs. The main aim of this chapter is to investigate the determinants of the net interest margins of financial institutions in China.

Angbazo (1997) studies different risk measures and concludes that default risk, rather than the interest rate risk, has a greater impact on the interest margin of large banks. Demirguc-Kunt and Huizinga (1999)

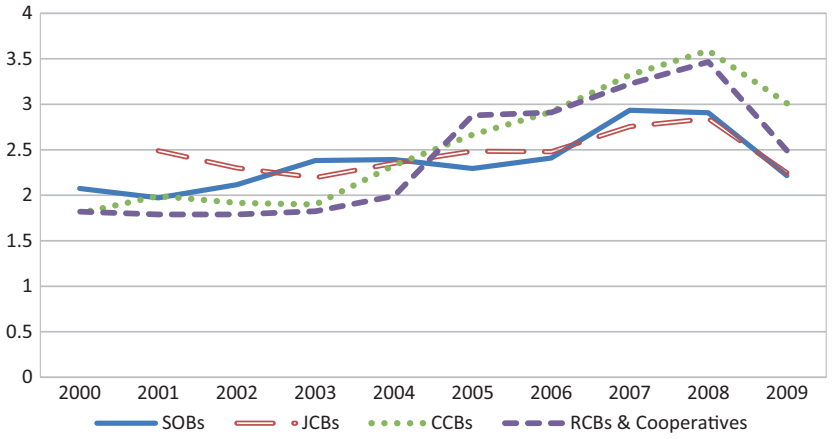

Fig. 11.1 Evolution of the net interest margins (NIM) of Chinese commercial banks

employ a sample of banks' interest margins in 80 countries during the period of 1988–1995. Saunders and Schumacher (2000) suggest a trade-off between the solvency risk and the net interest margins, employing a sample from the European and US setting and including operating costs and market power. They find that falling operating costs and credit risks contribute to the reduction in bank interest margins. The cases of transaction economies and developing countries are also investigated by Drakos (2003) and Claeys and Vennet (2008). These authors investigate the case of Central and Eastern European Countries (CEEC), finding a decreased interest margin and higher efficiency in CEEC banks. Kasman et al. (2010) compare the determinants of NIM between the new and existing EU member countries. They conclude that the difference in interest margins between the two groups still exists and that the mergers and acquisitions (M&A) need to be promoted in order to increase scale efficiency. As for the developing countries, Doliente (2005) investigates the banks in four Southeast Asian countries, finding that bank interest margins are sensitive to the short-term interest rate. Following the Ho-Saunders dealership model, Zhou and Wong (2008) examine the determinants of the net interest margins of the Chinese commercial banks during the period of 1996–2003. They confirm the impact of several conventional factors, including market concentration, size and risk aversion, among others, on the net interest margins.

2 Empirical Approach

Two empirical approaches have been used in the literature to estimate the determinants of net interest margins. Ho and Saunders (1981), Saunders and Schumacher (2000) and Doliente (2005) use the two-stage process. In the first stage, a cross-sectional regression is run to obtain a measure of the 'pure spread', defined as the spread between the interest revenue on bank assets and interest expense on bank liabilities as a proportion of average bank assets. In the second stage, the 'pure spread' is regressed on the volatility of interest rates. However, a long time series is required for the second-stage estimation. McShane and Sharpe (1985) and Angbazo (1997) propose an alternative single-stage approach, which includes both bank-specific characteristics and country-specific macroeconomic conditions as explanatory variables. Given that our sample covers annual accounting data between the years 2000 and 2009, we employ the single-step estimation approach for the estimation. In the empirical model, we

follow Angbazo (1997), using a single-step approach and including bank-specific variables and a market concentration index for the estimation. We first estimate the results using a fixed effect method, which controls for all individual characteristics of banks. The empirical framework is specified as follows:

$$\begin{aligned} NIM_{i,t} = {} & \beta_0 + \beta_1 HHI_t + \beta_2 Size_{i,t} + \beta_3 Opportunity_{i,t} + \beta_4 Inefficiency_{i,t} \\ & + \beta_5 Risk\_Aversion_{i,t} + \beta_6 Liquid\_Risk_{i,t} + \beta_7 Default\_Risk_{i,t} \\ & + \beta_8 Credit\_Risk_{i,t} + \varepsilon_{i,t} \end{aligned}$$

3 Data and the Description of the Sample

We use a sample of 116 Chinese domestic banks, comprising state-owned banks (SOBs), joint-stock Bbanks (JSBs), city commercial banks (CCBs) and credit cooperatives. All bank-level data are obtained from the Bureau Van Dijk's BankScope database. The sample includes 1113 observations over the period of 2000–2009. Table 11.1 shows the mean value of the net interest margin of Chinese banks in each year. We find that the NIM of domestic banks keeps increasing until 2008, in which year the influence of financial crisis had spread to China. In terms of the market competition, the Herfindahl-Hirschman Index is observed to decrease from 2000 to 2006, after which it began to rise slowly.[1] The opportunity costs of all financial intermediaries are seen to decline smoothly until 2007 and then suffered a sharp spike in 2008 and 2009. The summary statistics of the variables are shown in Table 11.2.

1. **HHI**: We use the Herfindahl-Hirschman Index (HHI) to capture the market concentration. This is defined as the sum of the squares of the market shares of each bank (Maudos and Fernandez de Guevara 2004). In spite of some evidence of the positive impact of the HHI on the interest margin (Maudos and Fernandez de Guevara 2004; Carbó-Valverde and Rodriguez-Fernandez 2007), Cetorelli and Gambera (2002) argue that the bank concentration can also have a depressing impact on growth. The HHI reflects the centralization of the market. As shown in Fig. 11.2, the HHI declined after 2001 due to the increasing market share of various banks, especially small banks.

[1] The Herfindahl-Hirschman Indices after 2001 are below 1000. According to regulation of the American Department of Justice (1992), it can be classified as a high competitive market.

Table 11.1 Annual mean value of variables

	2000	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*
NIM (%)	1.88	2.12	2.02	2.01	2.31	2.64	2.83	3.22	3.40	2.81
HHI	5247	1756	1505	1350	1267	1229	1196	1128	1090	1097
Size	8.02	8.57	8.40	8.46	8.29	8.12	7.90	8.13	8.82	9.21
Opportunity (%)	1.29	1.07	0.75	0.68	0.60	0.58	0.69	0.96	5.25	7.36
Inefficiency (%)	66.81	60.47	56.43	53.19	51.63	44.76	42.23	36.70	35.52	40.16
Risk_Aversion (%)	4.97	4.69	3.82	3.56	3.70	4.30	5.28	5.58	6.03	6.07
Liquidity_Risk (%)	23.69	18.53	17.26	16.60	18.03	20.10	20.04	22.77	23.63	22.31
Default_Risk (%)	0.52	0.55	0.75	0.75	0.85	1.10	1.04	0.84	1.19	0.68
Credit_Risk (%)	48.64	53.87	52.02	53.92	55.63	54.74	55.69	53.55	52.26	52.25

Table 11.2 Summary statistics for the full sample

Variable	*Definition*	*Mean*	*Std. dev*	*Minimum*	*Maximum*
Dependent variable					
NIM (%)	Difference between the interest revenue and interest expense, in logarithms	2.717	0.975	0.420	6.680
Explanatory variables					
HHI	The sum of the squares of the market shares	310.905	424.034	101.595	1570.146
Size	Total volume of loans, in logarithms	8.377	1.903	4.872	13.463
Opportunity	The ratio of liquid reserves to total assets	0.019	0.045	0.000	0.298
Inefficiency	The cost to income ratio as a measure of inefficiency (the quality of management)	0.446	0.158	0.040	1.699
Risk_ Aversion	The ratio of total equity to total assets	0.049	0.026	−0.137	0.313
Liquid_Risk	The ratio of liquid assets to total liabilities	0.210	0.090	0.012	0.971
Default_Risk	The ratio of loan loss provisions to total loans	0.009	0.007	−0.006	0.042
Credit_Risk	The ratio of total loans to total assets	0.539	0.091	0.186	0.885

Note: Liquid reserves refer to the sum of cash and due from banks

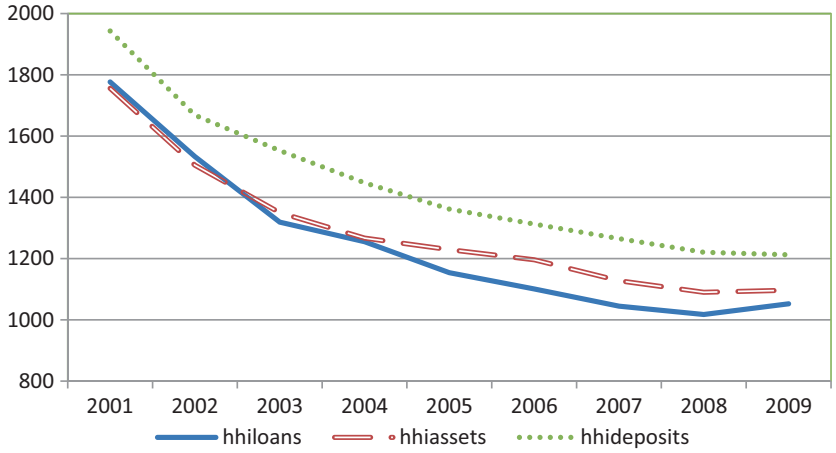

Fig. 11.2 Evolution of the HHI of China's banking industry

2. **Size**: The log of total loans is used as a proxy of the size of individual banks. Maudos and Fernandez de Guevara (2004) suggest a positive relationship between the bank interest spread and the average size of operations. The summary statistics indicates that the size of banks continued to grow during the period from 2000 to 2009 with the improvement in the Chinese economy and deregulation. As shown in Fig. 11.3, the SOBs also constituted the largest-sized banks in China, playing the most important role in the Chinese banking system.
3. **Opportunity**: We use the ratio of liquid reserves, which are the sum of cash and due from banks, to total assets, to proxy the opportunity costs.
4. **Inefficiency**: This variable is measured by the cost to income ratio. The interest margin is undermined by high costs, which are associated with high efficiency. The inefficiency of banks declined in general from 2000 to 2008. As shown in Fig. 11.4, deregulation had an impact on the bank's inefficiency. SOBs continued to maintain the lowest inefficiency level compared to other types of banks.
5. **Risk_Aversion**: In the context of the Ho-Saunders Model (1981), commercial banks are assumed to be risk-averse dealers. Therefore, we explore to what extent risk aversion can affect banks' interest

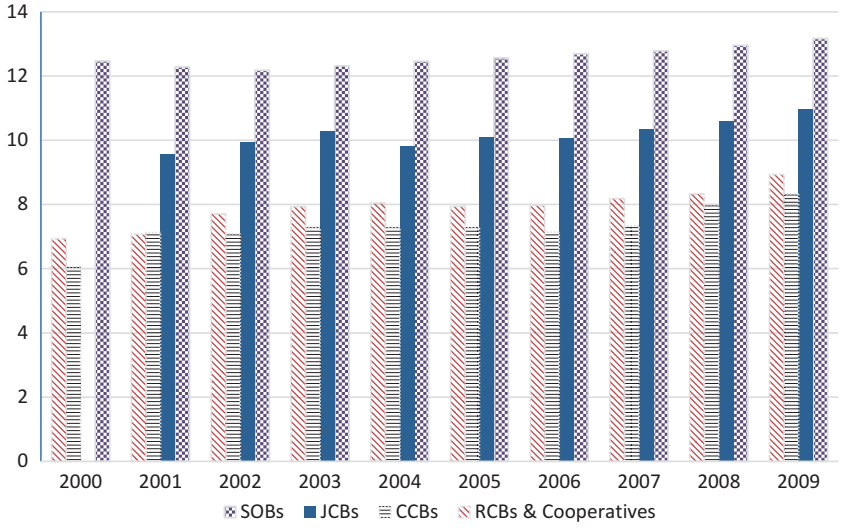

Fig. 11.3 Evaluation of the size of Chinese commercial banks

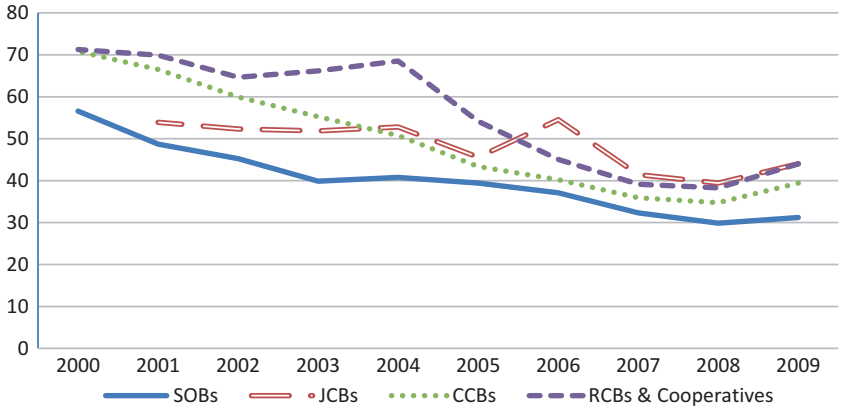

Fig. 11.4 Evolution of the inefficiency of Chinese commercial banks

margins. Following McShane and Sharpe (1985) and Maudos and Fernandez de Guevara (2004), this variable is proxied by the ratio of total equity to total assets. As shown in Fig. 11.5, the risk aversion underwent a process ranging from the decreasing trend before 2004 to a subsequent increasing trend. This finding indicates that the banks became less likely to burden risk.

6. **Liquid_Risk**: Following Angbazo (1997), we propose the ratio of liquid assets to total liabilities, that is, total deposits and borrowing, as a proxy for liquid risk. As shown in Fig. 11.6, the liquid risk of banks increased slightly, except for RCBs, which showed a decreasing trend.
7. **Credit_Risk**: We use the loan to assets ratio to proxy the credit risk (Maudos and Fernandez de Guevara 2004, Kasman et al. 2010). The credit risk of SOBs and JSBs decreased slightly before 2008 in line with the deregulation trend. However, the risk of RCBs rose with fluctuations.
8. **Default_Risk**: Following Kasman et al. 2010, we use the ratio of loan loss provisions to total loans to proxy the default risk. As shown in Fig. 11.7, the credit risk of SOBs and JSBs decreased slightly before 2008 in line with the deregulation trend. However, the risk of RCBs rose with fluctuations.

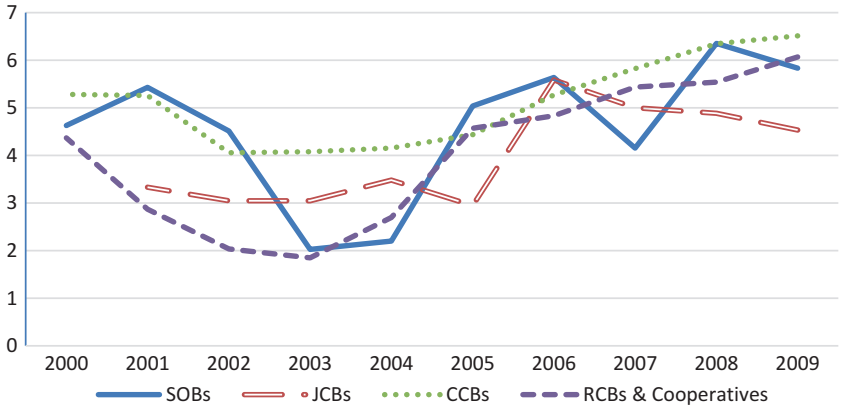

Fig. 11.5 Evolution of risk aversion in Chinese commercial banks

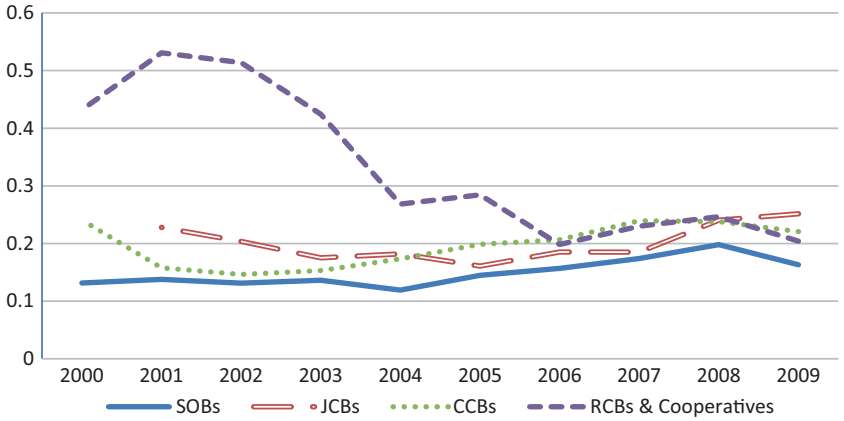

Fig. 11.6 Evolution of Liquid_Risk in Chinese commercial banks

4 Empirical Results

The results are shown in Table 11.3. Column (1) reports the estimation under the fixed effect model for all banks between 2000 and 2009. Column (2) reflects the results of the sub-period before 2007 under the fixed effect method. The results following the liberalization of the banking industry in 2007 under the fixed effect model are presented in Column (3). The positive and significant impact of loan size on interest margins

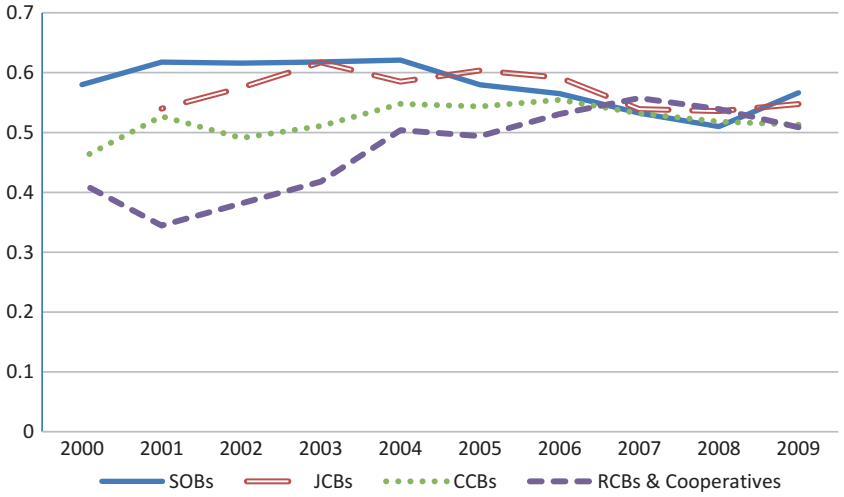

Fig. 11.7 Evolution of the credit risks of Chinese commercial banks

Table 11.3 The determinants of Chinese banks' net interest margins

	(1)	*(2)*	*(3)*
HHI	−7.98E-5	−2.54E-5	−9.22E-4
	(−0.90)	(−0.31)	(−0.36)
Size	−0.108	−0.273**	−0.418**
	(−1.53)	(−2.27)	(−2.26)
Opportunity	5.096***	2.544	4.130***
	(8.95)	(0.48)	(4.66)
Inefficiency	−3.374***	−3.670***	−3.317***
	(−9.28)	(−7.30)	(−3.06)
Risk_Aversion	4.531***	3.901	3.375
	(3.85)	(2.52)	(1.61)
Liquid_Risk	1.302**	−0.205	0.285
	(2.50)	(−0.26)	(0.30)
Default_Risk	15.05***	18.13***	17.83***
	(3.30)	(2.67)	(2.20)
Credit_Risk	1.919***	1.235	4.146***
	(3.77)	(1.63)	(3.60)
Constant	3.445***	5.484***	6.313
	(4.45)	(4.63)	(1.63)
Observations	515	303	212

Note: t-statistics in parentheses *$p < 0.10$, **$p < 0.05$, ***$p < 0.01$

before 2007 is not in line with the results of Zhou and Wong (2008). Before liberalization of the banking industry, foreign banks' business was subject to severe limitations and strict supervisions. The margins of domestic banks originate from the high interest rate spread which was established by the government. Therefore, the greater the volume of loans granted, the higher the interest margins the banks could earn. As the interest rate policy is controlled by the supervisor to a major extent, loan expansion was the main way to earn interest margins before 2007. The entry of foreign banks has challenged the monopolistic power of domestic banks and made the loan expansion a statistically less relevant variable in explaining profitability after the liberalization of the banking industry. Opportunity cost measured by the ratio of liquid reserves to total assets has a significant and positive impact on the net interest margins, a result that confirms the findings of Maudos and Fernandez de Guevara (2004). This result implies that the high interest margins are underpinned by liquidity reserves. This effect is particularly significant following the liberalization of the banking industry. Almost all the risk factors have shown significant and positive effects on the interest margins, except for the risk aversion. A high financial risk is associated with large non-performing loan ratios in Chinese domestic banks. They accordingly require high interest margins to compensate for defaults and credit risk exposures. Following the liberalization of the banking industry, market openness forced domestic banks to improve their profitability in order to overcome high risk exposures. These findings are in line with Maudos and Fernandez de Guevara (2004), Hawtrey and Liang (2008) and Kasman et al. (2010) for other international experiences.

5 Conclusions

In this chapter, we examine the determinants of the interest margins of the Chinese banks. Following the opening up of the financial market openness, especially of the nationwide banks, China's banking industry is able to manage financial stress better. Loan expansion is found to be the main way to improve interest margins during our research period. Credit risk is the major measure forcing the banking industry to enhance profitability. A high financial risk is associated with a high non-performing loan ratio in Chinese domestic banks. Therefore, they require high interest margins to compensate for the liquid, default and credit risk exposures. However, China began to open its domestic banking market in November

2006. A full line of banking businesses in both foreign and local currencies was then opened to foreign subsidiary banks and branches, without any restriction regarding their geographical or business scope. Regional-based banks achieved higher interest margins than nationwide banks to compensate for risk exposures. We also find that the loan size has a statistically significant negative effect on the net interest margins over our research period. Obviously, this extensive pattern of growth in China is not very sustainable, considering the fast-track expansion of credit. How to effectively control the scale of credit and promote the interest profitability is another problem crying out for solutions following the crisis. Interest rate liberalization reform and a flexible pattern for competition are needed to be introduced into the Chinese banking industry.

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PART III

Firm Financing and Valuation

CHAPTER 12

How Do Banks and Investment Funds Affect Family Risk-Taking? Evidence from the Financial Crisis

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1 Introduction

The study of the behaviour and characteristics of family firms is increasingly focussing on issues of corporate governance. As part of this analysis, research on risk-taking in family firms and its effect on performance has

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been particularly fruitful. The theoretical and empirical debate has hinged on two viewpoints. On the one hand, some authors argue that family firms are more risk-averse than non-family firms (Mishra and McConaughy 1999; Croci et al. 2011; Le Breton-Miller et al. 2011; Anderson et al. 2012). The theoretical rationale underlying these results is diverse. First, the agency theory suggests that, in its simultaneous role as both large shareholder and manager, the family minimizes the agency costs arising from the separation of ownership and control (Fama and Jensen 1983). As large shareholders, however, families often invest much of their wealth in the family company, which encourages low levels of risk-taking in corporate decision-making in order to reduce the risk of jeopardizing family wealth. Furthermore, family firms are very concerned about the long-term survival of the company (James 1999; Anderson and Reeb 2003). One of the most important goals of family businesses is therefore to keep the family firm alive and well and in the hands of the family. Hence, greater risk-taking might endanger this goal of business succession (Chua et al. 2003; Hiebl 2012).

The second viewpoint, led by Gomez-Mejia et al. (2007), argues that family firms may be both risk-taking and risk-averse. This apparent paradox is explained by combining the fundamentals of the prospect and agency theories to construct a new theory called the behavioural agency model or BAM (Wiseman and Gomez-Mejia 1998). The agency theory assumes the existence of divergence of interests between the company's stakeholders (principals and agents), leading to the emergence of agency costs (Jensen and Meckling 1976). In this context, the goal of corporate governance is to try to align the behaviour of participants in order to minimize these agency costs and increase corporate value. However, corporate governance solutions suggested by agency theory are limited by the assumption of consistent risk aversion among agents and its modelling of a recursive influence from risk choice on performance (Wiseman and Gomez-Mejia 1998). Prospect theory (Kahneman and Tversky 1979) suggests that individuals exhibit a mixture of risk-seeking and risk-averting behaviour that depends on their perception of gains and losses relative to a reference point or target.

The contribution of this chapter is firstly to document the existence of a U-shaped relationship between risk and return in family firms. In addition, we analyse the relationship between corporate risk-taking and the institutional environment, finding that corporate risk-taking is stronger both in countries with stronger creditor rights and in those with greater

uncertainty avoidance. Secondly, we analyse the role played by institutional investors in corporate risk-taking in family firms. Specifically, we analyse the behaviour of institutional investors both before and beyond the optimum value of a U-shaped curve. We present evidence that the pressure of investment funds before the target is negative for firm profitability, especially in a period of financial crisis, while the conservative role of banks to preserve the long-term financial relationship with the firm could have a positive impact on profitability.

The rest of the chapter is organized as follows. In Sect. 2, we develop the theoretical framework of the study using the agency and behavioural theories. Also in this section, we establish the hypotheses derived from the theoretical framework. Section 3 discusses the empirical research design, describing the sample, the model and the methodology used. The discussion of the main results can be found in Sect. 4. The final section of the chapter presents our main conclusions and suggestions for future lines of research.

2 Literature Review and Set of Hypotheses

2.1 Risk-Taking and Performance for Family Firms in Different Legal Environments

The behavioural theory suggests that firms set a target annual performance to achieve (Fiegenbaum and Thomas 1988; Miller and Bromiley 1990). So, when the company falls below this target, it may tend to increase risk-taking in order to achieve it. In contrast, when the company is above this target, it tends to moderate its level of risk-taking. Thus, the relationship between risk and return may assume a U shape, as shown in Fig. 12.1. The greater the difference between the firm's actual performance and the performance target figure, the greater the level of risk that the firm will take to try to reach this target (which leads to an inverse relationship between risk and return). However, after reaching the target performance, the firm will only assume higher levels of risk if this is compensated by an adequate increase in profitability (leading to a direct relationship between risk and return). The primary reference point for family firms is the loss of their socioemotional wealth. The concept of socioemotional wealth refers to "non-financial aspect of the firm that meet the family's affective needs, such as identity, the ability to exercise family influence and the perpetuation of the family dynasty" (Gomez-Mejia et al. 2007). In this context,

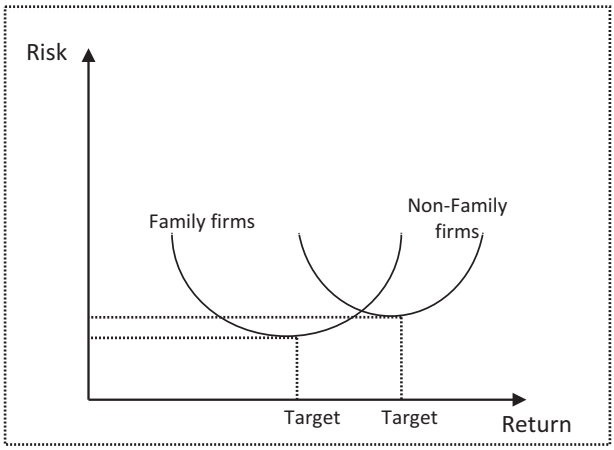

Fig. 12.1 U-shaped relationship between risk and return

when the family faces a possible loss of control of the firm due to poor performance (which implies a loss of socioemotional wealth), then it may decide to increase risk-taking in the firm in order to avoid this loss of control. Hence, family firms may be both risk-averting and risk-seeking. We may thus formulate Hypothesis 1a as follows:

Hypothesis 1a: There exists a U-shaped relationship between risk and performance in family firms.

The risk appetite of (family and non-family) firms, however, is influenced by institutional factors. Bruno and Shin (2014) state that the influence of external finance dependence and even the role of a global factor in the level of liquidity of the financial system can affect corporate risk-taking. Their study also analyses a nation's investor protection rights and its level of uncertainty avoidance as factors that may affect corporate risk-taking. Accordingly, Claessens et al. (2000) find that stronger protection of shareholder and creditor rights is associated with less financial risk. In countries where the rights of investors are better protected, following the law and finance approach (La Porta et al. 1998), they have more power to limit the level of risk-taking by managers and protect the value of their claims. This same inverse relationship is tested by Acharya et al. (2011), who show that

strong creditor rights in case of default lead firms to reduce risk. In countries with strong creditor rights, shareholders and managers reduce the probability of default of the company by reducing cash-flow risk in order to avoid the costs associated with bankruptcy (La Porta et al. 2000). In contrast, John et al. (2008) find that corporate risk-taking is positively related to the quality of investor protection. Their argument is twofold. On the one hand, in countries with poor investor protection, large shareholders decide on taking corporate risks. Following the traditional arguments, less diversified wealth among these large shareholders leads them to take fewer risks. On the other hand, non-equity stakeholders, such as banks, labour unions and the government, may constrain value-enhancing corporate risk-taking so as to protect their interests.

Cultural values such as the degree of uncertainty avoidance may also affect corporate risk-taking. Mihet (2013) and Li et al. (2013) find a negative association between uncertainty avoidance and risk-taking. Uncertainty avoidance expresses the degree to which the members of a society feel uncomfortable with uncertainty and ambiguity (Hofstede 2001). Individuals from countries with greater uncertainty avoidance are more resistant to change and possess a greater fear of failure and hence are less likely to take risks. According to these arguments, we may formulate Hypothesis 1b as follows:

Hypothesis 1b: *Companies in countries with stronger creditor rights and higher aversion to uncertainty assume lower levels of corporate risk-taking.*

2.2 *The Role Played by Institutional Investors in the Profitability of Family Firms*

There has been a worldwide shift in capital markets from the control of firms being in the hands of individual investors towards institutional investors playing a central role (Amihud and Li 2006). This trend probably has numerous causes, such as financial disintermediation, cuts in welfare state coverage, financial innovation along with the increasing sophistication of financial assets and advances in information technologies.

This new central role on the part of institutional investors has raised the question as to whether these investors tend to play a passive role, focussing

only on short-term financial returns, or whether—and if so, to what extent—they actively engage in the firm's main strategic decisions (Coffey and Fryxell 1991; Cox et al. 2004). This question has recently gained relevance due to the failure of US investment banks and the alleged lack of the banks' responses to the financial troubles of firms in recent years.

Institutional investors are considered outside shareholders interested in a financial return on their investments. Hutchinson et al. (2015) show a positive relationship between firm risk, risk management policy and performance for firms with increasing institutional shareholdings. These authors also find that, when firms are financially distressed, institutional investors are more likely to encourage short-term performance or success rather than support long-term value creation.

Nevertheless, the considerable stake they may hold and their focus on financial return can lead institutional investors to actively take part in the governance of the firms whose shares they own. Bhattacharya and Graham (2007) and Li et al. (2006) show that the various attitudes of and roles played by institutional investors may be attributed to their nature and legal status. Traditionally, empirical studies distinguish between two types of institutional investors. First, institutional investors who are more inclined to accept the decisions made by the management team of the company, that is, banks and insurance companies. These investors usually maintain a close relationship with the management and hence are less independent when taking decisions. Brickley et al. (1988) call this group *pressure-sensitive*. Second, institutional investors who do not have close ties with the management team, that is, mutual and pension funds or investment advisers, and are therefore less sensitive to the pressures they may receive from managers. Such investors are more independent and are called *pressure-resistant*.

Pressure-resistant institutional investors can efficiently control discretionary decisions by managers and large shareholders if the legal framework for corporate governance enhances this monitoring. In contrast, pressure-sensitive institutional investors can exacerbate the problems of corporate governance by maintaining both business and investment relationships with non-financial firms. In the case of family firms, the complex relationship between institutional investors and a family that controls the firm can lead to different risk-taking behaviours depending on the actual level of performance of the company (below or above the target).

2.2.1 *Institutional Investors in Family Firms When Profitability Levels Are Below the Desired Target*

Investment funds invest in family firms to obtain a certain expected level of return. When they become a large shareholder, they exert more and more pressure, as risk seekers, in order to obtain higher returns (Faccio et al. 2011). The target return can be obtained in line with the industry's performance or the historical performance of the company as a proxy for expected performance (Fiegenbaum and Thomas 1988; Fiegenbaum 1990; Bromiley 1991; Gomez-Mejia et al. 2007).

When return on assets (ROA) falls below the target return, which is the case of many family firms during this recent financial crisis, investment funds may play a perverse role, as they might exert pressure on the family to assume more risk so as to achieve the target, though this may have the opposite effect. As Fig. 12.2 shows, in line with the prospect theory, a high level of risk-taking for low values of ROA can reduce the return more, with negative consequences for family firms that may end in bankruptcy. In particular, in the years of the financial crisis, many family firms folded due to the pressure exerted by investment funds.

Hence, we formulate our third hypothesis as follows:

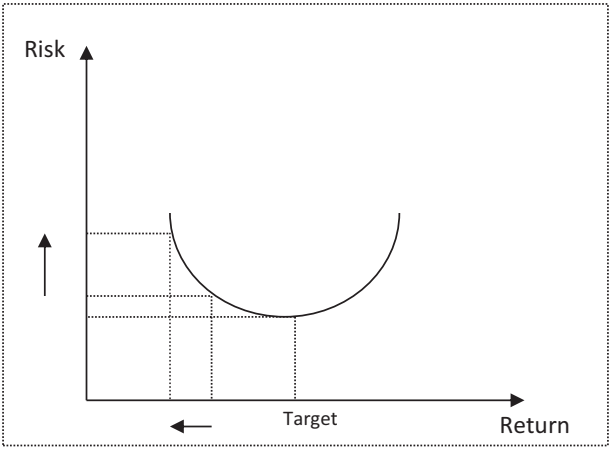

Fig. 12.2 Family firms' risk-return relationship in the presence of relevant investment fund (institutional investors) ownership when profitability falls below the target

Hypothesis 2a: *There exists a negative relationship between the presence of investment funds as shareholders and profitability in family firms when ROA is lower than the target level.*

Banks play a more conservative role than investment funds because they may also have a financial relationship with the family firm. Hence, they try to avoid an excessive level of corporate risk-taking, particularly when ROA falls below the target and it is more difficult to service the debt. The prospect theory suggests, as Fig. 12.3 shows, that a policy of lower risk-taking in this context can increase the return.

We accordingly formulate our fourth hypothesis as follows:

Hypothesis 2b: *There exists a positive relationship between bank ownership and profitability in family firms when ROA is lower than the target level.*

2.2.2 Institutional Investors in Family Firms When Profitability Levels Are Above the Desired Target

When ROA is higher than the target, there is a positive relationship between risk and return, as Fig. 12.4 shows, and the presence of investment funds favours increased risk-taking in family firms in order to increase expected returns.

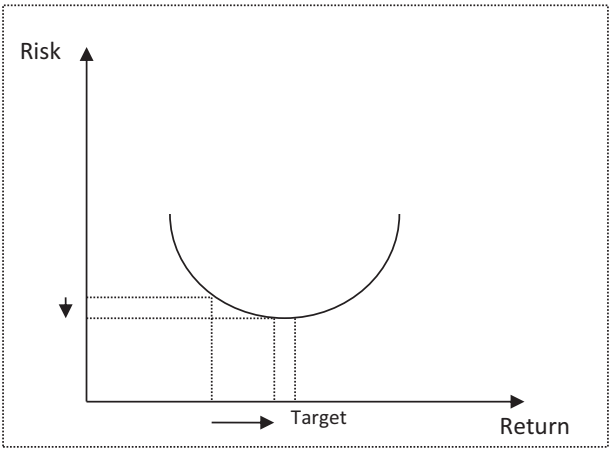

Fig. 12.3 Family firms' risk-return relationship in the presence of relevant bank (institutional investors) ownership when profitability falls below the target

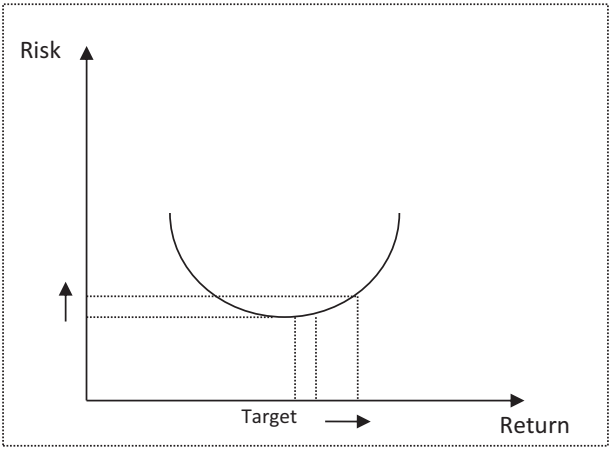

Fig. 12.4 Family firms' risk-return relationship in the presence of relevant bank ownership and investment funds when profitability is above the target

In this context, banks may play a conservative role and may accordingly try to prevent the company from assuming more risk, especially in family firms. For values of ROA above the target, a conservative role thus has a negative influence on the return of the company.

Banks may in fact act as investment funds, particularly in family firms, when the financial relationship is covered, increasing risk-taking to obtain higher levels of profitability (DeYoung et al. 2013). The new proactive attitude of banks in recent years as shareholders is the result of a decline in their net interest income and major financial deregulation in all countries. This effect is more likely in common law systems, and hence investment banks in these countries maintain a more speculative position in family firms, as Fig. 12.4 shows.

We thus formulate our fifth hypothesis as follows:

Hypothesis 3: *The pressure of investment funds to assume risk has a positive influence on levels of profitability in family firms, whereas the presence of banks (as shareholders) has a negative influence on levels of profitability when ROA is above the target.*

3 Sample and Method

3.1 Sample, Variables and Empirical Model

Our sample consists of 6180 firms from developed countries (USA, Canada, EU, Japan, Korea and Australia) for the period 2007–2014, resulting in 38,051 observations. More than 1000 companies are owned and controlled by families. We obtained data from financial statements (balance sheet and profit and loss statements) and on corporate ownership structure and share prices of the firms from the THOMSON ONE BANKER database. Table 12.1 provides a summary of the sample by country. The difficulty in obtaining data on the ownership structure prevents the analysis of all listed companies. Note also that this selection represents companies of all kinds and of different sizes.

To test corporate risk-taking, we use the standard deviation of return on assets (ROA) in a time period of three years to measure organizational risk (RTDT). This measure is widely used in previous literature on prospect theory and behavioural theory (Chang and Thomas 1989; Chou et al. 2009; Fiegenbaum 1990; Palmer and Wiseman 1999; Sinha 1994). As previously stated, accounting variables (like the return on assets) relate to organizational risk, defined as the uncertainty of a company's income stream (Palmer and Wiseman 1999). In this respect, we use the EBIT to total assets ratio, widely used in the literature (Deephouse and Wiseman 2000; Fiegenbaum 1990; Sinha 1994), for the measure of return (ROA). As we propose a nonlinear effect of return on corporate risk, the model has a quadratic relationship to the variable (ROA). This hypothesis also implies the existence of a turning point. This point is calculated by performing the first partial derivative risk regarding return. We thus obtain the breakpoint calculated as $(-\beta_1/2\beta_2)$. In our case, as it is a minimum

Table 12.1 Composition of the sample by countries (family and non-family firms)

Country	*# of observations*
USA	11,978
Canada	832
EU	7685
Japan	14,272
Korea	2762
Australia	522
Total	**38,051**

point, the second partial derivative must take values greater than zero, that is, $(2\beta 2) > 0$ (see De Miguel et al. (2004) for a further explanation of this procedure).

The model includes the variable FAM to identify the nature of the reference shareholder. FAM is a dummy variable that equals 1 if the major shareholder of the company is a family (or individual) and/or is managed by a family member as CEO, Chairman or CFO, and 0 otherwise.

The international dimension of our sample implies the existence of differences in legal and social environments that could influence corporate risk-taking decisions. We thus consider two additional variables: first, creditor rights, measured via the level of legal protection of creditors in each country (La Porta et al. 1998), and second, the uncertainty avoidance index (UAI) proposed by Hofstede (2001). The UAI variable measures the "extent to which the members of a culture feel threatened by uncertain or unknown situations" (Hofstede 2001). The higher the UAI, the greater the aversion to future uncertainty. We accordingly expect uncertainty avoidance (UAI) to be negatively related to risk-taking.

The ownership variables in our research are the percentage of shares held by the largest owner (OWN1) and the percentage of shares held by institutional investors (INVESTFUND) and by banks (BANKOWN). We also use creditor rights to determine these variables in each country. We thus determine the percentage of shares held by banks in countries more prone to risk and with a lower level of creditor rights where banks are often investment banks (BANKSOWNanglo).

Our models also include some control variables which are frequently used in the literature, making our study comparable with other related research. Although they are not the focus of our analysis, these variables provide significant information, the lack of which could mean running the risk of omitted variable biases. The analysis accordingly includes the market-to-book (MB) value ratio, defined as the ratio of the market value of a firm to its book value. Although several different alternative measures of growth opportunities are available (e.g. price-earnings ratios or market-to-book ratios), Adam and Goyal (2008) show that the market-to-book ratio has the highest informational contents with respect to investment opportunities. The market value of the firm is defined as the sum of the equity market value plus the book value of debt, as commonly defined in current research (Maury and Pajuste 2005; Villalonga and Amit 2006). The rationale is that the higher the market-to-book ratio, the lower the value attached to the assets in place and hence the higher the value arising from growth opportunities.

We also control for firms' capital structure (LEV), measured as the financial leverage ratio (i.e. the debt-to-equity ratio). To account for firm size (Holder-Webb et al. 2009), we calculate the log of total assets (LOGAST). As international business can be affected by the industry sector to which firms belong, we also include suitable industry sector dummies. All control variables are measured for each firm in each year. Finally, we include industry dummies and year dummies (INDUSTRY and YEAR, respectively).

Our model (1), used to obtain the target of the U-shaped relationship between risk and return and to test Hypothesis 1 of our study, is the following:

$$\begin{aligned} RTDT_{it} = {} & \beta_0 + \beta_1 ROA_{it} + \beta_2 ROA^2{}_{it} + \beta_3 CR \\ & + \beta_4 UAI + \beta_5 MB_{it} + \beta_6 LEV_{it} + \beta_7 LOGAST_{it} \\ & + \beta_i \text{ Country dummies} + \eta i + \varepsilon_{it} \end{aligned} \tag{12.1}$$

where i denotes the firm, t denotes the time period, η_i is the fixed-effects term of each firm or unobservable and constant heterogeneity and $\varepsilon_{i,t}$ is the stochastic error used to introduce possible errors in the measurement of the independent variables and the omission of explanatory variables.

Our model (12.2), used to test Hypotheses 2 and 3 of our study, before and beyond the ROA target, is the following:

$$\begin{aligned} ROA_{it} = {} & \beta_0 + \beta_1 ROA_{it-1} + \beta_2 RTDT_{it} + \beta_3 OWN1_{it} \\ & + \beta_4 INVEST_{it} + \beta_5 BANK_{it} + \beta_6 CR + \beta_7 UAI + \beta_8 MB_{it} \\ & + \beta_9 LEV_{it} + \beta_{10} LOGAST_{it} + \beta i \text{ Country dummies} + \eta i + \varepsilon_{it} \end{aligned} \tag{12.2}$$

where i denotes the firm, t denotes the time period, η_i is the fixed-effects term of each firm or unobservable and constant heterogeneity and $\varepsilon_{i,t}$ is the stochastic error used to introduce possible errors in the measurement of the independent variables and the omission of explanatory variables.

3.2 Empirical Method

The empirical analysis is divided into two stages. First, we present a descriptive analysis to show the main characteristics of our sample and to stress examine the consistency of our data with the results of previous research. This step provides preliminary evidence on a possible differential

effect of financial deregulation on corporate risk-taking and on possible differences among institutional investors. Second, we test our hypotheses via an explanatory analysis to validate the relationship between corporate risk-taking and financial freedom, creditor rights and institutional ownership in a period of financial crisis.

Our database combines time series with cross-sectional data, allowing the creation of panel data, estimated via an appropriate panel data methodology (Arellano and Bond 1991; Arellano and Bover 1990; Bond 2002). Using this technique has two advantages. First, we can control for what is known as constant unobserved heterogeneity, as the peculiarities of each company may affect their risk levels and these characteristics persist over time. Second, we address the possible endogeneity of the variables using a generalized method of moments (GMM). We use the system estimator, an enhanced version of the GMM estimator in which variable differences are also used as instruments in levels by equations (Blundell and Bond 2000; Blundell et al. 2000; Bond 2002).

The consistency of the GMM estimators depends on the absence of a second-order serial correlation in the error term of the model and the validity of the instruments. For this reason, we present the model specification tests in Tables 12.4 and 12.5. The validity of the instruments is assessed via the Hansen test of overidentifying restrictions that evaluates the joint validity of the selected instruments. We also perform a test (AR2) to verify that the error terms in the regressions do not present a second-order serial correlation, as the definition of the model makes the existence of first-order correlation very likely.

4 Results

4.1 Descriptive Statistics

Table 12.2 presents the mean value, median, standard error and maximum and minimum values of the main variables for all companies in the countries in our entire sample.

Table 12.3 presents the mean value, median, standard error and maximum and minimum values of the main variables for all the family companies in countries with a high or low level of creditor rights. We identify each country using the measure of creditor rights proposed by La Porta et al. (1998), which divides our sample into the group of countries with a high level of protection of debtholders (values equal to or higher than 2)

Table 12.2 Descriptive statistics (family and non-family firms)

Variable	*Mean*	*Std. dev*	*Median*	*Min*	*Max*
RTDT	0.052	0.065	0.0317	0	0.410
ROA	0.267	0.220	0.212	0	1.171
OWN1	0.168	3.133	0.026	0	0.400
INVESTFUND	0.802	21.15	0.069	0	0.350
BANKOWN	0.028	0.463	0	0	0.500
MB	0.720	0.726	0.494	0	4.335
LEV	0.559	0.200	0	0	1
LOGAST	9.963	1.226	10.018	3.744	14.47

Mean, median, standard deviation, maximum and minimum value of the variables. RTDT is the standard deviation of return on assets in a time period of three years and is used to measure organizational risk. ROA is the return on assets; OWN1 is the percentage of shares held by the largest owner; INVESTFUND is the proportion of shares held by investment funds; BANKOWN is the proportion of shares held by banks; MB is the market-to-book ratio; LEV is measured as total debt divided by total assets; and LOGAST is the log of total assets. The *t*-test value is the maximum level of significance (*p*-value) to reject the null hypothesis of equality of means between both subsamples according to the parametric *t*-test, whereas *MW*-TEST is the maximum level of significance to reject the null hypothesis of equality of means between both subsamples according to the Mann-Whitney nonparametric test. ***, ** and * indicate significance at the 99%, 95% and 90% confidence level, respectively

Table 12.3 Descriptive statistics for family firms

	Mean						
	Countries with high CR	*Countries with low CR*	*T-test p-value*	*Std. dev.*	*Median*	*Min*	*Max*
RTDT	0.044	0.076	***	0.075	0.038	0	0.410
ROA	0.305	0.287	***	0.243	0.226	0	1.143
OWN1	0.282	0.091	***	0.094	0.02	0.02	0.998
INVESTFUND	0.061	0.111	**	0.090	0.093	0	0.865
BANKOWN	0.017	0.001	***	0.029	0	0	0.732
MB	0.643	0.990	***	0.7335	0.443	0	4.021
LEV	0.431	0.550	***	0.277	0.522	0.07	1
LOGAST	10.032	8.625	***	1.225	9.064	3.543	12.223

Mean, median, standard deviation, maximum and minimum value of the variables. RTDT is the standard deviation of return on assets in a time period of three years and is used to measure organizational risk. ROA is the return on assets; OWN1 is the percentage of shares held by the largest owner; INVESTFUND is the proportion of shares held by investment funds; BANKOWN is the proportion of shares held by banks; MB is the market-to-book ratio; LEV is measured as total debt divided by total assets; and LOGAST is the log of total assets. The *t*-test value is the maximum level of significance (*p*-value) to reject the null hypothesis of equality of means between both subsamples according to the parametric *t*-test, whereas *MW*-TEST is the maximum level of significance to reject the null hypothesis of equality of means between both subsamples according to the Mann-Whitney nonparametric test. ***, ** and * indicate significance at the 99%, 95% and 90% confidence level, respectively

and countries with a low level of protection of debtholders (values between 0 and 1). The former group comprises Sweden, France, Spain, Japan, Italy, Belgium, the Netherlands, Germany, Austria, Korea, Finland, Luxembourg and Norway, and the latter, Ireland, Australia, Canada and the USA.

The values in Table 12.3 for family firms show that the differences in the mean values for all the variables of listed companies for countries with high or low creditor rights are statistically significant. Specifically, the risk, as a mean, is higher in companies in those countries with low creditor rights. But also, in Table 12.3, the average ROA for these group of countries is lower, which may reinforce the possible nonlinear relationship between the two variables that our study posits in line with the prospect theory. Furthermore, the mean of the variable MB is higher in countries with low creditor rights, which includes Anglo countries that are characterized by a stronger influence of capital markets.

Table 12.4 presents the mean value, median, standard error and maximum and minimum values of the main variables for all the family firms in countries more prone or less prone to risk. We identify each country using

Table 12.4 Descriptive statistics for family firms

	Mean						
	Countries less to risk	*Countries prone to risk*	*t-test p-value*	*Std. dev.*	*Median*	*Min*	*Max*
RTDT	0.054	0.073	***	0.074	0.038	0	0.410
ROA	0.315	0.277	***	0.246	0.226	0	1.171
OWN1	0.292	0.077	***	0.080	0.02	0.02	0.956
INVESTFUND	0.113	0.112		0.090	0.094	0	0.854
BANKOWN	0.016	0.001	***	0.026	0	0	0.781
MB	0.525	0.826	***	0.7335	0.450	0	4.335
LEV	0.541	0.524	***	0.277	0.536	0.08	1
LOGAST	10.044	9.564	***	1.317	10.014	3.704	13.900

Mean, median, standard deviation, maximum and minimum value of the variables. RTDT is the standard deviation of return on assets in a time period of three years and is used to measure the organizational risk. ROA is the return on assets; OWN1 is the percentage of shares held by the largest owner; INVESTFUND is the proportion of shares held by investment funds; BANKOWN is the proportion of shares held by banks; MB is the market-to-book ratio; LEV is measured as total debt divided by total assets; and LOGAST is the log of total assets. The *t*-test value is the maximum level of significance (*p*-value) to reject the null hypothesis of equality of means between both subsamples according to the parametric *t*-test, whereas *MW*-TEST is the maximum level of significance to reject the null hypothesis of equality of means between both subsamples according to the Mann-Whitney nonparametric test. ***, ** and * indicate significance at the 99%, 95% and 90% confidence level, respectively

the measure of the Hofstede variable UAI, which divides our sample into a group of countries with a culture that is less threatened by uncertainty or unknown situations (values of UAI lower than 85), and another with more fear of uncertainty. The latter group comprises France, Spain, Belgium and Japan.

Similar to the values in Tables 12.3 and 12.4 shows evidence that the differences in the means of all the variables of companies for countries prone more and less to risk is significant except for the variable INVESTFUND. We observe differences that may have an important influence on the econometric results. Specifically, the average value of risk is higher in companies in countries more prone to risk but which do not present the average ROA, in the line with the possible nonlinear relationship suggested by the prospect theory.

4.2 Regression Analysis

Our regression analysis expands on the results of the descriptive analysis. Tables 12.5, 12.6 and 12.7 report the results from the estimation of Eqs. (12.1) and (12.2).

The results in Table 12.5 evidence the nonlinear relationship between risk and return in family firms according to the set of hypotheses and following the prospect theory framework. Furthermore, the positive and significant coefficients of the institutional variables confirm the differences among countries in the risk-return relationship, as posited in Hypothesis 1b. In particular, the positive and significant coefficient of the ANGLO variable evidences the higher orientation towards risk of firms belonging to Anglo countries. Moreover, the negative and significant coefficient of the variable CR and the variable UAI likewise confirm that companies in countries with greater legal protection of creditors and with a higher level of uncertainty avoidance are more conservative and take fewer risk decisions.

With this model, we can obtain the turning point of ROA using the first and second derivative. The value is obtained by means of the $(-\beta_1/2\beta_2)$ ratio, taking the coefficients of the variables ROA and ROA squared. Also, the value is 0.16, which will be the value used to separate the results included in Table 12.6, where we report the relationship between ROA and ownership by institutional investors and banks.

The results in Table 12.6 for firms falling below the profitability target indicate a positive and significant relationship of the coefficient of

Table 12.5 Results of the estimation of Model 1

	Family		*Non-family*	
Constant	0.157	***	0.158	***
	(0.016)		(0.007)	
ROA	−0.042	***	−0.004	
	(0.011)		(0.005)	
ROAsq	0.132	***	0.128	***
	(0.011)		(0.005)	
CR	−0.006	**	−0.008	***
	(0.003)		(0.001)	
UAI	−0.001	**	−0.001	***
	(0.001)		(0.001)	
ANGLO	0.029	***	0.015	***
	(0.008)		(0.004)	
MB	0.010	***	0.001	
	(0.001)		(0.001)	
LEV	0.014	***	0.018	***
	(0.002)		(0.005)	
LOGAST	−0.017	***	−0.013	***
	(0.001)		(0.001)	
Wald test	1046.18	***	4568.65	***
	(15)		(15)	
R^2	0.0567		0.618	
n	7258		31978	

Estimated coefficients (standard errors) form the estimation of Eq. (12.1). Standard errors are robust to heteroskedasticity of Eq. (12.1). The dependent variable is the RTDT measured by the standard deviation of return on assets in a time period of three years and is used to measure organizational risk. ROA is the return on asset and ROAsq is the squared variable; CR, creditor rights, measures the level of legal protection of creditors in each country (La Porta et al. 1998); UAI is the uncertainty avoidance index proposed by Hofstede (2001); ANGLO takes the value 1 if it is an Anglo company, and 0 otherwise; MB is the market-to-book ratio; and LOGAST is the log of total assets; LEV is measured as total debt divided by total assets. ***, ** and * indicate significance at the 99%, 95% and 90% confidence level, respectively

BANKOWN and confirm the set of hypotheses, in which financial entities try to avoid corporate risk-taking when they are shareholders in order to maintain a long-term financial relationship with the company when the value of ROA is low. We also obtain a negative and significant coefficient for the variable INVESTFUND when firms fall below the target level of ROA. We thus observe evidence in favour of the posited hypotheses, as institutional investors seem to exert pressure to increase corporate risk-taking in family firms, with negative consequences for the profitability of the firm, when ROA is very low.

Table 12.6 Results of the estimation of Model 2 below and above the target of ROA in family firms

	ROA < 0.16		*ROA > 0.16*	
Constant	0.004	***	0.208	*
	(0.037)		(0.128)	
ROA(lag1)	0.820	***	0.82	***
	(0.051)		(0.014)	
RTDT	−0.188	***	0.248	***
	(0.046)		(0.051)	
OWN1	0.0062	***	0.001	***
	(0.001)		(0.001)	
INVESTFUND	−0.0008	**	0.001	*
	(0.001)		(0.000)	
BANKOWN	0.002	***	−0.003	***
	(0.001)		(0.001)	
CR	0.005		−0.038	**
	(0.007)		(0.015)	
UAI	0.01		−0.001	***
	(0.01)		(0.001)	
ANGLO	−0.008		−0.001	
	(0.027)		(0.069)	
MB	0.014	***	0.016	***
	(0.003)		(0.004)	
LEV	0.022	***	0.021	*
	(0.008)		(0.012)	
LOGAST	−0.002	***	−0.003	
	(0.002)		(0.004)	
Year 2013 to year 2008	Yes		Yes	
Observations	2009		3810	
Number of firms	752		1346	
Hansen test	55.73		50.54	
m2	0.47		0.30	

Estimated coefficients (standard errors) form the estimation of equation. Standard errors are robust to heteroskedasticity of Eq. (12.1). The dependent variable is the return on assets (ROA); RTDT is the standard deviation of return on assets in a time period of three years and is used to measure organizational risk; OWN1 is the proportion of ownership of the largest shareholder; INVEST is the proportion of shares held by investment funds; BANKOWN is the proportion of shares held by banks; CR, creditor rights, measures the level of legal protection of creditors in each country (La Porta et al. 1998); UAI is the uncertainty avoidance index proposed by Hofstede (2001); ANGLO takes the value 1 if it is an Anglo company, and 0 otherwise; MB is the market-to-book ratio; LEV is measured as total debt divided by total assets; and LOGAST is the log of total assets. ***, ** and * indicate significance at the 99%, 95% and 90% confidence level, respectively

Table 12.7 Results of the estimation of Model 2 below and above the ROA target in family firms

	ROA < 0.16		*ROA > 0.16*	
Constant	0.004	***	0.179	
	(0.037)		(0.222)	
ROA(lag1)	0.827	***	0.671	***
	(0.046)		(0.013)	
RTDT	−0.265	***	0.187	***
	(0.006)		(0.035)	
OWN1	0.006	***	0.001	***
	(0.001)		(0.001)	
INVESTFUND	−0.0005	**	0.001	*
	(0.001)		(0.000)	
BANKOWN	0.002	***	−0.003	**
	(0.001)		(0.001)	
BANKOWNanglo	−0.152	***	−1.278	***
	(0.0413)		(0.228)	
CR	0.003		−0.041	***
	(0.007)		(0.031)	
UAI	0.001		0.001	
	(0.001)		(0.001)	
ANGLO	−0.004		0.024	
	(0.027)		(0.113)	
MB	0.016	***	0.019	***
	(0.003)		(0.004)	
LEV	0.021	**	0.030	**
	(0.008)		(0.016)	
LOGAST	−0.001		−0.004	
	(0.002)		(0.004)	
Year 2013 to year 2008	Yes		Yes	
Observations	2009		3810	
Number of firms	752		1346	
Hansen test	67.20		72.58	
m^2	0.46		0.26	

Estimated coefficients (standard errors) form the estimation of equation. Standard errors are robust to heteroskedasticity of Eq. (12.1). The dependent variable is the return on assets (ROA); RTDT is the standard deviation of return on assets in a time period of three years and is used to measure organizational risk; OWN1 is the proportion of ownership of the largest shareholder; INVEST is the proportion of shares held by investment funds; BANKOWN is the proportion of shares held by banks; CR, creditor rights, measures the level of legal protection of creditors in each country (La Porta et al. 1998); UAI is the uncertainty avoidance index proposed by Hofstede (2001); ANGLO takes the value 1 if it is an Anglo company, and 0 otherwise; MB is the market-to-book ratio; LEV is measured as total debt divided by total assets; and LOGAST is the log of total assets. ***, ** and * indicate significance at the 99%, 95% and 90% confidence level, respectively

The results for firms whose ROA is above the target show a positive and significant relationship of the coefficient of INVESTFUND and confirm the hypotheses that the pressure of investment funds to increase family corporate risk-taking when ROA is higher than the target level. Furthermore, the coefficient of the variable BANKOWN is negative and significant, as the hypothesis posited, due to the conservative role that banks play. As to the control variables, the results confirm the influence of leverage and firm size on corporate risk-taking.

We now conduct a series of sensitivity analyses to test the robustness of our results. First, we calculate the variable BANKOWNanglo to include the influence of the shares of these banks in companies from Anglo countries, as these are mainly investment banks and may exert an influence as an institutional investor. The results are shown in Table 12.7.

For the results obtained for firms in which ROA falls below the target level, the coefficient of the variable BANKOWNanglo is negative and significant, similar to the result obtained by the variable INVESTFUND. Furthermore, it is also negative in the case when ROA is higher than the target, in contrast with the variable INVESTFUND, in keeping with the nature of the remaining banks. The rest of the results are analogous to those discussed above and are not presented for the sake of brevity.

5 Conclusions

We have studied the behaviour of family firms in terms of the risk-return relationship in different countries for the period 2007–2014. The prospect theory allows us to confirm the nonlinear relationship and the pertinence of defining a target level of profitability in order not to assume an excessive level of corporate risk-taking.

This profitability target is obtained as the optimum value of return depending on the situation of the company and industry sector and a number of important institutional factors. We provide evidence that the levels of protection of creditor rights and of uncertainty avoidance in each country are relevant factors in explaining the level of risk-taking by family firms.

We have found that large shareholders try to influence the level of risk-taking in family firms. Specifically, we show that institutional investors seem to exert pressure on family owners to increase risk-taking, even if the company falls below the target ROA, with the negative consequence of further reducing levels of profitability. This fact has had dramatic effects in

the years of financial crisis, when many family firms have gone bankrupt by assuming an excessive level of risk-taking due to the negative influence of investment funds. At the same time, as large shareholders, banks seem to be more concerned about preserving their core business and therefore act more conservatively in order to maintain a long-term financial relationship with the family firm. This policy seems to generate higher returns even when profitability is lower than the target, mainly in the critical years of the financial crisis.

Our research can have promising implications for practitioners, policy makers and academia. As we base our analysis on market information, our research is informative for practitioners regarding how it is necessary to know the risk-return relationship for a given company and its profitability targets so as to exert the appropriate influence in corporate risk-taking, mainly by large institutional investors in family firms. Furthermore, the cultural aspects and institutional factors of each country, such as the protection to creditor rights and aversion to uncertainty, are a necessary context to take into account before adopting a certain level of risk-taking.

Several directions for future research are evident. We have limited the scope of our study to the influence of family firms, but new research could introduce the factors considered here to other types of companies.

Finally, future research could introduce the influence of foreign institutional investors, which may constitute an additional factor to explain the level of corporate risk-taking.

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CHAPTER 13

Does Bank Regulation Spill Over to Firm Financing? SME Financing, Bank Monitoring, and the Efficiency of the Bank Lending Channel

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1 Introduction

Small and medium-sized enterprises (SMEs) make up more than 99 per cent of all firms in the EU and account, on average, for about two thirds of total employment. Clearly, these firms are fundamental to the economy, and the ways in which SMEs are financed are a widely debated issue (see Navaretti et al. 2015 for a recent summary of public and academic arguments with regard to SME financing). This chapter deals with one of the key channels of SME funding, namely, the bank lending channel (see Berger and Udell 1998; Bolton and Freixas 2000; López-Gracia and Sogorb-Mira 2008; Vera and Onji 2010; Moro et al. 2012), and particularly with how stricter capital regulations affect bank lending to SMEs.

While there are certainly strong arguments in favour of stricter capital regulations for banks (BCBS 2010; Admati et al. 2013), concerns have been raised that these requirements may have adverse effects on the economy (Allen et al. 2012; Francis and Osborne 2009; Mésonnier and Monks 2015), especially SMEs (Saurina and Trucharte 2004; Humblot 2014). One of the key concerns is whether the comparative informational disadvantage normally attributed to SMEs (Berger and Udell 1998; López-Gracia and Sogorb-Mira 2008) will result in banks being less willing to lend to them in the face of stricter capital requirements. This is an area of great political importance and several policy measures have been taken in the European Union (EU) to mitigate such adverse effects, including (1) a capital requirement rebate for banks on SME lending ('the supporting factor'), (2) specific government-funded facilities directly investing in SMEs, and (3) liquidity windows that increase the viability of packaging and securitizing SME loans (Navaretti et al. 2015).

Despite such measures, SMEs continue to express an experienced funding gap between their needs and the actual availability of funds. Furthermore, the 2017 Safe survey[1] shows that SMEs in Europe are in fact experiencing deteriorating access to bank lending. The extent to which market failure can explain this 'experienced funding gap' resides in a multitude of complementary (and sometimes ambiguous) theoretical arguments (see Calomiris and Kahn 1991; Hughes 1999; Diamond and Rajan 2001; Calem and Follain 2007; Acharya et al. 2016). For

[1] SAFE (2017) is a survey of financing conditions faced by SMEs, run jointly by EC DG Internal Market, Industry, Entrepreneurship and SMEs, and the European Central Bank. The survey has been conducted seven times since 2007.

instance, regulation may have negative effects on bank efficiency, banking competition, the monitoring capacity of banks, the pricing of loans, and firm access to loans. Both Allen et al. (2012) and Humblot (2014) argue that the most bank-dependent agents, such as SMEs, will be adversely affected by the recently introduced Basel III requirements. This is in line with claims that banks will reduce relatively risky lending such as lending to SMEs. Other explanations with similar implications for SMEs include (1) crowding out, that is, banks de-lever rather than raise new equity when faced with stricter capital requirements (Stein 1998; Aiyar and Jain-Chandra 2012; Wehinger 2012), (2) less reliance on soft in favour of hard information in bank monitoring (Grunert and Norden 2012), and (3) bank use of regulatory arbitrage, which means that regulation can lead to a comparative advantage or disadvantage depending on the relationship between actual risk and the risk estimated for capital purposes (Willesson 2017).

With theories in conflict and scant empirical evidence on the spillover from regulation—via banks—to clients, further research is motivated. One of the key empirical challenges is identification, because of the difficulty of distinguishing loan supply and demand shocks from each other (Ashcraft 2006). Controlling for demand, we empirically investigate the supply effects of capital regulation on the bank lending channel on data associated with higher risk and/or higher asymmetric information than average, that is, loans to SMEs. More specifically, drawing on a sample of Swedish SMEs as our laboratory, we test a number of hypotheses based on the conflicting theories of how capital requirements affect bank lending to SMEs. The remainder of the chapter is organized as follows. First, we introduce the channel and the various theoretical explanations for why and how changes in capital regulation could affect bank lending to SMEs. We then introduce our methods and empirical strategy, after which we present our results. Finally, we offer some concluding remarks.

2 Theoretical Framework

We draw on the intermediate approach in banking (Sealey Jr and Lindley 1977) to analyse the possible spillover from regulation to firms via the banking system. In its simplest form, this approach holds that a bank accepts deposits from the public and invests it in risky assets. The bank adds value by offering efficient monitoring services that reduce the impact of information asymmetries. This means that banks should maintain

control over both credit risk and liquidity on behalf of depositors, who would not accept depositing money unless proper risk management procedures were in place (Black 1975; Diamond 1984; Fama 1985). Within this framework, firms have access to loans which generate a positive net present value (NPV) for the bank and prices are adjusted according to the risk, so that riskier borrowers pay a premium.

Based on this general framework, there are numerous potential explanations for the expected reaction from banks when capital requirements change. Several studies build on the Modigliani and Miller (1958) (MM) theorem, which states that a company's value is independent of its capital structure. From the banking perspective, Mehran and Thakor (2011) argue that capital regulation affects the systemic risk of the financial system but does not spill over as a regulatory cost to the bank's owners or credit holders. Increased costs from a higher weight of more expensive equity financing versus loans are neutralized due to lower risk premiums. The weighted average cost of capital (WACC) is not affected and does not spill over to investors or creditors, because the investor's risk is similarly reduced and the value of a bank is the NPV of the investment opportunities from its assets. In essence, this means that capital regulation affects the risk premium of loans and equity, while access to new investment opportunities may be financed by additional loans or equity. Moreover, more capital reduces the risk of moral hazard and public bail-out.

Contrary to the MM approach (i.e. that reduced return requirements counterbalance the use of more expensive equity), Diamond and Rajan (2000) argue that regulation is inefficient and impacts profitability negatively when regulation increases. We call this the 'negative NPV effect', which is the focus of a series of studies that have identified additional explanations as to why NPV would be impacted by capital regulation. On the debt side, there are studies on changed credit worthiness due to regulation. For instance, regulation of deposits (deposit insurance) reduces incentives for bank monitoring (Demirgüç-Kunt et al. 2015) and spill over to the cost of funding (Hughes 1999). Moreover, capital regulation could also have an impact on the value of equity and hence the value of the assets. First, banks require consideration of their function as a liquidity provider to the financial markets, which should require additional risk premium from investors (Berger and Bowman 2013). Second, efficiency is influenced by regulatory requirements (Zhao et al. 2010). Third, exposure to risk is not necessarily linear with respect to bank capitalization. Hence, banks with higher capital levels could also be forced to take on higher risks in their loan portfolio. Several empirical studies support this

view, reporting a U-shaped relationship between capitalization and risk (Haq and Heaney 2012; Lindblom and Willesson 2012), and many of the worst performing banks in the recent financial crisis were among the highest capitalized (Lindblom and Willesson 2012). A number of observations on NPV following regulation are positive to the bank, but negative to its clients. Pelzman (1976) suggested that regulation increases entry barriers, which spill over to clients through lower competition and higher prices. Furthermore, the study by Beck et al. (2004) on competition and loan access in 74 countries suggests that more concentrated financial markets influence the availability of firm financing, but that for larger size firms, with access to capital markets, this effect is smaller.[2]

These arguments are linked to the pro-cyclical nature of banking. During good times, when NPV is higher (i.e. more projects are profitable), risk-taking increases, which could be exacerbated by the nature of the capital regulations in effect (see Athanasoglou et al. (2014), for a review). This may also be explained by signalling, that is, high-quality banks signal their quality monitoring capacity by increasing the risk of their asset portfolio (Lucas and McDonald 1992), or reaching for yield, that is, increasing the risk of their asset portfolio to cover losses from regulation, which is beneficial for banks that are not risk averse (Kahane 1977: Koehn and Santomero 1980). The latter increases the probability of failure despite higher capital requirements and can further be linked to the previous observations that highly capitalized banks tend to adopt high risk/return strategies.

Based on the seminal paper by Diamond and Dybvig (1983), there is also a stream of literature that links capital regulation to deposit insurance, arguing that deposit insurance has a negative impact on depositors' incentives for monitoring and hence reduces the pressure on banks to maintain prudent capital levels (Santos 2001; Demirgüç-Kunt et al. 2015). However, recent regulatory discussions are mainly concerned with the moral hazard problem, in which banks take on excessive risk because tax payers are expected to cover the downside risk (Calomiris and Kahn 1991). Risk-sensitive capital requirements (the Basel Accords) limit risk-taking by imposing higher capital requirements on riskier assets (Chorafas 2011: 8–10). The effect is that banks may favour (or invent new) less risky assets (as defined by the Basel Committee) over more risky assets such as SME lending.

[2] However, well-capitalized banks may also hold an additional capital buffer because they anticipate a downturn in the economy or have resources available to invest in future investment opportunities.

Access to debt by SMEs can also be explained by what Stein (1998) calls the 'Crowding out effect'. The crowding out effect differs from the positive NPV effect in that capital restrictions force banks to turn down loans regardless of whether they would positively contribute to firm value. Stein (1998) argues that this adds a dimension to 'market frictions' through adverse shocks by exogenous factors (falling profits, decline in collateral value (real estate prices), or rising interest rates). Due to capital requirements, banks cannot access short-term funding without further increasing equity in order to qualify for the minimum capital requirements. Accordingly, VanHoose (2008) argues that capital regulation may affect individual bank lending in the short term because capital requirements ties-up risk-based capital. A bank must consequently increase its equity levels (reinvest profit or issue new shares) to be able to attract additional loans. It is not only the growth opportunities (new loans) that could be negatively impacted by capital restrictions. Due to the increasing risk of bank losses during a recession, the requirement for additional funding is also dependent on reduced supply of loans, not only growth opportunities. To minimize this risk of pro-cyclicality, the Basel III requirements include a 'countercyclical buffer' that varies depending on economic conditions.

Banks may aim to avoid regulation by changing parts of their business profile, which results in *regulatory arbitrage*. According to Willesson (2017: 71ff), regulatory arbitrage may be a strategy or transactions arrangement for the purpose of avoiding effects of regulation, by utilizing regulatory inconsistency. Thus, if the expected effects on the loan portfolio are not materialized, this would imply that regulatory arbitrage is at work. However, regulation can have an impact on the loan portfolio as a consequence of regulatory inconsistency above and beyond the nature of the portfolio's risk profile. Firstly, as observed by Calem and Follain (2007), banks involved in real estate activities before Basel II was introduced found they were better off adopting the new regime, which resulted in early adoption of the new regulations. Secondly, observed differences between accounted and real (monitored) risk may result in regulatory arbitrage (Blaško and Sinkey 2006; Calomiris and Mason 2004). Accordingly, specific bank products may be favoured not for economic profitability reasons but because of regulatory compliance and the bank's maximization of profit given certain regulatory restrictions.

Finally, *bank monitoring* of risk also includes a set of theoretical explanations for regulatory spillover effects. Here the focus is placed on the role of asymmetric information in creating frictions that allow banks to differentiate their lending strategies. Having a long-term relationship leads to better

understanding of the client's risk and historical data that can be used to monitor clients more accurately. As noted by Berger and Udell (1995), the optimal type of lending depends on the level of information asymmetry of the firm and the extent to which hard information is available or not. Moro et al. (2012) argue that, because most SMEs lack pledgeable equity and are also considered to be information opaque, they are forced to rely on relationship-based lending. The reliance on soft information accessed through the relationship mitigates information opaqueness and allows SMEs access to bank lending (see Berger and Udell 1995, 2002; Baas and Schrooten 2006; Van Caneghem and Van Campenhout 2012).

Many authors have sought to empirically assess the impact of stricter capital requirements on bank behaviour. Reviewing the empirical research on the design and impact of bank regulation, Jakovljević et al. (2015) conclude that '[E]mpirical results on the effects of microprudential regulation (in terms of banks' capital level and performance) have been far from conclusive'. These authors go on to note that empirical research fails to provide definitive answers to whether regulatory policies affect banks' risk-taking and lending behaviour. This is consistent with Wilson et al. (2010), who refer to the variation in the business cycle and the pro-cyclical nature of bank capital, with the inherent implication that borrower access to finance also varies pro-cyclically. As addressed by the VanHoose (2007, 2008) literature surveys, there is a great deal of controversy regarding the channels through which bank lending is affected by stricter capital requirements. Although it is quite clear that a short-term effect does actually exist, it is much less clear whether the effects continue to exist in the longer term. In a recent study by Bridges et al. (2014), the short-term effect is confirmed and shown to be strongest for commercial real estate followed by corporate lending. Most loan growth recovers within three years. Accordingly, it seems highly relevant to continue investigating the empirical problem of the extent to which capital regulation has an impact on bank lending to SMEs. Hence, in the next section, we present our methodological approach aimed at addressing the multiple theoretical explanations outlined above.

3 Research Methodology

In accordance with our theoretical framework, we can identify four strategies, with implications for the lending channel, that banks may pursue in order to adapt to a change in capital regulation: (1) change in risk, (2) change in price, (3) change in volumes, and (4) change in portfolio

composition. As changes in these factors may not only be a result of regulation but also reflect the bank's risk profile, competition (between banks and access to non-bank funding opportunities), or economic conditions (interest rate levels and GDP), we require an analytical framework that allows us to control for demand-side effects.

Our main determinant is the use of bank loans by Swedish SMEs. In the pecking order of equity, non-bank loan, and bank loan, there is ample support for the claim that bank lending is in fact the cheapest source of long-term funding. Based on the framework developed above, we seek to identify changes in the lending channel due to regulation, based on the banks' regulatory responses. If these hypotheses cannot be rejected, this would be indicative of a disparity between the intended effect of the regulation and the actual effects on the distribution of loans. This would imply that there is a spillover in the value chain from regulation to the real economy through access to bank lending.

Regulation and banking responses could affect both the supply and demand of loans. The supply of loans can be traced through changes in volumes or in prices. The latter also affects the demand for loans, but demand factors are also associated with the supply of other funding sources, such as equity and non-bank loans. The four hypotheses each deal with possible changes to supply and demand.

Methodologically, our study is inspired by previous research investigating various determinants of bank lending supply, both in terms of loan volumes and lending rates. For example, Francis and Osborne (2012) study asset and liability changes arising from regulation. To identify changes in assets, they use changes in total assets, risk-weighted assets, and loans.[3] These relationships are estimated using fixed effect regressions and the generalized method of moments (GMM). Burgstaller and Scharler (2010) use an integrated approach to assess the impact of interest rate changes on loan rates. The loan rate is a function of the changes in interest rates. These results are controlled by using the capital ratio (to control for possible spillover on the loan supply) and volumes (to control for infinitely elastic loan supply). The (absolute) loan volume is estimated by economic activity, inflation, and interest rate changes.

We concentrate on one country, Sweden, for which we have more detailed and broader datasets for banks and SMEs than the cross-country

[3] The determinants are delta GDP, prices, and general credit conditions (measured as provision to total assets and charge offs to total assets).

databases available for similar purposes. There are several benefits in restricting our analysis to Sweden. First, part of the data we have access to on a national basis cannot be observed from the cross-national dataset. This means that we can draw on a broad spectrum of SMEs and achieve higher accuracy. Second, we can analyse a sample of firms that is only limited by time and selection constraints. In doing so, we partly limit the possibility of more general analyses related to banking environments. In the rest of the world, we would benefit from being able to identify each firm and bank relationship. However, Swedish legislation (the Bank Secrecy Act) limits the availability of doing so as well as the possibility of testing the association between SMEs and their respective bank/s. Finally, Sweden has moved ahead of many other EU countries in terms of implementing stricter capital regulations at a faster pace, which means that the Swedish case may be used as an example of what is to be expected when other EU countries follow suit.[4]

3.1 Data

We draw on three different sets of data, focusing our analysis on the period 2006–2016. Panel A is composed of two of these datasets. The *first* part of the panel contains a number of nonstationary country variables assumed to affect the pricing of loans and access to loans provided by banks and a measure of regulatory changes. The key variable here is the regulatory measure, which is calculated on the basis of both changes in risk weight and capital requirement given the risk weight. The time period under study covers three regulatory frameworks for capital, Basel I, Basel II (from 2007), and Basel III (from 2013). In Sweden, Basel II became effective as of February 2007, whereas Basel III gradually became effective from January 2013 onwards. Based on the standardized approach for credit risk in Pillar I of the Basel Accords, Basel II allowed greater diversity in terms of the number of risk-weight categories. The risk-weight categories were

[4] In terms of previous empirical literature analysing the importance of loan infrastructure, Sweden is generally considered a country with good access to finance and solid financial stability, as well as one where SMEs fund themselves partly through bank lending. According to the World Bank statistics, 6.7 per cent of the firms find access to finance to be their biggest obstacle, while 35.5 per cent of the firms in the country use bank loans as part of their financing. These factors imply that the results are not influenced by financial and infrastructure development. Unlike many other countries, Sweden's banking system experienced limited disturbances during the 2007–2008 financial crisis (Elliot 2016).

kept constant in the Basel III standardized approach, the actual capital requirement being gradually increased instead. The regulatory variable is based on non-disclosed compliance data from one of the big four banks. The remaining variables are used to control for opportunity costs of capital, an issue that is addressed in previous literature. In addition, we control for changes in the corporate tax rate during the period under study, as it may impact the opportunity cost between loans and equity financing. In 2009, the corporate tax rate was reduced from 28 per cent to 26.3 per cent and in 2013 was further reduced to 22 per cent. We also control for negative interest rates, because these may affect the banks' intermediation, fundamentally because deposit rates are higher than the market interest rate. Additional country-level data come from IMF (GDP/capita) and the Riksbank (market interest rates averages).

The *second* part of the panel is mainly obtained from annual entity-level balance sheet data, collected through the SNL database for the period 2006–2016. From SNL, we collected total assets, total net loans, total equity, Tier 1 common capital (CET1), capital adequacy method, total risk-weighted assets, interest income, interest expense, net interest income, operating income, fee and commission income, fee and commission expense, net income before taxes, and net income. As there are large numbers of missing values for the smaller banks, we complement the SNL data with non-public data from the Swedish Savings Banks Association for the period 2006–2016. This dataset contains a large number of balance sheet and income statement variables which we used to manually compile a comparative data sample for Swedish savings banks. As all Swedish savings banks are small, their corporate lending goes almost exclusively to SMEs.[5] It is worth noting that the figure for corporate lending by banks is an aggregate number and not limited to SMEs.

The firm-specific data are collected from Business Retriever and include detailed balance sheet and income statement information for all Swedish joint stock firms. Consistent with the EU definition of SMEs, we collect data on all firms with less than 250 employees, less than €50 million in turnover, and less than €43 million in total assets.[6] We exclude micro-firms

[5] The Savings Bank data covers all the savings banks but is unbalanced due to a number of mergers among the banks during the period under study.

[6] For the sake of simplicity, we use a SEK-to-EUR ratio of 10-to-1. The EURO/SEK spot price has varied between a lowest value of 8.20 and a highest value of 11.64, presenting an average value of 9.33 during the period under study (currency data from the Riksbank).

(firms with less than 10 employees) leaving us with a sample of 33,820 firms for which we have 2007–2016[7] data on number of employees, return on equity, liability interest, debt/equity ratio, turnover, operating profit/loss (EBIT), external interest costs, profit/loss for the year, cash and bank balances, total assets, total equity, long-term liabilities to credit institutions, total current liabilities, granted bank overdraft, and used bank overdraft. We also collected industry characteristics, which results in 29 different industries.

3.2 Empirical Strategy

We approach our hypotheses by determining access to bank funding and prices as separate regressions. Each hypothesis observes a change in banking strategy followed by a separate analysis of changes in the SME data due to SME characteristics. We identify the spillover from regulation via the assumption that regulatory cost shows up in the banks' prices, cut-offs, or increased collateral and in SME access to bank loans, prices, or their risk profile. This implies that regulation has an impact on the price or volume of loans either through (1) a reduction in bank lending as a share of total lending, (2) higher lending rates, or (3) changing attitudes towards risk. We identify the determinants on the basis of the changes in bank characteristics and regulatory changes. The bank characteristics include controls for risk, loan pricing, and loan supply.

We expect to determine the SMEs' share of bank loans (BANKSHARE) and their prices paid for the loans (LOANPRICE), which we expect to be interrelated. Our main determinant is the indication of regulatory impact, together with a set of variables to determine the characteristics of banks (BANK_CHAR) associated with different regulatory responses. Finally, we control for these results against different SME characteristics (SME_CHAR) and variables reflecting economic development (ECON).

$$BANKSHARE = f\begin{pmatrix} LOANPRICE, SME\_CHAR, BANK\_ \\ CHAR, REGULATION, ECON \end{pmatrix}$$

$$LOANPRICE = f\begin{pmatrix} BANKSHARE, SME\_CHAR, BANK\_ \\ CHAR, REGULATION, ECON \end{pmatrix}$$

[7] Data for medium-sized firms for 2016 is not included because of database restrictions.

Endogeneity concerns are likewise taken into consideration. We use random effect regressions as the primary econometric approach. The results are also checked using alternative statistical test methods. Each of the four hypotheses focuses on different aspects of why and how regulation influences bank lending to SMEs. The study also benefits from the characteristics of the banking sector. The Swedish banking market is dominated by four big banks, accounting for approximately 75 per cent of the market in terms of deposits and lending (Elliot 2016). We focus the analysis on these banks, as SMEs are more likely to take loans from these banks. The remaining banks operating on the corporate market comprise a few commercial banks and a number of smaller savings banks. We use insights from savings banks to deepen the analysis of regulatory responses, especially those associated with monitoring capacity. We address each of the regulatory responses employing the following strategies. Details of the strategies, the tests, and the variables used to analyse the strategies are presented together with the results.

3.3 The Negative NPV Effect

The analysis of the NPV effect is based on the assumption that supply and prices are affected by regulatory changes, being the result of a change in cash flow or discount rate in order not to reduce the value of the bank's assets. We address this regulatory response by analysing corporate lending, risk, and prices by banks as a first step. The NPV effect is observed if we identify changes in the capitalization of banks and loan assets associated with regulatory costs. The spillover of the bank response is observed if we can find support from regulation to both the SME borrowing and pricing. This implies there is a general impact on the bank from the regulatory variables, after controlling for firm characteristics and risk. We further identify spillover from regulation via the assumption that the impact on banks also affects SME lending, that is, increasing capital requirements may impose regulatory costs on banks that are passed on to SMEs via a reduction in bank loans as a share of total lending, the charging of higher prices, or changing risk attitude.

3.4 The Crowding Out Effect

The crowding out effect builds on the same relationship as the NPV effect but is affected by short-term restrictions in capital access. The crowding out effect is identified as an impact on SME lending when capital is

restricted due to economic conditions, regulations, or bank capitalization. The latter reflects the ability to absorb short-term effects. More precisely, SMEs are forced to postpone investments if capital is a restriction of making profitable, risk-adjusted investments or search for other investment opportunities with a different risk profile. We use the financial crisis as a separate case and consider capital restrictions and GDP over the full time period. The banking stage of this analysis compares the development of corporate lending with respect to capitalization in order to distinguish between reduced demand for loans and supply restrictions following crowding out. The spillover of the crowding out effect is analysed on the basis of differences between small and medium-sized firms in terms of economic and regulatory conditions.

3.5 The Regulatory Arbitrage Effect

The regulatory arbitrage effect implies that banks make adjustments in order to maintain their level of risk, while minimizing the effect of regulation. We focus on strategic regulatory arbitrage, which is closely related to the NPV effect. The conceptual difference lies in the attention given to a gap between actual risk and capital requirement for that risk. This implies that banks adjust to avoid possible regulatory costs rather than adjusting their assets to cover these regulatory costs. We study this from a bank perspective by looking at changes in the ratios of in risk-weighted assets to loan assets and to equity. The spillover to SMEs is analysed by identifying the regulatory impact on prices and bank lending together with differences between firms based on industry and risk. The former assumes that bank loans are more attractive to some industries that will then supposedly have a lower gap between regulation and risk. The latter—which can be seen as a combination of reaching for yield and regulatory arbitrage strategies—assumes that banks emphasize risk that yields a higher return on equity capital.

3.6 The Monitoring Effect

The monitoring effect response is approached from a relationship banking versus formal decision models perspective. We expect banks that are more involved in relationship banking to manage their loan asset risks differently from banks using formal decision models. The difference will lie in how the banks analyse information asymmetries. The relatively higher level of

information asymmetries of SMEs will consequently lead to lower aggregate probability of getting loans, or they will likely pay higher risk premiums. We approach this question by comparing the volumes of the banks' corporate lending, loan prices, and loan risk between savings banks and the four big banks. Savings banks in Sweden have a history of relationship banking, are distributed within limited geographical regions, and have historically been involved in the development of local society. The spillover of their possible monitoring capacity is approached to analyse existing information asymmetries. Consequently, we should not only identify changes in SME lending but also differences between small and medium-sized firms arising from regulation in terms of bank lending and prices.

4 Results

4.1 Regulatory Responses by Banks

The descriptive analysis of the banking data reveals some changes in bank strategies that may be related to the gradually increasing capital requirements between 2006 and 2016. Although short-term interest rates increase initially, after the financial crisis, they first fall and then gradually continue at negative levels during the last two years of observation.

GDP grows steadily over the period, as does bank capitalization. The banks use more equity to finance their assets during the period, and the ratio of loans to total assets is consistent over time, except during the financial crisis (2007/2008). The regulated riskiness of the banks' assets is reduced and moves in the opposite direction to the regulations. Nonetheless, prices increased over the period under study.[8] At the same time, we observe that the banks present more homogenous pricing and risk. The trend for the savings banks follows the market leaders, except for regulated risks, where savings banks show stable and consistent regulated risk over time.

Complementing these trends with analysis of the four regulatory response theories, we find support for three of the four regulatory responses. We observe attributes related to the NPV effect. There is a difference in prices, risks, and loans, while corporate loans tell the same story: a lower ratio of equity to RWA and lower levels of lending. From

[8] A significant drop is observed under and directly after the financial crisis, which may indicate a lag from the significant interest rate decrease. However, it could also be related to the fact that borrowers had to implicitly fund bank losses after the financial crisis (see Lindblom et al. (2011) for an assessment of Swedish banks' changing risk and return strategies during the financial crisis).

this perspective, the lower ratio of RWA to total assets is surprising, but could reflect the banks' initial attempts to reduce regulatory requirements. Changing the focus from the assets to the liability side, the observation may be a result of regulatory arbitrage, in which banks are trying to avoid having to raise additional capital. The crowding out effect is indicated by the capital requirement and GDP. The data do not allow us to observe differences in corporate lending, as they do not separate aggregate corporate lending from specific SME lending. As to monitoring capacity, we do observe a difference in the ratio of risk-weighted assets to total assets, which varies more for the big four as well as decreasing more for these banks. There is also a difference in terms of the financial crisis that affects the big four more than the savings banks. The latter observation comprises the essence of the monitoring effect. However, we cannot distinguish this potential monitoring effect as it is not related to regulation and could also correspond to the risk-weighted assets of the loan portfolio. Lending to the corporate sector is found to decrease more for the big four.

4.2 Regulatory Spillover from Banks to SMEs

The spillover from the banks' responses is analysed via the SMEs. In line with the motivation of our study, we observe that firm size is a key determinant of the share of banking loans used to finance the firm. This factor is observed both for the full sample and when the sample is split into small and medium-sized firms. The basic model shows this factor, as well as additional endogenous firm characteristics, including risk. The model captures the model assumptions, although the overall determination is only 17 per cent. Overall, this means that we manage to determine part of the differences among firms, but these are not very predictive in the full sample. The basic model for loan prices shows that the price is higher for firms lending more and lower for larger firms. The overall determination on the full sample is 5 per cent, but higher for the smaller firms. Although we identify the determining impact of firm differences, firm characteristics do not determine the changes in either the share of bank loans or prices.

4.3 The NPV Effect

The analysis of the NPV effect is based on a determination of loan access and return affected by regulation. We find that regulation has a (statistically) positive effect on both the level of bank loans and prices, supported

by the spillover from banks. Furthermore, lending supply (loan to total asset) affects the share of bank capital. This is in line with the expectations and can be argued to be a spillover from regulatory costs.

The ratio of equity to risk-weighted assets is seen to negatively affect the share of bank capital. This may be an indication of reaching for yield. Consequently, banks strive to increase the gap between regulated risk and actual risk, and increase the return on each share of equity. The effect is more significant for small firms. The results also show that equity does not affect the share of loans for medium-sized firms. This is an opportunity for smaller firms to access bank lending. From a banking response perspective, regulatory arbitrage is a possible complementary response (see more below).

We find that the banking variables have an impact on prices. Loan prices are positively influenced by lending supply, but are negative on risk. Both of these effects could arguably be related to spill over from regulation: assuming that the banks spill over regulatory costs to their assets. Once again, smaller firms are better determinants. However, we find no evidence that this is caused by regulation. The results of both of these dependent variables suggest that an NPV effect is a possible response strategy that impacts banks and spills over to SMEs, although the results are not very robust (Table 13.1).

4.4 Crowding Out

The analysis of the crowding out effect considers the prevailing economic conditions. We did not observe any such effect on the banking industry responses. However, SME lending may possibly be treated differently by banks from other types of corporate lending, which means that it is not showing up in the aggregated banking data. For instance, banks could rearrange their corporate loan portfolio to larger firms in which they have higher stakes if these firms face liquidity shortages or if banks are declining new business opportunities. However, we find no evidence for any impact of the crowding out effect on the analyses of the SME data. We do find that economic conditions have an impact on lending to smaller firms, but not to medium-sized firms. Nonetheless, we find no evidence for the opposite conditions, which comprises the essence of the hypothesis.

Table 13.1 The influence of regulation and bank spillover to the bank share of SME loans and SME loan pricing

	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	BANKSHARE BASIS	*BANKSHARE REG RESPONSE*	*BANKSHARE SMALL*	*BANKSHARE MEDIUM*	*PRICE BASIS*	*PRICE REG RESPONSE*	*PRICE SMALL*	*PRICE MEDIUM*
	b	*b*	*b*	*b*	*b*	*b*	*b*	*b*
LOANPRICE	0.017***	0.019***	0.019***	0.016***				
stdRETURN	−0.000***	−0.000***	−0.000***	−0.000	0.000***	0.000***	0.000***	0.000
FIRMSIZE	0.039***	0.040***	0.046***	0.033***	−0.137***	−0.176***	−0.180***	−0.112*
TAXRATE	1.106***	4.387***	4.490***	3.035***				
REGULATION_DUM		0.151***	0.154***	0.099***		0.397***	0.407***	0.155***
BANKSHARE					1.267***	1.457***	1.475***	1.122***
Constant	−0.381***	−1.266***	−1.341***	−0.955***	2.536***	2.644***	2.665***	2.149***
N	60,119	60,119	57,714	2405	60,119	60,119	57,714	2405
R-sqr-o	0.169	0.183	0.209	0.073	0.051	0.059	0.057	0.033
P	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
sigma_e	0.108	0.107	0.107	0.104	1.112	1.088	1.094	0.929

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

4.5 Regulatory Arbitrage

The lower ratio of equity to RWA by banks, despite higher equity levels, indicates the use of strategic regulatory arbitrage as a regulatory response strategy. Furthermore, the risk adjustments made by banks may be related to avoidance of regulatory capital restrictions that affects funding costs rather than asset margins.

We analyse the consequences for corporate lending in the event of regulatory arbitrage. This exercise is somewhat tricky, as overall corporate lending decreases and the bank lending channel simultaneously becomes less important over the period under study. Bank competitiveness appears to be affected. It is not possible to analyse within the scope of this chapter whether this is because of regulation or whether it reflects a general trend. However, in terms of regulatory arbitrage, we are able to identify a change in risk as measured by SME returns and return risk. The relative proportion of bank capital decreases less over time for the quartile of SMEs with the greatest returns and greatest risks. This implies that, even if SMEs with a larger risk/return potential have been looking for alternative sources of funding, they are on average better off than firms included in the other risk and return categories in terms of access to bank lending. Furthermore, loan prices can be described as being consistent over time. These observations are possible additions to regulatory theory and regulatory responses defined as regulatory arbitrage: a general interest to observe the balance between capital requirements and risk. However, further analyses are required in order to distinguish more clearly between reaching for yield strategies and regulatory arbitrage considering regulatory loopholes in the management of overall risk levels. We are not able to perform these analyses with the existing data. Nonetheless, we wish to address this issue as a possible line of further research related to regulatory responses, banking intermediation, and how regulation affects the lending channel.

We find support for a possible regulatory arbitrage strategy reliant on differences between regulated risk and actual risks. Banks that wish to adjust their risk without additional capital can consequently increase loans to sectors that have a higher risk than the regulator suggests, and vice versa. Although we cannot link industry risk to the risk capital requirement, we find that regulation has a different outcome in the determination of loan share and prices depending on industry.

4.6 Monitoring

The fourth regulatory response affects bank monitoring. Regulatory responses differ between savings banks and the big four banks in terms of corporate lending. We analyse spillover from these monitoring differences assuming that formal risk assessment models are more important after regulation. The results indicated by our analysis of regulatory arbitrage contradict the assumption that monitoring capacity spills over to SME financing. Contrary to the assumption relating to the monitoring hypothesis, we find that the decrease in bank lending is lower for smaller banks than for medium-sized banks. However, the trend also includes the overall decreasing use of banks as a source for SME lending, which means that this result could be an artefact of competition from non-bank actors. Loan price differences are consistent with the regulatory regime, although the spread between prices is smaller for the smaller banks when faced with stricter regulation. Comparing small and medium-sized firms, we find no significant differences in terms of pricing between the two sets of firms. We cannot state that monitoring capacity has an impact on lending for SMEs due to regulation. The higher cost for the smaller banks is revealed under the NPV effect as part of the risk premium. However, regulatory factors influence the prices for smaller firms statistically, but not those for medium-sized firms.

To sum up these findings, we can state that the results are neither straightforward nor consistent with respect to the monitoring capacity of banks. Having said this, the analysis is limited to the banks' lending channel and those loans that are actually granted by the banks. Outside of the banks, increasing reliance on formal risk assessment models may be a reason why there is a lower level of lending to SMEs and why SMEs seem to find other funding sources to a greater extent.

5 Conclusions

This chapter discusses and analyses bank intermediation by studying the impact of regulation on the lending channel. The study is built upon alternative theories to analyse regulatory responses and spillover to firms' loan financing on a set of Swedish banks and Swedish SMEs over a ten-year period. Contrary to the MM theorem and arguments stating that banks have buffers that absorb changes in the external environment, the results of this study show that banks respond to regulatory changes in a way that

increases profitability over regulatory costs. The empirical results provide support for two alternative theories: (1) the NPV effect, which assumes that costs associated with regulation are transferred to clients leading to restrictions from some unprofitable loans, and (2) regulatory arbitrage, which suggests that banks use regulatory loopholes to avoid costs related to regulation. Furthermore, we find no evidence for the crowding out effect and very mixed results with respect to the monitoring effect.

This chapter shows that policy makers require more comprehensive approaches in order to gain a better understanding of the need to consider alternative regulatory responses by banks in banking system analyses. There is a risk of not considering regulatory costs if the analyses are based solely on the MM theorem, which excludes regulatory responses. In this study, we find empirical support for the spillover of higher prices, a lower degree of bank loans, and possibly competition from non-bank sectors in order to finance SMEs. The last finding is contrary to the understanding that the smallest firms that are provided loans will partly benefit from regulation. This could have an impact on regulatory efficiency (regulatory deadweight loss), financial stability (higher risk in the financial world), and economic growth (higher funding costs should lead to lower investment volumes).

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CHAPTER 14

Earn-outs in Debt Restructuring Plans: Economics and Valuation

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1 Introduction

Debt restructuring emerges as a key theme in the sphere of corporate finance, especially during economic downturns. It has several far-reaching implications involving policy, managerial, and industrial issues while being closely related to the economic cycle and macroeconomic management policies.

Restructuring distressed firms and opportunities for distressed investors constitute a cyclical business insofar as it is directly related to economic downturns, default rates, and macroeconomic uncertainty. In very recent years, quantitative easing (QE) of central banks' policies in response to fragile financial conditions has sustained borrower-friendly market conditions. However, with interest rates rising, restructuring activity is expected to pick up in the near future according to recent surveys. From an industry standpoint, managing restructuring processes boosts capital market activity in terms of Mergers and Acquisitions (M&As) and feeds private equity and hedge funds with promising deals.

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For major financial and industrial firms, debt restructuring is just not a matter of surviving, but rather one of reorganizing the business, planning, and forecasting in order to thrive in the future. The notion of firm financial distress potentially encompasses different firm conditions and states. A restrictive definition identifies distress with a condition in which a firm's liquidation total assets is less than the total value of creditor claims (Chen et al. 1995). Giroux and Wiggins (1984) and Ward (1994) employ a broader definition, identifying as distressed those companies having negative cash flows and/or omitting or cutting dividend payments. Lau (1987) identifies five distressed stages ranging from stability to bankruptcy or liquidation of firm assets.

In fact, restructuring strategies include several courses of action that fall within three broad categories, respectively, representing business restructuring (Hillier et al. 2005; Lang et al. 1995; Lasfer et al. 1996; Weston et al. 2004), financial restructuring (Finnerty 1985; Powell and Yawson 2007), and managerial restructuring (Datta and Iskandar-Datta 1995; Furtado and Karan 1990). Sudarsanam and Lai (2001), however, provide four classifications of restructuring, namely managerial, operational, asset, and financial restructuring.

Financial restructuring involves a variety of policies and agreements with creditors spanning debt maturity renegotiations, cuts in the rates on debt, covenants, and, in many cases, debt write-offs associated with earnout agreements.

Lenders' concessions on troubled debt, covenants, and the inclusion of option-based clauses in restructuring agreements pose relevant concerns surrounding valuation issues.

While there is a bourgeoning strand of literature on bond pricing under default risk or dealing with the impact of renegotiations on bond price (Dumitrescu 2007) and gauging interesting implications for the relationship between firm value and capital structure, there is a lack of research on option-based contracts accompanying debt restructuring schemes.

The issue is of paramount importance for a variety of reasons. First, earnouts help to align the expectations of both firms and lenders under corporate restructuring schemes, where financial distress makes it difficult for contacting parties come up with a unanimous view of the firm's value and perspectives. Second, they pose interesting pricing and valuation issues in a context in which traditional securities and option pricing models are not consistent. Third, earnout agreements are strictly related to financial forecasts included in business plans prepared under restructuring

schemes. Financial forecasting helps both in assessing the feasibility of restructuring plans and in estimating earnout options.

We argue that there is room for improvement and the need to further the value-based literature, in particular when it comes to modelling debt under firm restructuring. The tenets of such developments require incorporating a probabilistic approach in financial planning which enables representing numerous projections of a few relevant financial variables. Such an approach elicits original improvements in earnout valuation, bringing together both financial and accounting principles.

The aim of this study is to achieve a probabilistic representation (not necessarily under a risk-neutral environment) of the wide spectrum of restructured debt pay-offs which allows the valuation of both debt and the various option-based arrangements (earnouts) that increasingly populate restructuring agreements.

The chapter is organized as follows. Section 2 provides a systematic review of the literature on corporate debt restructuring, pointing out option-related valuation issues and accounting implications. Section 3 presents and discusses the major issues related to the value estimation of earnouts. Section 4 proposes a Monte Carlo simulation-based methodology for valuating earnouts, while Sect. 5 presents our conclusions.

2 Theory

This section provides a systematic review of the literature on corporate restructuring. The reason for performing such a review is that corporate restructuring spans a variety of issues ranging from organizational to managerial and valuation matters. In such a burgeoning and heterogeneous bulk of research covering firm financial distress under various perspectives, a systematic literature review strategy helps both to identify a unifying framework and shed light on topics that have been somewhat neglected and which deserve further investigation.

Journal articles were sourced from the Scopus database. The aim of the review was to capture a snapshot of the diversity of research being conducted in the firm restructuring field. Accordingly, all Scopus journals were included in the search. Our search strategy can be summarized as follows.

An initial keyword search for articles containing the phrase ‘financial distress’ revealed that there were roughly 2000 contributions present in the database. Quality control was achieved by limiting the search to peer-reviewed publications only. Prefaces, editorial notes, book reviews,

and interviews, in addition to any articles from magazines or industry publications, were excluded from this set, leaving 1672 contributions, 932 of which had been published in management journals and 740 in econometric journals.

Our keyword search returned articles dealing with financial distress both at a macroeconomic level and firm level. We adopted such a broad criteria to ensure we avoided missing relevant papers, given the wealth of research topics falling under the domain of firm distress. We then conducted an abstract-by-abstract analysis, eventually identifying 150 papers dealing with distressed companies. We excluded those papers dealing with distress in banks and financial firms. After that, we refined the search by entering the terms 'debt restructuring' and 'corporate'. Eventually, the search yielded another 33 contributions not captured by the first stage of the search. Finally, we carried out a more specific search entering the terms 'debt restructuring', 'corporate', and 'value', obtaining an output of 23 contributions.

Overall, we were able to discern three major fields of research within the financially distressed firm-related literature.

A first strand of research engages in developing and investigating models to predict financial distress. Standing at the heart of financial distress early warning systems, distress prediction models have attracted a great deal of attention by scholars. A growing body of literature has emerged on the topic over the last four decades, following the seminal papers by Altman (1968). Contributions on the topic are quite varied. A relative minority of papers may be traced to the business, management, and accounting literature, while the majority of studies cover the fields of computer science, engineering, and economics/econometrics. In a nutshell, the research on financial distress prediction models has progressed from single variable analysis to multivariate predictions, and from statistical methods to artificial intelligence-based methods. Employing single variable analysis, Beaver (1966) proposed the profile analysis and the univariate discriminant models to discriminate between sound and distressed firms, using financial ratios as inputs. Altman (1968) first introduced multivariate discriminant analysis based on a linear discriminant function with five financial ratios. As an evolution, Ohlson (1980) proposed a logit linear probability model based on a logistic function to transform the dependent variable of the probability of financial distress into a continuous function suitable for linear regression analysis. Serrano-Cinca and Gutiérrez-Nieto (2014) applied partial least square discriminant analysis to predict the 2008–2011 US banking crisis.

More recently, research on financial distress prediction spurred a variety of artificial intelligence single classifier models such as neural networks (NN) (Tam 1991; Tam and Kiang 1992), evolutionary algorithms (Varetto 1998), rough set-based techniques (Dimitras et al. 1999; McKee 2000), case-based reasoning (CBR) (Jo and Han 1996; Jo et al. 1997), and support vector machines (SVM) (Wang et al. 2005; Li and Sun 2011a, b; Van Gestel et al. 2010). Single classifier methods have evolved into hybrid single classifier methods integrating two or three algorithms, with the most popular forms combining NN, CBR, or SVM with other techniques (Back et al. 1996; Yeh et al. 2010). More recently, dynamics models in their specifications of lateral dynamic modelling (Li and Sun 2011b) and longitudinal dynamic modelling have emerged (Li and Sun 2011a). An excellent review of the main models employed in the literature is provided by Sun et al. (2014).

A second field of investigation has to do with corporate restructuring. When it comes to distressed firms restructuring, various fields of research give rise to a multitude of contributions falling within diverse disciplinary areas embracing law, economics, finance, management, and accounting.

In brief, the finance and management literature addresses the value and performance implications of various corporate restructuring policies and strategies under classical asymmetric information and agency theory paradigms.

While different restructuring events may be driven by common factors, their implications are generally different; so choosing the right restructuring method constitutes a complicated task.

Powell and Yawson (2007) show that the variables normally used in takeover prediction models, such as poorer firm performance, lower firm growth, and higher leverage, help to explain the likelihood of other restructuring events, while the consideration of industry variables (growth, broad sales shocks, and concentration) help to explain the corporate restructuring decision.

A wide body of literature engages in investigating asset sales or other divisive corporate restructurings in which a firm takes a subsidiary public. It has been acknowledged that the divestiture method has far-reaching implications, ranging in terms of both value creation and the managers-investors relationship. First, leading research reports a positive market reaction to divisive restructurings (Schipper and Smith, 1983 and 1986; Miles and Rosenfeld, 1983). Given that the factor driving the choice of the divestiture method is likely to influence the value of the deal, the net

benefits of the transaction depend on the method chosen. Furthermore, the divestiture method is likely to reduce information asymmetries between managers and investors by revealing insider beliefs about the value of the subsidiary.

Information asymmetry reasoning can be advocated to assess asset sales, divestitures, spin-offs, and sell-offs as common ways to implement corporate restructuring (Krishnaswami and Subramaniam, 1999). Bergh et al. (2008) investigate the case of spin-off versus sell-off strategies, finding that assets belonging to the firm's main business lines have a potential for creating information asymmetries that can be resolved most effectively by spin-offs, while sell-offs mitigate the information and knowledge disadvantages of secondary businesses.

Nanda and Narayanan (1999) investigate the divisional informativeness gap, providing the theoretical support to explain value creation in an asset sale framework (divisions, subsidiaries, or product lines). Information asymmetries between managers and the market regarding divisional cash flows can lead to undervaluation of a two-division firm. These authors predict that announcement-period abnormal returns increase with the difference in cash flow informativeness of the retained and divested division. Based on Nanda and Narayanan's model, Desai and Gupta (2016) investigate the asset sale announcement-period abnormal returns. They find that abnormal returns increase with the difference in cash flow informativeness of divisions prior to the transaction, with the effect being stronger for a conglomerate that retains a division with greater growth opportunities.

Performances associated with corporate restructuring mechanisms eventually have significant agency implications. Bruton et al. (2002) focuses on buyouts, investigating the entire buyout cycle (public-private-public cycle of ownership) from an agency perspective. They find that agency theory explanations of performance are valid throughout the buyout cycle, with increasing managerial ownership leading to better performance while declines associated with agency costs re-emerging only several years after the reverse buyout. Previous studies (Larcker and Holthausen 1996) found similar results.

Cash constraints, operating synergies, financial reporting, and tax issues may finally drive the choice between spin-offs and carve-outs. According to Frank and Harden (2001), firms that carve-out are more likely to be cash constrained, have lower marginal tax rates, and choose the carve-out method for subsidiaries operating in related industries when there are benefits of control to the parent company. Moreover, carve-outs emerge as a financing mechanism for high growth firms.

The alignment of interests between different parties to a transaction has far-reaching implications in finance. In M&As, disagreements between the buyer and the seller about the future growth and expected performance of a target company often make it difficult to set a price for the transaction. Earnouts are therefore often employed in M&As so that the seller may earn part of the purchase price based on the firm's performance following the acquisition. In practice, they are structured in different ways depending on who will actually manage the firm after the closing, with terms and conditions designed to address mismanagement concerns.

Similar concerns surround debt restructuring policies by distressed firms. In fact, the incentive-based issue in debt restructurings has often been investigated in relation to the type of debt restructuring mechanism, that is, in-court debt restructuring versus private contractual arrangements.

Gilson et al. (1990) find that private (and less costly) arrangements prevail for firms that have more intangible assets, owe more of their debt to banks, and owe to fewer lenders. These authors also find that stockholders are better off in private renegotiations than in bankruptcy and thus have incentives to settle with creditors privately. More recently, Demiroglu and James (2015) find that loans from bank lenders are easier to restructure out of court than loans from institutional lenders.

A third strand of literature addresses pricing issues. While traditional financial theory contributed extensively to the literature by developing some prominent and widely used securities pricing models, there is a lack of research on specific and niche fields concerning securities pricing and valuation.

As we shall discuss in greater detail in Sect. 3, traditional securities and option pricing models rely on a few assumptions that prove to be somewhat flawed when dealing with securities pricing under financial distress. Dumitrescu (2007) discusses the limits of traditional bond pricing models for defaulted bonds.

In brief, risk-neutral assumptions are those that bear more concerns when valuing securities (stocks, bonds, options, convertible bonds) for troubled companies. Thus, starting with the papers by Leland (1994) and Anderson and Sundaresan (1996), numerous studies subsequently emerged aimed at refining these models in order to address the issue of corporate bond and option pricing under default risk.

Very few papers, however, investigate valuation issues related to specific clauses in debt restructuring agreements. Nor is it very common to find probabilistic approaches to debt restructuring policies.

What is lacking in the literature is a thorough investigation integrating financial planning issues within a distressed firm restructuring framework. We argue that there is room for improvement and the need to further the value-based literature, in particular when it comes to modelling debt value under firm restructuring.

The tenets of such developments require incorporating a probabilistic approach in financial planning that enables representing numerous projections of a few relevant financial variables. While not constituting a novelty within the practitioners' environment, such an approach leads to original improvements in restructured debt valuation, bringing together both financial and accounting principles.

The perspective is that of a probabilistic representation (not necessarily under a risk-neutral environment) of the wide spectrum of the restructured debt pay-offs that enables the valuation both of debt and the various option-based arrangements (earnouts) that increasingly populate restructuring agreements (Table 14.1).

3 Estimating Earnout Value: A Framework

In the present section, we present the basic model for valuing earnouts within a debt restructuring framework and discuss the major concerns and criticalities present in earnout value estimation.

Earnouts on debt are option-based agreements that may be helpful when settling debt restructuring contracts. They allow creditors to participate in future firm value enhancements. Generally, such clauses are associated with debt write-offs, with the creditor consenting to cancel the debt or a portion of it and the firm committing to a pay-off depending on a future contingent event normally related to a profit margin. Assuming earnings before interest, taxes, depreciation, and amortization (EBITDA) as a reference measure, a typical earnout agreement might be designed to correspond to the following pay-off:

$$\begin{cases} 0 \ if \ m \geq K \\ \left[K - m\right] \cdot EBITDA \ if \ m < K \end{cases} \tag{14.1}$$

where K is a scalar and m is the multiple of EBITDA (for instance, the ratio of net debt to the EBITDA margin).

Table 14.1 Systematic literature review. A selection of significant papers

Authors	*Paper*[a]	*Theoretical framework*	*Model*	*Contribution*	*Findings*
Wruck (1990)	E	Agency theory, information asymmetry	Reorganization, organizational efficiency	Investigates financial distress and its effect on organizational efficiency. Provides evidence on financial restructuring and distress costs, along with evidence on the organizational restructuring that accompanies financial distress	Financial distress has benefits as well as costs, and the financial and ownership structure affects net costs
Birge and Zhang (1999)	T	Asset pricing models	Project evaluation	Developing methods for incorporating the effects of production decisions into the pricing problem	Two methodologies for incorporating the effects of production decisions into the pricing problem. The first involves the use of the capital asset pricing model, while the second relies on the risk-neutral paradigm arising from option pricing models
Leland (1994)	T	Asset pricing models	Credit valuation model	Development of a credit valuation model in which bankruptcy is endogenously determined	Leland's model develops a unifying framework for assessing optimal capital structure and pricing debt with default risk

(*continued*)

Table 14.1 (continued)

Authors	*Paper*[a]	*Theoretical framework*	*Model*	*Contribution*	*Findings*
Anderson and Sundaresan (1996)	E	Asset pricing models	Bond pricing and capital structure	Introduction of debt renegotiation in a contingent analysis framework	Allowing for interaction between bondholders and shareholders, the model features strategic debt service. The costs associated with formal bankruptcy lead creditors to accept deviations from contractual payments. Endogenous determination of the reorganization boundary
Sudarsanam and Lai (2001)	E	Organizational theories	Restructuring strategies	Tests the effectiveness of strategies and identifies the underlying factors of effectiveness, the impact of timing, intensity, and implementation of strategies on corporate recovery	Recovery firms restructure more intensively than non-recovery firms. Non-recovery firms seem far less effective in strategy implementation. Recovery firms adopt growth-oriented and external-market focused strategies; non-recovery firms engage in firefighting strategies
Dumitrescu (2007)	T	Asset pricing models	Bond pricing contingent valuation model for zero-coupon bonds with default	Development of a bond pricing models for defaulted bonds	Renegotiation involves a significant change in bond prices, an effect that is dispersed through different channels (increasing the value of the firm, reallocating payments, and avoiding costly liquidation). The presence of two creditors leads to qualitatively different implications for pricing. The paper emphasizes the importance of bond covenants and renegotiation of the overall debt

Otsubo (2013)	E	Information asymmetry hypothesis; managerial discretion hypothesis; subsequent event hypothesis	Value creation	Assesses the impact of carve-outs on parent company shareholders' wealth	The stock of a parent company reacts positively to a carve-out, especially when the parent company is highly leveraged. Parent companies apparently use funds from carve-outs to lower their leverage, and continue to lower their leverage after carve-outs
Iwaisako et al. (2013)	E	Efficiency in factor allocation	Efficiency in factor allocation	Assesses whether debt restructuring in the 2000s increased the efficiency of factor allocations by Japanese corporations	Negative performance associated with increase in debt growth rate. After debt restructuring in the 2000s, inefficient firms still exist and banks still help them survive
Lee et al. (2013)	E	Agency theory	Value creation, shareholder wealth maximization	Assesses the impact of asset divestiture on post-divestiture performance. Investigates firm characteristics impacting on post-divestiture performance	Large assets are predominantly divested by financially constrained firms, which improve post-divestiture performance. Firms with lower constraints disinvest smaller assets to avoid scrutiny

(*continued*)

Table 14.1 (continued)

Authors	*Paper*[a]	*Theoretical framework*	*Model*	*Contribution*	*Findings*
Pandey and Ongpipattanakul (2015)	E	Agency theory	Agency behaviour	Investigates the impact of agency monitoring-related variables in selecting alternative restructuring strategies in an emerging economy	Restructuring strategies are significantly influenced by agency factors and control variables. Leverage-dominated firms enter into asset acquisition restructuring or employ capital expenditure strategies. Firms with CEO/chairman duality prefer debt extension and equity issue strategies
Koh et al. (2015)	E	Life-cycle theory	Restructuring strategies	Investigates firm strategies when facing financial distress and the impact of the life cycle on strategy choice	The influence of the life cycle is more pronounced in the choice of financial restructuring strategies

[a]Type of paper: T stands for theoretical, while E stands for empirical

Generally, debt earnouts are call options with the projected EBITDA as the strike price. From a theoretical perspective, debt earnouts are of particular interest because they involve numerous issues spanning bond and option pricing models, capital structure, and firm value. Research on earnouts thus falls within the wealth of literature on valuation and pricing. Nevertheless, it reveals several limitations inherent to the basic assumptions on which traditional valuation models are built, calling for alternative approaches to earnout valuation under firm distress.

The Black and Scholes (1973) and Merton (1974) option pricing models have become the backbones for the valuation of corporate debt in various applications. Any attempt to value earnouts relying on traditional pricing models faces major challenges, the most serious being mainly related to the design of these models as closed-form expressions. Therefore, addressing earnout valuation requires going one step further in the design of analytical tools for firms undergoing debt restructuring when financial distress occurs. In short, what makes earnouts an interesting case for valuation under conditions of distress is the definition of the uncertain cash flow and the framework that surrounds its manifestation. To provide a framework for suitable analytical models for debt earnout valuation, we require a conceptualization of cash flows.

In practice, debt renegotiation and related capital structure decisions occur within a financial planning framework that upholds the feasibility of the restructuring process. Financial planning involves projections of revenues, operational costs, and margins, representing the evolution of key economic and financial figures at discrete times over a medium-term period. Within a corporate restructuring framework, projections on future cash flows are of paramount importance. The assumptions underlying projections on future cash flows shape the overall credibility of the plan and contribute to defining the probability of success. Therefore, they have an impact on the feasibility of cash flows on securities issued in the renegotiation process (bonds or option-based securities such as earnouts).

When valuating an earnout agreement such that represented in Eq. (14.1), two strictly interrelated issues arise. The first is related to the nature of the risk associated with the contingent cash flow, while the second has to do with the methodological approach to valuation.

As regards the first issue (the treatment of risk), in a typical earnout agreement, the contingent cash flow—and thus the risk associated with it—depends on the decisions taken regarding the trigger point. The higher the trigger point, the higher the probability of the cash flow being paid

and hence the lower the risk. Moreover, corporate restructuring plans often involve decisions regarding the business model and the firm's capacity or production, all of which have an impact on EBITDA and their volatility. It thus follows that uncertain cash flow can be valuated only after decisions and business choices underlying the plan have been made.

From a theoretical perspective, valuating uncertain future cash flows requires finding an appropriate discount rate consistent with the risk associated with it. Unfortunately, finding a consistent discount rate is often difficult whenever the risk is actually a function of the decision driving the cash flow valuation. In such circumstances, the cash flow risk is actually determined only after a decision is made.

Scholars have addressed this issue. There are two methodologies for incorporating the effects of these decisions into the pricing problem. The first involves the use of the capital asset pricing model (CAPM), while the second relies on the risk-neutral paradigm arising from option pricing models (Birge and Zhang 1999).

The use of the CAPM is consistent with using a risk-adjusted discount rate for future cash flows and is equivalent to using a risk-free equivalent future cash flow. The drawback of the CAPM has to do with evaluating the covariance of the future cash flow with the market. To the extent that some other co-variances, such as that of a trading underlying asset, may be observable, the authors demonstrate that a risk-neutral pricing method is a simple way of incorporating risk into future cash flow.

Moreover, the cash flow to be paid under an earnout agreement is related to the firm's value. Given K in Eq. (14.1), the cash flow payment is triggered whenever $\frac{D}{EBITDA} < K$ or $D < K \bullet EBITDA$. Assuming $K = \frac{1}{E(R_o)}$, where $E(R_o)$ is the expected rate of return on the firm's assets, the condition becomes $D < K \bullet EBITDA = V$, where V denotes the firm's value.

When valuing a firm's equity, corporate debt (bonds, convertible bonds), and option-like agreements underwritten on the basis of the firm's projected financial figures, the characterization of default risk becomes crucial given its impact on value. Capturing the events that might drive the deterioration of firm value requires identifying credit valuation models in which the state of the firm and its evolution is endogenous. Therefore, earnout valuation can be investigated within the wealth of literature on capital structure and the pricing literature.

Option pricing models are generally studies carried out in a risk-neutral environment. The flaws of this assumption for distressed firms are logically brought to light when the probabilities of default are arguably high.

Leland (1994) pioneered a new approach to credit valuation in which bankruptcy is endogenously determined. Leland's model poses a unifying framework for assessing optimal capital structure and pricing debt with default risk. While capital structure affects default risk, it cannot be optimized unless the impact of leverage on bond value is recognized.

The introduction of debt renegotiation in a contingent analysis framework marked a step forward in bond pricing, enabling interaction between bondholders and shareholders (Anderson and Sundaresan 1996). This class of models features strategic debt service, given that the costs associated with formal bankruptcy lead creditors to accept deviations from contractual payments. Contrary to Merton's model, the reorganization boundary is now endogenous and deviations from the absolute priority rule occur in equilibrium.

Dumitrescu (2007) follows a similar approach, the difference being that only bondholders' strategic behaviour is allowed—the shareholders being residual claimants—within a multiple creditor framework and overall debt renegotiation rather than just coupon payments. Strategic interaction between two bondholders holding different maturity bonds with different seigniorage exacerbates the problem of overall debt renegotiation, as shown in Christensen et al. (2002). The presence of two creditors bears qualitatively different implications for bond pricing, in addition to stressing the importance of covenants. In a nutshell, allowing strategic renegotiation helps to avoid liquidation. In turn, the elimination of bankruptcy costs eventually leads to an increase in the value of the firm.

Many of the aforementioned papers assume that the firm's asset value follows a diffusion process with constant volatility. Apart from the limitations of the constant volatility hypothesis, the assumption of time-independent cash flows is over-restrictive.

Consider an earnout agreement maturing at time T. The length of the maturity obviously affects the probability of the cash flows becoming due; that is, the longer the maturity, the more uncertain EBITDA and the firm's value are. Stated in other terms, let $EBITDA_0$ denote current EBITDA. Each of the following periods' EBITDA (i.e. quarterly, annual, and semi-annual EBITDA) depends on past figures (Fig. 14.1).

This path-dependence feature makes it difficult to valuate earnouts through closed-form formulas. Moreover, option pricing models are

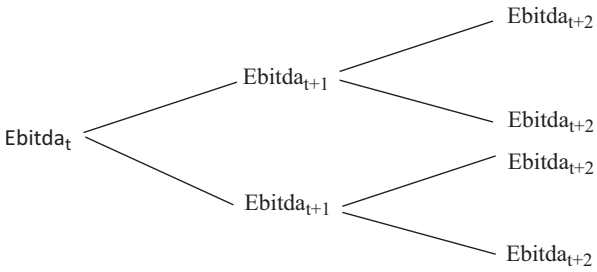

Fig. 14.1 The EBITDA binomial tree

appropriate for pricing options written on underlying assets that are traded on liquid markets and which are thus eligible for hedging. When considering projections on financial variables (i.e. revenues, EBIT, EBITDA, and so on), however, it becomes difficult to envisage or structure hedging strategies against their unpredictable dynamics.

Alternative approaches instead comprise binomial models such as the Cox-Ross-Rubinstein (CRR) model and Monte Carlo simulations. Numerical techniques are not new in financial applications. Brennan and Schwartz (1978) were the first to provide a quantitative insight into optimal capital structure. Numerical techniques allow them to determine the optimal leverage when the firm's unlevered value follows a diffusion process with constant volatility.

Monte Carlo simulations are also widely used in financial applications. A number of studies discuss the basics of Monte Carlo applications to securities pricing. Conceptually, such an approach is viewed as an alternative to the Black and Scholes (1973) and Cox and Ross (1976) models. It is flexible enough to allow accommodating different processes governing the returns on the underlying assets. Let us consider valuating a financial security, that is, a call option written on a stock. Monte Carlo simulations allow us to determine the distribution of terminal stock prices by means of the process generating future stock price movements. In other words, generating a series of stock price paths allows us to determine a set of terminal stock values to be employed to obtain an estimate of the call option value. Moreover, the Monte Carlo approach may have specific advantages in certain situations when stock returns show jump processes (Boyle 1977).

While we are aware of the limitations of such an approach for valuing earnouts and recognize the need for more insight on the topic, a Monte Carlo approach is nevertheless suitable to address major concerns regard-

ing valuation. This approach has sufficient flexibility to be employed in a variety of economic and financial applications, for example, logistic management and plant operation (Marseguerra and Zio 2000), or valuing government guarantees in project finance (Cheah and Liu 2006).

In financial forecasts, Monte Carlo simulations allow us to determine the evolutionary projections of key financial variables based on certain hypotheses regarding the drift term and volatility. More precisely, simulations allow us to generate future movements of revenues, operating costs, and ultimately EBITDA, together with net debt projections. The probabilities attached to each future path finally allow the firm's value to be determined.

4 A Monte Carlo Application to Earnout Valuation

The present section presents an application of the Monte Carlo simulation methodology to earnout estimations. Simulations allow us to determine the distribution of firm value by means of a process that generates future movements in key financial variables. Considering an earnout design such as that described in Sect. 3, estimations require the generation of EBITDA and net debt (net financial position (NFP)).

In the following, we model future projections of EBITDA starting from a stochastic representation of the firm's sales. Let us assume that sales (S) follow a Brownian motion. As is well known, a stochastic process $(X = (X(t))_{t>0})$ identifies a Brownian motion, given a certain probability distribution, provided that the following conditions are met:

1. $X(0) = 0$;
2. The distribution of increments, $X(t + u) - X(t)$, is independent on $\sigma(X(s) : s \leq t)\ \forall u \geq 0$;
3. Increments in X follow a Gaussian distribution; $X(t + u) - X(t)$ is normally distributed with mean 0 and variance u, $X(t + u) - X(t) \sim N(0, u)$;
4. The process $\{X(t) : t > 0\}$ almost surely has continuous paths.

Movements in firm's sales, $S(t)$, are thus represented by the following differential stochastic equation:

$$dS(t) = S(t)\left(\mu dt + \sigma dW(t)\right) \tag{14.2}$$

Within this framework, future projections of EBITDA can be determined by a number of hypotheses on both fixed and variable costs and depreciation and amortization. Typical earnout agreements are included in corporate restructuring plans based on financial forecasts under certain hypotheses regarding sales and other key financial variables such as operational costs. While creditors agree on a proposed restructuring scheme, the underlying forecasts on fixed and variable costs can be a useful starting point for gauging future projections of EBITDA. Moreover, estimations for the net debt at a given maturity derive from the projected long-term debt amortization plan and future projections on working capital. This assumption is sound, as earnouts are typically associated with debt restructuring plans in which repayments of the principal are tightly scheduled according to a specific amortization plan. Therefore, cash flows on outstanding debt are predictable. Obviously, net debt itself could be modelled as a stochastic variable.

Running a number N of trials (consider $N = 1000$), Monte Carlo simulations return the probability distribution of the relevant variable (in our case, the earnout value estimation), that is, the estimation of the earnout cash flow for each percentile with the related frequencies and probabilities attached. Following that, the estimation of the expected earnout value is straightforward:

$$E\left(Earnout\right) = \sum_{i=1}^{n} V_i \cdot p_i \tag{14.3}$$

where V_i is the estimation of the earnout value at the i-th percentile, and p_i is the associated probability. The expected value can then be discounted at the weighted average cost of capital to derive the present value of the option. Otherwise, employing a certain equivalent methodology may be considered:

$$Earnout\,Value = \frac{E\left(V_t\right) - \sigma_t}{R_f} \tag{14.4}$$

where V_t may be assumed to be the mean value of the earnout at the expiry of the option (t) obtained after running N trials, σ_t is the standard deviation of earnout estimated values, and R_f is the risk-free rate.

Let us consider an earnout agreement such as that in Eq. 14.1. Let us assume $K = 4$, that is, the earnout pays 4EBITDA-PFN (or, otherwise, EBITDA-NFP/4) provided that (NFP/EBITDA) < 4. We assume the earnout option expires at $t = 5$. Table 14.2 summarizes one of the possible projections of EBITDA and the earnout pay-off given $S(t)$. We assume $S = 0$ at time $t = 0$. $S(t)$ is derived assuming $\mu = 10$ and $\sigma = 60$ in Eq. 14.2. *MC* is the contribution margin (*S*-variable costs), where variable costs are assumed equal to 50% of sales. We assume fixed costs equal to 40 in order to derive the EBITDA margin. For the purposes of calculating the NFP, let us assume the firm makes an investment $I = 200$ (10% depreciation rate over a 10-year period) which is financed via 70% (or 140) debt and the remaining 30% via equity. The NFP is calculated according to a 10-year amortization plan and a 5% interest rate.

Table 14.3 summarizes the distribution of the stochastic variable $\{EBITDA - NFP/4\}$ at the end of the fifth year. For this purpose, a Monte Carlo simulation with 1000 iterations was run allowing us to estimate the earnout value for each percentile, together with the respective frequencies and related probabilities. The *Interval Probability Data* in Table 14.3 provides the estimations of the earnout for each percentile with their respective probabilities.

Figure 14.2 shows the distribution of the stochastic variable (EBITDA-NFP/4) at the end of the fifth year based on 1000 iterations.

Table 14.2 Future projections of sales, EBITDA, and cash flow on the earnout: an example

Year	*Sales*	*MC*	*EBIT*	*EBITDA*	*NFP*	*EBITDA-NFP/4*
	100.00	*50.00*	*10.00*	*30.00*	*140.00*	*−5.00*
1	84.26	42.13	2.13	22.13	145.15	−14.16
2	116.91	58.46	18.46	38.46	121.16	8.17
3	129.82	64.91	24.91	44.91	104.73	18.73
4	128.27	64.14	24.14	44.14	93.69	20.71
5	**137.37**	**68.68**	**28.68**	**48.68**	**77.39**	**29.34**
6	112.06	56.03	16.03	36.03	72.3	17.95
7	103.06	51.53	11.53	31.53	59.79	16.58
8	128.55	64.28	24.28	44.28	34.94	35.54
9	134.31	67.16	27.16	47.16	16.86	42.94
10	116.28	58.14	18.14	38.14	5.21	36.84

Table 14.3 Distribution of earnout value at year 5 (EBITDA-NFP/4)

Results summary		*Percentile distribution*		*Histogram data*		*Interval probability data*	
		Percentile (%)	*Value*	*Value*	*Frequency*	*Value*	*Probability (%)*
Mean	21.11	0	−60.35	−52	1	−52	0.1
Number of trials	1000	5.00	−24.44	−44	5	−44	0.5
Standard error	0.86	10.00	−14.84	−36	6	−36	0.6
		15.00	−7.27	−28	23	−28	2.3
Minimum	−60.35	20.00	−2.68	−20	33	−20	3.3
Maximum	96.92	25.00	1.27	−12	50	−12	5.0
Median	21.5	30.00	6.2	−4	64	−4	6.4
Range	157.28	35.00	10.63	4	95	4	9.5
		40.00	14.08	12	89	12	8.9
Standard deviation	27.18	45.00	17.7	20	110	20	11.0
Variance	738.53	50.00	21.5	28	118	28	11.8
		55.00	25.3	36	114	36	11.4
Skewness	−0.02	60.00	28.47	44	80	44	8.0
Kurtosis	2.69	65.00	31.83	52	74	52	7.4
		70.00	35.38	60	63	60	6.3
		75.00	39.29	68	38	68	3.8
		80.00	45.06	76	17	76	1.7
		85.00	50.38	84	9	84	0.9
		90.00	57.02	92	6	92	0.6
		95.00	64.39	100	4	100	0.4
		100.00	96.92	108	0	108	0.0

We are now able to derive the earnout estimations (Table 14.4) based on the distribution of cash flows and related probabilities.

Having obtained the probability distribution of the stochastic variable, the expected value of the earnout can be derived according to Eq. 14.3.

The net present value of the option can be calculated by discounting the expected value as in Eq. (14.3) at the weighted average cost of capital.

5 Conclusions

Despite being widely used in mergers and acquisitions, earnout agreements are frequently used within debt renegotiation under corporate restructuring procedures. Such agreements are options (generally, call

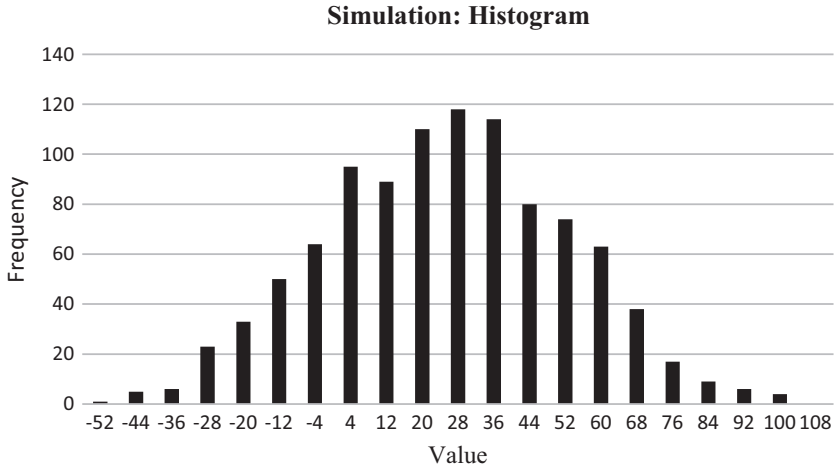

Fig. 14.2 Distribution of the stochastic variable (EBITDA-NFP/4)

Table 14.4 Earnout estimation

Value	*Probability (%)*	*Weighted value*
−52	0.1	0
−44	0.5	0
−36	0.6	0
−28	2.3	0
−20	3.3	0
−12	5.0	0
−4	6.4	0
4	9.5	0.38
12	8.9	1.068
20	11.0	2.2
28	11.8	3.304
36	11.4	4.104
44	8.0	3.52
52	7.4	3.848
60	6.3	3.78
68	3.8	2.584
76	1.7	1.292
84	0.9	0.756
92	0.6	0.552
100	0.4	0.4
108	0.0	0
Expected value		27.788
Present value		21.77

options) with EBITDA serving as the underlying in most cases. The pay-off at the expiry of the option depends on future movements in key financial variables. Within a corporate restructuring framework, the pay-off of the earnout may be related to financial forecasts included in business plans under corporate restructuring agreements. In this chapter, we have provided a wide-ranging review of the literature on financially distressed companies and corporate restructuring. While there is no literature on debt earnout valuation, we have built on the securities and option pricing literature in order to gauge the limits of traditional pricing methodologies for estimating earnout values on debt. We have finally proposed the basics of a simple Monte Carlo simulation for valuating such options. There is room for future research in developing formal debt earnout pricing models.

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CHAPTER 15

Book and Market Values of European Banks: Country, Size, and Business Mix Effects

Riccardo Ferretti, Andrea Landi, and Valeria Venturelli

1 Introduction

In the years since the outbreak of the crisis, the financial markets have persistently reduced the market value of European banks as a consequence of macroeconomic, regulatory, and structural factors.

According to recent banking literature, the persistence of low growth following a financial crisis along with a monetary policy stance aimed at maintaining a low-level interest rate in the long run is considered the main factor impairing the prospects of bank intermediation.[1]

[1] A large body of recent literature supports the view that the persistence of a prolonged low interest rate environment lowers the earnings prospects of banks, hurting especially the

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The fall in the market-to-book (M/B) ratio is interpreted as the result of the decline of rents or quasi-rents arising from the factors that make the banks special: the private information they have on borrowers, the intertemporal nature of banking relationships, and the monetary characteristic of bank liabilities.[2] These are the main determinants of the charter value of traditional intermediation that lose importance in an unfavourable economic context, thereby leading to both less higher-risk lending and a squeeze on interest margins on deposits.

The erosion of bank charter value is also related to the regulatory changes made in the wake of the financial crisis. Sarin and Summers (2016) attribute the fall in bank market value to the action of supervisory authorities that restricted some profitable—albeit risky—activities (e.g. proprietary trading), required banks to hold more liquid assets and stable funding, increased the capital constraints on bank activity growth, and, no less importantly, introduced uncertainty on likely future regulatory measures: a range of requirements that enhanced the competition from shadow banking.

The effect of regulatory action on bank market value may have been more severe for the larger banks, changing the relationship between charter value and their implicit 'too-big-to-fail' insurance. The widely held view that big banks have a competitive edge deriving from safety net subsidies has been challenged by the revision of regulatory guidelines regarding large and complex banks. Higher capital requirements, along with greater regulatory scrutiny, have caused these banks higher risk management and compliance costs, thereby reducing their prospective profitability.

A further factor affecting their market value is related to the rigid cost structure of banks in the face of evolving technological innovation. Banks have to deal with legacy issues such as branch networks in a market context in which an increasing share of financial products and services are delivered through online channels. The menace posed by new entrants that do not necessarily need a local presence to distribute their products is increasing the potential competition in retail financial markets and reducing the traditional franchise value of banks.[3]

smaller deposit-funded and less diversified banks. See Borio et al. (2015), IMF (2017), and Claessens et al. (2017).

[2] In a recent study on the determinants of value creation within US commercial banks, Egan et al. (2017) add evidence to the existing literature that the screening and monitoring of information-intensive loans is an important source of bank value, while the ability to raise sticky short-term funding is a key source of bank synergies.

[3] In the words of Philippon (2017), "Fintech…innovations can disrupt existing industry structures and blur industry boundaries, facilitate strategic disintermediation, revolutionize

While it is widely believed that the aforementioned macroeconomic, regulatory, and banking structure factors have impaired bank market value, the questions as to whether and to what extent these factors have affected national banking systems and bank business models in a different way are still open to debate.

As for the European banking industry, many differences could persist in bank market valuation across country and business model profiles.

The sovereign debt crisis that hit the euro area has changed the way in which markets assess the prospects of national banks. Therefore, we expect bank value to reflect certain indicators, such as GDP growth and interest rates, but also country risk on/off investment behaviour that highlights the impact of fundamental variables.

Country differences persist in taxation and consumer protection rules, as well as in insolvency laws. Even regulation and its effect on bank market value still reflect country situations. Changes in regulatory policies in the form of higher capital requirements, increases in bank liquidity, and the limits imposed on leverage have affected all European banks. However, there is as yet no single jurisdiction for the purpose of calculating global systemically important bank (G-SIB) buffers, and national discretions still prevail when implementing the single rule book (ECB 2017). Moreover, the banking union needs to be completed with a European deposit insurance scheme. The country effect also reflects the pre-emptive action of the supervisory authority, which has been more pervasive in financial systems with greater exposure to credit and market risk.

A further country specificity is related to the structure of the banking system, which shows a wide variation in efficiency across the European countries. For some European banks and systems, there is considerable room for improving operational efficiency, especially through branch rationalization (IMF 2016). The different degree of overcapacity along with the difficulties in reforming the systems by removing structural shortcomings could thus affect the way in which the market assesses the prospects of banks belonging to different countries.

The structure of the banking system is also related to the fragmentation of the banking market and to its effects in the competitive arena. In some countries, the large banks have to compete against a wide number of small savings and cooperative banks, which reduces the chance of improving

how existing firms create and deliver products and services, provide new gateways for entrepreneurship, democratize access to financial services, but also create significant privacy, regulatory and law enforcement".

profitability by moving decisively into the retail market. Moreover, the euro area countries differ substantially when it comes to the relative weight of foreign bank branches or subsidiaries (ECB 2016).

Country differences in terms of bank market valuation may be due to the intervention of governments to stabilize and restructure the domestic financial system. The global financial crisis and the subsequent recession affected domestic banking systems differently, as diverse were the responses of national authorities. As outlined in Millaruelo and del Rio (2017), the mixed experiences of bailout respond both to the differing intensity and duration of the economic crisis and to the vulnerability of the economies to the sovereign debt crisis.

Whereas regulation drove to implement homogeneous banking requirements, dichotomous strategies emerged in the industry. To respond to the crisis, some banks have restricted their size and the scope of their activities, while others have grown and enhanced diversification. How the market evaluates changing bank business models (and their effects on the business mix) is a question that has important implications for bank managers and for the funding of their strategies.[4]

This chapter focuses on the large European banks with the aim of assessing to what extent the financial markets set bank share prices in relation to banking business fundamentals, business mix indicators, and country variables.

The novelty of our contribution consists in the empirical methodology employed to isolate three different determinants of bank value. The first is related to the business fundamentals that, according to traditional financial models, are the pillars of market valuation: return, risk, and growth. Starting out from the traditional dividend discount model (DDM) and accepting some simplifying assumptions, we expect bank market value to positively reflect both the current return on equity and a proxy of growth, while negatively reacting to higher levels of market riskiness as a result of the increasing cost of capital, related even to sovereign risk.

The second set of variables considered determinants of market value refer to the business composition of banking activities. The research question can be expressed as follows: when setting bank value, does the market value the way in which return and risk originate? In other words, do business mix variables provide information to the market about the prospects

[4] As to the relationship between bank performance and business models, see the recent literature review in Cosma et al. (2017).

of bank profitability? The empirical methodology adopted in the study allows us to disentangle the effects of the two sets of variables (fundamentals and business mix), which are strictly correlated. Via a two-step econometric procedure, we first relate the M/B value to economic variables which represent the main business fundamentals of a bank's value. In the second step, taking into consideration the components of market value not explained by the first set of variables, we evaluate whether the business mix is considered by the market when setting the M/B value of banks.

Lastly, our study focuses on the importance that country specificities take on when the market looks at both the macroeconomic context and the structural features of the banking system. The relevance of country variables in explaining bank value is estimated both in the first econometric step, when we consider some macroeconomic national variables (national GDP growth and CDS spread), and then in the second step when we estimate the sign and level of significance both of banking system structure indicators and of country dummy variables.

The chapter proceeds as follows. In Sect. 2, we review how the financial literature deals with the determinants of bank value. In Sect. 3, we focus on the fundamental variables explaining the M/B ratio and related bank charter value. Section 4 describes the sample of banks, the data variables, and some descriptive statistics concerning the M/B ratio of the large European banks. Section 5 presents the econometric model employed to examine the link between market performance, bank variables, and national context indicators. We then present the main results of the two-step estimation procedure and compare them to those obtained with a model based a one-step econometric estimate. Section 6 concludes the chapter by discussing possible policy implications.

2 Literature Review

As result of the dramatic and persistent fall in the market value of banks in the major financial systems, several recent studies have examined the evolution and causes of this decline, calling into question the ability of banks to recover the values they had before the crisis.

One of the main puzzling questions concerns the effects of the regulatory changes imposed in the wake of the financial crisis. While regulatory requirements have increased the capital and liquidity of banks, making them safer when evaluated on the accounting evidence, the effect of these requirements on both the return for shareholders and economic capital is

still unclear. In fact, the negative impact of regulatory requirements on expected bank profitability may have more than offset the positive effect resulting from the reduction in financial riskiness related to leverage.

Sarin and Summers (2016) find that the measures of volatility and the contribution to systemic risk for the sample of US and non-US banks they analysed appear to be higher in the post-crisis period than in the pre-crisis period. Their explanation points to the decline of bank franchise as a result of a persistent low interest rate context and a regulatory regime that, in recent years, has progressively restricted some profitable activities.

Chousakos and Gorton (2017) explain the post-crisis decline of the Q-ratio for a sample of US and European banks as being due to regulation that would have made all banks essentially the same and inefficient.

The drastic fall in market value of bank equity compared to book capital has raised doubts about the reliability of bank accounting information. Huizinga and Laeven (2012) show that, since the onset of the financial crisis, US bank holding companies have preserved book capital by understating the impairment of their real estate-related assets and loan loss provisioning/charge-offs. Calomiris and Nissim (2014) assess the impact of the non-recognition of loan losses on the low level of US banks' M/B ratio. The relevance of this factor is related to the size of non-performing loans on bank balance sheets and to the provisioning policies that banks adopt to recognize incurred and expected losses.

In addition to the common factors driving market valuation, the banking literature also examines how the different characteristics of banks impact on their value.

Several studies raise the question of whether the market price of banks increases with size. The popular view that large banks have a competitive edge originates from the idea that their 'too-big-to-fail' (TBTF) status allows them to benefit from implicit funding subsidies. The market value of large banks may benefit from market power or reflect scale and scope economies as well as the advantages of an increased diversification of revenues. Further advantages may be related to easier access to market capital. Many studies support this conclusion. With respect to the bonds issued in the US market by a large sample of banks, nonbanks, and nonfinancial corporations between 1985 and 2009, Santos (2014) finds evidence that the largest banks benefit from a bigger discount. Kolaric et al. (2017) study the effect of rating change announcements on the credit default swap (CDS) spreads of a sample of 154 international financial institutions for the period 2004–15, concluding that rating downgrades have a limited

effect on the perceived creditworthiness of TBTF banks, thereby rendering downgrades an ineffective channel through which market discipline can be exercised on large banks.

Some authors contend this view and point to the possibility that subsidies via the financial safety net to systemically large banks may be reduced by weak public finances. Demirgüç-Kunt and Huizinga (2013) find that the market-to-book ratio of an international sample of banks for the period 1991–2008 is positively related to the absolute size of the banks' total assets, but becomes negative when related both to the banks' total liabilities-to-GDP ratio and to government debt and deficits. Minton et al. (2017) find no evidence that the valuation of large US banks increases with their size.

How the market evaluates the ability of banks to generate higher future profits is the research question of a large body of literature on diversification and business models. The effect of diversification on bank market value depends on the trade-off between synergies and economies of scope resulting from combining various activities and the costs arising from the complexity of the conglomerate organization. For Baele et al. (2007), stock market investors anticipate that financial conglomerates have been able to generate higher current and future profits. In their study spanning the period 1989–2004, the sample of 255 European banks benefited from revenue-based diversification, showing a significant positive relationship between revenue diversity and market value performance measures. In a study of a larger sample of banks from 43 countries over the period 1998–2002, Laeven and Levine (2007) obtain different results, finding that Tobin's Q Ratio of financial conglomerates is lower than that shown by financial intermediaries that specialize in individual activities. Calomiris and Nissim (2014) estimate the impact of US bank diversification by considering the contribution of the non-interest income variable to bank value. They conclude that the intangible value associated with diversification has declined substantially since the financial crisis. Analysing a sample of large European banks, Cosma et al. (2017) find evidence of how different bank business models have a different impact on price-to-tangible book ratios.

In the banking literature, the relevance of country variables in explaining bank value is analysed by considering the nexus between sovereign risk and the cost of capital. According to CGFS (2011), the underperformance of bank share prices has been greatest for banks headquartered in the euro area countries affected by sovereign debt concerns.

As outlined in Millaruelo and del Rio (2017), country differences have also affected domestic banking systems and bank value through the response of the authorities to the banking crises.

A further country effect on bank value is related to the structure of the banking system, which shows both a wide variation in efficiency across the European countries and a fragmentation of the banking markets, as well as to its effects in the competitive arena (IMF 2016; ECB 2016).

3 Bank Value

The M/B ratio is a popular measure of bank value (Chousakos and Gorton 2017; Egan et al. 2017; Minton et al. 2017; Sarin and Summers 2016; Calomiris and Nissim 2014). It relates the market price (M) to the book value (B) of a bank's equity and represents a measure of value creation, that is, the capability to earn a rate of return higher than the cost of capital.

Starting out from the traditional dividend discount model (DDM) and accepting the simplifying assumptions of perpetual flows, constant return on equity (ROE), and dividend growth (g), the M/B ratio can be traced to the business fundamentals: return, risk, and growth. In formal terms,

$$\left(\mathrm{M/B}\right)_i = \frac{\mathrm{E}\left(\mathrm{ROE}_i\right) - \mathrm{E}\left(g_i\right)}{\mathrm{E}\left(k_i\right) - \mathrm{E}\left(g_i\right)} \tag{15.1}$$

where

$\mathrm{E}(\mathrm{ROE}_i)$ = expected long-term return on equity of bank i;
$\mathrm{E}(g_i)$ = expected dividend long-term growth rate of bank i;
$\mathrm{E}(k_i)$ = expected cost of equity of bank i (a function of the risk borne by bank i's shareholders).

As such, M/B proves to be a measure of value creation, that is, the capability to earn a rate of return higher than the cost of capital: values greater (lower) than 1 reveal beliefs of ROE > k (ROE < k). By definition,

$$\mathrm{M}_i = \mathrm{B}_i + \mathrm{MVA}_i$$

where MVA = market value added. Therefore,

$$\left(\mathrm{M}/\mathrm{B}\right)_i = 1 + \frac{\mathrm{MVA}_i}{\mathrm{B}_i} \tag{15.2}$$

If $g = 0$, Eq. (15.2) can be written as:

$$\left(\mathrm{M}/\mathrm{B}\right)_i = 1 + \frac{\mathrm{E}\left(\mathrm{ROE}_i\right) - \mathrm{E}\left(k_i\right)}{\mathrm{E}\left(k_i\right)} \tag{15.3}$$

The second term in (15.2) and (15.3) is the 'franchise value' defined as "the present value of the future profits that a firm is expected to earn as a going concern. Profits are those gains beyond what is required to cover all costs, including the cost of capital" (Demsetz et al. 1996, p. 2). The franchise value is also the difference between a firm's market value and the expense of rebuilding the firm today (replacement cost):

Franchise value (FV) = market value − replacement cost.
Replacement cost is a core concept of the well-known 'Tobin's Q Ratio':
Q = (firm's market value) / (firm's replacement cost),

often adopted to represent bank value along with—or as an alternative to—the M/B ratio (Minton et al. 2017; Brewer and Saidenberg 1996; Demsetz et al. 1996). Unfortunately, the replacement cost is not observable and needs to be substituted by a proxy. For example, Demsetz et al. (1996) approximate the replacement cost of a bank's assets using the book value of its assets minus goodwill. This substitution gives the following proxy for Tobin's Q Ratio:

$$\mathrm{Q} = \left(\mathrm{M} + \mathrm{L}\right) / \left(\mathrm{A} - \mathrm{goodwill}\right),$$

where M is the market value of equity, while L and A are the book value of liabilities and assets, respectively.

In banking, the FV, sometimes called 'charter value' (e.g. by Chousakos and Gorton 2017), stems from various sources of rents or quasi-rents that Demsetz et al. (1996) group into market- and bank-related sources. Market-related sources refer to limits to competition created by regulation or innovation; that is, the evolution of banking regulation and the increasing pace of product and ICT innovations have raised the competition banks face from

other banks and from nonbank financial institutions and new types of competitors, with negative effects on the FV. Bank-related sources are usually related to competitive advantages granted by the branch network and what makes each bank 'special', that is, the production of private information about borrowers through long-term relationships that reduce the cost of loan origination with respect to other lenders. According to Chousakos and Gorton (2017, p. 3), "In oligopolistic industries like banking, the Q's may normally be above one, and can stay that way if there are barriers to entry".

4 Data, Variables, and Descriptive Statistics

4.1 Data and Variables

The bank sample is made up of 49 banking groups belonging to 14 European countries. The composition of the sample by country is provided in the Appendix (Table 15.10). We consider consolidated data on listed European banking groups with a total asset value greater than € 50 billion in 2015. We collect financial information from the SNL Financial database and market information from the Thomson Reuters Datastream. We exclude banks with missing data on basic accounting variables, including assets, loans, deposits, equity, interest income, non-interest income, and commissions. We use the last ten years of data, that is, 2006–15. The starting date is 2006 as we limit our analysis to a period in which banks report accounting data based on IAS/IFRS as of that date.

The final dataset includes 474 bank-year observations corresponding to 49 bank holding companies (BHCs) belonging to 14 countries. We select 34 banks from 9 countries in the euro area, accounting for more than 70% of the total banking assets of the European Monetary Union (EMU), plus 15 Non-EMU banking groups. Italy (8) and Spain (7) account for the majority of the banks in the sample, given the fragmentation of their banking systems.

Unlike other studies (DeYoung and Roland 2001; Chiorazzo et al. 2008), our analysis employs consolidated accounting data. This choice is of particular importance for a number of reasons. On the one hand, banks tend to reserve the carrying out of nontraditional innovative activities to nonbanking subsidiaries whose contribution can be more precisely evaluated if consolidated financial statements are available. On the other hand, diversification benefits may exist for the institution as a whole and not for the single subsidiary. Moreover, the financial holding company represents

the relevant unit of observation for regulators on extremely important topic such as the level of systemic risk (Stiroh and Rumble 2006).

We measure bank market value using the market-to-book ratio (the market value of equity divided by the book value of equity). We also use several measures of profitability and risk to assess bank performance during our sample period. Specifically, we use two accounting-based measures of profitability: ROAE, that is, net income divided by average equity over the prior year, and ADJ_ROAE_SQ, computed by scaling negative ROE to zero and then computing the square in order to account for the non-linear relationship between market performance and ROAE.

We use three measures of risk:

1. Equity VOLATILITY, that is, the annualized standard deviation of daily stock returns.
2. Beta, as a measure of systemic risk. The BETA of each bank was obtained by estimating the market model using the ordinary least squares (OLS) method. More precisely, the BETA of bank *j* for year *t* was estimated using daily returns in local currency of bank *j* in year *t*. The returns of the market portfolio are those of the S & P 100 E GLOBAL - PRICE INDEX (euro) and of the STOXX EUROPE 600 E - PRICE INDEX (euro) in order to obtain two betas: one referring to the world index (BETA_W) and one referring to the euro market (BETA_E).
3. TAIL risk, that is, the negative of the average return on a bank's stock over the 5% worst return days in the year, following Ellul and Yerramilli (2013).

To these fundamental indicators, we add some variables that reflect specific country situations: GDP growth, the evolution of which also affects the expected return on bank activity; CDS spread, as proxy of sovereign risk; a measure of the national banking system structure, expressed by the concentration index, C5; a productivity measure—BRANCH—computed as the ratio of country total banking assets over country total number of bank branches; and an indicator (GOVT) of the intensity with which the state performed bailout interventions, measured as financial instruments subscribed by government in financial institutions as a fraction of GDP. Moreover, the inclusion of country dummy variables allows us to verify the importance of national factors not captured in the first step.

To capture the degree of diversification of bank activities or, in other words, the results of choices concerning banking business mix, in line with the literature (Stiroh 2004a, b; Lepetit et al. 2008), we consider the ratio of the net interest margin mainly generated by traditional activities over operating income (INT). To proxy bank credit quality, we use the ratio of non-performing loans over gross loans (NPL). To capture engagement in market-related activities, we consider variable trading assets as a fraction of total assets (TRAD). We use the natural logarithm of book total assets as our measure of bank size (TA).

4.2 Descriptive Statistics

Table 15.1 shows the descriptive statistics by year for our final sample of banks. All variables are trimmed at the 1% level. The reported statistics are obtained by averaging the variables each year. We show the results for median values. The number of banks in our sample varies by year, increasing from 44 at the start of the sample period to 49 as of 2015. The median size of the banks increases from € 214.31 billion as of 2006 to € 253.17 billion as of 2015.

A detailed description of all the variables used in the study is available in the Appendix (Table 15.11).

The following tables (Tables 15.2, 15.3, and 15.4) report the mean, median, and standard deviation indicators of M/B values over time, country, and bank characteristics.[5] The data confirm that the decline in market valuation since the crisis has been drastic and that the median M/B ratio at the end of the period is still less than half the value of 2006.

If evaluated on the basis of average M/B values, the sovereign debt crisis has been much more severe and prolonged: in the period 2011–12, the ratio averaged around 0.6, a quarter of the values for 2006.

M/B variability across banks over the period shows a reduction at the start of the crisis (2008) and then stabilizes at lower values. Despite the improvement in the value of the banks in the sample, the disparity between them remains large, suggesting the persistence of profitability challenges and differences in the progress made by institutions in loosening structural constraints. Moreover, considering that European regulatory action has developed progressively during the study period, we do not find evidence that the more severe and uniform capital and liquidity requirements have made bank performance prospects more homogeneous across banks.

[5] The use of non-trimmed variables leads to similar results in all the analyses performed.

Table 15.1 Descriptive statistics by year, median value

Year	*No. of banks*	*M/B*	*ROAE*	*VOLATILITY*	*BETA_W*	*TAIL RISK*	*BETA_E*	*INT*	*NPL*	*TRAD*	*TA (billion euro)*
2006	44	1.98	17.21	0.22	1.12	0.03	1.14	53.14	2.94	16.47	214.31
2007	46	1.56	17.36	0.25	1.24	0.04	1.09	55.80	2.58	15.03	238.86
2008	46	0.58	7.58	0.68	1.13	0.10	1.28	66.04	3.27	10.20	221.10
2009	47	0.85	5.67	0.60	1.75	0.08	1.62	61.04	5.53	11.17	235.60
2010	47	0.66	7.07	0.42	1.64	0.05	1.51	57.41	6.08	11.18	241.95
2011	48	0.50	5.38	0.52	1.56	0.07	1.47	60.08	6.70	9.60	274.87
2012	49	0.57	3.45	0.45	1.65	0.06	1.54	57.71	6.78	9.71	282.31
2013	49	0.84	4.72	0.33	1.37	0.04	1.46	57.76	7.62	9.57	251.47
2014	49	0.80	5.28	0.30	1.42	0.04	1.40	59.01	5.93	9.56	247.12
2015	49	0.75	6.33	0.30	0.89	0.04	0.94	59.25	4.76	9.60	253.17
Total	474	0.83	7.02	0.37	1.35	0.05	1.28	58.97	4.99	10.74	249.51

Table 15.2 M/B values over time

Year	*Mean*	*Median*	*SD*
2006	2.09	1.98	0.53
2007	1.73	1.56	0.66
2008	0.67	0.58	0.34
2009	0.91	0.85	0.43
2010	0.78	0.66	0.41
2011	0.58	0.50	0.44
2012	0.65	0.57	0.45
2013	0.93	0.84	0.41
2014	0.89	0.80	0.41
2015	0.87	0.75	0.43
Total	0.99	0.83	0.64

Table 15.3 M/B values by country

Country	*Mean*	*Median*	*SD*
Austria	1.00	0.81	0.60
Belgium	0.74	0.54	0.68
Denmark	1.09	1.02	0.52
France	0.72	0.59	0.38
Germany	0.62	0.51	0.32
Greece	1.05	0.78	1.01
Ireland	1.06	1.10	0.89
Italy	0.72	0.57	0.45
Netherlands	0.94	0.76	0.62
Norway	1.11	1.09	0.38
Spain	1.16	0.93	0.69
Sweden	1.38	1.36	0.42
Switzerland	1.50	1.33	0.56
United Kingdom	1.09	0.92	0.62
Total	0.99	0.83	0.64

In Table 15.3, we group banks by country and report the country mean, median, and standard deviation. Wide differences can be seen in market values, both within the euro area and between banks respectively belonging to euro and non-euro countries. German, Italian, and French banks show the lowest M/B ratio values, a sign that the differences within the euro area cannot be primarily observed between core and Mediterranean Europe.

The breakdown of the M/B ratio by banks' total assets does not show evidence supporting the idea that the largest banks take advantage of

Table 15.4 M/B values by quartile of banks' characteristics, median value

Quartile	*TA*	*NII/operating income*	*NPL/loans*
1 Quartile (lowest)	0.86	0.91	1.33
2 Quartile	0.70	0.92	0.82
3 Quartile	0.94	0.86	0.69
4 Quartile (highest)	0.77	0.71	0.66

safety net subsidies (Table 15.4). Banks more focused on traditional intermediation, as evidenced by the fourth quartile value of the ratio between net interest income and operating income, suffer a lower market valuation. This undervaluation is also related to credit riskiness; thus, the banks with a higher rate of non-performing loans pay a lower market value.

5 Econometric Models: Results

5.1 First-Step Analysis: The Effect of Fundamental and Country Macroeconomic Context Variables

The econometric models employed to examine the link between market performance and the drivers of banking fundamentals are expressed as follows:

$$\begin{aligned} y_{i,t} = {} & \alpha_{i,t} + \beta_1 \mathrm{PERF}_{i,t} + \beta_2 \mathrm{RISK}_{i,t} + \beta_3 \mathrm{PERF}_{i,t} \times \mathrm{RISK}_{i,t} \\ & + \beta_4 \mathrm{GROWTH}_t + \beta_5 \mathrm{COUNTRYRISK}_t + \varepsilon_{i,t} \end{aligned} \tag{15.4}$$

where i identifies the individual bank observation belonging to the sample ($i = 1, 2, 3,\ldots,49$), t expresses the time variable ($t = 2006,\ldots, 2015$), and the βs are the parameters to be estimated. Both the constant and the error terms are also included in the model.

The approach is based on the panel relationship with year and bank fixed effects, between the market-to-book ratio (our dependent variable) and proxies for the banking fundamentals: a performance measure, a risk measure, and the interaction term between these two measures.[6] To these

[6] We tested whether Fixed Effects (FE) or Random Effects (RE) model was to be preferred for our final regression specifications using the Hausman specification test. The test suggests that a fixed effect model is more appropriate. To determine whether time fixed effects are needed when running a FE model, we use the command testparm. This is a joint test to see whether the dummies for all years are equal to 0; if they are, then no time fixed effects are needed. As the Prob > F = 0.0000, we reject the null that the coefficients for all years are jointly equal to zero; therefore, time fixed effects are needed in this case.

covariates, we add some variables that reflect specific macroeconomic country situations that are supposed to have direct consequences on business fundamentals: GDP growth, the evolution of which also affects the long-term expected growth of banking return, and CDS spread as proxy of sovereign risk, which can have implications on the cash flow discount rate.

In all regressions, we cluster standard errors by bank. Including year fixed effects and clustering standard errors by firm is a common approach used to address two sources of correlation when panel data have more firms than years (Petersen 2009). Results are reported in Table 15.5.

The results of the model are in line with our expectations. Profitability and growth positively influence bank market value, while risk has a negative impact. In particular, the variables ROAE and ROAE_ADJ_SQ are significantly positive when combined with the measure of stock volatility and with the tail risk. The different regressions consistently show that all the risk variables are significantly negative. The positive value of the GDP growth coefficient signals the importance of an economic context that fosters the intermediation of banks and their profitability. The sovereign CDS spread negatively affects bank value as a result of the higher cost of capital required by the market in banking systems in which credit and sovereign risk are strictly related.

In their assessment, investors may rely not only on the level of business fundamentals but also on how risk and return are generated. In other words, the pricing of bank shares might also reflect the viability of the bank's business model. Business mix information could provide a long-term perspective that complements the short-term profile of our risk and return variables, bridging the gap between current and expected business fundamentals. For instance, the equity market may view a heavy exposure to the interest margin as a weakness for future profitability and hence underprice traditional retail banks.

In Table 15.6, we add some variables to the baseline model that capture the business mix: the ratio of net interest margin over operating income (INT), the ratio of NPL over gross loans (NPL), and the ratio of trading assets over total assets (TRAD). We add the concentration index, C5, the productivity measure—BRANCH—computed as the ratio of country total banking asset over country total number of bank branches, and an indicator (GOVT) which measures the value of financial instruments subscribed by government in financial institutions as a fraction of GDP. We also add both a size variable (SIZE) to test the too-big-to-fail hypothesis and country dummies.

Table 15.5 M/B and different performance and risk measures

Dependent variable	*M/B*	*M/B*	*M/B*	*M/B*	*M/B*
Model	*1*	*2*	*3*	*4*	*5*
Constant	1.602***	1.379***	1.824***	1.611***	1.806***
	(0.105)	(0.106)	(0.159)	(0.121)	(0.161)
ROAE	0.015***		0.007	0.015***	0.006
	(0.005)		(0.005)	(0.005)	(0.006)
ROAE_ADJ_SQ		0.002***			
		(0.000)			
VOLATILITY	−0.418***	−0.357***			
	(0.092)	(0.096)			
BETA_W			−0.163**		
			(0.075)		
TAIL				−3.322***	
				(0.699)	
BETA_E					−0.151*
					(0.077)
ROAE x VOLATILITY	−0.013**				
	(0.005)				
ROAE_ADJ_SQ x VOLATILITY		−0.001**			
		(0.000)			
ROAE x BETA_W			−0.001		
			(0.002)		
ROAE x TAIL				−0.097**	
				(0.041)	
ROAE x BETA_E					−0.001
					(0.003)
GDP_GROWTH	0.024***	0.026***	0.024***	0.025***	0.024***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
CDS	−0.088**	−0.104***	−0.111***	−0.093*	−0.114***
	(0.041)	(0.031)	(0.037)	(0.048)	(0.037)
Fixed effect	Bank/year	Bank/year	Bank/year	Bank/year	Bank/year
Observations	433	438	433	432	432
Number of ID	49	49	49	49	49
Adj. R-squared	0.8025	0.8219	0.7979	0.8080	0.7977

Robust standard errors in parentheses

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

Table 15.6 Results for the full model: M/B and different performance and risk measures after the introduction of bank business model and banking system structure variables

Dependent variable	*M/B*	*M/B*	*M/B*	*M/B*	*M/B*
Model	*1*	*2*	*3*	*4*	*5*
Constant	4.621	5.886	4.061	3.927	3.813
ROAE	0.021***		0.011***	0.019***	0.012**
ROAE_ADJ_SQ		0.002***			
VOLATILITY	−0.330*	−0.358*			
BETA_W			−0,083		
TAIL				−2.283**	
BETA_E					−0,081
ROAE x VOLATILITY	−0.020***				
ROAE_ADJ_SQ x VOLATILITY		−0.001*			
ROAE x BETA_W			−0.003*		
ROAE x TAIL				−0.163***	
ROAE x BETA_E					−0,003
GDP_GROWTH	0.030***	0.030***	0.031***	0.031***	0.031***
CDS	−0.103*	−0.127***	−0.107*	−0.107	−0.105*
SIZE	−0.368**	−0.380**	−0.335*	−0.345*	−0.331
INT	0.001	0.000	0.000	0.000	−0.000
NPL	0.002	0.001	−0.001	0.003	−0.001
TRAD	0.007	0.005	0.005	0.004	0.005
C5	0.032	0.034	0.032	0.035	0.034
BRANCH	0.295	0.208	0.303	0.309	0.315
C5 x BRANCH	−0.003	−0.003	−0.003	−0.003	−0.003
GOVT	0.004	0.006	0.006	0.002	0.006
D_AT	0.921**	0.542	1.028***	1.100***	1.056***
D_BE	0.804***	0.611**	1.076***	0.928***	1.060***
D_DK	0.564*	0.564	0.800**	0.717**	0.781**
D_FR	0.848**	0.769*	0.759*	0.791*	0.746*
D_DE	−0.332***	−0.478***	−0.211**	−0.164	−0.200*
D_GR	0.643**	0.283	0.899***	0.771***	0.904***
D_IE	0.402*	0.174	0.531**	0.546**	0.557**
D_NL	0.846**	0.676*	1.111**	0.977**	1.081**
D_ES	0.848***	0.766**	1.011***	0.960***	0.998***
D_SE	0.439	0.398	0.710***	0.614**	0.682**
D_CH	1.010*	1.056*	1.365**	1.210**	1.308**
D_UK	0.735	0.785*	0.884*	0.877*	0.851*
Fixed effect	Bank/year	Bank/year	Bank/year	Bank/year	Bank/year
Observations	365	368	366	366	363
Number of ID	47	47	47	47	47
Adj. R-squared	0.8536	0.8667	0.8424	0.8533	0.8417

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

The main result of the full model is that ROAE continues to have a positive impact on market-to-book value, while risk decreases market valuation. No statistically significant effect is found with respect to business mix factors or the other banking structure variables. Among bank characteristics, only size shows a negative and statistically significant sign. Hence, we find no evidence that large banks are valued more highly or that their valuations increase with size as a result of implicit subsidies from the regulatory safety net.

These results seem to indicate that the market does not take into account the banking business mix or national banking structure variables behind the company's fundamentals, although further in-depth analysis regarding this point is needed. Firstly, the joint use of business mix and fundamental variables could be subject to collinearity. The two sets of explanatory variables are interrelated (see the correlation matrix in Table 15.12 in the Appendix) and the results of the full model could be biased. Moreover, among the other effects, the firm fixed effects could have captured bank specificity in terms of business composition.

To overcome some of the problems posed by the contemporaneous use of fundamental and business mix variables, we adopt a two-step estimation procedure; the first step is represented by Model 1, while the second regression relates the intercept of the first model (with the inclusion of year and bank fixed effects) with a group of variables reflecting the business mix, some structural features of national banking systems, and the country dummies.

5.2 The Role and Meaning of the Intercept

The results of our specifications (Table 15.5) were used to define the intercept of the model, that is, the fraction of fitted M/B not related to banking business fundamentals. For each bank in the sample, the intercept was computed as follows:

$$\text{INTERC}_{i,t} = \alpha + \text{Dummy Year}_t + \text{DummyBank}_i$$

The relevance of the intercept's value can be detected by analysing the fraction of the intercept over the fitted M/B (Tables 15.7 and 15.8); for the whole sample and for the entire period, the mean (median) weight is 2.30 (1.60).[7]

[7] Tables 15.7 and 15.8 show the fraction of the intercept over the fitted value just for Model 2, as it presents the highest Adj. *R*-squared (Table 15.5). The application of the other models yields similar results. Data are available upon request to the authors.

Table 15.7 Relationship between the fraction of the intercept and the fitted M/B and ROAE by year

Year	*Mean*	*Median*	*SD*	*ROE avg*	*ROE median*
2006	0.88	0.89	0.11	17.86	17.21
2007	0.96	0.92	0.17	16.15	17.36
2008	2.80	2.34	1.85	4.44	7.58
2009	1.93	1.77	0.78	3.79	5.67
2010	1.89	1.74	0.74	4.01	7.07
2011	3.64	2.39	3.83	−5.93	5.38
2012	4.80	2.09	17.24	−1.53	3.45
2013	1.81	1.57	1.29	1.58	4.72
2014	1.73	1.49	0.98	1.80	5.28
2015	1.87	1.46	1.78	3.57	6.33
Total	2.30	1.60	5.98	4.46	7.02

Table 15.8 Relationship between the fraction of the intercept and the fitted M/B and ROAE by country

Country	*Mean*	*Median*	*SD*	*ROE avg*	*ROE median*
Austria	1.53	1.53	0.33	6.68	7.08
Belgium	4.05	2.01	4.03	1.94	6.95
Denmark	1.45	1.39	0.47	7.91	5.45
France	1.93	1.69	0.82	6.34	7.03
Germany	2.19	1.78	1.41	4.69	5.05
Greece	6.10	2.00	19.82	−10.12	5.15
Ireland	2.56	1.96	2.24	−5.50	4.36
Italy	2.48	2.17	1.32	0.77	3.33
Netherlands	1.74	1.44	0.75	9.94	10.30
Norway	1.20	1.13	0.32	13.67	13.22
Spain	1.60	1.54	0.62	8.88	7.54
Sweden	1.18	1.06	0.34	13.25	13.07
Switzerland	1.30	1.24	0.14	4.38	6.64
United Kingdom	1.82	1.47	1.50	5.80	7.46
Total	2.30	1.60	5.98	4.46	7.02

Both Tables 15.7 and 15.8 reveal that current ROAE and the intercept value are negatively correlated: (a) in years undergoing a sharp drop in the current ROAE, the intercept tends to represent a higher fraction of the fitted M/B ratio; (b) the same intercept behaviour is observed for countries with a lower ROAE. To explain the underlying rationale for

this evidence, we need to underline the difference between the business fundamentals of the theoretical model described in Sect. 2 and the empirical variables of the regression model (15.5).

In regression (15.5), expected performance and risk are proxied by their current counterparts (values). This measurement error could alter the intercept value (α). This can be easily understood by referring to a restricted version of regression (15.5), including only the performance covariate:

$$Y_{i,t} = \lambda + \beta_i E_t\left(PERF_i\right) + w_{i,t} \tag{15.5}$$

Let $E_t(PERF_i) = ROAE_{i,t} + \gamma_{i,t}$
where

$E_t(PERF_i)$ = expected long-term return on average equity of bank *i* at time *t*;
λ = intercept;
$ROAE_{i,t}$ = return on the average equity of bank *i* at time *t*;
$\gamma_{i,t}$ = spread between the expected long-term return and current ROAE.

If

$$\gamma_{i,t} = \gamma + z_{i,t}$$

where

γ = average spread between the expected long-term return and current ROAE;
$z_{i,t}$ = an idiosyncratic component for bank *i* at time *t*;

then

$$Y_{i,t} = \lambda + \beta_i\left(ROAE_{i,t} + \gamma + z_{i,t}\right) + w_{i,t}$$
$$Y_{i,t} = \lambda + \beta_i ROAE_{i,t} + \beta_i\gamma + \beta_i z_{i,t} + w_{i,t}$$
$$Y_{i,t} = \alpha + \beta_i ROAE_{i,t} + \varepsilon_{i,t}$$

where $\alpha = (\lambda + \beta_1 \gamma)$ is the estimated intercept (whose value depends on the true intercept, λ, and the average measurement error, γ) and $\varepsilon_{i,t}$ is the error term. If the current ROAE underestimates (overestimates) the long-term return, the γ coefficient is positive (negative) and α overestimates (underestimates) λ. In years/countries with contingent negative (positive) shocks in ROAE, the relevance of α as a value component increases (decreases).

5.3 Second-Step Analysis: Country, Size, and Business Mix Effects on the Intercept Value

In the second step, we evaluate whether the business model variables add information to the market in setting bank value. For this purpose, we regress the intercept on different banks' characteristics in terms of size and business mix (BM) along with some principal banking system characteristics (BK) and country dummies (CD) to verify the importance of national factors not captured in the first step. The five models (INTERC 1–5) reflect five different intercepts resulting from the first-step econometric analysis with its respective five models. The pooled OLS regression takes the following form (Table 15.9):

$$\mathrm{INTERC}_{i,t} = \alpha_{i,t} + \beta_1 \mathrm{SIZE}_{i,t} + \beta_2 \mathrm{BM}_{i,t} + \beta_3 \mathrm{BK}_{i,t} + \sum_{s=4}^{15} \beta_s \mathrm{CD}_{i,t} + \varepsilon_{i,t} \qquad (15.6)$$

The results underline that, in this case, the market also assesses how fundamentals are generated. The variables associated with the business mix point to the fact that banks with a more traditional business orientation have a value-sensitive component that is negatively assessed by the market. Banks characterized by a substantial fraction of net interest on operating income (INT) associated with high credit risk (NPL) are expected to achieve lower future profitability, as highlighted by the negative and significant coefficient of the regression. The bank market activity captured by the ratio of securities held for trading on total asset (TRAD) is never statistically significant. The size variable has a negative sign; hence we do not find evidence of a too-big-to-fail effect. Rather, the restrictive stance of regulation applied to large banks could explain the discount set by the market on the bank book value.

Table 15.9 Country, size, and business mix effects

Dependent variable	*INTERC*	*INTERC*	*INTERC*	*INTERC*	*INTERC*
Model	*1*	*2*	*3*	*4*	*5*
Constant	0.359	1.352	0.431	−0.192	0.640
	(1.483)	(1.253)	(1.638)	(1.479)	(1.617)
SIZE	−0.064*	−0.063*	−0.048	−0.045	−0.049
	(0.032)	(0.034)	(0.038)	(0.034)	(0.037)
INT	−0.004**	−0.003*	−0.005**	−0.003*	−0.005**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
NPL	−0.006**	−0.004	−0.005	−0.006**	−0.005
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
TRAD	0.001	0.001	0.002	0.001	0.002
	(0.004)	(0.004)	(0.005)	(0.004)	(0.005)
C5	0.070***	0.046***	0.067***	0.070***	0.065***
	(0.017)	(0.013)	(0.017)	(0.017)	(0.017)
BRANCH	0.256**	0.153*	0.241**	0.268**	0.223**
	(0.103)	(0.083)	(0.111)	(0.102)	(0.109)
C5 X BRANCH	−0.007***	−0.005***	−0.007***	−0.007***	−0.007***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
GOVT	−0.023***	−0.011***	−0.022***	−0.023***	−0.023***
	(0.004)	(0.003)	(0.005)	(0.004)	(0.005)
D_AT	0.322	0.154	0.281	0.396*	0.250
	(0.220)	(0.172)	(0.237)	(0.216)	(0.234)
D_BE	0.492***	0.291*	0.410	0.470**	0.360
	(0.177)	(0.173)	(0.279)	(0.201)	(0.301)
D_DK	0.731***	0.553***	0.688***	0.704***	0.688***
	(0.113)	(0.091)	(0.119)	(0.118)	(0.118)
D_FR	−0.042	−0.038	−0.111	−0.078	−0.119
	(0.132)	(0.128)	(0.144)	(0.122)	(0.140)
D_DE	−0.345***	−0.376***	−0.349***	−0.326***	−0.367***
	(0.095)	(0.086)	(0.106)	(0.096)	(0.106)
D_GR	1.022***	0.825***	1.017***	1.070***	1.004***
	(0.157)	(0.141)	(0.167)	(0.173)	(0.163)
D_IE	0.668***	0.378*	0.611***	0.701***	0.615***
	(0.221)	(0.214)	(0.223)	(0.226)	(0.220)
D_NL	0.728***	0.473***	0.779***	0.714***	0.749***
	(0.139)	(0.109)	(0.147)	(0.142)	(0.144)
D_ES	0.523***	0.405***	0.565***	0.532***	0.564***
	(0.097)	(0.092)	(0.108)	(0.098)	(0.107)
D_SE	0.890***	0.640***	0.910***	0.881***	0.914***
	(0.141)	(0.105)	(0.148)	(0.140)	(0.147)
D_CH	1.753***	1.372***	1.732***	1.746***	1.701***

(*continued*)

Table 15.9 (continued)

Dependent variable	*INTERC*	*INTERC*	*INTERC*	*INTERC*	*INTERC*
Model	*1*	*2*	*3*	*4*	*5*
	(0.247)	(0.195)	(0.265)	(0.255)	(0.260)
D_UK	0.477***	0.378**	0.456**	0.452**	0.462**
	(0.172)	(0.153)	(0.189)	(0.169)	(0.187)
Observations	395	395	395	395	395
R-squared	0.616	0.620	0.544	0.627	0.558
Adj. *R*-squared	0.596	0.600	0.519	0.607	0.534

Robust standard errors in parentheses

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

The variable GOVT signals that banks headquartered in countries where government intervention has occurred are negatively assessed; in other words, government intervention is interpreted as a negative signal of a bank's future perspectives.

Particularly important are the variables C5 and Branch, along with their interaction effect (C5 x Branch). The positive sign associated with C5 and Branch signals that an increase in bank concentration and in branch productivity fosters the fraction of market value captured by the intercept. Finally, controlling for the interactive effect between C5 and Branch, we find that as both the concentration ratio and branch productivity increase, the intercept decreases. In the case of high concentration and productivity, where room for a further boost and improvement is limited, the market recognizes and captures this circumstance by lowering the spread between current and future performance.

The value of the intercept also varies depending on the individual country dummies. This means that, even after controlling for macroeconomic and national banking structure variables, a country effect persists that is explained by the several institutional, fiscal, and economic factors that the market reflects in its bank value assessment.

6 Conclusions

In the years since the outbreak of the crisis, the financial markets have drastically reduced the market value of European banks. This impairment has been severe in the two periods of financial and sovereign debt crises, respectively. However, even in recent years, the market has continued to valuate banks with a substantial discount with respect to book values. At

the end of the considered time period, the median M/B value of the main European banks was still less than half the 2006 value.

This trend indicates that the crisis has had long-term effects on the activity of European banking systems as a result of macroeconomic, regulatory, and structural factors.

The economic context, with a combination of slow economic growth and historically low levels of interest rates, has reduced the prospects of banks in terms of intermediation volumes and interest margins. Regulation has even contributed to making bank performance prospects uncertain. Supervisory authorities have progressively restricted capital and liquidity requirements, constraining bank growth and diversification strategies and making the banking industry more vulnerable to competition from shadow banking. Moreover, the legacy of costly and widespread bank branch networks has hindered the improvement in efficiency that represents the best way to regain a sustainable level of profitability.

Even though these factors have affected the European banking industry as a whole, differences in market valuations across countries still persist. These reflect macroeconomic variables such as GDP growth and interest rate levels that, even in a general deflationary context, point to a different path and level of risk for European economies. As far as regulatory policies are concerned, national discretion in implementing homogeneous rules still persists and the country effect also reflects the pre-emptive action of the supervisory authority, which has been more pervasive in financial systems more vulnerable to credit and market risk. The structure of the banking system in some countries more than in others shows considerable room for improvement in terms of operational efficiency, especially through branch rationalization. Hence, the differing degree of overcapacity could affect how the market valuates the prospects of banks belonging to different countries.

This study follows the methodology employed in the market value literature, testing for the difference between book and market values of a significant sample of large European banks for the period 2006–2015.

Compared to the existing literature, we have focused on three different determinants of bank value: the business fundamentals expressed in terms of return on equity and risk measures, the size and business composition of banking activity, and the country effect as a result of macroeconomic and banking structure variables.

By adopting a two-step econometric analysis, our study separates fundamental from business mix variables. The results are in line with the expected effects. The market value reflects the different return and risk

measures with the expected sign and in a statistically significant way. The business mix indicators seem to convey information to the market regarding the prospects of bank profitability. In particular, banks that are more dependent on interest income and traditional intermediation are penalized more in terms of market value compared to those more oriented towards fee and commission income. Furthermore, banks with a high rate of non-performing loans pay a higher market discount on their book value. Hence, what is relevant for the market valuation is not only the level of current risk-return indicators but also the way in which performance is related to (originated by) banking business mix choices.

The negative sign and statistically significant value of bank total asset point to a negative effect of size on market value. This result contradicts the too-big-to-fail hypothesis and probably reflects the higher costs that the large banks have to pay in terms of more stringent regulation.

Lastly, our study has focused on the importance that country specificities take on when the market looks at both the macroeconomic context and the structural features of banking systems. GDP growth and CDS spread as a proxy of sovereign risk have the expected sign, being, respectively, positive and negative. Both variables have a direct effect on the fundamental market valuation model based on the growth in bank earnings and on the cost of capital. In the second step of our econometric analysis, we include banking system structure indicators and country dummy variables. Bank market concentration and branch productivity positively contribute to explaining the difference in market values. The market seems to attribute a premium to banks belonging to national banking systems that have prospects to increase efficiency through concentration or higher branch network productivity.

The study highlights how and to what extent the performances and strategies of European banks are still dependent on national contexts.

The European banking union needs an integrated and levelled playing field where banks can compete against each other, exploiting their strategic goals and their efficient way of achieving these goals. On the regulatory side, this implies that any further regulatory or policy actions at an EU and national level need to harmonize supervisory practices, remove tax and legal differences, and address structural obstacles that prevent banks from restructuring distressed debt. Moreover, a fair, competitive banking arena requires monetary and fiscal policies aimed at reducing the growth and sovereign risk gaps across countries that represent the most hazardous legacy of the crisis and that still severely impinge on bank performance and market valuation.

Appendix

Table 15.10 Composition of the sample by country

Country/bank	*TA 2015 (EUR billions)*
Austria (average)	**157.1**
Erste Group Bank AG	199.7
Raiffeisen Bank International AG	114.4
Belgium (average)	**241.3**
Dexia SA	230.3
KBC Group NV	252.4
Denmark (average)	**257.0**
Danske Bank A/S	441.2
Jyske Bank A/S	72.8
France (average)	**1122.4**
BNP Paribas SA	1994.2
Crédit Agricole SA	1529.3
Crédit Industriel et Commercial SA	254.0
Natixis	500.3
Société Générale SA	1334.4
Germany (average)	**737.9**
Aareal Bank AG	51.9
Commerzbank AG	532.6
Deutsche Bank AG	1629.1
Greece (average)	**85.4**
Alpha Bank AE	69.3
Eurobank Ergasias SA	73.6
National Bank of Greece SA	111.2
Piraeus Bank SA	87.5
Ireland (average)	**117.0**
Allied Irish Banks, Plc	103.1
Governor and Company of the Bank of Ireland	131.0
Italy (average)	**265.7**
Banca Monte dei Paschi di Siena SpA	169.0
Banca Popolare di Milano	50.2
BPER Banca SpA	61.3
Gruppo Banco Popolare	120.2
Intesa Sanpaolo SpA	676.5
Mediobanca – Banca di Credito Finanziario SpA	70.7
UniCredit SpA	860.4
Unione di Banche Italiane SpA	117.2
Netherlands (average)	**838.5**
ING Groep N.V.	838.5
Norway (average)	**270.1**
DNB ASA	270.1

(*continued*)

Table 15.10 (continued)

Country/bank	*TA 2015 (EUR billions)*
Spain (average)	**438.2**
Banco Bilbao Vizcaya Argentaria, SA	750.1
Banco de Sabadell, SA	208.6
Banco Popular Español SA	158.6
Banco Santander, SA	1340.3
Bankia, SA	207.0
Bankinter SA	58.7
CaixaBank, SA	344.3
Sweden (average)	**357.3**
Nordea Bank AB (publ.)	646.9
Skandinaviska Enskilda Banken AB (publ.)	272.5
Svenska Handelsbanken AB (publ.)	275.3
Swedbank AB (publ.)	234.6
Switzerland (average)	**566.3**
Credit Suisse Group AG	754.7
Julius Bär Gruppe AG	77.3
UBS Group AG	866.9
United Kingdom (average)	**1305.8**
Barclays Plc	1519.8
HSBC Holdings Plc	2218.6
Lloyds Banking Group Plc	1094.6
Royal Bank of Scotland Group Plc	1106.5
Standard Chartered Plc	589.7
Total (average)	**523.9**

Table 15.11 Variable definition and sources

Variable name	*Definition*	*Source*
ROAE	Net income divided by average equity over the year	SNL Financial
ADJ_ROAE_SQ	Square of ROE, scaling negative values to zero	SNL Financial
Equity volatility	Annualized standard deviation of daily stock returns	Thomson Reuters Datastream
Tail risk	The negative of the average return on a bank's stock over the 5% worst return days in the year	Thomson Reuters Datastream
BETA_W	Market model Beta with respect to the world index	Thomson Reuters Datastream
BETA_E	Market model Beta with respect to the Euro Stock index	Thomson Reuters Datastream
GDP_GROWTH	Real GDP growth rate	Eurostat
CDS	Sovereign CDS spread	Thomson Reuters Datastream
C5	Total asset of the five largest institutions over country total asset	ECB
BRANCH	Ratio between country banking total asset over total number of bank branches	ECB
GOVT	Value of financial instruments subscribed by government in financial institutions as a fraction of GDP	Eurostat
SIZE	The natural logarithm of total assets (in euro 000)	SNL Financial
INT	Ratio of net interest margin over operating income	SNL Financial
NPL	Ratio of non-performing loans over gross loans	SNL Financial
TRAD	Trading assets as a fraction of total assets	SNL Financial

Table 15.12 Correlation matrix

	ROE	*ROE_ ADJ_SQ*	*VOLATILITY*	*BETA_W*	*TAIL*	*BETA_E*
ROE	1					
ROE_ADJ_SQ	0.5306*	1				
VOLATILITY	−0.4867*	−0.3194*	1			
BETA_W	−0.1476*	−0.2042*	0.3726*	1		
TAIL	−0.4693*	−0.2868*	0.9104*	0.3293*	1	
BETA_E	−0.2114*	−0.2629*	0.4304*	0.9361*	0.3954*	1
GDP_ GROWTH	0.3463*	0.3146*	−0.4339*	−0.1358*	−0.4383*	−0.1982*
CDS	−0.5545*	−0.4472*	0.5923*	0.1779*	0.5670*	0.2375*
SIZE	0.0828	−0.025	−0.1737*	0.2427*	−0.0922*	0.2058*
INT	−0.2633*	−0.1167*	0.2683*	−0.0718	0.3391*	0.0187
NPL	−0.4777*	−0.3187*	0.4155*	0.0957*	0.3553*	0.1740*
TRAD	0.1071*	0.0183	−0.1869*	0.1953*	−0.1500*	0.1187*
C5	−0.0771	0.0619	0.1104*	−0.0675	0.1035*	−0.08
BRANCH	0.1212*	0.0611	−0.2433*	0.0267	−0.2326*	−0.0542
GOVT	−0.2196*	−0.2584*	0.3176*	0.1266*	0.3282*	0.1048*

*Significant at 0.05 level

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GDP_ GROWTH	*CDS*	*SIZE*	*INT*	*NPL*	*TRAD*	*C5*	*BRANCH*	*GOVT*
1								
−0.5662*	1							
0.1138*	−0.2289	1						
−0.2125*	0.3438*	−0.2714*	1					
−0.1561*	0.5457*	−0.2390*	0.3109*	1				
0.1323*	−0.3227*	0.7279*	−0.4759*	−0.3676*	1			
−0.0057	0.1836*	−0.0283	0.0403	−0.0289	0.0282	1		
0.0856	−0.2802*	0.3300*	−0.4247*	−0.4100*	0.3841*	−0.1323	1	
−0.0766	0.3495*	0.0514	0.3311*	0.3023*	−0.0155	0.0643	−0.1522*	1

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PART IV

Contemporary Issues

CHAPTER 16

Assessing and Measuring Banking Culture

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1 Introduction

Banks are major players in the process of creating money and in mobilizing resources from savers to investors. Their participation in these processes creates value depending on their efficiency and ability to manage risk (Stulz 2015). It is a business with high volumes and low margins, in which pressure from competitors and shareholders to obtain short-term results and continuously increase profitability and revenue leads to taking excessive risks with a limited capital base.

Factors such as the moral risk associated with size ('too big to fail'), public guarantee of deposits (Brewer and Jagtiani 2013; O'Hara and Shaw 1990) and monetary policy (Jiménez et al. 2012) feed the accelerated expansion of bank credit, thereby increasing the risk of bankruptcy. None of this is unknown, or new. The novel argument in the debate is that the

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deep roots of the financial crisis are to be found in the poor control of risk, which would be related not so much to the procedures or models used in its management but to a more abstract and intangible dimension of organizational behaviour, namely, the risk culture of financial institutions.

Prior knowledge about behaviours associated with risk-taking and the impact of such on organizational results is mainly based on the effect of incentives and past performance (Bromiley 2010). The organizational context (risk culture and risk management practices) can also have a high predictive value as regards the risk assumed by the organization. However, prior research tells managers very little about what they have to do to manage the practices and the context within which individuals take decisions affecting their organization's risk (Bromiley and Rau 2014). It should also be borne in mind that, compared to non-financial activities, the decisions taken by employees of financial institutions can have a very significant influence over their organization's risk (Stulz 2015).

Following this introduction, Sect. 2 describes the historical context and the beginnings of the debate on the role of banking culture in the financial crisis. Section 3 is devoted to clarifying the concept of banking culture in the field of studies on organizational culture. It focuses primarily on what is called 'risk culture'. Section 4 presents three possible methods for assessing and measuring banking culture: the framework proposed by the Financial Stability Board (FSB 2014) for assessing risk culture; the De Nederlandsche Bank's experience in supervising the culture and behaviour of financial institutions (DNB 2015); and, finally, the construction of instruments to measure the organizational climate related to risk management. This chapter ends with the conclusions drawn and the list of bibliographical references consulted.

2 Context: The Debate on Banking Culture

Between 2008 and 2009, several documents and reports were published on the corporate governance of the banks in which we can find the first allusions to banking culture, especially what is known as 'risk culture', either recognizing the need for all employees to be aware of the impact of their behaviour and actions on the organization,[1] or requiring greater

[1] This is reflected in the Walker report: *A Review of Corporate Governance in UK Banks and other Financial Industry Entities* (November 2009, p. 92). In this 184-page report, the term 'risk culture' appears on one single occasion.

focus on risk, with the recommendation being to cultivate a "robust and omnipresent" risk culture, fully integrated within the organization, that makes everyone, in all areas and activities, responsible for risk, not just the control functions.[2] However, these first reports do not include a negative appreciation of the risk culture of financial institutions.

In the report entitled *Reform in the Financial Services Industry: Strengthening Practices for a Stable System*,[3] published by the Institute of International Finance (IIF 2009)—we do find, however, negative assessments of risk culture in the sector (weak, dysfunctional) or of banking culture (sales-driven), as well as references to the need for a change in culture in the industry. It is stated that "it became apparent that risk culture played an extremely important role in determining whether firms were more or less successful in managing their risks during the crisis" (IIF 2009, p. 31).

Seen in retrospect, this exercise in self-criticism did not help much. The scandal of the manipulation of the London Interbank Offer Rate (LIBOR)[4] in 2012 supposed a real shock to the industry. Given the magnitude of the scandal, the British prime minister convened a parliamentary committee of inquiry on the professional standards and culture of British banking. The parliamentary commission published its report entitled *Changing Banking for Good* in June 2013. The report describes a culture characterized by very poor standards of behaviour.

Barclays in turn commissioned Anthony Salz to draw up an independent report to assess the entity's culture. The commissioning of this report formed part of a profound process of change and cultural reform initiated in 2012, as a result of the LIBOR scandal. The report (Salz 2013) constitutes both an in-depth and critical review of the entity's culture in its desperate attempt to survive in the financial crisis without state aid.

[2] *Final Report of the IIF Committee on Market Best Practices* (July 2008, Principle I.i., p. 31), of the Institute of International Finance. The term 'risk culture' appears 15 times in a report of 182 pages in length.

[3] In this 201-page report, the term 'risk culture' appears 126 times, and the term 'culture' 209 times.

[4] This scandal led to the investigation of Barclays, UBS, Citigroup, JPMorgan Chase, Royal Bank of Scotland, Société Générale and Deutsche Bank for manipulating the LIBOR, a practice that traders regularly carried out before the start of the crisis. In 2013, another new scandal came to light in the United Kingdom. Traders continued to manipulate exchange rates, this time the FOREX, and the names of the banks involved were repeated: Citibank, JPMorgan Chase, UBS, Royal Bank of Scotland, HSBC, Bank of America and Barclays.

In Great Britain, malpractice in the retail marketing of payment protection insurance (PPI) also reached proportions of scandal as of 2009, when financial institutions had to deal with a barrage of complaints by customers to the Financial Services Authority (FSA). This product offers a high profit margin, the reason for which banks put pressure on their commercial networks and encouraged its sale linked to the granting of credit.[5] In 2011, a court ruling dismissed the appeal filed by the British Bankers' Association against the new procedure adopted by the FSA in 2010 to address the high volume of complaints which, among other measures, provided that insured persons who had not raised any claim should also be compensated for any damages caused.

The Salz report includes a very revealing fact: between 2002 and 2007, the FSA imposed fines on the financial sector amounting to 78 million pounds, while in the period 2008–2014, the total amount of the fines amounted to 627 million pounds, of which 312 million corresponded to 2012. British banks would have had to provision 53,200 million pounds between 2000 and 2015 to meet their responsibilities, 37,800 million of which is estimated to correspond to PPI mis-selling.[6]

On the other side of the Atlantic, it is estimated that the fines and sanctions imposed on financial entities in the United States between 2008 and 2014 would amount to well over 100 billion dollars (Dudley 2014).[7] In 2013, the US Department of Justice reached an out-of-court settlement with JPMorgan Chase & Co,[8] in which the entity committed to pay 13,000 million dollars to settle the lawsuits filed for fraud and malpractice in the design, development, marketing and insurance of assets linked to subprime mortgages, without this supposing the exemption of its managers and employees from possible criminal liability. Similar agreements were established with other entities (Bank of America, Citigroup, UBS).

[5] An employee of RBS reports that his quarterly commissions depended on how many PPI insurance policies he sold. He was under intense pressure to meet his targets under threat of dismissal (*The Guardian*, "PPI Exposé: How the banks drove staff to mis-sell the insurance", November 8, 2012). The report by Spicer et al. (2014), *A Report on the Culture of British Retail Banking*, provides numerous examples of malpractices and testimonials from employees about the pressures they received, as in the case of 'Cash or Cabbages day'.

[6] Source: New City Agenda, http://newcityagenda.co.uk/the-top-10-retail-banking-scandals-50-billion-reasons-why-shareholders-must-play-a-greater-role-in-changing-bank-culture/

[7] S. Chaudhuri, "Banks' legal tab still running higher", *Wall Street Journal*, 23/07/2014.

[8] JPMorgan Chase & Co undertook a process of change and reform equivalent to that of Barclays, in which cultural aspects have major relevance. See *How we do business – The report* (JPMorgan Chase and Co 2014).

According to data from the *Conduct Costs Project Report* (CCP Research Foundation 2017),[9] drawn up by the Conduct, Culture and People Research Foundation on a sample of 20 large global banks, between 2012 and 2016, these entities would have incurred conduct costs totalling an amount of 264,030 million pounds. Twelve out of the 20 entities exceeded the threshold of GBP 10 bn, while the provisions of this group of entities at the end of 2016 remained above GBP 60 bn. Conduct costs mean all costs borne by a bank as a consequence of misconduct or, more widely, of the crystallization of 'conduct risk' (Benedict 2015; Stears and McCormick 2015). Conduct risk refers to risks "attached to the way in which a firm and its staff conduct themselves. As such, it includes how customers and investors are treated, mis-selling of financial products, violation of rules and manipulation of markets" (ESRB 2015). From a micro-prudential supervision perspective, conduct risk is a subset of operational risk. However, from a conduct supervision perspective, misconduct risk concept is broader as it includes not only the risks to which banks may be exposed as a result of their poor business conduct, but also the risks to which such conduct exposes their customers and the whole society, for its potential systemic impact (ESRB 2015).

The crisis of culture and standards of conduct in banking also led to important regulatory changes. In 2013, the British FSA was replaced by the Prudential Regulatory Authority (PRA) and the Financial Conduct Authority (FCA). The former depends directly on the Bank of England and safeguards the stability of the British financial system, ensuring the solvency and liquidity of its financial institutions. The latter regulates the sale of financial products, investment management and the offer of financial services. The regulatory structure adopted by the United Kingdom is similar to that of the United States, where the Consumer Financial Protection Bureau (CFPB), set up in 2011, is intended to protect consumers from unfair, deceptive or abusive practices and to take legal action against those entities that break the law.

This reorganization of the institutions regulating the provision of financial services is due to a new approach that, among other changes, entails

[9] This CCP Research Foundation project seeks to quantify the direct costs of misconduct in the banking sector. These costs include fines or comparable financial penalties imposed on the bank by regulators, compensation to customers and any payments made by a bank for misconduct and litigation arising from court, tribunals or settlement proceedings; additionally, the bank's provisions are also included. For a more detailed classification of conduct costs, see: http://conductcosts.ccpresearchfoundation.com/conduct-costs-definition

greater protection for investors and banking customers and a greater accountability for managers and financial institutions. In this respect, the British regulator has gone particularly far with the approval of the *Senior Managers Regime*, which considers severe prison sentences for senior managers who cause the collapse of their entities by reckless management.

The forward-looking supervision of banking culture aimed at anticipating and preventing any possible excessive risk-taking is another important novelty. Its motivation is twofold. First, the high amount of fines and compensation in the industry has a very significant impact on the income statements of the affected entities, supposing a risk to stability when it affects systemic entities. It also generates uncertainty about the quality of the controls or their business model, solvency and profitability (McNulty and Akhigbe 2015). Second, bank failures and scandals associated with malpractice have systemic effects insofar as they create a crisis of confidence in the sector and limit the creation of bank money available for the granting of credits. At this point, misconduct risk becomes a matter of concern from the macro-prudential supervision approach, which aims to ensure the stability of the financial system as a whole (Parajon Skinner 2016).

It is the supervisor's understanding that if poor banking culture may be at the root of future problems, it must preventively intervene on this culture to avoid any such problem (DNB 2015; IMF 2014; Nuijts and de Haan 2013). Preventive intervention on culture is based on the principle of self-regulation of risk culture: supervisors understand that they should not regulate or prescribe organizational culture, although they do deem it necessary to supervise it and consider that they have the competence to do so given the risks involved vis-à-vis stability (DNB 2015). Each entity must act proactively by monitoring, assessing and correcting its deficiencies. If significant risks are appreciated, the supervisor may require more capital as a buffer, or, otherwise, reduce capital requirements when an appropriate culture is perceived (Parajon Skinner 2016). Accordingly, some entities have begun to create their own instruments to measure and study their culture. In the United Kingdom, following the recommendation made by the parliamentary committee in its report *Changing Banking for Good*, the main financial entities created the Banking Standards Board in order to jointly raise standards of conduct and competition in the banking sector. The Group of Thirty report (2015) also provides an extensive study of the shortcomings of pre-crisis banking culture and identifies and proposes a series of good practices to promote and maintain a strong banking culture.

In July 2015, the Basel Committee on Banking Supervision (BCBS) published the latest version of its guidelines for the corporate governance of banks (BCBS 2015). The introduction to the document states that national supervisors should strengthen their capacities to assess the risk culture of banks and participate more often at the meetings of bank boards and on their risk and audit committees. The first principle of corporate governance of these guidelines states that:

Principle 1: Board's overall responsibilities. *The board has overall responsibility for the bank, including approving and overseeing management's implementation of the bank's strategic objectives, governance framework and corporate culture.*

3 Organizational Culture and Banking Culture

Various academic disciplines (psychology, anthropology, sociology, organizational behaviour, economics and strategic management) converge in the research on organizational culture, the aim being to define this concept, determine its antecedents and analyse its consequences. Its study began in the 1980s, the paper by Pettigrew (1979) being a seminal reference. Schein (1984, p. 3) defines the culture of a group as "a pattern of shared basic assumptions learned by a group as it solved its problems of external adaptation and internal integration, which has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems". Schein (1989) also coined the terminology characterizing the different levels of organizational culture (artefacts, espoused values and basic assumptions and values), as well as highlighting the importance that has traditionally been given to leadership in the shaping and evolution of culture (O'Reilly et al. 2014).

Organizational culture is an entity that has been built throughout the history of an organization, endowing it with a sense of permanence or collective identity, influencing the behaviour of its members and fulfilling an integrating role. It brings together a set of beliefs, values, rules, precedents, expectations and anecdotes shared by the members of a group that define the way of doing things in said group and serve as a guide to judge the behaviour of its members, resolve disputes and maintain internal cohesion. It is the 'glue' that keeps group members together and stimulates their commitment to the group. Guiso et al. (2015a, b) show that

corporate culture is determined by the top management of the company and that it can foster cooperation.

Culture has been analysed in economic terms as part of an efficient system of implicit contracting within the company (Camerer and Vepsalainen 1988) or as a signal to attract a certain type of staff, reducing information asymmetries in the field of labour relations (Kreps 1990). Hermalin (2001) models the decision on the strength of corporate culture as a choice between high fixed costs and low marginal costs (a strong culture) or low fixed costs and high marginal costs (a weak culture). In this model, competition affects the benefit of developing a strong culture. Culture also affects transaction costs and conditions the efficiency of transaction governance structures (Handley and Angst 2015).

The strategic literature has also highlighted the value of organizational culture and its contribution to competitive advantage (Barney 1986; Fiol 1991; Hall 1992). More recently, O'Reilly et al. (2014) note that organizational culture is related to the attitudes of employees and also to organizational results. It can contribute to excellent organizational performance (Kotter and Heskett 1992; Gibbons and Henderson 2013), but it can also be dysfunctional (Collier 2016). It is not a very ductile or malleable material; it neither changes nor mixes well, as shown by the poor results in mergers between companies with major cultural differences (Chatterje et al. 1992). One of the first papers on organizational culture already highlighted the same problem, the difficulty of cultural change (Jaques 1951). Moreover, it may be said that the fact it does not change is functional in itself: culture is useful only if it is persistent (Collier 2016). Organizational culture provides identity, stability, cohesion and commitment. It could hardly provide these intangibles if it were a changing reality. Culture is formed and changes organically, slowly, influenced by the environment and history of the organization, by the strong personality of some of its most decisive leaders or by events that have supposed important changes (mergers, acquisitions), which have necessarily led to a rethinking of how (and why) things are done.

The study by Fahlenbrach et al. (2012) provides evidence of this persistence. These authors note that the banks with the poorest performance as regards their results during the 1998 crisis are also those that performed the worst during the recent financial crisis. This behaviour demonstrates the existence of specific cultural characteristics in each bank that persist over time and help explain their level of risk (Stulz 2015).

Studies on organizational culture in the banking sector have begun to be published in recent years. A good number of these analyse the extent to which bank managers and employees behave unethically or illegally and the possible motivations for such behaviour. Undoubtedly, the seminal work in this line of research is the quasi-experimental laboratory study conducted in 2012 by Cohn et al. (2014). These authors note that, in principle, bank employees do not behave in a more dishonest way than other people. However, if they are asked about their professional activity before the experiment commences, the lack of honesty increases. The authors attribute this effect to the prevailing culture in the financial industry, which leads employees to behave dishonestly. An alternative explanation would be that put forward by Tirole (1996). This author argues that there are few incentives to behave honestly when one belongs to a group with a poor collective reputation. Therefore, when banking employees are asked about their professional activity, their propensity to behave dishonestly increases, not because they are conditioned by the organizational culture in their industry but because they are less motivated to behave honestly once the job they do is known.

Van Hoorn (2015) analyses organizational culture in the financial industry by comparing how personal traits and values influence the success of professional careers in banking compared to other industries. This author does not report significant differences, a finding that does not fit well with the idea of professionals seeking their personal profit at the expense of customers. Van Hoorn concludes that banking culture does not promote unethical behaviour to a greater extent than other industry sectors. Other papers along these same lines include Boddy (2011), who identifies managerial behaviours that qualify as authentic corporate psychopathies, Santoro and Strauss (2012) and Werner (2014).

Song and Thakor (2017) draw up a formal model of banking culture. In their modelling, which involves designing an optimal incentive contract to promote the desired allocation of managerial effort to security or growth objectives, the bank and the manager may have different expectations about the priority of growth or risk control. By introducing culture, these expectations are adjusted for, and the excessive focus that market competition places on growth is also reduced. The effect spreads to other banks that may not have this emphasis on risk culture. The larger the capital base of the entity and the smaller the public safety net, the stronger the spillover effect of the culture will be.

Lo (2015) proposes a framework for analysing culture in the context of financial practices and institutions. According to Lo (2015), "the Gekko effect highlights the fact that some corporate cultures may transmit negative values to their members in ways that make financial malfeasance significantly more probable". This author concludes that the culture can be changed to improve risk management through behavioural risk management.

Bushman et al. (2018) report that the materialism of bank CEOs (valued through external signs of wealth and consumption) has grown significantly between 1994 and 2004, a fact that they attribute to the deregulation of the sector, which had a considerable influence on the corporate culture of banks and their risk management.

We conclude this review of the empirical evidence on banking culture and its role in the crisis by referring to the study published by the International Monetary Fund in Chap. 3 of its report on global financial stability in October 2014 (IMF 2014). The study analyses the relationship between risk-taking in banks, their ownership and governance structure and the remuneration policies of their CEOs. Carried out on more than 800 banks in 72 countries, it posits the hypothesis that, in addition to these factors, organizational culture also plays a role in explaining risk-taking. The previous evidence highlighted in the aforementioned IMF report suggests that a strong risk culture is associated with less risk-taking (Keys et al. 2009; Aebi et al. 2012; Fahlenbrach et al. 2012; Ellul and Yerramilli 2013).

The IMF study (2014) defines corporate culture as a set of unwritten rules or norms that are widely accepted in the organization and determine which conducts or behaviours are acceptable and which are not. Citing Sorensen (2002) and Stulz (2014), it argues that, when there are no explicit rules or incentives that lead to correct decision-making, corporate culture acts as a guide to the decision-making process, complementing the bank's capacity and ability to manage risk. The study concludes that corporate culture has a considerable influence on risk-taking.[10] For example, the CEO's professional background (considered an imperfect and indirect

[10] One of the main limitations of this type of study is that both the explanatory variables (e.g. indicators of corporate governance and compensation schemes for the CEO) and the dependent variables that measure the risk taken by banks are in turn affected by the business model and culture of each entity. Additional empirical tests carried out in this same study by the IMF suggest that institutional factors (regulatory, investor protection) would explain about half of the variance unexplained by its model, while the other half would be attributable to specific characteristics of each organization, such as its business model or corporate culture.

proxy of the entity's risk culture) is clearly associated with risk-taking in the bank. When the CEO comes from the field of commercial or retail banking or has previous experience in the area of risks, the bank tends to take fewer risks. The opposite occurs when previous professional experience is linked, for example, to investment banking. This result suggests that the pattern marked from above (the 'tone from the top') is important when determining risk-taking in the organization.

4 Assessing and Measuring Banking Culture

4.1 Risk Culture in Banking: FSB Indicators (2014)

Taking the definition of safety culture found in Wiegmann et al. (2002) as a reference, we can define the risk culture of an organization as the enduring value that reflects the priority given to controlling risk by any of its members, in every group and at every level of the organization. It refers to the degree to which individuals and groups are personally committed to risk management and take personal responsibility for the risks they take, in addition to acting to preserve, raise and communicate their concerns about risk. It furthermore refers to the efforts they make to actively learn, adapt and modify their behaviour, based on lessons learned from mistakes, behaviour that is rewarded in accordance with these values.

The report by the Institute of International Finance (IIF 2009, p. 36) defines risk culture as "the norms and traditions of behavior of individuals and of groups within an organization that determine the way in which they identify, understand, discuss, and act on the risks the organization confronts and the risks it takes". Risk culture influences decision-making at all levels of the organization, and this decision-making reveals the values that prevail and take priority in it with regard to risk. According to this IIF report (2009), a robust risk culture would be one that allows an organization to successfully implement its strategy within the appetite for the risk it has established.[11] This appetite for risk will be as effective as the formal and informal network in which it spreads and which shapes the decision-making of employees. It is not enough to implement procedures and control

[11] Risk appetite can be defined as the amount and type of risk that a company can manage and want to assume to achieve its objectives. It is a different concept to risk capacity, which refers to the maximum amount of risk that it can assume based on its situation of capital, liquidity, debt capacity and legal limits (IIF 2009).

processes; it is necessary for employees to be aware of the risks they are taking, for them to weigh them, to adopt the correct decisions and to raise all the appropriate objections, all these being the key attributes of a robust or strong risk culture.

We tend to think that a weak risk culture is one that has shortcomings in risk governance, in the risk management skills of its employees or in the instruments or methodologies used to manage risks. The weakness of the culture, the evidence that the roots of the problem are deeper, however, can be seen in certain dysfunctional organizational behaviours (at least in relation to risk): feeling immune to risk, tolerating employee behaviour aimed at deceiving or beating the system (the regulator, internal controls, algorithms), concealing problems, denying the facts or reality, killing the messenger who brings bad news (and also spoilers), passivity and indifference to certain types of behaviour, signs and alerts, staying in the comfort zone or feeling that one works more for oneself than for the organization are some examples of this type of behaviour (IIF 2009).

Power et al. (2013) conducted a field study of 15 financial institutions (banks and insurance companies). They noted that, in the post-crisis period, there has been a tendency to centralize control over risk and to formalize control processes by implementing structures based on the three lines of defence and creating new units of internal risk supervision. They see risk culture as the outcome of a series of trade-offs and tensions across a number of dimensions:

- Trade-off 1: Balancing the commercial and regulatory authority of the risk function.
- Trade-off 2: Balancing the use of formal organizational arrangements with interactive approaches to risk management.
- Trade-off 3: Balancing risk support for disciplined business decisions against the risks of imposing excessive controls.
- Trade-off 4: Balancing the use of advisors with 'going it alone'.
- Trade-off 5. Balancing regulator and regulated culture.
- Trade-off 6. Balancing ethics and incentives as levers over behavioural change.

Sheedy et al. (2014, 2015) studied risk culture in six banks in Australia and Canada. These authors state that a strong risk culture (e.g. one that does not tolerate non-compliance with rules and procedures) is generally associated with desirable risk behaviours (speaking up) while avoiding undesirable behaviours (e.g. manipulating controls).

The aforementioned study by the IMF (2014) acknowledges the difficulty of measuring risk culture but suggests using the indicators proposed by the FSB in the document entitled *Guidance on Supervisory Interaction with Financial Institutions on Risk Culture*—hereinafter FSB (2014)[12] as possible measures of a sound risk culture. Published in April 2014, this FSB document contains a series of guidelines to help supervisors in their assessment of the risk culture of financial institutions, so that they could approach said assessment from a more analytical and formal perspective.

The FSB (2014) document describes risk culture as the "norms, attitudes and behaviours related to risk awareness, risk taking and risk management". An effective risk culture promotes sound risk-taking and addressing of emerging risks or risk-taking activities that are consistents with the institution's desired risk appetite. It must also ensure that employees conduct business in a legal and ethical manner. The institution must create an environment that promotes integrity, including focusing on fair outcomes for customers.

The document identifies four areas or facets of corporate culture that should be analysed to assess the strength and effectiveness of risk management in a financial institution. As there are interdependencies and complementarities between them, they should accordingly be analysed jointly. The guide also establishes a series of specific performance indicators for each area. These four areas are:

- Tone from the top.
- Accountability.
- Effective communication and challenge.
- Incentives.

4.1.1 Tone from the Top

Reckless risk-taking by some employees or their illegal behaviours should not be seen as isolated actions but as evidence of a failure in the governance and management of institutions to provide a suitable orientation to their risk culture. The FSB paper highlights the importance of the board and senior management in setting the tone at the top. The corporate

[12] The edition of the FSB Guide (2014) met the recommendation made to supervisors in the FSB Progress Report to the G20 and to central bank governors, of November 2012, in the sense of being more active in the assessment of the risk culture and in the exploration of ways to assess misconduct risk, especially in Global Systemically Important Financial Institutions (G-SIFIs). In this document, entitled *Increasing the Intensity and Effectiveness of SIFI Supervision*, the term 'culture' is mentioned 32 times in 32 pages.

governance guidelines for BCBS banks (BCBS 2015) also attribute responsibility to the board of directors for the corporate culture of financial institutions.

A sound risk culture begins at the top, and the cultural weaknesses usually start in the boardroom ('a fish rots from the head down'). The board and senior management must lead by example, systematically supervising the prevailing risk culture and proactively addressing any identified areas of weakness or concern. They should show that their behaviour and management of risk are in accordance with the espoused core values of the organization and with its appetite for risk.

Setting the tone from the top also implies encouraging and supporting openness to challenge; assessing whether the espoused values are communicated and proactively promoted at all levels, as well as assessing whether the institution's risk appetite framework is clearly understood and effectively embedded in the decision-making and operations of the business, ensuring common understanding and awareness of risk.

Finally, the board and senior management play an important role in the assessment and communication of lessons learned from past experiences that are seen as an opportunity to enhance the institution's risk culture.

4.1.2 Accountability

Accountability means that a policy of risk ownership has been established in which employees are held accountable for their actions and are aware of the consequences of not adhering to the desired behaviours towards risk. Appropriate escalation and whistleblowing procedures are in place and are expected to be used by employees to support effective compliance with the risk management framework. Employees also have mechanisms to raise and report concerns when they feel uncomfortable about products or practices, even when they are not making a specific allegation of wrongdoing.

The absence of accountability means, for example, that direct responsibilities regarding risks are not clear or that behaviours contrary to the organization's principles and values are tolerated if they yield a short-term profit; excusing such behaviour, even rewarding those responsible, instead of showing them the inconvenience of such behaviour; not reacting when variations in risks or new emerging risks are reported; not reacting either to breaches of internal or external norms or to frequent breakdowns in control procedures or risk limits.

4.1.3 Effective Communication and Challenge

The indicators contained to be found in the FSB Guide (2014) in this area aim to assess to what extent the decision-making processes in the organization promote a range of views, allow for testing of current practices and stimulate a positive, critical attitude among employees and an environment of open and constructive engagement.

An effective culture creates an environment in which people speak clearly and are comfortable about expressing their views without fear of retaliation. An environment of open communication and effective challenge means that different interests, criteria and points of view are considered in the decision-making process; that is, differences are put on the table and debated. The opposite is an organization in which there is no communication, one which promotes passivity by suffocating and subduing alternative visions and which does not foster effective change, staying in the comfort zone (IIF 2009).

In this section, the guidance also includes the stature and independency of control functions as an indicator:

- Do they have the same stature as the business lines and are proactively involved in all relevant risk decisions and activities?
- Do they have an appropriate direct access to the board and senior management?
- Do they have sufficient stature not only to act as advisors but to effectively exert control tasks with respect to the institution's risk culture?

4.1.4 Incentives

The recent financial crisis shows how the incentives linked to short-term profit, without any adjustment to risk, combined with a highly flexible, fluid and non-transparent labour market, motivated excessive and reckless risk-taking (Bahgat and Bolton 2014; Bolton et al. 2015; Brunnermeier 2009; DeYoung et al. 2013; Ellul and Yerramilli 2013). They also led to ignoring the interests of clients, to the inappropriate marketing of products or services and to the breach of legal norms, internal procedures and ethical codes.

Human resource policies and practices express the incentive structure that motivates individual behaviour much better than any statement of principles or values. Accordingly, in this last section, the FSB Guide (2014) includes a set of indicators that aim to assess whether the compensation structure and performance metrics consistently support the institution's

desired core values, drive the desired risk-taking behaviours, risk appetite and risk culture of the financial institution and encourage employees to act in the interest of the greater good of the company, including treatment of customers, cooperation with internal control functions and supervisors, respect of risk limits and alignment between performance and risk.

It also stresses that an assessment should be made as to whether the succession plans in key management positions consider experience in risk management as a criterion for promotion, and whether the individuals who have responsibilities related to the positions of chief risk officer, chief compliance officer and chief audit executive can be considered as potential candidates for executive positions, including that of chief executive officer.

Finally, the supervisor should assess whether the plans related to talent development (development plans, job rotation and training programmes) contribute to improving the understanding of key risks, the essential elements of risk management and the institution's culture, introducing risk awareness to the decision-making process of the business line and effective challenge and open communication.

4.2 The DNB (De Nederlandsche Bank) Approach to Culture Supervision

The DNB has been a pioneer in this field, developing a new approach to the prudential supervision of banking behaviour and culture since 2010 based on insights from behavioural economics. To this end, it has created a specialized centre (Expert Center for Governance, Behavior and Culture) made up of experts in organizational psychology, organizational change and corporate governance, which develops new intervention methods. The DNB does not predefine what characterizes a good or bad culture but understands that each corporate culture has its own balance of virtues and risks. Its role as supervisor is to identify these risks and prevent them from materializing by urging the financial institution to mitigate them. Its work has focused primarily on two areas:

1. The conduct of the governing bodies of financial entities and their observable culture.

An entity may have an adequate corporate governance structure yet; nevertheless, the prevailing conduct and culture in the management and governing bodies may be completely dysfunctional. In this area, the DNB

experts observe and study the meetings of the management and supervisory boards on-site to assess their effectiveness and identify situations and patterns of behaviour that could create potential risks, like docility of board members or overconfident and dominant CEOs whose proposals and actions are not sufficiently challenged, ineffective boards or a management board taking ill-prepared decisions as a result of 'groupthink' or the strain for consensus. They use different methodologies such as desk research, surveys among staff from all organizational levels and interviews with members of the executive board, supervisory board and other tiers of management.

Some points for improvement identified in the workings of the management and supervisory boards have to do with the improvement of group dynamics (the underlying relationships between and among senior managers and board members); more accurate and balanced decision-making (e.g. following step-by-step decision processes); organizing a constructive conflict and challenging process in a structural way (such as the appointment of a 'devil's advocate', taking things to working groups); more formal decision-making, more consistent with strategic or other objectives espoused; collective self-reflection, which permits organizational learning; and a flexible leadership style for chairmen.

Their experience also shows the importance of involving key officers of risk and compliance functions not only to a greater extent but also earlier in the opinion-forming and decision-making process to ensure the sound, independent and objective judgement of the board. It also highlights the important role played by the independent members of boards in defending the general interests of the organization's group of stakeholders and in breaking down the dynamics of confrontation between members of the board representing certain particular interests.

2. The capacity to successfully undertake organizational and cultural changes.

In this area, the DNB has worked together with the Netherlands Authority for the Financial Markets (AFM). Changes in culture and behaviour require a great deal of both attention and time; it is not easy to speed them up. The ability to change an institution is defined as "the extent to which groups of people within that organisation are willing and able to effectively implement ambitions and objectives and ensure they succeed" (DNB and AFM 2014). This includes the ability to change course if the

chosen approach seems to be unsuccessful, or when faced with a major change in circumstances. Their research shows that the institutions they examined have a genuine will to change. Staffs at all levels are very willing to change. There is also a widely shared sense of the urgent need to make changes.

Their research has made it possible to identify the following key aspects in the processes of change (DNB and AFM 2014; DNB 2015):

(a) Priorities set in the numerous challenges currently facing financial institutions are not sufficiently clear;
(b) Financial institutions have difficulties with the long-term approach required to bring about and anchor change;
(c) Financial institutions have problems with self-reflection during change processes and therefore do not learn enough from experience; and
(d) Leadership plays a crucial role when it comes to success factors and impediments.

4.3 The Risk Climate

The construction of scales for measuring risk climate is a more recent line of research which can make an important contribution to the development of instruments for measuring organizational behaviour and the analysis of its influence on risk management and controlling misconduct risk.

This line of research takes studies on the safety climate as a reference. The inclusion of the safety climate as an explanatory variable has been a particularly useful research strategy in the empirical analysis of the occupational safety culture of organizations (Johnson 2007; Zohar 2010). The safety climate summarizes the collective attitude of an organization towards safety, the level of priority that is given to it. Zohar coined this term in 1980 to highlight the importance of social and organizational processes in the generation of accidents. The theoretical construction of the safety climate subsequently evolved, research focusing on developing instruments or scales to measure it based on employees' perceptions of safety policies and risk prevention practices. Psychometric techniques are usually applied based on structural equation models that conceptualize it as a higher-order factor composed of more specific first-order factors or dimensions related to observable policies and practices. Although there is consensus regarding the

definition and methodology used for its measurement, there are different proposals as to the dimensions that make it up (Johnson 2007).

The differences between the concepts of culture and climate are mainly methodological (Denison 1996), as there is a marked convergence and integration between both fields in theoretical and conceptual aspects (Schneider et al. 2013). The study of culture employs a qualitative research methodology (case method, ethnographic studies) aimed at appreciating the singularities of the environment or social context of the organization, fundamentally the values, beliefs and assumptions deeply rooted in it. In these studies, it is important to investigate how culture is formed, evolves and is expressed (through narratives, rituals, symbols, language), as well as its strength, in terms of resistance to change or influence over behaviour.

Organizational climate studies use a quantitative methodology to measure the shared perceptions of employees about the procedures, practices and types of behaviour that are supported and rewarded by the organization and their influence on the behaviour of individuals and groups (Reichers and Schneider 1990; Schneider 1990). In these studies, the researcher establishes categories and analytical dimensions that allow measuring these perceptions of organizational behaviour, which are summarized in a specific environment or climate. It is assumed that individual behaviour depends not only on personal characteristics but also on the organizational climate with respect to a certain aspect or focus of interest. When this focus is placed on risk and its management, the resulting shared perceptions make up the risk climate.

Sheedy et al. (2017) have been pioneers in the study of risk climate in financial institutions. They define it as "the shared perceptions among employees of the relative priority given to risk management, including perceptions of the risk-related practices and behaviours that are expected, valued and supported". These authors found evidence for four unique factors of risk climate that were invariant across three organizations, two countries and two levels of analysis (individual and business unit):

- Avoidance: this factor captures a tendency within the organization to ignore or avoid employees' questions about risk-taking and acceptable risk. It also captures the tendency within the organization to ignore, excuse or hide breaches of risk policy or procedures.
- Valued: this measures the degree to which risk management and risk managers were valued and respected throughout the organization.

– Proactive: this measures practices to actively address risk management.
– Manager: this factor measures managers' encouragement and role modelling of appropriate risk management.

5 Conclusion

The concern for the cultural aspects associated with the banking business is very recent, although it seems to be widespread and well justified. Many international organizations (e.g. IIF, IMF, FSB) recommend that such entities should be permanently vigilant about their risk culture and also that supervisors should conduct a more complete assessment of risks, not only financial but also non-financial, including an assessment of behaviour and culture.

Banking regulators and supervisors have thus placed the focus on the cultural context of the organization as a determining factor in excessive risk-taking and misconduct risk in the industry. There is a clear awareness that systems and controls do not replace the human factor or risk management culture. Organizational performance is also determined by human behaviour. Ineffective culture and organizational behaviour are often conducive to bad organizational performance, such as excessive risk-taking or misconduct risks.

Unlike traditional supervision, which focuses on solvency and liquidity indicators, culture is more difficult to monitor. Its more tangible or visible aspects, such as corporate governance structures and remuneration schemes, are more easily verifiable by supervisors and have also changed more rapidly, adapting to generally accepted international norms and standards. However, culture also includes other aspects that are less tangible, deeper and more difficult to observe, which are equally determinants of organizational behaviour.

Three approaches to assessing and measuring banking culture are reviewed in this chapter. First, the guidance issued by the FSB to assist supervisors in their assessment of risk culture. The FSB (2014) guidance identifies some foundational elements that contribute to the promotion of a sound risk culture with a financial institution and sets out indicators to evaluate its strength. The guide attributes maximum responsibility to the board and senior management in setting the right tone, values and expectations for the entire bank. A sound culture makes *individuals* more *accountable* for their *conduct* and responsible *for the risks taken* in their

activities. It promotes an environment of transparency, dissent, open dialogue and effective challenge. It also establishes the right incentives to motivate compliance, client satisfaction and conducts aligned with risk appetite frameworks. The FSB guidance asks supervisors to pay attention to all these areas.

The second noteworthy example of this new form of preventive supervision is the methodology of qualitative assessment of behaviour, culture and cultural change developed by the central bank of the Netherlands (DNB) as a complement to its role of prudential supervision. This entity has played an important and leading role in emphasizing the role of conduct and culture in banks. Focusing attention on behaviour and culture enables early detection of non-effective behavioural patterns (regarding leadership, the quality of decision-making, communication, group dynamics and mind-set at the senior management level), which may generate problems and failures in the future. A critical aspect that its research has highlighted is the quality of challenge between members of boards during decision-making. This approach could be extended beyond the Netherlands. The European Central Bank is now planning a new aspect of supervision, focused on organizational behaviour, learning from DNB's approach.

The third path of moving forward has to do with measuring the risk climate in financial institutions, an essentially empirical concept that aims to measure employees' perceptions about the priority that the organization gives to foresight in risk management. In a more general sense, this concept could be extended to include aspects related to the orientation to satisfy the customer's interests, misconduct risk (ESRB 2015; Nguyen et al. 2016; Parajon Skinner 2016) and the culture of compliance (Langevoort 2017).

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CHAPTER 17

A Multidimensional Approach to Equity Crowdfunding: Bridging the Equity Gap and Boosting Social Capital

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1 Introduction

Equity crowdfunding is recognized as an alternative financing tool for the development of start-ups and small and medium-sized enterprises (SMEs) and for supporting innovation. Crowdfunding facilitates access to finance for those companies that would otherwise have great difficulty in accessing it

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(Giudici et al. 2013; Hornuf and Schwienbacher 2014). Europe, in particular, has also adopted online alternative finance over the past few years as a viable fundraising source for individual projects and charitable organizations.

Access to finance is a well-known and widely investigated problem for start-ups and innovative SMEs. The concept of the equity gap and the broader concept of the financing gap point to market failures due especially to information asymmetry, where deserving companies do not receive the volume of financing to which they would be entitled in an efficient market (Venturelli and Gualandri 2009). These financial constraints affect the creation and development of firms, especially innovative ones, whose contribution to economic growth is widely recognized (Gualandri and Venturelli 2008). The credit crunch and the constraints on bank lending triggered by the financial crisis have worsened the problem of fundraising for these firms, creating room for the development of new financial instruments and intermediaries, such as crowdfunding (equity and lending). The European online alternative finance industry, comprising crowdfunding, peer-to-peer lending, and other activities, grew 72% from €594m in 2014 to €1019m in 2015. If we also consider the United Kingdom, the largest market for alternative finance instruments, the total amount rose to €5431m in 2015, of which €159.32m came from equity crowdfunding. In 2015 in particular, alternative business funding provided capital to 9442 start-ups and SMEs across Europe (Zhang et al. 2016).

Although the market is still growing in terms of volume, the phenomenon is still understudied, especially the equity crowdfunding model.

One branch of studies on crowdfunding has investigated the determinants that influence the success of campaigns. In particular, researchers pinpoint the crucial role of entrepreneurs' social capital, developed through social network sites, in compensating information asymmetry, facilitating fundraising, and attracting early funders (Mollick 2014; Colombo et al. 2015; Marelli and Ordanini 2016; Skirnevskiy et al. 2017; Butticè et al. 2017). Even though the importance of social capital for project creators in crowdfunding is widely known, all studies focus their attention on just one subject: the entrepreneur. In the literature on management and social capital, spillovers of social capital across different levels are well documented (Inkpen and Tsang 2005). The heterogeneity of social capital, in both structure and connections, provides a means of overcoming the problem of information asymmetry while also generating a variety of benefits (Uzzi 1999; Shane and Cable 2002). Thus, current analysis of the social capital perspective in equity crowdfunding is still incomplete. Our starting point is to analyse social capital using a multidimensional approach with regard to the types of subject considered: the entrepreneur and the project. We hypothesize that the extent

of online social capital, at both founder and project level, may have a significant influence on the number of investors funding the campaign.

We test our hypotheses by means of a hierarchical multiple regression analysis based on a proprietary/unique dataset made up of 311 crowdfunding campaigns launched by different European platforms: British, Italian, Finnish, and Dutch.

Our study makes two main contributions to the literature on entrepreneurship and crowdfunding. First, equity crowdfunding campaigns are not simply influenced by the entrepreneur's relationships but rather by the ability to appeal to a "professional network" and word of mouth through project channels. Second, crowdfunding offers entrepreneurs strategic tools and mechanisms for improving their networks by broadening and deepening their behaviour.

This chapter is organized as follows. The next section reviews the theoretical framework and states the research hypotheses based on a multidimensional approach to social capital. The presentation of the methodology and data follows in Sect. 3. We then illustrate the empirical results of the analysis in Sect. 4. The final section presents a number of implications for entrepreneurs and future research.

2 Background and Development of Research Questions

Funding companies and sustaining innovation through the crowd have been discussed intensively since 2010 and have been explored both in practice and in theory. There are different ways of classifying the major streams of contributions which have arisen over time; this study adopts a classification approach based on research themes (Moritz and Block 2016), which the authors subdivide into the four groups described below.

The first group of contributions is made up of studies aimed at defining and classifying crowdfunding models and subjects in the market. It is now widely accepted that there are four crowdfunding models: reward-based crowdfunding, lending-based crowdfunding, donation-based crowdfunding, and, finally, equity-based crowdfunding. The same classification is also found in European and national documents that recognize crowdfunding as an alternative financing instrument. Key studies include Belleflamme et al. (2013), Giudici et al. (2013), Haas et al. (2014), Hu et al. (2015), Wash and Solomon (2014), Bruton et al. (2015), Moritz and Block (2016), and Lehner et al. (2015).

The second group of contributions consists of studies that investigate investor and proponent motivations for participating in crowdfunding

campaigns. On reward- and donation-based platforms, in particular, investors are driven to fund projects by intrinsic motives such as social reputation, shared identity, or other non-pecuniary benefits, whereas those on equity-based platforms are driven predominantly by extrinsic—financial—motivation (Schwienbacher and Larralde 2010; Ordanini et al. 2011; Collins and Pierrakis 2012; Klaebe and Laycock 2012; Ahlstrom and Bruton 2006; Cholakova and Clarysse 2015) or a combination of both extrinsic and intrinsic drivers (Hemer 2011).

The third group of contributions investigates the relationship between crowdfunding and specific types of businesses, aiming to answer research questions such as: "For what types of ventures is crowdfunding a suitable financing alternative?", "Do socially-oriented firms receive more from crowdfunding platforms?", or "Does crowdfunding sustain more environmental projects?". These studies highlight the fact that the special characteristics of crowdfunding make it reasonable to assume that this type of financing is not appropriate for all companies. The most important contributions on the crowdfunding of social innovation and environmental projects include Lehner (2013), Lehner and Nicholls (2014), Azar and Mackey (2015), Hörisch (2015), Meyskens and Bird (2015), Bernardino and Santos (2016), Calic and Mosakowski (2016), and Stanko and Henard (2017).

The fourth stream of contributions—which is also the most copious and the broadest—identifies the drivers that influence the likelihood of campaign success, answering the research questions: "What are the main factors that have a positive or negative effect on campaign funding?", "What factors drive the selection process of crowdfunding investors?", "How does this specific factor influence the campaign's success?", or "How and why do consumers turn into crowd-funding participants?". In reward-based crowdfunding studies, the variables considered can be divided into two groups: project- and proponent-related variables. Project-related variables include the number of members in the team, the quality of the information provided, the use of videos and project updates during the launch, the presence and types of reward, and campaign duration (Frydrych et al. 2014; Mollick 2014; Marelli and Ordanini 2016; Ralcheva and Roosenboom 2016). Examples of proponent-related variables are sex, nationality, founder's human and social capital, and the pitch's narration and linguistic aspects (Mollick 2014; Manning and Bejerano 2017; Davis et al. 2017; Mohammadi and Shafi 2017; Parhankangas and Renko 2017). Researchers into equity crowdfunding maintain the reward-based variables but also add those related to the project's financing aspects, such as the presence of a

professional investor, percentage of equity offered, risk involved, prices of shares sold, information disclosure, and planned exit strategies (Ahlers et al. 2015; Moritz et al. 2015; Hornuf and Neuenkirch 2017; Vismara 2016a, b; Block et al. 2017; Lukkarinen et al. 2016; Polzin et al. 2018). Both reward and equity crowdfunding studies pinpoint the role of online social capital in the likelihood of campaign success.

This study falls within the last-mentioned research stream, in that it aims to test for a significant causal relationship between social capital created online and the number of investors involved in equity crowdfunding campaigns.

2.1 Social Capital in the Crowd

Crowdfunding studies highlight the role of social capital in bridging the asymmetry gap and facilitating fundraising (Mollick 2014; Colombo et al. 2015; Marelli and Ordanini 2016; Skirnevskiy et al. 2017; Butticè et al. 2017). In particular, during the initial financing start-up process, social capital reduces asymmetry between the information held by the lender and that provided by the entrepreneur and can save on the times and costs necessary to get information and improve its quality and relevance (Shane and Cable 2002; Shane and Stuart 2002). For example, supporters geographically closer to the entrepreneur tend to invest more than twice as much as those in distant locations. It is therefore possible to assume that there are consolidated social relations or a direct acquaintanceship between the entrepreneur and his/her backers (Agrawal et al. 2014).

Studies of social capital in crowdfunding distinguish between external social capital (online social ties established outside the platform) and internal social capital (online ties established inside the platform). They both influence the likelihood of campaign success. Internal social capital is associated with the support of early backers (Colombo et al. 2015; Skirnevskiy et al. 2017; Butticè et al. 2017), and first-stage backer communities also sustain the entrepreneur in a second round of financing, thus replacing contributions from "family and friends" (Skirnevskiy et al. 2017).

External social capital is always measured in its online dimension, in relation to the web landscape in which the crowdfunding took place. In particular, entrepreneurs have increased their use of social network sites to deal with other entrepreneurs and strengthen weak ties (Morse et al. 2007; Fischer and Reuber 2014).

In fact, friends and followers on Twitter, LinkedIn, or Facebook increase the likelihood of crowdfunding campaign success (Giudici et al. 2013; Mollick 2014; Vismara 2016a). All these studies focus on a single subject, although spillovers of social capital across different levels are well documented in the management literature (Inkpen and Tsang 2005).

Crowdfunding social capital is assessed on the basis of social network sites, and only the funding dimension is considered when measuring its output. Therefore, in the crowdfunding literature, authors analyse the impact that the use of social network sites has on the campaign's success or failure and the percentage of the amount raised (e.g. Mollick 2014; Marelli and Ordanini 2016; Courtney et al. 2017). To measure campaign output, we consider crowdfunding by crowd size, using the number of investors for successful campaigns concluded. Stanko and Henard (2017) state that the amount of funding raised during a crowdfunding campaign does not significantly influence the subsequent market performance of the crowdfunded product, while the number of backers attracted to the campaign does.

Our theoretical framework adopts a multidimensional view of external social capital, focusing on network heterogeneity, which facilitates the funding of firms, access to financial capital, and its cost. Entrepreneurs who are well connected with a large number of contacts including both professional and relational ties are able to seize opportunities and acquire the resources for building new ventures (Dubini and Aldrich 1991; De Carolis et al. 2009).

2.1.1 The Funder's Online Social Capital

The relationship between entrepreneurs' online social capital and the likelihood of success of their projects has been investigated by Mollick (2014). His analysis, based on the reward-based crowdfunding platform Kickstarter, reveals that the proponent's number of Facebook friends is positively associated with the amount of capital raised during the campaign. The study demonstrates that having only a few friends is worse than not having a Facebook account at all. Marelli and Ordanini (2016) also use the Kickstarter platform to analyse 500 campaigns, showing that a Facebook profile with fewer than 500 friends has a negative impact on the project's success. The survey conducted by Vismara (2016a) on a sample of equity projects launched on two British platforms, Crowdcube and Seeders, reveals that the number of LinkedIn professional connections is one of the factors that increase the likelihood of success.

All these studies confirm that the proponent's online social capital is crucial for attracting backers and raising funds. In our study, we extend the

online social capital dimension and consider the entrepreneur's presence on several social network sites: Facebook, LinkedIn, and Twitter. A presence on different types of social network sites gives access to a wider audience. Heterogeneous social capital generates greater benefits for the campaign, because it consists of different types of relationships. Thus, we formulate Hypothesis 1 as follows:

***H1**: The extent of the founder's online social capital, developed through different types of social network sites, is positively associated with the number of investors that funded the equity campaign.*

2.1.2 The Project's Online Social Capital

During crowdfunding campaigns, the backers themselves can be expected to produce social capital for the project by sharing the campaign across a wide range of online communities. On equity crowdfunding platforms, it is possible to check the number of users who shared the campaign on their own networks, such as Twitter, Facebook, and LinkedIn. In this way, crowds become promoters of the project, creating indirect ties with new potential investors. Indirect ties are an important mechanism in the formation of new ties and the development of exchange relationships (Gulati and Gargiulo 1999; Vissa 2011). These numbers create the project's own social capital and may influence investors during the campaign, above all because information asymmetry in equity crowdfunding is very high (Schwienbacher and Larralde 2010), so users' evaluations of the project can be influenced by other investors who have already underwritten the investment. Thanks to the pointers provided by the number of shares and the identification of the source users who have already joined the initiative, project shares on Facebook, Twitter, and LinkedIn stimulate social proof. The social proof mechanism is based on the principle that there is a tendency to imitate other participants when the situation is uncertain and a particular behaviour seems correct to the extent that other people adopt it (Cialdini 2009). Furthermore, participants in crowdfunding are not only investors but also promoters. In order to bring the campaign to completion, they will have an interest in spreading it on their personal networks to recruit more people and reduce the investment risk. Wider dissemination of the project on the investor's network can involve more contacts, which can in turn generate additional contacts and create a variety of benefits. Lu et al. (2014) used Kickstarter projects to measure how project promotion on Twitter influences the final result of the campaign. A study by Hong et al. (2015) on 223 Indiegogo

projects also highlights the way in which social media can have important implications for an audience's receptiveness during the campaign. In particular, social media activity on Twitter will give greater benefits to campaigns pertaining to a product, because Twitter users are more responsive to information about consumer goods and services. Conversely, social media activity on Facebook will give greater benefits for campaigns pertaining to public goods, because Facebook users are more responsive to information about desirable behaviours in a social group. We thus hypothesize that:

H2: *The extent of campaign message sharing on different types of social network sites is positively related to the number of backers involved in equity crowdfunding campaigns.*

3 Methods

3.1 Data Collection and Sample

To analyse the role of different facets of online social capital in equity crowdfunding (CF) campaigns, we collected data from different European equity crowdfunding platforms. The countries were selected on the basis of the availability of campaigns in English. Since our interest lies in the number of investors involved, we focus on successful campaigns only in order to better understand how different facets of online social networks may have a valuable impact on the crowd-investing process.

We thus collected data on 311 equity CF campaigns. Data were collected in the period between 15 October 2016 and 15 January 2017. We only considered CF campaigns initiated at the beginning of 2014 and terminated before the end of 2016. We selected campaigns launched through different European crowdfunding platforms: Crowdcube (UK), Symbid (NL), and Invesdor (FL), as well as nine platforms from the fragmented Italian equity crowdfunding industry (StarsUp, CrowdFundMe, InvestiRE, Equinvest, Muum Lab, Next Equity, Opstart, Mamacrowd, and Tipe Equite).

3.2 Campaign Characteristics

Table 17.1 provides information on the characteristics of the crowdfunding campaigns comprising the sample. Successful equity campaigns principally come from Crowdcube (211), the leader in the UK equity crowdfunding market. Equity campaigns were funded by an average of 213 investors; in fact, more than half of the campaigns in the sample

Table 17.1 Descriptives

Indicators	*Items*	*%*
Platforms	Symbid	11.8
	Invesdor	7.3
	Crowdcube	77.3
	Italy	3.6
No. of investors	10–50	11.7
	50–100	21.5
	100–500	59.5
	> 500	7.3
Target amount (.000 euro)	< 100	30.3
	100–300	43.9
	300–500	9.3
	500–1000	11.3
	> 1000	5.2
Firm age (no. of years)	< 3	48.2
	3–5	29.2
	5–10	15.8
	> 10	6.8

were financed by fewer than 500 investors. The campaign which attracted the largest crowd was launched through Invesdor and was funded by more than 2000 investors.

The target amount was more than 281,500 euro on average and the equity averaged 16%.

As regards the firms that launched equity campaigns, the sample consists mainly of young firms less than five years old and the average team size is below five members. As to the rewards presented in the campaign, the average number is less than three.

3.3 Measurements

Given that successful equity crowdfunding campaigns aim to raise capital from a large number (crowd) of investors, the number of investors funding the campaign was used as the dependent variable (Vismara 2016a). The extent of online social capital was measured by considering Facebook, Twitter, and LinkedIn accounts. The number of friends/followers/connections was used to measure the extent of social network sites (Colombo et al. 2015) with regard to the founder's online presence (Founder_Link, Founder_Fbf, Founder_Twf). As regards the campaign, we focused on the

number of shares within the three different social network sites (CF_share_Link, CFshare_Fb, CFshare_Tw). The capacity to use different social network sites in the management of both formal and informal relationships was measured using the sum of active accounts (within the three social network sites) at the founder level (Founder_SN). At the campaign level, the capacity to manage and activate effective engagement by using a wide range of social network sites was measured using the sum of the social network sites effectively used to share the campaign (CF_share_SN).

We also tested for a series of control variables at founder and campaign level. We include the founder's gender (Gen) among our regressors in order to check the ability of female (or male) founders to attract investors. Team size (Team) was approximated by counting the number of members involved in the project. Firm age (Age) was measured using the number of years since its incorporation. The frequency of updating during the different stages of the campaign was measured by the number of times additional information was included in the campaign page (N_update). We also considered the number of rewards combined with the amount invested and offered during the campaign (N_reward). Finally, the platform effect was measured by means of three dummy variables (Invesdor, Symbid, Italy) corresponding to the European countries included in the analysis. As our focus is on successful campaigns, we decided not to test for the target amount of the campaign, due to its potential over-correlation with the dependent variable (no. of investors).[1]

4 Results

To test our hypotheses, a hierarchical multiple regression analysis was performed to check for groups of variables and examine their contribution to R2 for each model (Table 17.2). We first regressed our dependent variable, the number of investors, on the control variables. The first group of independent variables, that is, founder's social capital, was introduced in Model 2. In Model 3, we introduced the factors relating to the sharing of the campaign on social network sites.

A forward stepwise regression approach was chosen in order to clearly identify those variables capable of improving the overall explained variance. We also checked for the Variance Inflation Factor (VIF). This test underlines the fact that multicollinearity between the predictor variables is not a problem.

[1] See Appendix for a description of the variables.

Table 17.2 Hierarchical multiple regression results

Predictors	*Model 1*		*Model 2*		*Model 4*	
	St. coeff.	*Sig*	*St. coeff.*	*Sig*	*St. coeff.*	*Sig*
(Constant)		.006		.072		.466
Invesdor	−.025	.701	−.046	.489	.164	.250
Symbid	−.115	.126	−.144	.054*	.091	.613
Italy	−.113	.080	−.126	.049*	−.070	.410
Age	.124	.028*	.123	.028*	.122	.024*
Gen	.013	.813	.018	.741	.019	.715
N_rewards	.135	.032*	.107	.090	.122	.045*
N_updates	−.099	.235	−.105	.202	−.135	.093
Team	.087	.127	.059	.303	.021	.699
Independent variables						
Founder_Link			.053	.427	.022	.733
Founder_Fbf			.110	.070	.077	.196
Founder_Twf			.099	.095	.042	.475
Founder_SN			.031	.668	.027	.694
Cf_share_Tw					−.172	.175
Cf_share_Fb					.034	.545
Cf_share_Link					.288	.000**
Cf_share_SN					.071	.632
R^2	0.039		0.065		0.129	
ΔR^2			0.026		0.064	
N. observations	311		311		311	

*$p < 0.05$, **$p < 0.01$

In Model 1, the four control variables explain 3% of the amount of variance in the overall number of investors. Only the relationships between firm age and number of rewards are significant and positive. This means that investors are strongly attracted by older and more knowledgeable firms, and that campaigns that offered not only monetary contributions were therefore more crowded.

In Model 2, we explore the effects of founder online social network variables on our dependent variable and find that the types of platforms—Symbid and all the Italian platforms—are significant with a negative sign. These correlations lose their significance when other independent variables are introduced in Model 3, where the results show that the number of campaign shares on LinkedIn (CF_share_Link) is significant and positive. In contrast with previous work (Vismara 2016a; Colombo et al. 2015),

our findings reveal that it is the campaign's shares on the professional online social network that have a significant impact on the crowd-investing process, rather than those on the founder's online social network. Thus, the ability to activate social sharing within a professional network can stimulate the crowd-investing process.

5 Discussion and Implications for Research

This study has analysed the characteristics of equity crowdfunding campaigns and the relationship between online social capital and equity crowdfunding employing a multidimensional approach that encompasses two levels of analysis: the founder and the campaign. Our results refute the hypothesis that the heterogeneity of the social network sites on which the founder is present and where the campaign is shared is the factor that generates a large number of investors. Equity crowdfunding is characterized by more company relationships in specific online communities.

Our study offers two main contributions to the current debate.

First, we support the hypothesis that equity crowdfunding is not simply a process influenced by the founder's network of relationships but depends rather on the ability to involve a professional network through campaign-specific channels.

The second contribution concerns tools for boosting online social capital: crowdfunding offers entrepreneurs strategic tools and mechanisms for improving their strategies for both broadening and deepening their networks. In the digital age, social capital can be developed on social network sites. Being aware of how much the community matters helps entrepreneurs to implement crowdfunding and social capital benefits.

Our research offers important theoretical and practical contributions while also opening up future research perspectives. Theoretically, we extend prior empirical studies on equity crowdfunding by deepening the effect of the founder's online social capital and its capacity to bridge the asymmetry gap.

Furthermore, in this study, we develop a cross-country analysis based on a large number of campaigns launched on several equity platforms, whereas previous studies focus only on a single platform from a single country (Ahlers et al. 2015; Hornuf and Neuenkirch 2017; Lukkarinen et al. 2016).

From a managerial perspective, our results also provide implications for the management of equity crowdfunding campaigns, platforms, and

founders. The construction of a powerful word-of-mouth marketing strategy on a specific professional network during the fundraising campaign has a significant influence on commitment to the business project, thus helping to bridge the equity gap.

Future research should deepen the analysis of the firm's online social network and its role in the campaign and the management of the specific equity platform's community. The limits of this study are that we did not take into account the level of interactions within a single social network and that we are not aware of the connections which overlap in various networks. Furthermore, following the approach adopted by Hong et al. (2015), future research could also consider the impact of the equity crowdfunding platform's community on the likelihood of a successful campaign.

From an empirical perspective, it would also be interesting to extend the analysis to consider how online social capital can be maintained over time within companies and its potential effect on the firm's future performance. Online social capital can dissolve very quickly. For this reason, the achievement of long-term effects requires active management of online ties.

Appendix

Table 17.3 Variable description

Investors	*Number of investors involved in the campaign*
Age	Firm's age
Gen	Gender of the firm's founder
Team	Number of people in the firm's team
Invesdor	Finnish platform
Symbid	Dutch platform
Crowdcube	British platform
Italy	Group of Italian platforms
N_update	Number of updates during the campaign
N_rewards	Number of rewards during the campaign
Founder_Link	Number of founder's LinkedIn connections
Founder_Fbf	Number of founder's Facebook friends
Founder_Twf	Number of founder's Twitter followers
Founder_SN	Sum of founder's active accounts
CF_share_Link	Number of users that have shared the campaign on LinkedIn
Cf_share_Fb	Number of users that have shared the campaign on Facebook
Cf_share_Tw_	Number of users that have shared the campaign on Twitter
CF_share_SN	Sum of campaign's shares on social network sites

Table 17.4 Correlation matrix

	Investors	*Invesdor*	*Symbid*	*Crowdcube*	*Italy*	*Age*	*Gen*	*N rewards*	*N updates*
Investors	1.000								
Invesdor	−.009	1.000							
Symbid	−.081	−.100	1.000						
Crowdcube	.101	−.664	−.557	1.000					
Italy	−.102	−.059	−.050	−.333	1.000				
Age	.131	.086	.033	−.084	−.005	1.000			
Gen	.028	−.017	−.014	.026	−.009	.025	1.000		
N rewards	.158	−.297	−.172	.412	−.187	−.016	.059	1.000	
N updates	.056	−.267	−.543	.689	−.324	−.062	.025	.359	1.000
Team	.121	.017	−.095	.060	−.026	.092	.032	.134	.093
Founder_Link	.103	−.058	.092	−.027	.024	.039	.029	−.009	.025
Founder_Fbf	.143	.101	.048	−.137	.074	−.014	−.026	.023	−.122
Founder_Twf	.167	−.048	.033	.039	−.059	.026	−.020	.163	.068
Founder_SN	.139	.130	.086	−.139	−.039	.068	.006	.066	−.043
Cf_share_Tw	−.085	.496	.695	−.787	−.096	.075	−.017	−.299	−.546
Cf_share_Fb	.111	−.122	−.102	.184	−.061	−.091	−.003	.098	.148
Cf_share_link	.326	−.217	−.182	.327	−.109	−.004	.004	.146	.288
Cf_share_SN	.120	−.467	−.646	.907	−.326	−.044	.030	.363	.666

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Team	*Founder_ Link*	*Founder_Fbf*	*Founder_ Twf*	*Founder_ SN*	*Cf_ share_Tw*	*Cf_share_ Fb*	*Cf_ share_ link*	*Cf_share_ SN*
1.000								
.093	1.000							
.027	.186	1.000						
.188	.204	.185	1.000					
.098	.523	.378	.277	1.000				
−.073	.019	.096	.009	.098	1.000			
.084	−.007	−.044	.085	−.008	−.150	1.000		
.182	.174	.134	.272	.105	−.223	.276	1.000	
.075	−.042	−.128	.043	−.127	−.694	.197	.332	1.000

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CHAPTER 18

Structure and Risks of the Chinese Shadow Banking System: The Next Challenge for the Global Economy?

Piotr Łasak

1 Introduction

The shadow banking system is defined as the network of financial institutions functioning outside the traditional, regulated financial market. It usually comprises non-depository institutions such as investment banks, structured investment vehicles, hedge funds, money market funds, and other, non-bank financial institutions. Unregulated banking structures have been developing in many Western countries over the last 20 years. In the wake of the global financial crisis of 2008–2009, the shadow banking system also began to rapidly grow in the Chinese economy. It has become especially important in recent years, as the unregulated part of the Chinese financial market generates major systemic risk for the economy as a whole. The magnitude of the system is estimated at $9.5 trillion,

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while the volume of its assets amounts to around 80 per cent of the country's GDP (Weinland and Wildau 2017). Chinese shadow banking differs from the system in Western countries not only in many structural aspects (institutions and instruments, the mechanisms of their development and functioning, and the level of their complexities) but also in the pace of its development following the crisis. While the speed of its development was constrained in states such as the USA, the UK, and the EU countries, in China it has shot up since 2008.

Chinese shadow banking has emerged due to the fact that the system concentrates on taking deposits mainly from the retail market and lending the money to small and medium-sized enterprises (SMEs) and individual investors. One of its main features is regulatory arbitrage, which means that the system enables the participants to avoid typical bank regulatory burdens. Simultaneously, investments are characterized by a lack of collateral. Hence, in case of a default, the parties are exposed to the risk of substantial losses. The main components of the Chinese shadow banking system are wealth management products (WMPs) and trust companies. Both of these generate liquidity, transaction, and systemic risks.

The aim of this chapter is to analyse the underlying causes of the development of the Chinese shadow banking system, as well as the features of the system and its main differences with respect to the systems in other countries. A significant part of the description is devoted to the analysis of the main risks posed by WMPs and trust companies. The last part of the study presents the nature of other risks stemming from Chinese shadow banking and the possible consequences of their development for the global economy.

There are not many papers describing the features of Chinese shadow banking, compared to the amount of papers describing shadow banking in some Western countries, especially in the USA. The most important publications include the books written by Sheng and Soon (2016) and Zhang (2014). The key articles comprise those by Elliot et al. (2015), Chen et al. (2016), Sheng et al. (2015), and Sekine (2015). The contributions of this chapter comprise the selection of the main determinants of the development of the shadow banking system in China and the identification of the main risks related to WMPs and the functioning of trust companies in China. An additional aim of the study is to identify the most important threats for the global economy.

2 Determinants of the Development of Chinese Shadow Banking

The development of the shadow banking system in China covers two periods. One comprises the period between the 1980s up to the global financial crisis of 2008–2009; and the other encompasses the subsequent time period. It should be noted that shadow banking had existed in China for a few decades before the moment when economists began to study its nature. It was initiated by the process of financial deregulation, which had its origins at the beginning of 1980s. The former Chinese banking system was wholly state-owned, and before the 1978 reform, the People's Bank of China (PBOC) was the only financial institution in the country. It acted both as the central bank and as a commercial bank. Reforms commenced at the beginning of the 1980s which have established a formal banking system in China. During these reforms, four additional state-owned banks were created (the Big Four), as well as other banking institutions such as joint-stock banks, regional banks, rural credit cooperatives, urban credit cooperatives, and trust companies. The specific feature of the system was strong government influence, moneylending activities requiring a permit from the financial regulatory authorities (Guo and Xia 2014). Despite relatively strict banking business rules, some lending was carried out in other ways, under the cover of 'joint cooperation', 'investment', 'deposit receipt', 'compensatory trade', 'wealth management products', or other contrived transactions. Such behaviour may be considered the origins of shadow banking in China. All the aforementioned institutions, instruments, and investments operated in parallel with China's formal banking system. It is noted in the literature that the term 'shadow banking' covers a diverse range of 'non-bank' markets and market participants, such as trust companies, brokerage firms, local government financing vehicles (LGFV), and other institutions (Awrey 2015).

While the first period did not play an important role, the second phase is very important and has speeded up the development of shadow banking. The system helped to stabilize the output of Chinese factories following the global crisis of 2008–2009. The Chinese government approved a large stimulus package in the fall of 2008 to support the economy after the crisis. Subsequently, between 2010 and 2013, the central bank implemented a policy of monetary tightening. Both of these measures fostered the development of the shadow banking sector. The government stimulus package contributed to the explosion in new lending, though this comprised not

only lending through traditional banking channels but in tandem with non-loan channels such as entrusted loans, trust loans, banker's acceptances, and corporate bonds (Borst 2013). The contractionary monetary policy, implemented since 2010 by the People's Bank of China, has resulted in a simultaneous fall in bank loans and became the second important factor to foster the development of the shadow banking sector after the financial crisis (Chen et al. 2016). The continuation of large-scale investments, initiated in the Chinese economy in previous years, was possible due to the funds from shadow banking sources. During the last few years, shadow banking has been developing due to the growth of e-commerce and e-finance markets in China, and as a result of the supply of funds from retail investors, who invest via peer-to-peer lending channels.

The development of the Chinese shadow banking system had three main determinants: market forces (the demand for credit and credit supply), monetary policy (investment rate repressions), and the regulatory arbitrage applied by traditional (commercial) banks (Sheng and Soon 2016; Elliot et al. 2015; Moizet 2016). The main causes of the development of Chinese shadow banking include directives implemented on commercial banks by the central bank (PBOC). These affected the 'demand' for and 'supply' of credit. Restrictions on credit access in the country created the natural division of institutions into those which have the privilege to gain access to credit financing through the traditional banking sector, and those which exist 'outside' the system. It is noted in the literature that some SMEs in China face barriers in accessing credit from state-owned commercial banks. The Chinese bank-dominated financial system gives privilege in financing to state-owned enterprises (SOEs) rather than to the private sector (Tsai 2015). SMEs and local government entities have usually been restricted from accessing formal lending. Even if some entities were not formally restricted from accessing credit, there were other informal shortcomings, like the lack of 'connections' necessary to obtain bank loans, the lack of profitability, and the lack of credit worthiness. Sometimes a given sector did not operate in sectors identified as 'strategic' in the government's five-year plans (Parker 2014). All these obstacles brought about the rapid growth of the shadow banking system, which constituted an alternative source of capital.

The second major driving forces of Chinese shadow banking development were monetary policy and interest rate regulation. These have a major impact on credit supply. During the 1980s and 1990s, the government exercised close control over interest rates; even after the creation of the

interbank market in 1996, the government kept control of these rates. The changes implemented during the late 1990s began the process of liberalization of interest rates and contributed to a bifurcation in this matter (Dang et al. 2014). Following the global crisis (2008), the problem of overregulation of interest rates returned. Artificially maintained low interest rates triggered the desire for higher-return investments, like WMPs and trust products.

The third driver of shadow banking development in China was regulatory arbitrage. Traditional banks were keen to use shadow banking (off-balance-sheet) channels to avoid regulatory controls. The banking sector in China is the subject of significant regulations. One such restriction is aimed at lowering interest rates. The real interest rates in China were at zero or negative level during most of the time following the financial crisis of 2007–2009. The situation caused the reaction of savers, who withdrew deposits from banks and began searching for alternative forms of investment. This in turn triggered a reaction in banks, which started to pursue the possibility of offering a higher rate of return to their clients. The ideal instruments for this purpose were wealth management products (WMPs) (Dang et al. 2014). Moreover, the macro-prudential regulations imposed on banks meant that the institutions were responsible for financing mainly state-owned enterprises. The other entities, which fell outside the scope of banking lending, began to search for shadow banking sources of financing. The impact of overregulation was particularly visible after the global financial crisis of 2008–2009. As a result of the crisis, the Chinese government tightened financial market regulations. This triggered regulatory arbitrage and the search for new solutions and financial innovation development, for example, offline payments.

3 The Characteristics of Chinese Shadow Banking

The official definition states that shadow banking is a credit intermediation outside the formal banking system. However, shadow banking in China and in Western markets are based on different mechanisms. Not only are the institutions and instruments forming the system different, the entire nature of shadow banking differs in these markets. The first issue is that the financial markets play a different role in the different economies. While the aim of the financial market in Western countries is to act as a servant to the economy (as an intermediary between savers and borrowers), the financial market in China is treated as a tool of the State. The government

uses it as a means of regulating the economy in accordance with the overall state directives (Tsang 2016). Moreover, the financial institutions in Western countries enjoy a certain level of independence, whereas the Chinese financial market is subject to the party leadership's political will. Traditionally, the Chinese financial market has been rule-bound and has needed more regulation than other industries.

The second issue is related to the financial market model. China's market is bank-centric. This means that banks have some advantages over other types of financial institutions and that the capital market in China is still underdeveloped. The situation is changing with time, but the activity of money lending is the core activity in the entire system. There are two reasons for such a situation: banks are dominant as deposit institutions (they have access to individual and institutional savings); and their deposits are guaranteed by the State (Wang et al. 2015). In the Western-oriented model, in contrast, firms use the capital market (non-bank financial institutions) as a source of their funding. In such a system, banks play only a complementary role to the system as a whole.

The third issue that makes Chinese shadow banking different from the systems in Western countries comprises technical features. The Chinese shadow banking system is less complex than the system in Western economies (see Table 18.1). There is a higher interconnectedness between shadow banking and commercial banking, although the intermediation chain is relatively low. In China, securitization plays a less important role and the lever-

Table 18.1 The comparison between shadow banking in China and in Western countries

China's shadow banking	*Western shadow banking*
Domestic financial system	Both domestic and foreign financial system
Mainly driven by commercial banks	Mainly driven by non-bank financial institutions
Underdeveloped secondary market	Well-developed secondary market
Low securitization rate	High securitization rate
Low leverage rate	High leverage rate
Purchases made by individual investors	Purchases made by institutional investors
Immature development phase with inherent risks	More mature development phase
Irregular fund raising and lending operations	More regular fund raising and lending operations

Source: Van der Linden (2015), pp. 111–114

age rate is lower than in Western countries. Individual investors play a greater role in the system (vs. institutional investors in Western economies).

As regards the mechanisms of creation, it may be stated that shadow banking in China is a result of financial innovation and broadens investment channels for the private sector. In contrast, shadow banking in Western economies has grown due to the emergence and development of asset securitization and is situated mainly outside the formal financial market (Van der Linden 2015).

Just like shadow banking in other countries, the Chinese shadow banking system consists of many institutions and instruments. The institutions include traditional banks, trust companies, leasing companies, pawnshops, money market funds, and microcredit companies. The key Chinese shadow banking instruments are WMPs, entrusted loans, bankers' acceptances, trust loans, and local government financing vehicles (LGFV) (Sheng et al. 2015; Sekine 2015). The interconnectedness of the institutions and instruments consists of three layers:

- bank off-balance-sheet financing;
- a credit enhancement layer;
- a non-bank lending layer.

Through bank off-balance-sheet financing, traditional banks help to satisfy credit demand, using off-balance-sheet channelling, such as WMPs and banker's acceptances. The credit enhancement layer consists of institutions (such as trust companies) that help to enlarge lending capacity by providing guarantees (indirect participation) or loans (direct participation). The non-bank lending layer consists of institutions such as leasing companies, pawnshops, and microfinance companies, which, with their Chinese characteristics, belong to the shadow banking sector. This layer involves such instruments as entrusted loans, trust products (loans), LGFV, financial leasing, underground high-yield lending, and P2P lending (Sheng et al. 2015; Sekine 2015).

The key components of Chinese shadow banking are WMPs and trust products. It can be seen in the Fig. 18.1 that WMPs have the biggest share in the structure of Chinese shadow banking. They are financial products sold by banks and other financial institutions and are treated as 'quasi-deposits'. The idea of WMPs arose at the beginning of the twenty-first century, when commercial banks were permitted to offer their retail customers specialist services, such as financial analysis, planning, investment advice, and asset management. Many banks began to engage in fund

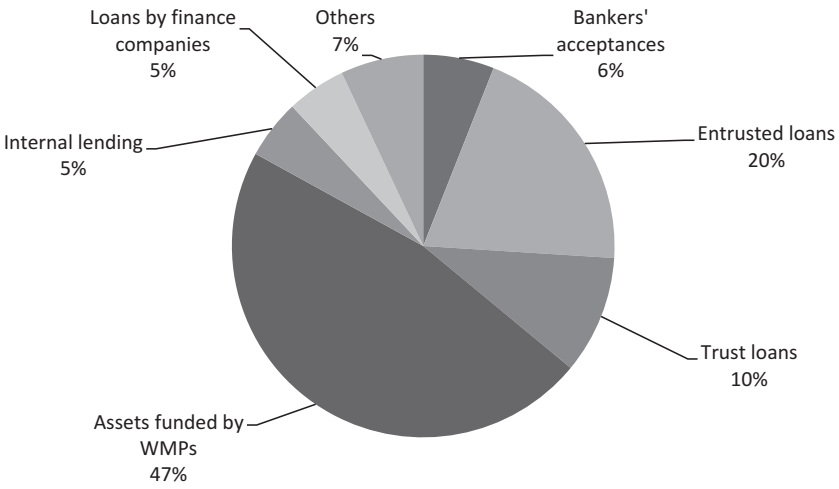

Fig. 18.1 The structure of Chinese shadow banking (end of 2016). (Source: Moody's Investment Service)

(asset pool) operations. They pooled together various money market instruments, interbank notes, credit assets, and so on and, on the basis of such an asset pool, began issuing WMPs (Sekine 2015; Sheng and Soon 2016). Issuance of these products has grown rapidly in China in recent years, and the process has been supported by a higher yield compared to the yield offered by traditional deposits.

WMPs are usually created on the basis of risky loans given to sectors where bank credit is restricted. WMPs are single large loans or a pool of loans but are treated as off-balance-sheet investments and are not guaranteed by banks or other guarantee systems (see Fig. 18.2) (Perry and Weltewitz 2015). The characteristic feature of these instruments is that they offer fixed rates of return well above the official interest rates applied to bank deposits. WMPs are mostly short-term vehicles created and issued to ordinary investors through banks or trust companies (Elliot et al. 2015). Very often, banks intentionally use other financial institutions (known as 'channel firms') to keep WMPs off their balance sheets and enable regulatory arbitrage.[1] Despite

[1] For example, in June 2014, only 11 per cent of the total amount of WMPs in China were pure bank WMPs. The remaining 89 per cent were split between 'bank-trust cooperation WMPs' and 'other chanelled WMPs'—Perry and Weltewitz (2015).

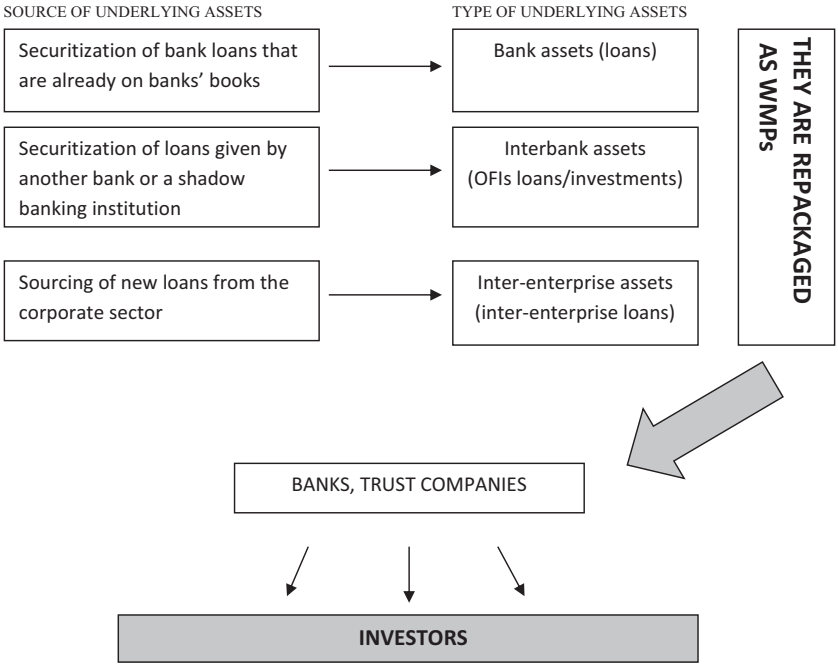

Fig. 18.2 The types of assets and institutions involved in the creation of WMPs. (Source: Compiled by the author based on Elliot et al. (2015), Sheng and Soon (2016))

being off-balance-sheets instruments, they are treated as 'low risk investments', which can be deceptive for investors.

The second important component of Chinese shadow banking is trust companies. Trusts are non-bank institutions that sell high-yielding investment products and use money to make loans to risky borrowers (Liang 2016). They have special financial licences which enable them to engage in the activities that the traditional banking sector and capital market cannot undertake (e.g. asset securitization, private equity operations, etc.) (Sheng and Soon 2016). Trust companies usually play an important role as intermediaries between banks and investors and link the financial market with the real economy.

The assets managed by Chinese trust companies have been growing rapidly over the last decade. The growth of these entities in China was enhanced by a flexible charter for trust companies and their interconnectedness with other financial institutions. Originally, in the 1980s, trust companies were used by local government to mobilize funds from other sources (e.g. foreign capital). Later, their activities became more speculative and trust companies began to cooperate more fully with traditional banks. Currently, bank-trust cooperation is, in fact, the main driver of their development. Banks are their most important funding source, which stems from the fact that trust products enable obtaining a higher return than traditional bank deposits (e.g. the average return on trust products in 2013 was 7 per cent per annum instead of 3.3 per cent maximum interest for time deposits) (Zhu and Conrad 2014). Furthermore, trust companies are funded by non-bank institutions, cash-rich companies, and some wealthy individuals. The significant role of trusts is their participation in banks' off-balance-sheet activities, which led to regulatory arbitrage (see Fig. 18.3). An example of such an activity is when banks buy trust companies' products and record them as WMPs. On the other hand, cooperation between banks and trust companies exposes both of these types of institutions to major risk due to the fact that trust companies are not backed by the guarantee schemes typical to banks.

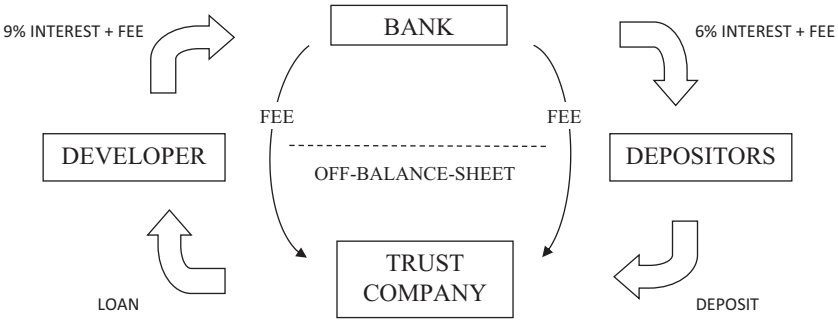

Fig. 18.3 The role of trust companies in the banking activity in China. (Source: Compiled by the author based on based on the literature description)

4 Inherent Risks and Impact on the Regular Financial System

4.1 Risks Created by WMPs

As stated previously, the Chinese shadow banking system is simpler than the systems in Western countries, although both kinds of the systems generate similar categories of risk. WMPs and trust companies, which are at the core of Chinese shadow banking, pose the greatest threat to financial stability and have a huge impact on the economy as a whole.

The level of the risk posed by WMPs varies depending on the type of the product. In China, there are a few major categories of WMPs:

- on-balance-sheet bank WMPs ('pure' bank WMPs and direct bank-trust cooperation WMPs);
- off-balance-sheet bank WMPs linked to trusts (collective trust products, indirect bank-trust cooperation);
- other channel bank WMPs.

While on-balance-sheet WMPs have explicit guarantees and their investments are relatively low-risk assets, off-balance-sheet WMPs are unguaranteed and involve greater risk (Perry and Weltewitz 2015). The main risk of unguaranteed WMPs is the maturity mismatch between the WMPs sold to investors and the assets they ultimately fund. WMPs usually have a lifespan of a few months, while the projects they finance are often of much longer maturity. A significant part of these products is invested in illiquid assets, and, in such cases, the issuers of the WMPs need to roll over these products continuously in order to maintain a positive cash flow. The transmission mechanism of converting liabilities into assets creates the risk of liquidity. Accordingly, the risk from WMPs is levied on banks, which have to use their own capital to protect investors.

Apart from liquidity risk, the other types of risks related to WMPs in China are transaction risk and systemic risk. The main causes of risks include pooling, lack of transparency, and interconnectedness between traditional banks and other institutions.

Chinese banks creating WMPs use the mechanism known as pooling. This means that money raised from several individually created WMPs is aggregated into a general pool. Banks use such a pool to fund a variety of assets, such as infrastructure and real estate projects, sometimes in the

shadow sector. When the pool of WMPs goes bust, banks are expected to cover the losses incurred by investors. The whole process resembles the securitization process in Western banking systems. Sometimes state banks intentionally repackage at-risk loans into 'investments', thus improving their balance sheets. At the beginning of the twenty-first century, Chinese banks had a very high level of non-performing loans (NPLs), so they used WMPs as a very convenient way to move them off their balance sheets. Investors wrongly assume that the quality and profitability of WMPs is guaranteed by banks, but in fact their money can be lost (Nunlist 2016; Chovanec 2011).

Another risk is related to the lack of transparency or proper information for consumers. Very often, WMPs are not properly protected but are offered to single, mass-market investors. This means that, when buying WMPs, investors expect a typical deposit, but in fact they obtain an investment product different from deposits. Investors only know such details of the product as maturity, the interest rate, and the name of the issuer; they have no idea what their money is funding, what the level of risk is, and so on. The products are offered by many institutions, for example, directly by banks, by third parties, and sometimes by third parties at bank locations. It is difficult for individual buyers to discern the location and level of risk of these products. Moreover, every product differs individually in terms of interest rates, maturity, and other details. Additionally, WMPs are both loan substitutes and deposit substitutes and are aimed at ordinary people who spend their entire savings on these products, yet they are non-capital protected (Wei 2015).

WMPs in China are interconnected with other instruments and link up different sectors of the financial market, which means that the risks they incur may affect the entire financial system. A large part of the money involved in WMPs has been channelled into the shadow banking system, yet they are not guaranteed by any guarantor or regulator. Banks are competing for deposits and they issue WMPs in large numbers. The issuance is a process with a 'rolling nature' and the whole process exacerbates the systemic risk in the system. Moreover, some banks have cross-ownership of WMPs, which creates a possible default chain reaction. Since 2008, the People's Bank of China has imposed a number of regulations aimed at decreasing the level of involvement of traditional banks in WMPs. This had a huge impact on the development of systemic risk, because, in response, Chinese banks began searching for ways to circumvent these legal restrictions. They have found some ways to avoid the regulations and

channel the money by adding additional agents (e.g. investment banks) to the loan intermediation chain. A larger chain of transmission of the money in WMPs from lenders to borrowers raised transmission costs, reduced transparency, and enhanced liquidity risks. Moreover, the liquidity risk of an individual bank could very easily trigger liquidity problems in the market as a whole (Acharya et al. 2016). This constituted an important cause of systemic risk.

4.2 Risks Created by Trust Companies

The risks of the trust companies functioning in China are similar to those posed by WMPs and have a major impact on the financial system in the country as a whole. Theoretically, they are licenced arrangers of fundraising and have the potential to be very profitable if they are carefully managed. In fact, the functioning of trust companies is associated with numerous threats. The difficulties arise from the fact that some trust lending is targeted at sectors which are vulnerable to the economic slowdown. Moreover, they suffer from excessive leverage and the investments made by trusts are not collateralized, which means they incur a very high risk. Trust investments sometimes have collateral, but this comprises land real estates or company shares, which means that any decline in the value of such collateral will have an impact on investments and lenders. In times of economic slowdown, such industries as real estate or the stock market will be the first to be affected. If they have a few major losses, their equity can be wiped out, which can trigger problems for other institutions forming part of the Chinese financial market (Elliot et al. 2015; Zhang 2014).

Trust companies have a very high impact on the formal banking sector. Very often, banks lend money to trusts (via entrusted loans), while trusts in turn lend funds to risky investments. If such investment fails, it will have a negative spillover effect on banks. Similar to the case of WMPs, trust channelling is linked to certain risks, such as lack of transparency and lack of information about the quality of the asset pool management by trust companies. Trust products are often very complicated in nature; hence, in case of a default, unwinding these structures would be difficult. Trusts also issue WMPs by themselves and use traditional banks to distribute these products. In this way, large loans are made to sectors with the risk of economic slowdown, for example, the coal industry, real estate, local government infrastructure investments, and so on. This increases the risk that the loans will not be repaid (Liang 2016).

A particular risk is triggered by the dynamics of the development of trust companies. Loans generated and managed by trust companies in China during the last few years have become very substantial. Before 2010, there was no regulation in China on bank-trust cooperation. This meant that companies did not report the scale of their cooperation with banks, while banks used this channel to apply regulatory arbitrage. In 2010, the People's Bank of China implemented a number of regulatory requirements on bank-trust cooperation. This sparked the search for regulatory circumventing and resulted in the establishment of transitory bridging entities. Despite the implemented regulations, trust assets associated with the Chinese banking sector increased eightfold in the period 2010–2016.[2]

4.3 Other Risks of the Chinese Shadow Banking System

The threats stemming from the operations of trust companies and WMPs show the nature of the typical risks of the Chinese shadow banking system. Apart from those described above, there are many other dangers resulting from the complexity of the unregulated part of the Chinese financial system, its interconnectedness, lack of transparency, and the growing share of non-bank financing of the real economy. Some risks are associated with the general structure of the Chinese financial system. The growing imbalance related to the issue derives from the fact that the Chinese economy is based on bank credit and much less on the capital market. The majority of funding circulates within the banking system, and there is an imbalance between equity and debt in the financial system. Furthermore, bank lending concentrates on state-owned enterprises, but small and medium-sized retail clients still have problems with accessing these funds. They must use shadow banking as a natural source of funding.

There is also another type of risk that related to the development of new technologies. For the past several years, the development of the shadow banking system has been supported by technological innovations. E-commerce creates new payment methods, financial services, and peer-to-peer (P2P) lending. Very often, SMEs are financed by affiliates of e-commerce platforms. The adoption of new technologies and innovative business models resulted in the situation that China currently has the largest P2P lending market in the world. The rapid

[2] The author's calculations based on CEIC Data statistics.

growth of such activities within a short period of time poses new risks associated with the new business models. Moreover, such threats are still not fully recognized by the regulators, a fact which poses additional threats (Li 2016; Deer et al. 2015).

It is worth noting that the rapid development of shadow banking in China might cause a systemic risk to the global economy in the future. The nature of such a risk will not be the same as that of the risk which occurred in Western countries in the past through institutional interconnectedness and risk spread to many markets. Shadow banking in China may potentially pose a major threat mainly to the local economy. The risk for international markets derives from an indirect impact via the slowdown of the real economy. This can exert an influence especially on the global commodities market, and in turn have an impact on the economic situation in commodities' exporters. The second mechanism of risk spread might be spillover from China to other countries through the trade channel. China is still the major driving force for the global economy. An economic slowdown in the country and the collapse of its trade would affect the economies of many other countries. Certain mechanisms of financial contagion might also arise, although it is difficult to estimate their extent, especially due to the fact that the Chinese shadow banking system is still domestic in nature.

5 Conclusion

The aims of this chapter were to characterize the Chinese shadow banking system and the mechanisms of its development, indicate the differences between the system in China and in Western countries, and describe the main risks inherited by the system and their potential impact on the other sectors of the Chinese economy. It can be concluded that the Chinese shadow banking system has many similarities to the existing systems in other countries, although the pace of its development and its structure is very strongly linked to the country's financial system, which is still underdeveloped. While the development of the unregulated parts of the financial markets in the USA, the UK, and the EU countries has slowed considerably, Chinese shadow banking has been developing very dynamically following the last financial crisis. This was largely a result of a government stimulus package and the monetary policy applied by the People's Bank of China. The impact of Chinese shadow banking on the real economy is much greater than in the case of Western countries. Such instruments

as WMPs, banker's acceptances, entrusted loans, P2P lending, and many others threaten not only small and medium-sized enterprises but also ordinary citizens who have deposited their savings in the institutions belonging to or interconnected with the shadow banking system.

The examples of regulatory actions taken in China in the past have shown that they can limit the development of the shadow banking system in the country but that they are neither able to constrain it completely nor limit its potential harmful effects. Moreover, new channels are always being created that lead to exacerbating the risks of shadow banking, especially for retail customers and small and medium-sized enterprises. The positive regulatory effect might be achieved by improving transparency in the use of WMPs and trust products, increasing the accessibility of banking services to the aforementioned group of customers, and eliminating the caps imposed on interest rates. Promotion of the development of the traditional banking system and its accessibility for a broader range of clients would limit crowding out banking activity to the shadow banking system. As regards the corporate sector, it is vital to reduce the overreliance on bank credit and foster the development of funding via capital markets, which should lead to reducing the imbalance of equity versus debt.

The risks stemming from the development of the shadow banking system in China pose a major threat to the global economy. It is important to highlight the fact that limiting the size and scope of the system will have a positive effect on the economy. The best way to achieve this goal might, as already mentioned, be that of fostering the development of the traditional banking sector in China and increasing the participation of the capital market in financing the economy.

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CHAPTER 19

Analysis of the Main Trends in European and US Banks and Their Impact on Performance

Giusy Chesini and Elisa Giaretta

1 Introduction

The research starts out from the consideration that, following the 2007–2008 financial crisis in Europe, increasingly stringent regulatory constraints and technological advances have both had a major impact on the operation of banks. In particular, technological advances have changed the way banks interface with clients. In practical terms, the technological advances can be described in short as a 'digital revolution', which indicates that banking services are no longer offered through traditional channels but through special applications (apps) and the use of mobile devices. Furthermore, in these changing operating conditions, new competitors—FinTech companies—have begun to offer banking services, very often with more favourable terms for clients than traditional banks.

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On the other hand, in particular when they manage the financing needs of corporations, banks need to take into account increasingly stringent prudential regulation as this may even be penalizing in terms of capital and revenue earning.

In summary, banks nowadays face new and higher costs to both implement complex new regulation—especially regulation introduced following the 2007–2009 financial crisis and recession—and transit towards new electronic platforms.

The originality of this study stems precisely from the fact of linking prudential regulation with the phenomenon of the digital revolution. These topics are not usually addressed in conjunction, as they require different skills to analyse them. At present, they are both relevant and related to one another due to the fact that prudential regulation—in particular, that in force in Europe—calls for higher capitalization, when banks should instead be investing in digital transformation. In order to deal with this scenario of fundamental changes, banks need to reshape their businesses. Hence, the main research question is 'Are the major banks in Europe and the US reducing their sizes (measured in terms of branches and employees) in line with the need to increase prudential capital and invest in technology?' If so, 'Do these trends have any positive effect on bank profitability?'

We are aware that size is not the only factor affecting a bank's long-term profitability. In fact, profitability depends both on the characteristics of individual banks (i.e. business strategies) and of the markets in which they operate (level of competition, unemployment rate, etc.). Consequently, immediately following the financial crisis, we expect to find a reduction in profitability, mainly due to the deterioration of macroeconomic conditions without a reduction in size.

Following the financial crisis and recession (2007–2009), new regulation was adopted. In particular, the re-regulation introduced in the wake of the crisis is triggering strategic changes in business models to adapt balance sheet structures to new regulatory requirements: liquidity, high-quality capital, more stable funding resources, and bail-inable debt (Cosma et al. 2017).

In the USA, the Dodd-Frank Act of 2010 introduced new financial regulations to reduce risks to the banking sector and enhance overall financial stability. In Europe, so many laws have been issued in the last six to seven years that bankers have declared that they are unable to keep pace and need a break to 'digest' all the documentation issued by several regulatory bodies (*The Banker*, 05/11/15).

We can expect stronger regulation with higher capital requirements to decrease the size of bank activity and also its profitability.

Starting from 2012, we expect to find a reduction in size, in particular for European banks, together with an increase in bank profitability. The reduction in size is due to the need to transform banking activity, via a reduction in the number of branches and employees and greater use of digital channels following the introduction of new technological innovations in mobile and digital banking.

In order to consider all these phenomena, we take into consideration an extended period of time: from 2006 to 2016. We are thus able to consider the effects of the great financial crisis, the sovereign crisis which affected some European banks, the changes in prudential regulation, and the subsequent strategic changes due to the advances in technological innovation and the entry of new competitors emerging from the digital environment.

This chapter is structured as follows. Section 2 reviews the theoretical and empirical literature on the link between bank size, new evolutionary drivers, and profitability. Section 3 presents the data and describes the quantitative analysis and the econometric methodology employed. Section 4 describes the results and, finally, Sect. 5 presents our conclusions.

2 Literature Review

This chapter investigates some relevant aspects of the recent evolution of banking activity, some of which have been analysed in previous studies though with different objectives. In particular, we have found two papers which address a similar topic. First, Gobbi (2016) describes the same phenomena currently influencing various banking systems. Specifically, the author studies the consequences of the regulatory reforms on banks' profitability and the challenge of a number of new companies, labelled FinTech firms, which are entering the financial services market, posing a serious threat to banks' profitability. Second, the paper by Regehr and Sengupta (2016) analyses the relationship between bank profitability and bank size. In particular, they find that profitability measured by banks' return on assets increases with the bank crisis, but at a decreasing rate. They do not find a statistically significant difference in the size-profitability relationship before and after the crisis.

Except for these two papers, the relevant literature tends to consider the impact on bank profitability of technological evolution and regulation separately.

As to technological evolution, starting in the mid-1990s, most banking institutions began to use Internet websites as an important alternative distribution channel. At first, banks and their customers began to use the Internet channel as a complement, rather than a substitute for physical branches, and some authors found that Internet adoption had improved bank profitability (De Young et al. 2007).

We consequently analysed the relevant literature on the changes in bank distribution channels due to the use of Internet (Furst et al. 2002; Sullivan 2000; De Young 2005). We consider this change to be a sort of first step followed by a second step consisting in digital transformation. As to the latter, Milne (2016) suggests that the FinTech revolution in banking will not be as rapid as some suppose, because public policy intervention is necessary to overcome the technological barriers which protect the incumbents. Very interestingly, Sahut (2014) studied the 'e-Business Model' of Internet-primary banks in order to determine whether it can perform better than the 'Business Model' of traditional banks.

Furthermore, given the additional need to analyse the impact of regulatory pressure on bank performance, we reviewed the literature on the effect of stringent regulation on profitability. In this regard, Aiyar et al. (2015) found that raising minimum capital requirements is not socially costless; bank profitability, share prices, and loan supply are likely to suffer. However, avoiding the dramatic consequences of banking crises would more than repay those costs. Another interesting paper (Beccalli et al. 2015) analysed the relation between regulation, profitability, and size of banks. The authors started out from the consideration that, as a consequence of the financial crisis, regulators in the EU (such as the recommendations contained in the Liikanen Report 2012 currently being implemented into UK law and those made by the Vickers Report 2011 implemented into UK law) and in the USA (under the Dodd-Frank Act of 2010) have imposed restrictions on banks by requiring more capital and liquidity (in line with Basel III requirements) and have also begun to restrict riskier areas of activity, all of which constrain bank size. In addition, Bolt et al. (2012) begin their paper by stating that the Basel III Accord—requiring banks to retain more profits and pay out

fewer dividends when Tier 1 capital buffers are below required levels—calls for more research into the main determinants of bank profit. Finally, and most interestingly, Bitar et al. (2018) examine whether the imposition of higher capital ratios is effective in reducing risk and improving the efficiency and profitability of banking institutions in the OECD countries.

Furthermore, we likewise considered the information periodically offered by some important institutions. For example, the European Central Bank collects extensive, detailed, vital information on banks subject to direct supervision for the purposes of supervision (ECB, Annual Report for 2014). The ECB also publishes a report on financial structure divided into two parts: the first considers non-bank balance sheet data, while the second considers consolidated data. The approach is both cross-sectional (different types of banks and different business models) and offers a time perspective (ECB, Report on Financial Structure, October 2015). This report is something that we cannot neglect in this study; however, by relying solely on balance sheets, it illustrates the main trends without describing the evolution of different banking activities in Europe.

The European Commission also periodically provides aggregate data on institutions in the European Union, considering in particular the development and stability of banks in the various financial systems (EU, European Financial Stability and Integration, April 2015). These are very interesting studies but are carried out with different objectives to those of the present one. Mediobanca has also been producing an annual survey of major international banks for more than ten years. The banks are considered at group level, and aggregate data are compiled on the main budget indexes (R&S Mediobanca, Annual survey of major banks based in Europe, Japan, the USA, and China, July 2015). The aim is to highlight the main management issues and the capital trends of the major banks which account for at least 1% of the aggregate in their respective countries. The analysis is definitely of interest for the present study but does not provide usable data.

To answer our research questions, another interesting study is that conducted by the Centre for European Policy Studies (CEPS), which set up the Banking Business Models (BBM) Monitor for Europe in 2013. While pursuing a goal that, at first glance, seems very similar to that of the present study, the researchers only analyse 147 major European banking

groups, identifying four types of business model (Ayadi and De Groen, Banking Business Models Monitor 2014: Europe). The study does not respond to the research questions of this research, even though it provided important results.

3 Data and Method

We conduct a quantitative analysis. The data refer to the size, the regulatory capital, and the relationship between intangible and tangible assets and profitability for each bank in the sample. Bank-level data are collected from the Bloomberg database.[1] We analyse listed banks located in the European Union and in the USA included in two well-known indexes: the Stoxx Europe 600 Banks Price (SX7P Index) and the Dow Jones US Total Market Banks Index (DJUSBK Index).

The former is a capitalization-weighted index in euros which includes European companies involved in the bank sector. The parent index is the SXXP. The index was developed with a base value of 100 as of 31 December 1991.

The latter is a US capitalization-weighted index and is evaluated in dollars. The index was developed with a base value of 100 as of 31 December 2004, and the data are distributed by the Dow Jones data feed of the Chicago Board of Trade.

We chose these two indexes because we think that major changes in performance are more observable in large banks subject to market monitoring.

Our sample of banks (See Table 19.4 in the Appendix for the list of the banks) is located in a set of countries that were affected by the global financial crisis to varying degrees. We thus have sufficient variability across the sample to detect any meaningful effect of the crisis.

Data are collected in units of euros[2] for the period 2006–2016.

We exclude the outliers and banks with all missing values from the sample. The final sample comprises 770 bank-year observations.

[1] Bloomberg is an online database providing current and historical financial quotes, business newswires, and descriptive information, research, and statistics on over 52,000 companies worldwide.

[2] For the data collection process, we chose to use the currency that was used by the greatest number of banks in the sample so as to minimize any possible conversion problem. However, the data are processed as a ratio, so the unit of measurement becomes irrelevant.

To categorize banks on the basis of their size, we adopt Ward's linkage cluster analysis, grouping banks according to the number of employees and number of branches. The first variable indicates the bank dimension, while the second measures its presence in the territory. Via this cluster analysis, we identify three groups of banks:

- Cluster 1, 'typical' banks: this includes the greatest number of banks (87%). It comprises banks with a lower number of both employees ($\leq$ 100,000) and branches ($\leq$ 5000) in relation to the size of the sample.
- Cluster 2, 'alternative: more branches' banks: this comprises banks with a greater number of branches and employees than banks in Cluster 1. The ratio between branches and employees is also greater than that for banks included in Cluster 1, which means that these banks are deeply rooted in the territory. It includes 7% of the banks in the sample.
- Cluster 3, 'alternative: more employees' banks: banks with a large number of employees but with a lower number of branches than banks in Cluster 2 constitute this group. The lower ratio between branches and employees than that for banks included in the other two clusters means that these banks do not have a major presence in the territory, but mostly work through online channels. This cluster includes the remaining 6% of the banks in the sample.

The distribution of banks in the three groups is shown in Table 19.1, while Fig. 19.1 represents the distribution of banks in the three groups on the basis of employees and branches in the form of a graph.

The descriptive statistics for the three groups of banks are reported in Table 19.2. The precise constructs of the variables analysed in the present study are reported in the Appendix, together with the data sources (Table 19.5). We also run a test for the equality of means for each variable considered. The standard Analysis of Variance (ANOVA) F test assumes that the groups have equal variances, and when this assumption is violated, actual type I error rates can exceed nominal type I error rates. We perform Bartlett's test for equal variances which provides variances and sample sizes to compute actual type I error rates given that the null hypotheses is true. As our type I error rates are inflated (see the Appendix for the Bartlett

Table 19.1 Distribution of banks in the three groups

	Freq.	*Percent. (%)*	*Cum. (%)*
Cluster 1 'typical' banks	674	87	87
Cluster 2 'alternative: more branches' banks	57	7	94
Cluster 3 'alternative: more employees' banks	39	6	100
Total	770	100	100

Source: Compiled by the authors using the Bloomberg database

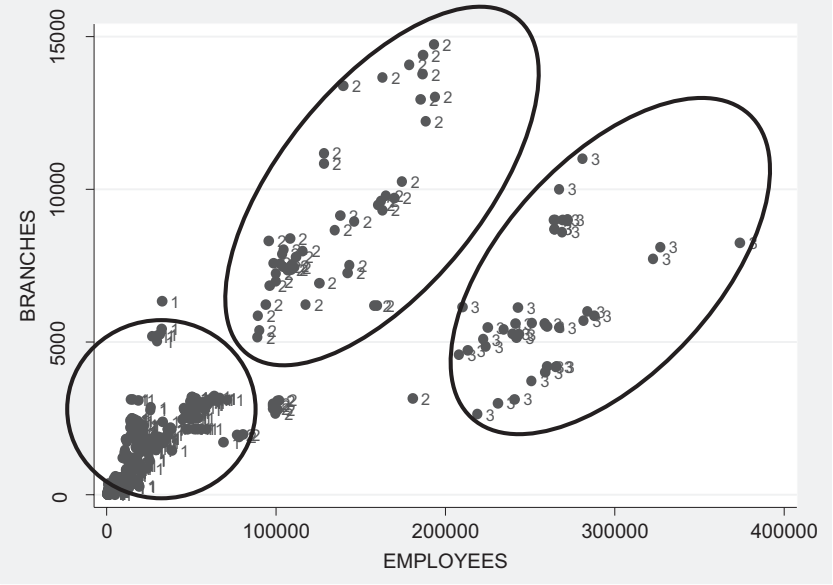

Fig. 19.1 Scatterplot of the three groups of banks. Variables: number of employees and number of branches. (Source: Compiled by the authors using the Bloomberg database)

test results, Table 19.6), we use Welch's correction of ANOVA (the W test), which is more effective in yielding appropriate type I error rates under conditions of unequal variances and unequal means across groups (see Wilcox et al. 1986).

Table 19.2 Descriptive statistics for the three groups of banks. Mean values and W test

	Cluster 1 'typical' banks	*Cluster 2 'alternative: more branches' banks*	*Cluster 3 'alternative: more employees' banks*	*W test*
ROA	0.7003	0.3604	0.6633	0.0069***
ROE	6.9053	5.9674	6.0038	0.7229[a]
Net interest spread	2.6837	1.0646	2.7193	0.0000***
Tier 1 capital ratio	12.4094	10.6563	11.8295	0.0000***
Total risk-based capital ratio	14.6934	13.5811	14.2915	0.0009***
Risk-weighted assets on assets	0.6931	0.4663	0.6383	0.0000***
Intangibles on assets	0.0242	0.0171	0.0257	0.0000***
Goodwill on assets	0.0222	0.0133	0.0220	0.0000***
Tangible common equity ratio	7.6901	4.2860	6.4923	0.0000***
Sales per employee	293,735.4000	359,892.7000	311,743.2000	0.0000***
Sales revenue turnover	2919.2140	45,353.7300	79,715.4600	0.0000***
Debt on assets	18.3103	33.2156	29.5479	0.0000***
Deposits on assets	0.6783	0.3904	0.5310	0.0000***
Net loans on assets	0.6401	0.5052	0.4183	0.0000***
Loans on assets	0.6529	0.5248	0.4295	0.0000***
ST&LT investments	0.2127	0.2048	0.2614	0.0000***

Source: Compiled by the authors using the Bloomberg database

* = 10% level of significance, ** = 5% level of significance, *** = 1% level of significance

[a]The ANOVA test as the result of Bartlett's test shows that its assumption is not violated

As can be seen from the table, nearly all the means of the variables analysed for the three groups of banks differ statistically. The value of ROA for banks in Cluster 1 is 0.7003, which is higher than that of banks in Cluster 2 (0.3604) and Cluster 3 (0.6633). Furthermore, the mean value of the banks' ROE is higher for banks in Cluster 1 (6.9053 versus 5.9674 for banks in Cluster 2 and 6.0038 for banks in Cluster 3). However, this is the only variable that does not statistically differ between the three groups. However, these two ratios show that 'typical' banks are more profitable than 'more branches' and 'more employees' banks. Conversely, the net interest spread is higher for banks in Cluster 3 (2.7193 versus 2.6837 for Cluster 1 and 1.0646 for Cluster 2). This means that 'more employees'

banks can apply a greater price gap in their core activity. It is important to note that 'more branches' banks are the ones that present the lowest values in all the three measures of profitability analysed here. Thus, it would initially appear that more branches means less profitability.

As regards regulatory capital requirements, banks in Cluster 1 are the most stable and most capitalized: in fact 'typical' banks present the highest values for the tier 1 capital ratio (12.4094), total risk-based capital ratio (14.6934), and risk-weighted asset divided by total assets (0.6931). They are followed by banks included in Cluster 2 (11.8295, 14.2915 and 0.6383, respectively, for the tier 1 capital ratio, total risk-based capital ratio, and risk-weighted asset on total assets). Also in this case, 'more branches' banks present the lowest values (10.6563, 13.5811 and 0.4663). Thus, more branches seem to be linked to less capitalization and hence less stability.

As expected, the share of intangible assets on total assets is greater for 'more employees' banks. It amounts to 0.0257, while it is 0.0242 and 0.0171, respectively, for 'typical' and 'more branches' banks. The ratio between goodwill and total assets is greater for banks in Cluster 1 (0.0222). This means that, for these banks, a greater part of intangibles is made up of goodwill, which probably does not imply technological advances. This value is slightly lower for banks in Cluster 3 (0.0220) and is around half these values for banks in Cluster 2 (0.0133).

However, 'typical' banks present a higher tangibility of assets, their mean value of tangible common equity ratio being 7.6901, versus 6.4923 and 4.2860, respectively, for 'more employees' and 'more branches' banks.

'More branches' banks present a greater value of sales per employee (359,892), followed by 'more employees' banks (311,743), while 'typical' banks have the lowest mean value (239,735). Sales revenue turnover is also the lowest for banks in Cluster 1 (2919), whereas it is the highest for banks in Cluster 3 (79,715), followed by banks in Cluster 2 (45,353).

The mean value of banks' debt on total assets is higher for 'more branches' banks (33.2156), followed by 'more employees' banks and 'typical' banks (29.5479 and 18.3103, respectively).

The values of deposits, net loans, and loans scaled on total assets are higher for banks in Cluster 1 (0.6783, 0.6401, and 0.6529, respectively), followed by that of banks in Cluster 3 as regards the value of deposits (0.5310) and by that of banks in Cluster 2 for the remaining two variables (0.5052 and 0.5248).

Finally, it should be noted that 'more employees' banks are the ones that invest the most: the mean value of ST&LT investments is higher for banks included in Cluster 3 (0.2614 versus 0.2127 for banks in Cluster 1 and 0.2048 for banks in Cluster 2).

We subsequently analysed these three groups of banks in greater detail in order to test the influence of the drivers of regulation and technological advances on bank profitability by linearizing this relationship and estimating a model. This allowed us to study how the three different groups of banks react to the present challenges for financial companies. Through the use of the Stata 11 software package,[3] we run a generalized least squares (GLS) regression model with random effects[4] for unbalanced panel data for the three groups of banks separately.

The dependent variable is bank profitability, while the explanatory variables consist of technological advances (digitalization) and regulatory capital requirements (regulation). We also include control variables and error terms in the regression along the following lines:

$$\begin{aligned}\text{Profitability} &= \alpha_0 + \alpha_1 \,\text{digitalization} + \alpha_2 \,\text{regulation} \\ &+ \alpha_3 \,\text{control} + \varepsilon_{i,t}\end{aligned} \tag{19.1}$$

Values are calculated for each bank i in period t. Here, $\varepsilon_{i,t}$ is a random residual.

We run the model with the variable ROA as a proxy for bank profitability.

Bank digitalization is estimated by the ratio between intangibles and total assets. This ratio provides a direct measure of the tangibility of bank assets; a higher ratio may be interpreted as a symptom of strong bank digitalization.

How banks comply with regulation is estimated by the tier 1 capital ratio. The tier 1 capital ratio is the comparison between a bank's core

[3] Stata is an integrated statistical software package that provides tools for data analysis, data management, and graphics. It was created in 1985 by StataCorp.

[4] In this study, we are interested in analysing time-invariant variables. Random effects models estimate the effects of time-invariant variables, while fixed effects models are not useful for estimating the effects of variables that do not change over time. Moreover, we decided to adopt a random effects model due to the fact that the subjects of our analyses—banks—do in fact change only slightly, or not at all, over time. In this case, a fixed effects model may not work very well, or even at all, as there needs to be within-subject variability in the variables; otherwise the standard errors from fixed effects models may be too large to tolerate (Allison 2009).

equity capital—also known as tier 1 capital—and its total risk-weighted assets. Core equity capital is the measure of a bank's financial strength based on the sum of its equity capital and disclosed reserves, and sometimes non-redeemable, non-cumulative preferred stock. In particular, it includes the value of its common stock, retained earnings, accumulated other comprehensive income (AOCI), non-cumulative perpetual preferred stock, and any adjustments to such accounts. In times of financial distress or recession, tier 1 capital is the first to absorb losses before other investors, such as debt holders, and to experience losses. Risk-weighted assets include all assets that the bank holds that are systematically weighted for credit risk. The tier 1 capital ratio indicates how well a bank can withstand financial distress before it becomes insolvent.

We include the amounts of sales per employee and the ratio between total customers' deposits and assets as control variables in the equation. We also include a dummy variable for the onset of the global financial crisis that takes the value 0 for the years 2006 and 2007 and the value 1 otherwise.

The final model is the following:

$$\begin{aligned}\mathrm{ROA}_{i,t} &= \alpha_0 + \alpha_1 \text{intangible on assets}_{i,t} + \alpha_2 \text{ tier1 capital ratio}_{i,t} \\ &+ \alpha_3 \text{ sales per employee}_{i,t} + \alpha_4 \text{ deposits on assets}_{i,t} + \alpha_5 \text{ crisis} + \varepsilon_{i,t} \quad (19.2)\end{aligned}$$

The null hypothesis of the model is H_0: all return coefficients = 0, and states that technological advances and the need to comply with regulation do not influence bank profitability. Some effects of the technological advances require that α_1 in Eq. (19.2) differs significantly from zero. An estimated $\alpha_1 \neq 0$ implies that bank profitability depends on bank digitalization: specifically, $\alpha_1 > 0$ means that more digitalized banks earn more than their counterparts; conversely, $\alpha_1 < 0$ means that the process of bank digitalization has a negative impact on bank earnings.

Moreover, in the case of α_2 being equal to zero, there is no effect of regulation on bank profitability. Contrariwise, if $\alpha_2 < 0$, this means that the regulatory requirements have a negative impact on bank profitability; while if $\alpha_2 > 0$, this means that more capitalized banks perform better.

In addition, the coefficients α_3, α_4, and α_5 are related to the control variables and are not relevant for the present study.

4 Results

We now present and interpret the estimation results for Eq. (19.2), which provides a simple framework for estimating the relationship between profitability, technological advances, and regulation. Our empirical model is designed to capture the linear relationship between the aforementioned factors for different bank business models.

The correlation matrixes can be found in the Appendix (Tables 19.7, 19.8, and 19.9, respectively, for regression for Cluster 1, Cluster 2, and Cluster 3).

Table 19.3 presents these coefficients and their corresponding statistical significance for the specification in Eq. (19.2). Column 2 reports the results for 'typical' banks; column 3 reports the results for 'more branches' banks; while the information about results for 'more employees' banks can be found in column 4. We identify some significant influence coefficients, the analogues of α in Eq. (19.1). Therefore, the null hypothesis that all return coefficients are equal to zero is rejected. Specifically, we find that the significant coefficients are different for 'typical' banks and the two alternatives of 'more branches' and 'more employees' banks.

As emerges from column 2, for banks included in Cluster 1, the intangibles on assets regressor is statistically significant, with a positive coefficient of 7.29309 and a *p*-value of 0.001***. Furthermore, the tier 1 capital ratio variable for 'typical' banks is also statistically significant (*p*-value < 0.001***), with a positive coefficient (0.0501). Sales per employee is statistically significant with a positive coefficient lower than 0.0001 and a *p*-value of 0.005***. The ratio between deposits and assets is also statistically significant (*p*-value < 0.0001***) and has a positive coefficient (1.55183). Moreover, the crisis dummy related to the years after the onset of the global financial crisis has a negative coefficient (−0.66752) and a statistically significant value (*p*-value < 0.0001***). Furthermore, the constant term is statistically significant (coefficient = −0.85755 and *p*-value = 0.011**).

As can be seen in column 3, the coefficient for the share of intangible assets is positive (18.28528) and statistically significant (*p*-value 0.023**) for the 'more branches' banks, included in Cluster 2. Conversely, the tier 1 capital ratio for these banks presents a non-statistically significant value. The coefficient for sales per employees does not present a statistically

Table 19.3 Results for Eq. (19.2). Random effects GLS regression model for panel data, including 770 observations for banks in 2006–2016

	Cluster 1 'typical' banks	*Cluster 2 'alternative: more branches' banks*	*Cluster 3 'alternative: more employees' banks*
Intangibles on assets	7.29309	18.28528	−19.65106
	(0.001***)	(0.023**)	(0.004***)
Tier 1 capital ratio	0.05011	0.01768	−0.02515
	(0.000***)	(0.641)	(0.579)
Sales per employee	8.68e-07	5.25e-07	4.70e-06
	(0.005***)	(0.327)	(0.000***)
Deposits on assets	1.55183	1.80878	5.07063
	(0.000***)	(0.040**)	(0.000***)
Crisis	−0.66752	−0.83188	−0.64336
	(0.000***)	(0.000***)	(0.022**)
Intercept	−0.85755	−0.38039	−2.09783
	(0.011**)	(0.543)	(0.000***)
No. of observations	674	57	39
No. of groups	68	7	4

Source: Compiled by the authors using the Bloomberg database

* = 10% level of significance, ** = 5% level of significance, *** = 1% level of significance

significant value either. The ratio of deposits on assets is statistically significant (p-value 0.040**), with a positive coefficient (1.80878). The crisis dummy is also statistically significant (p-value < 0.0001***), although the coefficient is negative (−0.83188). Additionally, the intercept of the model is not significant.

In the regression for the 'more employees' banks (column 4), the intangibles on assets variable is statistically significant (p-value 0.004***), but, in contrast with the previous two regressions, has a negative coefficient (−19.65106). It should be noted that the coefficient for the tier 1 capital ratio is not statistically significant. Both the sales per employee and the deposits on assets variables take significant values in this regression (p-value < 0.0001***), with positive coefficients, respectively, equal to 0.00004 and 5.07063. The coefficient for the crisis dummy is −0.64336 (p-value 0.022**). Finally, the constant term presents a negative significant coefficient that is equal to −2.09783 (p-value < 0.0001***).

5 Conclusions

Technological innovations, regulatory changes, and evolving market conditions presently pose a challenge for banking activity worldwide. The issue of the profitability of banks in these changing situations is increasingly attracting the attention of bank managers, regulators, investors, and financial analysts.

From the analysis of the results of our regressions, it emerges that these drivers affect profitability in different ways depending on bank size. In particular for 'typical' banks, technological advances have a positive impact on profitability, while the regulatory requirements also positively affect their ROA. However, 'typical' banks may improve their financial returns by becoming more digitalized and more capitalized. Furthermore, 'more branches' banks benefit from technological advances: the greater their degree of digitalization, the higher their ROA. However, regulatory requirements regarding capital do not change the financial results of these banks, either positively or negatively. 'More employees' banks present no impact of regulation on profitability. This could mean that, above a dimensional threshold, complying with regulation does not put stress on bank earnings. Finally, technological advances have a negative impact on the profitability of 'more employees' banks. The banks that follow this model have had to make huge investments to be able to operate in this way, which evidently represents a cost and curbs profitability. It may well take some years for these banks to recover their investments and benefit from the technological advances of digitalization.

5.1 Limitations and Directions for Further Researches

The limitations of this study are related to the number of banks in the sample and the intrinsic characteristics of these banks belonging to two different but relevant indexes. We would like to enlarge the analysis to a greater number of banks and to better specify the regressors.

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Appendix

Table 19.4 Banks included in the samples

	Bank	*Index*
1	Associated Banc-Corp	Dow Jones US Total Market Banks Index
2	BancorpSouth	Dow Jones US Total Market Banks Index
3	Bank of America	Dow Jones US Total Market Banks Index
4	Bank of Hawaii	Dow Jones US Total Market Banks Index
5	Bank of the Ozarks	Dow Jones US Total Market Banks Index
6	BankUnited	Dow Jones US Total Market Banks Index
7	BB&T	Dow Jones US Total Market Banks Index
8	BOK Financial	Dow Jones US Total Market Banks Index
9	Capitol Federal	Dow Jones US Total Market Banks Index
10	Cathay	Dow Jones US Total Market Banks Index
11	Citigroup	Dow Jones US Total Market Banks Index
12	Citizens Financial Group Inc	Dow Jones US Total Market Banks Index
13	Comerica	Dow Jones US Total Market Banks Index
14	Commerce Bancshares	Dow Jones US Total Market Banks Index
15	Cullen/Frost Bankers	Dow Jones US Total Market Banks Index
16	East West Bancorp	Dow Jones US Total Market Banks Index
17	Fifth Third	Dow Jones US Total Market Banks Index
18	First Financial Bankshares	Dow Jones US Total Market Banks Index
19	First Horizon National	Dow Jones US Total Market Banks Index
20	First Republic Bank	Dow Jones US Total Market Banks Index
21	FNB	Dow Jones US Total Market Banks Index
22	Fulton	Dow Jones US Total Market Banks Index
23	Glacier	Dow Jones US Total Market Banks Index
24	Hancock	Dow Jones US Total Market Banks Index
25	Huntington Bancshares	Dow Jones US Total Market Banks Index
26	IBERIABANK	Dow Jones US Total Market Banks Index
27	International Bancshares	Dow Jones US Total Market Banks Index
28	Investors Bancorp	Dow Jones US Total Market Banks Index
29	JPMorgan	Dow Jones US Total Market Banks Index
30	KeyCorp	Dow Jones US Total Market Banks Index
31	M&T Bank	Dow Jones US Total Market Banks Index
32	MB Financial	Dow Jones US Total Market Banks Index
33	NewYork Community Bancorp	Dow Jones US Total Market Banks Index
34	PacWest	Dow Jones US Total Market Banks Index
35	People's United	Dow Jones US Total Market Banks Index
36	PNC Financial	Dow Jones US Total Market Banks Index
37	Popular	Dow Jones US Total Market Banks Index

(*continued*)

Table 19.4 (continued)

	Bank	*Index*
38	PrivateBancorp	Dow Jones US Total Market Banks Index
39	Prosperity Bancshares	Dow Jones US Total Market Banks Index
40	Regions Financial	Dow Jones US Total Market Banks Index
41	Signature	Dow Jones US Total Market Banks Index
42	SunTrust Banks	Dow Jones US Total Market Banks Index
43	SVB	Dow Jones US Total Market Banks Index
44	Synovus	Dow Jones US Total Market Banks Index
45	TCF Financial	Dow Jones US Total Market Banks Index
46	Texas Capital	Dow Jones US Total Market Banks Index
47	Trustmark	Dow Jones US Total Market Banks Index
48	UMB Financial	Dow Jones US Total Market Banks Index
49	Umpquas	Dow Jones US Total Market Banks Index
50	United Bankshares	Dow Jones US Total Market Banks Index
51	US Bancorp	Dow Jones US Total Market Banks Index
52	Valley National Bancorp	Dow Jones US Total Market Banks Index
53	Washington Federal	Dow Jones US Total Market Banks Index
54	Webster Financial	Dow Jones US Total Market Banks Index
55	Wells Fargo&Co	Dow Jones US Total Market Banks Index
56	Western Alliance	Dow Jones US Total Market Banks Index
57	Wintrust	Dow Jones US Total Market Banks Index
58	Zions	Dow Jones US Total Market Banks Index
59	Banco BPM SpA	STOXX Europe 600 Banks Price
60	Banco Bilbao Vizcaya Argentaria SA	STOXX Europe 600 Banks Price
61	Banco Santander SA	STOXX Europe 600 Banks Price
62	BNP Paribas SA	STOXX Europe 600 Banks Price
63	Natixis SA	STOXX Europe 600 Banks Price
64	Komercni banka as	STOXX Europe 600 Banks Price
65	DNB ASA	STOXX Europe 600 Banks Price
66	Unicredit SpA	STOXX Europe 600 Banks Price
67	Mediobanca SpA	STOXX Europe 600 Banks Price
68	CYBG PLC	STOXX Europe 600 Banks Price
69	Banco Popular Espanol SA	STOXX Europe 600 Banks Price
70	KBC Group NV	STOXX Europe 600 Banks Price
71	ING Groep NV	STOXX Europe 600 Banks Price
72	Julius Baer Group Ltd	STOXX Europe 600 Banks Price
73	Jyske Bank A/S	STOXX Europe 600 Banks Price
74	Erste Group Bank AG	STOXX Europe 600 Banks Price
75	Sydbank A/S	STOXX Europe 600 Banks Price

(*continued*)

Table 19.4 (continued)

	Bank	*Index*
76	Credit Suisse Group AG	STOXX Europe 600 Banks Price
77	Intesa Sanpaolo	STOXX Europe 600 Banks Price
78	HSBC Holdings PLC	STOXX Europe 600 Banks Price
79	Royal Bank of Scotland Group PLC	STOXX Europe 600 Banks Price
80	Skandinaviska Enskilda Banken AB	STOXX Europe 600 Banks Price
81	Banca Popolare dell'Emilia Romagna Scrl	STOXX Europe 600 Banks Price
82	Barclays PLC	STOXX Europe 600 Banks Price
83	Svenska Handelsbanken AB	STOXX Europe 600 Banks Price
84	Danske Bank A/S	STOXX Europe 600 Banks Price
85	ABN AMRO Group NV	STOXX Europe 600 Banks Price
86	Bankia SA	STOXX Europe 600 Banks Price
87	Societe Generale SA	STOXX Europe 600 Banks Price
88	Cembra Money Bank AG	STOXX Europe 600 Banks Price
89	Standard Chartered PLC	STOXX Europe 600 Banks Price
90	Bankinter SA	STOXX Europe 600 Banks Price
91	Lloyds Banking Group PLC	STOXX Europe 600 Banks Price
92	Unione di Banche Italiane S.p.A.	STOXX Europe 600 Banks Price
93	FinecoBank Banca Fineco SpA	STOXX Europe 600 Banks Price
94	Swedbank AB	STOXX Europe 600 Banks Price
95	Banco de Sabadell SA	STOXX Europe 600 Banks Price
96	CaixaBank SA	STOXX Europe 600 Banks Price
97	Commerzbank AG	STOXX Europe 600 Banks Price
98	Bank of Ireland	STOXX Europe 600 Banks Price
99	Deutsche Bank AG	STOXX Europe 600 Banks Price
100	Credit Agricole SA	STOXX Europe 600 Banks Price
101	Raiffeisen Bank International AG	STOXX Europe 600 Banks Price
102	Metro Bank PLC	STOXX Europe 600 Banks Price
103	Nordea Bank AB	STOXX Europe 600 Banks Price
104	UBS Group AG	STOXX Europe 600 Banks Price

Table 19.5 Data source and definition

Variable	*Definition*	*Source*
Employees	Number of employees Bloomberg command: NUM_OF_EMPLOYEES	Compiled by the authors using the Bloomberg database
Branches	Number of branches Bloomberg command: NUM_OUTLETS_BRANCHES	Compiled by the authors using the Bloomberg database
ROA	Return on assets Bloomberg command: RETURN_ON_ASSETS	Compiled by the authors using the Bloomberg database
ROE	Return on equity Bloomberg command: RETURN_ON_COMMON_EQUITY	Compiled by the authors using the Bloomberg database
Net interest spread	Interest revenues/interest expenses Bloomberg command: NET_INT_SPREAD	Compiled by the authors using the Bloomberg database
Tier 1 capital ratio	Tier 1 capital/risk-weighted assets Bloomberg command: BS_TIER1_CAP_RATIO	Compiled by the authors using the Bloomberg database
Total risk-based capital ratio	Capital/risk-based capital Bloomberg command: BS_TOT_CAP_TO_RISK_BASE_CAP	Compiled by the authors using the Bloomberg database
Risk-weighted assets on assets	Risk-weighted assets/total assets Risk-weighted assets = total assets weighted according to risk Bloomberg command: BS_RISK_WEIGHTED_ASSETS Total assets = includes total earning assets + cash and due from banks + foreclosed real estate + fixed assets + goodwill + other intangibles + current tax assets + deferred tax + discontinued operations + other assets Bloomberg command: BS_TOTAL_ASSETS	Compiled by the authors using the Bloomberg database

(*continued*)

Table 19.5 (continued)

Variable	*Definition*	*Source*
Intangibles on assets	Intangibles/total assets Intangibles = total assets – tangible assets Bloomberg command: BS_DISCLOSED_INTANGIBLES Total assets = includes total earning assets + cash and due from banks + foreclosed real estate + fixed assets + goodwill + other intangibles + current tax assets + deferred tax + discontinued operations + other assets Bloomberg command: BS_TOTAL_ASSETS	Compiled by the authors using the Bloomberg database
Tangible common equity ratio	(Total equity – intangible assets – preferred stock equity)/tangible assets Bloomberg command: TCE_RATIO	Compiled by the authors using the Bloomberg database
Goodwill on assets	Goodwill/total assets Goodwill = amount the acquiring bank pays for the target company over the target's book value Bloomberg command: BS_GOODWILL Total assets = includes total earning assets + cash and due from banks + foreclosed real estate + fixed assets + goodwill + other intangibles + current tax assets + deferred tax + discontinued operations + other assets Bloomberg command: BS_TOTAL_ASSETS	Compiled by the authors using the Bloomberg database
Sales per employee	Sales/number of employees Bloomberg command: ACTUAL_SALES_PER_EMPL	Compiled by the authors using the Bloomberg database
Sales revenue turnover	Sales revenue turnover Bloomberg command: SALES_REV_TURN	Compiled by the authors using the Bloomberg database
Debt on assets	Debt/total assets Bloomberg command: TOT_DEBT_TO_TOT_ASSETS	Compiled by the authors using the Bloomberg database

Deposits on assets	Deposits/total assets Deposits = includes total customer deposits + deposits from banks + other deposits and short-term borrowings Bloomberg command: BS_CUSTOMER_DEPOSITS Total assets = includes total earning assets + cash and due from banks + foreclosed real estate + fixed assets + goodwill + other intangibles + current tax assets + deferred tax + discontinued operations + other assets Bloomberg command: BS_TOTAL_ASSETS	Compiled by the authors using the Bloomberg database
Net loans on assets	Net loans/total assets Net loans = total loans to customers minus possible default losses and unearned interest income Bloomberg command: BS_LOAN_MTG Total assets = includes total earning assets + cash and due from banks + foreclosed real estate + fixed assets + goodwill + other intangibles + current tax assets + deferred tax + discontinued operations + other assets Bloomberg command: BS_TOTAL_ASSETS	Compiled by the authors using the Bloomberg database
Loans on assets	Loans/total assets Loans = total loans to customers Bloomberg command: BS_TOTAL_LOAN Total assets = includes total earning assets + cash and due from banks + foreclosed real estate + fixed assets + goodwill + other intangibles + current tax assets + deferred tax + discontinued operations + other assets Bloomberg command: BS_TOTAL_ASSETS	Compiled by the authors using the Bloomberg database
ST&LT investments	Total investments Bloomberg command: ST_AND_LT_INVEST	Compiled by the authors using the Bloomberg database
Crisis	Dummy variable where years 2006 and 2007 are coded 0 and years 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, and 2016 are coded 1	Compiled by the authors using the Bloomberg database

Table 19.6 Bartlett's test for equal variances

Variable	*chi2(2)*	*Prob > chi2*
ROA	40.0774	0.000***
ROE	4.3351	0.114
Net interest spread	40.7305	0.000***
Tier 1 capital ratio	31.4448	0.000***
Capital to risk-based capital	46.6113	0.000***
Risk-weighted assets on assets	357.9568	0.000***
Intangibles on assets	77.0068	0.000***
Goodwill on assets	92.1347	0.000***
Tangible common equity ratio	27.1920	0.000***
Sales per employee	49.2848	0.000***
Sales revenue turnover	442.1593	0.000***
Debt on assets	21.3278	0.000***
Deposits on assets	32.4892	0.000***
Net loans on assets	8.0710	0.018**
Loans on assets	9.7225	0.008***
ST&LT investments	57.3735	0.000***

Source: Compiled by the authors using the Bloomberg database

* = 10% level of significance, ** = 5% level of significance, *** = 1% level of significance

Table 19.7 Correlation matrix for Cluster 1

	Tier 1 capital ratio	*Intangibles on assets*	*Sales per employee*	*Deposits on assets*	*Crisis*
Tier 1 capital ratio	1.0000				
Intangibles on assets	−0.1404	1.0000			
Sales per employee	0.0148	−0.2409	1.0000		
Deposits on assets	0.0740	0.1633	−0.4948	1.0000	
Crisis	0.2939	−0.1148	−0.0621	0.0973	1.0000

Source: Compiled by the authors using the Bloomberg database

Table 19.8 Correlation matrix for Cluster 2

	Tier 1 capital ratio	*Intangibles on assets*	*Sales per employee*	*Deposits on assets*	*Crisis*
Tier 1 capital ratio	1.0000				
Intangibles on assets	−0.4904	1.0000			
Sales per employee	0.1122	−0.2718	1.0000		
Deposits on assets	−0.1191	0.1746	−0.4440	1.0000	
Crisis	0.5943	−0.1565	−0.1462	−0.0485	1.0000

Source: Compiled by the authors using the Bloomberg database

Table 19.9 Correlation matrix for Cluster 3

	Tier 1 capital ratio	*Intangibles on assets*	*Sales per employee*	*Deposits on assets*	*Crisis*
Tier 1 capital ratio	1.0000				
Intangibles on assets	−0.5168	1.0000			
Sales per employee	0.1460	0.2705	1.0000		
Deposits on assets	0.1953	−0.1781	−0.3400	1.0000	
Crisis	0.6489	−0.2558	−0.2375	0.3814	1.0000

Source: Compiled by the authors using the Bloomberg database

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