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SOCIALLY RESPONSIBLE INVESTMENTS

The Crossroads Between Institutional and Retail Investors

Edited by
Mario La Torre
Helen Chiappini

Palgrave Studies in Impact Finance

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Socially Responsible Investments

The Crossroads Between Institutional and Retail Investors

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Contents

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List of Figures

List of Tables

CHAPTER 1

Introduction

Mario La Torre and Helen Chiappini

Abstract The aim of this chapter is to introduce the aim and structure of the book. Specifically, the aim of the book is to build a bridge between corporate social responsibility (CSR) and sustainable finance in financial markets. Classic CSR topics have been investigated in the light of a modern conception of sustainability. The book is organized in two main blocks. The first block emphasizes four relevant topics in the CSR panorama of financial institutions: banks remuneration practices; human capital disclosure; the impact of environmental performance on banks, and finally, the institutional investors' attitude towards socially responsible investments (SRIs). The second block looks to CSR practices within the financial markets and discusses risk-return profiles of SRI and non-SRI indexes in different time frames; it investigates whether thematic social responsible funds obtain different risk-return than traditional funds, and finally, assesses whether equity crowdfunding could foster social innovation.

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Keywords Corporate social responsibility (CSR) · Sustainable finance · Sustainability · Socially responsible investments (SRIs) · Financial markets

The aim of the book is to build a bridge between corporate social responsibility (CSR) and sustainable finance in financial markets. Classic CSR topics have been investigated in the light of a modern conception of sustainability.

The book is organized in two main blocks. The first block (Chapters 2–4) emphasizes four relevant topics in the CSR panorama of financial institutions: banks remuneration practices; human capital disclosure; the impact of environmental performance on banks, and finally, the institutional investors' attitude towards socially responsible investments (SRIs).

The second block (Chapters 5–8) looks to CSR practices within the financial markets and discusses risk-return profiles of SRI and non-SRI indexes in different time frames; it investigates whether thematic social responsible funds obtain different risk-return than traditional funds, and finally, assesses whether equity crowdfunding could foster social innovation.

In more detail, Chapter 2 "Responsible Remuneration Policies in Banks: A Review of Best Practices in Europe"—by Stefania Sylos Labini, Antonia Patrizia Iannuzzi and Elisabetta D'Apolito—explores whether bank remunerations are aligned to a set of CSR measures, going beyond the traditional (and controversial) alignment to financial performance. Results of this analysis appear promising, although European banks need to strengthen practices in terms of measurement of social performance and of a concrete link between remuneration and social performance.

Chapter 3 "Intellectual Capital Disclosure: Evidence from the Italian Systemically Important Banks"—by Giuliana Birindelli, Paola Ferretti and Helen Chiappini—assesses the extent and accuracy reporting of intellectual capital (IC) of Italian systematically important banks. The analysis shows that Italian banks may improve both the extent and accuracy of disclosure of IC to be in line with other international competitors.

Chapter 4 "Assessing the Relationship Between Environmental Performance and Banks' Performance: Preliminary Evidence"—by Rosella Carè and Antonio Fabio Forgione—investigates whether

performance of European banks is related with their environmental disclosure and performance. Findings support the thesis of a stringent link between environmental performance and banks value.

Chapter 5 "Ready or Not, Here I Come, You Can't Hide. Are Italian Institutional Investors Ready for Responsible Investments?"—by Duccio Martelli and Luca Testoni—analyses the institutional investors' attitude towards SRIs. This chapter demonstrates that pension funds and family officers are more interested in SRIs than in the past, due to a growing awareness sustainability practices. However, the SRI risk-return profile does not appear always clear and understandable, limiting the investments of pension funds and family officers.

Chapter 6 "Sustainable and Responsible Investments: *Same Sea, Different Fishes?*"—by Alberto Burchi, Duccio Martelli and Paola Musile Tanzi—shifts the lens from financial institutions to financial markets. The chapter investigates risk-return trade-off of socially responsible indexes, taking into account different periods and different social responsible strategies. The study highlights that SRIs risk and return profile does not consistently differ from traditional investments, while they produce benefits in a portfolio view.

Chapter 7 "A New Approach to Sustainable and Responsible Investment: The Sustainability-Themed Mutual Funds"—by Federica Ielasi and Monica Rossolini—focuses on a specific category of SRI: the sustainability-themed mutual funds. The research outlines that sustainability-themed mutual funds differ in terms of risk-return both from other classes of socially responsible funds, and from themed funds that are not engaged in the SRI panorama.

Finally, Chapter 8 "Is Equity Crowdfunding a Good Tool for Social Enterprises?"—by Stefano Cosma, Alessandro Giovanni Grasso, Francesco Pagliacci and Alessia Pedrazzoli discusses the relevance of equity crowdfunding in the financing of social innovation and social change through the support of social firms. Equity crowdfunding does not appear the most suitable model for expanding social change in Italy, thus, other types of financial architectures may be implemented to support the span social innovation in Italy.

CHAPTER 2

"Responsible" Remuneration Policies in Banks: A Review of Best Practices in Europe

Stefania Sylos Labini, Antonia Patrizia Iannuzzi and Elisabetta D'Apolito

Abstract The inclusion of non-financial metrics in remuneration plans can help companies achieve sustainable business goals. Moreover, investors, by assessing the remuneration policies of companies, could be better able to identify worthy firms in the long-term interests of shareholders and society, enabling them to make more responsible

Although the work is the result of collaboration of the authors, Sects. 1, 3 and 4.1 are attributed to Stefania Sylos Labini, Sects. 2, 4.2 and 6 are attributed to Antonia Patrizia Iannuzzi, while Sects. 4.3 and 5 are attributed to Elisabetta D'Apolito.

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investments. This work investigates the use of non-financial performance measures in executive compensation. A sample of globally, systemically important European banks are analysed over the period 2013–2016. A quantitative score is developed using the content analysis approach. The results show an increasing use of these metrics by banks. However, the approaches adopted are still very diversified and not uniform. The main contributions of this study are (i) a systematic review of the adoption of non-financial metrics in bank remuneration contracts; (ii) a comparison of best practices in Europe; and (iii) useful indications for top management and investors to promote the use and knowledge of these non-financial criteria.

Keywords Banking compensation · ESG criteria · Corporate governance · Content analysis

1 Introduction

According to the definition of the United Nations Principles for Responsible Investment (UN PRI), "responsible investment" describes a process by which environmental, social and governance (ESG) issues are incorporated into investment decisions. The linking of remuneration to ESG performance can be analysed from a double point of view. From the perspective of the investors, the capacity to assess complex pay packages and corporate performance represents an important challenge in their investment decision process (UN PRI 2012). Investors could be better able to deliver sustainable companies in the long-term interests of shareholders and society. This presupposes in-depth knowledge of these kinds of practices. From the perspective of companies, the consideration of ESG issues when setting executive pay could help to align them with performance and long-term strategy in order to promote sustainable value creation (UN PRI 2016). Companies are interested in developing these practices and disclosing them to obtain a positive evaluation by investors, which means easier opportunities for financing.

In the last few years, supervisory authorities have acknowledged the need for the inclusion of sustainability targets (or ESG criteria) in bank executive remuneration (FSB 2009, 2017; EBA 2015). In other words, regulators recommend that in addition to analysing the financial results, banks verify the pursuit of social responsibility objectives related

to the creation of value from a stakeholder point of view. As stated by the supervisory authorities, examples of such "*sustainability performance measures*" include customer satisfaction objectives, the achievement of strategic choices, compliance with both internal and external regulations and the mission and reputation of bank. More particularly, EBA stated that "*institutions should set and document both quantitative and qualitative, including financial and non-financial, performance criteria for individuals, business units and the institution. The performance criteria should not incentivise excessive risk taking or mis-selling of products*" (EBA 2015). Several motivations push the authorities to urge the use of sustainability measures in banking compensation. On the one hand, such targets strengthen the overall risk adjustment process of remuneration practices by introducing "*a different lens through which performance is measured*" (BCBS 2010); on the other hand, these measures could also neutralize the risk of misconduct (FSB 2017) and encourage managers to develop long-term growth strategies (Banker et al. 2000; Belcredi and Ferrarini 2013; Flammer et al. 2016).

This study focusses on social, corporate governance and environmental targets in executive remuneration implemented by the most important European banks for the period 2013–2016. More specifically, we aim to achieve the following objectives:

(a) To analyse the adoption of these metrics by the most important European banks through the elaboration of an "ad hoc" governance score;
(b) To verify the qualitative and quantitative diversification of these non-financial (or sustainability) indicators; and
(c) To identify and examine some best practices adopted by European banks.

To answer the previous research questions, a qualitative analysis is conducted. Specifically, through the content analysis approach, a qualitative score is developed on the basis of a survey model composed of 12 items. The analysis is performed by analysing data of the annual corporate governance/remuneration reports of 41 listed European banks. This study contributes to the academic literature and practice in several ways. First, to our knowledge, no study on this specific issue has been carried out in the banking sector. Second, previous research mainly focussed on environmental targets in executive remuneration (Campbell et al. 2007;

Russo and Harrison 2005; Cordeiro and Sarkis 2008). In contrast, we analyse all types of sustainability targets belonging to the three areas of ESG performance, namely social, environmental and corporate governance. Third, our approach is also innovative because we elaborate the first corporate governance score that focusses only on the non-financial performance criteria adopted in remuneration contracts. Finally, our paper contributes to the best practices because the results shed more light both on the application of sustainable remuneration in the banking sector and on which elements contribute to sustainable development. The remainder of this paper is structured as follows. The next section presents an overview of the existing literature on the adoption of sustainability targets in executive remuneration. Section 3 analyses the regulatory framework. Section 4 describes the sample and the model behind to elaboration of the ESG-performance rating. In Sect. 5, some cases of European banks adopting "responsible" remuneration policies are presented. Section 6 provides final conclusions and policy implications.

2 Literature Review

The integration of non-financial items in management remuneration contracts was analysed in several studies. At first, these contributions focussed only on environmental performance. Among these, Campbell et al. (2007) showed that environmental risk is a determinant of management packages. In other words, when the exposure to environmental risk is high, the top management will be induced to demand higher salaries. However, this connection can be "neutralized" by linking the incentive plans to environmental performance. In this case, indeed, the manager will be encouraged to improve the environmental performance of his company and, therefore, to request a significantly lower premium for its exposure to environmental risks. This confirms a positive relationship between the use of environmental standards in the remuneration of top management and the firm's environmental performance. However, other authors found more contrasting or limited results. For example, Russo and Harrison (2005) noted that using Corporate Social Performance (CSP) targets might contribute to CSP improvement of firms, but its sample only includes companies in the electronics industry. In contrast, Cordeiro and Sarkis (2008) showed no significant linkage between environmental performance measured relative to industry and CEO compensation.

More recently, however, scholars extended the area of investigation by examining a possible link between non-financial indicators of management compensation and Corporate Social Responsibility (CSR) performance. In this case, the empirical evidence is more convergent; the most recent contributions, in fact, identified a positive relationship between the use of "non-financial metrics" in remuneration packages and the ethical performance of corporations. In more detail, Velte (2016), based on a sample of German listed companies, showed that non-financial elements (social or environmental aspects) in the compensation of board management positively influence ESG performance. According to Maas (2016), however, only hard CSP targets are effective in improving CSP results, while soft CSP targets seem to be mainly used to appear compliant with regulation.

At the same time, other authors analysed the strategic role assumed by an effective corporate governance system in positively influencing the adoption of non-financial metrics (Hong et al. 2015). In this vein, Ittner et al. (1997) provided no support for the hypothesis that CEOs with greater influence over the board of directors are more likely to be compensated based on non-financial measures.

Moreover, the relationship between CSR and non-financial incentives would also be bidirectional: if the latter have a positive influence on the social performance of companies, then the level of CSR (i.e. the adoption of greater social responsibility practices) could also be a determining factor in the use of non-financial metrics in remuneration packages (Hong et al. 2015). Abdelmotaal and Abdel-Kader's research confirmed as much: firms adopting sustainability practices—such as the CSR sustainability committee, the CSR sustainability index and sustainable resource efficiency policies—are more likely to use sustainability incentives in their compensation contracts (Abdelmotaal and Abdel-Kader 2016).

Finally, a greater interest also seems to emerge with regard to economic performance. Some studies highlighted that the use of ESG criteria in remuneration packages positively impacts not only on the CSR but also the overall value of the company measured in terms of Tobin's Q (Flammer et al. 2016). In this vein, Said et al. (2003) reported a positive relationship between the non-financial measures used in compensation contracts and a firm's stock market returns performance. Further, Schiehll and Bellavance (2009) found that firms with high growth opportunities rely more on non-financial performance measures to

monitor and reward their CEOs. In other words, "*firm's growth opportunities are an important predictive factor for the use of non-financial information in the CEO bonus plan*." Finally, Hassabelnaby et al. (2010) suggested that the use of non-financial performance measures in compensation contracts was inversely correlated to the adoption of earnings management behaviour.

However, despite the importance of such empirical results, the literature that analyses the adoption of non-financial metrics in remuneration packages still appears to be limited both in terms of the relationships investigated (Maas 2016) and with regard to the sample analysed (Kolk and Perego 2014). Concerning this last aspect, based on our knowledge, no study has been conducted on the banking sector only, despite these companies being addressed by numerous regulatory measures that stress the importance of implementing adequate risk-sensitive performance criteria (Iannuzzi 2013; EBA 2015). Just a few studies concern the European context (Eurosif 2010). Nevertheless, recent research showed that the "pay for non-financial performance" approach is slowly spreading in the financial sector (Morgan Stanley 2016; Maas and Rosendaal 2016). Therefore, on the basis of these considerations, this study aims to fill this gap in the literature by carrying out an in-depth overview of the implementation of non-financial criteria in banks' executive compensation.

3 Regulation

The European regulation of bankers' remuneration originated after the international financial crisis of 2007. Bank governance, and remuneration policies, was considered one of the possible causes of the crisis. The high level of bankers' compensation has been considered to be too generous in the context of banks' low performance during the crisis (Ferrarini 2017). An international debate upon the relevance of bankers' pay in the financial crisis has arisen both in an academic context and at a political and institutional level. Many authors investigated the role of incentives in the crisis (Bebchuk et al. 2010; Fahlenbrach and Stulz 2011; Barontini et al. 2013; Levina 2014). The main question investigated is whether inappropriate remuneration practices in the financial services industry induced excessive risk-taking and, thus, contributed to the significant losses of major financial intermediaries. Although the regulation does not appear to be completely justified (Ferrarini and

Ungureanu 2011),[1] the answer to the previous question seems to be positive. Indeed, numerous principles, standards and rules concerning sound remuneration policies have been promoted on an international level (FSB 2010, 2013).

The EU adopted a regulatory approach, implementing two Directives. The supervisory role is more marginal with respect to other jurisdictions. However, in addition to the Directives, the CEBS,[2] before, and the EBA, after, provided guidelines in order to facilitate the application of the principles included in Directives.

The first Directive—Directive 2010/76/EU (CRD III)—is about performance pay and required that the total amount of remuneration should be based on a combination of the assessment of the performance of the individual and of the business unit concerned, and of the overall results of the credit institution. Second, this Directive stated that the assessment of performance should be set in a multi-year framework in order to ensure that the assessment process is based on longer-term performance and that the actual payment of performance-based components of remuneration is spread over a period which takes into account the underlying business cycle of the institution and its business risks.

The provisions of the CRD III on remuneration were accompanied by the interpretative lines of CEBS of 10 December 2010 (CEBS 2010), which specify the scope (especially applicative) of the provisions.

The second Directive—Directive 2013/36/EU (CRD IV)—replaced CRD III. This Directive substantially confirms the plan already envisioned by CRD III, including the principle of proportionality, but introduces a system of rules much more complex and pervasive than the previous one. The greater novelty consisted in the introduction of a bonus cap to the variable component of remuneration. This component cannot exceed the 100% of the fixed component. However, this

[1] The authors argue that the case for regulating the structure of bankers' pay is rather weak, while regulation of remuneration and risk governance and of remuneration disclosure are to some extent justified.

[2] CEBS—Committee of European Banking Supervisors—was an independent advisory Group on banking supervision in the European Union (EU). It was established by the European Commission in 2004 by Decision 2004/5/EC. On 1 January 2011, this committee was succeeded by the European Banking Authority (EBA), which took over all existing and ongoing tasks and responsibilities of the Committee of European Banking Supervisors (CEBS). The European Banking Authority was established by Regulation (EC) No. 1093/2010 of the European Parliament and of the Council of 24 November 2010.

limit could be extended to 200% with the approval of the shareholders. Member States may set a lower maximum percentage.

The EBA Guidelines of 2015 (EBA 2015) introduced a much more restrictive regulation on proportionality. No exception is admitted, except for those expressly admitted by the CRD IV or by the same guidelines, especially with reference to the rules concerning variable remuneration. The EBA Guidelines will apply from 1 January 2017, so the CEBS Guidelines will no longer be in effect after 31 December 2016. The EBA Guidelines are directly binding not for banks but only for the competent national authorities.[3] Indeed, the EBA has no direct sanctioning powers over banks that do not comply with the EBA Guidelines. The EBA Guidelines specify that the award of variable remuneration, including long-term incentive plans (LTIP), is based on past performance of at least one year but also depends on future performance.

The EU regulations are more rigorous than US regulation. The stricter European rules, on the one hand, facilitate the process of convergence, ensuring a more uniform application. On the other hand, they leave little room for the discretion of the national supervisory authorities and other institutions in defining remuneration policies, thereby limiting their flexibility.

Finally, the element of major innovation in regulations concerning bankers' remuneration is represented by the focus on long-term incentives (LTI). The 2007 financial crisis showed the dramatic consequences of a short-term incentives-based system. The new regulations try to overcome these weaknesses by promoting a better balance between

[3]The guidelines become directly binding on a single bank only at the moment of their transposition by the competent authorities of each Member State. The competent national authorities are subject to the "comply or explain" principle: this means that they will be able to adapt to the EBA's Guidelines, thus modifying the national provisions on practices and remuneration policies in the credit sector (which are instead directly binding on the banks of individual Member States), or they may choose not to adapt. In case of non-compliance, the competent national authorities will have to inform the EBA and justify their reasons. In this circumstance, the EU Commission could initiate an infringement procedure against any defaulting Member State, if it considers the reasons for non-compliance to be inadequate: this procedure could bring the EU Commission and the Member State in front of the EU Court of Justice, which would then have the power to judge on the lawfulness of the decision not to adapt to the guidelines issued by the European Banking Authority.

Table 1 Chronology of European regulation on remuneration policies

Date	*Institution*	*Rule/document*	*Reference to non-financial criteria*
April 2009	European Commission	Recommendation on remuneration policies in the financial sector, C (2009) 3159	Section II—5.4 When determining individual performance, **non-financial criteria**, such as compliance with internal rules and procedures, as well as compliance with the standards governing the relationship with clients and investors should be taken into account
April 2009	Committee of European Banking Supervisors (CEBS)	High-Level Principles for Remuneration Policies	5. iv For individual performance measurement, while financial criteria may be one dimension in determining performance, other **non-financial factors** should also be considered such as skills acquired, personal development, compliance with the institution's systems and controls, commitment to the business strategies and its major policies and contribution to the performance of the team. Where it is appropriate, poor performance in the non-financial variables should override good performance in terms of profit generation, i.e. unethical or non-compliant behaviour cannot be compensated for by good financial performance
January 2010	Basel Committee of Banking Supervision (BCBS)	Compensation Principles and Standards Assessment Methodology	41 j. Bonus awards should also be sensitive to employees' performance with respect to **non-financial** aspects of behaviour. Bad non-financial performance (in particular, unethical or non-compliant behaviour) should be enough to override good financial performance and diminish compensation. Compensation should be fully aligned (provide the right incentives) with the institution's risk policy in the medium and long term
June 2010	Committee of European Banking Supervisors (CEBS)	Report on national implementation of CEBS High-Level Principles for Remuneration Policies	11. **Qualitative**, risk-sensitive criteria have been taken on board in the remuneration scorecards at institutions

(continued)

Table 1 (continued)

Date	*Institution*	*Rule/document*	*Reference to non-financial criteria*
November 2010	European Parliament and the Council	Directive 2010/76/EU	Annex 1. where remuneration is performance related, the total amount of remuneration is based on a combination of the assessment of the performance of the individual and of the business unit concerned and of the overall results of the credit institution and when assessing individual performance, financial and non-financial criteria are taken into account
December 2010	Committee of European Banking Supervisors (CEBS)	Guidelines on Remuneration Policies and Practices (CP42)	95. Institutions should use both quantitative (financial) as well as qualitative (non-financial) criteria for assessing individual performance. (…) However, qualitative criteria can also be relevant at a institution-wide level or business level (such as the achievement of results, compliance with strategy within the risk appetite and compliance track record). 97. In addition to quantitative performance measures, variable remuneration awards should also be sensitive to the staff's performance with respect to qualitative (non-financial) measures
June 2013	European Parliament and the Council	Directive 2013/36/EU	Article 94 Variable elements of remuneration 1. For variable elements of remuneration, the following principles shall apply in addition to, and under the same conditions as, those set out in Article 92(2): (a) where remuneration is performance related, the total amount of remuneration is based on a combination of the assessment of the performance of the individual and of the business unit concerned and of the overall results of the institution and when assessing individual performance, financial and **non-financial criteria** are taken into account

(continued)

Table 1 (continued)

Date	*Institution*	*Rule/document*	*Reference to non-financial criteria*
December 2015	European Banking Authority (EBA)	Guidelines on sound remuneration policies under Articles 74(3) and 75(2) of Directive 2013/36/EU and disclosures under Article 450 of Regulation (EU) No 575/2013	204. Institutions should set and document both quantitative and **qualitative**, including financial and **non-financial**, performance criteria for individuals, business units and the institution. 210. Qualitative criteria (such as the achievement of results, compliance with strategy within the risk appetite and compliance track record) should be relevant at an institution, business unit or individual level. Examples of qualitative criteria are the achievement of strategic targets, customer satisfaction, adherence to risk management policy, compliance with internal and external rules, leadership, teamwork, creativity, motivation and cooperation with other business units, internal control and corporate functions

short- and long-term incentives, not only in the CEO's compensation but also in that of all bank employees involved in risk-taking activities.[4]

The control of remuneration policies is entrusted to supervisors whose power is expanded and enhanced compared to how it previously was. Effective supervision allows intervention with prompt and appropriate corrective measures.

Table 1 illustrates, in chronological order, the main documents/rules on remuneration introduced by different institutional entities in Europe. The reference to non-financial criteria is reported in the last column.

4 Empirical Analysis

4.1 Sample and Survey Model

Our sample includes 41 global and other systemically important institutions (G-SIIs and O-SIIs), belonging to European geographical areas over the period 2013–2016 (see, www.eba.com).[5] In terms of managed assets up to December 2016 (Table 2), the Anglo-Saxon banks (5 British banks and 2 Irish banks) manage overall 28.7% of total assets attributable to the whole sample of examined banks. They are followed by French banks, with 22.3% of managed assets, then Spanish banks with 12.2% and German banks with 9.3%.

The analysis focussed on the elaboration of a survey model, composed of 12 items (Table 3), for the construction of a quantitative indicator ("ESG-remuneration performance rating") in order to verify the degree and the intensity of the use of non-financial metrics in executive remuneration plans by selected banks, as well as to identify the most virtuous behaviours.

[4]The European Commission published Regulatory Technical Standards (RTS) on the criteria to identify categories of staff whose professional activities have a material impact on an institution's risk profile, as Delegated Act on 6 June 2014.

[5]Bank Millenium, Bank Zachodni WBK SA and ING Bank Śląski SA have been excluded because they belong to banking groups for which only the holding bank has been considered.

Table 2 Global and other systemically important institutions (total assets in millions of euro)

No.	*Bank*	*Total asset 31.12.2016*	*Country*	*No.*	*Bank*	*Total asset 31.12.2016*	*Country*
1	HSBC	2250.60	UK	22	Svenska Handelsbanken	267.97	Sweden
2	BNP Paribas	2070.86	France	23	Swedbank	224.8	Sweden
3	Deutsche Bank	1581.88	Germany	24	Erste Bank	207.99	Austria
4	Credit Agricole	1521.66	France	25	Banco de Sabadell	205.73	Spain
5	Barclays	1414.83	UK	26	Banca Monte dei Paschi di Siena	149.88	Italy
6	Société Générale	1376.91	France	27	Banco Popular Español	143.02	Spain
7	Banco Santander	1317.86	Spain	28	Bank of Ireland	121.83	Ireland
8	Lloyds Banking	954.88	UK	29	Raiffeisen International	111.72	Austria
9	Royal Bank of Scotland	933.52	UK	30	Allied Irish Banks	92.79	Ireland
10	Unicredit	845.51	Italy	31	Jyske Bank	78.91	Denmark
11	ING Groep	844.77	Netherlands	32	National Bank of Greece	73.45	Greece
12	BBVA	715.46	Spain	33	Banco Comercial Português	68.08	Portugal
13	Intesa SanPaolo	713.97	Italy	34	PKO BP	64.46	Poland
14	Nordea Bank	613.80	Sweden	35	Eurobank Ergasias Bank	61.45	Greece
15	Standard Chartered	613.19	UK	36	Alpha Bank	60.35	Greece
16	Commerzbank	477.40	Germany	37	Bank Polska Kasa Opieki Pekao	39.34	Poland

(continued)

Table 2 (continued)

No.	*Bank*	*Total asset 31.12.2016*	*Country*	*No.*	*Bank*	*Total asset 31.12.2016*	*Country*
17	Danske Bank	468.42	Denmark	38	Banco BPI	37.84	Portugal
18	Caixabank	338.28	Spain	39	OTP Bank	36.61	Hungary
19	DNB	292.08	Norway	40	Bank of Cyprus	26.33	Cyprus
20	Skandinaviska Enskilda Banken	273.36	Sweden	41	Sydbank	19.72	Denmark
21	KBC Groep	272.95	Belgium				

Table 3 The diffusion of non-financial performance evaluation metrics (*years 2013–2016*)

	Items	*2013 (%)*	*2014 (%)*	*2015 (%)*	*2016 (%)*
1	Use of non-financial performance criteria	86	83	90	93
2	Number of non-financial performance criteria used	52	67	71	71
3	Differentiated valorization of qualitative targets for each executive	7	10	10	13
4	Definition of the % of variable remuneration linked to non-financial performances	25	30	27	30
5	Definition of quantitative targets for each non-financial criterion	14	19	21	21
6	Balance between non-financial criteria and financial criteria	55	55	57	55
7	Balance % between non-financial criteria and financial criteria	24	31	33	33
8	Use of non-financial criteria at the individual level and/or business units	50	50	60	62
9	Use of non-financial criteria at the Enterprise level	55	60	76	76
10	Claw-back or malus clauses in the presence of unethical conduct by managers	50	52	50	52
11	Inclusion of non-financial metrics within the long-term incentive plan	36	40	45	45
12	Use of non-financial criteria also for senior management	14	17	17	19

In line with the previous research methodology of Gompers et al. (2003), Bianchi et al. (2011) and La Porta et al. (1998),[6] we measured the ESG-remuneration performance rating on a binary scale which takes the value 1 if the item is disclosed (and thus implemented by bank), and 0 otherwise. Then, we calculated the cumulative score using the following formulation:

ESG-remuneration performance rating = N. of items disclosed/implemented by bank/total items of the model.

Through the consultation of specific corporate documents (Compensation/Remuneration report, Annual report, Corporate Governance report), a value was assigned to each item of the analysis model for each survey year. Attributed scores vary between zero (non-compliance of the items or absence of relative information) and 1 (compliance of the bank with the item). Only for item 2 a graduated valuation is considered (if < 3 = 0; if > 3 = 1).

4.2 The Compliance of Banks with Each Item of the Survey Model

During the investigation period, the number of banks that used non-financial criteria in their remuneration policies was growing (item 1, from 86% in 2013 to 93% in 2016), as was the number of non-financial performance criteria adopted by banks (item 2, from 52% in 2013 to 71% in 2016). This positive trend may denote a greater sensitivity of banks towards this innovative governance issue. However, when we check whether banks differentiate between non-financial targets for a single

[6]The "Governance Index," denoted as "G" (Gompers et al. 2003), was built using 24 distinct corporate governance provisions for a sample of about 1500 firms as a proxy for the balance of power between manager and shareholders in each firm. The "Compliance on Related Party Transactions" (abbreviated as "CoRe" index, Bianchi et al. 2011) attempts to measure the quality of a company's internal procedures for RPTs (related party transactions). Finally, the "Anti-Director Rights index" (La Porta et al. 1998) tries to measure how strongly the legal system protects minority shareholders against managers or dominant shareholders. Finally, Djankov's Anti-Self-Dealing index (Djankov et al. 2008) consists of numerical measures of the intensity of regulation of self-dealing across 72 countries, evaluating both public and private enforcement. Another remuneration disclosure score was built by Laksmana (2008), who used a comprehensive checklist of 23 compensation-related items to provide evidence that greater compensation disclosure reduces information asymmetry. However, the score of Laksmana excludes the banking industry and concerns the examination period before the subprime crisis.

executive (item 3), the percentages collapse, reaching a maximum of 13% in 2016. This virtuous behaviour is, in fact, only practised by a few banks, including HSBC and Lloyds Banking, Banco Popular Español and Credit Agricol. The overwhelming majority of the banks, indeed, choose to apply these criteria in a homogeneous and univocal manner without considering the specificity of the role and functions held by each executive manager. Further critical issues also emerged from the analysis of the subsequent items, a circumstance that denotes the presence of behavioural standards susceptible to ample room for improvement. In fact, there are still very few banks that communicate the percentage of variable remuneration linked to non-financial criteria (approximately 30% in 2016; item 4) or define quantitative targets associated with these metrics (between 14 and 21% in the survey period; item 5).

Finally, for the balance between financial and non-financial criteria, although most banks (approximately 55%, item 6) are concerned with estimating and communicating this relationship, the weight of non-financial indicators still appears to be significantly reduced compared to the economic ones (on average, the weighting of non-financial indicators is between 31 and 50%). Greater compliance, on the other hand, emerges with regard to the articulation of the use of these non-financial criteria (items 8 and 9). In fact, most banks declare using such metrics at the enterprise level, the business unit level and the individual level, thus satisfying a precise regulatory requirement (EBA 2015). Moreover, there is always an above-average proportion of banks (approximately 52% at the end of 2016) that appear to adopt appropriate clawback or malus arrangements for variable compensation in the presence of unethical conduct by the manager (item 10), while there are fewer banks who adopt non-financial metrics, both for the preparation of bonuses and for the definition of LTI (between approximately 36 and 45% in the investigation period; item 11), as well as banks that extend the use of non-financial criteria to senior management also (approximately 19% in 2016; item 12).

As a second step, this analysis led to the creation, distinctly for all banks, of the "ESG remuneration performance rating" for each year of the investigation period (2013–2016). Then these ratings are been grouped in order to elaborate descriptive statistics both for the total sample and for each country (see Table 4). A first important aspect concerns the extreme variability of the score, ranging from over 100% to approximately 0%. This aspect demonstrates a wide lack of homogeneity in

Table 4 ESG-remuneration performance rating—descriptive statistics for country and total sample (*years 2013–2016*)

Country	*2013 (%) Mean value*	*2014 (%) Mean value*	*2015 (%) Mean value*	*2016 (%) Mean value*
UK	77	86	86	88
Netherlands (only 1 bank)	83	83	83	88
Germany	52	65	65	65
France	58	58	58	61
Italy	50	56	58	58
Spain	50	58	62	58
Norway (only 1 bank)	42	58	58	58
Hungary (only 1 bank)	50	50	50	50
Poland	42	42	46	46
Belgium (only 1 bank)	17	17	17	42
Denmark	22	22	33	33
Cyprus (only 1 bank)	17	25	33	33
Greece	33	30	30	30
Austria	21	25	25	29
Portugal	4	17	25	25
Ireland	8	8	21	21
Sweden	17	17	19	19

Total sample	*2013 (%)*	*2014 (%)*	*2015 (%)*	*2016 (%)*
Mean	39	43.57	46.60	47.60
Median	38	46	46	46
Stand. Dev.	27	29	28	27
Min	0	0	0	0
Max	83	100	100	100

the behaviour of banks. During the time laps of the survey, the English banks, with an average score of over 80%, confirm themselves as leaders in the use of "non-financial performance indicators" in remuneration packages, while the Irish, Portuguese, Austrian and Swedish banks, with a final 2016 average score between 10 and 30%, are positioned at the bottom of the ranking.

Figure 1 reports the average value of the "ESG-remuneration performance rating" for all banks analysed. The growing trend of the overall average score (which rose from 39.36% in 2013 to 47.60% in 2016)

demonstrates the gradual adjustment by banks to the new regulatory obligations, as well as a major awareness of the importance of using and disseminating information about "non-financial performance indicators" within remuneration schemes.

4.3 Non-financial Targets: Categories and Diffusion

A further analysis consisted of cataloguing all non-financial performance criteria used by banks, and highlighting, for the survey period (2013–2016), the respective degree of diffusion in the sample analysed. Overall, 42 metrics are used, and as shown in Table 5, they can be traced to three different macro categories (ESG). The first macro category concerns environmental sustainability (Environmental—E) and is composed of 2 indicators; the second consists of relations with stakeholders (Social—S) and includes 10 indicators; finally, the third area consists of corporate governance structures (Corporate Governance—G) to which 29 indicators belong. Sub-categories were also assigned to each area of investigation based on the choices made by the main ethical rating agencies.

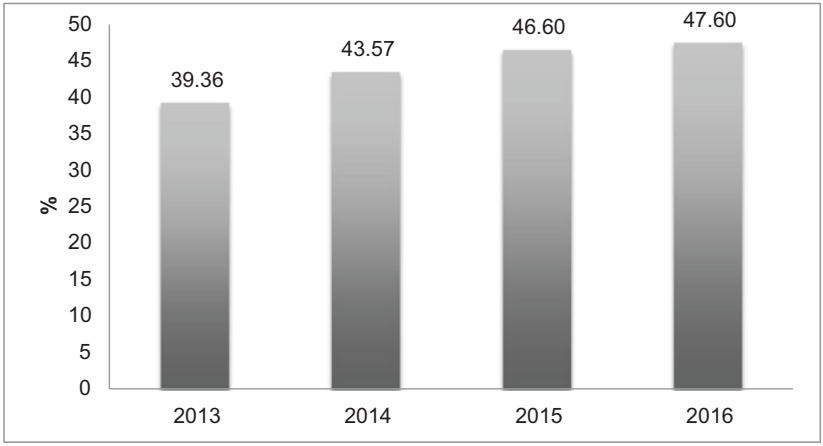

Fig. 1 ESG-remuneration performance rating (average percentage values, *years 2013–2016*)

Table 5 Sustainability targets and sub and macro categories (years 2013–2016, value %, average value %)

	Sub-category	*Macro-category*	*2013 (%)*	*2014 (%)*	*2015 (%)*	*2016 (%)*	*Media (%)*
Environmental and social risk	Environment	Environmental	2	5	5	2	4
Environmental impact			–	2	5	5	4
Customer satisfaction	Client	Social	21	40	52	57	43
Net promoter scores			2	10	10	7	7
Net trust scores			2	2	2	–	2
Product innovation			–	–	2	5	4
Digital transformation client			2	5	5	10	5
Sales development			2	2	5	5	4
Employee commitment (people management, development of human capital)	People (Employment)		24	33	40	40	35
Diversity and inclusion			2	2	5	7	4
Strengthen key stakeholder relationships (engagement)	Community		2	2	2	–	2
Society						2	2
Governance structure	Governance	Governance	5	5	7	7	6
Organizational effectiveness	System		–	2	2		2
Financial crime risk mitigation	Risk		–	–	2	2	2
Non-financial risk management	management		–	2	2	–	2
Risk management (all risks)			17	26	36	29	27
Operational risk			2	2	5	5	4
Customer complaint handling	Compliance		–	2	2	2	2
Compliance with adequate sales and loyalty conduct			–	–	–	2	2
Compliance with internal and external regulations			7	10	10	14	10

(continued)

Table 5 (continued)

	Sub-category	*Macro-category*	*2013 (%)*	*2014 (%)*	*2015 (%)*	*2016 (%)*	*Media (%)*
Conflicts of interest			2	2	7	5	4
Code of conduct (code of ethics)			10	5	14	12	10
Anti-money laundering					2	5	4
Risk and compliance policies			5	5	5	5	5
Balance sheet management			2	2	2	2	2
Culture (global standards and conduct)	Vision and strategy		5	7	12	12	9
Bank quality (brand value)			10	12	12	17	13
Leadership			7	10	12	10	10
Reputation			10	12	17	14	13
Growth and/or profitability			–	–	2	2	2
Group CSR policy			–	–	–	2	2
CSR and sustainable growth			5	7	14	14	10
Bank's strategy			21	24	31	31	27
Internal service quality	Efficiency		2	2	2	2	2
Streamline (adherence) processes and procedures			2	5	5	5	4
Strengthen the operational and legal structure (+ operational results)			5	5	2	2	4
Efficiency ratio				2	2	2	2
Cost control/reduction			7	7	7	5	7
Competitive benchmarking of results			2	2	2		2
Business process efficiency			–	–	–	2	2
Other criteria			10	14	17	14	14

Some interesting aspects emerge from the analysis of the data. The first concerns the number of non-financial criteria used by banks in their high diversification. At first, this circumstance induces support for how banks adopt rather diversified behaviours among themselves, choosing wide and varied criteria. In reality, as emerged during the course of the analysis, many criteria, although they are similar to each other, are often referred to by different expressions. From this, it follows that the wide diversification in the selection of non-financial parameters is much lower than that detected. However, one criticism is that the frequent use by banks of names that are often slightly ambiguous or at least not perfectly understandable with regard to the aspect investigated.

A second element worthy of consideration concerns the primacy of the social area: the criteria belonging to this field, in fact, not only always prevail in all the years of investigation but also increase between 2014 and 2015–2016 at the expense of the environmental area. In other words, there emerges a clear preference of the sample banks to use criteria related to the value produced for the stakeholders rather than environmental sustainability parameters. Moving on, from an overall viewpoint with an analysis of the individual metrics, the most used criteria, attributable to the social universe, concern customer satisfaction in its various meanings (customer satisfaction, customer retention, customer experience). In fact, these objectives are present in many remuneration reports; indeed, it could be said that they represent the first value that banks rely on in articulating their non-financial performances (this, moreover, is in line with the most recent literature, see, Maas and Rosendaal 2016). Next, always in a prevalent position, are the non-financial criteria relating to employee satisfaction and retention. Even in this case, the spread appears adequate, although it is a minority compared to the importance attributed to customers.

Finally, the analysis carried out also shows a good orientation of the banking system towards the qualitative criteria referable to the corporate governance area, among which it is possible to cite, in order of diffusion, the criteria linked to the "Bank's strategy" that relates to "Risk Management" and, finally, the parameter linked to "Reputation" and "Bank quality." This appears to be in line with the "dogmas" of the new regulation on the subject of banking compensation which, on several

occasions, reiterates the need that remuneration practices are strongly linked not only to the bank's mission and strategy, but above all to its risk profile. Then, with more homogeneous percentages of diffusion, follow the criteria of "CSR and sustainable growth," of "Compliance with adequate sales and loyalty conduct," of "Code of conduct (code of ethics)" and of "Leadership."

5 Best Practices in Europe

In this paragraph, we present a case study analysis of five European banks whose "ESG remuneration performance rating" is the highest among those elaborated. Such banks represent leaders in the adoption of non-financial performance criteria in remuneration contracts and, thus, can be considered the most virtuous banks in this field.

HSBC Holdings plc has made progress on the use of non-financial metrics in remuneration plans by aligning them to the Group's strategic actions, leadership and people metrics. The bank, when assessing the value of the LTI, takes into consideration non-financial measures (weighted 40%) as part of a balanced scorecard for ensuring alignment with the long-term strategy of the Group. Targets are based on the achievement of key long-term commitments and of a successful global standards roll-out, including risk and compliance measures and conduct, and a minimum of 25% of the scorecard for Group Management Board members was set. The Group Remuneration Committee has the discretion to change the overall weighting of the financial and non-financial measures, to vary the measures and their respective weightings within each category and to apply malus and clawback under the policies it has adopted, considering an individual's proximity to and responsibility for the issue in question. The table below provides an example of the non-financial performance achieved by each executive Director (Table 6).

Deutsche Bank introduced in 2016, a new compensation framework for aligning employee compensation with the strategic and business objectives of the bank, and for ensuring that Fixed Pay over Variable Compensation are appropriately balanced. The company determines the recipient of the Long-Term Performance Award (LTPA) by including non-financial metrics and the so-called Culture & Clients factor, namely that Employee Commitment, Behaviour and Reputation agreed with

Table 6 Non-financial performance criteria for HSBC

Global standards including risk and compliance	**Assessment**
Effective risk management in compliance with AML (anti-money laundering), sanctions and anti-bribery and corruption policies Enhancement of customer due diligence Implementation and embedding of global conduct programme Progress on embedding global standards	65.0%
Personal objectives	**Assessment**
Progress transactions in Brazil and Turkey Progress key milestones on set-up of UK ring-fenced bank Delivery of other high-priority projects People development including diversity	81.3%
Global standards including risk and compliance	**Assessment**
Strengthen governance and control around financial processes Delivery of controls optimization project Implementation and embedding of global conduct programme Enhancement of operational risk management framework Successful delivery of stress testing in key markets	65.0%
Personal objectives	**Assessment**
Deliver cost savings Implementation of consistent capital management framework Progress key milestones on set-up of UK ring-fenced bank People development including diversity	80.0%
Global standards including risk and compliance	**Assessment**
Effective risk management in compliance with AML, sanctions and anti-bribery and corruption policies Enhancement of customer due diligence Implementation and embedding of global conduct programme Enhancement of operational risk management framework Implementation of US risk management measures.	65.0%
Personal objectives	**Assessment**
Deliver cost savings Successful delivery of stress testing Support business growth and improve RWA effectiveness/efficiency. People development including diversity.	80.0%

Source HSBC Holdings plc (2016), Strategic Report, p. 200

each Management board member. Under the new compensation framework, variable compensation has the advantage of being able to differentiate between the "Group Component" links to Group performance and the "Individual Component" that considers a number of financial and non-financial factors. These metrics include the applicable divisional

Table 7 Non-financial performance criteria for Deutsche Bank

	Relevant indicators	*Relative weight (%)*
	Group component	
Short-Term Award (STA)	CET1 ratio	25
	Leverage ratio	25
	Adjusted non-interest expenses	25
	Post-tax return on tangible equity (RoTE)	25
	Individual component (exemplary)	
Short-Term Award (STA)	Revenue growth/IBIT y-o-y versus plan	30
	Project-related objectives (realization, management)	30
	Employee commitment index (% y-o-y)/diversity objectives	30
	Adjustment based on informed judgement	10
Long-Term Award (LTA)	Relative total shareholder return	33.34
	Organic capital growth (net)	33.33
	"Culture & client factor"/ control environment grade Group	33.33

Source Deutsche Bank, Annual Report 2016, p. 213

performance, the employee's individual performance and conduct, relativities within the employee's peer Group and retention considerations. The allocation of the objectives to the individual compensation components is set out (Table 7).

Banco Santander simplified qualitative assessment for calculating variable remuneration by reducing the number of categories and metrics. The framework score card contained in the remuneration applied to executive directors is presented (Table 8).

A qualitative assessment cannot adjust the quantitative result by more than 25% upwards or downwards. The company also evaluates the following elements: management of the risk appetite model, level and disclosure of excesses; the general control environment in accordance with

Table 8 Non-financial performance criteria for Banco Santander

Qualitative assessment	
Customers (15%)	• Effective development of the franchise • Compliance with adequate sales and loyalty conduct
Employees (10%)	• Evidence of a strong Simple, Personal & Fair culture. A comparison with high-performance organizations' standards was also taken into account
Society (5%)	• Support for the society of the future
Risks (10%)	• Effective risk appetite management • Reinforcing culture and risk control • Operational risk management • Progress towards risk management (Pillar II)
Capital (10%)	• Management of regulatory changes affecting capital • Effective capital management in business decisions • Progress in the capital plan to achieving Pillar III objectives
Profitability (50%)	• Growth compared to the previous year, considering the market environment and competitors • Sustainable profits and capital management • Cost management • Effective capital allocation

Source Banco Santander (2016), Annual Report on the Remuneration of Directors of Listed Companies, p. 37

internal regulations and Group standards; the degree of compliance with internal and external regulations, observations made by regulators and supervisory bodies; and prudent and efficient liquidity and capital management.

BNP Paribas published a new structure of remuneration of executive corporate officers, in compliance with the new European Banking Authority (EBA) guidelines, on 21 December 2015. "The variable portion of remuneration linked to qualitative assessment by the board of directors is capped at 25% of the target variable remuneration" (Table 9).

The board assesses the qualitative aspect of annual variable remuneration, looking at implementation of the bank's strategic guidelines, particularly its transformation plan, the Leadership for Change initiative and CSR, in the general context of the year under consideration. The performance of this qualitative assessment by the board of directors is considered essential, especially in view of the reinforcement of its responsibilities

Table 9 Non-financial performance criteria for BNP Paribas

Criteria applicable	*% of fixed remuneration*
Assessment with regard to implementation of the bank's strategic guidelines, particularly its transformation plan, the Leadership for Change initiative and CSR, in the general context of the year under consideration	25.0

Source BNP Paribas (2016), Registration document and annual financial report, p. 45

for monitoring and controlling provided by the French Monetary and Financial Code since 2014 (thereby implementing CRD 4). Variable compensation includes "penalty" and "clawback" clauses as well as a cancellation clause in the event of a bank resolution measure, in accordance with the same terms and conditions described in the LTIP.

Unicredit defined the categories of the main indicators of financial and non-financial Group performance annually within the KPI Bluebook. Among the non-financial goals, the Group includes goals related to both risk and compliance, e.g. credit quality, operational risks, application of MIFID principles, products sales quality, respect of the customer, Anti-money-laundering requirement fulfilment. The four categories of core drivers represent "financial and non-financial performance," and they are mapped into 12 clusters of business to help identify the most relevant standardized KPIs (all certified by relevant functions) for each business, with specific focus on risk-adjusted, sustainability-driven metrics and economic measures (Table 10).

6 Conclusions and Practical Implications

This paper aimed to analyse the sustainability targets in executive remuneration implemented by most important European banks for the period 2013–2016. To this end, we have elaborated an "ad hoc" governance score (ESG-remuneration performance rating) in order to verify the degree and the intensity of the use of non-financial metrics in executive remuneration plans. Finally, we have identified and examined some best practices adopted by European banks.

The results that emerged appear encouraging, even if there are some critical issues. In fact, on the one hand, almost all the intermediaries examined declared, at the end of 2016, that they include non-financial

Table 10 Non-financial performance criteria for Unicredit

The 4 categories of core drivers	
1. Financial & Economics	• Economic profit • Net operating profit • Total direct cost
2. Risk	• Expected loss% • Coverage on impaired • Reputation risk management effectiveness
3. Controls (audit & compliance)	• Compliance risk assessment completed • Enhance risk & control culture via audit effectiveness • Process performance and control—critical/major findings issued on own processes
4. Operational & clients	• Internal service quality index • Reputation index • People engagement index

Source Unicredit (2016), Group Compensation Policy, p. 63

metrics in their remuneration policies but appeared rather limited in the subdivision of non-financial metrics according to each executive. Most banks, in fact, do not provide such an articulation that they apply the same criteria and the same weighting to each manager. Furthermore, the methodologies for measuring non-financial metrics are rather limited, the names of non-financial criteria are often slightly ambiguous and it is often not possible to understand how the bank concretely realizes the link between pay incentives and non-financial performance, or through which instruments and/or parameters these results are measured. In our opinion, the aspect of the measurability of qualitative performance is of considerable importance because it depends strongly on the effectiveness of the link between remuneration practices and "non-financial performance criteria."

This study has important policy implications. First, it presents encouragement for the use of non-financial targets in banks' executive compensation. Indeed, incentive contracts incorporating sustainability performance measures facilitate investor monitoring, improve the board of director's ability to enhance shareholder value and allows a more balanced assessment of the top manager performance, thereby

improving managerial incentives and, thus, the corporate governance system. Second, the strong heterogeneity of the use of non-financial targets in remuneration plans denotes the need for enhanced disclosure of the performance criteria linked to executive compensation, which would improve investor understanding of the alignment between executive pay and firm performance. To this end, national and European regulations on compensation should introduce more detailed guidelines to urge banks to give more and better information on non-financial performance criteria and on their selection and implementation processes.

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CHAPTER 3

Intellectual Capital Disclosure: Evidence from the Italian Systemically Important Banks

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Abstract The need to overcome the limitations connected with the traditional financial reporting has driven the development of intellectual capital (IC) and corporate social responsibility (CSR) disclosure. Such need has also highlighted the relevance of an integrated reporting, recently supported by the Directive 2014/95/EU, which makes mandatory the disclosure of non-financial information for large-sized enterprises. The chapter focusses on the disclosure of the IC issues provided by the Italian systemically important banks. To conduct our analysis, we defined a disclosure model for the IC issues and collected data from the

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reports available on the banks' websites; we used a deductive content analysis, integrated by the Scott's pi test in order to evaluate the inter-coder reliability. Our findings, accordingly to prior literature, point out an incomplete IC disclosure, meaning that banks should extend the level of reporting on IC issues, and particularly they should improve the presence of forward-looking information and the quantified terms of IC elements.

Keywords Intellectual capital · Non-financial information · Disclosure · Italian banks · Content analysis

1 Introduction

The need to overcome the limitations connected with the traditional financial reporting has driven the development of intellectual capital (IC) and corporate social responsibility (CSR) disclosure, aimed to better represent the firm's value and the firm's business activities (Guthrie et al. 2007). Nevertheless, over the years, the disclosure of intangible and social issues, increasingly considered as critical key-factors for the competitiveness of any organisation, has shown overlaps and/or shortcomings in terms of goals, contents and vehicles of reporting: while environmental, social and sustainability reports have been largely issued on a voluntary basis, IC reports have had a more limited diffusion.

At the same time, taking into account that IC and CSR have a common root and thus that there is a close relationship between them, the need of an integrated reporting has been increasingly highlighted by the doctrine (Lev and Zambon 2003), practitioners (Veltri and Nardo 2008; Demartini and Paoloni 2013) and interest groups (Global Reporting Initiative—GRI 2011; Integrated Reporting 2013). The issuing and implementation of Directive 2014/95/EU, which makes mandatory the disclosure of non-financial information for public-interest entities and large-sized enterprises, banks included, are probably moving in this direction.

Our study focusses on the disclosure of the IC issues provided by the four Italian banks recognised as systemically important institutions at national level for 2018 (Bank of Italy 2018). The final aim of this chapter is to present the state of art of the IC disclosure in the Italian banking system also in the light of the entry into force of the Legislative Decree 254/2016, transposing the above mentioned Directive. To this end, we defined a disclosure model for the IC issues and collected data from the

reports available on the websites of the four banks. Considering that the Italian Leglislative Decree is in force from the beginning of 2017, we decided to focus our analysis on 2017 data, by collecting information from either the Integrated Reports or the Non-financial Statements, as well as the Annual Reports. To conduct our analysis, we used a deductive content analysis, integrated by the Scott's pi test in order to evaluate the inter-coder reliability.

2 Defining Intellectual Capital

The increasing focus on the limitations of the traditional financial reporting helps explain the importance of the need of disclosure of non-financial information, defined by Robb and Zarzeski (2001), as "all information disclosed outside the financial statements issued by the company". Particularly, the reference is to the information made available from the CSR and IC fields. Indeed, it is widely recognised that the most relevant shortcomings of the traditional financial reporting are linked to the fact that both the business activities and the value of a firm are not fully taken into account, and that CSR and IC reporting are suitable to overcome such limitations. On these premises, Guthrie et al. (2007), among others, suggest an integrated framework for the CSR and IC information also in order to avoid overlap of content. At the same time, the increasing emphasis on the voluntary disclosure of non-financial data is explained as it represents a means for the firms to achieve significant benefits, such as the reduction of the asymmetry information (Lang and Lundholm 2000; Guo et al. 2004) and the improvement in the efficiency of investment decisions (Gray et al. 1990).

Focussing on the IC reporting, this is considered as a successful tool, for example, for the creation of sustainable competitive advantages for firms, such as those linked to the opportunity of improving their image (Polo and Vázquez 2008). Over the years, the value drivers of firms have increasingly been represented by intangibles rather than tangibles—the former defined as firms resources without physical substance generating future benefits through innovation, unique organisational designs or human resources practices (Lev 2001). Moving from the basic/simple concept of goodwill in the 1980s, since the early 1990s the IC issues have been reaching significant proportions and attracting growing attention and interest from academics, practitioners and standardisation bodies. The IC definition, even if still not unambiguous as literature

provides different cues, may be referred to the notions of knowledge and information and their capacity of contributing to firms value (Edvinsson and Malone 1997). Hence, the knowledge-based economy represents the natural cradle for affirming the IC dominance: indeed, the effective management of knowledge and its exploitation for the benefits of the stakeholders are key-variables for the success of firms (Cabrita et al. 2017), especially, of course, when they are knowledge-based, as banks are (Sect. 4). On the basis of an accounting-based approach, this could also mean that the IC allows to assess the gap between the market and the book value of a firm: the more the firm is knolwledge intense, the higher the difference between the two values is. Otherwise said, the IC may be expressed by the gap between the market and the book value of a firm (Edvinsson and Malone 1997; Sveiby 1997), a difference quite ignored by the traditional balance sheet and financial statements, which thus provide a partial picture of a firm's value (Hope and Hope 1998; Brennan and Connell 2000). It is worth adding that the incomplete account of the firm's value could lead to suboptimal decisions, such as those about capital allocation and investments in IC-creating activities (Carroll and Tansey 2000). Therefore, the completeness of the information about a firm's value should include information on IC: that is the best way to assess viability and the true value of a firm (Guthrie et al. 2007). Hence, the IC, linked to the specific resources, capabilities and competences of a firm, is strategically (and increasingly) relevant in the contemporary context, as it contributes to the wealth and the growth of the economy (Cabrita and Vaz 2006).

Despite its strategic importance, however, IC value measurement and reporting show some difficulties; this helps explain the reasons many categorisation schemes and methods have been developed over time. The most widely adopted approaches tend to split IC into different elements, conceived as the combination of value creating (Brooking 1996; Marr et al. 2004). Among these, the framework provided by Sveiby's Intangible Asset Monitor (Sveiby 1997) defines the following categories of IC: external structure (customers), internal structure (organisation) and employee competence (people); for each class, growth, renewal, efficiency and stability indicators are provided. The business navigator Skandia includes five key-dimensions of business: financial, renewal and development, customer, process and human focus, the latter represents the heart of the model (Edvinsson and Malone 1997). Lastly, on the basis of the Balanced Scorecard approach four perspectives

are considered: financial, customer, business process, and learning and growth (Kaplan et al. 2004). All these models share the multidisciplinary character of IC, expressed by the internal and external resources used by firms (through their activities) in the process of value creation and therefore able to generate future benefits (Mention 2011). Consistently with the definition within the Meritum Project (2002), IC is nowadays conceived as the combination of the human, organisational and relational resources (capitals) of a firm. Undoubtedly, more than a mere sum, IC is hence represented by the value-creating mix of such resources, among which the strongest interconnection may be achieved through the appropriate intangible activities carried out by a firm. A brief description of the Human Capital, the Structural Capital, and the Relational Capital is provided below:

- Human Capital includes the knowledge, skills, motivation, experience, abilities of the firm's personnel. Some of this capital is unique to the individual (e.g. personal attributes, technical competence, previous experience, creativity), some may be referred to the organisation (e.g. teamwork, healthy work environment). Sveiby (1997) defined Human Capital as "the capacity to act in a wide variety of situations to create both tangible and intangible assets".
- Structural Capital may be considered as the knowledge produced by an organisation and not separable from it (e.g. procedures, systems, cultures, databases, technologies, organisational learning capacity). Brooking (1996) defined Structural Capital as "the skeleton and the adhesive of the organization, which strengthens the company and creates a close and coherent relationship between individuals and their processes".
- Relational Capital is linked to the relationships of a firm with external actors, such as customers, suppliers, investors, creditors. This capital includes image, customers loyalty and satisfaction, environmental activities. Relational Capital is connected with the relations a firm has with third parties, and at the same time it is expression of the perception external parties have on the firm (Cabrita et al. 2017).

As shown, among others, by Cabrita (2009), the IC is of a dynamic nature and for this it may be conceived as a "phnenomenon of interrelationships and interactions, having each component little value if considered per se, but as a whole it represents great value for the organization".

3 The Intellectual Capital Disclosure: Determinants and Open Issues

As previously mentioned, there are various factors explaining the intellectual capital disclosure: the opportunity to mitigate information asymmetries and litigation risks; to promote credibility, image and reputation; to support more efficient investment decisions; to contribute to the decrease of equity costs; to contribute to the creation of the firm economic value and, through it, ensure its long-term viability. At the same time, there are many theories explaining the IC disclosure; they could be mainly referable to the stakeholder theory, legitimacy theory and signalling theory. As regards the first theory (e.g. Guthrie et al. 2006), the stakeholders of a firm (investors, creditors, government/authorities, competitors, media, etc.) are the main (and most powerful) addressees of the IC reporting, as this contributes to reduce the asymmetry information between the two parties and, as a consequence, helps give stakeholders a correct representation of the firm value and performance. On the other hand, as a result of the legitimacy theory (e.g. Deegan 2002), IC disclosure allows a firm to legitimise its status: it is the means to ensure that its business is compliant with regulations and perfomed consistently with the market/community expectations. Lastly, the signalling theory (among others, Whiting and Miller 2008) focusses on the opportunity of reducing the information asymmetry between the agent and the management; particularly, positive signals to the market may produce advantages for the firm. Given the different theories, An et al. (2011) argue that an adequate theoretical framework for IC disclosure needs above all an integration among them.

By speaking of IC disclosure, the link with the CSR reporting is immediate. There are differences, but also similarities, common roots, as well as overlaps, which over the years have driven an intense debate on these issues, also in terms of rising awareness on the opportunity of an integrated reporting. Particularly, the integration of different types of disclosure may be considered as a key-factor for corporate reporting, provided that it does not result in a stratification and proliferation of data but in a better and more complete understanding of the dynamics of a firm: in essence, the focus should shift from the quantity of information disclosed to the quality and correct scope of reporting (Nardo and Veltri 2014).

In operational terms, the elaboration of IC reports as separate statements providing exclusively information on aspects of IC management

and resources is fairly widespread among few countries, such as Denmark and Sweden, which are considered pioneers of this type of reporting. However, in most countries, firms tend to disclose little information on IC, especially for the absence of a IC reporting framework (Cinquini et al. 2012). Moreover, such information tends to be included in the Annual Reports or in the CSR/Sustainability Reports, with the consequence that some relevant information on IC issues may be lost or overlapped. This is one of the reasons several studies analyse whether CSR/Sustainability reports may represent a channel for disclosure of IC information (among others, Oliveira et al. 2010) and why many scholars state the crucial relevance of the integrated reporting (Nardo and Veltri 2014). Hence, the need of an integrated reporting has been increasingly highlighted by several interested parties: the doctrine (e.g. Lev and Zambon 2003), practitioners (Veltri and Nardo 2008; Demartini and Paoloni 2013) and interest groups (GRI 2011; Integrated Reporting 2013). The issuing and implementation of Directive 2014/95/EU, which makes mandatory the disclosure of non-financial information for public-interest entities and large-sized enterprises, banks included, may contribute to the achievement of this goal, as it is aimed to improve the quality and systemisation of the information disclosed (Venturelli et al. 2017).

4 Why the Focus on Banks IC Disclosure?

The general remarks regarding the IC disclosure apply in a specific manner for certain industries, such as the banking, as one of the most knowledge-intensive sectors, for which the management of the knowledge basis certainly represents a strong competitive advantage, also considering the increasingly dynamic market where banks operate. In this respect, it is useful to point out that over the last decades the globalisation process has accelerated the dynamism of the financial service industry (Joshi et al. 2010) and as a consequence the banking sector has experienced great changes connected with new and complex challenges to face. It should be sufficient to recall the changes in regulation, business models and information technologies, all phenomena that have drastically altered the external context and consequently affected, sometimes reshaped, the structure, the organisation and the business of the banks. Particularly, reference is made, among others, to the new business strategies, aimed to better meet the needs of the market and withstand the competitive

pressures (Latif et al. 2012)—e.g. the development of new financial products and services as well as the entrance in new markets; the role of new technologies, with impacts also on the ways of reaching customers; the consolidation operations. These considerations help understand the link with the IC, and its disclosure, as well as its centrality in the banking activity (Mention 2011): indeed, the changes mentioned may require new skills (Human Capital), adjustments to the processes and procedures (Structural Capital) and the improvement/enhancement in the relations with the wide range of stakeholders (Relational Capital). Hence, in a hypercompetitive and dynamic environment, banks have to focus on tangible assets, but above all improve the ability in the IC management and exploitation, as a key issue to ensure their long-term viability.

Moreover, the peculiarities of banks draw attention to the intellectual nature of their business (Mavridis 2004) and to the presence of an intellectually staff more homogeneous than staff in other sectors (Kubo and Saka 2002). Banks offer knowledge-based products and services by integrating professional competencies and market needs, in order to achieve positive economic results from financial knowledge and risk management (Shih et al. 2010). Banks therefore are typical knowledge-intensive institutions, as they are characterised by a heavy reliance on individual knowledge workers, a strong role of technologies and a close interaction between employees and customers (Mention 2011). It is the IC that determines the quality of banks' business, by highlighting the knowledge as unique resource. Indeed, the success of banks activity relies on the quality of human capital and the ability to leverage the talents (Muhammad and Ismail 2009). Technologies are also crucial for the development of new products and services as well as the automation of processes; this may strengthen the relationship with customers and thus give more evidence to the connection between Relational and Structural Capitals (Cabrita and Bontis 2008).

The extraordinary focus on knowledge in the banking sector, compared to others in the economy, helps explain the need of a great transparency of bank's information aimed, among others, to ensure the protection of stakeholders (Chen and Pan 2011). This must be considered for different reasons: economic ones, but above all those linked to the need of maintaining or increasing the legitimacy of banks in the market where they operate. Otherwise said, the IC disclosure may help the restoring of trust and confidence, as core intangibles, in particular in times of general lack of belief in banks' reliability (Cabrita et al. 2017).

5 Sample and Methodology

5.1 Sample

The significance of IC disclosure for the banking industry has led scholars to explore empirically this issue with exclusive focus on banks (e.g. Mention 2011; Cabrita et al. 2017) or considering both financial and non-financial firms (e.g. Cinquini et al. 2012). Nevertheless, the analysis of banks IC disclosure still represents a significant area for research, as the practices of the banking sector are rather unexplored to date.

Our chapter is part of this strand of research, by analysing the IC disclosure of a sample of Italian banks: the four banks recognised as systemically important institutions at national level for 2018: Unicredit, Intesa Sanpaolo, Monte dei Paschi di Siena (MPS), Banco BPM (Bank of Italy 2018). We consider this type of banks particularly representative of IC disclosure practices in the light of their size, operational complexity and listing status, as key-factors for a greater propensity for IC reporting (Oliveira et al. 2010; Venturelli et al. 2017). For our purposes, we focus the analysis on 2017, corresponding with the entry into force of the Legislative Decree 254/2016, transposing the Directive 2014/95/UE, by collecting data from either the Integrated Reports or the Non-financial Statements, as well as the Annual Reports.

The Italian banking sector, like other systems, has been hard-hit by the international crisis and some national banks have experienced (or are still experiencing) critical situations. This calls for a renewed attention (also) to the centrality of the role of the intangible values, in order to maintain, and enhance, leading competitive positions in the financial markets, increasingly threatened by new entrants and technologies. As reported by Nardo and Veltri (2014), the Italian context shows a certain delay in the IC reporting, contrary to CSR disclosure (among the studies focussed on the integration between CSR and IC, we mention Cordazzo 2005; Pedrini 2007). Such delay seems to be related to cultural reasons or information asymmetries. Focussing on a sample exclusively consisting of banks, we try to provide further insights on these questions, by investigating the present state of art of IC disclosure.

5.2 Methodology

To measure the extent and accuracy of IC disclosure, we employ a multi-step methodology. Foremost, we identify the IC components deriving

and adapting them from the prevalent literature. Then, we analyse banks' reports (see Sect. 5.1), applying the encoding technique to understand what and how Italian banks disclose on IC. A summary of the findings is obtained through the measurement of the extent and accuracy of IC disclosure (see Sect. 5.2.2). Finally, we test the reliability of the content analysis.

5.2.1 The Model of IC Disclosure

The methodology applied in the first step is content analysis, one of the most common research method used to analyse IC disclosure, as reported by Guthrie et al. (2004). Through the content analysis, texts can be resumed in a restricted number of categories (Berelson 1952; Krippendorff 1980; Weber 1990), identifying the main characteristics of a message (Holsti 1969).

Specifically, we apply a deductive content analysis deriving and adapting our IC disclosure indicators from the prevalent literature. We follow, in particular, three models: two models focussed on the IC disclosure of European banks (Mention 2011; Cabrita et al. 2017) and a model on the IC reporting of Italian listed firms, including banks (Cinquini et al. 2012).

Our final model includes the three common elements of IC—Human, Structural, and Relational capital—and a set of specific indicators for each capital, grouped by categories and sub-categories.

Human capital reporting includes two categories (Staff characteristics and Policy) and six sub-categories of indicators, mapping the most relevant features of employees—such as education and gender—their attitudes and skills, training, stability of employability, staff incentives and satisfaction, and how talents are managed (Table 1).

Structural capital is composed by two categories: Organisational capital and Technological capital. Specifically, Organisational capital gathers information about mission and strategies, operational and innovation processes, teamwork and internal cooperation, and Technological capital shows disclosure on communication systems and management and control systems.

Finally, Relational capital comprises information about Business capital and Society capital, disclosing the relationships established with customers and investors (Business capital), and with the society and other stakeholders (Society capital).

Table 1 presents the model and the specification of all the IC indicators.

Table 1 The model of IC disclosure

Human capital		*Characteristics*	Staff break down by job function
			Staff break down by age
			Staff break down by gender
			Staff break down by functions and gender
			Staff break down per education
			Staff by seniority
			Number of qualified employees per level of salary
			Employee efficiency index
	Staff characteristics	*Attitudes and Skills*	Teamwork
			Technical competencies
			Leadership
			Customer centric attitude
			Communication attitude
	Policy	*Training*	Description of training programme
			Investments in training
			Number (average) of hours of training per employee
		Incentives and Satisfaction	Benefit and compensation
			Employee controversies
			Health
			Internal social/cultural activities
		Stability	Number of employees working part-time
			Number of employees in apprenticeship
			Rate of turnover
			Absenteism
		Talent Management	Diversity and equal opportunity
			Internal job rotation
			Career opportunity
			Work life balance plans
			Incentives plan to attract talent
			Recruitment policy

(continued)

Table 1 (continued)

Structural capital	Organizational capital	*Mission and corporate strategies*	Description of Mission and Values statement Code of conduct Description of organization's functional structures
		Operational and innovation processes	Definiton of management by objectives systems Performance evaluation systems Statement of policy, strategy and/or objective of I&D activities Innovation and development investments (I&D)
		Team work and internal cooperation	Number of projects Programs of internal mobility and working flexibility Programs and activities of knowledge sharing
	Technological capital	*Systems of communication*	Internal communication channels External communication channels Social media Communication Technologies in development
		Management and control systems	Technology investments to meet regulatory requirements Investments in digitalization and big data Systems of internal control Cybersecurity systems Information technologies in development Quality evaluation process and certifications

(continued)

Table 1 (continued)

Relational capital	Business capital	*Customer relations*	Number of branches/agencies and their location
			Online customer service channels (access)
			Products/services solutions for clients
			Promotional strategies and activities
			Segmentation of customers
			Business per segment or product
			Market share by segment/product
			Dependence on key customers
			Information regarding systems for handling suggestions and complaints
			Customers litigations and legal actions
			Client satisfaction measuring process
		Investors relations	Information about company growth
			Informantion about future projects
			Information about relationship with investors
			Value added to investors and shareholders
	Society capital	*Actions in social and environmental fields*	Identification of stakeholders
			Social responsibility activities
			Social and environmental impact investments
			Commitments regarding good environmental and energetic practice
		Relationship with other actors	Description of actors with whom partnerships are maintained
			Relation with regulatory body
			Outsourcing/subcontracting
			Collaborations with universities and research centre: typology and number
			Donations to universities and research centre
		Corporate reputation	Financial reputation
			Social reputation
			Environmental reputation
			Reputation evaluation process
			Prizes and awards received

Source Authors elaboration

5.2.2 Encoding Technique, Extent and Accuracy of Disclosure

We use the encoding technique to verify the extent and accuracy of IC disclosure.

We use two different indicators to summarise the results: the Index of disclosure level (1) and the Index of accuracy (2). We calculate the Index of disclosure level (1), to express the extent of Italian banks' reporting in terms of Human, Structural and Relational capital, and in terms of IC categories and sub-categories. According to Mention (2011), this Index synthetically describes what is mainly reported by banks. Thus, independently of the level of disclosure, we assign the value 1 when information is disclosed, and 0 when it is not provided.

However, to take into account that information could not be exhaustively reported by banks, we identify an intermediate score (0.5) and we synthesise results in the Index of accuracy (2). This is useful to classify banks according to the value (0, 0.5 or 1) attributed to the reporting. Thus, the numerator of the Index of accuracy (2) represents the sum of values obtained by each bank, instead of the number of the observed indicators disclosed, as in the Index of disclosure level (1). Therefore, the Index of accuracy can be considered sensible to the accuracy of disclosure, while the Index of disclosure level does not take in consideration this element.

We are also aware that the Index of accuracy can be mostly affected by subjectivity of the point of view of different researchers, increasing concerns on content analysis reliability. To mitigate this limit, we implement a set of strategies, described in Sect. 5.2.3.

$$\textit{Index of disclosure level} = \frac{\textit{Number of observed indicators disclosed}}{\textit{Total number of indicators possible}} \quad (1)$$

$$\textit{Index of accuracy} = \frac{\textit{Value obtained in the IC disclosure}}{\textit{Total value possible}} \quad (2)$$

5.2.3 Reliability Test

One of the most common concerns on content analysis is the reliability. According to Stemler (2001), reliability regards the stability and reproducibility of the content analysis. A content analysis is stable when a researcher obtains the same results repeating the analysis in a following period, while reproducibility is ensured when two researchers find the same evidence analysing a text.

Thus, to ensure reliability of content analysis, two different researchers analyse the text repeating everyone the analysis two times.

The Scott's pi (3) is used to summarise the level of reproducibility of our content analysis, according to Mention (2011).

$$\text{Scott's}\,\pi = 1 - \frac{100 - \%\,of\ observed\ matches}{100 - \%\,of\ expected\ matches} \tag{3}$$

The Scott's pi reveals a good level of reliability of this analysis, showing a value of 0.935. Indeed, 0.80 is considered an acceptable lower limit for reliability (Perreault and Leigh 1989).

6 Findings and Discussion

This section summarises the results of our analysis on IC disclosure of the sample banks. We analyse where banks report IC, what information banks provide to stakeholders, and how accurate is the reporting.

The four systemically important institutions at Italian level report on IC in the Non-Financial Statement (Banco BPM and Intesa Sanpaolo) or in the Annual Report (MPS and Unicredit). Banco BPM and Intesa Sanpaolo disclose specific indicators in the Annual Report. That is the case of Dependence to key customers and Financial reputation.

To evaluate what banks report, we use the Index of disclosure level and relative sub-indexes for IC categories and sub-categories. The Index, as previously described, measures the IC disclosure in terms of number of items disclosed, independently of the accuracy of the reporting. The sample banks, on average, show an Index of 62%, while Intesa Sanpaolo, representing the most appreciable bank in terms of IC reporting, shows an Index of disclosure of 73% (Table 2). These levels of disclosure are below the level obtained by Mention (2011) examining five European banks. Indeed, Mention (2011) recognised an average disclosure of 80%.

Regarding the IC elements (Human, Structural and Relational capital), the sample banks mostly report on Relational capital (71%). The disclosure of Structural capital follows the Relational capital (60%), while Human capital represents the lowest disclosed element by Italian banks (56%). An exception is represented by Unicredit, which mostly reports on Structural capital (75%). Relational capital (72%) and Human capital (53%) follow in the Unicredit IC reporting.

Table 2 Index of disclosure level

Banks	*Unicredit (%)*	*Intesa sanpaolo (%)*	*BPM (%)*	*MPS (%)*	*Total (%)*
Human capital	**53**	**73**	**53**	**43**	**56**
Characteristics	63	88	75	38	66
Attitude and skills	0	20	0	0	5
Training	67	100	67	67	75
Incentives and satisfaction	75	75	75	75	75
Stability	75	100	75	25	69
Talent management	50	67	33	67	54
Structural capital	**75**	**60**	**50**	**55**	**60**
Organizational capital	60	50	40	30	45
Mission and corporate strategies	100	100	100	67	92
Operational and innovation processes	50	25	25	0	25
Team work and internal cooperation	33	33	0	33	25
Technological capital	90	70	60	80	75
Systems of communication	100	75	50	75	75
Management and control systems	83	67	67	83	75
Relational capital	**72**	**83**	**66**	**62**	**71**
Business capital	67	80	73	60	70
Customer relations	64	82	73	82	75
Investors relations	75	75	75	0	56
Society capital	79	86	57	64	71
Actions in social and environmental fields	100	100	75	75	88
Relationship with other actors	40	60	60	80	60
Corporate reputation	100	100	40	40	70
Total	**66**	**73**	**57**	**53**	**62**

Source Authors elaboration

Although the exception of Unicredit, Relational capital results the most disclosed element, according to previous studies (Guthrie and Petty 2000; April et al. 2003; Oliveras et al. 2008; Struikova et al. 2008; Mention 2011), and this result may be because Relational capital is still considered as the element that is "most available to be disclosed" (Cabrita et al. 2017).

In contrast with other findings (Guthrie and Petty 2000; April et al. 2003; Oliveras et al. 2008; Struikova et al. 2008; Mention 2011), Structural capital is second in the ranking of IC disclosure. The prevalent disclosure of Structural capital, compared to Human capital, is mostly determined by the disclosure of technological capital, in turn explained by the increasing spreading (and reporting) of communication and of control systems. This is supported by Mention (2011), who recognises a growing trend for Structural capital and a relative low trend for Human and Relational capital. Therefore, the sample banks IC disclosure, on average, can be assumed as a final picture of that growing international trend.

Intesa Sanpaolo and Banco BPM represent an exception: they pay a relative higher attention to the disclosure of Human capital (73 and 53% respectively) than to the disclosure of Structural capital (60 and 50% respectively), although Relational capital remains the most reported element also for these banks.

Going through the sub-categories of IC, Actions in social and environmental fields represents the most reported sub-category of Relational capital, with an average Index of 88%. This may be explained by the increasing demand of social and environmental commitments and investments over the last years. Indeed, banks are increasingly involved in environmental issues either directly, as companies, or indirectly, through their lending activity (Alberici and Querci 2016).

Regarding Structural capital, the most disclosed sub-category is mission and strategies (92%), while Incentives and satisfaction (75%) as well as Training (75%) are the most disclosed sub-categories in Human capital.

By contrast, attitudes and skills represents the most challenging subcategory: the sample banks, on average, report on 5% of this section's indicators. Specifically, banks do not seem oriented to the disclosure of current staff's attitudes and skills, while they pay attention to how they can improve some skills through training. This finding is in contrast with Mention (2011), who shows attitudes and skills as a widespread sub-category.

Operational and innovation processes as well as teamwork and internal cooperation represent other under disclosed sub-categories (Table 2), with an average of reporting of 25%.

Furthermore, some indicators of the most reported category Society capital surprisingly are not reported by all the banks. This is, for instance, the case of identification of stakeholders. The identification of stakeholders is a common practice also in terms of corporate social responsibility (Freeman 1984; Carroll 1991; Mitchell et al. 1997), thus the

lack of reporting was not expected. The missing reporting of Social and Environmental reputation is a little unexpected.

We introduce the Index of accuracy to appreciate the how of IC disclosure, namely, we do not consider just whether banks provide or not information, but also its completeness (Table 3).

Results of our analysis do not change substantially when we consider the accuracy of the disclosure. The four banks examined, on average, account an Index of accuracy of 58%, four points below the average Index of disclosure level. Intesa Sanpaolo remains the most appreciable bank in terms of IC disclosure, obtaining an Index of accuracy of 66%, while its IC Index of extent shows a value of 73%.

Relational capital is confirmed as the most disclosed element in terms of accuracy (65%), Structural the second (54%), and Human the last one (53%). The most reported sub-category of Relational capital remains Actions in social and environmental fields (84%), although all the sub-categories show higher (in few cases, equal) Index of disclosure level than Index of accuracy (Tables 2 and 3).

Regarding Structural capital, technological capital remains the most reported category (75%), confirming one more time that banks have been making a substantial effort to increase their digital and tech investments and to inform stakeholders of these technological innovations.

These findings, although mostly confirming results of the Index of disclosure, show that a lot of information is partially reported by banks. Thus, in terms of policy suggestions, Italian banks should work on the improvement of disclosure of items not accurately reported, as well as on the enhancement of IC disclosure in general terms.

7 Conclusions

Considering the growing significance of IC disclosure, we decided to investigate the related practices of a sample of Italian banks: the four banks recognised as systemically important institutions at national level for 2018. To this end, we defined a disclosure model for the IC issues, by collecting data from the 2017 Integrated Reports, Non-Financial Statements and Annual Reports of the four banks, and developed two indexes aimed at measuring, respectively, the extent of the information disclosed and the accuracy of the reporting.

The main results of our study show that among the three IC capitals, the Relational one represents the most disclosed in terms both of extent

Table 3 Index of accuracy

Banks	*Unicredit (%)*	*Intesa sanpaolo (%)*	*BANCO BPM (%)*	*MPS (%)*	*Total (%)*
Human capital	**52**	**68**	**52**	**40**	**53**
Characteristics	63	88	69	38	64
Attitudes and skills	0	10	0	0	3
Training	67%	100	67	67	75
Incentives and satisfaction	63	63	75	63	66
Stability	75	100	75	25	69
Talent management	50	58	33	58	50
Structural capital	**65**	**55**	**48**	**50**	**54**
Organizational capital	**45**	**45**	**35**	**25**	**38**
Mission and corporate strategies	83	100	83	67	83
Operational and innovation processes	38	25	25	0	22
Teamwork and internal cooperation	17	17	0	17	13
Technological capital	85	65	60	75	71
Systems of communication	100	75	50	75	75
Management and control systems	75	58	67	75	69
Relational capital	**67**	**72**	**62**	**57**	**65**
Business capital	**60**	**73**	**70**	**60**	**66**
Customer relations	55	77	73	82	72
Investors relations	75	63	63	0	50
Society capital	**75**	**71**	**54**	**54**	**63**
Actions in social and environmental fields	88	100	75	75	84
Relationship with other actors	40	40	50	50	45
Corporate reputation	100	80	40	40	65
Total	**61**	**66**	**54**	**49**	**58**

Source Authors elaboration

and accuracy. Nevertheless, our general findings, accordingly to prior literature, point out an incomplete IC disclosure, meaning that banks should enhance the level of reporting on IC issues, and particularly they should improve the presence of forward-looking information and the quantified terms of IC elements.

This helps explain the need of further research on these topics, for example by extending the sample period and the number of banks, as well as investigating the existence of a relationship between the level and accuracy of IC disclosure and some governance variables, in order to show whether the sensitivity to a better reporting could depend on internal features of banks.

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CHAPTER 4

Assessing the Relationship Between Environmental Performance and Banks' Performance: Preliminary Evidence

Rosella Carè and Antonio Fabio Forgione

Abstract The question of whether it pays to be green has been addressed by many studies, but despite the growing number of works, the debate about the relationship between environmental performance, environmental disclosure, and banks' performance is still unresolved, and mixed results have been found. This work explored the relationship between environmental disclosure, environmental performance, and financial performance by using a sample of 57 EU15 listed banks. Moreover, by applying the value relevance methodology, we analyzed the

This work is the result of a collaboration between the authors. In particular, Carè contributed to Sects. 1, 2, 2.1, 2.2, 2.3, 3.1, and 5; while Forgione contributed to Sects. 3.2, and 4.

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relationship between market values, environmental disclosure, and environmental performance. Our findings reveal strong evidence of the value relevance of environmental disclosure.

Keywords Banking industry · Environmental performance · Financial performance · Value relevance · Environmental disclosure

1 Introduction

The entire banking sector has come under increasing pressure since the subprime mortgage crisis to take a more long-term view of their stakeholders' interests and to acknowledge and respond to their obligations to society (De la Cuesta-González et al. 2006; Matten 2006; Lauesen 2013; Jizi et al. 2014). The engagement of the banking industry in non-socially responsible practices has caused a loss of trust among the industry's customers (Hurley et al. 2014; Esteban-Sanchez et al. 2017). In particular, the consequence of the negative external effects that poorly managed banks can impose on society and the perception of the firms' corporate social responsibility (CSR) activities are important not only for investors' and customers' risk assessment but also for regulators' goodwill and for the public's confidence in the financial system (Jizi et al. 2014). The expectations of stakeholders—and more generally of the community—regarding sustainable development have strengthened the importance of CSR practices in banks. Consequently, banks have changed their overall approach to CSR and to CSR disclosure by paying attention to the potential reputational risks and brand image damage related to these issues (Thompson and Cowton 2004; Scholtens 2006; Carnevale and Mazzuca 2014). In this sense, Laidroo and Sokolova (2015) underline that the CSR disclosure scores of international banks in 2013 were significantly higher than those in 2005, but significant improvements are required in the area of sustainable products and environmental management policies (Laidroo and Sokolova 2015; Carè 2018). The disclosure quality of European banks has been further increased with the endorsement of IAS/IFRS principles, particularly with regard to credit risk exposures (Bischof 2009).

Environmental considerations are becoming an important facet, both in the sustainability engagement and communication process of banks. Several key changes are occurring in the regulation and supervision of

banking (and financial) systems, and banks have incentives to voluntarily provide information regarding their engagement and commitment to sustainable practices and environmental/social activities (Wright 2012; Carnevale and Mazzuca 2014; Caldecott and McDaniels 2014). Furthermore, it is widely recognized that, in recent years, banks have significantly increased their commitment to CSR, with particular attention to corporate environmental performance (CEP) (Porter and Van der Linde 1995; McDonald and Rundle-Thiele 2008; Weber et al. 2008; Truscott et al. 2009; Prior and Argandoña 2009; Laguir et al. 2018).

The question of whether it pays to be green has been addressed by many studies (Bansal and Hoffman 2012; Jo et al. 2015). However, despite the growing number of works, the debate about the relationship between environmental performance and firm performance is still unresolved, and mixed results have been found (Al-Tuwaijri et al. 2004; Elsayed and Paton 2005; Clarkson et al. 2008; Nor et al. 2016). With regard to environmental disclosure, Fazzini and Dal Maso (2016) explored the case of Italian banks and concluded that environmental voluntary disclosure represents value-relevant information positively correlated with firms' market value, while Carnevale and Mazzuca (2014) showed that investors appreciate sustainability reports and that this disclosure produces a positive effect on stock prices. In the wide range of proposed methodological approaches, the value relevance method—devoted to exploring the firm's market value and its variations—is particularly useful to analyze whether environmental disclosure provides information to the market (Moneva and Cuellar 2009) and to understand whether environmental performance is reflected in the market value of banks (Hassel et al. 2005).

Moving from these considerations, by using a multiple econometric approach, this work explored: (i) the relationship between environmental disclosure and financial performance; (ii) the relationship between environmental performance and financial performance; and (iii) the value relevance of environmental disclosure and environmental performance. This exploratory analysis—based on a quantitative approach—provides useful insights on the role and relevance of the environmental disclosures and performance of European banks. To our knowledge, no study has explored and compared environmental performance and environmental disclosure from both a financial and a market relevance perspective and with regard to the banking sector. The contribution of this work

is twofold: on one hand, we provide better knowledge of the above-described relationships and, on the other hand, we offer several suggestions to banks and regulators with regard to the attention the market pays to this kind of information.

The remainder of this paper is organized as follows: the next section provides a literature overview. Section 3 explains the characteristics of the sample, the empirical model and the methodology. The final sections conclude, discuss the limitations of this exploratory study, and point to future lines of research.

2 Literature Review and Hypotheses Development

Environmental considerations are becoming an important aspect of both the sustainable engagement and communication process of banks. In this vein, Mengze and Wei (2015, p. 159) highlight that "*for most banks the primary basis for sustainable finance is incorporating environmental consideration into their bank lending products and services such as lending, project finance* etc." The contribution of the banking sector to environmental protection has been explored by many authors (Jeucken 2004; Weber 2005; Scholtens 2006; Scholtens and Dam 2007; Weber et al. 2008, 2010; Bouma et al. 2017). The literature indicates that banks consider environmental risks as part of the credit appraisal process (Weber et al. 2008), and the banking industry has come to realize that banking operations, and in particular lending, affect and are affected by the environment (Thompson 1998b; Emtairah et al. 2005; Mengze and Wei 2015; Weber et al. 2015). The 1990s marked a turning point for new environmental sensitivity (Costa and Torrecchia 2018), and environmental legislation increased (Carè 2017, 2018). Banks affect and are affected by environmental issues both directly and indirectly (Thompson and Cowton 2004; Scholtens 2009; Weber 2012; Bouma et al. 2017). Direct risk is defined as the exposure to risk that stems from the borrower damaging the environment such that it becomes a cost for the bank, while indirect risk is related to the potential value or profit decreases for the bank due to the acts of the borrower (Thompson 1998a, b; Thompson and Cowton 2004). In the same vein, Bouma et al. (2017) classify the environmental impacts of the banking sector by distinguishing between internal—related to their direct contribution to environmental protection in terms, for example, of energy or water consumption—and external—related to the impact of their products. The term "sustainable lending"

is considered by Jeucken (2004) to be one of the main aspects of the "sustainable banking" model. Weber et al. (2015) show that some banks apply sustainability criteria in their lending business by considering credit risk management as one of the major activities guaranteeing the business success of a bank (Weber 2012) and the improvement of their reputation (Thompson and Cowton 2004; Nandy and Lodh 2012; Carè 2018). Moreover, Weber (2014) highlights that stakeholder pressure on sustainable development influences the reputational risk of banks and has an impact on their financial performance (Scholtens and Zhou 2008). In line with the research aims of this work, our literature review is developed around three main research lines. The first two explore previous studies—both related to the banking industry and not—that have analyzed the relationship between environmental disclosure and financial performance and the relationship between environmental performance and financial performance. The third research line is dedicated to the relationship between environmental performance/environmental disclosure and the market value of banks. The analysis of previous works led us to develop our three main research hypotheses, which are described in the relative sections.

2.1 Environmental Performance and Financial Performance

Previous works—not focused on the banking industry—suggest that firms that have improved environmental management systems and better environmental performance show a lowering of their betas (Feldman and Soyka 1997), are exposed to lower levels of risks (Labatt and White 2003; Sun and Cui 2014) and are able to improve investors' perceptions of the firm, both in terms of reputation and in terms of future performance (Lee et al. 2016). Miles and Covin (2000) have explored the relationship between environmental performance, reputation, and financial performance, concluding that good environmental performance provides firms with a reputational advantage that enhances their financial performance. Similarly, by analyzing the interrelations among environmental performance, environmental disclosure, and economic performance, Al-Tuwaijri et al. (2004) highlight that "good" environmental performance is significantly associated with "good" economic performance. At the same time, firms with a better CEP tend to be exposed to lower levels of risks (Sharfman and Fernando 2008; Sun and Cui 2014; El Ghoul et al. 2018). CEP has an influence on investors' perceptions of a firm,

both in terms of reputation and in terms of future performance (Russo and Fouts 1997; Gilley et al. 2000; Peloza 2006). However, only a few studies have analyzed the relationship between CEP and financial performance in the banking sector. Despite the evidence of a positive link between CEP and CFP, recent studies on environmental practices in the banking sector (Sobhani et al. 2012; Weber 2005) indicate that only the largest and wealthiest banks (Branco and Rodrigues 2006; Chih et al. 2010; Darnall et al. 2010) give a strategic role to these issues by promoting both of these actions related to internal management systems rather than external actions, such as the development of new products or services (Wu and Shen 2013; Carè 2018; Laguir et al. 2018). By exploring a sample of 68 banks from 2008 to 2011, Laguir et al. (2018) highlight that high CFP is associated with high CEP. At the same time, the authors also reveal that CFP and CEP may strengthen each other, suggesting a complex bidirectional relationship. Given the aforementioned literature, our study tests the following hypothesis:

> H1: The level of a bank's CEP significantly and positively influences the level of its financial performance.

2.2 Environmental Disclosure and Financial Performance

The fast growth of interest in environmental disclosure comes from the recognized presence of financial investors who consider firms' ethical practices in their decision-making process (Berthelot et al. 2003; Gupta and Goldar 2005; Moneva and Cuellar 2009; Fazzini and Dal Maso 2016; Baldini et al. 2018). Corporate environmental reporting (CER) can be considered as an outcome of management's assessment of the economic costs and benefits related to additional disclosure (Barth et al. 1997; Cormier and Magnan 1999, 2003). Other studies highlight a negative relationship between the level of financial disclosure and the cost of capital (Botosan 1997; Richardson and Welker 2001). In particular, El Ghoul et al. (2011) show that firms with better CSR scores exhibit cheaper equity financing and that investment in CSR issues, including environmental policies, contributes substantially to reducing firms' cost of equity. Arshad et al. (2012) highlight that CSR practices are positively related to the reputation and performance of banks, and the results showed that banks' CSR disclosure indices significantly and positively affect ROA and ROE. In recent years, an extensive body of literature has

explored how CSR reporting can positively affect stakeholders' perceptions of firm performance, risk, value, share price, profitability, and cost of capital (Gray et al. 1995; Scholtens 2008; Cormier et al. 2011; Jizi et al. 2014). Given the aforementioned literature, our study tests the following hypothesis:

> H2: The level and quality of banks' corporate environmental disclosure significantly and positively influences the level of its financial performance.

2.3 The Value Relevance of Environmental Performance and Environmental Disclosure

Many works have explored the relationship between ESG performance and firm value (Li et al. 2018). In particular, previous works have explored the value relevance of CSR disclosure (Li et al. 2018), the value relevance of environmental performance (Konar and Cohen 2001; Hassel et al. 2005; Clarkson 2012; Baboukardos 2018) and the value relevance of environmental disclosure (Iatridis 2013; Plumlee et al. 2015). Nevertheless, mixed results have been retrieved and are often related to measurement concerns, data constraints (Li et al. 2018), subjective environmental performance criteria (Konar and Cohen 2001), methodological misspecification, or different methodological approaches (Alberici and Querci 2016; Li et al. 2018). Moreover, the results are strongly influenced by the sector investigated. In this sense, for example, positive disclosure quality is significantly positively associated with firm value in the case of the oil and gas, chemical, food/beverage, pharmaceutical, and electric utilities sectors (Plumlee et al. 2015), while Johnston et al. (2008)—by analyzing a sample of publicly traded US electric utilities—find that the value of a firm's bank of emission allowances has two components that are likely to be positively valued by the capital market: (1) an asset value component; and (2) a real option value component (p. 760). Cormier and Magnan (2007) investigate the impact of environmental reporting on the relationship between a firm's earnings and its stock market value by highlighting that the interaction among environmental reporting, financial statement information, and firm stock market value is conditioned by the reporting context of firms. Hassel et al. (2005) show that environmental performance has a negative effect on the market value of a Swedish sample of firms. These different results are

often attributed to the broad range or research methods and to the lack of common environmental performance measures (Ilinitch et al. 1999; Konar and Cohen 2001; Al-Tuwaijri et al. 2004; Delmas and Blass 2010; Delmas et al. 2013). An interesting classification of prior environmental accounting research is provided by Clarkson et al. (2008) who highlight three main categories: (i) studies that examine the valuation relevance of CEP information, (ii) studies that analyze factors affecting managerial decisions to disclose potential environmental liabilities, and (iii) studies that explore the relation between environmental disclosures and environmental performance. Studies on the relationship between environmental disclosures and firm value show different approaches (Cormier and Magnan 2007). From a short-term perspective, empirical analyses based on the event study methodology highlight a clear stock market reaction to environmental announcements. In this sense, Endrikat (2016) accumulated the empirical evidence of 29 event studies and corroborated a positive relationship between CEP and CFP by demonstrating that there is a positive market reaction to positive CEP related events and a negative reaction to negative events.

Moreover, with regard to environmental disclosure, Fazzini and Dal Maso (2016) explored the case of Italian banks, concluding that voluntary environmental disclosure represents value-relevant information positively correlated with firms' market value, while Carnevale and Mazzuca (2014) show that investors appreciate sustainability reports and that this disclosure produces a positive effect on stock prices.

In the wide range of proposed methodological approaches, the value relevance method is particularly useful to analyze whether environmental disclosure provides information to the market beyond what is captured in traditional financial statements (Moneva and Cuellar 2009) and to understand whether environmental performance is reflected in the market value of banks (Hassel et al. 2005). Moneva and Cuellar analyze the value relevance of different types of financial and non-financial environmental disclosures. The authors suggest that non-financial environmental disclosures are not value relevant, but that financial environmental disclosures are relevant, concluding that there is a relation between environmental reporting and financial performance in the Spanish context.

To assess the value relevance of environmental disclosure and environmental performance, we test the following hypothesis:

H3: Environmental disclosure and environmental performance is value relevant and enhances banks' market value.

3 Empirical Study

3.1 Sample and Variables

With the aim of verifying our research hypotheses, we carried out a quantitative analysis on a sample of 57 EU15 listed banks. To select the sample, we considered only banks for which Datastream, BvD Orbis, and ASSET4 provide data regarding prices and other accounting variables of interest. Environmental data are obtained from the ASSET4 database—commonly used in empirical corporate governance and CSR research—under the category ESG—ASSET4 for the business years 2012, 2013, 2014, 2015, and 2016. Data are obtained from Datastream, Thomson Reuters, and BvD Orbis in March 2018. Table 1 summarizes the variables used and the source of data.

In our analysis, we used the environmental performance score (*EnvPerf*), which is an aggregated value between 0 and 100 that summarizes the company's environmental impact on living and non-living natural systems, including the air, land, and water, as well as complete ecosystems. This variable reflects how well a company uses best management practices to avoid environmental risks and capitalize on environmental opportunities in order to generate long-term shareholder value. The *EnvPerf* provided by ASSET4 is commonly used in the academic literature as a proxy for the bank's engagement in environmental activities in CSR studies (Eccles et al. 2012; Cheng et al. 2014; Misani and Pogutz 2015; Benlemlih et al. 2018; Dell'Atti et al. 2017). With regard to the quality of environmental disclosure, we used the environmental transparency score (TS) provided by ASSET4. TS is calculated on the number of data points reported by the company and is largely used as proxy for a company's transparency in reporting environmental information. With regard to financial performance, previous studies recognize a good proxy of CFP in market-based and accounting-based variables (Soana 2011; Gama Boaventura et al. 2012; Esteban-Sanchez et al. 2017). In particular, Gama Boaventura et al. (2012) and Esteban-Sanchez et al. (2017) suggest return on equity (ROE) and return on assets (ROA) as the most used (Griffin and Mahon 1997; Simpson and Kohers 2002). Several authors used ROA as a proxy for financial performance when doing research that explores the relationship between CSR and financial performance (Trang and Yekini 2014; Taskin 2015; Platonova et al. 2018; Nguyen 2018). We also included control variables based on the findings of previous authors. In particular, Bikker and Hu (2002) and Nguyen (2018)

Table 1 Variable definitions and sources

Variable		*Description*	*Source*
Environmental performance score	*EnvPerf*	Overall measure that reflects how well a bank uses best management practices to avoid environmental risks and capitalize on environmental opportunities in order to generate long-term shareholder value.	Asset4—Thomson Reuters
Environmental transparency score	TS	Overall measure based on the number of datapoints reported by the bank.	Asset 4—Thomson Reuters
Financial performance score	ROE	Measure of financial performance. The Return on equity (ROE) is defined as profits (net income after taxes) relative to equity.	Orbis Bank Focus
	ROA	Measure of financial performance. The Return on assets (ROA) is defined as profits relative to total assets.	Orbis Bank Focus
Market to book value	MtB	Bank market capitalization divided by book value of its equity	Orbis Bank Focus
Control variables	*Z*-Score	Risk measure that reflects the bank's probability of insolvency. It is the number of standard deviations that a bank's rate of return on assets should fall for the bank to become insolvent. A higher Z-score value signals a lower probability of bank insolvency.	Orbis Bank Focus
	Leverage	It has been calculated as equity divided by total asset	Orbis Bank Focus
	Loanloss	Bank loans quality indicator.	Orbis Bank Focus
	Loantodep	Bank liquidity indicator	Orbis Bank Focus
	Cost to income ratio	Efficiency indicator, given by total bank costs over total income. The latter is given by net interest income plus non-interest income.	Orbis Bank Focus
	ln (equity)	It represent a proxy for firm size and is calculated as the natural logarithm of the bank's total assets	Orbis Bank Focus

Source Authors' elaboration

indicated that bank size has an impact on banks' financial performance, as banks of large size might attract more capital at a lower price, leading to higher profits. In our study, we used the control variables described in the sections below.

3.2 Empirical Model

The longitudinal structure of our data set, and the kind of the variables employed in the model, allow us to apply a panel data estimator. In particular, we will exploit the fixed effect (FE) estimator to attenuate distortion from omitted variables, since the variables are constant over time in a given state. Previous empirical studies have also used such statistical techniques (Moneva and Cuellar 2009; Fazzini and Dal Maso 2016).[1] The resulting panel data are unbalanced because all variables are not observed for all banks and years, meaning there are missing observations. We report standard errors asymptotically robust to heteroskedasticity and possible serial correlation. As explained below, we have run several econometric regressions.

The general equation for panel data is as follows:

$$y_{it} = \alpha_1 + x_{it}^{'}\beta_n + u_{it}\, with\, i = 1, \ldots, N;\ t = 1, \ldots T_i;\ u_{it} = \alpha_i + \lambda_t + v_{it} \quad (1)$$

Where i is the statistic unit, t is the time, and $x_{it}^{'}$ is a vector of the explanatory variable, whereas u_{it} is the statistical error, which can be decomposed in the temporal effect (λ_t) and in the traditional stochastic component (v_{it}).

Our first empirical assessment regards the relationship between environmental disclosure—by using the transparency score (henceforth *TS*)—and financial performance (HP1), and the relationship between environmental performance—by using the environmental performance score (henceforth *EnvPerf*) and financial performance (HP2). Therefore, we have tested our hypothesis regarding the ability of the two variables of non-accounting performance measures (*NAPerfMeasures,* namely, *TS*

[1]We have chosen the fixed-effect estimator against the random-effect, because the Hausman test results suggest that the first estimator is the more suitable for the data.

and *EnvPerf*) to affect bank profitability (*Perf*), proxied by ROA and ROE ratios. To that end, we have estimated the coefficients of the following equation:

$$Perf_{it} = \beta_1 + \beta_2 NAPerfMeasures_{it} + \sum_{i=1}^{7} \varphi C_{it} + \beta_3 \tau + \varepsilon_{it} \qquad (2)$$

Regarding the control variables in Eq. (2), we have included seven different covariates capturing bank characteristics, such as risk, size, liquidity, bank business model, and efficiency. In this selection, we also consider possible multicollinearity issues between variables.

In more detail, the bank risk profile has been captured by two different variables for the two measures of financial performance: *Z-Score* and *Leverage* and *Loanloss*. The first has been calculated as the ratio between the sum of equity capital as a percentage of assets and the ROA, in the numerator, and the standard deviation of ROA, in the denominator (Boyd and Runkle 1993). The higher the score value, the lower the probability of bank insolvency. For the ROE ratio, instead of the *Z-Score* variable, we have used *Leverage*, calculated as equity divided by total assets and *Loanloss*, namely, the ratio of the loan loss provision to gross loans, as a bank loan quality indicator. The prior of the first two bank risk variables is positive, reflecting the risk attitude of management, whereas *Loanloss* is negative, since it represents a credit portfolio quality indicator.

Size has been proxied by the natural logarithm of equity. Its influence on financial performance cannot be predicted, since high capitalization is directly related to lower bank default risk; however, at the same time, it may have a negative impact on bank efficiency.

Loantodep is the ratio of loans to short-term funds at the bank level and controls for bank liquidity. It measures the weight of the most bank bearing-interest illiquidity assets regarding short-term bank funding. The ratio of non-interest operating income to operating income controls for bank business model, given that it is a proxy of a bank's aptitude in selling non-financial services (*NNII*). Additionally, for the latest ratio, the effect on the dependent variables is uncertain, because the services sold by the bank are usually high added-value services, but—at the same time—revenue generated by non-financial bank services is often unclear. Finally, *Cost to income ratio* is a rough measure of bank efficiency and has been calculated as the ratio of operating cost to operating income. The expected sign for this variable is positive.

Then, we tested our third hypothesis. In fact, we are interested in two issues: either the relationship between the accounting performance measure and the key variables of our analysis and, separately, the possible difference among the effect of *TS* and *EnvPerf* on bank market performance measures and accounting-based bank performance. Therefore, we would like to verify the market sensitivity of the information embedded in such variables.

In this regard, following Fazzini and Dal Maso (2016), we have used as a dependent variable of these models the market to book value (*MtB*), which is the bank market capitalization divided by the book value of its equity. It is a continuous variable capturing the *i*th bank's market performance in year *t*. The higher the ratio is, the higher the market values of a bank's assets compared to its accounting value. Our sample concerns listed companies operating in the same industry (banks) that own similar assets evaluated according to the same accounting rules. In light of this, higher value in such a ratio may indicate the market aptitude to grasp bank value, beyond an accounting standpoint.

We estimate the coefficient of the following equation, which reports the two critical variables of our hypothesis (*TS* and *EnvPerf*) and two control variables. It also controls for the time effect.

$$MtB_{it} = \beta_1 + \beta_2 NAPerfMeasures_{it} + \beta_3 Equity_{it} + \beta_4 Earning - to - Equity_{it-1} + \beta_5 \tau + \varepsilon_{it} \quad (3)$$

We have added to our equation as covariates the natural logarithm of bank equity at time *t* (*Equity*), and the ratio between bank operating income and the book value of equity in the previous period (*Earning-to-equity*). As prior of these two control variables, we expect a negative sign for the coefficient associated with *Equity* and a positive for the latter. Indeed, the former is also the denominator in the dependent variable, even if it has been transformed in logarithmic terms. Indeed, the former is also the denominator in the dependent variable, even if it has been transformed in logarithm terms. Instead, the rationale for prior of the second control variable is that a high ratio in the dependent variable must be supported by high profitability.[2]

Table 2 reports the summary statistics for all our variables. The two main variables of our analysis span from zero (or almost zero) to 100% (or almost), with a mean far higher than 50% and quite a low variance. On

[2] In a first attempt, we also include in the regression the growth rates of revenue, but the associate coefficient was never significant.

Table 2 Summary statistics

Variable	*n.*	*Mean*	*Std. Dev.*	*Min*	*Max*
MtB	239	1.101	0.849	0.064	3.737
ROA	270	0.310	1.447	−6.560	9.930
ROE	270	3.323	20.926	−99.798	80.264
EnvPerf	262	0.780	0.25	0.089	0.972
TS	270	0.594	0.127	0	1
Equity	270	15.909	1.667	9.089	17.732
Earning-to-equity	239	0.508	0.368	0.066	1.839
Z-Score	270	0.043	0.167	−0.744	1.157
Leverage	262	0.068	0.036	0.006	0.287
Loanloss	262	1.230	1.669	−0.594	12.793
Loantodep	270	0.957	0.845	0.016	7.200
NNII	270	2.971	10.787	−54.332	71.970
CIR	270	63.685	17.342	−23.553	129.020

Source Authors' elaboration

average, the financial performance measures (*ROA* and *ROE*) and *MtB* of our sample appear to be in line with the industry. In particular, the *MtB* variable takes a value close to one, and can be explained both by the specificity of many bank assets and by accounting rules (fair value), which tend to align book value with the market value. Such specificity makes our analysis of the factors explaining the differences in the two values relevant. Finally, the control variables take their value in line with the industry.

Table 3 reports the results of our estimation of Eq. (2). Our data do not provide evidence that *TS* and *EnvPerf* affect the financial performance of accounting-based measures, except for the *TS* in the ROA model, where such factor is highly statistically significant with a positive sign. This means that the higher the transparency score is, the higher the return on bank assets will be. Surprisingly, this result is sensitive to the performance measure used. It is worth noting that our results show significance only for the profitability indicators that are less market-sensitive, such as the ROA.

The control variables, if statistically significant, take the expected sign. In detail, we find that higher risk is associated with high profitability. Our proxies for bank liquidity and bank efficiency do not affect the dependent variables in the different models, whereas a bank's ability to sell non-financial services (*NNII*) negatively affects the return on equity.

Table 3 Results for EnvPerf and TS on accounting-based profitability indicators

	ROE	*ROA*	*ROE*	*ROA*
EnvPerf	−13.254	0.496		
	(16.67)	(0.49)		
TS			3.712	0.457***
			(12.37)	(0.16)
Z-Score	175.524***		174.385***	
	(17.10)		(17.12)	
Leverage		15.095***		14.068***
		(3.66)		(3.30)
Loanloss		−0.575***		−0.571***
		(0.05)		(0.05)
Equity	−9.270**	−0.055	−9.256**	−0.039
	(3.80)	(0.04)	(3.80)	(0.03)
Loantodep	1.660	0.129	2.138	−0.144*
	(2.65)	(0.08)	(2.02)	(0.08)
NNII	−0.592***	0.238	−0.583***	0.237
	(0.07)	(0.22)	(0.06)	(0.22)
CIR	0.131	−0.012	0.121	−0.011
	(0.23)	(0.01)	(0.22)	(0.01)
Yeardummy	Yes	Yes	Yes	Yes
Constant	146.043**	0.493	133.531**	0.466
	(60.48)	(0.84)	(66.20)	(0.85)
R^2 *between*	0.3130	0.1720	0.3239	0.1624
R^2 *overall*	0.2746	0.2085	0.2912	0.2016
Banks (groups)	270 (57)	262 (57)	270 (57)	262 (57)

Notes Robust standard error in parenthesis
*Significant at 10%; **significant at 5%; ***significant at 1%
All estimations have been conducted applying fixed effect
All variables have been winsorized at 5th and 95th percentiles
Source Authors' elaboration

We have checked for the multicollinearity problem among the explicative variables. In particular, we have calculated the variance inflation factor, and the results show a mean lower than 2 as the higher variable score. We have also specifically checked our models for potential endogeneity issues. However, the results of the specifics test conducted do not provide evidence for endogeneity and for the validity of the set of applied instruments.

Table 4 reports the results of the estimation of the value relevance for *EnvPerf* and *TS*, which is the estimated coefficient of Eq. 3.

Table 4 Results for EnvPerf and TS on MtB

	MtB	*MtB*
EnvPerf	0.253*	
	(0.15)	
TS		1.076***
		(0.37)
Equity	−0.204***	−0.258***
	(0.08)	(0.10)
Lag of Earning-to-equity	0.230***	0.257***
	(0.60)	(0.06)
Yeardummy	Yes	Yes
Constant	77.330**	4.352***
	(31.89)	(1.52)
R^2 *between*	0.2593	0.2071
R^2 *overall*	0.2362	0.2037
Banks (groups)	239 (64)	239 (64)

Notes Robust standard error in parenthesis
*Significant at 10%; **significant at 5%; ***significant at 1%
All estimations have been conducted applying fixed effect
All variables have been winsorized at 5th and 95th percentiles
Source Authors' elaboration

Our empirical analysis provides evidence that the environmental performance score seems to positively affect the market value of banks. We find also evidence that confirms the relationship with *TS*, which is rather statistically significant at 1%. Therefore, *ceteris paribus*, the transparency score also positively affects the market to book ratio, which explains the divergence between the numerator and denominator of the ratio. The other control variable, which is highly significant, takes the expected sign, meaning that a high value of equity reduces the *MtB* ratio and, on the contrary, previous year earnings push the bank market value beyond its equity book.

Additionally, for model (3), we have checked for multicollinearity issue, calculating the variance inflation factor. The result confirms the absence of such distortion in the estimated coefficient (mean is lower than 2, as the higher variable score). Similarly, we have also checked for possible endogeneity issue, by performing the appropriate statistic tests, which does not highlight concerning evidence for the presence of endogeneity.

4 Concluding Remarks

Our study analyzed the relationship between environmental performance and financial performance and the relationship between environmental disclosure and financial performance and explored the value relevance of environmental disclosure. With regard to our first two hypotheses, we find that only the transparency score—which we used as a proxy of the quality of the environmental disclosure—is positively associated with ROA. Comparing such results with the estimated coefficient of ROE—which is not statistically significant—it could be intended as the effect of a latent variable related to other aspects that require further analysis. In more detail, it seems that the transparency score can be associated with a better internal organization.

Turning to our third hypothesis, we find strong evidence of the value relevance of environmental disclosure, while for environmental performance the significance for the associated coefficient is only 10%. This is an interesting result, because it means that environmental disclosure is value-relevant information, positively correlated with firms' market value. This latter finding is of potential interest to a much broader constituency than the academic world. In particular, banks could reconsider the importance of their disclosed environmental information, since it is able to affect their market value.

Overall, our findings need more tests and are a preliminary attempt to explore these relationships in the banking sector that face a lack of studies that perform the same analysis.

5 Limitations and Future Research Directions

There are a few limitations in the approach adopted in this paper. First, we used the transparency score as a proxy of the quality of disclosure. Many previous works (see among others Fazzini and Dal Maso 2016) used stand-alone score as a unique indicator of the quality of the information provided by banks to their stakeholders. However, the literature shows the possibility to assess the quality of disclosure by using other methodological approaches. Among others, content analysis could be considered as a better way to analyze not only the quantity (as in the score) but also the quality and extent of disclosure of various items in disclosed documents. Future development of this work will consider the possibility of developing a new environmental disclosure score able

to consider not only the quantity of information disclosed but also the quality and to consider other factors that may affect the information provided to stakeholders, such as country-specific environmental regulations, the typology of published documents (e.g., sustainability report, integrated report) and the availability of further information (e.g., specific documents).

Another aspect is related to the sample dimension and characteristics. The group of EU15 listed banks shows many differences, both in terms of banks size and their characteristics. Despite the use of the widely used control variable, *lnequity*, this aspect could affect our results (in particular in the case of HP1 and HP2).

Future investigations about the issues analyzed in this work can find space in the field of risk management and reputational risk. Finally, future research needs to be designed to more clearly establish the relationships between environmental disclosure and reputational perception of stakeholders, and between the quality and quantity of environmental—and CSR—disclosure and effective responsible practices in banks.

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CHAPTER 5

"Ready or Not, Here I Come, You Can't Hide." Are Italian Institutional Investors Ready for Responsible Investments?

Duccio Martelli and Luca Testoni

Abstract Despite the number of studies showing the potential advantages of responsible investing, and the growing number of international investors interested in this type of assets, at the domestic level it is not clear yet whether Italian investors are ready for this switch. Thanks to the use of a proprietary database, collecting data about institutional investors, and two partnerships (with the Italian Association of Pension Funds—Assofondipensione, and the Italian Family Officers Association—AIFO), it has been possible to conduct a preliminary survey among major Italian institutional investors, potentially interested in responsible assets.

Keywords Responsible finance · Italian institutional investors · Survey

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The results of the pilot study seem to point out a change in their attitude: A large portion of respondents declares themselves to be ready to invest either in sustainable and responsible assets or in companies running responsible businesses. However, the results of this pilot inquiry show a delay by domestic players in investing in these assets, compared to foreign investors, who appear to be more familiar with them. The survey, therefore, confirms the growing interest and awareness regarding responsible finance among domestic players; in fact, sustainable and responsible investments (SRIs) currently represent a tendency among institutional investors toward the future way of investing.

SRIs can be defined as type of assets designed to generate social and environmental benefits alongside financial returns. In the past, this type of investments were closely associated with philanthropy; however, recent studies (among others, Eccles et al. 2012) have shown that they may provide favorable returns in addition to volatility reduction. A growing evidence states that responsible investing can produce financial returns comparable to those of alternative traditional investment strategies, as well as being particularly favorable over a long time period. This is especially beneficial for institutional investors, who often employ long investment horizons and long-term investment objectives. That is why institutional investors (such as pension funds, foundations and family offices) are considered key players in creating and developing an international responsible market. At the same time, it could be hard for such players to move towards these new types of investments, mainly because of cultural and behavioral issues.

Despite the number of studies showing the potential advantages of responsible investing, and the growing number of international investors interested in this type of assets, at the domestic level it is not clear yet whether, Italian investors are ready for this switch. Thanks to the use of a proprietary database, collecting data about institutional investors, and two partnerships (with the Italian Association of Pension Funds—Assofondipensione, and the Italian Family Officers Association—AIFO), it has been possible to conduct a preliminary survey among major Italian institutional investors, potentially interested in responsible assets.

The results of the pilot study seem to point out a change in their attitude: almost the entire sample of respondents has move beyond the

concept of responsible investments as a synonym of philanthropy, also showing a wider awareness of responsible finance in general. Moreover, a large portion of respondents declares themselves to be ready to invest either in sustainable and responsible assets or in companies running responsible businesses. However, the results of this pilot inquiry show a delay by domestic players in investing in these assets, compared to foreign investors, who appear to be more familiar with them. The survey therefore confirms the growing interest and awareness regarding responsible finance among domestic players; in fact, SRIs currently represent a tendency among institutional investors towards the future way of investing.

1 Introduction

Over the last decade, responsible finance has become an increasingly discussed topic among institutional investors, who aim to combine social or environmental goals with financial returns (Eccles et al. 2012).

The survey presented in this paper is part of this strand of research, aiming to investigate the beliefs of investors in the Italian market toward responsible finance, and the operational issues financial institutions have in putting in practice sustainable and responsible principles. In particular, the survey is targeted to pension funds and family offices, as these are the institutional investors which are more likely to foster responsible investments in the near future, also considering that insurance companies and foundations are already among the major players in the market. Unlike other surveys conducted in the Italian market, the present study shows that participants are more aware of the meaning of responsible finance, although investors still face practical issues in identifying the right approach to invest in these assets.

The study is divided as follows. Section 2 summarizes the literature review regarding the perceptions investors have toward responsible finance, while Sects. 3 and 4, respectively, describe the methodology and the preliminary results of the analysis. Finally, the concluding section highlights the main evidence that emerges and underlines both the limits of the study and some suggestions to promote SRIs in Italy.

2 Literature Review

In recent years, responsible finance has played a key role, especially for institutional investors and high-net-worth individuals. According to Eurosif, "Sustainable and Responsible Investment ('SRI') is a long-term oriented investment approach, which integrates environmental, social and governance (ESG) factors in the research, analysis and selection process of securities within an investment portfolio. It combines fundamental analysis and engagement with an evaluation of ESG factors in order to better capture long term returns for investors and to benefit society by influencing the behaviour of companies."[1] From what emerges from the 2016 European SRI Study (Eurosif 2016), in recent years institutional players have always increased their investments in sustainable and responsible assets. In particular, at the European level, responsible investments amounted to about 11,000 billion euros at the end of 2015. Among a few big players, insurance companies continue to play a central role, despite pension funds having increased their market presence over the last two years, although their assets are still limited. As for retail investors, high-net-worth individuals are showing an increasing awareness of responsible investments and have started demanding responsible assets, after a few asset managers decided to launch SRI products.

However, despite the growing body of literature suggesting that investor interest in SRIs is growing rapidly, some issues appear to limit the potential of the market. One of the main issues is represented by the skepticism some institutional investors still have toward the financial performance of responsible assets, despite several studies find that there is no difference in terms of return between responsible and traditional assets. The perceived lower returns of responsible investments are seen as an important obstacle to the real development of the market: About 30% of fund managers experience the "return issue" as an obstacle to implementing SRI strategies (Escrig-Olmedo et al. 2013).

Another issue in the development of a responsible market is that fund managers tend to focus mainly on short-term returns. According to several studies (among others Rappaport 2005), when investors have a strong focus on the short term, they are more willing to emphasize short-term information (e.g. market momentum) and to underweight

[1] Eurosif. European SRI Study 2016. Brussels: 2016, p. 9.

information relevant to the evaluation of an investment in the long run, such as social and environmental impacts (Guyatt 2006; Juravle and Lewis 2008).

Furthermore, reputational issues can be detrimental to the growth of a responsible market. When institutional investors are afraid of reporting lower performances compared to their peers, they are more willing to show a herding behavior (i.e., a tendency to follow others). This behavior reduces the need to justify the choices made to their clients and internally, since most other investors in the market behave in a similar fashion. Since responsible investments still represent a niche in the asset allocation of institutional investors, the fear of reputational damage does not represent an incentive to invest in sustainable and responsible assets (Guyatt 2006).

To further develop this strand of research, the present study aims to investigate the perceived drivers of SRIs among pension funds and family offices in the Italian market. Understanding their beliefs and the issues they face while implementing responsible strategies is, in fact, crucial for the development of a responsible market in Italy.

3 Methodology

The study aims to understand the awareness Italian pension funds and family offices of responsible investments, as these investors could in the near future foster the growth of these assets in the Italian market. The study is based on an online self-administered pilot survey promoted by ETicaNews in Spring 2017, in collaboration with the Italian Association of Pension Funds (Assofondipensione) and the AIFO. A self-administered survey is a quantitative research method, which does not require the use of an interviewer in submitting the questions. Respondents receive the questionnaire by e-mail and select their responses themselves. While a self-administered survey allows the interviewer to contact a large number of potential respondents within a short period of time, one of the disadvantages of this methodology is the relatively low response rate (among others Bourque and Fielder 2002).

The survey, involving 142 Italian pension funds and family offices, with a response rate of 20.42%, is structured in 10 close-ended questions, 5 of which are dichotomous (yes/no questions) while the other 5 are multiple-choice questions. The number of questions has been

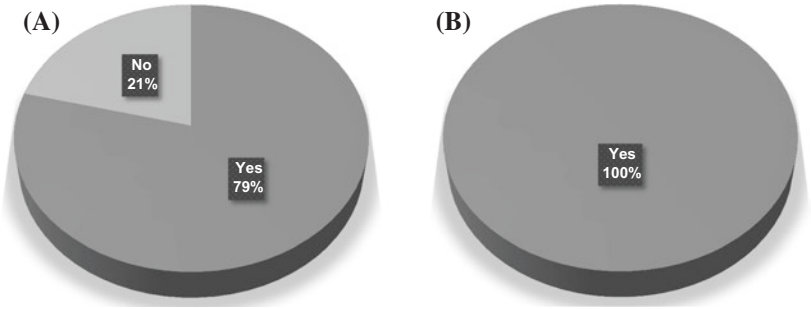

Fig. 1 **Panel A** Level of awareness of family offices. **Panel B** Level of awareness of pension funds (*Source* Authors' elaboration)

deliberately kept low, as this is a pilot survey. The questions mainly focus on two areas of interest: on the one hand, the perception of investors regarding responsible finance, and on the other, whether investors have implemented responsible strategies in their portfolios (or are likely to in the near future). Although the questionnaire is short and the number of respondents is limited, to our knowledge the study represents one of the first attempts in Italy to directly investigate the interest of institutional investors toward responsible assets.

4 Preliminary Results

Analyzing the answers given by the institutional investors surveyed, Italian pension funds and family offices show a general interest in SRIs. When asked if they or some of their clients had started to consider investing in responsible assets, the level of awareness is very satisfactory: 79% of respondents affirm they have started thinking about these alternatives, and this percentage reaches 100%, if we filter only the answers given by pension funds (Fig. 1).

The different sensitivity toward responsible investments probably denotes some reservations among high-net-worth individuals toward sustainable and responsible assets, which are still perceived as a form of charity. Family offices have instead definitively abandoned the philanthropic aspect generally associated with responsible assets, seeing these types of investments as alternatives like any other (Fig. 2).

Fig. 2 Perception of responsible investing: investment strategy vs philanthropy (*Source* Authors' elaboration)

Given the managers' awareness of the role of responsible finance, they have been specifically asked whether the family offices they work for have planned or are planning to make responsible investments in the near future. The answers given are quite surprising, as only half the professional investors surveyed are actively engaged in these forms of investments, or will be shortly; 48% of respondents still seem not to perceive correctly, or not to believe, in the real benefits that these alternative investments can generate from both a social and a financial points of view (Fig. 3).

Among managers who believe in the opportunities offered by responsible assets, around 40% consider these alternative ways of investing to be a good model for supporting local communities; others see in responsible finance a system for funding deserving initiatives or a high-yield asset class, with both financial and social returns (Fig. 4).

The same family office managers, interested in responsible investments, also appear to be more likely to invest directly in companies adopting sustainable strategies, such as greater respect for the environment or other social aspects, and focusing on the quality of their governance. About six out of ten investors believe that these companies will outperform their competitors, mainly thanks to a correct integration of all ESG factors. Companies, which follow only one of these three principles, are by contrast only seen as an interesting investment by a third of the interviewees, while the attractiveness of companies which only follow corporate social responsibility principles has dropped dramatically over the years (Fig. 5).

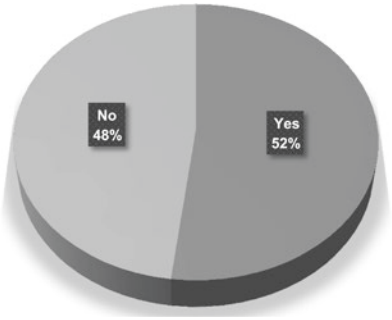

Fig. 3 Willingness to make responsible investments (*Source* Authors' elaboration)

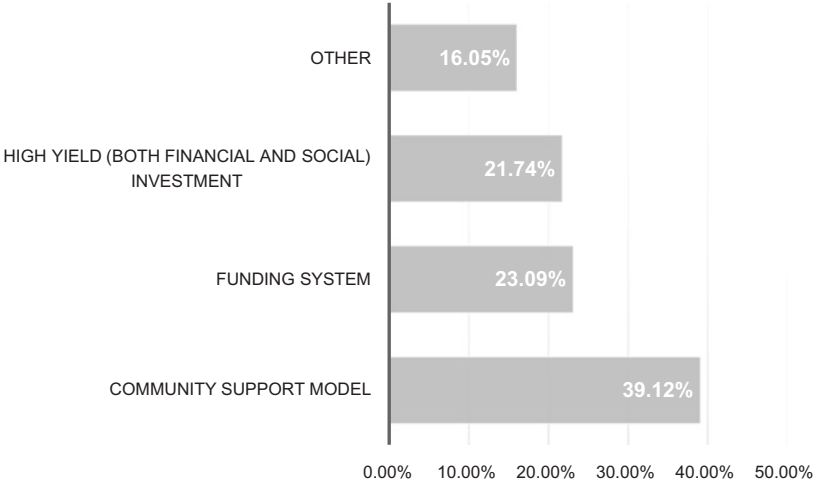

Fig. 4 Aims of responsible investments (*Source* Authors' elaboration)

Pension funds also seem to prefer companies that integrate ESG principles as a whole, as compared to companies which have either high standards of governance, or respect for the environment, or social aspects. In these cases, however, response rates show that preferences for these types of investments are higher, compared to the answers given by family offices: More than 40% of pension funds are willing to invest in environment-oriented or social-oriented companies, while only under

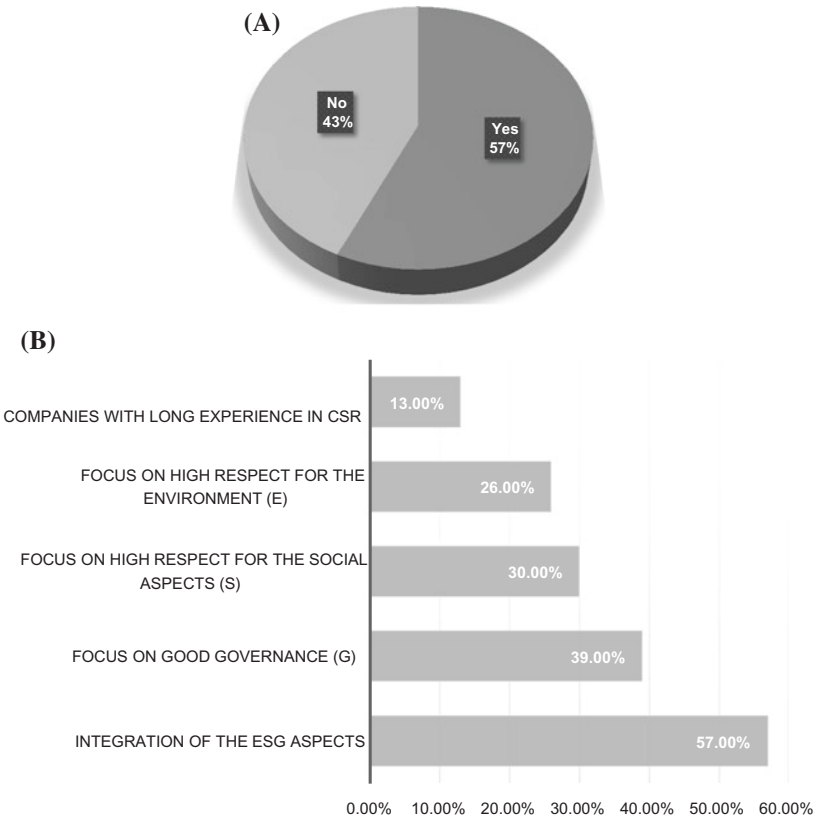

Fig. 5 **Panel A** Investments in responsible companies: family offices' view. Attractiveness of responsible companies. **Panel B** Investments in responsible companies: family offices' view. Characteristics of companies selected (*Source* Authors' elaboration)

a third of them would choose companies focusing exclusively on governance. The data regarding pension funds willing to choose companies which fully integrate ESG principles might appear to be quite surprising at first (Fig. 6). This percentage (100%), however, is not entirely unexpected, as a strong inclination toward responsible investments has already been observed in Fig. 1—Panel B.

While previous tables highlight the fact that Italian pension funds and family offices are theoretically interested in investing in responsible

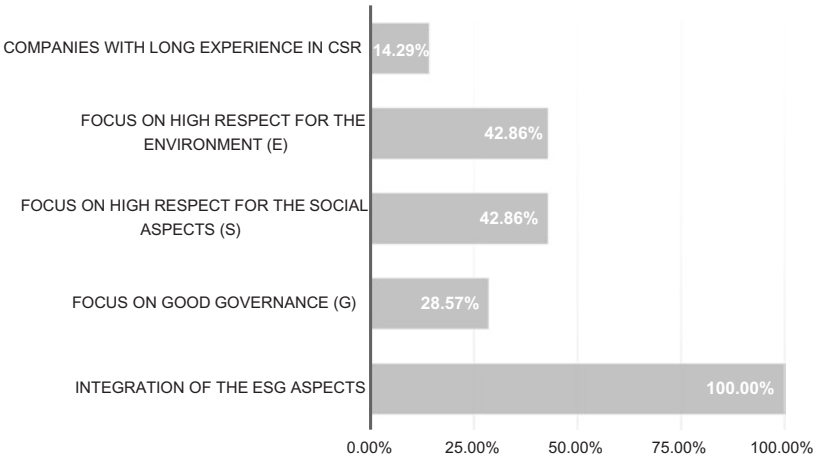

Fig. 6 Investments in responsible companies: pension funds' view. Characteristics of companies selected (*Source* Authors' elaboration)

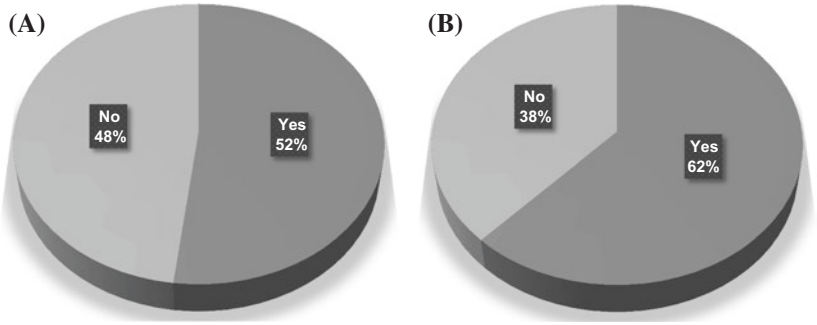

Fig. 7 **Panel A** How many family offices apply ESG filters in the investment process. **Panel B** How many pension funds apply ESG filters in the investment process (*Source* Authors' elaboration)

assets, in practice only a small percentage integrate ESG aspects in the investment process. The percentages are similar both for family offices and pension funds, although the latter are more active in using responsible selection strategies (52% of family offices against 62% of pension funds) (Fig. 7).

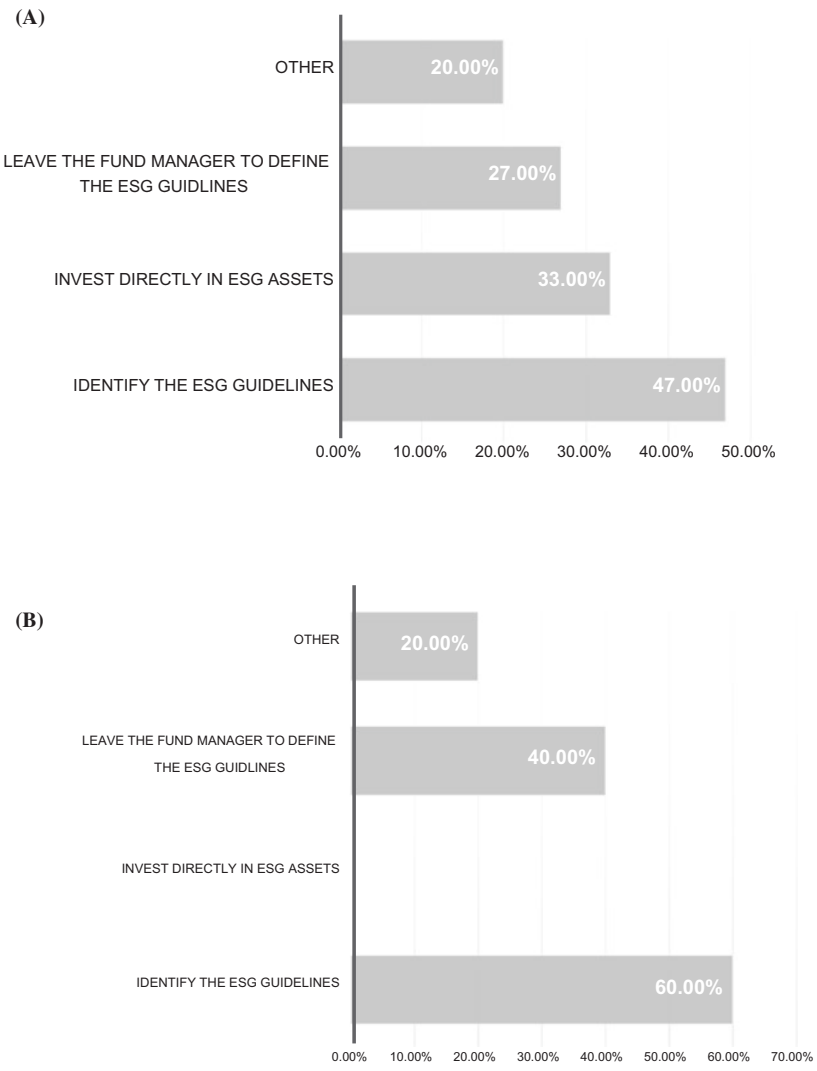

Fig. 8 **Panel A** Responsible investment strategies: family offices. **Panel B** Responsible investment strategies: pension funds (*Source* Authors' elaboration)

In particular, among family offices, which integrate responsible filters in their investment processes, about half define the guidelines that fund managers have to follow, while another 30% prefer either to invest directly in responsible companies or leave fund managers free to define the guidelines to follow. These behaviors are completely different if we analyze pension funds: Indeed, they mainly tend to define the guidelines themselves, or allow the manager choose the strategy to adopt (Fig. 8).

5 Conclusions

The pilot survey presented above shows interesting preliminary results regarding the level of interest institutional investors have in responsible investments. In particular, many players are aware of the importance of the issue of sustainability while choosing the right investments, although they are not completely sure of the real added value (in terms of achieving a better risk-return trade-off) that responsible investments can effectively give portfolios. These beliefs still survive, although the similarities between responsible investing and philanthropy have disappeared. In practice, players adopt a number of practical approaches while selecting responsible assets: Sometimes it is the institutional investor who decides the strategy to follow (as in the case of pension funds), while in other cases this choice is delegated to fund managers (as in the case of family offices). This lack of homogeneity seems to demonstrate an operational issue that asset managers have to face when practically choosing responsible assets to add to their portfolios. There is, therefore, a very strong demand for qualified training and events on these topics, which can help investors to correctly evaluate the risk-return profile of such assets. It does not matter, therefore, whether Italian institutional investors are actually ready to invest effectively in responsible assets; these alternatives, which only a few years ago were considered very specific investments reserved for certain types of clients, are nowadays widely appreciated among both institutional and retail investors.

Following studies which focus on other European countries (such as the analysis proposed by Escrig-Olmedo et al. 2013 for the development of the responsible retail investment market in Spain), it is possible to suggest some guidelines to increase awareness among institutional investors of responsible finance in the near future. The main aims of these suggestions are, on the one hand, to finally overcome the

prejudice of their hypothetically low level of profitability, and on the other, to highlight the benefits these assets give when added to institutional and retail portfolios. In order to achieve these aims, more in-depth studies are needed, focusing on both the risk-return trade-off of well-diversified portfolios, including responsible assets, and the potential demand for these instruments from wealthy and retail investors. This second field of studies will allow institutions to offer products which are more in line with the real needs of the market. Moreover, institutional investors should raise the awareness of final investors, through the promotion of events and the distribution of brochures, which show the characteristics of responsible alternatives, in order to capture the unexpressed demand. Finally, governments should also promote these forms of investment (also using tax incentives), given the positive impacts the companies and projects financed have on local communities and the environment.

Although the pilot survey has highlighted interesting preliminary results, which need to be confirmed in future studies, the above analysis shows certain limitations. Further development of this strand of research should follow these lines of enquiry: (i) increase the number of respondents, including not only pension funds and family offices, but also other financial institutions (e.g., foundations) and retail investors as well; (ii) survey respondents on one specific topic at a time, focusing for instance on the reasons why investors are (or are not) willing to invest in responsible assets; and (iii) finally, employ alternative strategies (such as nudging to overcome potential behavioral issues) to make institutional and retail investors more aware of SRIs.

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CHAPTER 6

Sustainable and Responsible Investments: *Same Sea, Different Fishes?*

Alberto Burchi, Duccio Martelli and Paola Musile Tanzi

Abstract The current international economic scenario, long characterized by interest rates close to zero and a higher positive correlation between traditional investment solutions, has persuaded retail and professional investors to rethink their investment strategies and to consider alternative investment solutions. The appeal of specific investments, combining financial returns and social wellness, is increasing. Such a strategy, which seeks to achieve both goals, is generally called sustainable and responsible investing or socially responsible investment (SRI). This paper attempts to answer two research questions: (1) What are the SRI

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risk-return trade-offs over different time horizons? and (2) Is SRI able to meet investors' needs, to reduce risk without a negative impact on returns? Preliminary results show that SRI is not completely different from the others investment opportunity, but in a portfolio view, SRI produces benefits for investors.

Keywords Socially responsible investment (SRI) · Risk-Return trade-off · Portfolio optimization

1 Introduction

The current international economic scenario, characterized by interest rates close to zero and the higher positive correlation between traditional investment solutions, has persuaded retail and professional investors to rethink their investment strategies and to consider alternative investment solutions classes. In addition, recent corporate scandals (e.g., Volkswagen) have increased the appeal of specific investments that combine financial returns and social good. Such a strategy, which seeks to achieve both aims, is generally called sustainable and responsible investing or socially responsible investments (SRI). The interest in SRI has grown impressively, especially since the recent financial crisis: according to the 2016 Global Sustainable Investment Review, global assets rose to $22.89 trillion, increasing by 25% since 2014.

In practice, there is unfortunately no consensus either on the terminology to use—depending on the emphasis, investors can refer to sustainable and responsible investments as "ethical investments," "(socially) responsible investments," or "sustainable investments"—or on the style of investing that SRI represents.

In the literature, the question of whether SRI is an alternative to traditional forms of investment is still widely debated (El Ghoul and Karoui 2017). This research analyzes, from the financial perspective, the benefits and limits for a generic investor of having part of her/his portfolio allocated to SRI instruments. Beginning with a literature review, our research tries to answer in its empirical part two research questions:

1. What are the SRI risk-return trade-offs over different time horizons?
2. If we consider SRI as part of a diversified portfolio, can this style of investment meet investors' needs and reduce risk without having a negative impact on returns?

The methodology proposed follows two steps: We perform a mean–variance portfolio optimization, using two SRI funds over different time horizons (research Question 1); and we simulate the impact of holding those portfolios over different time horizons (research Question 2). Therefore, we are able to evaluate the expected contribution (in terms of risk and performance) offered by SRI to generic investors.

The methodology proposed and the data used appear to be consistent with the existing literature on the construction of efficient investment portfolios (Calvo et al. 2015; Herzel et al. 2011). Our approach also addresses the gap of the single time horizon, typical of the mean–variance methodology.

In our opinion, this work has a couple of points of novelty: First, it investigates a plurality of time horizons, from 5 years up to a year; and second, it evaluates the investment benefits both for SRI and for Impact funds, according to which it adopts a logic of efficient portfolios with different risk measures.

2 Literature Review

SRI, sometimes also defined as ethical investment, is a management style that aspires to achieve social or environmental goals, in addition to the objectives typical of traditional financial investments (the return). Next to the classical approaches to responsible investments, such as exclusion, which avoid investing in companies that are active in unacceptable areas (e.g., tobacco, weapons, and alcohol), now it is possible to identify other styles of investing that focus more on the goodness of management and on the corporate governance of companies (e.g., activism or engagement). Following the recent financial crisis, which affected traditional investments more significantly than it did responsible ones, SRI funds have shown interesting growth rates, driven mainly by the increasing interest of institutional investors, such as pension funds and foundations, and retail investors, who are able to benefit from the growing number of responsible funds in the market.

Despite the increasing interest in responsible investments, some players still hesitate to prefer SRI funds over traditional alternatives; their main concern is the lower expected performance of the former compared with the latter, given the smaller number of assets that responsible fund managers can invest in. Although the number of studies on this issue has grown rapidly over the last decade, the results are still unclear.

Most studies in this field, such as Hamilton et al. (1993), Statman (2000), Bauer et al. (2005), Bello (2005), and Utz and Wimmer (2014), do not find significant performance differences. A number of studies, such as Schröder (2004, 2007), Statman (2006), and Lee and Faff (2009), do not provide evidence of an out- or underperformance of SRI indices compared with conventional indices.

In particular, Mill (2006) does not show significant differences, in comparing the performances of some UK funds, between traditional strategies and responsible strategies. Similar results are achieved by Bauer et al. (2007), who do not show any significant lower performance of SRI funds compared with others. Comparisons of alphas of traditional funds and of ethical investments also do not show a big difference (Bauer et al. 2005; Amenc and Le Sourd 2008). Belghitar et al. (2014) find no difference in the expected returns and their variance. However, SR investors pay a high price in terms of utility if higher moments are taken into account.

On the other hand, Kempf and Osthoff (2007) show that the adjusted returns for SRI funds are higher than those of others, contradicting Hamilton et al. (1993). Similar findings are reported by Statman (2000), who shows how responsible investments perform better than traditional alternatives.

Other researchers find opposite results, highlighting how traditional investments, the so-called sin stocks, report higher returns (Hong and Kacperczyk 2009), or how the selection of only SRIs leads to small losses in terms of risk-adjusted returns (Herzel et al. 2011).

Most studies focus on one special ESG rating database. However, discrepancies in search results could be attributed to the underlying rating approach. Dorfleitner et al. (2015) reveal significant differences in distribution, level, and risk of various ESG rating concepts. Furthermore, most studies are based on very short time series, since most rating agencies did not commence their work before 2000.

Derwall et al. (2011) suggest that the diversity of findings in the literature depends in particular on the different style of management of the funds. On one hand, investors who prefer to exclude certain assets (negative screening) are willing to give up part of their financial performance to achieve non-financial objectives. On the other hand, investors who actively select companies (positive screening) are convinced that these assets can generate higher returns given the higher standards followed. Another study, trying to explain this uncertainty in the results in literature (Barnett and Salomon 2006), demonstrates how the performance

of SRI funds is usually lower in the funds' early years, when managers are less experienced, but tends to increase over time, as managers are able to choose high-value assets more carefully. This seems to confirm that it is the manager's ability to determine the success of an SRI fund, being able to compensate a lower diversification benefit (Fabretti and Herzel 2013; Kurtz 1997; Herzel et al. 2011).

The present study tries to shed light in this field of research, focusing on the benefits that responsible investments offer to traditional portfolios.

3 Methodology

To evaluate the goodness of SRI, we adopted a portfolio logic, using different risk measures. This allowed us to compare the behavior of SRI in two respects: the potential effect when combined with traditional investments and when the concept of risk aversion changes.

The asset-allocation methodologies assume several measures of risk that impact the same portfolio's allocation.

In this section, the risk measurements that we adopt are:

(a) standard deviation;
(b) maximum loss;
(c) conditional value at risk (CVaR); and
(d) conditional drawdown at risk (CDaR).

Recent developments show that linear programming-based algorithms can handle portfolio allocation problems with thousands of instruments and scenarios (Andersson et al. 2001; Chekhlov et al. 2004; Rockafellar and Uryasev 2000, 2002). We formulate all measures as a linear programming problem, following Krokhmal et al. (2001). All the calculations and analyses were made in the R environment for statistical computing and graphics using the Systematic Investor Toolbox (SIT) package.

CVaR is also called expected shortfall (ES), average value at risk (AVaR), and expected tail loss (ETL). The CVaR was created by Rockafellar and Uryasev (2000, 2002) as an extension of the value at risk (VaR) framework (Duffie and Pan 1997; Jorion 1997). Basically, VaR answers the question "What is the maximum loss, which is expected to be exceeded, say, only in 5% of the cases within the given time horizon?" Mathematically, VaR with confidence level α is the α-quantile of the loss distribution. However, the VaR optimization process can be very difficult if the return distributions of a portfolio's

instruments are not normal. These VaR problems are caused by its non-convex and non-subadditive nature (Artzner et al. 1997). The difficulties with controlling and optimizing VaR in non-normal portfolios have forced the search for similar percentile risk measures that would also quantify downside risks while being efficiently controlled and optimized (Krokhmal et al. 2001).

CVaR was created to calculate the average of the losses that occur beyond the VaR cutoff point in the distribution. CVaR can be defined as an average (expectation) of high losses residing in the α-tail of the loss distribution, or, equivalently, as a conditional expectation of losses exceeding the α-VaR level. From this, it follows that CVaR incorporates information on VaR and on the losses exceeding VaR. In other words, CVaR answers the question "In case of losses so severe that they occur only α% of the time, what is our average loss?" A comprehensive description of the CVaR risk measure and CVaR-related optimization methodologies can be found in Rockafellar and Uryasev (2000, 2002).

CVaR is a more adequate measure of risk than VaR because it accounts for losses beyond the VaR level. In other words, VaR can be seen as the "optimistic" low bound of the losses in the tail, whereas CVaR estimates the value of the expected losses in the tail. Moreover, CVaR is easily optimized. Formally, if X is the payoff of a portfolio in future and $0<\alpha<1$, then we define the CVaR as

$$CVaR_\alpha = \frac{1}{\alpha}\int_0^\alpha VaR_\alpha(X)d_\gamma,$$

where VaR_α is the value at risk. This can be equivalently written as

$$CVaR_\alpha = -\frac{1}{\alpha}\left(E\left[X1_{\{X\le x_\alpha\}}\right] + x_\alpha(\alpha - P[X \le x_\alpha])\right),$$

where $x_\alpha = inf\{x \in \mathbb{R} : P(X \le x) \ge \alpha\}$ is the lower quantile and $1_\alpha(x) = \begin{cases} 1\ if\ x \in A \\ 0\ else \end{cases}$ is the indicator function (Acerbi and Tasche 2002).

Conditional drawdown at risk (CDaR) is a portfolio performance measure (Chekhlov et al. 2004) that is closely related to CVaR. A portfolio's drawdown is the drop of the uncompounded portfolio value compared with the maximal value attained in the previous moments. Denote by function $w(x,t)$ the portfolio return at time t, where the components of the portfolio vector $x = (x_1, x_2, x_3, ..., x_n)$ are weights of n instruments in the portfolio. The drawdown function at time t is defined as the

difference between the maximum of the function $w(x,t)$ over the history preceding time t and the value of this function at time t.

Mathematically, the drawdown function for a portfolio is

$$D_{(x,t)} = \max_{0 \le \tau \le t} \{w(x,t)\} - w(x,t).$$

It follows that the drawdown quantifies the losses for the most "unfavorable" investment moment in the past compared with the current moment. This approach reflects pretty well the preferences of investors who define their acceptable losses as percentages of their initial investments (e.g., an investor may consider it unacceptable to lose more than 20% of his investment). While an investor may ignore short-term drawdowns in his account, he would begin to be troubled about his capital in the case of a long-lasting drawdown.

Such drawdown accounts not only for the amount of losses, but also for the time length of these losses.

For a specified sample path, the drawdown function is defined for each time moment. However, to evaluate the performance of a portfolio on the whole sample path, we would like to have a function that aggregates all drawdown information, over a given time period, into one number. We can consider different risk functions: maximum drawdown (MaxDD), average drawdown (AvDD), and conditional drawdown at risk (CDaR). Mathematically, the MaxDD on the interval $[0,T]$ is the maximum of the function $D_{(x,t)}$:

$$MaxDD_{(x)} = \max_{0 \le \tau \le t} \{D(x,t)\}.$$

Therefore, the AvDD is

$$AvDD_{(x)} = \frac{1}{T} \int_0^T D(x,t)dT.$$

However, both functions may inadequately measure losses. The MaxDD is based on one "worst case" event in the sample path. This event may represent some very specific circumstances, which may not appear in the future. The risk management decisions based only on this event may be too conservative. On the other hand, the AvDD takes into account all drawdowns in the sample path. However, small drawdowns are acceptable, and averaging may mask large drawdowns (Krokhmal et al. 2001).

Chekhlov et al. (2004) suggested a new drawdown measure that combines the drawdown concept of measuring risks with the CVaR approach in estimating downside losses. The CDaR risk function is actually a family of risk functions parameterized by the parameter α. It contains, as a special case, the MaxDD and AvDD risk functions.

Let N denote the number of time sub-periods in the time interval $[0, T]$ and $\alpha \in [0, 1]$ denote the confidence level. In the case where $(1 - \alpha)$ N is an integer (so we are able to precisely count $(1 - \alpha) \times 100\%$ of the drawdowns), the CDaR is defined as the mean of the worst $(1 - \alpha) \times 100\%$ drawdowns. For instance, if $\alpha = 0$, CDaR equals the AvDD over all sub-periods, and if $\alpha = 0.95$, then CDaR is the average of the worst 5% drawdowns. Let $\zeta_\alpha(x)$ denote a threshold such that exactly $(1 - \alpha) \times 100\%$ of drawdowns exceed this threshold (it is supposed that $(1 - \alpha)$ N is an integer). In this case, CDaR with a confidence level α is the average of $(1 - \alpha) \times 100\%$ of the drawdowns. Formally:

$$\Delta_x = \frac{1}{(1-\alpha)T} \int_{\Omega_t} D(x,t)dt$$

where $\Omega_t = \{t \in [0, T] : D(x, t) \geq \zeta_\alpha(x)\}$. Also, CDaR can be efficiently treated with linear optimization algorithms (Chekhlov et al. 2004).

As a last step, we want to test the performance of an investment strategy. More precisely, we adopt an investment strategy, based on minimizing the risk measures shown above. Therefore, at each portfolio rebalancing, the composition will be the one that coincides with the minimum-risk point within the efficient border. The negotiations take place each quarter. The simulation takes into account the whole analysis period at our disposal. Therefore, with each quarter, we have low-risk portfolios that are kept constant until the next rebalancing. At the end of the period, it will be possible to evaluate the performance and the dynamics of the investment amount.

The simulation makes it possible to evaluate the differences in terms of minimized risk measures and to evaluate the benefits due to the inclusion of SRI funds in the possible investments.

4 Data and Results

4.1 Data

Our sample consists of eight indices from January 1, 2012 to September 15, 2017. The number of price observations is calculated monthly. All

Table 1 Sample composition (Data as at September 21, 2017)

Ticker	*Fund Name*	*Issuer*	*AUM*	*Segment*
SPY	SPDR S&P 500 Trust	State Street Global Advisors	$248.54B	Equity: U.S.—Large Cap
EFA	iShares MSCI EAFE	BlackRock	$80.29B	Equity: Developed Markets Ex-U.S.—Total Market
AGG	iShares Core U.S. Aggregate Bond	BlackRock	$50.30B	Fixed Income: U.S.—Broad Market Investment Grade
GLD	SPDR Gold Trust	State Street Global Advisors	$35.76B	Commodities: Precious Metals Gold
VNQ	Vanguard REIT	Vanguard	$35.01B	Equity: U.S. Real Estate
BSV	Vanguard Short-Term Bond	Vanguard	$22.69B	Fixed Income: U.S.—Government/credit Investment grade Short-Term
DSI	iShares MSCI KLD 400 Social	BlackRock	$877.18 M	Equity: U.S.—Total Market
MPCT	iShares MSCI Global Impact	BlackRock	$25.83 M	Equity: Global—Total Market

Source Our elaboration from ETF.com data

data are expressed annually. Table 1 shows the composition of the analysis sample, the means (return) and standard deviations (risk). The initial six market indices represent an investment portfolio of traditional but very well-diversified assets. Subsequently, we have added two funds, falling into the world of SRI. To bring the analysis closer to the real possibilities of the investor's, instead of using the returns of the indices we adopt the returns of the largest exchange-traded funds (ETF)[1] for each selected index. The choice of US asset classes is due to the greater availability of historical data for these.

We chose to conduct the empirical testing with a variety of approaches. On one hand, we adopted a variety of optimization models; on the other hand, we analyzed a range of time horizons. We report the results on a horizon of almost 5-year (5Y: January 1, 2012–September 15, 2017)

[1]To select ETFs we used the ETF Database (www.etfdb.com).

and almost 3-year horizons (3Y: January 1, 2015–September 15, 2017). We considered a very short time horizon (about 1 year) to add an impact investment ETF to the analysis. The impact investment fund is considered only in this short-term simulation (since the beginning: May 1, 2016–September 15, 2017), as data are only available from April 22, 2016.

The sample includes larger ETFs for assets under management (AUM) to compose a well-diversified portfolio. More precisely, regarding the two SRI assets, the selected ETFs are iShares MSCI KLD 400 Social ETF (AUM $886,638,533) and iShares MSCI Global Impact (AUM $25,831,403).[2] The iShares MSCI KLD 400 Social ETF tracks a market-cap-weighted index of 400 companies deemed to have positive environmental, social, and governance characteristics by MSCI. The iShares MSCI Global Impact ETF tracks an index composed of companies whose revenues are driven by products and services that address at least one of the United Nation's Sustainable Development Goals.[3]

Tables 2 and 3 show the average rate of return, standard deviations, and correlations of ETFs considered in the different time horizons. Figure 1 illustrates the input ETFs in the mean–standard deviation space.

The figure shows the different characteristics of individual ETFs. It also shows that the two SRI funds have virtually identical performance and risk, despite having different investment policies. This is also confirmed by the correlation data (Table 3).

The correlation results show behavior that is similar to the stock index. This is due to the investment policies of the funds, which are focused precisely on large enterprises. SRIs therefore are not fully unique assets. In other words, the sea in which the managers are swimming is the same as for the other operators.

The ability to provide benefits will be evaluated according to their inclusion in the portfolio through different optimization models.

4.2 SRI Or Not Under the Mean–Variance Optimization

This part of the analysis allows us to answer the first research question: What are the SRI risk-return trade-offs over different time horizons? To create the efficient frontier, in the optimization procedure we imposed two constraints: Each ETFs must have a capital allocation between 0 and 80% and a total portfolio weight equal to 100%.

[2] http://www.ishares.com.

[3] http://www.etf.com.

Table 2 Sample composition, mean and Standard deviation of the return (annual basis)

Symbol	*Asset Class*	*Return*	*Risk*	*Return*	*Risk*	*Return*	*Risk*
		5Y		*3Y*		*1Y*	
SPY	SPDR S&P 500 Trust	11.90%	9.80%	9.00%	10.40%	13.80%	5.50%
EFA	iShares MSCI EAFE	5.60%	12.70%	4.90%	12.40%	11.40%	8.10%
AGG	iShares Core U.S. Aggregate Bond	−0.2%	3.00%	−0.9%	2.90%	−0.7%	3.20%
GLD	SPDR Gold Trust	−4.3%	15.70%	1.20%	15.50%	1.00%	14.70%
VNQ	Vanguard REIT	6.40%	13.30%	−0.3%	13.10%	2.40%	10.50%
BSV	Vanguard Short-Term Bond	−0.3%	1.30%	−0.4%	1.40%	−0.7%	1.50%
DSI	iShares MSCI KLD 400 Social	11.90%	10.00%	9.00%	10.80%	13.90%	6.00%
MPCT	iShares MSCI Global Impact					13.20%	7.00%

Source Our elaboration from Thomson Reuters Eikon data

We conducted the analysis to confirm the benefits obtainable by including SRI in a portfolio that is already well diversified. Thus, the results that follow are presented to show, first, the portfolio of traditional funds only, followed by the portfolio with SRI funds added, each for both of the temporal analysis horizons. The transition map displays portfolio weights as we move along the efficient frontier. We display portfolio risk along the X-axis and portfolio weights along the Y-axis. The width of the portion represents the portfolio weight for the given risk level. The graph is limited to the maximum risk level reached by the efficient frontier. For this reason, the transition graph is not affected by the flattening effect toward the Y-axis due to the X-axis scale.

In the transition map plot in Fig. 2, the allocation to the S&P500 (SPY; blue) was less than 3% at the lower risk level and steadily grew to 80% at the higher risk level. Similarly, the allocation to Fixed Income: USA—Government/Credit Investment Grade Short-Term (BSV; light blue) was about 80% at the lower risk level and steadily decreased to 0% at the higher risk level.

The SRI inclusion produces an improvement to the efficient frontier. The investor then has the opportunity to reach a more favorable risk-return trade-off. The transition map shows that the greatest contribution is possible in high-risk portfolios. The presence of SRI in high-risk

Table 3 Correlation matrix in our sample

Five Years	EFA	AGG	GLD	VNQ	BSV	DSI	
SPY	78.60%	−7.3%	−2.7%	44.00%	−8.4%	98.60%	
EFA		6.00%	6.60%	38.00%	6.90%	76.90%	
AGG			44.60%	55.60%	89.80%	−9.5%	
GLD				16.10%	52.20%	−5.8%	
VNQ					44.20%	45.40%	
BSV						−9.9%	
Three Years	**EFA**	**AGG**	**GLD**	**VNQ**	**BSV**	**DSI**	
SPY	83.40%	−7.8%	−18.7%	55.20%	−23.0%	98.80%	
EFA		1.30%	−17.2%	33.70%	−12.0%	83.40%	
AGG			61.90%	49.70%	91.50%	−7.8%	
GLD				6.50%	67.60%	−20.5%	
VNQ					34.90%	58.80%	
BSV						−21.8%	
One Year	**EFA**	**AGG**	**GLD**	**VNQ**	**BSV**	**DSI**	**MPCT**
SPY	34.10%	−14.7%	−7.3%	51.00%	−19.1%	96.20%	37.50%
EFA		11.90%	9.00%	−4.2%	10.30%	44.50%	76.60%
AGG			84.70%	55.60%	94.70%	−18.5%	36.30%
GLD				46.20%	93.10%	−10.3%	29.40%
VNQ					47.60%	45.20%	28.40%
BSV						−21.5%	29.00%
DSI							47.00%

Source Our elaboration from Thomson Reuters Eikon data

portfolios reaches over a fifth of all invested assets. Presumably, this result is due, on one hand, to the presence in the sample of SPY (S&P500) that in the periods shows particularly high risk-return performance. On the other hand, the SRI funds are characterized by returns and risks that are not particularly high; indeed, the low correlation with the other securities at our disposal leads us to reflect before setting them aside.

Confirming our expectations, efficient portfolio compositions are not particularly affected by the observation period, since these are three moments of different lengths but within the same historical period. The 5- and 3-year periods see a weight distribution of bonds between bonds and equity, almost "scholastic," with the weight of bonds high for low-risk portfolios and decreasing as the risk profile increases.

In all periods, the share of capital allocated to the S&P500 index is prevalent, but, in the shortest simulation period, the efficient portfolio is

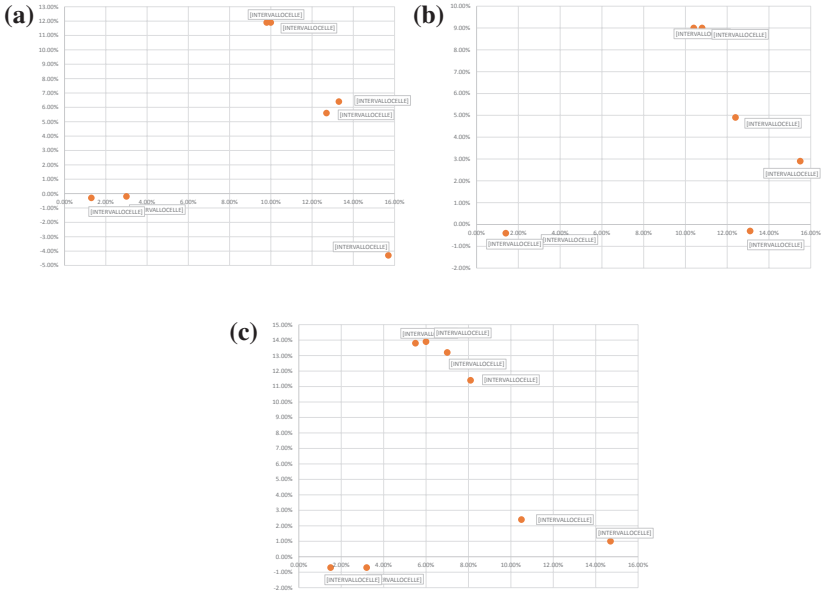


Fig. 1 Representation of the asset class in the mean–variance space

also composed of a part of the Impact fund, so there is a sort of substitution effect: The part of capital allocated in the stock market is moved from the general index to the Impact investment.

For space reasons, hereafter, we show the results only in reference to the shorter horizon (1Y).

4.3 Expected Shortfall (CVaR), Conditional Drawdown at Risk(CDaR) and Maximum Loss (ML) Risk Measures.

Let's examine efficient frontiers computed under different risk measures. In Fig. 3, we show the results obtainable by two optimization models: mean variance and minimization of the ML. In Fig. 4, we show the individual ETFs and the efficient frontier obtained with the more complex optimization models. The graphs show, on the Y-axis, the expected return, and on the X-axis, the different risk measures.

The results of the mean–variance model are shown above. Here, it is useful to compare the advantage obtained by inserting SRI even when

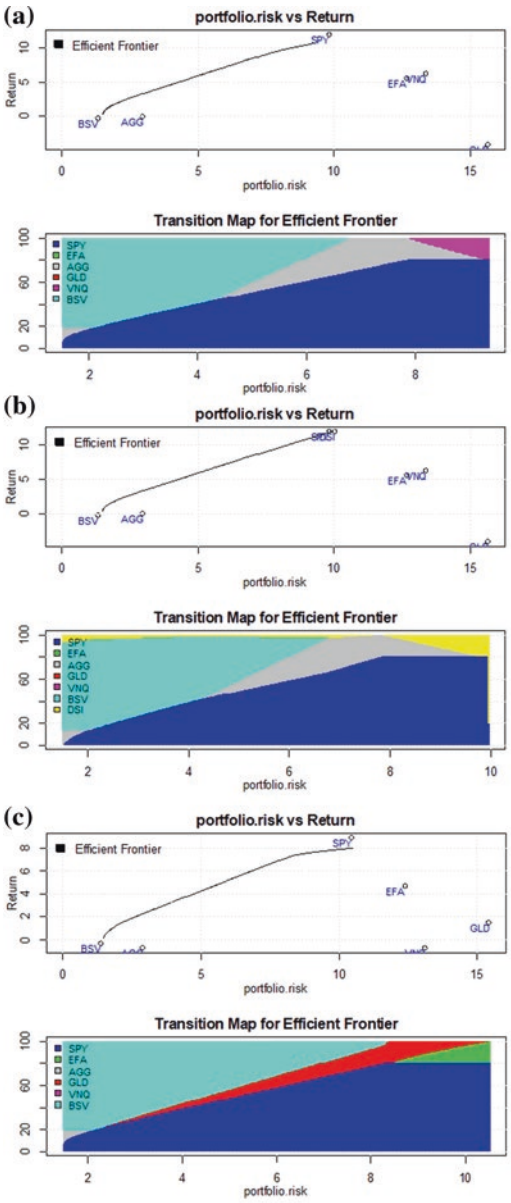
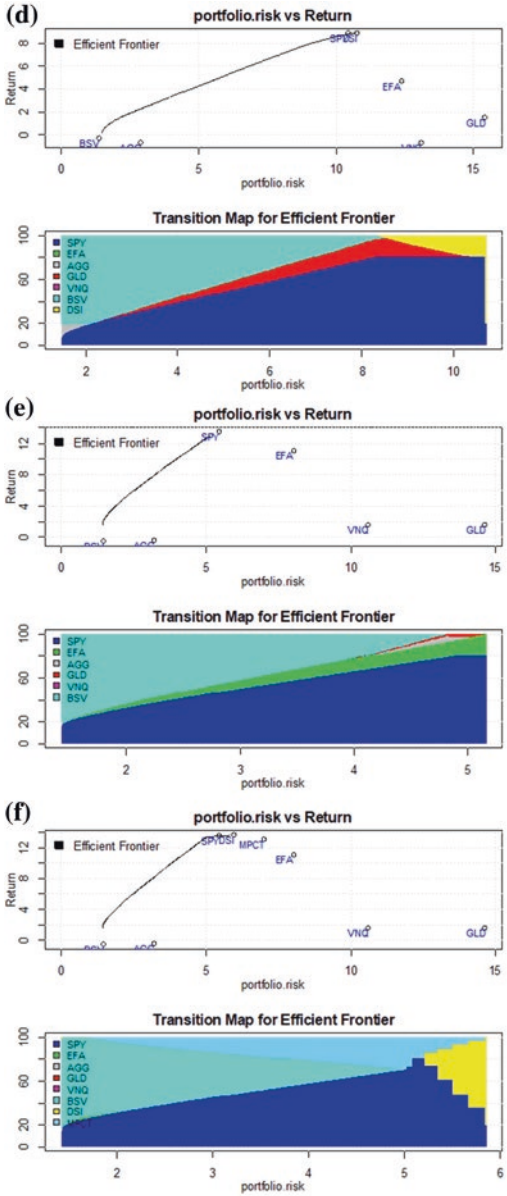


Fig. 2 Efficient frontier and transition map

Fig. 2 (continued)



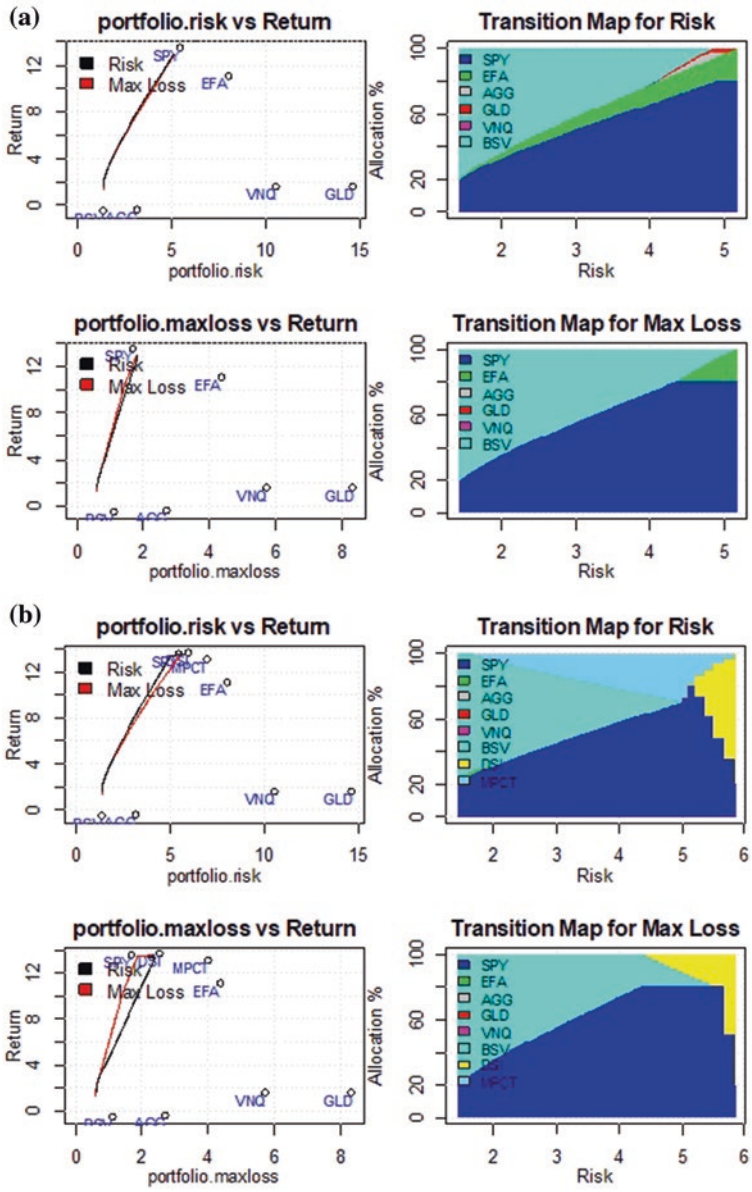


Fig. 3 Efficient frontier under maximum loss optimization model

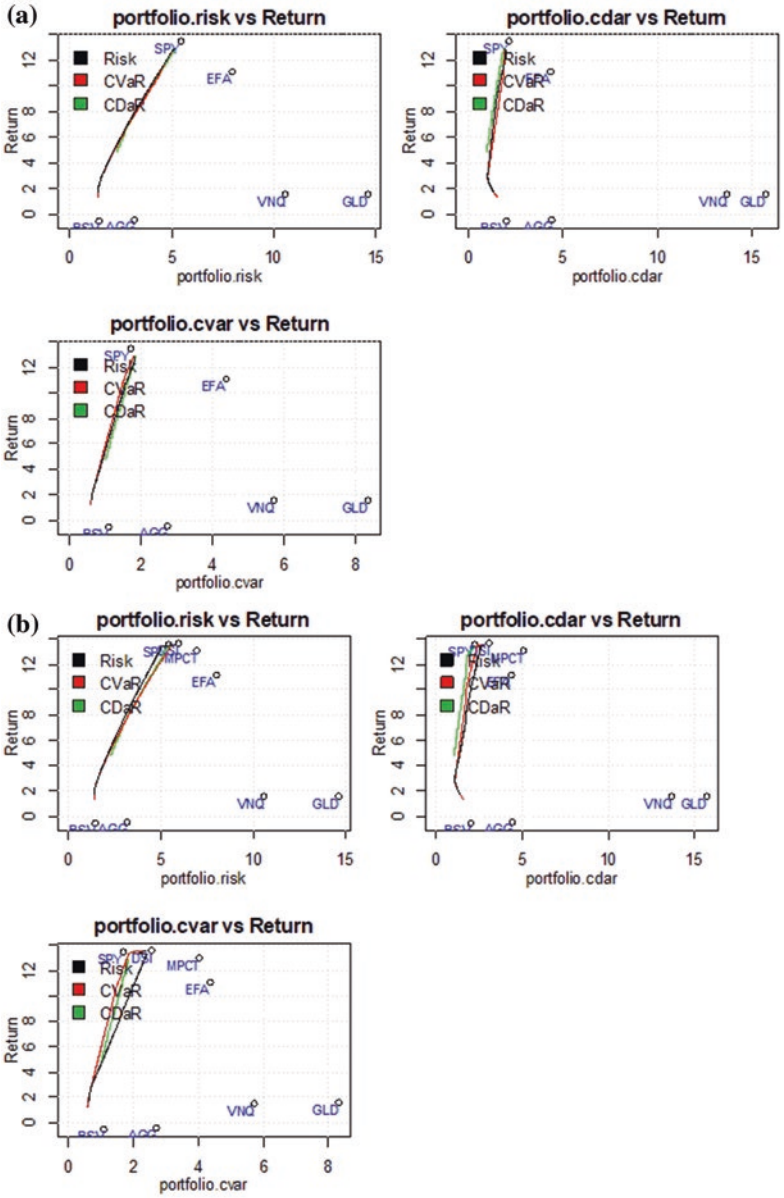


Fig. 4 Efficient frontier under three optimization models in the space return-risk

the risk measure is not the standard deviation. In fact, when using the maximum-loss measure, the ETF DSI is included in the high-risk efficient portfolios. The ML for the SRI is lower than in the other asset of our sample.

The efficient frontiers constructed under ES (CVaR) and standard deviation risk measures look similar. As we expected, each efficient frontier is superior to the others in the specific risk on which the model is optimized. However, the difference between the efficient portfolios of different models is more evident when analyzing the risk of drawdown. The distance between the efficient frontier constructed under conditional drawdown at risk (CDaR) and under ES (CVaR) is more evident.

The transition graphs (Fig. 5) show consistent changes in weights. Whereas the CDaR model better incorporates the "feelings of risk" typically associated with the investor, this analysis highlights the possible differences between an asset allocations optimized for estimating the risk unsuitable to capture "undesirable events."

The comparison of different optimization models allows us to outline the results in a deeper way. The optimization process, in fact, tries to obtain the maximum return while minimizing risk. The model changes to varying what the investor considers "risk."

Surprisingly, in all models the SRI, contribution is present. In the mean–variance optimization (panel a), the results confirm what we have seen previously: in this case, the inclusion of SRI in relation to low-risk portfolios.

Given that the investor's risk profile, quantified by the VaR, may have an advantage in the SRI inclusion, the addition of SRI in fact occurs in particular in low-risk portfolios.

Finally, the results for CDaR here are very interesting. In the other models, the benefit of the SRI concerns portfolios placed in the low-risk part: When we adopt a risk acceptation as the CDaR, the contribution of SRI moves in high-risk portfolios.

This can smooth the initial result. Analyzing SRI only in the mean–variance space does not allow us to appreciate its uniqueness. If instead we evaluate the SRI in a portfolio context, it makes it possible to highlight the benefits of the inclusion.

The introduction of SRI funds produces in each model an increase in overall efficiency. However, the benefit is greater in the ES, where inserting SRI funds results in a more marked shift to the left of the efficient

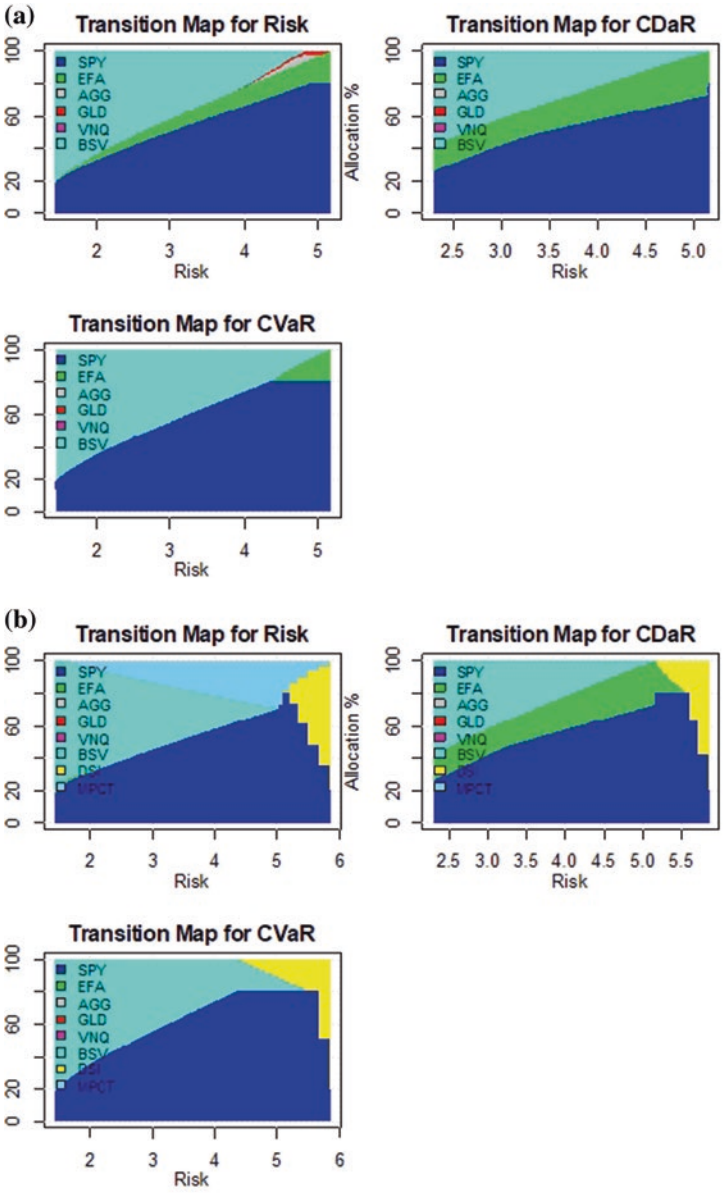


Fig. 5 Transition map of the efficient frontier under three optimization models

frontier, which, by contrast, is not captured by the simple variance measure.

Finally, at this point, we propose the simulation of the investment strategy shown in Sect. 3. The strategy is replicated over two time horizons: 5 years and 1 year. In the former, the SRI fund can be involved, whereas the investment in the Impact fund is also included in the latter.

The backtest of the strategies allows us to answer the second research question: If we consider SRI as part of a diversified portfolio, can this style of investment meet investors' needs and reduce risk without having a negative impact on returns?

We highlight two aspects:

- First, from observing the chart, we can see that the equally weighted strategy always reaches the highest capital, but with greater volatility.
- Second, in both time frames analyzed, adding SRI ETFs allows all the investment strategies to achieve better results. This is clearly shown by the graphs: higher capital levels with visually lower volatility. Also, the evaluation of various risk-adjusted performance measures (omitted for space reasons) confirms the benefit of including SRI funds.

However, the backtest could produce distorted results: The adoption of a risk-minimization policy is equivalent to a highly risk-averse attitude. Therefore, in favorable market times (such as the US markets in the past 5 years), any approach that reduces the risk profile seems to lose to a simply equally weighted strategy. The same can be said about the differences between risk measures. The minimum-risk portfolio also produces the smallest possible differences between alternative measures (Fig. 6).

5 Conclusions

In this paper, we analyzed the benefits arising from including SRI funds in the investment basket. The analysis was conducted using a variety of models and different time horizons.

First, analyzing different time horizons, the SRI does not seem to be completely different from the other investment solutions. Rather, it appears to be a subsample of a larger investment universe. However,

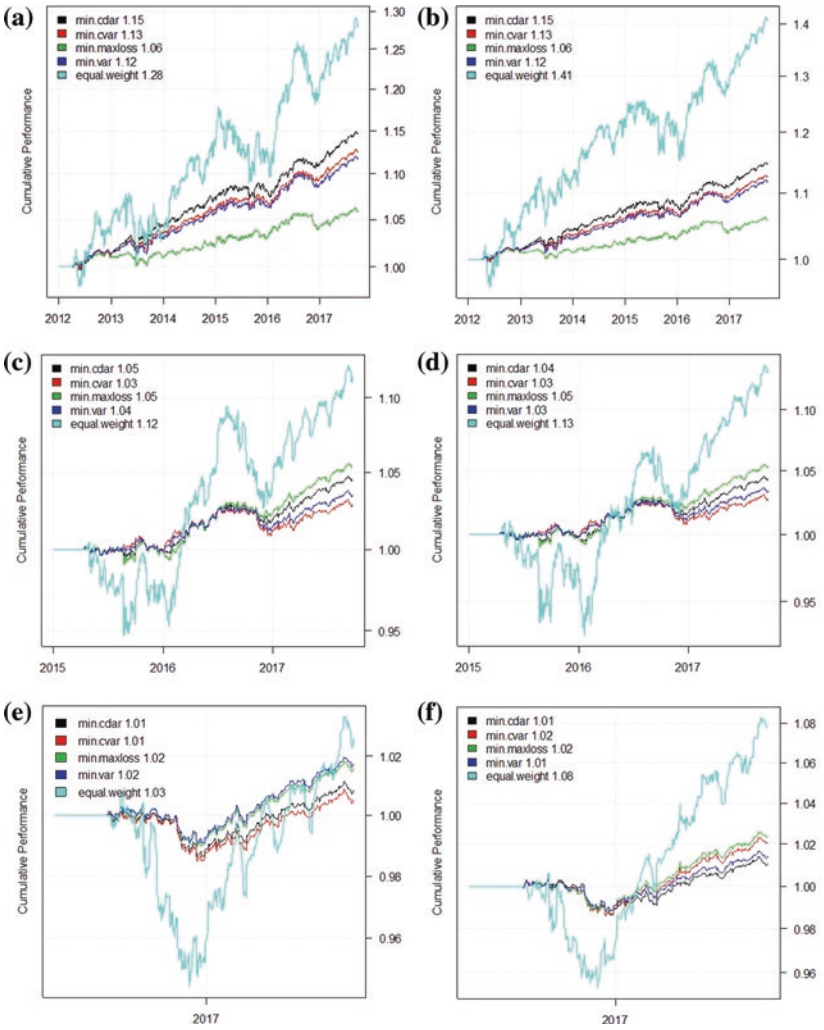


Fig. 6 Backtest

while they share the same game plan, the selection of SRI produces a more favorable trade-off between return and risk. This is better appreciated by adopting different risk metrics.

Second, from a portfolio view, the benefits of SRI are better appreciated. The correlation data by itself may have conflicting results. However, in our simulation, SRI funds are included in financial portfolios. This inclusion also occurs by adopting different optimization processes with varied risk profiles, especially using ML measures. These results confirm the ability of SRI to produce benefits for investors.

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CHAPTER 7

A New Approach to Sustainable and Responsible Investment: The Sustainability-Themed Mutual Funds

Federica Ielasi and Monica Rossolini

Abstract This research analyzes the risk-adjusted returns and the investment style of sustainability-themed funds, a fast-growing category of sustainable and responsible mutual fund. Sustainability-themed funds are compared with sustainable and responsible mutual funds that implement different approaches in portfolio selection and management, and with thematic funds not involved in responsible investment strategies. The study uses a European sample of 1512 mutual funds where 468 are sustainability-themed funds, 633 are other sustainable and responsible funds, and 411 thematic funds. Monthly performance and fund characteristics are analyzed for the period 2007–2017 using a single

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factor Capital Asset Pricing Model (CAPM), a Fama and French (1993) 3-factor model, and, lastly, a Fama and French (*Journal of Financial Economics*, 116: 1–22, 2015) 5-factor model. The analysis is extremely innovative. During the last 15 years, literature about sustainable and responsible investment has focused on the differences in terms of risk and performance between socially responsible and conventional funds. Starting from the methodology applied in previous studies, and in light of their exponential growth in recent years, this paper focuses on sustainability-themed mutual funds. We demonstrate that sustainability-themed funds differ in terms of risk, performance, and investment style from other funds that implement social responsible strategies and from thematic funds focusing on a specific theme, but not responsible investment.

Keywords SRI · Responsible mutual funds · Thematic funds · Sustainability-themed funds · Performance measures

1 Introduction

Sustainable and Responsible Investment (SRI) is continuing to increase in Europe, not only in terms of SRI assets relative to total professionally managed assets, but also in terms of approaches used for portfolio selection and management (Vigeo Eiris 2016; GSIA 2017). On the basis of a general strategy that integrates environmental, social, and governance (ESG) factors in the research, analysis and selection of securities within an investment portfolio, SRI fund managers are now adopting and sometimes combining the following different approaches (Eurosif 2016):

1. Negative/exclusionary screening: the exclusion from a fund or portfolio of certain sectors, companies, or practices based on specific ESG criteria;
2. Positive/best-in-class screening: investment in sectors, companies or projects selected for positive ESG performance relative to industry peers;
3. Norms-based screening: screening of investments against minimum standards of business practice based on international norms;
4. ESG integration: the systematic and explicit inclusion by investment managers of environmental, social, and governance factors into financial analysis;

5. Sustainability-themed investing: investment in themes or assets specifically related to sustainability (e.g., clean energy, green technology, and sustainable agriculture);
6. Impact/community investing: targeted investments, typically made in private markets, aimed at solving social or environmental problems, and including community investing, where capital is specifically directed to traditionally underserved individuals or communities, as well as financing that is provided to businesses with a clear social or environmental purpose; and
7. Corporate engagement and shareholder action: the use of shareholder power to influence corporate behavior, including through direct corporate engagement (i.e., communicating with senior management and/or boards of companies), filing or co-filing shareholder proposals, and proxy voting that is guided by comprehensive ESG guidelines.

Table 1 shows how some of these approaches are emerging in Europe.

This research aims to analyze the investment style and the risk-adjusted returns of a fast-growing approach: sustainability-themed investing (Towers Watson 2012). As shown in Fig. 1, funds that implement this kind of approach are experiencing a high level of CAGR in different European countries.

In general, theme-based funds, or thematic funds (TH funds), focus their investments across one or more sectors related to a common theme,

Table 1 Assets professionally managed under responsible investment strategies in Europe

Approaches	*2014 ($)*	*2016 ($)*	*Growth 2014–2016 (%)*
Negative/exclusionary screening	7470.81	11,064.15	48.1
ESG integration	2071.04	2884.52	39.3
Corporate engagement and shareholder action	3570.76	4654.35	30.3
Norms-based screening	3960.84	5545.67	40.0
Positive/best-in-class screening	385.37	537.78	39.5
Sustainability-themed investing	64.27	158.32	146.3
Impact/community investing	22.09	107.18	385.1
Total	**10,774.61**	**12,039.57**	**11.7**

Source GSIA, Global Sustainable Investment Review 2016, 2017

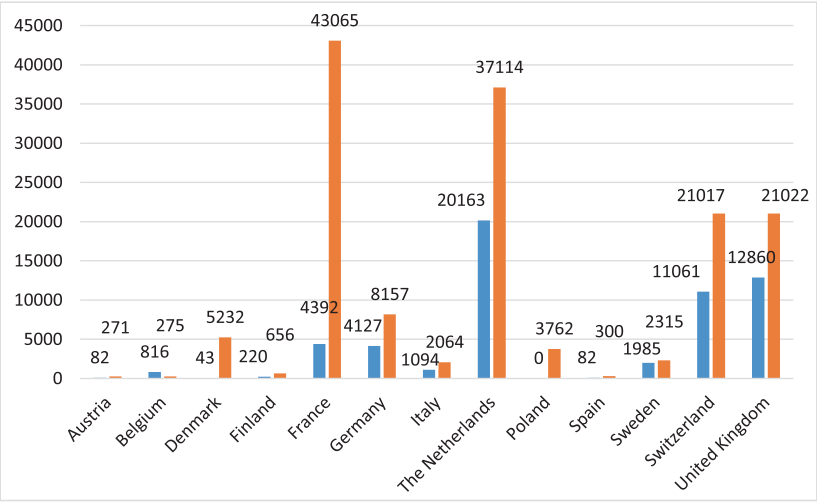

Fig. 1 Growth of sustainability-themed investments by country (*Source* Eurosif (2016))

such as digital, robotics, security, global environmental opportunities, water, or infrastructure. Recent analysis shows that energy efficiency and environment are the most frequent themes for European investors (Nicholls 2015; CBI 2016; Eurosif 2016; European Commission 2016).

In a TH fund, asset managers first select a key trend and then a more specific-related theme. Trends have a broader scope, and a single trend can produce many themes, which can be defined as the implications generated in a region or sector of interest. The proper recognition of themes depends on the ability of asset managers to rapidly identify the consequences of a trend, in terms of potential profits and values generated.

In the field of sustainability, current main trends around the world can be identified with reference to United Nations' Sustainable Development Goals (SDGs), the common objectives for international development, which can be reached through the mix of economic growth, social inclusion, and positive environmental impact.

An increasing number of investors are now seeking investments which offer solutions to such challenges, generating both positive environmental and social impacts as well as attractive financial returns. For example, investors look favorably on climate-sensitive topics, so renewable energy

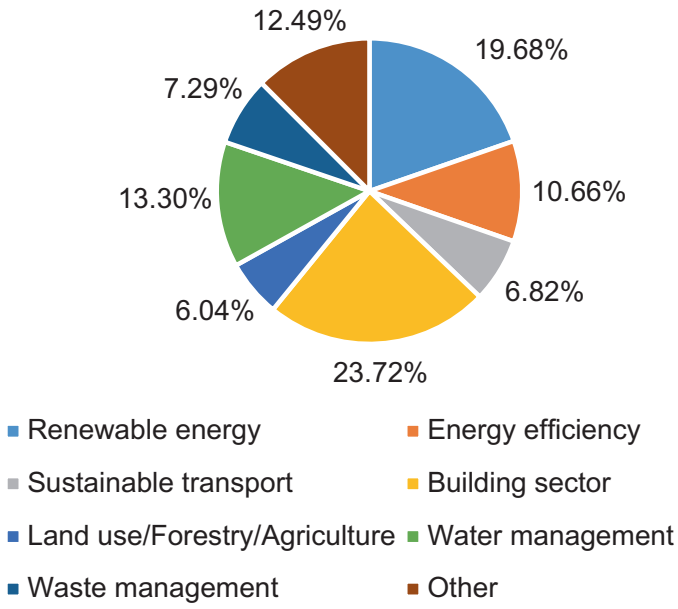

Fig. 2 Sustainability-themed investments, by sector (*Source* Eurosif (2016). "Other" includes: Multi-theme, Climate-related opportunities, Healthcare, Education, Safety, Well-being)

and energy efficiency are among the most frequent themes at European level, as shown in Fig. 2. These are followed by waste and water management, sustainable practices in agriculture and transport, as well as in the real estate market, with investments in the subsector of energy-efficient building and social housing.

During the last 15 years, literature about sustainable investing has focused especially on the differences in terms of risk and performance between sustainable and responsible mutual funds (SR funds) and conventional funds, which are often considered to be more diversified and profitable. This paper, using the methodology applied in previous studies, focuses on the specific category of sustainability-themed mutual funds (ST funds) in order to verify the differences in terms of performance compared to other sustainable approaches and other thematic strategies.

First of all, the research aims to compare sustainable funds which implement a thematic approach with sustainable funds adopting the

other types of responsible approaches. Given the same level of sustainability, the study aims to verify if a specific managerial approach impacts on investment returns. Our first research questions are:

1. Do ST funds differ from SR funds, in terms of returns, age, size, and asset allocation?
2. Do the risk-adjusted returns and investment style of ST funds differ from those of SR funds?

ST investing is a relatively new approach in the field of asset management, and we expect ST funds to be younger and with a lower level of diversification than SR funds. Selection of securities related to a specific theme may in fact constrain fund managers' choices and the consequent asset allocation of funds. Given the set of constraints on portfolio choice imposed by the thematic approach, and the correlated impact on the level of mutual fund diversification, we expect ST funds to be riskier than SR funds. At the same time, ST funds have a portfolio centered on a common theme, which is expected to grow long term more than the market as a whole. The aim of the thematic approach is in fact to select the long-term winners on the global market by identifying megatrends changing the world globally. In our hypotheses, ST funds are more volatile, but can produce higher returns than SR funds. We thus expect ST funds not to differ statistically from the other sustainable mutual funds, despite the differences in terms of portfolio characteristics.

We also analyze the thematic approach to verify whether it is more suitable for sustainable than other themes. We investigate whether the choice of a specific theme impacts on investment returns where the investment approach is thematic. Our second group of research questions is:

1. Do ST funds differ from TH funds, in terms of return, age, size, and asset allocation?
2. Do the risk- adjusted returns and investment style of ST funds differ from those of SR funds?

Sustainability-themed investing is a long-term-oriented approach which combines fundamental analysis and engagement with an evaluation of ESG factors in order to better capture long-term returns for investors, and benefit society by influencing the behavior of companies (European Commission 2016; Eurosif 2016). This implies that as well as being a thematic approach, sustainable investing is long-term oriented, powered by

the megatrends shaping the world, and designed to provide a source of long-term capital growth. Theme-specific investing fits well with sustainable investing. We thus expect ST funds to be older and bigger than other TH funds. Concerning the level of diversification, we expect ST funds to be more specialized than TH funds, because the selection of securities is influenced both by the choice of the theme, and by the application of ESG criteria. Looking at themes chosen by ST funds, the most important criterion applied for these products is related to the Environment. Landmark events such as COP21 have reminded the investor community of the connection between environmental and financial risks. We thus expect a lower level of financial risk for ST funds than for other TH products. On the other hand, the environmental issues that characterize a high percentage of European ST funds, including those connected with the mitigation of climate change, the de-carbonization of the economy, and water consumption, produce returns in the very long term and not as disruptively as some innovative technologies. Compared to other TH funds, we expect that ST funds produce lower financial returns.

Our study refers to a European sample of 1512 mutual funds where 468 are ST funds, 633 are SR funds, and 411 TH funds. The monthly performance of each fund is downloaded from Bloomberg for the period from August 31, 2007 to July 31, 2017. We analyze fund performance by applying the single factor Capital Asset Pricing Model (CAPM), a Fama and French (1993) 3-factor model, and, lastly, a Fama and French (2015) 5-factor model.

The research contributes to the existing literature in two main ways. First, it introduces into the strand of literature related to sustainable investing, a specific focus on the category of ST funds, characterized by a new and developing screening approach. In fact, literature about SRI has to date focused on the differences in terms of risk and performance between sustainable and responsible mutual funds and conventional ones, without distinguishing different methodologies of portfolio selection and management. Our second contribution is analyzing the impact of an important new strategy in the field of asset management: the thematic approach, a new investment strategy which differs from the traditional regional-/sector-based approach. Surprisingly, to our best knowledge, there are no studies existing on risk-adjusted performances of TH funds.

Our main finding is that ST funds are able to reach a risk-adjusted performance not lower than other SR funds. Sustainability- themed investing thus occurs simultaneously and in a growing number of

possible combinations with the other SRI strategies, without modifying the general level of risk-adjusted performance. Mutual fund managers can consider thematic approach as an efficient opportunity for reconciling financial performance and economic sustainability.

However, when ST funds are compared with other TH funds, they demonstrate a lower capability to produce financial returns and a lower risk- adjusted performance. This study also identifies many differences between the investment styles of ST and TH funds.

The paper is organized as follows. Section 2 reviews the literature about the relationship between SR funds and conventional ones, because the starting hypotheses and the assumptions are the same used for the comparison of ST, SR, and TH funds. Section 3 provides information about sample data and the methodology used for the analysis. Section 4 presents the empirical results. Section 5 concludes.

2 Literature Review

Reference models for this study come from the early literature about sustainable and responsible funds (SR) from the mid-twentieth century, relating in particular to differences in performance levels of conventional and SR funds (Markowitz 1952; Sharpe 1966; Jensen 1968; Diltz 1995; Mallin et al. 1995; Cohen et al. 1997; D'Antonio et al. 1997).

Moskowitz (1972) was among the first authors interested in the effect of social issues on investment decisions. He suggested that a portfolio of responsibly screened stocks might perform as well as or better than an unscreened portfolio. Rudd (1979) and Grossmann and Sharpe (1986) found that any constraint placed on investment decisions would reduce utility or leave it constant. Some years later, Markowitz (1991) made important findings on portfolio choice and diversification as well as the CAPM: SR investments seemed to be condemned to an ethical sacrifice in terms of returns, because of their portfolio constraints.

Nevertheless, Luther et al. (1992) in a study of UK unit trusts, including ethical ones, found that ethical trusts outperformed the market index. Similar results were obtained by Bernett and Salomon (2006). Thereafter, other authors (Hamilton et al. 1993; Gregory et al. 1997; Mackenzie and Lewis 1999) found no statistical difference in average returns between ethical funds and conventional ones. Various studies (Bello 2005; Renneboog et al. 2008a, b; In et al. 2014; Das and Rao 2014) confirmed an equivalence between SR funds and conventional ones in terms of performance measures and portfolio characteristics.

Bauer et al. (2005) applied the Fama and French 3-factor model and, using a database containing 103 German, UK and US ethical mutual funds, found no evidence of significant differences in risk-adjusted returns between ethical and conventional funds for the 1990–2001 period. Many studies analyze the performance and the mutual fund characteristics (Statman 2000; Scholtens 2005; Benson et al. 2006; Bauer et al. 2007). Gregory et al. (1997) showed that the age of the funds can influence returns, regardless of fund size and ethical status. Becchetti and Fucito (2000) found that ethical sacrifice decreases when the ratio between SRI and all shares are large enough, and rejected Markowitz's explanation for such cases. Kreander et al. (2005) discovered that management fees were a significant explanatory variable for the Jensen measure. Chen et al. (2004) investigated the effect of scale on performance in the active money management industry by analyzing the role of liquidity and organization. Lastly, Hudson (2005) found that stocks yield market returns and the share price of ethical firms are unaffected by the actions of ethical investors.

3 Data and Methodology

In order to create our database, data were collected mainly from the Bloomberg database and missing information was completed from Morningstar. During the data collection, we only considered mutual funds, both open and closed-end, and funds of funds; we excluded hedge funds, private equity funds and funds investing in these categories, respectively fund of hedge funds and funds of private equity funds. We limited our selection to funds classified by Bloomberg as active, and to funds domiciled and distributed around Europe, using Euro as main currency in their ongoing operations. Among the other fund features, we did not limit the sample according to the asset class in which it invests, its rating or its market capitalization.

We then used a Bloomberg function consisting of selecting the general attributes of an investment. We used "Ethical" and "Environment, Social, Governance" as attributes for SR funds, Then, focusing on the Fund Industry variable, that is able to categorize funds according to the industry, or the list of industries in which they operate, we selected the funds with the label "thematic," for identifying funds concentrated in just one reference theme, related to sustainability or not. Lastly, among TH funds, the general attributes of "Clean energy," "Climate change," "Environmental sustainability" and "Religiously responsible" are used for selecting ST funds.

The sample obtained is composed of 1512 mutual funds where 633 are SR funds and 879 are TH funds. A percentage of 53.24 of TH funds are focused on sustainable themes (ST funds). We collected data for each fund relative to: monthly return, net asset value, age, asset allocation (equity, fixed income, or mixed allocation), geographical diversification (European, global, or other) and the juridical structure (open-end, closed-end, or fund of funds). We calculated the average returns, comparing first ST funds with SR funds and then, separately, ST funds with TH funds not sustainably themed. We did not exclude the funds with establishment date after 2007, but we took into account the specific period between the date of establishment and 2017.

Using this sample, statistical tests were run in order to compare ST, SR, and TH funds in terms of fund characteristics, performance, and asset allocation.

We analyzed the differences in risk-adjusted performance between our subsamples by estimating Jensen's Alpha using the CAPM model. The CAPM Model has been the main model used in studies on mutual fund performance for decades.

The first model used is a CAPM based-single-index model. The intercept of the model α_p gives the Jensen Alpha

$$r_{pt} - r_{ft} = \alpha_p + \beta_{p(r_{mt} - r_f)} + \varepsilon_{pt} \tag{1}$$

where

r_{pt} is the return on fund p in month t,
r_{ft} is the return on one-month Euribor in month t,
r_{mt} is the return on the benchmark portfolio in month t,
β_p is the portfolio p's beta, which measures the portfolio's risk with respect to market risk, and
ε_{pt} is the residual term during period t.

CAPM single-index model proved to have many weaknesses and was replaced by multi-factor models many years ago. The need for a multi-factor asset pricing model is clearly expressed in recent literature on the cross-sectional variation of stock returns (see e.g., Fama and French 1993, 1996; Chan et al. 1996; Imbens 2004; Huij and Verbeek 2009), and these studies question the adequacy of a single-index model to explain mutual fund performance. The Fama and French (1993) 3-factor model was introduced to give a better explanation of fund behavior. It contains a value-weighted market proxy, and two additional risk proxies; the returns on size- and

book-to-market-sorted equity portfolios. The model was based on the consideration that smaller firms, along with the so-called value stocks (i.e., with a low market price/book value) tend to outperform bigger and growth stocks.

We estimate:

$$r_{pt} - r_{ft} = \alpha_p + \beta_{0p(r_{mt}-r_{ft})} + \beta_{1p}SMB_t + \beta_{2p}HML_t\varepsilon_{pt} \quad (2)$$

where:

SMB_t is the difference in return between a small cap portfolio and a large cap portfolio at time t,

HML_t is the difference in return at time t between a portfolio containing value stocks (with a high book-to-market ratio) and one consisting of growth stocks (with a low book-to-market ratio).

Although this model already mitigates CAPM pricing errors, it was only one of the many multi-factor models using the initial intuition of Fama and French. More recently, the same two authors extended their model to include five explanatory factors (Fama and French 2015). The 5-factor model aims to capture the size, value, profitability, and investment patterns in average stock returns and includes two new effects, profitability and an investment factor. The profitability effect is that stocks with a high operating profitability perform better, and the investment factor is that stocks of companies with the high total asset growth have below average returns.

The Fama French 5 factors model is shown in Eq. 3:

$$\begin{aligned} r_{pt} - r_{ft} =& \alpha_p + \beta_{0p(r_{mt}-r_{ft})} + \beta_{1p}SMB_t + \beta_{2p}HML_t \\ &+ \beta_{3p}RMW_t + \beta_{4p}CMA_{t+}\varepsilon_{pt} \end{aligned} \quad (3)$$

where

RMW_t is the difference between the returns in diversified portfolios of stocks with robust and weak profitability;

CMA_t is the difference between the returns in diversified portfolio of low (conservative) and high (aggressive) investment stocks.[1]

All these models were applied with different benchmarks. We first used the MSCI World Index and the Dow Jones Industrial Average

[1] SMB, HML, RMV and CMA factors relating to European markets were downloaded from the Web site http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html#Developed (downloaded the 30/6/2017).

Index, and then the Dow Jones Sustainability Index, which as its name suggests, features sustainable investments.

4 Results

As described above, we expected differences in terms of asset allocation and fund characteristics between ST funds and SR funds, and between ST funds with TH funds as a whole.

Table 2 presents the main differences between ST funds and SR funds.

ST funds show a higher net asset value than SR funds. No differences were found in terms of age: more or less both these categories present an age of 7.5 years. No differences in terms of mean returns were found. There are many differences in asset allocation. A percentage of 68% of ST fund investments are in global portfolios, whereas for SR funds the percentage is only 49%. SR funds concentrate more on European investments (39% of the total) than ST funds (26%). For both SR and ST funds, asset allocation is concentrated in equity investments but ST funds present a higher percentage in equity investment and a lower percentage of investment in fixed income or mixed allocation. In more than 90% of cases, ST and SR funds are open-end funds, but the percentage is higher for SR funds, whereas the percentage of fund of funds is slightly higher for ST funds.

Table 3 compares the entire sample of TH funds, classified into ST funds and TH funds not focused on the theme of sustainability. There are clear differences in the average returns; ST funds show a lower return than TH funds. ST funds have a higher net asset value than TH, and are on average 1.5 years older than TH funds. There are also some differences in terms of asset allocation. Although the main percentage of investment is in global portfolios, ST funds invest in this strategy less than TH funds. The percentage of global investment is 68% for ST funds and 77% for TH funds. On the other hand, ST funds invest more in European investment (26%) than TH funds (13%). Most asset allocation is on equity portfolios but ST funds show a lower percentage (66%) than TH funds (85%). Regarding other type of investment, ST funds invest more than TH funds in fixed income and mixed allocation. In terms of fund structure, in more than 90% of cases ST and TH funds are open-end funds, but the percentage is higher for TH funds, whereas the percentage of fund of funds is slightly higher for ST funds.

Summarizing our main findings, ST funds seem to apply an investment strategy more similar to TH funds than to SR funds but with a

Table 2 Descriptive statistics of ST funds and SR funds

	Sustainability-themed funds (ST)					*Socially responsible funds (SR)*					*Mean (ST)-Mean (SR)*
	Obs.	*Mean*	*St. Dev*	*Min*	*Max*	*Obs.*	*Mean*	*St. Dev*	*Min*	*Max*	
Return (%)	45,014	0.3702	3.8529	−36.9276	29.1755	59,862	0.3543	3.6160	−90.4323	39.6697	0.0159
Net asset value (log)	43,892	10.0298	0.9440	6.3099	11.0129	59,383	9.9421	1.0341	0	11.0129	0.0877***
Age (years)	45,313	7.59	6.99	0	38.98	60,465	7.62	6.04	0	45.28	−0.03
Investment strategies											
Global	56,160	0.6859	0.4642	0	1	75,960	0.4913	0.4999	0	1	0.1945***
European	56,160	0.2671	0.4424	0	1	75,960	0.3902	0.4878	0	1	−0.1231***
Other	56,160	0.0470	0.1028	0	1	75,960	0.1185	0.1871	0	1	−0.0257***
Equity	56,160	0.6688	0.4706	0	1	75,960	0.5782	0.4938	0	1	0.0906***
Fixed income	56,160	0.1474	0.3545	0	1	75,960	0.1927	0.3944	0	1	−0.0452***
Mixed allocation	56,160	0.1838	0.3855	0	1	75,960	0.2291	0.4181	0	1	−0.0443***
Open-end fund	56,160	0.9295	0.2560	0	1	75,960	0.9684	0.1749	0	1	−0.0389***
Close-end fund	56,160	0	0	0	1	75,960	0.0031	0.0561	0	1	−0.0031***
Fund of funds	56,160	0.0705	0.2560	0	1	75,960	0.0285	0.1662	0	1	0.0421***

Significance is expressed with one, two, or three asterisks, indicating the rejection of the null hypothesis (the two means are equal) with probability levels of 10, 5, and 1%, respectively

Table 3 Descriptive statistics of ST funds and TH funds

	Sustainability-themed funds (ST)					*Thematic funds (TH)*					*Mean (ST)-Mean (TH)*
	Obs.	*Mean*	*St. Dev*	*Min*	*Max*	*Obs.*	*Mean*	*St.Dev*	*Min*	*Max*	
Return (%)	45,014	0.3702	3.8529	−36.9276	29.1755	38,412	0.4452	4.5672	−47.2416	87.2216	−0.0751***
Net asset value (log)	43,892	10.0298	0.9440	6.3099	11.0129	37,419	9.9885	1.0048	5.6312	11.0128	0.0413***
Age (years)	45,313	7.59	6.99	0	38.98	38,717	6.94	5.53	0	34.49	0.65***
Investment strategies											
Global	56,160	0.6859	0.4642	0	1	49,320	0.7786	0.4152	0	1	−0.0927***
European	56,160	0.2671	0.4424	0	1	49,320	0.1314	0.3378	0	1	0.1357***
Other	56,160	0.0470	0.1028	0	1	49,320	0.0900	0.2519	0	1	−0.0574***
Equity	56,160	0.6688	0.4706	0	1	49,320	0.8564	0.3506	0	1	−0.1876***
Fixed income	56,160	0.1474	0.3545	0	1	49,320	0.0316	0.1750	0	1	0.1158***
Mixed allocation	56,160	0.1838	0.3855	0	1	49,320	0.1119	0.3153	0	1	0.0697***
Open-end fund	56,160	0.9295	0.2560	0	1	49,320	0.9464	0.2251	0	1	−0.0170***
Fund of funds	56,160	0.0705	0.2560	0	1	49,320	0.0536	0.2251	0	1	0.0170***

Significance is expressed with one, two, or three asterisks, indicating the rejection of the null hypothesis (the two means are equal) with probability levels of 10, 5, and 1%, respectively

lower emphasis. For instance, they invest more than SR funds in equity, but with a lower percentage of investment than those applied by TH funds. They apply greater geographical diversification than SR funds, but the percentage of global investment is lower than TH funds.

In light of the differences between these subsamples of funds, we deepen the analysis with the application of CAPM models and the computation of Jensen's Alpha. Table 4 presents the results of the CAPM models on the two groups: ST funds and SR funds. We analyze the two portfolios of funds separately and then compare them calculating the difference between coefficients and their statistical significance. In this analysis, we use the MSCI World Index as a benchmark.[2]

We notice an increase in average *R* squared for the multi-factor models compared to 1-factor CAPM models. This confirms that multi-factor models are superior in explaining mutual fund returns.

The Alpha estimate is negative for both ST funds and SR funds, which indicates underperformance compared to a market proxy, but no significant difference in terms of Alpha is found between the two groups. All the funds are characterized by a market Beta lower than one, and ST funds show a higher exposure to the market risk than SR funds. By applying a Fama and French (1993) 3-factor model, we overcome the limits of a CAPM based-single-index model. The results of Eq. 2 are presented in Table 4. We confirm the differences in terms of Beta: ST funds tend to have a higher market risk exposure than ST funds. ST funds are relatively less invested in small caps (or more invested in large caps) than SR funds. The Fama and French 5-factor model confirms the results of the previous models in terms of difference in market risk exposure and the SMB factor. In this model, we add some information on the investment style since ST funds are more value oriented (or less growth oriented) compared to the sample of SR funds. They are more heavily exposed to stocks with robust profitability (or less exposed to stocks with weak profitability) than SR funds.

Table 5 presents the result of the CAPM models for ST funds and TH funds.

Comparison between ST funds and TH funds does not reveal differences in terms of market risk exposure, but reveals differences in terms of Alpha. ST funds show more serious underperformance compared to a

[2]We run the same analysis with DJIA index obtaining similar results. These results are available from the authors on request.

Table 4 CAPM models for ST and SR funds (MSCI World Index)

	ST funds	*SR funds*	*Difference*
Single Model			
Alpha	−0.2437***	−0.2404***	−0.0033
Market	0.3009***	0.2604***	0.0405***
R squared	0.1147	0.0953	
3-factor Model			
3-factor Alpha	−0.2588***	−0.2648***	0.006
Market	0.3063***	0.2689***	0.0374***
SMB	0.0574***	0.0886***	−0.0312**
HML	−0.0207***	−0.0313***	0.0106
R squared	0.1154	0.0972	
5-factor Model			
5-factor alpha	−0.4081***	−0.3903***	−0.0178
Market	0.3234***	0.2881***	0.0353***
SMB	0.1233***	0.147***	−0.0237*
HML	0.1264***	0.0719***	0.0545***
CMA	0.142***	0.1514***	−0.0094
RMW	0.354***	0.2785***	0.0755***
R squared	0.1222	0.1027	

The table reports the results of the estimation of Eq. 1 (CAPM based-single-index model), Eq. 2 (Fama and French 3-factors model), and Eq. 3 (Fama and French 5-factor model) for the period 2007:08-07:2017.

Reported are the OLS estimates for both sustainability-themed mutual (ST) funds and Socially Responsible Funds (SR). The benchmark used is MSCI World Index. Significance is expressed with one, two, or three asterisks, indicating the rejection of the null hypothesis with probability levels of 10%, 5%, and 1%, respectively

benchmark than TH funds. These results are confirmed by the 3-factor model, but are not confirmed by the 5-factor model.

The 3- and 5-factor models show that ST funds are more growth oriented or less value oriented than the sample of TH funds. They are more heavily exposed to stocks with weak profitability (or less exposed to stocks with robust profitability) than TH funds and they invest more in aggressive stock (or less in conservative stock).

4.1 Robustness Tests: Dow Jones Sustainability Index

To verify the robustness of these results, the analysis is run using a specific benchmark, the Dow Jones Sustainability Index, to take into account the peculiarity of sustainable investment.

Table 5 CAPM models for ST and TH funds (MSCI World Index)

	ST funds	*TH funds*	*Difference*
Single Model			
Alpha	−0.2437***	−0.1399***	−0.1038***
MarketMarket	0.3009***	0.305***	−0.0041
R squared	0.1147	0.0859	
3- factor Model			
3-factor Alpha	−0.2588***	−0.1405***	−0.1183***
Market	0.3063***	0.298***	0.0083
SMB	0.0574***	0.0305**	0.0269
HML	−0.0207**	0.0351***	−0.0558***
R squared	0.1154	0.0863	
5-factor Model			
5-factor alpha	−0.4081***	−0.4008***	−0.0073
MarketMarket	0.3234***	0.3351***	−0.0117
SMB	0.1233***	0.1495***	−0.0262
HML	0.1264***	0.2642***	−0.1378***
CMA	0.142***	0.2847***	−0.1427***
RMW	0.354***	0.5888***	−0.2348***
R squared	0.1222	0.1016	

The table reports the results of the estimation of Eq. 1 (CAPM based—single-index model), Eq. 2 (Fama and French 3-factors model), and Eq. 3 (Fama and French 5-factor model) for the period 2007:08-07:2017.

Reported are the OLS estimates for both sustainability-themed mutual (ST) funds and Thematic Funds (TH). The benchmark used is MSCI World Index. Significance is expressed with one, two, or three asterisks, indicating the rejection of the null hypothesis with probability levels of 10%, 5%, and 1%, respectively

Table 6 confirms the result of the previous analysis using the MSCI World Index as a benchmark (Table 4). ST funds show a higher exposure to the market risk than SR funds and no differences exist in terms of Alpha. The 5-factor model confirms that ST funds invest more in value stocks (and less in growth stocks) than SR funds, and they invest more in stocks with robust profitability than SR funds. The results relative to the investment in small and large caps are not confirmed.

Table 7 confirms the results reported in Table 5. ST funds show more serious underperformance than TH funds, but this difference is not confirmed by the 5-factor model either. Regarding the investment style all the results are confirmed: ST funds show a different investment style from TH funds. They invest more in growth stocks (or less in value

Table 6 CAPM models for ST funds and SR funds (Dow Jones Sustainability Index)

	ST funds	*SR funds*	*Difference*
Single Model			
Alpha	−0.2172***	−0.2159***	−0.0013
Market	0.2677***	0.2308***	0.0369***
R squared	0.1073	0.0887	
3-factor Model			
3-factor Alpha	−0.2379***	−0.2453***	0.0074
Market	0.2798***	0.2454***	0.0344***
SMB	0.0677***	0.0977***	−0.03**
HML	−0.0487***	−0.0559***	0.0072
R squared	0.1087	0.0915	
5-factor Model			
5-factor alpha	−0.3822***	−0.3666***	−0.0156
Market	0.2977***	0.2656***	0.0321***
SMB	0.1342***	0.1571***	−0.0229
HML	0.0839***	0.0328***	0.0511***
CMA	0.1513***	0.1619***	−0.0106
RMW	0.3374***	0.2636***	0.0738***
R squared	0.1152	0.0968	

The table reports the results of the estimation of Eq. 1 (CAPM based—single-index model), Eq. 2 (Fama and French 3-factors model), and Eq. 3 (Fama and French 5-factor model) for the period 2007:08-07:2017.

Reported are the OLS estimates for both sustainability-themed mutual (ST) funds and Socially Responsible Funds (SR). The benchmark used is the Dow Jones Sustainability Index. Significance is expressed with one, two, or three asterisks, indicating the rejection of the null hypothesis with probability levels of 10, 5, and 1%, respectively

stocks), they are more heavily exposed to stocks with weak profitability (or less in stocks with robust profitability) and focus more on aggressive stocks (and less on conservative) than TH funds.

5 Conclusions

According to the Financial Standard Guide to Thematic Investing (Financial Standard 2009), "thematic mutual funds identify the best future global investment opportunities by examining significant structural, macroeconomic, social, demographic or political shifts taking place around the world …." Bérubé et al. (2015) define TH funds as suitable instruments for taking advantage of the present global marketplace,

Table 7 CAPM models for ST funds and TH funds (Dow Jones Sustainability Index)

	ST funds	*TH funds*	*Difference*
Single Model			
Alpha	−0.2172***	−0.11***	−0.1072***
Market	0.2677***	0.2708***	−0.0031
R squared	0.1073	0.0805	
3 factor model			
3-factor Alpha	−0.2379***	−0.1172***	−0.1207***
Market	0.2798***	0.2696***	0.0102
SMB	0.0677***	0.0398***	0.0279*
HML	−0.0487***	0.0093***	−0.058***
R squared	0.1087	0.0807	
5-factor model			
5-factor alpha	−0.3822***	−0.3699***	−0.0123
Market	0.2977***	0.3064***	−0.0087
SMB	0.1342***	0.1595***	−0.0253
HML	0.0839***	0.2199***	−0.136***
CMA	0.1513***	0.2925***	−0.1412***
RMW	0.3374***	0.5693***	−0.2319***
R squared	0.1152	0.0954	

The table reports the results of the estimation of Eq. 1 (CAPM based—single-index model), Eq. 2 (Fama and French 3 factors model), and Eq. 3 (Fama and French 5-factor model) for the period 2007:08-07:2017.

Reported are the OLS estimates for both sustainability-themed mutual (ST) funds and Thematic funds (TH). The benchmark used is the Dow Jones Sustainability Index. Significance is expressed with one, two, or three asterisks, indicating the rejection of the null hypothesis with probability levels of 10, 5, and 1%, respectively

since global megatrends will provide opportunities to investors who take a long-term view and identify the beneficiaries of those changes before they become widely recognized.

In the field of SRI, themed investment is also characterized by an exponential growth. Sustainability-themed strategy for screening and selecting securities is one of the investing approaches which has seen the highest growth in the last five years.

Many studies on sustainable and responsible investments have compared SR funds with conventional funds, which were expected to be more diversified and profitable. Starting from the hypotheses tested in these previous studies, this research focused on sustainability-themed mutual (ST) funds. ST funds were compared with other SR funds and

with generic TH funds, in order to verify whether portfolio qualitative characteristics and the risk-adjusted performance of sustainability-themed mutual funds are related more closely to their responsible nature or to their thematic approach.

Our analysis of the sustainable and responsible mutual fund context showed that ST funds are more exposed than SR funds to market risk, but there are no differences in terms of Alpha and returns. The investment style of ST funds differs from SR funds: they are more value oriented (or less growth oriented) and tend to focus on stocks with robust profitability.

The substantial equivalence in the level of performance between ST funds and other SR funds has important implications for investors and asset managers. ST funds demonstrate the capacity to generate returns in line with other SR strategies. In building a sustainable strategy for professionally managed funds, asset managers can combine thematic screening and different investment policies without substantially modifying the expected average results of investment portfolios. This means that different SRI strategies can be applied simultaneously and in a growing number of possible combinations.

The reasons for these results can probably be found in the specific areas ST funds are invested in, which are usually related to energy and the environment. These areas incorporate several sectors and countries, which lowers the level of constraints for asset managers. For example, an investment strategy for major environmental problems should ideally focus on companies involved in energy transition in different ways, such as energy efficiency in public transport and construction, low-carbon power generation, sustainable waste management, water and power distribution infrastructures, and food safety. Many economic sectors and companies are engaged in offering more energy-efficient products and in producing/consuming low-carbon forms of energy. "Responding to the various challenges of the energy transition constitutes in itself a step towards investment diversification" (Eurosif 2016). A level of diversification can thus be maintained, and moreover, divestment from carbon-producing companies and the inclusion of companies considered leaders in mitigating climate change can produce a positive impact on the overall risk of investment portfolio.

With performance results, comparable to other SR funds, ST funds respond to the increasing awareness of climate change and its

implications and the growing interest in climate-sensitive topics. They are thus expected to expand in the near future.

Nevertheless, the specific areas of investment of ST funds lead to big differences in terms of performance compared to other thematic (TH) funds. Thematic mutual funds show no differences in terms of market risk exposure, whereas ST funds show more serious underperformance than TH funds. TH funds focused on a theme of sustainability show an investment style different from other TH funds. They are more growth oriented, and heavily exposed to stocks with weak profitability and high investment stocks.

In conclusion, it appears that the theme of SRI is not able to generate high performance in the field of thematic investing. Funds specialized in SR themes are one of the oldest and most consolidated type of TH funds, but they are not suitable for investors who are keen to focus on specific areas of investment, with a high propensity to risk, and who are aiming to maximize performance. Our findings indicate that asset managers should not consider thematic funds as a single category of fund characterized by a specific risk/return. The same investment strategy could in fact yield different risk-adjusted performance levels depending on the theme.

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CHAPTER 8

Is Equity Crowdfunding a Good Tool for Social Enterprises?

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Abstract Equity crowdfunding is an emerging financing tool that can help social start-ups and firms to collect people and resources around a project. This paper focuses on equity crowdfunding. We look at this as a complementary financing channel useful for promoting innovation and social change by cutting down the traditional features of financial investment. Our unique data set regards all the 104 Italian equity crowdfunding campaigns, launched by different platforms on the Italian equity crowdfunding market from 2013 to 2017. Our aim is twofold: (a) to describe the characteristics of the social firms which have had resource to equity crowdfunding and (b) with a logit model, to investigate which factors influence the success of the campaign, in particular by the social orientation of the issuers. The results suggest that social firms' investment offerings are not different

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from those of non-social ones, but so far, the Italian equity crowdfunding market does not seem suitable for supporting the financial needs of this type of firms, on the side of either investors or firms.

Keywords Equity crowdfunding · Sustainability · Social enterprises · Entrepreneurial finance

1 Introduction

Due to major changes in socio-economic and political contexts, academics and policymakers are paying increasing attention to social enterprises and social innovation, and the rate of growth in research and studies in this field has also accelerated (Nicholls 2008; Bacq and Janssen 2011). The question of what exactly constitutes a social enterprise has been the subject of a rigorous, lengthy debate in the academic literature, but so far no consensus on the exact definition has been reached. At the same time, there is a growing need to meet the financing needs of social enterprises and sustainability-oriented ventures.

Studies on the financing decisions of social enterprises are unanimous that social enterprises lack sufficient access to finance (Miller et al. 2010; Nicholls 2010). This financing gap is due to a small group of factors: (a) the presence of information asymmetries and the lack of collateral; (b) a problem of scale, with high fixed costs and small average investments; and (c) a local dimension that means that these enterprises are predominantly found in economically and socially deprived areas, where the need for their services is highest (Santos 2012). Because of these features, it is clear that conventional finance does not always offer the types of capital needed by this growing sector. Alternative forms of financing have been on the rise in the last ten years, including microfinance, peer to peer lending and crowdfunding (Giudici et al. 2012; Bruton et al. 2015).

In particular, crowdfunding is a collective call to a heterogeneous crowd able to make small financial pledges to an entrepreneurial project, issued using new form of intermediary institution (Belleflamme et al. 2014; Lehner 2013; Lehner 2014). The financial pledges can be donations, prepayment for a product not yet marketed, or debt and equity investments (Mollick 2014). Specifically, equity crowdfunding allows backers to become shareholders in the firm, and entrepreneurs may obtain the capital they need, which is not available from more traditional

sources. Moreover, crowdfunding in general offers other potential benefits to entrepreneurs, such as more information from the target market and early feedback for products, while also attracting public and social media attention at the same time (Giudici et al. 2012; Agrawal et al. 2014; Gerber and Hui 2013; Belleflamme et al. 2014).

Crowdfunding is particularly relevant today because it is viewed as an alternative means of financing sustainability-oriented ventures and environmental technologies (Lehner et al. 2015; Hörisch 2015; Calic and Mosakowski 2016). In particular, Goodman and Polycarpou (2013) maintain that crowdfunding is a potentially revolutionary application of social networking with direct consequences for sustainability. Crowdfunding is an opportunity to create forms of economic growth that answer to social and environmental needs (Calic and Mosakowski 2016).

Policymakers and regulators have been focusing an increasing amount of attention on this theme and there is a need for closer study of the phenomenon. There is an established body of works that refer to the financing of social enterprises but, to the best of our knowledge, none of them has investigated the equity crowdfunding tool. More specifically, our study sought to address the following research question: Is equity crowdfunding a good tool for social enterprises? We investigate this research question in a unique data set—comprising all funded and non-funded projects—from the Italian equity crowdfunding market.

This paper therefore sets out to explore social enterprise-related aspects of equity crowdfunding through an in-depth look at the Italian equity crowdfunding market. In fact, Italian legislation has just recently recognized crowdfunding as a financial instrument for sustaining their growth (Law 6/06/2016, n. 106). Given the lack of a universally accepted definition, in our work we define social enterprises in two ways: the first based on the definition used in Italian legislation, and the second expands this social dimension, following the broader European Commission guidelines.

This research contributes to crowdfunding literature by empirically examining the characteristics of social enterprises in the Italian equity crowdfunding market. In addition, it sheds light on the key debate within the area of social entrepreneurship financing.

This article proceeds as follows: firstly, we introduce the phenomenon of social enterprises and the financing problems related to their development. Next, we review the literature on crowdfunding for social

enterprises. We follow with a discussion of the sample and descriptive used in the study. Finally, we conclude by reviewing and discussing the results and providing future directions.

2 Theoretical Framework

With reference to our research question, we focus our literature review on three main parts: the first regards the definition of social enterprises; the second is about social enterprises' financing problems; and the last one concerns equity crowdfunding as a tool for meeting social enterprises' financial needs.

2.1 Definition of Social Enterprises

The definition of social enterprises has evolved and benefited from the injection of ideas derived from a broad array of theories and research fields. These have allowed economics researchers to develop a multiple perspective on social enterprises with regard to both their definition and the measurement of their social impact. Some definitions of social enterprise build from a focus on social change for communities or client groups, others on business and revenue-generation aspects, and others on the organization's structure.

Due to the fact that the field of social enterprise research is highly fragmented across disciplines, many studies accept that there is no clear definition of the concept and try to review all perspectives. (Kerlin 2006; Peredo and McLean 2006; Dacin et al. 2011; Huybrechts and Nicholls 2012, Lehner, and Nicholls 2014). Dacin et al. (2011) identify 37 different definitions of social enterprises in the literature from 1998 to 2010. Young and Lecy (2014), using a zoo animal metaphor, restrict the classification to six major kinds of organizational entities.

Most scholars and practitioners agree that social enterprises are hybrids, with characteristics of both commercial and non-profit organizations, and that they combine social values with pursuit of financial success in the private marketplace (Dart 2004; Di Domenico et al. 2010; Mair and Martí 2006; Esposito 2012). Social enterprises put into practice the triple bottom line principle, which identifies three areas of focus: profit, people and the planet, instead of profit alone. Pearce (2003) names the prevalent areas of business of social enterprises: trading; service delivery contracts; cross-sector partnerships; culture and the arts,

community development, education and employment skills training; child-care provision; community safety schemes; low-cost transport; recycling; and infrastructure and subsidized housing.

Definitions of social enterprise vary between countries and are a product of the different political regimes and traditions of the countries from which they originate (Kerlin 2006). Bacq and Janssen (2011) compare researchers from different geographical origins, who use different approaches to define the concepts. American studies focus their attention on the importance of the social entrepreneur as an individual and on his/her characteristics, and therefore they argue that social enterprises will survive by conducting profit-generating activities in order to finance social value creation. They do not impose any constraints regarding legal form and profit distribution. Conversely, European studies create a specific legal framework for social enterprises to protect the primacy of the social mission.

In this field, the Italian definition of social enterprises is provided by the Law on Social Enterprises (Legislative Decree no. 155/2006) and the Law on Social Cooperatives (Decree no. 381/1991), which set out specific requirements. For example, the Law on Social Enterprises (Law no. 155/2006) stipulates that a social enterprise must generate at least 70% of its income from entrepreneurial activities—for example, the production and sale of socially useful goods and services. Therefore, to be a social enterprise in the eyes of the law, a business can only operate within certain defined sectors. These include: social services; health care; education; environmental conservation; cultural heritage; social tourism; and support services to social enterprises supplied by entities which are at least 70% owned by social enterprises. Its operations are restricted to the furthering of its social purpose and it cannot distribute profit. Profits must be used to either further the primary activity of the organization or to increase its capital.

In contrast, the European Commission does not restrict social enterprises to a single legal form and defines a social enterprise as an operator in the social economy whose main objective is to have a social impact rather than to make a profit for its owners or shareholders. It operates by providing goods and services for the market in an innovative entrepreneurial way and uses its profits primarily to achieve social objectives. It is managed in an open and responsible manner and, in particular, involves employees, consumers and stakeholders affected by its commercial activities. The interpretation of what constitutes a social aim varies from a

narrow focus on work integration to broader societal and environmental goals including such areas as renewable energy and fair trade. In particular, on the basis of existing sectorial classification, social enterprises' activities are (European Commission 2015, p. 5):

- social and economic integration of the disadvantaged and excluded (such as work integration and sheltered employment);
- social services of general interest (such as long-term care for the elderly and for people with disabilities; education and child care; employment and training services; social housing; health care and medical services);
- other social and community services: for example, counselling, youth outreach, microfinance, temporary housing for homeless;
- public services: for example, maintenance of public spaces, transport services, refuse collection, rehabilitation of ex-offenders;
- land-based industries and the environment: for example, reducing emissions and waste, recycling, renewable energy;
- cultural, tourism, sport and recreational activities;
- practising solidarity with developing countries (such as promoting fair trade).

Even if the object of this study is not to provide a review of all academic and legal definitions of what constitutes a social enterprise, it is clear that broader criteria need to be used to identify the characteristics of a social enterprise.

2.2 Financing of Social Enterprises

Despite their efforts to make changes in society, social entrepreneurs stand at disadvantage in bridging the financing gap in their seeding stage (Lehner 2013; Miller et al. 2010). Financial needs vary according to their level of development (conceptual support, development of pilot projects or prototypes, large-scale development) and sector. Also, financing instruments for social enterprises range from grants and debt capital, common for non-profit organizations but also available for social enterprises, to equity capital, debt capital and mezzanine capital, common for for-profit companies but available for social enterprises as well. Social enterprises are typically less grant-dependent than their traditional third sector counterparts. They rely on external financing markets to pursue a

self-sustainable financing strategy. Hence, the growth and development of the sector is crucially dependent on well-functioning finance markets. Unfortunately, access to finance has been identified as one of the biggest obstacles to the continuous development of the sector (Brown and Murphy 2003; Perrini and Marino 2006; Bugg-Levine et al. 2012).

Social enterprises appear to be less attractive to traditional capital providers, such as banks, venture capitalists or private equity investors. Literature highlights different ways for social enterprises to raise money and various subjects involved in this process. Reviewing Larralde and Schwienbacher (2012), Lehner (2013) identified different types of investors: social banks, government agencies, bootstrapping techniques and donations. Other intermediaries are hybrid partnerships of ethically and environmentally oriented banks and mainstream financial institutions: impact investment funds that explicitly aim to create a positive impact beyond financial returns, or social impact bonds that pioneer new ways of combining public and private funding.

On the demand side of the social finance market, there are a growing number of investors who seek to use their capital to achieve economic, social, cultural and environmental objectives. The decision-making criterion for investment is social return on investment (SROI) but social impact value is actually the most important principle. Usually social investors are patient and generally willing to accept below-market financial returns, at least over the short term, because they expect their money to generate a social benefit before yielding returns. Spiess-Knafl and Jansen (2013) categorize three types of potential investors from which social enterprises can raise funds: investors with market-rate financial return expectations, focused almost exclusively on financial returns but considering social issues as a constraint in their investment decisions; investors with reduced financial return expectations, for example clients of ethically oriented banks using special saving accounts; and investors without financial return expectations, who focus on the social mission and do not demand financial returns in exchange for their investment.

Crowdfunding investors' motivations could be the same as those of these last two types of investors. Social investors range from angel investors or high-net-worth individuals to funders of large-scale initiatives. Crowdfunding in all its models has enlarged the audience for social investment.

2.3 Equity Crowdfunding and Social Enterprises' Needs

Funding of companies and sustaining innovation through the crowd has been discussed intensively since 2010 and explored in practice and theory. A group of studies have aimed to define and classify the crowdfunding model. In fact, it is widely accepted now that there are four crowdfunding models: reward-based crowdfunding, lending-based crowdfunding, donation-based crowdfunding and finally equity-based crowdfunding. The donation-based model, in particular, provides a large number of financial instruments for social enterprises (Larralde and Schwienbacher 2012), but in view of investors' motivations and the characteristics of crowdfunding, other models cannot be marginalized.

The nature of social enterprises is closely related to the motivations of crowdfunding investors and proponents. From the investors' perspective, Lehner (2013) maintains that crowd investors typically do not pay much attention to business plans, concentrating instead on the firm's ideas and core values, and thus its legitimacy: this is why crowdfunding could be an answer to the financing needs of social ventures. In particular, crowdfunding investors enjoy some additional utility over other regular consumers and they value the feeling of belonging to a group of "special" individuals who contributed to the very existence of the product (Belleflamme et al. 2014). Gerber and Hui (2013) identify the motivations for participation in crowdfunding campaigns: to support creators and causes by confirming values, and to seek rewards and strengthen connections with people in their social networks. From the proponents' perspective, Bernardino and Santos (2016) highlight that proponents' personality traits influence the decision to finance social projects through crowdfunding, especially the conscientiousness personality trait that refers to responsibility and reliability.

Given the fact that entrepreneurial financing is characterized by a relationship where external investors possess incomplete and imperfect information compared to the entrepreneur, one solution for the better informed party is to disclose information about unobservable characteristics and send signals of quality to the less informed one. A group of crowdfunding studies have investigated which signals can facilitate fund-raising success (Agrawal et al. 2014; Mollick 2014; Marelli and Ordanini 2016; Ralcheva and Roosenboom 2016; Courtney et al. 2017). In particular, equity crowdfunding research highlights the presence of a professional investor, the percentage of equity offered, and the planned exit strategies (Ahlers et al. 2015; Moritz et al. 2015;

Hornuf and Neuenkirch 2016; Vismara 2016; Lukkarinen et al. 2016). Sustainability orientation in projects is also a signal of additional legitimacy for the crowd and influences campaign success (Dart 2004; Lehner and Nicholls 2014). Calic and Mosakowski (2016) show that sustainability-oriented projects experience greater levels of crowdfunding success, relative to commercial-only entrepreneurs. Therefore, they are likely to receive higher total pledge amounts. The study was conducted on Kickstarter, the most famous, widely used international reward-based platform. Another important signal in some forms of social enterprises is the limit on monetary motivation for owners, which can be seen as a strong signal that the owners give significant weight to quality of outcome and less to monetary gains (Lehner 2013).

The connection between social enterprises and crowdfunding in the literature continues to be very limited, and although the reward-based model and donation are known, nobody has explored the equity crowdfunding model for social enterprises as yet. Equity crowdfunding could be an opportunity for financing social ventures.

One reason lies in the large number of shareholders participating, which may bring benefits for social ventures, by improving external legitimacy and refining the approach to the social needs, generating greater effectiveness (Lehner 2013). Another reason is that equity crowdfunding may amplify and extend social change through the business scalability of social entrepreneurial ventures. In fact, crowdfunding is not only a means of bridging the equity gap but also has other advantages for firms, such expanding awareness of their work, attracting media attention and providing connections (Gerber and Hui 2013). In the case of social enterprises, shareholders could be also consumers and thus enlarge the firm's market base, increasing the diffusion of social innovation. Finally, social enterprises make extensive use of social networking strategy to increase stakeholders' participation as a means of expanding their governance structures, to generate new contacts and links with key market players (Haobai et al. 2007; Johannisson and Olaison 2007). Also in the crowdfunding context, social networking and the entrepreneur's social capital are two key factors that influence campaigns' success, helping to fill the asymmetry gap and facilitating fund-raising (Mollick 2014; Colombo et al. 2015; Marelli and Ordanini 2016; Skirnevskiy 2017; Butticè et al. 2017). Crowdfunding may be an instrument not only for strengthening social entrepreneurs' strategic tools and improving their networks but also for promoting business scalability.

3 The Italian Equity Crowdfunding Market

The Italian equity crowdfunding market has grown rapidly since 2013, with an average growth rate of 73%. There were more than 40 campaigns in 2016 and we recorded 45 campaigns during January–August 2017: 31 of them have already been completed and 14 campaigns are currently still open.

In the Italian equity crowdfunding market 22 portals have been authorized, but only 15 have operated in the market: 2 have shut down, 6 are authorized but still not operating and 1 portal closed without presenting a campaign. Although the number of platforms is high, some of them have run more than 20 campaigns each, while others have held far fewer campaigns. The equity crowdfunding market appears to be concentrated: the Herfindahl-Hirschman Index for campaigns per portal is 0.34. The target amount for the 104 initial crowd offerings closed is almost €32 million. About 60% of campaigns have been successful and have raised €14.4 million.

The characteristics of the 101 issuers vary widely. More than 50% of them operate in the ICT sector (using a broad definition of ICT). On a geographical basis, 60.3% of issuers are from northern Italian regions, 20.3 of issuers are located in central Italy and only 15.8% of them are located in the South. In most cases, issuers are start-ups: 93 out of 101 cases are five years old and less. On average, when issuers decide to undertake a crowd offering campaign, they are relatively young: the average time between the year of the crowd offering and the year of the establishment of the business is 2.33 years.

Campaign types vary. On average, campaigns last about three months (93 days). The average target amount (which also includes the share premium) observed on the Italian equity crowdfunding market is € 297,976.

4 Data and Results

4.1 Sample

This research focuses on the Italian equity crowdfunding market. The major novelty of this work lies in the original data set it adopts. Data about Italian equity crowdfunding campaigns were collected by the authors in an ongoing process which has lasted since 2013, constantly monitoring the campaigns published on all Italian platforms. Previously,

collecting data about equity crowdfunding projects was a major hurdle in this field, because platforms generally delete information about past projects, especially in the case of non-funded ones. Thus, our data set is unique and generates an updated picture of the state of the art of the Italian equity crowdfunding market, with data referring to the whole set of campaigns that have taken place in Italy.

As of August 2017, 118 campaigns had been published and 104 of them had been completed: these campaigns are the sample for our analysis. However, in the rest of the paper, we will consider only 101 out of the 104 total campaigns due to the fact that two issuers completed more than one campaign each (three and two campaigns, respectively).

Out of the sample of 101 issuers, we identified issuers with a socially oriented business. In defining social enterprises, we refer to two different descriptions: strictly social issuers (SSIs), corresponding to the Italian legislation's definition, and broadly social issuers (BSIs), or firms that engage in socially oriented business as defined by the European Commission's broader guidelines. We checked issuers' areas of business by examining the articles of association, trade register extracts and business plans of every company in the sample.

According to the company profiles, only 6 out of 101 cases can be classified as SSIs. Under our broader definition, the number of issuers with a socially oriented business significantly increases: actually 23 out of 101 (namely, 22.8% of the total). Thus, Table 1 singles out three different types of enterprises: non-social, broadly social and strictly social. This classification will be adopted in the rest of the analysis. Table 1 also reports the distribution of issuers by geographical area. Across the northern regions, there are a large proportion of non-social issuers, while in central and southern regions the relative share of social issuers is larger.

Our concept of social enterprise does not seek to replace the concepts of the non-profit sector *strictu* sensu; rather, it is intended to bridge these two concepts, by focusing on enterprises that pursue social aims.

In our selection, we do not consider a harsh distinction between commercial and social enterprises, because traditional business companies are incorporating social impact aims in their strategies and non-profit organizations are also increasingly adopting strategies and behaviours from the business sector (Maurer et al. 2011; Wilson and Post 2013). In addition, institutional theory analysis suggests that social enterprise is likely to continue its evolution with a more narrow focus on market-based solutions

Table 1 Social and non-social issuers, according to different definitions, by geographical area

Number				
Issuers	*Total*	*North*	*Centre*	*South*
Non-social issuers (NSIs)	**72**	48	14	10
Broadly social issuers (BSIs)	**23**	11	7	5
Strictly social issuers (SSIs)	**6**	2	3	1

and with a pro-market approach, because of the broader validity of this business model in the social environment (Dart 2004). Ownership and legal status are also not the defining criteria.

By socially oriented business, we refer to corporate missions and activities: for example, we consider whether the project benefits and operates in those sectors that can improve social and economic integration, health care, environment, cultural, tourism, sport and recreational activities as the European Commission states. Environmental purposes are also considered as closely linked to social orientation (Thompson et al. 2011).

4.2 Variables

We focus on several key variables related to the issuers and the campaigns. The selection of the variables follows the studies by Vismara (2016) and Lukkarinen et al. (2016).

The share capital before the issue (SHARE CAPITAL) is the nominal face value of total outstanding shares.

The number of shareholders (SHAREHOLDERS) is the number of shareholders before the issue.

The number of administrators (ADMINISTRATORS) is the number of shareholders involved in the company's administration.

The target amount (TARGET AMOUNT) is the capital outstanding offered (the sum of nominal face value and share premium).

The share premium account (SHARE PREMIUM) is the difference between the value at which the shares were issued by the company and their nominal face value.

The percentage of share capital offered post-campaign (% SHARE CAPITAL POST-CAMPAIGN) is the ratio of the amount of shares offered to total share capital after campaign.

The minimum investment (MINIMUM INVESTMENT) is the minimum amount of money (in euros) that an individual can invest to participate in the campaign.

The number of non-professional investors (NON-PROFESSIONAL INVESTORS) is the number of backers that participate in the campaign.

4.3 Characteristics of Broadly Social Issuers and Strictly Social Issuers

BSIs and SSIs represent more than a quarter of the total number of issuers. Table 2 returns some important features that characterize these types within the Italian equity crowdfunding market.

Almost all SSIs and BSIs are start-ups and their level of share capital is close to the minimum set by law. Even though the level of share capital is low, the target amount is high, averaging eight times share capital value, due to a high premium share. Indeed, the share capital of the equity crowdfunding campaign is, on average, about 25% of the share capital after the campaign. The specific feature pinpoints the request for a price premium from the market in recognition of the quality of the business idea owned by the enterprise. Even if the minimum investment is low to encourage the widest participation of investors in the campaign,

Table 2 Summary statistics of broadly social issuers (BSIs) and strictly social issuers (SSIs)

	BSIs (23)		*SSIs (6)*	
	Mean	*Median*	*Mean*	*Median*
Share capital before the issue	42,962	11,194	3037	10,7928
Shareholders	6.43	5.00	5.17	2.50
Administrators	2.52	3.00	1.67	1.00
Target amount	295,537	240	247,383	175
% of share capital post-campaign	21.50	16.00	28.71	17.15
Share premium	130.74	39.00	88.08	61.00
Minimum investment	569.72	460.00	276.94	150.00
Non-professional investors	27.75	15.50	31.40	17.00
Average investment	9704	3201	33,750.75	4264

especially for SSIs, neither type of issuers attracts a high level of participation from non-professional investors.

When considering each single variable, we performed One-Way ANOVA (Analysis of Variance) tests to assess whether average values are statistically different among non-social issuers, BSIs and SSIs. Preliminarily, Levene's test is computed to test whether groups' variances are equal.[1] Data suggest that no significant differences are found across the number of issuers considered here. The Kruskal–Wallis test was also estimated with regard to median values, to allow a statistical comparison of the median values among observed groups. Unfortunately, no significant differences are identified among the groups.

The limited sample and the high level of heterogeneity of the enterprises having recourse to equity crowdfunding affect the statistical significance of the mean and median values.

4.4 Equity Crowdfunding and Social Orientation Effect

The second aim of our analysis is to assess the relevance of some variables for the campaign's success. In particular, we try to verify whether the success of the campaign is influenced by the characteristics of the issuers, and in particular by the social orientation of the issuers.

Table 3 returns the main results of two logit models, computed on the whole set of campaigns run in the Italian equity crowdfunding market. In both models, the dependent binary variable is represented by the success of the campaign. Among the selected independent variables, the models control for some of the most traditionally used characteristics in equity crowdfunding literature. In particular, two models are defined as follows:

$$\begin{aligned} logit\, p(success) = {} & \beta_0 + \beta_1 \log(Share\ capital) + \beta_2 Shareholders + \beta_3 \log(Target\ amount) \\ & + \beta_4\, Age\ of\ the\ issuer + D_{geo} + D_{type\ of\ issuer} \end{aligned} \tag{1}$$

$$\begin{aligned} logit\, p(success) = {} & \beta_0 + \beta_1 \log(Share\ capital) + \beta_2\, Administrators \\ & + \beta_3 \log(Target\ amount) + \beta_4\, Age\ of\ the\ issuer + D_{geo} + D_{type\ of\ issuer} \end{aligned} \tag{2}$$

[1] If groups' variances are equal, simple F test for the equality of means in a One-Way ANOVA is performed; otherwise, Welch (1951) method is adopted.

Table 3 Success of the issuers: logit models

	Model_1	*Model_2*
Intercept	3.311	2.679
	−3.825	−3.955
Log (SHARE CAPITAL)	**−0.261***	**−0.243***
	(0.142)	(0.129)
SHAREHOLDERS	0.059	
	(0.044)	
ADMINISTRATORS		**0.426****
		(0.184)
Log (TARGET AMOUNT)	−0.021	−0.036
	(0.329)	(0.334)
AGE of the issuer (in years)	0.083	0.041
	(0.082)	(0.083)
GEOGRAPHICAL LOCATION (Centre+South)	−0.606	−0.491
	(0.451)	(0.454)
DTYPE OF ISSUERS:	−0.758	**−1.017***
Diff. BSIs—NSIs		
	(0.528)	(0.553)
Diff. SSIs—NSIs	0.481	0.507
	(0.955)	(0.959)
Deleted obs.	1	1

Standard errors in parentheses
Signif. codes: ****0.001, ***0.01, **0.05, *0.10

where:

D_{geo} is a dummy, which is equal to 0 for issuers located in northern regions and to 1 for issuers located in central and southern regions;

$D_{type\ of\ issuer}$ is a categorical variable, which assumes three levels, disentangling NSIs, BSIs and SSIs.

The number of shareholders is not significant in Model 1, while in Model 2 the number of administrators is positively associated with the success of the campaign. The presence of a team or more than one administrator in the board of the company seems to reassure investors and to influence the likelihood of the campaign's success.

As specific variables, both models also include the degree of social orientation of the issuers, here considered as categorical variables, with three levels: NSIs, BSIs and SSIs.[2]

[2] In Table 3 both models do not show the non-social issuers level. Coefficients for BSIs and SSIs refer to the respective differences with that level.

When controlling for the aforementioned variables, the social orientation of the issuer seems to play a role in explaining the success of the campaign.[3] Especially in Model 2, BSIs show a lower rate of campaign success than NSIs, although statistical significance is weak. No significant results are returned when considering SSIs. According to these findings, we may assume that equity crowdfunding is not particularly suitable for social issuers.

When considering other control variables, one unexpected finding is linked with the share capital. In contrast to the financial literature (Ross 1977; Leland and Pyle 1977), a lower equity value increases the likelihood of the campaign's success. The negative sign here seems to be associated with the fact that equity crowdfunding is a particularly useful tool for start-ups, which have a low amount of share capital. In fact in a large number of cases (41 out of 101 observations), the share capital is close to the minimum amount required (€10,000).[4]

In both models, the other control variables—geographical location, age of the issuers and target amount—are not significant.

5 Conclusions and Research Implications

Equity crowdfunding is an emerging financing tool that can help social start-ups and firms to collect people and resources around a project. This study is one of the first to explore equity crowdfunding for social enterprises. In this paper, we look on the one hand at the characteristics of social firms which have had recourse to equity crowdfunding and on the other hand consider whether equity crowdfunding could help social firms to bridge their equity gap. We view crowdfunding as a complementary financing channel useful for promoting innovation and social change by cutting down the traditional features of financial investment. Although the Italian equity crowdfunding market is in its infancy, the growth rate has been increasing since 2013.

[3] In Annex 1, correlation coefficients of the selected variables are returned (Table 4).

[4] The number of issuers with capital above €100,000 is 28 out of 104. The remaining number of issuers has capital between €10,000 and €100,000.

About one quarter of equity crowdfunding campaigns have concerned social enterprises, both BSIs e SSIs. The results suggest that, so far, the Italian equity crowdfunding market does not seem appropriate to support the financial needs of this type of firms. Given that the market is still in its initial phase, it is not yet possible to understand whether this derives from the characteristics of social enterprises or from the characteristics of the market. In fact, differences between social issuers, both BSIs and SSIs, and NSIs, are not significant.

In our study, we confirm results reported by other researchers that pinpoint the difficulties for social enterprises in raising money. Therefore, from a practical perspective, consistent with previous studies, our research may suggest that equity crowdfunding is not suitable for this kind of firms, so other models may be considered, for example donation and reward-based crowdfunding models (Calic and Mosakowski 2016).

Moreover, even if equity crowd investors' motivations are also include the desire for better financial returns on their investments, financial aspects do not influence the likelihood of campaign success. We do not rule out the possibility that non-financial aspects may also play a role in this decision such as: the presence of a video, proponent's sympathy and authenticity. Private equity investments and business angels' decisions are also driven by other factors apart from financial ones. For example, personal factors, enjoyment and fun, rather than return (Hall and Hofer 1993; Mason and Rogers 1997; Mason and Harrison 2008). In this vein, future research could extend the aspects of campaigns studied to include non-financial ones and test their effects on funding success.

From a theoretical perspective, these results encourage future research into improving the potential of equity crowdfunding for social enterprises, extending both the size of the data set and the number of countries considered. Future research could also shed light on platforms' characteristics and the financing objectives of social investors, in particular how investors' willingness to support the same social project changes on reward-based and equity-based platforms or on a dedicated socially oriented platform.

Annex 1

Table 4 Correlation coefficients: selection of variables

	Share capital	*Shareholders*	*Administrators*	*Target amount*	*% of social capital offered*	*Share premium*	*Minimum investment*
Share capital	1	0.059	0.094	0.098	−0.145	−0.038	0.026
Shareholders		1	0.326	0.050	−0.247	0.006	−0.091
Administrators			1	0.201	−0.114	−0.113	0.142
Target amount				1	0.233	0.008	0.132
% of social capital offered					1	−0.079	0.292
Share premium						1	0.235
Minimum investment							1

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Index

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