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The Evolution of Insurance Regulation in the EU Since 2005

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9.1 Introduction

While the consequences of the 2008 financial crisis seem to roll away, with many countries either back to growth or facing different problems, there is still a common tendency to blame the financial sector for the grim economic situation of the Eurozone, as if every financial institution bore a portion of liability for high unemployment, low investment and poor economic outlook. Some seem even more liable than others: in a report to the G20 members, the International Monetary Fund (IMF) (2009) chose to study the cases of Northern Rock, Lehman Brothers and American International Group (AIG). Is this to say that the insurance sector is responsible for *one-third* of the misfortunes of the time? This would be highly questionable. Nevertheless, there is a widespread idea that strong regulation of the insurance sector is needed to improve overall welfare. In the European Union (EU), the legal framework has shifted from the "Solvency I" set of third generation EU directives (2002/13/EC for non-life insurers and 2002/83/EC for life insurers) implemented in

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2004 to Solvency 2 (S2), passed in November 2009 as directive 2009/138/EC, eventually implemented from 1 January 2016 after many delays. Meanwhile a European Insurance and Occupational Pension Authority (EIOPA) was created in 2010 together with banking (EBA) and market (ESMA) counterparts to enforce the law and supervise the corresponding actors. To what aim?

The International Association of Insurance Supervisors (IAIS) issued in 2011 "insurance core principles" (later ICP) defining the objectives of supervision: "maintaining a fair, safe and stable insurance sector for the benefit and protection of the interests of policyholders" (IAIS 2013c p. 4). Decoding is needed to understand that "fair" is related to market or conduct regulation, "safe" to solvency regulation and "stable" to the system-wide consequences of firm-level problems, hence systemic risk.[1] The EU Commission, on the other hand, takes into account a broader picture, where regulation aims at economic growth and employment through adequate microeconomic incentives (DG ECOFIN 2007). European regulation, though, must also develop the European single market, while the insurance sector still appears fragmented at country level. A true European insurance market is needed to enable students and workforce to move freely inside the EU; it would make local innovation available at EU level; it would thus benefit employment and growth.

In order to analyse in due detail the aforementioned themes, the remainder of the chapter is organized as follows: Sect. 9.2 deals with market regulation; Sect. 9.3 is concerned with solvency; Sect. 9.4 with systemic risk; Sect. 9.5 summarizes the costs of regulation and their consequence; while Sect. 9.6 looks at the consistency of the whole and offers some further developments and alternatives.

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9.2 Market Regulation

Market regulation is related to business conduct, comprising both business-to-business and business-to-consumer relationships. We will review price regulation (Sect. 9.2.1) and explicit consumer protection (Sect. 9.2.2) before

[1] The recent reference paper on insurance regulation in the *Handbook of insurance* (Klein 2014) uses different words to address the same issues: "(1) catastrophe risk, (2) competition and (3) systemic risk," with catastrophe being connected to solvency, competition to market and conduct and systemic risk being obvious. See also recital (16) of S2: "The main objective of insurance and reinsurance regulation and supervision is the adequate protection of policy holders (…) Financial stability and fair and stable markets are other objectives of insurance regulation."

turning to solvency, which can be understood as a particular form of consumer protection.

9.2.1 Price Regulations

Back in the 1980s or early 1990s, insurance firms were in many continental European countries under close supervisory tutelage since EU member states could introduce "laws, regulations or administrative provisions concerning, in particular, approval of general and special policy conditions, of forms (…) of premiums…" (Dir. 1988/357/EC on non-life insurance art. 18, Dir. 1990/619/EC on life insurance art. 12). The 1992 Directives terminated this "interventionist era" and abolished prior approval of prices and forms (see especially art. 39 of Dir. 1992/49/EC on non-life and art. 29 of Dir. 1992/96/EC on life insurance). By that time, 31 US states also had prior rate approval for automobile insurance (Harrington 2002 p. 292). The rationale for the EU's liberal move was the inefficiency of prior approval; as Harrington later brilliantly summed up: "There is little or no evidence that prior approval on average has a material effect on average rates for any given level of claim costs. This finding is consistent with an inability of rate regulation to reduce average rates materially and persistently in competitively structured markets without significantly reducing product quality or ultimately causing widespread exit by insurers" (Harrington 2002 pp. 310–311).

In fact, some marginal price regulation remained, such as the compulsory "bonus" system in France (*code des assurances* A. 121); the basic idea behind it was to allow comparison of prices over time, a feature now rendered useless by Internet price comparison sites and on-demand contract termination (enabled by the recent 2014-344 law on consumption in France). The strongest point on pricing policy, though, was made by the European Court of Justice ruling of 1 March 2011 in the Test-Achats case (C-236/09), which gave insurers until 21 December 2012 to change their pricing policies in order to treat individual male and female customers *equally* in terms of insurance premiums and benefits. The scope of the ruling has since then been thought (Rego 2015) as encompassing all topics covered by Article 21 of the Charter of Fundamental Rights of the European Union (2000/C 364/01): "Any discrimination based on any ground such as sex, race, colour, ethnic or social origin, genetic features, language, religion or belief, political or any other opinion, membership of a national minority, property, birth, disability, age or sexual orientation shall be prohibited." It is now uncertain whether place of residence will remain a valid basis for price discrimination after the EU

commission decided in July 2015 to probe Eurodisney for charging Northern European customers more (Barker 2015). But the general idea is this: the supervisor is no longer supposed to decide on insurance prices; only the principles of pricing policy are amenable to regulation according to general non-discrimination principles.

The overall effect of the liberalization of insurance marketing since the 1990s seems quite satisfactory. Table 9.1 shows that the price of insurance grew overall at almost the same pace as general inflation, with property-casualty insurance (as exemplified by dwelling and transport insurances) even slower than Consumer Price Indices, and health insurance growing faster since health expenses outpaced other consumption items in the EU. Appendix 9.1 shows that prices in the EU grew not as fast as in the European Economic Association, for instance, indicating that EU regulation could be better than its neighbour countries'. Now if we look at price convergence in the EU, the Eurostat Harmonised Index of Consumer Prices (see Appendix 9.1) is not precise enough, since it provides only variations, not absolute levels; hence all we can learn is that Eastern Europe (apart from Romania and Bulgaria) experienced a relative fall in prices, which can be interpreted as convergence toward Western European prices. It seems difficult to go farther than this conjecture, since average price for insurance contracts computed by most member states' insurance associations do not feature the same guarantees from one country to another. Overall, the general moderation of prices tends to show that competition is working better than under the previous overdone supervision. Until recently, academic evidence interpreted the Internet as a disciplining device: Brown and Goolsbee (2002) had shown that the use of the Internet significantly reduced the price of insurance products which were offered through online channels, and hence were amenable to easy comparison. This evidence has been recently challenged by theoretical papers (Edelman-Wright 2015; Ronayne 2015), which proved that price comparison websites do not warrant the desirable properties of perfect competition (e.g. a unique price for a given service); furthermore these sites add their margin to the price paid by the consumer, which has a significant negative welfare impact. The combined effect has to be taken into account, not before business models in distribution are stabilized after further innovation likely to happen in the coming years.

Table 9.1 Evolution of insurance prices 1996–2014 as percentage of CPI

Average	Dwelling	Health	Transport	Other
104.26	91.07	164.43	99.58	186.86

Source: Eurostat, HICP COICOP CP125

Our inquiry so far proves that consumer protection issues have changed dramatically since the 1980s: with increased competition, overpricing is no longer a concern for the supervisor. Concern remains on misinformation and misselling on the one hand dealt with by "conduct authorities," while on the other hand "prudential authorities" focus on solvency (Sect. 9.3, below), which might become an issue when contracts are underpriced (see also Plantin and Rochet 2007).

9.2.2 Consumer Protection

Most new rules pertaining to consumer protection are related to information: S2 articles 183 to 186 list precisely what information should be included in the contracts. Moreover, the Packaged Retail and Insurance-based Investment Products (PRIIPs, Regulation EU1286/2014) defines the set of key facts (assembled in a Key Information Document or KID), which should be provided to retail customers by investment product manufacturers; the number of pre-sale obligations also rise (from 29 to 102 according to Insurance Europe). The Insurance Distribution Directive (Directive EU 2016/97 due for implementation in national law in 2018) will force brokers to disclose the incentives and remuneration given to them by insurance companies. This normative approach is in fact different from prior form approval, as it existed before 1992, since consumer information is now in a process of being harmonized among member states, not the contractual clauses themselves.

It should be emphasized that a common legal framework does not imply uniform supervision, as recent history has shown: the appointment of Martin Wheatley as head of the Financial Conduct Authority of the United Kingdom in 2011 was seen as a symbol of an especially tough stance, which now seems to have reached its limits in the UK (FT 2015). Martin Wheatley had a personal record of solving a difficult case at Hong Kong's Securities and Futures Commission, where thousands of savers lost money in complex structured products linked to Lehman Brothers. George Osborne, the UK Chancellor of the Exchequer, chose him to broker a solution in the Personal Protection Insurance (PPI) misselling crisis, as more than 1 million complaints have already been filed against intermediaries for various misselling of these products (which were usually sold to people who already enjoyed an income insurance in case of illness or unemployment, or were sold on wrong promises). The boss of the Financial Conduct Authority (FCA) set up a simplified process, which enabled the plaintiffs to get their money back (FCA 2014). As of May 2016, more than 15 million complaints have been filed, leading to more than £23.8

billion in redress being paid since 2011.[2] Never had such a large sum been paid as the result of a financial regulator's decision. The need for funding led to price increases in the UK (see Appendix 9.1), which appeared to be detrimental to the consumer in the long run; this ultimately led Wheatley to resign.

The punitive approach is still fashionable on the Continent, especially in France, where every foreign example is followed rigorously:

1. the French Conseil d'Etat decision n° 353885 (23 July 2012) about loan insurance mimics the FCA approach to PPI,
2. the French and Belgian action in favour of dormant life insurance contracts is inspired by the reparation of Nazi Germany crimes against the Jews.

In France, complaints against loan insurance are very common, and the PPI is a regular reference among commentators. There is an undeniable problem as competition between banks crushed their profit margins, so most of the money they make when lending is on loan insurance: a typically perverse situation which has led to many complaints. In 2012, the Conseil d'Etat eventually settled the pending cases by deciding that (1) a section of the *code des assurances* (article A. 331–3) was illegal before an ordinance of 23 April 2007 was issued to correct the problem; and (2) no redress was to be awarded, since decision 307089 of 5 May 2010 by the same Conseil d'Etat had already established that only a clause in the contracts (which was banned by the aforementioned article A. 331–3) could have justified such redress. In the end, the Conseil did not go far enough to make the State liable for its past error, but the symbolic aspect of the decision was widely commented upon.

The French and Belgian action about dormant life insurance contracts has its origin in the action taken in reparation for Aryanization by Nazi Germany. An International Commission on Holocaust Era Insurance Claims was set up in 1998 (ICHEIC 2007b), which eventually permitted the award of more than $300 million to 48,000 claimants (ICHEIC 2007a). In Europe, the Directive 2002/83/CE included some provisions to enable the claims to be processed; they were translated in France by law 2005-1564 15 December 2005 and in Belgium by the 24 July 2008 law, after an independent commission reported on the extent of looting of Jewish property during the war (Buysse 2008). Hence a one-off reparation of past injustices led to a permanent jurisprudence with non-negligible consequences: in France alone, two more laws were passed to settle the case of dormant insurance contracts (law 2007-1775,

[2] https://www.fca.org.uk/consumers/financial-services-products/insurance/payment-protection-insurance/ppi-compensation-refunds.

17 December 2007 and 2014-617, 13 June 2014). Media coverage boasted billions retained by the insurers while the vice-president of the supervisor (ACPR, the *Autorité de contrôle prudentiel et de résolution*) claimed the insurers to have behaved "scandalously" (Le Monde 2013), but no formal impact assessment was performed; in the end, the French legal provisions organize the custody of dormant contracts via the state-owned *Caisse des Dépôts* before they are taken over after 20 years: the State is so much concerned by customer protection that it has appointed itself as perpetual trustee. Apart from these good intentions, the main result for the time being has been administrative penalties imposed upon some insurance companies by ACPR, the largest so far in French history.[3]

* * *

Since the liberal reform of 2002, Europe has been relying on effective competition to achieve price discipline in the insurance sector, with apparent success. Consumer protection is now seen by European authorities as provision to the prospect or consumer of exhaustive product information. Recently, some national insurance supervisors or regulators have taken a tougher stance, which contrasts with a legal approach aimed at European harmonization. Let us look now more precisely at the solvency regulation, which is designed to enforce the policyholder's right to indemnification.

9.3 The Solvency II Process

The S2 regulatory package contains provisions for consumer protection, but as the name implies, its main focus is on solvency. We introduce the objectives and features of the regulatory package (Sect. 9.3.1) before we review the positive aspects (Sect. 9.3.2) and the more controversial, still unsolved issues (Sect. 9.3.3).

9.3.1 Objective and Features of the Solvency II Package

The proposed directive was introduced with an accompanying document (EC 2007) that looks like an extended set of recitals, stating four weaknesses of the then current regulatory regime and four objectives for the planned one:

[3] €10 million for Cardif on 7 April 2014, €40 million for CNP on 31 October 2014, €50 million for Allianz on 19 December 2014.

1) Weaknesses of existing regime

   a) (**w1**) Lack of risk sensitivity (the capital requirement of Solvency I was a function of premia or claims, not of the effective risk faced by insurance institutions);
   b) (**w2**) Restriction of the single market (Solvency I "sets out minimum standards that can be supplemented by additional rules at national level") ;
   c) (**w3**) Insufficient supervision of conglomerates and groups;
   d) (**w4**) Lack of convergence with both the banking regulation (i.e. Basel) and the international standards (as promoted by the International Association of Insurance Supervisors) leading to the possibility of regulatory arbitrage.

2) Objectives of planned reform

   a) (**o1**) Deepen the integration of the EU insurance market;
   b) (**o2**) Enhance the protection of policyholders and beneficiaries;
   c) (**o3**) Improve the international competitiveness of EU insurers and reinsurers;
   d) (**o4**) Promote better regulation;

3) One should now add

   (a) (**o5-r**), financial stability, which was not a major issue in 2007, but became the main concern of policymakers when the crisis broke out and took momentum.

While **o4** seems an obvious objective for any concerned lawmaker and **o1** seems to respond to **w2** by extending the scope of the EU regulation (thus leaving less to do at the national level to prevent regulatory arbitrage between countries), **o3** and **o2** might appear conflicting as the protection of policyholders raises the cost function of the insurers, while greater international competitiveness could only be achieved by extracting a higher profit from the domestic consumers. Alternatively, the idea behind the reform package is simply that insurance buyers are paying to be sure that they will get relief in case of an unfortunate event; in other words they are buying the insurance company's solvency. Better regulation (**o4**) can then warrant solvency (hence the name) and thus raise consumer satisfaction in order to improve insurer competitiveness.

The constraints **w4** and **w3** determine S2 to converge with the banking sector regulation to guarantee conglomerates are correctly monitored and to prevent regulatory arbitrage between sectors. Hence the architecture of the new reform looks very much like the then-in-force Basel II standards, with three "pillars"[4]:

- Pillar 1—quantitative (capital) requirements—includes market-consistent valuation of the balance sheet leading to a risk-sensitive (**w1**) assessment of capital requirements.
- Pillar 2—is relative to corporate and risk governance.
- Pillar 3—is concerned with disclosure and transparency requirements.

More precisely, Pillar 1 introduces deep changes with former practices:

1. All assets and liabilities obey a market consistent valuation (art. 75).[5] Insurance liabilities that cannot be valued using market prices are split into a best estimate (current estimate of expected cash flows, discounted using the risk-free yield curve) and a risk margin (costs of ensuring that the capital needed to support the insurance obligations, based on a cost-of-capital rate given by the supervisor).
2. Then a Solvency Capital Requirement or SCR is calculated as the sum of partial risks plus correlation factors. For every risk class, an assessment is made of the loss that may arise with a 0.5 % probability over the next 12 months[6]: this is the (100%–0.5 %=) "99.5% 1-year Value-at-Risk."

[4] Although neither the pillars themselves nor their designation appear in the Directive, every analytical introduction to Solvency II describes these pillars by analogy with Basel II.

[5] Prudential accounting standards are specific, albeit close to IFRS 4 "phase I," which are compulsory for listed companies and will be replaced by "phase II," likely to be implemented in 2019 after two exposure drafts in 2010 and 2013. For a comparison of the two standards, see Visser and McEneaney (2015).

[6] The solvency capital requirement is such that it must provide the insurance firm with enough of its own funds to absorb the operating loss that could occur 199 years out of 200 (if the financial future is consistent with the observed history since 1971). Conversely, there is only a one in 200 chance that the solvency capital requirement is not enough to overcome the operating loss.

This operating loss can be computed with an *internal model* authorized by the relevant supervisor or with the *standard formula* as the sum of partial risks (EIOPA 2014) broken down into three categories (basic SCR, operational risk and adjustment); BSCR features six modules and 35 sub-modules, every one being the Value-at-Risk at 99.5 % of the corresponding risk. The standard formula takes correlation into account, through the definition equation:

$$BSCR = \sum_{i=1}^{35} SCR_i + \sum_{i=1}^{35} \sum_{\substack{j=1 \\ j \neq i}}^{35} \sqrt{\rho_{i,j} SCR_i SCR_j}$$

or more generally

3. If the own funds (classified in three tiers according to their quality) are below SCR, then the supervisor should take appropriate action.
4. Minimum Capital Requirement (MCR) is a lower threshold[7]: if the own funds are insufficient to cover MCR, immediate and ultimate supervisory action is triggered.

Pillar 2 (art. 40–50) defines the central Own Risk Self Assessment (art. 45) and imposes strong requirements on the key functions (art 41–49: actuarial function, internal audit, internal control, risk management plus governance), which should be performed by fit and proper persons. **Pillar 3** defines specific prudential accounting standards as well as disclosure modes to the supervisor (art. 27–39, revised in Omnibus) and to the public (art. 51–56).
This important regulation had a mixed reception.

9.3.2 Positive Interpretation

By comparison with other regulatory frameworks, S2 was generally welcomed by academics. In particular, Doff (2008), Holzmüller (2009), Lorent (2010) among others, compared the planned reform to other frameworks by applying a set of criteria: EU solvency appears to clearly dominate the US regulations, and does marginally better than the Swiss in some respects, as their summary table shows.

These criteria, while being somewhat shared among insurance academic specialists, are not aligned with the Insurance Core Principles as defined by the IAIS, for instance (IAIS 2013c). There is some overlapping among the sets of criteria, though: for instance item 1 "getting appropriate incentives," in Holzmüller is connected to ICP7 (corporate governance) and ICP17 (capital requirements); item 2 is reminiscent of ICP16 (ERM for solvency purposes)[8]

$$BSCR = \sum_{i=1}^{35}\sum_{j=1}^{35}\sqrt{\rho_{i,j}SCR_iSCR_j}$$

where $\rho_{i,j}$ denotes the linear correlation coefficient between SCR_i (for sub-module i) and SCR_j provided by the supervisor.

[7] Article 129 of the Directive introduced calculation principles for the MCR, which were rather vague, and article 130 enabled the Commission to adopt implementing measures. The final rules (Delegated Regulation EU 2015/35 art 248–253) are far more complex than the usually alleged "1-year 85% VaR" of the original Directive. The most striking feature of the complete rule set is that MCR is not fully risk-sensitive. To be more precise, MCR is the maximum of a linear formula (involving mostly technical provisions of the company) and of 25 % of the SCR, capped at 45 % of the SCR.

[8] Cf. 16.16.13 "risk sensitive regulatory financial requirements should provide the incentive for optimal alignment of the insurer's risk and capital management and regulatory requirements."

and ICP17; item 3 is relative to preliminary impact assessment which should meet, among others, ICP17 at a micro level and ICP24 at a macro level; item 4 is also connected to ICP24; item 5 is related to ICP14 (valuation); and so on.

Preliminary impact assessment generally concluded that sound principles were correctly implemented by the projected reform, and that they would enable more effective competition and supervision, leading to healthier insurance firms and better pricing of products, hence a higher demand and consumption of insurance products, leading to enhanced consumer satisfaction with a positive impact on growth, as academic research such as Outreville (1990) and Webb et al. (1992) had shown. While "the direct *macroeconomic effect of Solvency II would be rather marginal*," the study ordered by the European Commission in 2007 concluded that the process would lead to better efficiency and better European integration of both the insurance industry and the financial markets (DG ECOFIN 2007). The ECB was more prudent in identifying possible short- to medium-term issues (see below Sect. 9.5.3). In the long term, though, the effect was to be positive for the aforementioned reasons. It should be emphasized that, in comparison with the Basel regulation for banks (see Pradier and El Khalloufi in Chap. 15, this volume), the impact studies were mostly qualitative, with no precise forecasting of impact on the EU economy.

The a priori impact assessments were then supplemented by a series of Quantitative Impact Studies (QIS) : five rounds have been carried out by the former insurance supervisor committee (CEIOPS) and voluntary insurers, from 2005 to 2010. The summary information shown in Table 9.2 deserves interpretation:

1) QIS and QIS2 were *reviews* intended to set up the methodology and new accounting rules. Hence not all participating firms were able to compute even the best estimate of insurance liabilities, let alone the probabilistic distribution thereof (needed to provide percentiles). Increased participation between QIS and QIS2 resulted in a falling response rate.
2) QIS3 and later were true calibration experiences, testing the practicability of the standard formula among various social forms, such as insurance groups and mutual insurers.[9]
3) In QIS4 and QIS5, a significant share of the participants used internal models, so that their output should be compared to the result of using the standard formula.

[9] QIS3 noted about the mutual insurers that a "severe fall was detected in their financial position and this might be an insolvable issue because of the limited possibilities these firms have in raising own funds" (p. 23). Additional reflection was thus devoted about the mutuals' specific capitals through supplementary member calls to be tested in QIS4.

Table 9.2 Summary of Quantitative Impact Studies

Exercise name	QIS	QIS2	QIS3	QIS4	QIS5	LTGA (S0)	LTGA (S12)	LTGA (S10)	LTGA (S1)	2014 ST (base)	2014 ST stressed
Year	2005	2006	2007	2008	2010	2012	2004	2009	2012	2014	2014
# of participating firms	272	514	1027	1412	2520	427	427	427	427	167/225	167/225
Market share (premium)	44 %	60 %	>65 %	>75 %	>85 %	70 % (TP)	70 % (TP)	70 % (TP)	70 % (TP)	55–60 %	55–60 %
% of participants reporting *best estimate*	90	80	91	100	100	100	100	100	100	100	100
% of participants reporting 90th percentile	66	68	most	100	100	100	100	100	100	100	100
% of participants with partial internal models	nil	some	13	50	42	n/a	n/a	n/a	n/a	n/a	n/a
% of participants with total internal models	nil	some	some	n/a	10	n/a	n/a	n/a	n/a	n/a	n/a
% of participants that do not meet MCR	n/a	n/a	2	1.20	4.60	28	4	3	10	6–8	?
% of participants that do not meet SCR	n/a	n/a	16	11	15	46	13	12	29	14–16	20–44
Additional regulatory capital (S2 RC – S1 RC)	n/a	n/a	n/a	(€46 bn)	€56 bn	n/a	n/a	n/a	€88 bn	n/a	n/a
Cost of capital (EY Euro Upper Bound + 6% as of QIS5)	–	–	–	10.5 %	10 %	–	–	–	11.5 %	–	–

Source: CEIOPS (2006), (2007a), (2007b), (2008), (2009); EIOPA (2011), (2013), (2014); authors' calculations

4) QIS5 involved 50 % of all EU insurers totalling 85 % of underwritten premiums and 95 % of insurance provisions. 4.6 % of the participants did not meet the MCR, which triggers "immediate and ultimate supervisory action."

This latter figure was both very high, as it meant 116 companies should be resolved or have their portfolio transferred, and rising quickly in comparison with QIS4, where the MCR failure rate was 75 % lower. QIS5 was therefore a turning point in the preliminary assessment, with a significant deterioration of the companies' solvability. While this can be partly attributed to the consequences of the financial crisis, it could be feared that smaller, more fragile insurance undertakings surfaced with the extension of the sample, hence even more should follow among the 2,500 remaining firms who did not take part in QIS5.

As a result, an additional impact study was performed under the title Long-Term Guarantees Assessment (LTGA), testing a few scenarios to fine-tune S2. While **S0** provides the baseline scenario (S2 as of the 2009 Directive), **S1** introduced some accounting changes so that the failure rate was kept at a more reasonable level. 10 % is still a very high failure rate, in comparison with the historical values recompiled for 2004 and 2009, even if one keeps in mind that the assessment did not make use of (generally less demanding) internal models. The latest simulation to date, a set of stress tests conducted in late 2014 (EIOPA 2014), also showed a high level of SCR/MCR violation (respectively 14–16 % and 6%–8 %) in unstressed scenario, climbing up to 44 % in the case of stress. Meanwhile, critics became increasingly vocal.

9.3.3 Criticism

The advent of a protracted financial crisis interfered with the consultation and deployment process and displayed disappointing consequences of the planned framework. Critical features included procyclicality and the feedback loop between accounting rules and capital requirements (Sect. 9.3.3.1), impact on investments (Sect. 9.3.3.2) and (Sect. 9.3.3.3) low predictive power of the *capital requirements*. While the appropriateness of a bank-based prudential model is still controversial, we save this criticism for later discussion (see Sect. 9.4).

9.3.3.1 Accounting-Capital Requirements Feedback Loop

In stark contrast with the lenient preliminary impact assessment (DG ECOFIN 2007), some economists issued a critical appraisal of the interaction between market value accounting and capital requirements: the Glachant et al. (2010) volume by the French economic council (the prime minister's counselling team) issued an early warning shot. First, Valla (2010) recalled that an investor with liquidity constraint might be forced to sell his assets in order to get cash; if forced to do so in time of trouble, he would be caught in a feedback loop: I need some cash therefore I sell assets, but by doing so I increase the excess supply of assets, which leads to falling prices and the need to sell more assets in order to obtain the same amount of cash, and so on. As Rodarie (2010) shows, the business model of insurance (with inverted production cycle) normally leads to positive cash flows; hence no liquidity constraint should be experienced unless the firm is poorly managed, in which case the supervisor should intervene *before* the liquidity problem arises. Eventually, thinking in terms of liquidity constraints is just like thinking all insurers are doing badly, which does not seem a sound basis for supervision.

Lombard and Mucherie (2010) advance a step further, showing that the combination of market valuation of asset *and* one-year value-at-risk (VaR) actually transforms the risk of feedback loop into certain procyclicality: when the balance sheet of the insurance company is assessed according to market value, the value of the asset side will follow the economic cycle, while the liabilities (being mostly insurance provisions) will stay steady; hence the own funds fluctuate according to the cycle (while the target SCR is approximately constant). Insurance firms will then need to build up capital requirements in the downturns. If they cannot raise any more own funds, they will need to sell part of their asset to diminish their SCR. In the first case, they will crowd out other borrowers, hence negatively contributing to the long-term financing of the economy. In the second case, they will start fire sales that could cause market crash according to Valla's feedback loop model. In both cases, the capital requirements are procyclical and only add problems in time of crisis.

In the same volume, La Martinière (2010) shows that Value-at-Risk (VaR) is not intrinsically perverted: if one-year VaR means that we consider stress on the economic environment while the assets set to be held to maturity (of the corresponding liabilities, as stocks, for instance, do not have an intrinsic maturity) are valued at their "long-term" price, then the procyclicality would disappear. The problem is that most supervisors interpreted one-year VaR to be computed on the liquidation value of assets, which leads to procyclicality. Once again, this would mean that all insurance firms are supervised in a way

which contradicts their business model. Overall, the Glachant volume calls for changes in accounting rules, in order to limit the prudential undervaluation of assets needed for long-term financing (mostly stocks and securitized assets) as well as the volatility of the whole balance sheet.

The facts proved the authors of the 2010 volume to be correct. As we have seen, from QIS5 on (2010), worsening market conditions led to rising SCR for life insurance companies so that many of them were no longer able to cover their SCR (Planchet Leroy 2012), as the 2014 stress tests ultimately showed (Table 9.2). The same authors diagnosed that the standard formula incentivized sovereign bonds against other instruments: this is another line of criticism.

9.3.3.2 Long-Term Financing and Asset Concentration

The distribution of investments of the insurance firms dramatically changed in the last ten years as Table 9.3 shows. Between 2005 and 2013,[10] the relative weight of shares fell by almost 50 % (or 18 percentage points) while bonds, particularly sovereign securities, rose by a comparable amount: the private sector has been losing billions of potential funding to EU states. Given the primary importance of the insurance sector in the funding channels of the EU economies, this could lead to severe consequences regarding the financing of long-term growth. Laas and Siegel (2015) have shown this tendency to be a direct result of the standard formula, which imposes far higher capital requirements on stocks than on sovereign debt, thus negating the benefits of the formers' excess return.

Table 9.3 Distribution of investments of EU insurance firms

	2000	2005	2010	2011	2012	2013
Land and buildings	5.24 %	4.2 %	3.1 %	3.1 %	3.1 %	3.4 %
Participating interests	3.80 %	4.4 %	6.3 %	6.2 %	7.9 %	7.8 %
Shares and variable yield	36.72 %	37.5 %	31.0 %	30.9 %	21.0 %	19.5 %
Debt securities and fixed-income	30.98 %	35.7 %	41.6 %	41.8 %	50.4 %	52.4 %
Loans, including mortgages	16.36 %	10.6 %	10.7 %	10.3 %	13.2 %	13.6 %
Deposits	1.07 %	2.4 %	2.5 %	2.4 %	1.3 %	1.4 %
Other investments	5.84 %	5.3 %	4.8 %	5.5 %	3.0 %	1.8 %

Source: Insurance Europe

[10] No satisfactory consolidated regional data exist beyond 2012 since the ECB and OECD statistics rely on different typology (for instance, OECD statistics usually consider a significant share of "other" investments which have to be broken down). The state-level data confirm that the 2012 level is still valid in 2015 for many countries.

It seems difficult to disentangle the combined effects of a major financial crisis from the anticipation of S2 by the companies in order to form a definite opinion of the impact of the Directive on the financing of long-term growth; however, Pradier and El Khalloufi in Chap. 15, this volume argue that regulatory uncertainty surrounding Basel III is detrimental to the funding of the EU economy by the banks; the same point could be made about S2 and the insurance companies. A more detailed look at some countries will show that the current structure of investment differs greatly from one EU country to another (Table 9.4): Eastern and Latin Europe countries exhibit a very low relative weight for shares and conversely a large share of bonds; Scandinavian countries are just the reverse; German insurers grant a large amount of loans. One would hardly see a common pattern; hence the change might not be entirely attributable to S2, as S2 is supposed to imply convergence.

Diversity across countries of the EU would avoid asset concentration, which has been shown in the banking sector (Blundell-Wignall and Atkinson 2012) to be responsible for the build-up of systemic risk. The level of asset concentration is notwithstanding high enough for the EIOPA to recently announce it will "monitor consistency and convergence of supervisory practices" relative to "the modelling of Sovereign Exposures" (EIOPA 2015). As the internal models are supposed to be approved by national supervisors, it shall be asked whether the difference in Table 9.4 proceeds from national idiosyncrasies or from incentives provided by the National Competent Authorities (national supervisors; hereafter NCAs). One possible explanation is that NCAs in over-indebted countries are especially lenient toward the holding of domestic sovereign debt by insurers. This raises questions about a possible conflict of interest of national supervisors (an issue which will be discussed in Sect. 9.4), for instance in assessing the need for regulatory action, now supposedly prompted by capital requirement thresholds.

Table 9.4 Distribution of investment of insurance firms in selected countries (2013)

	Real estate	Mortgage loans	Shares	Bonds	Loans, non-mortgage	Other investments
Denmark	0.8 %	0.0 %	50.7 %	40.2 %	1.1 %	7.2 %
Germany	1.8 %	5.2 %	5.8 %	38.6 %	18.9 %	29.7 %
Hungary	2.0 %	0.0 %	1.9 %	88.5 %	0.1 %	7.5 %
Portugal	2.3 %	0.0 %	2.6 %	75.0 %	0.0 %	20.1 %
Sweden	3.0 %	0.1 %	35.6 %	52.9 %	1.1 %	7.4 %
United Kingdom	3.9 %	2.9 %	16.6 %	51.1 %	1.6 %	23.9 %

Source: OECD insurance database, authors' calculations

9.3.3.3 Very Low Predictive Power

In a risk-sensitive framework, the capital requirements of any firm are proportional to the level of risk it is facing, and the probability of a failure should rise with the capital gap. So far, many tests of the US prudential framework have been performed to assess its predictive power.[11] Cummins et al. (1999), for instance, tested on a large sample of insurance companies whether the US Risk Based Capital (RBC) formula correctly predicted corporate failures and their results were disappointing: type I error (i.e. wrongly assessing a failing firm as solvent) as high as 89 % (p. 442), which means that almost 9 out of 10 insolvency cases are not predicted. This figure can be diminished at the price of rising type II error (i.e. wrongly assessing a healthy firm as insolvent): for a 5 % type II error, type I error ranges from 48 % to 84 % according to the year and the test in consideration, while for a 20 % type II error, type I comprises between 18 % and 52 %. The lack of predictive power is a serious problem, since type I error means failures are not predicted and type II error means measures would be taken against healthy firms: in both case, the legitimacy of the supervisor is likely to be eroded.

Further advances have shown that prediction is in fact difficult for purely statistical reasons: Kartasheva and Traskin (2011) have shown that very low insolvency rates lead to low predictive accuracy. As the EU experienced far lower failure rates than the USA, as can be seen in Table 9.3, the predictive accuracy of the SCR/MCR, whatever their sophistication, is likely to be even lower than the often-criticized US RBC model. As a comparison, failure rate was equal to zero for the whole 2008–2012 period in many EU countries, while 4.6 % (2010) to 28 % (2012) of companies were reported as amenable to "immediate and ultimate supervisory action" (DR 2015/35 art. 378–380). Type II error is then at 100 % for countries without failures (and above 95 % on average): this seems intolerably high after five years of calibration; moreover type I error is still undocumented in countries with failed firms (Tables 9.5 and 9.6).

While statistical literature has emphasized the importance of using twin threshold (see for instance Lalkhen and McCluskey 2008), the only acceptable way to deal with the MCR/SCR should be to calibrate them more finely in order to guarantee that SCR (which triggers supervisory inquiry) will minimize type I error, which is obtained at the cost of very high type II error.

[11] It should be recalled here that the laws governing US insurance activity and supervision are enabled at the state level. The National Association of Insurance Commissioners has nevertheless developed and sponsored a prudential framework known as "risk-based capital," which has been passed into law in most states.

Table 9.5 Fraction of total insurance sector's liabilities in default, p. 15

Percentage of world assets (2012)	Country	2008	2009	2010	2011	2012	2008–2012
27 %	United States	0.042 %	0.006 %	0.012 %	0.013 %	0.004 %	0.0151 %
24 %	Japan	0.078 %	0.000 %	0.000 %	0.000 %	0.000 %	0.0147 %
12 %	United Kingdom	0.000 %	0.001 %	0.000 %	0.000 %	0.001 %	0.0002 %
9 %	Germany	0.000 %	0.000 %	0.000 %	0.000 %	0.333 %	0.0075 %
5 %	France	0.000 %	0.000 %	0.000 %	0.000 %	0.000 %	0.000 %
3 %	Netherlands	0.000 %	0.000 %	0.000 %	0.000 %	0.000 %	0.000 %
3 %	Switzerland	0.000 %	0.000 %	0.000 %	0.000 %	0.000 %	0.000 %
3 %	Sweden	0.355 %	0.002 %	0.034 %	0.056 %	0.004 %	0.0820 %
2 %	Denmark	0.000 %	0.000 %	0.000 %	0.000 %	0.000 %	0.000 %
1 %	Ireland	0.000 %	0.000 %	0.867 %	0.000 %	0.000 %	0.1613 %
1 %	Italy	0.058 %	0.012 %	0.078 %	0.017 %	0.000 %	0.0326 %
1 %	Spain	0.000 %	0.005 %	0.056 %	0.000 %	0.009 %	0.0155 %
0 %	Belgium	0.000 %	0.000 %	0.000 %	0.052 %	0.000 %	0.0102 %
94 %	Global default rate	0.038 %	0.002 %	0.020 %	0.006 %	0.005 %	0.0139 %

Data from Baranoff (2015), The Geneva Association

Standard, low-cost procedures should be designed for further inquiry. On the contrary, MCR, which prompts immediate action, should be calibrated to minimize type I error under type II error constraint of, say 1 or 5 %. These figures should be made public so that the supervisory procedures become easier to understand for the stakeholders.

* * *

The S2 package is a comprehensive legal reform package, which goes far beyond solvency, since it also features provision for consumer protection and aims above all at European integration. While the initial assessments of the microprudential incentives and the macroeconomic effects were enthusiastic, a protracted tuning process has shown, from 2010 on, a significant number of the insurance firms not able to meet the capital requirements and, more generally, time has paved the way for criticism. The procyclicality issue has been reduced by the Long-Term Guarantees Assessment (LTGA) package, but S2 (as Basel II–III) still leads to asset concentration on sovereign debt, and the usefulness of crucial capital requirements to predict insurance firm failures seems unsatisfactory. One can argue that these are necessary costs to prevent regulatory arbitrage with the banking sector. Before we can judge on this matter, we should add the cost of systemic risk regulation to the equation.

Table 9.6 Number and rate of property-casualty insurance insolvencies per year

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Number of companies	1897	1968	2012	2061	2065	2084	2100	2096	2096	2042	1952
Number of failures	23	33	21	22	7	8	25	6	10	18	16
% failed	1.21	1.68	1.04	1.07	0.34	0.38	1.19	0.29	0.48	0.88	0.82

Source: Kartasheva and Traskin (2011)

9.4 Systemic Risk Regulation

Whether the insurance sector is subject or source of systemic risk is still debatable. While the Financial Stability Board (FSB) has concluded that it is (Sect. 9.4.1), a large body of evidence suggests it is not (Sect. 9.4.2). We shall then distinguish more precisely the type of insurance activity or products exhibiting systemic risk.

9.4.1 From Academic Evidence to Enhanced Supervision of GSII

In the wake of their landmark paper on financial contagion, Allen and Gale circulated in the early 2000s a paper about "systemic risk and regulation." They showed that "there is evidence that risk has been transferred from the banking sector to the insurance sector. One argument is that this is desirable and simply reflects diversification opportunities. Another is that it represents regulatory arbitrage and the concentration of risk that may result from this could increase systemic risk" (Allen Gale 2007 p. 342). Only months later, the US government had to rescue AIG in order to prevent a failure with possible systemic implications. The subsequent IMF (2009) report clearly proved that the problems with AIG were entirely due to the sale of credit default swap together with securities lending, carried on by a London branch called AIG-Financial Products, which was clearly not active in the insurance business. Nevertheless, the report by the FSB at the November 2010 G20 Summit in Seoul insisted on the role of Systemically Important Financial Institutions (SIFIs) in financial crises and proposed to mitigate systemic risk by identifying such firms and taking appropriate measures. A list of Global Systemically Important Banks (G-SIBs) was published in November 2011 and has been updated every year, while for insurance the IAIS proposed a list of nine Global Systemically Important Insurers (GSIIs) in July 2013,[12] which was confirmed by the FSB in November 2014 (IAIS 2015) and updated in 2015.[13]

Together with the listing of G-SIIs, a framework of policy measures was published (IAIS 2013a, 2013b). These measures include:

1) Enhanced Supervision comprises both supplementary prudential requirements decided by national authorities and proper international coordination of supervisors.

[12] These are: AIG, Allianz (Assicurazioni) Generali, Aviva, Axa, MetLife, Ping An insurance, Prudential, Prudential financial.

[13] On 15 November 2015, the list became: Aegon NV, AIG, Allianz, Aviva, Axa, MetLife, Ping An insurance, Prudential, Prudential financial.

2) Effective resolution of SIFIs in an orderly manner without destabilizing the financial system and exposing the taxpayer to the risk of loss should be made possible for the supervisors.
3) Higher Loss Absorbency capacity for GSIIs to reflect the greater risks that these institutions pose to the global financial system.

As of 2016, IAIS is still consulting the stakeholders to agree on what will be done precisely from 2019 on.

It should be emphasized that there has been a fierce opposition to the classification of insurance institutions as systemic.

9.4.2 The Insurance Business Is Not Systemic

Since 2009, numerous authors have shown that the insurance business model is not systemic by design: the inverted production cycle allows the building up of capital reserves before payments are due. Only non-traditional and non-insurance activities, as in the case of AIG, lead to systemic risk. Thimann (2015) reviewed the theoretical literature on this topic and offers a nice classification of insurance activities, as well as product and balance sheet management tools according to their systemic riskiness. For example, pure life annuities are typical insurance business (they rest on a mortality table and the law of large numbers) while variable annuities with living benefits rely on the uncertain performance of financial instruments, hence they could be systemic: as Baranoff 2015 has shown, most failures of large insurance companies are linked with interest rate risk (especially in Japan during the 2000s). The aforementioned GSIIs are financial conglomerates (amenable to the Financial Conglomerates Directive (Dir 2002/87/EC) (FiCoD), and their systemic riskiness does not come from their insurance business. Overall, it appears that the key issue is to distinguish which activities and products could really build up systemic risk, being clear that pure insurance business is not concerned: Thimann (2015) shows that current typologies are not entirely consistent in 2015. Further research seems necessary in this area.

Very recently, empirical papers made a contribution to the question. In particular, Bierth et al. (2015) has shown that "the insurance sector predominantly suffers from being exposed to systemic risk, rather than adding to the financial system's fragility." Very significantly, they added that "our study reveals that both the systemic risk exposure and the contribution of international insurers were limited prior to the financial crisis with all measures of systemic risk increasing significantly during the crisis. In contrast to the

banking sector, however, systemic risk in the insurance sector does not appear to lead but rather follow macroeconomic downturns as evidenced by our analysis." While these results have to be confirmed, they add empirical evidence to the theoretical assertion that the bank metaphor could be misleading.

9.4.3 Is the Bank Metaphor Fully Justified?

The rationale for capital requirements for banks shall be recalled: banks create money by giving credit. They are thus subject to liquidity risk, which can be prevented by holding cash balances and having enough own funds to absorb losses. Moreover, the banks enjoy a high level of public concern, with both a deposit guarantee scheme (which prevents bank runs) and a lender of last resort (which provides the banks with liquidity). As beneficiaries of public spending, it seems obvious that they *should* be regulated. Not only do the banks benefit from public spending, they also have invisible costs for the society: an implicit subsidy, which is more or less the difference between what they should pay to borrow at the cost incurred by their standalone credit rating and what they do with an implicit state support that will not let them fail (Hoenig 2014). The reason why the state will not let the large bank fail is simply their systemic relevance. Overall, too-big-to-fail or systemic banks rely on hypothetic or probable public support: they should accept some regulation in exchange. Basically, capital requirement lessen the probability of their failure and can so be used to diminish the moral hazard, which grows with their systemic significance.

For the insurance firms, the picture is quite different: at any rate, the expected cost of bailout for an insurance company is small as the probability appears minimal; the liabilities side of the balance sheet is only marginally borrowed, hence a minimal implicit subsidy; insurance companies do not have access to the lender of last resort (such access qualifies a bank in most jurisdictions) and the insurance liabilities are not guaranteed by a public insurance scheme in the EU (and nothing like this is planned, albeit there has been a white paper: see EC 2010). Overall, the dependence of insurance on possible public spending is far less than for banking institutions. And, very significantly, it does not seem necessary to pile up own funds to start an insurance business, as payment is made by the customer up front, while a borrower must repay the bank for months or years before the bank gets its money back. Hence, correctly priced insurance contracts should not consume own funds, and the prime motive for supervision is simply to check whether the pricing of contracts covers the expenses.

It seems then legitimate to ask whether the whole project of convergence with banking regulation is healthy. While it makes some sense to impose on insurers the same kind of constraints the banks experience in order to guarantee that the insurers will not host clandestine banking operations, it does not necessarily make sense to impose the same set of constraints on *true* insurance business. The aforementioned supervisor tendency to assume every company will act in contradiction to the business model of insurance (Sect. 9.3.3.1) adds up to the idea that insurance regulation the way it is brought by the S2 framework is, unless appropriately proved, not optimal and must thus have social costs, which were not appropriately accounted for in the preliminary impact assessment. What can be said about this?

9.5 From Private to Social Costs

It appears now that all the costs of the S2 reform have not been taken into account. We try to list (Sect. 9.5.1) and assess (Sect. 9.5.2) these costs before thinking of the consequences (Sect. 9.5.3).

9.5.1 How Many Costs?

So far, we have mentioned many cost sources which are amenable to categorization. Impact studies usually distinguish between the direct cost of regulation (i.e. funding of regulatory authorities through taxes) from indirect costs, featuring a one-off cost of implementation of the reform (a project team should be set up in order to meet the new supervisory expectation, IT systems are often in need of a revamp, etc.) and the recurring cost of compliance (additional capital and reporting requirements). In the case of S2, the literature has taken into account administrative costs, but costs of additional regulatory capital (as S2 commands more costly capital than the current framework) for instance, or cost of asset concentration (since sovereign bonds have a lower return than stocks, especially in conjunction with OECD-wide Quantitative Easing) should have been reviewed.

It should even be noticed that, while impact studies usually consider the cost of optimally working regulation, the process of fine-tuning S2 through the QIS is still far from this ideal state. Chneiweiss and Schnunt (2015) recently argued that the distribution of power among authorities has not yet reached an equilibrium point; on the contrary they give many examples for what they call “competition between authorities […] to take an ever larger

share of the market regulation." Taking a more theoretical approach, Plantin and Rochet (2007) concluded their remarkable book with a warning that "public regulators might aim to expand the scope of their mission in order to increase their resources." A few examples will show how the legal innovation of the past years opened many avenues for coordination problems, both inside member states of the EU and between local and regional authorities.

Inside member states, interesting cases of competition between authorities involve, for instance, the following:

1) *Double jeopardy*—The European Court of Human Rights (ECHR 2014) recently settled the Grande Stevens v. Italy case condemning Italy for various procedural offences as well as a double punishment in the same case. The plaintiff has been imposed an administrative sanction by CONSOB (Italy's financial market regulator) together with a sentence by a criminal court; this contradicts a legal principle that has held since the Roman Republic: *non bis in idem*.
2) *Insufficient legal provision*—The French Conseil Constitutionnel (2015) ruled against the national supervisor (ACPR), which transferred for solvency reasons an insurance company's portfolio to another company: the French *Code monétaire et financier* was ruled unconstitutional, violating property right, as the plaintiff was not given the opportunity to find a buyer for his portfolio.

As to the relationship between national and regional authorities, there has been a clear distribution of powers in the banking sector with first the Eurosystem and then the banking union. In the insurance sector, EIOPA is producing standards and recommendations according to the Lamfalussy process, but also *opinions*, which might contradict the ACPR *instructions* (eight such texts about insurance have been produced between 2010 and 2015 without a clear legal status; see Thourot 2015). Another example is the interpretation of the insurance Directives: we already mentioned in Sect. 9.3.3.1 how the one-year VaR was interpreted in the most counterproductive way; today there are some worries on the implementation of the "fit and proper" condition as part of Pillar 2. As the IMF assessment of observance of the ICP has shown the French regulator was too lenient on the suitability of persons, there seems to be room for "setting an example," especially with the administrators of (small) mutual insurance societies. ACPR first held that the chairman of the board could not be counted as executive director, but since 2015 it has held to a "one-size-fits-all" approach to "properness," in contradiction to ICP2.5: "the supervisor applies [requirements and procedures] consistently and equi-

tably, taking into account the nature, scale and complexity of insurers." It seems fairly obvious now that some member states' regulators (e.g. Ireland and Luxembourg) adopted a more relaxed and business-friendly stance than some others; different interpretation from country to country would mean different costs to the companies, this therefore being a case of regulatory arbitrage among jurisdictions.

Regulatory arbitrage incurs social costs, as it leads to capital misallocation and above all increased risks, hence a larger probability of a more serious financial crisis. Among other social costs, one can imagine that larger capital requirements will raise the demand for capital, which could cause a crowding out effect (although probably not in the same amount as Basel III: Oliveira Santos-Elliott 2012). While crowding out has been prevented by years of relaxed monetary policy, regulatory arbitrage is precisely what S2 was aiming to destroy: albeit there can still be competition among authorities as illustrated by Chneiweiss and Schnunt (2015), risk transfer from banking to insurance seems under control, as Laas and Siegel (2015) have shown that it is usually more costly (in terms of regulatory capital) to hold assets under S2 than under B3. One could be tempted to think, then, that the current European regulatory framework is successful at controlling social costs at the expense of the insurance sector. The next section elaborates on this idea to compute the cost to the sector.

9.5.2 The Cost to the Insurance Sector (See Also Appendix 9.2)

While some preliminary impact studies made some significant contributions to the computation of regulatory costs, it should be made clear that the costs and their effects were considerably underestimated, both at sector and individual firm level.

9.5.2.1 Sector-Wide Costs

From QIS4 on, the preliminary impact studies have computed the overall surplus, that is to say, the difference between the excess regulatory capital in the whole insurance sector under solvency 2 minus the same under solvency 1. While this overall surplus provides an indicator of the sector's health, it has no practical meaning for cost computation since it gives no information about the distribution of shortage (which implies effective costs) among companies. Under the vague assumption of conserving the same level of overall surplus with a mean cost of capital (see Table 9.2), QIS5 would imply €10 billion

additional cost of capital per year, but this figure is extremely variable from one QIS to another and sensitive to the distribution of surplus/shortfalls.

While it could be computed straightforwardly (national supervisors publish detailed reports), the direct cost of regulation is rarely mentioned since supervisors usually argue their mandate is country-specific. Eling and Kilgus (2014) produced a notable breakthrough by computing the cost of supervision per employee in the financial sector in Austria, Germany and Switzerland. In order to expand the comparison, we performed additional computation for France and the UK. The results appear in Table 9.7.

France and Germany seem to enjoy the same cost per employee, while the financial centres of the UK and Switzerland are higher, with Austria somewhere in between. Nevertheless, it should be emphasized that the data for the UK were taken before the split of the Financial Services Authority (FSA) into the Prudential Regulation Authority (PRA) and the Financial Conduct Authority (FCA). The budget of the PRA alone, which is closer to the current definition of ACPR and BaFin, is of the same order of magnitude (**), while the FCA has a larger budget. Evolutions should be taken into account: for instance FSA/FCA+PRA had the strongest growth since 2008 with the budget doubling; in France the tax on insurance was raised sharply in 2013; hence the cost of regulation per employee in the insurance sector is 50 % above the average cost per employee in the overall financial sector (*). While a comparative appraisal of the value for money of regulation remains to be done, there is much room for European harmonization, and regulatory arbitrage.

9.5.2.2 Individual Level Costs

Preliminary impact studies focused on administrative costs (linked to reporting and governance requirements of Pillars 2 and 3 in S2): CEIOPS (2007 p. 16) counted €2.7 billion overall for the whole EU27, or €40,000 for each insurance company, on the basis of two months' equivalent full-time job for each of the four "key functions." A report by the Centre d'Etude des Assurances on the very same year (CEA 2007 p. 22) counted twice as much overall, while in 2011 Ernst and Young estimated with the FSA that the figure was close to £1.8 billion (€2.3 billion) for the UK alone, accounting for one-

Table 9.7 Cost of supervision in € per employee in the financial sector in 2012

AT	CH	DE	FR	UK
467.07	593.62	231.45	222.30	645.07
		2014:	334.2*	244.71**

fifth of the European insurance market. The implementation costs have then been multiplied at least by five between 2007 and 2011, and they continue to grow with every new QIS, with the recurring cost of compliance still difficult to assess. The only certainty about these recurring costs is that the 4 x 2 months-persons are insufficient to staff the key functions and fulfil the reporting obligations: Chneiweiss and Schnunt (2015) lists the 21 reports to be prepared annually for the stakeholders (including the supervisors) and reviewed by board members. Administrative costs thus appear as non-negligible fixed costs, which must be added to the legal uncertainties reviewed in Sect. 9.5.1, and, rather unexpectedly, to regulatory capital-linked fixed costs.

Regulatory capital as it appears in Pillar 1 of the S2 reform is supposedly risk-based; it should then be treated as a variable cost. Nevertheless, the QIS5 and later quantitative assessments have shown that the internal models were able to save a considerable amount of capital.[14] More precisely, they benefited large insurance companies more than medium and small ones, as Table 9.8 demonstrates:

While the standard formula leads the large companies to halving their overall surplus, internal models allow them to boost their surplus by 137 % and look even better under S2 than under S1. The boost is less than 20 % for both medium and small companies, which cannot reclaim under S2 the surplus level they have under S1. Internal models thus appear as an investment: they are costly to develop but can save regulatory capital and lower the mean cost of capital, since firms with better solvency experience better financial rating and lower funding costs. A very productive investment, since they save the large companies more than €70 billion (hence at 10 % WACC (weighted average cost of capital), which was the working assumption of QIS5, close to

Table 9.8 Solvency global surplus and internal models

Insurance company type	S1 surplus	S2 surplus/Standard formula	S2 surplus/Internal model
Large	109.4	54.6	129.5
Medium	26.7	15.5	18.3
Small	64.3	43.6	49.5

Source: CEIOPS (2010) p. 136

[14] More recently, Picagne and Tam (2016) have shown that the definition of capital was broadened during the S2 maturing process, with additional categories (such as Deferred Tax Assets) being added under the pressure of companies to achieve more easily the requirement threshold. This analysis marginally lowers the overall cost of S2 without changing the argument in this section (on the contrary, these authors show that new capital categories were included as a consequence of efficient lobbying by larger insurance companies).

€7 billion a year). While it seems obvious that the largest companies need a more complex model, there is still a minimum cost to these internal models, which make them look like fixed costs.

The discussion of implementation and compliance cost might seem trifling in comparison with what has been lost on investments in crisis-stricken countries or with potential losses in life insurance when interest rates will revert to their normal level. Although trifling at industry level, they are more or less in the nature of fixed costs (larger insurers had larger project teams but some of them prepared internal models to save regulatory capital); hence they weigh far more on small businesses and must lead to concentration.

9.5.3 From Costs to Concentration and Uniformization

The preceding section has argued that most recent reforms, whether prudential (such as S2) or consumer oriented have been basically adding to fixed costs, thus promoting concentration in the sector. Do we really observe concentration in the insurance industry? While the summer of 2015 saw many merger announcements, Table 9.9 shows the broader perspective. It features the rate of reduction in the number of insurance firms, hence a positive rate means the number of firms is falling and conversely a negative rate means a rising number of firms. Perimeter is crucial to the understanding of concentration in Europe. In EU28, the number of firms is most often rising, with an exception between 1998 and 2003; EU12 seems to be less dynamic with 0.5–1 % more concentration per year, probably because the market is more mature. But only the UK has a rising number of firms: with the UK excluded, the EU12 market is experiencing accelerating concentration: more than 3 % of insurance firms disappear every year between 2008 and 2013. A line EU28 minus UK is added for symmetry: it should be pointed out that without the UK, the entire EU insurance sector has been experiencing consolidation since the beginning of the century (Table 9.9).

Is the acceleration of concentration the effect of regulatory proliferation or the proof that additional regulation is necessary? Given the institutional variety of the insurance sector, takeover is not the only possibility for firms to merge: one can also go on runoff and choose its legatee, in the case of mutuals friendly fusions are also possible directly (in France, the legal regime thereof has been modernized by decree 2014–12, 8 January 2014 on fusion of mutual insurance societies), or through specific forms such as SGAM (*société*

Table 9.9 Concentration rate in the EU insurance industry

	1993	1998	2003	2008	2013
EU28	5083	5173	4756	4914	4968
Yearly concentration rate		–0.3504 %	1.6951 %	–0.6515 %	–0.2183 %
EU28 – UK	4255	4341	3984	3942	3739
Yearly concentration rate		–0.3994 %	1.7312 %	0.2122 %	1.0630 %
EU12	*4284*	*4212*	*3804*	*3741*	*3611*
Yearly concentration rate		0.3396 %	2.0586 %	0.3346 %	0.7099 %
EU12 – UK	*3456*	*3380*	*3032*	*2769*	*2382*
Yearly concentration rate		0.4457 %	2.1968 %	1.8313 %	3.0567 %

Source: Insurance Europe

de groupe d'assurance mutuelle) or even complex business agreements where a large group backs a small insurer by providing it with solutions to complete its product range, and comply with S2. These kind of packages make the smaller insurer look more like a front for the larger group without economic capital links (although the group can provide regulatory capital through reinsurance treaties, for instance). Hence it is likely that the concentration process is underestimated by counting the number of companies: the driver of this trend does not seem to be multiple failures calling for additional supervision, but the financial crisis, changes in consumer tastes and distribution channels (especially investments required to follow the evolution of digital technologies) leading to increased competition might have their impact, as well as the increase in the cost of regulation. Therefore, the acceleration of concentration deserves attention.

Concentration will lead to larger firms: while the US experience shows that very small insurance firms are more prone to bankruptcy (see e.g. Baranoff 2015), further concentration has serious drawbacks, illustrated by the banking industry. A paper by Demirgüç-Kunt and Huizinga (2011) has shown that relative (to their home economy) size is "a liability, as it lowers return without an offsetting reduction in risk," and that systemic size protects banks from market discipline and supervisory action through moral hazard resulting from being too big to fail. Recent empirical studies confirm the increasing risk of concentration. Mühlnickel and Weiß (2015), for instance, conclude that "insurance mergers thus (expectedly) on average do not lead to immediate crashes of the financial system, *they nevertheless coincide with a significant increase in the potential of a system-wide crash* [emphasis added]. Thus, our key result is that mergers in the insurance industry can have a destabilizing effect on both the insurance as well as the banking sector." A more general statement was made in a previous paper by the same authors, since Weiß and Mühlnickel (2014), after studying a sample of US insurance companies, concluded that

"contrary to current conjectures of insurance regulators, we find that the contribution of insurers to systemic risk is only driven by insurer size."

There are hence some converging signs that the cost of regulation is leading to concentration and through concentration, to systemic risk. A concurrent process of uniformization deserves attention of its own. The S2 process is a strong factor of uniformization. ECB (2007) has already interpreted convergence in terms of "herding behaviour," possibly leading to systemic risk:

> As S2 aims at consistency with the banking regulatory framework and at reducing regulatory arbitrage opportunities, a certain degree of convergence will be achieved regarding risk and capital management across the two sectors. As a result, more homogeneous risk assessment and management within the European financial landscape may be expected from the implementation of S2. This could result in herding behaviour if a growing number of financial institutions were to adopt a common risk modelling framework, possibly posing risks of adverse dynamics at times of market stress.

Herding behaviour may result in cycles and systemic risk, two notions the authors of the ECB report purposively refrained from using because they are infamous keywords. The idea is nevertheless simple: if all decision-makers decide on the same grounds, they might find no counterparty in time of uncertainty. This is what happens during panic when all owners of an asset try to sell while nobody wants to buy. So far, the insurance business has been safe as most decisions have been driven by "industrial" reasons with rigid asset management rules (the life insurance business is an exception since the huge balance sheet is financial in nature). S2 leads give insurance decision-makers much more freedom to optimize but at the cost of thinking in financial terms: this might induce decisions to be strongly correlated, especially for those who do not have the means to behave as sophisticated investors. Recently, Danielsson, Shin and Zigrand (2013) provided a theoretical framework for this unpalatable phenomenon labelled "endogenous risk."

Since John Maynard Keynes, there has been some literature about the unexpected composition effect of individual decisions. A paper by De Long et al. (1990) is especially interesting since it showed how overconfident speculators can benefit from self-fulfilling returns, at the cost of augmented risk. The model by De Long could describe the behaviour of insurers under S2, not because the insurers overestimate the return on risky assets, but because the insurers' metric is different from the other players on the market: the insurers subtract from the return experienced by other players the cost of regulatory capital. The result is concentration on sovereign debt (Frunza 2014 p. 22),

which no longer appears risk-free and paradoxically exposes the companies to capital shortfall when the interest rates rise to their long-term average. It should be emphasized that, without the current QE, the interest rate risk would be a major risk for insurance companies.

A recent paper by Lévy-Vehel (2015) gives an even more precise example of how new management rules could polarize financial decisions. If one thinks of S2 as a global valuation of risk, as opposed to rigid rules (such as concentration thresholds) in S1, then S2 leads to match regulatory capital with both asset management and underwriting policy. The latter being given, the optimization problem is focused on the 99.5 % VaR of Pillar 1. This is the precise point of Lévy-Vehel, who shows that under the (false) assumption of continuous prices, while prices actually make jumps, trying to minimize VaR under a constraint of activity leads to *maximizing* the value-at-risk of the decision portfolio. Hence, improper implementation of a rational management rule turns out to produce adverse effects. The Lévy-Vehel model could well be interpreted to account for asset concentration on sovereign debt: insurance companies' balance sheets appear almost riskless until it is too late to react.

It might seem ironic that the solvency framework, which focuses on individual firm solvency, and was amended (LTGA) with much care in order to avoid procyclicality as seen in Basel II, might nevertheless lead to systemic risk through the polarization of decisions. Scholes had already argued in 2000 that this unexpected result was the consequence of an outdated conception of systemic risk, inherited from 1929, when initial failures triggered a chain reaction of bankruptcies. This model still dictates our response to systemic risk with the prevention of individual failures. The FSB approach to systemic risk directly inherits from this tradition, as it calls for more regulatory capital in individual firms. While the contagion and build-up kind of systemic risks are consciously addressed by the current regulatory evolution,[15] the polarization of financial decisions problem, noticed by ECB (2007) and documented by our examples, did not deserve much attention. It should be emphasized that not just decision-making processes are subject to uniformization: the Directive also does not seem neutral about ownership structures.

It has been stated already that a first draft of S2 did not incorporate specific provisions for "the limited possibilities [the mutuals] have in raising own

[15] Geneva Association (2010) has shown that some "non-core activities [when] they are conducted on a huge scale and using poor risk control frameworks" could have the potential for systemic risk. S2 has targeted sources for systemic risk as excessive concentrations on a given class of asset that could build up structural fragility set to detonate when asset price dynamics changes (see e.g. the connection between mortgage backed securities and the bursting of the real estate bubble in the USA). Recent research has tried to assess the potential for systemic risk in the equity sub-module (Martin 2013, Eling-Pankoke 2014): generally speaking, firms with a systemic potential are likely to develop an internal model; hence the control of systemic risk is at the discretion of the supervisor.

funds" (CEIOPS 2007b, p. 47). Though this had been corrected by incorporating supplementary member calls in Tier 2 capital by the 2009 Directive, this demonstrates how difficult it is to find a common measure between stock and mutual insurers. Another instance of the same problem might appear with the Pillar 1/Pillar 3 articulation: while MCR prompts for immediate and ultimate supervisory action, SCR is more likely to be a signal for stakeholders, together with the yearly Solvency and Financial Condition Report. It is very unlikely that the policyholders will read these reports: Plantin and Rochet (2007) rightly pointed out that their personal stake in the firm is too low to invest much time in reading all the reports of all operating companies before choosing one. As members of a mutual association have basically the same amount at stake than policyholders, the agency problem is the same for them. Only large investors with a significant interest in the firm will take their time to read the supervisory report. It seems, then, that the whole architecture of the Directive can be interpreted as promoting an ownership structure open to large investors, that is, large joint-stock companies.

While the European Community never agreed to this idea, the nature of information disclosed to parties, as well as the tendency toward concentration with the rising cost of regulation, are undeniable evidence of a bias in favour of joint-stock insurers. While joint-stock companies have without doubt been a powerful vector of economic progress since the eighteenth century, there is some misplaced irony in trying to shape insurance after them when mutual insurance societies have been the basis of insurance since antiquity. The sharing economy is experiencing a very peculiar moment, with the information economy allowing for direct contact between people and direct support to projects (such as crowdfunding). Start-up companies recently introduced some fresh new ideas into the insurance business through shared deductible (e.g. Friendsurance in Germany, Guevara in the UK, Inspeer in France): none of these platforms offer real insurance activity, only legal counsel for drafting the sharing contract between the coinsured. It should then be asked whether the current regulation does not act as a barrier to entry for new schemes. While EC (2015) boasts the numerous measures designed to lower the cost of small insurance businesses, the planned framework might be too complex for new, innovative ventures as well as small mutuals and other grassroots projects. This could both hinder innovation and lessen resilience of the insurance sector.

* * *

The legal package under elaboration in the EU has so far raised the administrative costs of insurance businesses. It is likely also to raise the costs of

capital requirements, especially for insurers without internal models. While the social costs seems to be efficiently blocked—in the long run S2 will rule out regulatory arbitrage, and in the short run crowding out is unlikely under QE—the insurance sector seems to bear the brunt of the regulatory overhaul after a crisis to which it did not significantly contribute. Other unpalatable aspects of the planned reform include a protracted tuning process, with competition among authorities and rising administrative cost, all being very likely to add fixed costs to insurance businesses, leading to increased concentration in the sector. Adding uniformization of decision processes to the picture leads to the conclusion that the current package is probably building up moderate but significant systemic risk. The common FSB–IAIS effort to supplement GSII supervision draws a path for further regulation; one could nevertheless ask whether this is the only avenue for the insurance sector.

9.6 Rationale for Regulation and Future Agenda

So far, the evolution of the EU regulation appears as a drive to rule out insolvency of individual financial institutions; this concern constrained a no arbitrage between sectors approach, which appears costly for the insurance business while it leads to significant increase in complexity. This whole process seems in contradiction to the intuitive appeal of a European market, which should bring in simplified procedures, lower prices and increasing opportunities for stakeholders. Before we suggest further moves, one should understand how the stakeholders behave. To this end, Table 9.10 gives some insight into the rationality they pursue.

From this table, it is clear that most European insurance supervisors were largely sleeping partners until recently: insurers under the direct monitoring of the State, who offered to be lenient in exchange for arbitrary levies and employment protection (Plantin-Rochet 2007 pp. 13–14). When supervisors became independent, the mandate remained the same: no fuss, employment must be protected, hence no strong action should be taken against firms because that would push consumer toward foreign firms with better credibility. At best, this could be interpreted as a delegation of public authority to a supervisory body in charge of brokering deals that would serve "general interest" in the way they would interpret it. Since the mid-2000s the political authorities chose a stiffer stance on finance and the supervisory authority chose to "set examples" in order to attract attention and further resources. Generally speaking, the current approach to supervision is confused: the politicians are struggling to convince the voters they are tough on finance so they should vote for them, the supervisory authority is struggling to convince

Table 9.10 Rationale of stakeholders and likely consequences

Agent	Shareholders	Managers	Policyholders	Supervisor	Political authorities	EC administration
Rationale	Maximize expected utility of asset according to their own risk-loving utility function	Depends on the incentive scheme. Joint-stock companies: usually aligned with shareholders. Mutual societies: likely to favour employment	Look for simpler package, then maximize expected utility of net technical provisions according to their own risk-averse utility function.	Maximize its resources. Try to convince the other stakeholders that he must be awarded more powers.	Far-sighted: maximize the expected present value of future taxes. Myopic (election-cycle driven): maximize next period employment.	Maximize its resources. Try to convince the other stakeholders that he must be awarded more powers.
Likely Consequences	Favour risky decisions, "gamble for growth".	JS: as shareholders. MS: no general answer.	Likely to "play safe". Would recommend definite action in case of problems.	Depends on incentives.	FS: protect policyholders interest. M: protects (local) employment.	Introduces new, more complex regulations

the politicians that they should invest with them to show how tough they are, while the European Commission and European Parliament are playing their own part. This looks very much like competition between authorities at all possible levels with rising costs and efficiency missing in action. We believe, therefore, that the problems should be fixed as further integration of the EU market takes place. In the next sections we offer three main lines for the agenda.

9.6.1 Addressing Transition Costs and "Regulatory Avalanche"[16]

The European Commission is conscious of the general problem of overlapping or competing authorities and has addressed it by describing as much as possible the future practices of the insurance sector: put together, the 2009 and 2014 Directives plus the 2015 Delegated Regulation amount to 1,013 pages in the *Official Journal of the European Union* (at 5,000 typographical signs per page). This is far less than the literature surrounding the US Dodd–Frank Act, but the aim is more modest, with directives of pending implementation such as the Packaged Retail and Insurance-based Investment Products (PRIIPs, Regulation EU1286/2014 due for implementation in national laws in late 2016) and Insurance Distribution Directive (EU 2016/97, due in early 2018) about to further impact the insurance sector. The "simplification" effort looks somewhat contradictory, though, as adds to the regulatory burden (see for instance art. 56–61 of Delegated Regulation 2015/35). Eventually, the law, as any contract, can never describe completely every possible event: this should be taken into account in organizing the delegated supervision of the financial institutions.

It is of course the responsibility of national authorities to adapt *smartly* to the European regulation, reducing double costs and double jeopardy by avoiding competing authorities. The UK has taken a dramatic step in this direction with the better regulation initiative, which seeks simplification of regulation and questions the utility of government involvement in private affairs (NAO 2006). Nevertheless, in the banking sector, this drive is not left to member states, and a banking union has superseded the principle of subsidiarity: Regulations 1022/2013 and 1024/2013 established the ECB as supervisor for the largest European banks, with national supervisors being left with the non-significantly systemic institutions; Regulation 806/2014 established a single resolution mechanism intended to cover the banking sector as well

[16] The expression "regulatory avalanche" appears in Chneiweiss and Schnunt (2015).

as conglomerates operating under the FiCoD (which can include insurance groups and notably GSII) and subsidiaries thereof. In the insurance sector, we surveyed two reasons to proceed in much the same way:

1) EIOPA is concerned with possible conflict of interest between states as borrowers and states as supervisors in assessing the internal models related to sovereign exposures (see above Sect. 9.3.3.2),
2) Competition between authorities has led to misinterpretation of EU rules (see above Sects. 9.2.2, 9.3.3.1, 9.5.1) and redundant costs.

We believe that a direct European supervision should be relevant in the insurance sector too. A true European supervision agency would solve at the same time the competing authorities and complexity issues as well as the agency problem of delegated supervision. Hence it might be convenient to think of an insurance union that would produce harmonization by teaming together member states' supervisors: the banking union has taken this course, at a high cost since 1,000+ positions have been created. In order to reduce costs, a ten or 15 year schedule for extinction of member state authorities can be set up, with progressive transfer of volunteers to the new entity.

Complexity, cost and barrier-to-entry issues could be more broadly targeted by easing up the present complex rule-based approach by enabling principles-based simplification, especially for smaller and innovative businesses. Unfortunately there is no reason for the supervisors nor the EU Commission to follow this simplifying trend on its own (Table 9.9). Hence, simplification has to be incentivized: this is a complex matter of political science (OECD 2010), and of political priority. The "best idea for red tape reduction award" could be restarted, for instance, and given a sectorial declination to promote cooperation between firms and supervisors. While the trend of regulation since 2009 has been in the opposite direction, it seems necessary to recall the academic evidence for focused supervision.

9.6.2 Toward Focused Supervision

While S2 and the Insurance Core Principles of the IAIS offer an all-encompassing supervisory program that derives from the banking metaphor, Plantin and Rochet (2007) in their landmark contribution advocated for a more focused approach to supervision. Their book started from case studies of insurance failure to introduce the peculiar feature of the so-called inverted production cycle. As the true production cost of insurance is only

known years after the premium has been paid, since long-tailed events can span on decades, risk-loving insurance stockholders and managers may have a tendency to underwrite too much contracts at too low a price to gather premiums, underestimate future liabilities and pocket "profits," which are overvalued at the expense of policyholders. Plantin and Rochet show with some insolvency cases that even well-established companies may be guilty of this misconduct by trying to "gamble for resurrection" when their economic model has lost momentum. They argue that the policyholders hold insufficient incentive to take action against the stockholders and managers, hence the conflict of interest is aggravated by asymmetric information: public intervention is then needed to prevent the collapse of the insurance business that simply could not exist with too much information asymmetry. The precise role of supervision is then to act as an informed policyholder and make sure that the money collected from customers is not "gambled" for further growth.

The case made by Plantin and Rochet is especially important under strictly competitive pressure, when insurers cannot charge the customer too much. As we have seen in Sect. 9.2, this seems to be the case in Europe now. As the customer decision is mainly concerned with the price/service arbitrage, only the supervisor is able to deduce from periodical reporting the true probability of failure of the insurance company. In case this probability becomes significant (so as, for instance, the customer would not have bought insurance from the company), the supervisor takes all necessary action to ensure that the policyholders will be paid accordingly to the contract they signed. This might involve radical measures such as the transfer of the portfolio to another firm or resolution of the failed firm. But this is not the only way in which the supervisor could act. Table 9.9 summarizes the likely objective of the stakeholders: while it has its own agenda, the supervisor could be incentivized to act on behalf of others. There must be a clear political choice of which point of view the supervisor is supporting.

We think the mandate for supervisory authority should be to protect policyholders against conflicting interests of other parties. Period. The other consumer protection issues related to business conduct should be dealt with by a separate entity in order to curb the tendency of the supervisor to seek new resources. Moreover, the insurance supervisor should focus on its insurance expertise and leave complex asset schemes for the single supervisor already set up for banks and financial conglomerates. This will lead to a reduction in the cost of supervision, a useful reversal of the recent trend. Meanwhile, the steering of risk aggregates should be left to higher-level authorities.

9.6.3 From (Infinite) Layer Cake to Fitness Menu

With the Insurance Capital Standard and other GSII requirements under elaboration by the IAIS, European insurers might by 2019 experience three levels of regulatory compliance: national, European and global. The overall result will probably look like a layer cake where different layer are produced by competing authorities with no overall regulation. This will add more fixed costs, and, as we have shown in Sect. 9.5, this approach to systemic risk is basically flawed since it is likely to produce endogenous risk. The idea of a more holistic approach (or macroprudential policy) has been put forward by many authors. In the insurance context, this could take the form of EU level reserves for specific risks, which would be broken down among companies according to individual prudential indices (see for instance Macron 2016 or Rodarie 2015 p. 357–9). This approach seems necessary to address systemic risk, and to decide at what price (in terms of regulatory capital) insurance companies should continue non-insurance business. This seem to be a matter for the European Systemic Risk Board, but there is no reason to think its action should not be supervised by the European Parliament, in order to add a slice of transparency and accountability in this menu, which should target a more appropriate balance between regulatory capital and EU-wide perceived risk.

* * *

9.7 Conclusion

Since the Directives of 2002, Europe has abandoned direct price supervision and is relying on effective competition to achieve price discipline in the insurance sector. This move has had positive results in terms of prices, without degrading the soundness of the insurance businesses, which proved far more resilient than banks during the overstretched financial crisis. Nevertheless, governments and supervisors adopted a tough stance toward the insurance sector, which somewhat hijacked the Solvency 2 reform: competition among authorities produced a rigid interpretation of European texts, leading to infamous cases such as the condemnation of the French supervisor by the Conseil d'Etat, or the resignation of the head of the UK conduct authority. On the strictly prudential side of the reform, while the initial assessments of the microprudential incentives and the macroeconomic effects were enthusiastic, a protracted tuning process has shown a significant part of the insurance firms not to meet the capital requirements and, more generally, time has

paved the way for criticism. The procyclicality issue has been reduced by the LTGA package, but S2 (as Basel II–III) still leads to asset concentration on sovereign debt, and the usefulness of crucial regulatory indices (the capital requirements) to predict insurance firm failures seem unsatisfactory. While the social costs seems to be efficiently blocked—in the long run S2 will rule out regulatory arbitrage, and in the short run crowding out is unlikely under QE—the firms experience costs, which have been vastly underestimated. The insurance sector seems to bear the brunt of the regulatory overhaul after a crisis to which it did not significantly contribute.

Focusing on the cost of regulation brings some unexpected results: regulatory capital charges are not just variable costs increasing with the insurers' risks. Thank to internal models, the larger insurers can save significant amounts of capital. Internal models are but fixed costs, adding to the already burdensome reporting and governance requirements, and to the protracted implementation and legal uncertainty. All these costs are more or less fixed costs: overall, the reform package weighs more on small businesses, and is likely to strengthen a trend of concentration in the sector. Adding uniformization of decision processes to the picture leads to the conclusion that the current package is probably building up moderate but significant systemic risk. The common FSB–IAIS effort to supplement Insurance Capital Standard and GSII supervision draws a path for further regulation; one could nevertheless ask whether this is only an avenue for the insurance sector. The agenda is thus consistently addressing the foreseen issues, but at rising costs which penalize future activity and innovation.

To prevent rising costs, it seems necessary to focus on the rationale of stakeholders and design incentive schemes to improve efficiency of the supervising process. We advocate a clear mandate for a single European supervisor, with strong incentives to simplify an overly complex regulation and a steering of regulatory capital from a higher-level authority, preferably with European Parliament approval. Moreover, we would like to plea for the advent of a more European insurance market. At the moment, it is difficult to insure a German-registered car with a Spanish insurer, or a home in Italy with the Belgian branch of a Danish insurer; it is almost impossible to transfer motor insurance personal records as a French driver to the Irish market, even at branches of French companies. Moreover, the Spanish leader is unknown to Italian customers, as is Germany's number two insurer, and so on. While these facts do not seem a problem for most EU consumers, they are likely to limit workers' mobility inside the EU, and they would be solved by further integration: now that insurance companies obey the same supervisory framework, it should be easier; let us hope for the benefit of all stakeholders that further unification will result from simplification.

Appendix 9.1: Relative Insurance Prices in EU28

The following table shows the average level of insurance prices relative to CPI in 2014, where base 100 was in 1996, 2000 or 2005 according to data availability.

Country	Insurance price in 2014 / CPI	Base 100 in
AT – Austria	98.29	1996
BE – Belgium	104.27	1996
BG – Bulgaria	206.95	2000
CH – Switzerland	96.33	2005
CY – Cyprus	103.06	1996
CZ – Czech Republic	129.46	2000
DE – Germany	104.94	1996
DK – Denmark	130.97	1996
EE – Estonia	75.16	2000
EEA[a]	113.92	1996
EL – Greece	89.09	1996
ES – Spain	123.73	1996
EU28	104.26	1996
FI – Finland	144.23	1996
FR – France	100.74	1996
HR – Croatia	81.26	2005
HU – Hungary	72.34	2005
IE – Ireland	225.93	1996
IS – Iceland	125.46	1996
IT – Italy	180.66	1996
LT – Lithuania	83.95	1996
LU – Luxembourg	85.23	1996
LV – Latvia	63.70	1996
MT – Malta	97.37	1996
NL – Netherlands	123.22	1996
NO – Norway	132.27	1996
PL – Poland	78.90	2000
PT – Portugal	101.39	1996
RO – Romania	361.48	2005
SE – Sweden	156.24	1996
SI – Slovenia	124.67	2000
SK – Slovakia	127.70	1996
TR – Turkey	100.36	2005
UK – United Kingdom	187.63	1996

Reading the table: "Between 2005 and 2014, the average price of insurance contracts grew 81.26% of the consumer price index in Croatia"

[a]EEA = European Economic Area = EU28 + Iceland, Lichtenstein, Norway

Appendix 9.2: Cost of Insurance Regulation in EU28

Short name	Description	Reference	Fixed or variable cost	Current solutions	Alternative solutions
Direct cost of regulation	Paid to fund prudential supervision/consumer protection	Eling and Kilgus (2014) This study	Mainly variable		Simplification (needs incentives)
Indirect costs of regulation					
Administrative cost	Cost of staffing to meet the regulatory/ supervisory requirements	CEIOPS 2007 CEA Europe 2007 EY 2011	Mainly fixed		Simplification (needs incentives)
Cost of regulatory capital	Cost of additional regulatory capital under S2 in comparison with current regulation (S1)	QIS4, QIS 5, LTGA This study	Variable but internal models add a fixed component		
Cost of asset concentration	Opportunity cost of total asset returns under S2 in comparison with current regulation (S1)	?[a]	?	(securitization)	Single European Supervision
Cost of competing authorities			Likely fixed		Single European Supervision
Social costs					
Business failure/ systemic risk			n. a.	S2	European market development
Crowding out		Oliveira Santos-Elliott 2012	n. a.	QE Securitization	
Regulatory arbitrage			n. a.	S2	Simplification (needs incentives)

(*continued*)

Appendix 9.2 (continued)

Short name	Description	Reference	Fixed or variable cost	Current solutions	Alternative solutions
Concentration, Uniformity, see below			n. a.	See § 6	

[a]There is no literature on this subject. A rough estimate could be computed with some assumptions. For instance, considering the MSCI world as an equity index and the euro area ten-year Government Benchmark bond yield (ECB) as the proxy for return of fixed yield instruments, the return on the 2010-composition portfolio (that is 31.0 shares and 41.6 bonds) would have been 38 % for the period between 2010 and 2015. Now adjusting the composition of the portfolio yearly with respective shares evolving linearly between 2010 and 2015, the return for the same 2010–2015 period would have been 29 %. Considering the total investment value of insurance companies in 2010 (€7,547,690 million), the opportunity cost of asset concentration on debt instrument is in the order of magnitude of €350 billion for the 2010–2015 period. This rough measure obviously neglects the dividend received in the case of shares and the risk premium on corporate debt

Appendix 9.3: Insurance Core Principles

While the banks have enjoyed since 1974 an international Committee on Banking Supervision (BCBS 2014), which produced the three Basel Agreements plus an enormous literature on good supervision practices, the insurance relative (International Association of Insurance Supervisors or IAIS, also hosted by the Bank of International Settlements since 1994) did not provide for a similarly globally accepted framework. Nevertheless, the role of IAIS has dramatically increased since the US financial crisis, with the G20 establishing the Financial Stability Board (FSB) at the London Summit in 2009. Since then, the IAIS has been producing recommendations in three areas to international convergence: (1) Insurance Core Principles (ICP); (2) a Common Framework (ComFrame) for the Internationally Active Insurance Groups (IAIG) and a global Insurance Capital Standard (ICS); and lastly (3) additional supervision requirements for Global Systemically Important Insurers (G-SIIs).

Insurance Core Principles (ICP)

The aim of the ICP is to provide a globally accepted framework for the supervision of the insurance sector. These principles are supposed to apply in every jurisdiction, whatever the level of development of the insurance market and the type of activity being supervised. They define the objectives of supervision—"maintaining a fair, safe and stable insurance sector for the benefit and protection of the interests of policyholders" (IAIS 2013c p. 4)—as well as the limits of the insurance sector. In this respect, the framework states that entities providing reinsurance and intermediation services are not directly under the scope of supervision, but their indirect impact on insurance activity command supervisory attention. For reinsurance, the supervisor should ensure that the guarantee provided by the reinsurance treaties effectively meets the expectations of the cedants (as reported in the assets side of their balance sheet). For insurance intermediaries, the ICP prescriptions are far more stringent, since they cover consumer relationship management at large in ICP18 (intermediaries), ICP19 (conduct of business), ICP21 (countering fraud) and ICP22 (AML-CFT regulations enforcement). Eventually, IAIS recommends a careful monitoring of intermediaries and reinsurers, but this is not necessarily to be done by the supervising body of insurance companies.

Table A.9.1 Overview of insurance core principles implementation

	Singapore	Switzerland	Australia	Italy	France	Japan	Belgium	Ireland	Malaysia	USA	Denmark	Spain	South Africa	Brazil	Nigeria
ICP1 Objectives, Powers and Responsibilities of the Supervisor	3	3	2	3	3	3	2	3	2	1	2	3	2	2	3
ICP2 Supervisor	2	3	1	1	2	1	1	1	2	1	1	1	1	1	2
ICP3 Information Exchange and Confidentiality Requirements	3	3	3	3	2	3	3	3	2	2	3	3	3	2	2
ICP4 Licensing	3	2	3	3	2	3	3	3	2	2	3	3	2	2	2
ICP5 Suitability of persons	3	2	2	2	1	2	2	2	2	2	2	2	3	2	1
ICP6 Changes in Control and portfolio transfers	3	3	2	3	2	3	3	3	2	3	3	3	2	3	1
ICP7 Corporate Governance	3	3	3	3	1	2	2	2	2	1	2	1	1	1	2
ICP8 Risk Management and Internal Controls	3	2	3	3	2	3	3	3	2	2	1	1	1	3	2
ICP 9 Supervisory Review and Reporting	3	2	2	1	2	2	2	1	3	2	2	2	2	2	1
ICP 10 Preventive and Corrective Measures	3	3	3	3	3	2	3	2	3	3	3	3	3	3	2
ICP11 Enforcement	3	3	3	2	3	3	3	3	2	3	3	3	3	3	2
ICP12 Winding-up and Exit from the Market	3	3	2	3	3	3	3	3	3	3	2	3	1	2	3
ICP13 Reinsurance and Other Forms of Risk transfer	3	2	3	3	3	2	2	2	2	3	3	2	2	2	1

ICP14 Valuation	3	3	3	1	2	1	2	2	3	1	3	1	2	2	1
ICP15 Investment	3	3	3	3	3	3	2	2	2	3	2	3	2	3	2
ICP16 Enterprise Risk Management for Solvency purposes	2	3	2	3	1	2	2	2	1	2	2	1	1	0	1
ICP17 Capital Adequacy	2	3	2	1	2	2	1	1	2	2	2	1	2	2	1
ICP18 Intermediaries	3	1	3	1	3	2	2	3	1	2	2	1	3	1	1
ICP19 Conduct of Business	3	1	1	3	3	3	2	2	2	2	1	2	2	2	1
ICP20 Public Disclosure	2	1	1	2	1	2	1	1	2	3	2	2	1	3	1
ICP21 Countering Fraud in Insurance	3	2	3	2	3	3	3	3	2	3	1	0	1	3	1
ICP22 Anti-Money Laundering and Combating the Financing of Terrorism	3	3	3	2	3	3	3	2	3	2	1	3	1	2	2
ICP23 Group-wide Supervision	3	3	2	3	3	3	2	1	1	1	2	3	1	0	0
ICP24 Macroprudential Surveillance and Insurance Supervision	3	2	3	2	2	1	3	3	3	2	1	1	2	1	1
ICP25 Supervisory Cooperation and Coordination	3	3	3	3	3	2	3	3	3	2	3	3	3	1	1
ICP26 Cross-border Cooperation and Coordination on Crisis Management	2	3	2	2	3	1	2	2	1	2	2	1	2	0	0
Total	73	65	63	61	61	60	60	58	55	55	54	52	49	48	37

These principles are not just theoretical. In April 2009, the London G20 summit decided to have the IMF producing detailed assessments of the observance of the ICP as part of the Financial Sector Assessment Program. Since 2011, 15 countries have been surveyed and the results are shown in Table A.9.1. While KPMG 2014 insists that "the reviews demonstrate major themes that permeate the ten reviews,"[17] the whole picture shows large differences in practices among countries, even inside the EU: for 11 of the 26 insurance core principles,[18] the difference between the most and the least compliant EU member state is two notches or above on a four notch scale (from 0 – principle not observed to 3 – observed). Large differences in insurance supervision across countries pave the way for supervisory arbitrage; this is particularly the case in the EU, as passporting enables companies to operate across jurisdictions. While the EU has a specific approach to this issue (see above Sect. 9.2.1), the objective of tightening supervisory gaps seems of general relevance: IAIS is then working on a common framework for insurance groups operating across borders.

Common Framework for International Groups and Capital Standard

The IAIS issued its first exposure draft of the Concept Paper on ComFrame in July 2011 (IAIS 2011). The idea behind this project, which is due for implementation in 2019, is to impose convergent prudential rules to Internationally Active Insurance Groups (IAIGs) in order to prevent supervisory arbitrage. Around 25 IAIGs have volunteered to work on the project, since they too would be more comfortable with a harmonized regulation rather than multiple group supervision framework in the jurisdictions they are operating in.

ComFrame is to include a risk-based insurance capital standard (ICS), which will set minimal rules that can be supplemented by additional rules at local level ("goldplating"), in contrast to the European S2 regime (see below Sect. 9.3), which is based on maximum harmonization. While IAIS is still consulting to determine these capital standards, the definition of internationally active insurance groups (IAIGs) is now accepted as

- writing premiums in at least three jurisdictions,
- total assets must be at least US$50 billion
  or gross written premiums at least US$10 billion.

[17] Five more have been published since the KPMG survey.

[18] These are ICP7, ICP8, ICP14, ICP16, ICP18, ICP19, ICP21, ICP22, ICP23, ICP24, ICP25. For ICP2, ICP17 and ICP20, EU member states appear to perform poorly overall: Solvency II is addressing these issues in priority.

According to this definition, the IAIS expects there to be about 50 IAIGs worldwide (IAIS 2014). The process of refining this Insurance Capital Standard is complex, involving IAIS consultations of insurance companies and detailed responses with no synthesis to date (see http://www.iaisweb.org/page/news/consultations/closed-consultations/insurance-capital-standard-ics//file/58015/ics-cd-resolution-of-comments-october-stakeholder-meeting).

It should be noted that these capital standards will also apply to Global Systemically Important Insurers (G-SIIs), although the definitions of IAIGs and G-SIIs are not exactly aligned. First, there are no clear-cut criteria for defining a G-SII: G-SIIs are designated by the FSB following consultation with the IAIS and national authorities. Then, proceeding from the definition of IAIGs, it appears that a solo national insurer of global systematic significance could be a G-SII without being active in three jurisdictions, hence without being an IAIG. Ping An for instance, while being a global systematically important financial institution with geographically diversified interests in banking, is underwriting mainly in China, hence it would not necessarily qualify as an IAIG if it were not designated by the FSB as a G-SII.

While the G-SIIs will be submitted to the same requirement as the IAIGs, they will deserve additional supervisory attention since national supervisors might not correctly address the systematic risk.

Additional Supervision Requirements for G-SIIs

See above Sect. 9.4. Systemic risk regulation.

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