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Could we rely on market discipline as a substitute for insurance regulation?

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Abstract

Purpose – The purpose of this paper is to examine empirically whether the market discipline works, and if so, whether it is a complement or substitute of prudential regulation in the insurance markets. Market discipline is intended as “the power of . . . market forces . . . to evaluate and control the risky behaviour of the financial institutions”. The authors’ formal hypothesis is that if market discipline works as complementary to prudential regulation, the response of the insured is expected to be weaker than if market discipline acts as a substitute to prudential regulation.

Design/methodology/approach – The authors designed an experiment examining policy subscription reaction to adjustments in insurers’ risk ratings in three different regulatory environments, to compare market discipline in each market. An econometric model was estimated to test the reaction of policy subscription to changes in credit ratings of the insurers.

Findings – The findings indicate that more market discipline was exerted in the crisis period, and more intensely where it is intended to replace regulation. A formal hypothesis was tested: in a less regulated environment, consumers’ protection rests more heavily on their caution and use of market information about the insurers’ financial condition.

Research limitations/implications – The research is constrained by the availability and detail of the publicly available data.

Practical implications – The results imply that regulation and market discipline work more as complements than as substitutes.

Social implications – Market discipline does not replace prudential regulation in the insurance market.

Originality/value – The approach presented in the paper adds to precedent work studying comparatively different regulatory environments, and also concerns the response of market discipline in the financial crisis context.

Keywords Regulation, Insurance, Market discipline, Financial crisis, Credit ratings

Paper type Research paper

JEL classification – L51, G22

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1. Introduction

The recent financial crisis has motivated the debate on how the financial markets in general, and insurance markets in particular are regulated, including the question of how does market discipline work. There is not a formal and generalized definition for market discipline; the one we adopt is that of Flannery (2001): “the power of investors, consumers and risk rating agencies (among other market forces) to evaluate and control the risky behavior of the financial institutions”.

In this paper we seek to answer empirically whether the market discipline has worked, and if it did so as a substitute or a complement of prudential regulation. In order to answer this, we have examined the reaction of policy subscriptions to variations in the independent risk rating of the insurers in three different regulatory environments. The regulatory and supervisory practices in the European Union Countries (EUC) and in Switzerland rest on capitalization, prudential regulation and market discipline, while in New Zealand, they rest strictly in market discipline.

We aim to respond a fundamental question: does market discipline work in the insurance markets? If so, is it a complement or a substitute of prudential regulation?

Two subordinated questions could be addressed with our results: how the insured responded to variations in lagged risk ratings during the recent crisis?[1] And could the risk rating agencies have warned the insured of the proximity of the crisis and allowed them to unsubscribe their policies in advanced?

Our formal hypothesis is that if market discipline works as complementary to prudential regulation, the response of the insured is expected to be weaker (i.e. a change in the risk rating is relatively not strongly followed by policy subscriptions) than if market discipline acts as a substitute to prudential regulation (i.e. a change in the risk rating has more powerful impact in changes in policy subscriptions). The rationale behind the hypothesis is that while credit ratings incorporate much relevant information, prudential regulation protects the consumers of insurance policies, but also increases moral hazard on the financial condition of the firms. In a less regulated context (i.e. a regulatory environment which leaves more degrees of freedom to market signals), consumers have to protect themselves therefore they pay more attention to market signals (being credit ratings a qualified synthesis). Thus, we will test the reaction to rating changes in different regulatory environments, expecting some clues on the hypothesis, arising from the estimated coefficients.

After this introduction, Section 2 summarizes the reasons for the insurance market to be regulated and the regulatory arrangements that currently exist; Section 3 displays the model to test; Section 4 presents the data; Section 5 shows the empirical results; Section 6, closes with conclusions.

2. Insurance: a regulated market

The regulation of the insurance market is based on the existence of market failures which affect the social welfare maximization otherwise achieved under perfect competition. Welfare economics established that the optimality in resource allocation is not achievable under certain conditions, thus being necessary to seek for second best results.

A rationale for the regulation of the insurance industry is to diminish efficiently the insurer’s ability (or that of their intermediaries) to distort their promises at the moment of selling their products, and/or to default on their duties (by insolvency or deficient

sinister compensation). The emphasis of the regulation is put thence in solvency issues, to face the liabilities of the insurers (Cummins and Doherty, 2006; Baltensperger *et al.*, 2008; Grace and Klein, 2009).

In addition, solvency requirements should serve as minimal standards allowing regulators to know whether they should take actions on the insurers to protect consumers. Although monitoring solvency demands an extended variety of regulatory activities, its cost minimization could be achieved in two ways. First, by taking actions which minimize the insurers' insolvency risk. Second, by taking control of insurers with liquidity problems in order to preserve, rehabilitate, reorganize or liquidate them.

Four regulatory models (three national cases and a supra-national one) can be distinguished in the real world. Each of them has well defined characteristics. However, in the context of our discussion, their main differences are related to the importance given either to prudential regulation, or to market discipline, to minimize moral hazard. We describe briefly the four environments (EUC, the USA, Switzerland and New Zealand) to present their differences and resemblances. The empirical section does not consider the American model.

European Union

Solvency II is a prudential supervision scheme for insurance companies, that is currently being introduced in the European Union. It is a refinement of the precedent model (Solvency I), and it is expected to be completely implemented by the end of 2012. Solvency II will be structured in three pillars:

- *Pillar 1.* Quantitative requirements: the capital requirements reflect the risk profile of the company based on an economic vision of the financial statements, and considering different risks in a broad manner. The capital minimum requirement (CMR) is determined by a specific formula. It is also established a solvency capital requirement (SCR) which implies the maximum yearly loss at the 99.5 percent of confidence (calculated as a standard value at risk or by means of internal models) (Doff, 2008).
- *Pillar 2.* Supervisory activities: identifies risks not considered in Pillar 1. Group supervision is established by means of a set of supervisory bodies. Additional capital requirements could be imposed in specific cases. Incorporates a tool (own risk and solvency assessment (ORSA)) to identify, measure, monitor and control risks.
- *Pillar 3.* Information to supervisors and public disclosure: encourages the publication of previously private information, for consumers and regulators. The industry transparency is improved by requiring institutions to publish risk taking actions and particular issues.

Under Solvency II related financial institutions that constitute conglomerates are going to be jointly regulated. Financial groups could face increased capital requirements if any of its subsidiaries gets involved in risky activities, with special interest placed in speculative derivative trading. Moreover, the regulator could ask for additional capital if a specific risk is not correctly covered by the established capital requirement.

USA

The US insurance market regulation is based on standards set at a state level, despite the reforms introduced in the 1990s to unify the regulatory arrangement. Each State

Regulatory Commission sets the regulations considered necessary, and each insurer has to adequate to the norms of each state, except for solvency regulation, which is responsibility of the “home state” (Harrington, 2009). The risk capital model is only an element of the regulatory arrangement of the USA. Beyond the minimum capital required, there are reserve and financial reports requirements, cash flow and liquidity proofs, etcetera.

The USA’ risk based capital (RBC) system has two components:

- (1) the risk adjusted capital formula, which establishes a minimum hypothetical capital level to be compared with the company’s current level; and
- (2) a model act of risk adjusted capital requirements which gives an automatic warranty to the State Regulatory Commission to take specific actions in case of insolvency.

The capital requirements and the model act have been standardized by the National Association of Insurance Commissioners (NAIC). Almost all states have adopted laws or regulations based on the NAIC model (Klein, 2000). NAIC model objectives are to relate capital requirements to risk, to generate a safety net to insurers, to secure certain uniformity between states and to anticipate actions if the requested capital falls below the minimum level.

Switzerland

The future European Union regulatory arrangement (Solvency II) and the recently introduced Swiss Solvency Test (SST) have many overlaps. They are based in principles, use risk capital requirements based on market values, both allow the use of internal risk models (yielding flexibility to insurers), and consider the need to make a joint overseeing. Economic risk capital models were first introduced by the SST and represent an innovation in regulation, considering the importance of supervising solvency and other qualitative concepts.

In the SST model, regulators determine the capital required to warranty an adequate solvency level via a two-tier scheme. The first level of capital requirement is based on minimum capital rules, while the second specifies a desired capital level (target capital). The model includes a quality evaluation which highlights internal risk control processes. SST allows internal model usage, but is based on standardized models to determine market risk, credit risk, idiosyncratic risk and scenarios to analyze other risk categories, such as catastrophic ones (Eling and Holzmüller, 2008). Although the SST was introduced in 2006, the insurers and their financial groups subject to this regulatory arrangement had until the ending of 2010 to build the required capital level, being in force since January 2011. The calculations of the capital requirements analyze the financial statements of both insurers and their related business.

New Zealand

New Zealand presents one of the less-regulated insurance markets in the world. Insurers have to accomplish with a self-regulatory arrangement, based on ethical norms, which seeks to achieve a quality service to those insured. It mandates insurers to achieve an external rating which summarizes its ability to face present and future liabilities. Such a rating rests on accounting information and other data asked to the insurers. The rating is updated yearly and published by the regulator. This model

is based on market discipline and assumes that the participants demand the insurers to behave properly (Eling and Holzmlüller, 2008).

A synthesis of the regulatory regimes and their relation with market discipline

The four regulatory arrangements described above can be placed across a wide spectrum in terms of market discipline, with New Zealand in one extreme. New Zealand's arrangement actively encourages market discipline and relies on customers actions that tend to self-regulate the industry. The other models take into account market discipline by motivating insurance companies to make private information available to customers, but they continue to be based on solvency regulations and to set minimum capital requirements (adjusted for liquidity and other risk factors) to protect consumers. We pursue to measure the existence and influence of market discipline, through the effect of publicly available information on policy levels.

Previous work on insurance market discipline

The literature presents models and empirical works tempting to quantify market discipline, mostly based on the banking sector, with only a few analyzing the insurance market. In the former group, Demirguc-Kunt and Huizinga (2004) analyze the impact of explicit deposit insurance (and its key features) on bank interest rates and market discipline. Between the latter, Lee *et al.* (1997) show that the risk of the assets of certain insurers increased after introducing warranty funds; Brewer *et al.* (1997) conclude that the risk of the assets of life insurers is greater for those with more business in states where the warranty funds are calculated against surviving insured, compensated against state taxes, and then charged to taxpayers. Epermanis and Harrington (2006), analyze the effect on policies due to changes in risk ratings of insurers in the USA. They find that the policies sold by insurers fall as a consequence of a downgrade of the risk rating of the latter. This is a signal of well functioning of market discipline in the USA, indicating that the insured retain enough power to influence the risk behavior of the insurers. Eling and Schmit (2008) replicate Epermanis and Harrington model and argued in favor of the existence of market discipline in the German market.

Both Epermanis and Harrington (2006) and Eling and Schmit (2008), show that the policies purchased decreased after a downgrade in the risk rating but that the opposite effect is weaker (an improvement in the rating not necessarily yields an increase in policy purchases). Thus, from an insurer's perspective, the risk of sending a bad signal to the market (a rating downgrade) is greater than the benefits of sending a good one (a rating improvement).

3. The model

Methodology

We replicate, with some adjustments, the methods applied by Epermanis and Harrington (2006) and Eling and Schmit (2008). We evaluate the existence of market discipline in the insurance markets of Germany, Spain, the UK (taking together as representatives of EUC), Switzerland and New Zealand between 2002 and 2009. Thus, we cover three of the four regulatory environments briefly described earlier, setting aside the USA, already tested by Epermanis and Harrington (2006).

We add the novelty of studying different countries simultaneously, grouping them by regulatory environment as a control, allowing us to compare the degree market discipline that exists in each of them.

We made operative the concept of market discipline as the reaction of the logarithm of policy subscription, against risk ratings variations, in each regulatory environment. We expect that a downgrade (improvement) in the risk rating yields a fall (increase) in the policies subscribed by the insured, since market discipline should reward (penalize) a growth (fall) of the risk implicit in the rating.

Our data considers volume (price \times quantity) of policies. We recognize that a decrease in policies' subscriptions in any particular period could be due to a decrease in price, in quantity or in both of them. But we cannot separate the effects with our data. Regarding the price times quantity discussion, it is difficult to identify which effect is due to changes in customer behavior and which one due to changes of the company in pricing. We have two effects here (changes in demand versus changes in supply), but we can only identify the "equilibrium point", resulting from demand and supply intersection.

There are also some more concerns regarding the data. We use a combination of AM Best, Standard & Poor's, Moody's and Fitch. One potential problem is how to handle double counts (i.e. two rating downgrades at the same time)? What about years with downgrades and upgrades (from the same agency)? Are there also cases with downgrade from one agency and upgrade from another agency? We have to make some decisions: first, we count downgrades and upgrades (or not change). We do not account for the "degree" of the downgrade or upgrade (i.e. a company which losses two positions is a downgrade, the same as a company which losses one position in the ranking). Second, ratings are medium and long run evaluations, we do not have cases of downgrade/upgrade in the same period. Normally, the rating agencies anticipate their future movements with outlooks (negative, positive, stable). Third, the event of one rating agency upgrading and other downgraded in the same period is rare. We have one case in our sample (Friends Provident, 2008). We simply compute one downgrade and one upgrade. Then, the results are not expected to vary.

We analyze the life insurance market, since it is the most relevant at the world level, and because of its characteristics it is internationally comparable, which is not the case in the majority of non-life markets.

Model

We summarize the role of market discipline in equation (1), which relates changes in policy subscriptions with the expected changes in them and changes in the risk ratings of the insurers:

$$\Delta P_{jt} = E(\Delta P_{jt}) + \delta RC_{jt} + \varepsilon_{jt} \quad (1)$$

where $\Delta P_{jt} = \ln(P_{jt}/P_{jt-1})$, being j the insurer and t the year, and RC_{jt} is vector which indicates how the risk rating of the insurer j behaves in the year t :

$$RC_{jt} = \left[RC_{jt}^{improvement}, RC_{jt}^{downgrade}, RC_{jt}^{nochanges} \right] \quad (2)$$

For example, $RC_{jt}^{improvement}$ is equal to 1 if the rating of insurer j in the year t has improved with respect to the year $t - 1$, and equal to 0 otherwise. In the same way, $RC_{jt}^{downgrade}$ is

equal to 1 if the insurer j rating in the year t has worsen with respect to the year $t - 1$, and equal to 0 otherwise, and finally, $RC_{jt}^{nochanges}$ is equal to 1 if no changes in risk rating occurred and it is equal to 0 otherwise. Then, the vector could assume the forms: $[1, 0, 0]$, $[0, 1, 0]$ or $[0, 0, 1]$. The expression ε_{jt} in equation (1) represents the error term, with zero average. We consider contemporaneous and lagged effect of rating changes.

4. The data

The ratings represent independent opinions on the ability of the insurers to accomplish with the obligations contracted with their insured. We used information of four rating agencies, AM Best, Standard & Poor's, Moody's and Fitch, extracted from agencies and insurers reports.

We analyzed the change in gross policies (denominated in local currency, and adjusted by inflation). The results are based on the logarithms of the annual changes in (gross) issued policies. We take logarithm to minimize the influence of price variations due to commercial policies of the insurance companies. We consider that the policy purchases represent (or should represent) the most sensitive variable in the consumer behavior, since in other industries it is represented in growth/fall of sales. That is, policy variations represent changes in demand faced by the insurers. We recognize the inertias to cancel policies, proper of the industry, due to penalties and terms imposed in the contracts.

As Table I points out, the risk ratings of the considered insurers had behaved in a stable manner, with more downgrades in the years 2008 and 2009 due to the financial crisis. The number of observations in the sample is not constant along the time, because the insurers are not mandated to publish their ratings (with the exception of New Zealand insurers), limiting their willingness to do so after rating downgrades.

Table I also shows the information by country and by regulatory environment. German, Spanish, and UK markets are merged under the EUC label; we also included Switzerland (CH) and New Zealand (NZ). As Table II indicates, the model does only includes information freely available in internet, thus it does not include data of all life insurers of each market.

Table II summarizes the average evolution of the policies, in real terms, for the selected regulatory arrangements. All regulatory frameworks reported an average 1 percent yearly growth rate after adjusting for inflation. Two factors explain such

Country	Regulatory environment	Insurers in the sample	Improvement	Down	No change	Total
Germany	EUC	7	4	15	96	115
Spain	EUC	13	8	24	143	175
The UK	EUC	13	14	44	122	180
Germany + Spain + The UK	EUC	33	26	83	361	470
New Zealand	NZ	10	12	21	98	131
Switzerland	CH	8	3	15	71	89
Total	All	51	41	119	530	690

Table I. Observations by country and by regulatory framework (period 2002-2009) (ratings of life insurers)

Source: Own elaboration on annual reports of insurers and rating agencies

Year	EUC (%)	NZ (%)	CH (%)	Average (%)
2002	1.52	-2.97	2.80	0.45
2003	-1.11	0.53	-4.45	-1.67
2004	-0.70	-0.71	3.28	0.62
2005	2.08	-5.88	-1.41	-1.74
2006	3.22	2.11	-3.09	0.75
2007	1.83	5.76	-2.69	1.63
2008	-0.47	4.35	0.77	1.55
2009	0.43	-0.88	0.27	-0.06
Average	0.85	0.29	-0.57	0.19

Table II.
Yearly changes in
average policies by
regulatory environment

Source: Own elaboration on annual reports of insurers and rating agencies

increase: first, the degree of maturity of the life insurance market (different to that of other markets, as the credit default swaps one, which grew markedly until it plummeted with the crisis). Second, the existence of a near zero- or negative-demographic growth rate in most of the analyzed countries in the period.

Table III shows the behavior of the sample by rating agency. In the analyzed period, a 17 percent of the rating changes were downgrades and 5 percent upgrades, while a 78 percent remained unchanged. The sample has majority of observations from S&P, which has the higher quantity of rating changes. The percentage of “no changes” is similar between the other three agencies. Fitch registers very few ups in the period.

The ratings changes of the sample are highly correlated between agencies. S&P has the higher correlations with Fitch (0.82) and with AM Best (0.81). In turn, between those agencies with majority representation in the sample, S&P and Moody's, the correlation is somehow lower, of 0.76. Among the two smaller agencies, the correlation reaches 0.79, and between those and Moody's, they fall to 0.69 and 0.75, respectively.

5. Empirical results

We aimed to respond one fundamental question, and two other subordinated. The first, related to the market discipline in the whole period, seeks to answer on the sign and significance of the change in policies when ratings vary. Implicitly, the rating is supposed to summarize, and not to add, information already known by the market, since the variation in ratings and subscription/de-subscription are contemporaneous.

Ratings	AM Best	S&P	Moody's	Fitch	Total	Average	SD
Down	18	51	29	21	119		
No change	99	172	157	102	530		
Improvement	7	22	9	3	41		
Total	124	245	195	126	690		
Down (%)	15	21	15	17	100	17	3
No change (%)	80	70	81	81	100	78	4
Improvement (%)	6	9	5	2	100	5	2
Total	100	100	100	100			

Source: Own elaboration

Table III.
Changes in ratings in the
sample, by rating agency

The second inquire is related with the response of the policyholders after the new rating is issued. In other words, we ask if the rating implies a new informative content for the insured. The third test is devoted to know if the response to new ratings was or nor stronger in the more turbulent period of the recent financial crisis.

Question 1: does market discipline work in insurance markets? If so, is it a complement or a substitute of prudential regulation?

The model analyzes the reaction of the logarithm of the variation of policies to changes in risk ratings of the insurers.

Table IV includes the results for the all-period case (2001-2009), where we analyze the reactions of the insured to contemporary changes in insurers' ratings. Recall that, the average yearly real growth rate of the policies in the period was 1 percent. Looking at the results of the model in Table IV, and using Switzerland as example, it is expected that the annual sales of life insurers grow at -0.10 percent if they could maintain their rating, while, sales decrease by -3.42 percent if ratings are downgrade, or increase by $+1.63$ percent if ratings are upgraded.

The signs are the expected ones. The neutral rating implies scarce up or down variation in policy sales. As in the models of Epermanis and Harrington (2006) and Eling and Schmit (2008), the effects of rating downgrades are greater than those of upgrades (except in the New Zealand case, where the effect is more symmetrical). This implies that policies diminish more in average when the rating worsens than what they increase when the rating improves. Additionally, in EUC, it is not true that an improvement in the risk ratings of the insurers triggers an important increase in the policy sales.

As mentioned earlier, the New Zealand insurance market is one of the less regulated of the world, and it is based almost exclusively in the market discipline existence. The estimates of the model support this fact, since the greatest absolute values of the coefficients are those obtained for New Zealand, followed by the Swiss and the EUC ones.

Although the directions of the results are the expected, only the New Zealand results for upgrade and no changes in rating are significant at 5 percent confidence. The remaining seven results are not statistically significant different than zero in our sample. For cases of downgrade ratings the coefficients are not significant even for New Zealand.

	Down		No change		Improvement	
	t	t - 1	t	t - 1	t	t - 1
<i>2001-2009</i>						
EUC (%)	-0.79	-2.87	0.99	0.85	0.39	3.01
CH (%)	-3.42**	-3.79	-0.10	-1.54	1.63	-6.99
NZ%	-6.17	-1.27	0.06*	5.14	6.71*	-4.25
<i>2007-2009</i>						
EUC (%)	-2.21	-2.23	1.92*	4.01*	-1.34	3.89
CH (%)	-0.98	0.20*	-0.46	-1.62	0.04*	-7.84
NZ (%)	-5.43**	3.97	5.17*	8.20*	6.09**	10.43*

Table IV. Summary of policies' elasticities with respect to ratings (2001-2009 and 2007-2009)

Notes: Estimates significant at: *5 and **10 percent; t indicates reaction to contemporary rating changes; t - 1 indicates reaction to lagged rating changes

Source: Own elaboration

Subordinated questions

How was the response of the insured to variations in lagged risk ratings? None of the estimated coefficients is statistically significant in this case, and the signs of the estimates are only satisfactory in the case of downgrades. Signs and absolute values of the estimated coefficients became more volatile in the remaining cases (Table IV also includes the results for this period).

Has the market discipline worked better in the recent crisis (sample 2007-2009, instead of 2001-2009)? Considering the contemporaneous cases, the reactions have the expected signs for downgrades (but the absolute value falls in Switzerland and New Zealand and only increases in EUC in relation with the complete period). The rating upgrades trigger fall in policy sales in the EUC and maintain the increase, in sign and absolute value, in New Zealand. In Switzerland, the responses are very limited in absolute value.

The period between 2007 and 2009 presents more statistically significant coefficients, considering either contemporaneous or lagged rating changes (nine out of 18 possibilities). However, half of the estimated coefficients are not statistically significant. Also, the significant coefficients present consistent absolute values and signs.

6. Conclusions

The financial crisis has introduced the role of market discipline – whether it works, and in that case, if it is complementary or substitute of regulation, among other issues, in the precedent discussion on financial regulation. Some opinions are very critical with respect to the role played by regulation during the crisis; others point out the peril of allowing the markets to self-regulate an industry with information asymmetries of complex correction.

We tested our formal hypothesis: if market discipline works as complementary to prudential regulation, the response of the insured to changes in credit ratings is expected to be weaker than if market discipline acts as a substitute to prudential regulation. In a less regulated environment, consumers' protection rests more heavily on their caution and use of market information about the insurers' financial condition.

Following methodologies tested previously in the individual cases of the USA and Germany, we have replicated the analysis for a comparison between three national cases regulated under the common label of EUC, plus Switzerland and New Zealand. The empirical model proposes to examine whether variations in the risk rating have impact on policy sales of the insurers. If the clients are waiting signals to punish or reward insurers after changes in ratings – which are related with observed and anticipated solvency, then figures should reflect that.

Results for the whole period (2001-2009) are poor: only the estimated coefficients are significant in New Zealand for both rating upgrades and no changes, and in Switzerland for downgrades. These coefficients have the correct signs and consistent absolute values.

When the same sample is evaluated for rating variations one-period lagged, none of the results are statistically significant.

Analyzing a sub-sample of the crisis period (2007-2009), results improve, both for contemporary and lagged estimated coefficients. Half of the estimates are significant and signs and coefficients are as expected. Only for New Zealand all the coefficients are significant, with the expected signs and important absolute value of the policy sales response.

Market discipline was exerted more intensely in the crisis period, and in the country where it is intended to replace the regulation.

Note

1. For a comprehensive treatment of the crisis see Geneva Association (2010).

References

- Baltensperger, E., Buomberger, P., Iuppa, A., Keller, B. and Wicki, A. (2008), "Regulation and intervention in the insurance industry – fundamental issues", *The Geneva Reports: Risk and Insurance Research*, The Geneva Association, Geneva, February.
- Brewer, E., Mondschean, T. and Strahan, P. (1997), "The role of monitoring in reducing the moral hazard problem associated with government guarantees: evidence from the Life Insurance Industry", *Journal of Risk and Insurance*, March.
- Cummins, J.D. and Doherty, N.A. (2006), "The economics of insurance intermediaries", *Journal of Risk and Insurance*, Vol. 73 No. 3, pp. 359-96.
- Demirguc-Kunt, A. and Huizinga, H. (2004), "Market discipline and deposit insurance", *Journal of Monetary Economics*, Vol. 51 No. 2, pp. 375-99.
- Doff, R. (2008), "A critical analysis of the Solvency II proposals", *Geneva Papers on Risk and Insurance: Issues and Practice*, Vol. 33, pp. 193-206.
- Eling, M. and Holzmüller, I. (2008), "An overview and comparison of risk-based capital standards", Working Paper on Risk Management and Insurance, Institute of Insurance Economics, University of St Gallen, St Gallen, June.
- Eling, M. and Schmit, J. (2008), Working Papers on Risk Management and Insurance, University of St Gallen, St Gallen, September.
- Epermanis, K. and Harrington, S. (2006), "Market discipline in property/casualty insurance: evidence from premium growth surrounding changes in financial strength ratings", *Journal of Money, Credit and Banking*, September.
- Flannery, M. (2001), "The faces of 'market discipline'", *Journal of Financial Services Research*, Vol. 20 No. 2, pp. 107-19.
- Geneva Association (2010), "Anatomy of the credit crisis – an insurance reader from the Geneva Association", in Lietdke, P. (Ed.), *The Geneva Reports Risk and Insurance Research No. 3*, Geneva Association, Geneva, January.
- Grace, M. and Klein, R. (2009), "Insurance regulation: the need for policy reform", in Grace, M. and Klein, R.W. (Eds), *The Future of Insurance Regulation*, Brookings Institution Press, Washington, DC (forthcoming).
- Harrington, S. (2009), "The financial crisis, systemic risk and the future of insurance regulation", A Public Policy Paper of the National Association of Mutual Insurance Companies, September.
- Lee, S.-J., Mayers, D. and Smith, C. (1997), "Guaranty Funds and risk taking: evidence from the insurance industry", *Journal of Financial Economics*, April.

Further reading

Eling, M., Schmeiser, H. and Schmit, J.T. (2008), "The Solvency II process: overview and critical analysis", *Risk Management and Insurance Review*, Vol. 10 No. 1, pp. 69-85.

Holzmüller, I. (2008), "The United States RBC Standards, Solvency II, and the Swiss Solvency Test: a comparative assessment", Working Papers on Risk Management and Insurance No. 59, Vol. 59, Institute of Insurance Economics, University of St Gallen, St Gallen, August.

Market discipline

15

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