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Market discipline in the Argentine insurance industry: An empirical investigation

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Abstract

Along with a proper regulation and supervision regime, market discipline constitutes one of the pillars of financial stability and consumer protection. While several studies have found strong indication of market discipline in banking in Latin American and other countries, less attention has been given to this issue in regard to nonbank financial intermediaries. As institutional investors are growing vis-à-vis banks at the international and regional level, it becomes increasingly relevant to study market discipline beyond the banking system. In this spirit, this work studies, for the first time, this topic in relation to the Argentine insurance market, based on company-level information for 1998-2002. The results lend support to the claim that there does not seem to exist market discipline in the Argentine insurance market, as none of the fundamental variables measuring liquidity, solvency and profitability display any explanatory power with respect to the premium revenue growth. This finding reinforces the need to strengthen official supervision and other disciplinary devices, and to study why consumers exert different degrees of monitoring on banks as opposed to nonbanks, a fact that can fruitfully interpreted in the light of recent behavioural theories.

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Introduction

Being the case that financial intermediaries manage other people's money, they are prone to commit moral hazard by taking excessive risks at the time of investing such funds (see Bebczuk (2003)). In principle, as their money is at stake, the very clients of the financial system should take care of the monitoring of financial companies. However, it is often advocated that savers are unable to fully exert the so-called market discipline, leading the government to take over such role through the regulatory and supervisory regime.

Market discipline tends to be lax because the typical saver is in an disadvantaged position vis-à-vis the intermediary in terms of information and control. Even with reasonable disclosure and transparency standards –which it is not always the case-, financial information is costly and difficult to interpret. But the question remains as to whether savers are as blind as they may seem.

Large clients, both individual and institutional, are usually sophisticated customers and possess the required technical skills to watch over their money. Furthermore, they have access to public, free-of-charge balance sheet data. Small investors, in turn, can free ride on such monitoring effort via an information cascade, where they take decisions based on actions taken by the large investor group, even when their information is private. In the case of listed financial firms, information is rapidly reflected in security prices, making free riding even easier. On top of this, there are specialized firms devoted to the analysis of financial and nonfinancial companies, which provide their services to investors willing to pay the corresponding fee.

Additionally, the variety of financial arrangements gives rise to differences in market discipline across financial intermediaries. For instance, there are intermediaries that manage funds at their clients´ risk –such as mutual and pension funds, and life insurance companies- and others that do it at their own risk –like banks and nonlife insurance companies-. Although misbehavior can occur in both cases, it is in the second one where incentives are less aligned between intermediaries and clients, as the latter might relax their surveillance trusting that the former will honor their (nominally fixed) obligations in any event.

Finally, there exist differences between bank and nonlife insurance obligations. Indeed, it is not clear a priori whether public's incentives to monitor are higher in either of these cases. Bank liabilities toward depositors are certain and usually short-term, while those of nonlife insurance companies are contingent on the realization of claims. On one hand, as their actual wealth is at stake, the depositor might be more active than the policyholder, who will be especially concerned only at the time of having a claim, but, on the other hand, the banking system is typically protected by a governmental safety net and is subjected to more stringent supervisory standards, which in turn may relax market discipline. The very contingency and long term of many insurance contracts turn the business of the companies even more opaque for outsiders than bank contracts, giving rise to a higher degree of adverse selection. Long tails –that is, extended time spans between the occurrence of the event and the actual claim payment - further blurs the informational content of insurers' balance sheets, hindering the clients' ability to discriminate between good and bad companies.

Thus, the debate over the existence of market discipline cannot be settled on theoretical grounds and calls for empirical work. This paper aims at testing for market discipline in the insurance market in Argentina. The methodology applied builds on related research on the banking system, where strong indication of market discipline was found (see Demirguc-Kunt and Huizinga (2001) and Martinez Peria and Schmukler (1998)). The econometric procedure points out to assess, for the first time, whether the percentage change in premiums has anything to do with the underlying fundamentals (solvency, liquidity, profitability, among others) of each individual insurance company.

There are at least two reasons that make this kind of analysis of particular relevance.[1] On one hand, the exercise allows to examine whether some alleged market practices are successful at all to expand business. There exists a widespread consensus among practitioners that policyholders do not care much about the company they hire. Instead, according to most market players, they simply choose those insurers that charge lower premiums for a similar level of coverage. Additionally, analysts assert that local companies are quite dependant on independent selling agents (called *productores de seguros*), who have a decisive influence on client's decisions based on long-term

[1] These market features seem to be present in both the life and nonlife lines of business, but are more prevalent in the latter.

business relationships. These agents advise policyholders on the company selection process, and so they have a considerable power over companies, which in some cases are willing to pay higher-than-competitive brokerage commissions as a means of attracting more business, sometimes without a careful selection of risks.

Under these conditions, operating profitability may be put at risk, as (a) The competition via prices brings about poor underwriting, that is, selling of insurance policies that are not adequately supported by reserves. For a company going through financial distress, this could be a highly attractive strategy to cashing in premium and keep the company alive for a while at the expense of their clients, who will be unable to be paid for their due claims in the future. Adding to this, good companies might be forced to slim its premiums and compromise its future solvency. As negative profitability seems to be the norm rather than exception in the Argentine marketplace, this point should not be disregarded; and (b) The alleged conflict of interest between companies and agents vis-à-vis policyholders not only creates moral hazard but also inflates the costs of intermediation, thus reducing profitability and/or increasing the level of premiums faced by clients.

The diminished operating profitability, in turn, might lead companies to balance their income statements with higher financial returns and, hence, high risks. Financial risk is often overlooked by market analysts, clients and even regulators, whose attention is placed mostly on the liabilities side of the balance sheet. In Argentina, moral hazard in portfolio selection took the form of heavy and increasing exposures in public bonds as the 2001-2002 approached.[2]

The second motivation is related to the public interest implications of the extent of market discipline. There is a partial trade-off between market discipline and the regulation/supervision regime in that whenever the former fails to exist, the latter should be reinforced to better protect systemic stability and consumers themselves. In the particular case of Argentina, this appears to be a pressing issue. As shown next, almost 200 companies were liquidated since 1990 –in part, owing to the perverse behavior described above-, leaving many claims unpaid. Letting alone the cost for the

[2] In the case of companies controlled by banks, the investment in bank deposits (subsequently invested in public bonds) was yet another manifestation of moral hazard.

policyholders already affected, this situation erodes the confidence of new ones, shrinking the potential size of the market.

The rest of the paper is structured as follows: Section 1 puts forward some stylized facts about the insurance market in Argentina. Section 2 describes the data and the hypotheses to be tested. Section 3 and 4 discuss the main econometric results and their robustness, respectively. Some conclusions and policy recommendations are offered in Section 5. Finally, an Appendix presents a behavioural-based theoretical view to understand the differences between banks and insurance companies in terms of market discipline.

1. Some market trends

Just to give a flavor of the analysis to be developed, some relevant aggregate figures are presented here.[3] The Argentine insurance market is small, as shown in the next table. Total annual premiums have been on average below $7 million and 2% of GDP, well below industrial countries, where this last ratio usually exceeds 6%. The industry is dominated by property and casualty (P&C) companies, indicating that long-term saving-related products (in particular, retirement -or voluntary pension- products) are underdeveloped.

Insurance Industry Premiums, 1998-2002
In millions of current pesos

Year	Total	P&C	Life	Retirement
1998	6.2	4.1	1.5	0.6
1999	6.5	4.2	1.6	0.7
2000	6.8	4.2	1.7	0.9
2001	7.0	4.4	1.8	0.8
2002	7.3	5.0	1.4	0.9

Source: CFS based on SSN figures.

[3] Karaglozu (2002) depicts the functioning of the Argentine insurance market during the nineties.

The number of companies have been shrinking during the nineties and the market is still in the process of finding an equilibrium level of concentration:

Number of insurance companies operating in Argentina, 1997-2002

Activity	1997	1998	1999	2000	2001	2002*
Retirement	34	31	30	27	24	25
Life	72	71	68	63	62	59
P&C	153	149	134	126	117	110
Total	259	251	232	216	203	194

* As of May

Source: CFS based on SSN figures.

Some performance indexes are reproduced in the following table, which supports some of the above assertions. The market consistently displays negative operating ratios that, in spite of positive financial revenues, determine negative net results. Marketing and overhead costs seem quite high, consuming about 50% of total premiums.[4]

Insurance Industry: Profitability Indexes
In percentage of total premiums

Item	**1998**	**1999**	**2000**	**2001**	**2002**
Technical result	-11.6	-10.2	-12.2	-8.4	-13.8
Of which:					
Marketing costs	-20.7	-20.5	-21.2	-19.9	-19.8
Overhead costs	-29.8	-29.9	-32.0	-28.3	-29.9
Financial result	2.0	6.1	10.5	5.4	11.9
Total result	-10.0	-4.8	-2.2	-3.3	-4.3

Source: CFS based on SSN figures.

[4] For the sake of comparison, IMF (2002) present some related figures for non-life insurance markets in G-7 countries for the period 1995-2000. While technical results are negative in all cases but in Germany and Japan, total expenses are just about 30% of premiums on average.

2. Data and hypotheses

Annual balance sheet information compiled by the insurance regulator (the *Superintendencia de Seguros de la Nación*) for the period June 1998-June 2002 will be used to conduct the empirical analysis. The estimation, based on panel data techniques, seeks to explain the growth in premiums against a set of variables reflecting the ability of the company to fulfill its obligations, and that can be grouped into solvency, liquidity and profitability.[5] The variables included are:

Profitability is proxied by four components of net income, all scaled by total premiums: accrued claims (*Siniestros Devengados*), overhead costs (*Gastos de Explotación*), marketing costs (*Gastos de Producción*) –whose net sum amounts to the loss ratio (*Resultado Técnico*)-, and financial income (*Resultado Financiero*). Accrued claims are expected to have a negative effect on premiums growth as they reveal the reliance on a high-risk pool of previous clients, insufficient premiums, or both. The same applies to the overhead costs, which should be interpreted as a signal of inefficiency in the running of the company. Less clear-cut is the impact of marketing costs, which includes the commissions paid to independent selling agents (*productores*). As any other expense, high marketing costs have an adverse effect on profitability but, as explained above, they provide incentives for selling agents to channel more business to some companies than others, so a countervailing effect might take place. Financial income is also likely to have a dual impact: on one hand, it improves profitability but, on the other hand, it exacerbates the riskiness of the company assets.[6] The capital to assets ratio is the natural measure of *solvency*, while *liquidity* is captured by the ratio of cash plus investments (which excludes real state) to debt owed to policyholders.

In addition, the following control variables were employed in alternative specifications:

(a) *Group*: A dummy variable taking value one if the company belongs to a financial conglomerate, and zero otherwise. The expected sign is ambiguous, as being part of a conglomerate might indicate that the other units may be willing to financially assist the

[5] Panels are unbalanced because of the liquidation of some firms and the creation of new ones over the period.

company in the event of financial distress to avoid negative contagion or reputation effects, but also conflicts of interest may arise that adversely affect consumers.

(b) *Foreign*: A dummy variable taking value one if the company belongs to foreign residents , and zero otherwise, according to SSN criteria. The expected sign is positive because the public often perceives foreign companies as better managed and regulated (by local as well as foreign regulators) and might also anticipate that the main house abroad will come to the rescue of affiliates in trouble to preserve its international reputation and franchise value.

(c) *Lagged market share*: This variable tries to test whether uninformed policyholders prefer hiring companies with a substantial presence in the market, which might be a signal of good reputation and success.

(d) *Default*: A dummy variable taking value one in the year previous to the liquidation of the company, and zero otherwise. Market discipline should imply that customers run away from companies whose liquidation will take place within the next months. Since experience teaches that default frequently follows a gradual deterioration in the company business and hence it hardly is an unexpected event, policyholders may react to bad news by keeping themselves away from troubled companies.

(e) *Public debt to total financial assets*: As explained earlier, most institutional investors were drawn toward public debt negotiable instruments offering ever increasing returns since 1998. While these assets may have boosted financial results, an excessive exposure without proper diversification should have had an impact on risk perception by the public.[7]

(f) *Reinsurance credit to assets*: Argentina had a monopolistic, public reinsurer until 1991. When the *Instituto Nacional de Reaseguros* (INDER) was liquidated, it owed debt many insurance companies that are partly unpaid so far. Since these debts were not properly documented, it is still unclear whether the credit recorded by companies are

[6] For nonlife companies, the positive effect might be more important because companies are to a great extent money managers.

correct or they are overvalued. Thus, policyholders may be suspicious of the actual value of assets of companies with high credits against the INDER.

The following table summarizes the main variables under study for the whole industry and broken down into P&C and life and retirement. The first observation is that all variables have very high standard deviations, turning the mean a poorly informative statistic. The wide dispersion of premium growth makes it advisable to eliminate outliers when running econometric regressions. Relying on the median values, it can be noticed that negative technical and total result are common to both groups. The simple correlation matrix for the whole sample shows that premium growth does not appear to be closely associated to neither explanatory variable –the only significant correlations are those with overhead costs and net worth, but both of them are relatively low. The highest correlation in the table is the one between marketing and overhead costs (0.79), suggesting a priori that high marketing costs are not part of a deliberate business strategy but are just a mere reflection of cost inefficiency.

Descriptive statistics

Variable	*All companies*			*P&C*			*Life and retirement*		
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.
Annual premiums growth (%)	1680.8	17.0	18871.4	188.2	14.3	2101.2	3838.2	23.3	29278.2
Claims to premiums	-61.0	-44.2	252.6	-72.4	-53.9	282.5	-42.3	-21.9	209.0
Marketing costs to premiums	-28.9	-20.8	139.6	-25.3	-25.8	21.2	-35.6	-10.4	216.9
Overhead costs to premiums	-139.4	-37.1	823.7	-110.2	-35.2	454.8	-185.5	-42.3	1171.8
Technical result to premiums	-130.6	-9.7	989.1	-93.2	-8.3	550.4	-187.7	-12.9	1404.7
Financial result to premiums	2.2	4.7	1237.5	-56.6	4.4	1553.8	92.8	6.4	616.3
Total result to premiums	-122.5	-2.5	1631.5	-125.6	-2.1	1879.3	-113.9	-3.2	1273.6
Net worth to assets	41.4	33.8	27.5	38.2	31.5	23.6	46.1	43.1	31.5
Liquidity	4918.3	143.2	26115.8	992.7	101.1	5169.7	12250.4	649.6	42625.1

Source: CFS based on SSN figures.

[7] For the market as a whole, public debt steadily increased over the period, going from 40.8% en 1999 to 51.9 in 2002.

Correlation Matrix

	Premium growth	Claims	Marketing costs	Overhead costs	Financial results	Net worth	Liquidity	Market share
Premium growth	1							
Claims	0.01	1						
Marketing costs	-0.02	-0.02	1					
Overhead costs	-0.34***	0.06*	0.79***	1				
Financial results	-0.01	0.12***	-0.11***	-0.06*	1			
Net worth	0.07*	0.03	0	-0.12***	-0.04	1		
Liquidity	0.01	0.04	-0.01	-0.03	0.01	-0.05	1	
Market share	-0.03	-0.04	0.04	0.04	0.01	-0.23***	0.03	1

Note:(***), (**), and (*) denotes statistical significance at 1%, 5%, and 10% levels, respectively.

3. Results

By way of contradiction, this work lends support to the claim that there does not seem to exist market discipline in the Argentine insurance market, as none of the fundamental variables measuring liquidity, solvency and profitability display the expected sign at acceptable confidence levels. Regressions were run using standard panel data methods. Panels are unbalanced, and outliers were eliminated using the Hadi (1992, 1994) procedure. Anyway, not reported regressions (available upon request along with the database) confirmed that results are not sensitive to the inclusion of outliers. Time dummy variables for each year were included (but not reported) in order to detect potential changes of a systemic or macroeconomic nature affecting all companies.[8]

Regressions (1) through (4) represent the baseline case. Regression (1) and (2) include the whole universe of companies except the outliers. The Hausman test leads to choose the fixed effects over the random effects model. In any case, the hypothesis of market discipline is plainly rejected, as the majority of fundamental variables exhibit no statistical significance, and the overall goodness of fitness as measured by the R-squared is quite low. On top of this, net worth has a striking negative and significant effect on premium growth. The remaining significant variable is marketing costs, which presents a negative sign consistent with the inefficiency effect pointed out in Section 2.

[8] In this case, the dummy corresponding to 2002 turned out to be the only statistically significant and with positive sign. This is most likely consequence of the post-crisis inflation, so later on robustness will be checked by dropping the observations for that year.

In the last two cases, the quantitative effect is low, though.[9] Even though the fixed effects dummies serve to control for any firm-specific characteristic, regressions (3) and (4) present results for the sample partitioned into nonlife (regression 3) and life (regression 4), with unaltered conclusions regarding the lack of market discipline. It is worth noting that market share is only significant in these last two specifications, and in such a case, the sign is negative. This means that the initial company size is not positively associated with subsequent growth, with in turn is in line with the low market concentration observed in the Argentine insurance market.[10]

[9] For instance, in regression (1), if the marketing costs to premiums ratio rises one percentage point over the company's mean, premium growth decreases just 0.58 percentage points below the company's mean.
[10] In 2002, the 20 biggest companies in total premiums had a joint market share of 19% and 24% in the nonlife and life markets, respectively.

Dependent variable: Premium Growth

Variables	(1)	(2)	(3)	(4)
Claims	-0.003	-0.01	0.004	-0.035
	(-0.25)	(-1.06)	(0.28)	(-0.52)
Marketing costs	-0.58**	-0.07	-0.359	-1.21**
	(-2.48)	(-0.68)	(-1.15)	(-2.09)
Overhead costs	-0.01	-0.01	-0.009	0.029
	(-0.70)	(-1.49)	(-0.80)	(0.12)
Financial result	0.0001	-0.002	-0.0007	0.015
	(0.06)	(-0.91)	(-0.42)	(0.25)
Net worth to assets	-0.59**	-0.31**	-0.251	-1.572**
	(-2.00)	(-2.31)	(-0.78)	(-2.29)
Liquidity	-0.00001	0.0002	-0.000162	-0.000129
	(-0.07)	(1.55)	(-0.04)	(-0.71)
Lagged market share	-0.19	-0.4	-30.3***	-6.8*
	(-0.10)	(-0.83)	(-3.73)	(-1.83)
Constant	59.3***	32.3***	54.4***	15.0***
	(4.16)	(4.16)	(3.27)	(4.34)
R-squared	0.22	0.18	0.33	0.12
No. Observations	585	585	370	193
No. Companies	199	199	119	75
F (FE), Wald (RE)	10.3***	134.4***	11.7***	3.5***
F-Statistic FE	1.53***		0.137	0.111
Method	Fixed effects	Random effects	Fixed effects	Fixed effects

Notes:
(***), (**), and (*) denotes statistical significance at 1%, 5%, and 10% levels, respectively.
T-statistics are in parenthesis below each estimated coefficient.
All variables are ratios to total premiums unless specified.
Liquidity equals cash plus liquid investments to assets.
Other variables as defined in the text.
All equations include year dummies not reported.

In the next table, regressions (5) through (8) revisit the previous estimations by including additional variables likely to have influence on premium growth. Once again, neither variable appears to improve the goodness of fit. After dropping cross-section dummies, the last column shows that neither the activity (life or nonlife) or the ownership structure (being part of a financial conglomerate or being foreign-owned) have any explanatory power.

It must be highlighted that a test of market discipline is, to a great extent, a binary one, in that market discipline can be claimed as a fact only if all the main fundamentals have the expected sign and are not statistically rejected. If, say, liquidity is positive and significant, but net worth is not significant, it would be disputable to assert that the first finding supports the existence of market discipline, since one should have a strong theoretical argument to explain why policyholders care about solvency but not liquidity. Accordingly, in cases where results are mixed, common sense dictates to reject the hypothesis of market discipline or, at most, to leave the issue unsettled.

Dependent variable: Premium Growth

Variables	(5)	(6)	(7)	(8)
Claims	-0.003	-0.005	-0.004	-0.015
	(-0.22)	(-0.38)	(-0.28)	(-1.31)
Marketing costs	-0.585**	-0.548**	-0.57**	-0.119
	(-2.48)	(-2.33)	(-2.41)	(-1.14)
Overhead costs	-0.009	-0.012	-0.009	-0.014
	(-0.68)	(-0.94)	(-0.75)	(-1.44)
Financial result	0.0001	-0.0001	0.00004	-0.001
	(0.06)	(-0.03)	(0.02)	(-0.58)
Net worth to assets	-0.6**	-0.546*	-0.589**	-0.332**
	(-2.01)	(-1.83)	(-1.98)	(-2.41)
Liquidity	-0.000009	0.000004	-0.00001	0.00012
	(-0.06)	(0.02)	(-0.07)	(1.18)
Lagged market share	-0.184	-0.411	-0.166	-0.974
	(-0.10)	(-0.22)	(-0.09)	(-1.26)
Default dummy	-3.559			
	(-0.22)			
Public debt to total assets		-0.645*		
		(-1.66)		
Reinsurance credit to assets			0.488	
			(0.67)	
Activity dummy				7.18
				(1.23)
Conglomerate dummy				-0.155
				(-0.01)
Foreign				-9.96
				(-1.21)
Constant	59.6***	65.1***	55.6***	32.1***
	(4.16)	(4.45)	(3.64)	(3.86)
R-squared	0.22	0.22	0.22	0.20
No. Observations	585	585	585	566
No. Companies	199	199	199	194
F (FE), Wald (RE)	9.4***	9.7***	9.4***	145.6***
F-Statistic FE	1.5***	1.5***	1.5***	
Method	Fixed effects	Fixed effects	Fixed effects	Random effects

Notes:
(***), (**), and (*) denotes statistical significance at 1%, 5%, and 10% levels, respectively.
T-statistics are in parenthesis below each estimated coefficient.
All variables are ratios to total premiums unless specified.
Liquidity equals cash plus liquid investments to assets.
Other variables as defined in the text.
All equations include year dummies not reported.

4. Robustness checks

In order to make sure that the previous results are not driven by evident estimation flaws, a series of robustness checks are presented in the next table that confirm the earlier findings. While coefficients are volatile across all regressions in the study, no strong pattern of market discipline emerges from any of them. In column (9), a between estimation is conducted. This method measures whether changes in the explanatory variables from their cross-section means affect the dependent variables. In the present context, this estimator assumes that policyholders would be concerned about the recent history of the company (the last 4 years) instead of just the current or the previous year.[11] Regression (10) eliminates the observations for 2002, as accounting statements might have been distorted by the mix of inflation, devaluation and public default, making balance sheets more obscure in the eyes of policyholders and thus relaxing market discipline. However, no major change is observed.

The possibility that policyholders rely on last year's information instead of contemporaneous values is explored in column (11). This also helps to address any potential endogeneity problems, even though the theory and the evidence at hand do not suggest any particular concerns in this regard.[12] Pursuing additional endogeneity tests, the Anderson-Hsiao (1982) and Arellano-Bond (1991) methods were employed in column (12) and (13).[13] Finally, White's heteroskedastic-consistent variance estimators appear in the last regression, leading to discard heteroskedasticity as a relevant problem.

[11] The use of contemporaneous values can be justified on the basis that policyholders (and selling agents) may have access to the latest quarterly balance sheets or other preliminary figures, and that in highly volatile environments past, publicly available information may be of little use to assess the future.

[12] There is no solid ground to claim that premium growth might affect any of the right-hand side variables in a clear-cut way. One can especulate, though, that, in the presence of market discipline, premium growth at time t could influence some fundamental variables from t on, as companies seek to strenghten their market position in the future. But, judging from the available evidence, this does not seem to be the case.

[13] After taking first differences, both techniques instrument the explanatory variables using their own lagged (either absolute or differenced) values. Even though these methods are primarily used to deal with the inclusion of the lagged dependent variable in the right-hand side and the resulting estimation inconsistency, they are also handful to test for endogeneity under certain conditions. They both have been criticized and improved upon in recent years (see for instance Blundell and Bond (1998)), but they are presented just to rule out endogeneity problems, even at the cost of losing a large number of observations.

Dependent variable: Premium Growth

Variables	(9)	(10)	(11)	(12)	(13)	(14)
Claims	-0.07***	0.01	-0.05	-0.372	-0.353	-0.0032
	(-2.7)	(0.57)	(-0.65)	(-0.78)	(-1.25)	(-0.26)
Marketing costs	-0.02	-0.83***	-0.99***	-16.98***	-1.241	-0.582**
	(-0.2)	(-2.61)	(-3.72)	(-2.84)	(-0.31)	(-1.93)
Overhead costs	0.001	0.04**	-0.07**	-0.148	-0.464	-0.09**
	(0.05)	(1.96)	(-2.26)	(-0.37)	(-0.70)	(-0.32)
Financial result	-0.01	0.09***	-0.09	.0297	-.0249	0.0001
	(-1.55)	(2.68)	(-1.03)	(0.41)	(-0.67)	(0.08)
Net worth to assets	-0.27	-0.39	0.41	17.71*	5.494	-.594
	(-1.52)	(-0.94)	(1.16)	(1.64)	(0.83)	(-1.61)
Liquidity	0.0002	-0.0001	0.0002	0.007	-0.133	-0.0000
	(1.4)	(-0.51)	(0.75)	(0.24)	(-1.20)	(-0.11)
Lagged market share	-0.18	-0.69	1.7	-77.24*	-54.070	-0.1898
	(-0.29)	(-0.33)	(0.78)	(-1.69)	(-0.76)	(-0.09)
Constant	44.8***	57.9***	-22.6	-221.5	41.26	59.3
	(5.08)	(3.18)	(-1.37)	(1.76)	(0.58)	(3.52)
R-squared	0.08	0.07	0.06	0.012		0.297
No. Observations	585	456	600	405	236	585
No. Companies	199	194	207	171	131	199
F (FE), Chi-squared (AH)	2.5**	2.3**	3.8***	9.2***		9.2***
F-Statistic FE		1.5***	1.5***			
Sargan					2.68	
First-order autocorrelation					0.749	
Method	Between effects	Fixed effects	Fixed effects	Anderson-Hsiao	Arellano Bond	Random effects

Notes:
(***), (**), and (*) denotes statistical significance at 1%, 5%, and 10% levels, respectively.
T-statistics are in parenthesis below each estimated coefficient.
All variables are ratios to total premiums unless specified.
Liquidity equals cash plus liquid investments to assets.
Other variables as defined in the text.
All equations include year dummies not reported.

5. Discussion and conclusions

This study intended to test for the existence of market discipline in the Argentine insurance market in the period 1998-2002. The overall interpretation of the econometric work leads to strongly reject that hypothesis.

What lies behind this situation is a matter of debate. In the Introduction, some particular features of the insurance market were highlighted, such as the contingency of some insurance contracts. As such, a behavioral explanation can be advanced by assuming that consumers assign too low a probability to the event that triggers the company payment, and thus that they are not particularly concerned about their fundamentals.[14] However, the question remains open after noticing that many of these contracts are similar in nature to other money management activities in which obligations are certain. Contract complexity is also an appealing explanation. In this case, the counterargument lies on the expected role of sophisticated costumers as monitors, with the remaining clients possibly acting as followers.

Focusing on the Argentine market, the less-than-perfect reliability of balance sheets as a source of information on the companies, compounded by the lax supervisory regime, can be yet another reason why fundamentals do not seem to matter. And even when these fundamentals are and look strong, many policyholders complaint that claims are paid with considerable delay and after a legal suit is settled, so balance sheet strength might not be the only relevant dimension of the problem. In sum, regardless of the ultimate causes of the insensitivity of premium growth to fundamentals, clients may choose their company mostly based on the premium charged -a hypothesis consistent with the underwriting phenomenon cited at the beginning of the paper. Random company selection may also be present, and the lack of detailed pricing data makes it hard to establish whether premium cost minimization or random selection are at work here.

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[14] If this is the case, one may ask here why any person would contract an insurance policy in the first place. The answer is that, as long as there is a positive probability and risk aversion, insurance will be still bought. Anyway, it must be noted that some insurance contracts are not voluntary, for instance, auto insurance and life insurance attached to every pension fund contract. In these cases, risk neutral or irrational consumers may completely disregard the company's quality. But realistically we should assume that they do not represent the median policyholder.

The present results contrast with previous research providing robust evidence of market discipline in the banking system of Argentina and other countries. As discussed in the Introduction, market and contractual characteristics should be taken into account to determine the expected degree of market discipline, and it is difficult to theoretically establish its relative intensity in insurance vis-à-vis banking. At the academic level, such discrepancy calls for more in-depth investigation of the idiosyncratic features of these two financial markets -an initial step in this direction is given in the Appendix to this document.

As for the policy implications, it is apparent that authorities should enhance their regulation and supervision framework in order to ensure financial stability and consumer protection, which in time will foster the development of the insurance market. The revision of capital requirements, the upgrade in corporate governance practices, and the surveillance of independent selling agents and other ancillary activities are items of particular priority, which should be complemented with improved transparency and disclosure standards on the part of both companies and the regulator. Last but not least, mechanisms to promote market discipline should gradually be pursued, including public access to risk ratings by specialized private agencies and the issuance of subordinated debt.

Appendix: A behavioral interpretation of market discipline in insurance and banking

A striking finding of this paper is that, contrary to banks, no market discipline seems to exist in Argentina. The goal of this appendix is to highlight that, for the typical financial consumer, a deposit is much riskier than an insurance contract, and thus it makes sense that he or she will be more concerned about bank rather than insurance company fundamentals. This claim can be clearly rationalized under the framework of *prospect theory* (see Kahneman and Tversky (1979), Barberis and Thaler (2002) and Johnson et al. (1993), among others), an insightful approach that introduces an alternative view to the widely accepted paradigm according to which individuals assess risky outcomes according to expected utility. In a nutshell, this theory asserts that people is not fully rational and that psychology plays a major role in decision making. The validity of prospect theory has been supported by numerous experimental results, by which a large number of individuals are asked to choose among different risky options. Since then, prospect theory has been gaining increasing popularity, as it has proven to offer satisfactory answers to many real-world financial puzzles.

In what follows, this novel approach will be applied to understand bank deposit and insurance contracts. The main features of prospect theory are: (a) Utility is defined over gains and losses rather than over final wealth (as it is the case in the expected utility framework); (b) These gains and losses are evaluated against a reference level (statu quo); (c) There is *loss aversion*, that is, individuals are more sensitive to losses than to gains of the same magnitude; (d) There is decreasing sensitivity to losses; and (e) Individuals overestimate high probabilities and underestimate low probabilities, in what it is sometimes called *certainty effect*.

Next it will be shown that the fundamentals or, more specifically, the ability to pay is more valuable in terms of utility for the depositor than for the insured. The following notation will be needed: U_I^{PT} is the utility for the insured under prospect theory (with the subscript *I* denoting that the individual buys insurance and *NI* that he does not), π is the probability of occurrence of the bad event, $\phi(\pi) < \pi$ is the subjective probability assigned to this (usually low-probability) event, $\phi(1-\pi) > (1-\pi)$ is the subjective probability assigned to the (usually with high-probability) event of no loss, *l* is the loss in case of no insurance, u_g is the utility for gains, u_l is the utility for losses, *q* is the payment to the policyholder in the event of loss (and here represents the quality or fundamentals of the financial intermediary), *p* is the premium, and *w* is the policyholder's initial wealth.[15] Now, the minimum q^* that makes an individual purchase a policy under prospect theory is given by: [16]

$$U_I^{PT} = \phi(\pi)u_g[q-p] + \phi(1-\pi)u_l[-p] \geq 0$$

while under the expected utility theory the threshold is:

$$U_I^{EU} = \pi u[w+q-l-p] + (1-\pi)u[w-p] \geq U_{NI}^{EU} = \pi u[w-l] + (1-\pi)u[w]$$

or

$$\pi\{u[w+q-l-p] - u[w-l]\} + (1-\pi)\{u[w-p] - u[w]\} \geq 0$$

Provided the utility function under expected utility has the usual concavity properties -which it shares with u_g-, that the other parameters are the same under both approaches, and that the subjective probability is not too different from the actual one, it turns out that:

$$q_{EU}^* > q_{PT}^*$$

The same exercise will now be applied to a bank deposit contract. With *r* and *d* being the interest rate and the deposit amount, the previous inequalities can be rewritten as:

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[15] For simplicity and because it does not affect the essence of the argument, the premium and the interest rate later on are assumed to be parameters, even though they are in fact economically related to q.

[16] Consistent with prospect theory, the equation postulates that the reference point or statu quo to compute gains and losses is zero, meaning that neither the initial wealth nor the loss in case of no insurance should be taken into account.

$$U_D^{PT} = \phi(\pi)u_g[rd] + \phi(1-\pi)u_l[-d] \geq 0$$

$$U_D^{EU} = \pi u[w+rd] + (1-\pi)u[w+q-d] \geq U_{NI}^{EU} = \pi u[w] + (1-\pi)u[w]$$

or

$$\pi\{u[w+rd] - u[w]\} + (1-\pi)\{u[w+q-d] - u[w]\} \geq 0$$

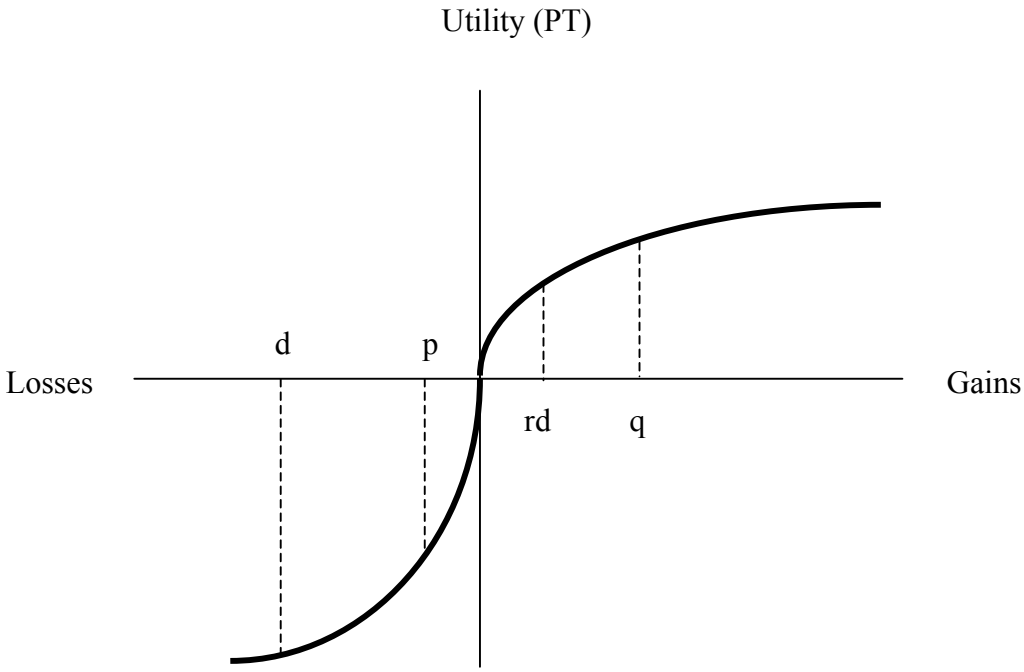
From here, it can be demonstrated that:

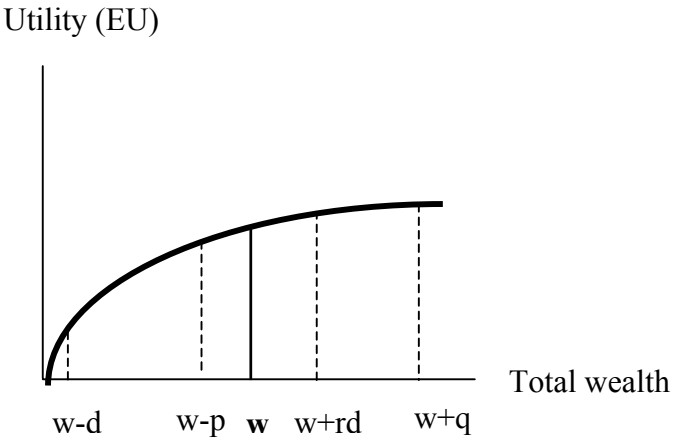
$$q_{EU}^* < q_{PT}^*$$

The results from this setup are basically explained by two factors: (1) In the expected utility framework, utility changes are measured around initial wealth, making losses less costly due to the concavity of the utility function; (2) Prospect theory attach a higher utility cost to losses by introducing loss aversion.

A graphical presentation may be useful to fix ideas. Under the assumptions previously described, the utility functions under prospect (PT) and expected utility (EU) can be drawn as follows:

Utility under an insurance and a deposit contract





For values of insurance coverage similar to the deposit amount, and low probabilities of bank default and of occurrence of a bad insurance event, the upfront loss d is much bigger than p, while the bigger gains in the insurance contract q - compared to the deposit return rd- raise utility by a smaller magnitude. Consequently, it should be expected that depositors will exert a closer monitoring than policyholders when it comes to maximize utility.

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