



Mergers, coordinated effects and efficiency in the Portuguese non-life insurance industry[☆]



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ABSTRACT

We evaluate the impact on market power and efficiency of a series of mergers on three Portuguese non-life insurance markets. We specify and estimate, with a panel of firm-level data, a structural model which includes: preferences, technology, and a market equilibrium condition. Firms' demand curves are not very elastic. Firms' technologies exhibit scale and scope economies and high cost efficiency scores. We find that, for the period following the mergers, there is no evidence of: (i) an increase in market power through coordinated behavior, or (ii) changes in cost efficiency levels. In addition, social welfare increased.

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1. Introduction

When analyzing a merger, Competition Authorities usually focus on the impact the operation has on market power and efficiency. Supposedly there is a trade-off between these two aspects. On the one hand, mergers may increase firms' incentives to increase prices, either unilaterally or through coordination. On the other hand, mergers may reduce firms' marginal costs, as argued by Williamson (1968). Economies of scale, economies of scope, or other synergies, due to the combination of complementary assets, may lead to this decrease in costs. However, managerial slack, due to the decrease in competition, may have the opposite effect. Thus, the overall impact of a merger on prices, marginal costs and welfare is potentially ambiguous.

In Portugal, between 1999 and 2007, there were seven concentration operations involving firms operating in non-life insurance markets, as summarized in Table 1. This series of mergers provides a unique opportunity to measure ex-post some of the aforementioned effects. In

Section 3 we provide additional information about the Portuguese non-life insurance sector.

In this article, we evaluate the impact of mergers on: (i) the exercising of market power through coordinated effects, and (ii) the firms' internal efficiency. To conduct the analysis, we specify and estimate a structural model that includes: preferences, technology, and a market equilibrium condition. Our data set consists of a rich panel of annual accounting data from 13 Portuguese insurers for the period of 1999 to 2007 operating in three non-life insurance markets: motor vehicles, employers' liability and fire and other damage to property. On average, these firms accounted for about 80% of the premium volume in the whole non-life sector for the period of our sample.

Preferences are represented by a discrete choice model, which is used to estimate the price elasticities of demand. Firms' demands are elastic, although not much.

Technology is represented by a stochastic cost frontier, which is used to estimate marginal costs, returns to scale and efficiency levels. Firms exhibit scale and scope economies and high efficiency scores. In the period following the mergers, there is no evidence of changes in cost efficiency.

The market equilibrium is represented by a set of first-order conditions for prices, which nest Nash equilibrium and joint profit maximization, as well as intermediate degrees of competition between these two cases, allowing a rich characterization of strategic interaction

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Table 1
Mergers and acquisitions in the Portuguese insurance market between 1999 and 2007.

Merger year	Acquiring company/group	Acquired company	Non-life market share (%)		Ranking in the non-life market	
			Pre-merger year	Merger year	Pre-merger year	Merger year
<i>Mergers</i>						
2000	Açoreana	Oceânica	[0–5]/[0–5]	[0–5]	18th and 27th	13th
2000	AXA	Royal Exchange	[5–10]/[0–5]	[5–10]	6th and 13th	4th
2001	Império	Bonaça	[5–10]/[5–10]	[15–20]	2nd and 6th	1st
2002	Fidelidade	Mundial Confiança	[10–15]/[5–10]	[20–25]	2nd and 3rd	1st
2002	Açoreana	O Trabalho	[0–5]/[0–5]	[0–5]	12th and 15th	9th
2004	Tranquilidade	ESIA	[5–10]/[0–5]	[5–10]	4th and 21st	4th
<i>Acquisitions</i>						
2005	CGD group	Império-Bonaça	–/[10–15]	[10–15]	2nd	2nd

Note: market shares are measured by premium volume and do not take into account companies operating under the free-to-provide-services regime.

in the industry. Given the demand and cost estimates, obtained separately, we estimate the market equilibrium condition and use it to analyze the exercising of market power through coordinated effects, before and after the mergers. We find no evidence of an increase in coordination. In addition, both consumer surplus and aggregate profits increased.

The retrospective evaluation of the impact of mergers has been of interest to industrial organization for a long time. More recently this theme gained an added interest as several authors, e.g., Ashenfelter et al. (2009) and Carlton (2009), called for more empirical studies evaluating the effectiveness of merger policy, to help competition authorities improve the merger review process. A fundamental question is whether the current merger policy is too lax, as claimed by Baker and Shapiro (2008), or too stringent, as claimed by Crandall and Winston (2003). While most articles have focused on the impact on prices: Argentesi and Filistrucchi (2007), Ashenfelter and Hosken (2010), Focarelli and Panetta (2003), Hosken et al. (2011) and Taylor and Hosken (2007)¹; other articles focused on the impact on costs: Kwoka and Pollitt (2010) and Velturo et al. (1992); and a few analyzed the impact on both prices and costs: Ivaldi and McCullough (2010).²

As mentioned before, one of the key aspects used to evaluate the effectiveness of merger policy is its ability to control the exercise of market power. Three main alternative approaches have been commonly used in the literature to measure market power.³

The *new empirical industrial organization* approach, reviewed in Bresnahan (1989), consists of simultaneously estimating a demand equation and an equilibrium equation. The latter, in addition to cost parameters, includes a conjectural variations parameter. The estimate of the conjectural variation parameter measures the degree of competition.

The *non-nested test* approach, pioneered by Bresnahan (1987) and Gasmí et al. (1992), consists of estimating simultaneously, by maximum likelihood, a demand equation, a cost equation, and an equilibrium condition, under both the assumption that firms play a Nash equilibrium and the assumption that firms maximize joint profits.⁴ Afterwards, a non-nested hypotheses test, such as Vuong's

(1989), is performed to select which of the two models explains the data better.

The *menu* approach of Nevo (2001) consists of first estimating the demand and cost functions separately. Afterwards, the demand estimates and an equilibrium equation are used to estimate hypothetical price-marginal cost margins, under both the assumption that firms play a Nash equilibrium, and the assumption that firms maximize joint profits. Finally, the two hypothetical price-marginal cost margins are compared with the observed price-marginal cost margin to determine which model explains the data better.

The new empirical industrial organization's approach has the shortcomings pointed out by Corts (1999), Genesove and Mullin (1998) and Nevo (1998). The non-nested test and the menu approaches can be thought of as being equivalent, with the former formalizing the test with more detail, and the latter providing a richer economic interpretation, since it gives a measure of how close the observed price-marginal cost margin is to the two hypothetical margins.

Our approach consists of specifying and separately estimating a structural model that includes: preferences, technology, and a market equilibrium condition; each providing a different set of estimates. Hence, we differ from the *new empirical industrial organization's* approach because we estimate the demand, cost and coordination parameters separately, through three, rather than two equations. In fact, since we have independent demand and cost estimates, our procedure corresponds to what Corts (1999) and Genesove and Mullin (1998) refer to as the “direct” or “complete information” approach. Furthermore, instead of using the equilibrium condition to estimate marginal costs under both Nash equilibrium and joint profit maximization, we insert the demand and cost estimates, obtained independently, into our equilibrium condition, which nests Nash equilibrium and joint profit maximization, as well as intermediate degrees of competition between these two cases, and estimate the weight given by firms to their rival's profits. By allowing the weight to change over time, we evaluate the exercising of market power through coordinated effects before and after the mergers. Hence, our approach builds on and extends the *non-nested test* and *menu* approaches, and allows a parsimonious characterization of both: (i) the initial level of coordination, and (ii) how coordination changed over time.

A reason to use a structural model to investigate the effects of mergers on prices and costs in cases similar to ours is that mergers are not randomly assigned over time and are likely to affect the whole country. Hence, even with pre- and post-merger data available a differences-in-differences strategy would be infeasible.⁵

¹ See also Ashenfelter et al. (2011), Borenstein (1990), Dafny (2009), Kim and Singal (1993), Kwoka and Shumilkina (2010), Prager and Hannan (1998), Sapienza (2002), Simpson and Taylor (2008), Vita and Sacher (2001) and Winston et al. (2011), or Weinberg (2007) for a survey.

² Since merger simulation models are being increasingly used by competition authorities in the merger review process, some articles have focused on the evaluation of the predictive power of these models: Peters (2006), Weinberg (2011) and Weinberg and Hosken (2009). A few articles analyzed the impact of divestitures: Friberg and Rohman (2012), Slade (1998) and Tenn and Yun (2011).

³ Black et al. (2004) and Michel (2012) develop alternative strategies, similar to our approach, to measure market power. However their work is still in a preliminary stage.

⁴ We focus on these two cases for expositor simplicity, but the approach can handle any other form of oligopolistic behavior.

⁵ The timing of the mergers is likely to be endogenous and correlated with prices and other determinants of demand, observed by market participants but not by the researcher, which is also a problem for the structural approach.

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