The Competing Risks of Acquiring and
Being Acquired: Evidence from
Colombia´s Financial Sector

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The Competing Risks of Acquiring and Being Acquired: Evidence from Colombia´s Financial Sector[*]

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Abstract

This paper studies the determinants of the probability of participating in a process of merging or acquisition for financial institutions in Colombia. We use survival analysis techniques and competing risks models to estimate the probability of participating in such processes as an acquiring or acquired firm. Using an especially rich database containing financial information of Colombian banks for the period 1990 – 2007, we find that both macroeconomic and microeconomic variables are important determinants of such probability. However, there are differential effects for the acquiring firm and the acquired firm. Particularly, while firm size and solvency result significant determinants of the probability of being an acquiring firm, efficiency is an important determinant of the probability of being acquired. Also, the concentration index, that plays no role for acquiring firms, plays an important role in the probability of being acquired.

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1. Introduction

There is a wide economic literature studying mergers and acquisitions (M&A). Theoretical literature on the topic focuses on explaining causes and consequences of these processes. According to neoclassical economic theory, integration events obey profit maximization logic. Two or more firms decide to vertically or horizontally integrate in order to benefit from economies of scale or scope, or from a larger market power. Integrations may also take place in order to achieve more efficiency in management. More generally, the main reason argued in favor of capital reallocations among firms, is the search of its most productive use (Tirole, 2006). There are also other reasons different from the profit maximization behavior that may lead to M&A and relate to managerial objectives (Meschi, 1997).

The effects of M&A have long been studied since the seminal work of Bain (1951). Integration processes have been considered to have welfare effects in the sense that they can potentially change the competitive structure of markets, favoring increases in mark-ups for the firms that integrate. However, M&A can also lead to gains in cost efficiencies, which translate into welfare gains. Williamson (1968) argues that the net effect of an integration process on social welfare results from the balance of a welfare loss generated by the increase in prices and a welfare gain produced by cost efficiencies that lead to price reductions. In order to study these trade-offs, different models have been developed by industrial organization theorists. These models can be generally classified under the categories of non-cooperative oligopoly models (e.g. Levin, 1990) and collusion models (e.g. Chamberlin, 1956).

The empirical literature on M&A has concentrated in studying the efficiency gains (or losses) of these processes on different markets. Many studies analyze the effects of

M&A on firms´ efficiency, emphasizing on their effects on transactional and operational costs. The idea behind most of these studies is that firms with a higher production capacity have lower plant adjustment costs and a lower failure probability (regarding financial firms, see for instance Focarelli et. Al, 1999; Bracho et. Al, 2002; Azofra et. Al, 2006; Hannan and Pillof, 2006; and, Ayala et. Al, 2007).

The seminal works on M&A in the financial sector present case studies of the main integration processes in different countries, such as the USA, Russia, Italy, and more recently Venezuela and Colombia. These studies make a qualitative analysis of their effects in terms of market concentration and the price of financial services. They differentiate between cost efficiency and benefit efficiency, also known as X-efficiency (e.g., Rhoades, 1996, Carree, 2003, and Clavijo, 2006).

From the empirical evidence point of view, the determinants of M&A processes have been studied using probabilistic models. Recently, most studies use survival analysis techniques to model the conditional probability of participating in an integration event (see, for instance, Hannan and Pillof, 2006, Ayala et. Al, 2007, and García-Suaza and Gómez-González, 2009). A common result has been obtained in these studies: a good firm performance reduces the probability of participating in a M&A process.

However, in general these studies do not make explicit reference to the difference that may exist between participating as an acquiring institution or an acquired firm. There are good reasons to think that the significant determinants of participating as an acquiring institution or an acquired firm are different, and thus cannot be properly identified by a model in which the risks of being acquired and of acquiring are not modeled separately. Indeed, a model in which both risks are pooled in just one category can induce to a misunderstanding of the determinants of the probability of participating

in an integration process. For instance, as it was mentioned above, most empirical studies suggest that a bank in good financial health has a lower probability of participating in that process that a bank with poor financial health. Nevertheless, one can think that an entity with a good financial health has a greater probability of participating in a process of M&A as an acquiring institution that an entity with bad financial health.

This study contributes to the literature on the determinants of the probability of participating in an integration event, using an especially rich data set from financial sector institutions of Colombia, for the period 1990 – 2007[1]. We estimate a competing risks model using survival analysis techniques, in which the risks of participating as an acquiring or an acquired firm are modeled separately. We show that the significant determinants of both probabilities are different, as expected. In particular, while firm size and solvency result significant determinants of the probability of being an acquiring firm, efficiency is an important determinant of the probability of being acquired. Also, the concentration index, that plays no role for acquiring firms, plays an important role in the probability of being acquired. We also show that the effect of macroeconomic variables on the probability of participating in an M&A process respond to the stage of the economic cycle. Particularly, the effect of GDP growth is larger in periods of economic recession.

Section 2 presents a brief survey of the empirical studies concerning the determinants of M&A. Section 3 presents the data used in the empirical analysis, the empirical model, and estimation results. Finally, section 4 presents conclusions.

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[1] The dataset used in this study is especially rich because considers monthly data from the balance sheets of all financial institutions existing in Colombia during the observation period. We benefit from the information provided by a time of financial stress in which many integration processes – and also failures – occurred. For more in the period of financial stress and its consequences on the banking industry, see Gómez-González and Kiefer (2009).

2. Review of Related Empirical Literature

From the point of view of this study, the empirical literature on the topic can be divided in two groups. The first group corresponds to the literature on the causes and consequences of M&A events. The second group corresponds to empirical analyses using probability models to estimate the probability of participating in these actions.

The first group is characterized by case studies and estimations of cost functions to explain the role played by efficiency in M&A processes. The evidence about efficiency changes is mixed. Rhoades (1998) presents case studies for nine integration events of American banks. He considers three efficiency measures – scale efficiency, X-efficiency, and total efficiency – and obtains evidence that suggests that the events considered generated cost efficiency gains in all cases. However, benefit efficiency gains only happened in some of the cases.

Pillof and Santomero (1996) use two alternative methods to estimate the effect of integration events on efficiency and the value of those operations. The first method consists in comparing institutional unemployment – or efficiency – before and after the integration process. The second method consists in analyzing market reactions after the announcement of a M&A process. The study finds that there are no significant changes in terms of efficiency.

Houston et. Al (2001) analyses the merging processes of a group of large American banks between 1985 and 1996, and evaluates the market-extension effects of these processes. The study estimates a positive average value of the integration events considered. Huzinga et. Al (2001) makes a similar study using information from the Euro zone, and includes 52 mergers and acquisitions that happened between 1994 and

1998. The study finds evidence in favor of the absence of scale economies and X-efficiency.

In contrast to the findings of Huzinga et. Al (2001), Díaz et. Al (2004) find evidence in favor of efficiency gains generated by M&A´s of banks in the Euro zone, using panel data methodologies and a sample of banks from 1993 to 2000.

The second group is characterized by empirical approximations using probabilistic models to estimate the probability of participating in these actions. The seminal works in this group are Hannan and Rhoades (1987) and Amel and Rhoades (1989). The first study uses a sample of more than 1000 Texas banks between 1970 and 1982, and shows that financial institutions with large market share, low capital to asset ratio and operations in rural areas are relatively more likely of being acquired. The second study uses a sample of 1724 American banks between 1978 and 1983, and shows that profitability, firm growth, and market share, are variables that influence significantly the probability of participating in a merging process.

Focarelli et. Al (1999) analyzes the Italian banking industry between 1985 and 1996, and studies separately merging and acquisition processes. The paper considers aspects not included in other studies, such as regulation and technical change. A multinomial logit model is estimated, in which the outcomes of the dependent variable distinguish between a bank that participates in an acquisition and a bank that merges. The main finding of the paper is that mergers and acquisitions are determined by different factors, and thus the authors suggest that these integrations processes should be studies separately when possible[2].

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[2] Generally, it is not possible to differentiate between a merging process and an acquisition process. For example, in Colombia all integration processes are catalogued as acquisitions by the Superintendency of Financial Institutions – the regulator of the financial system in Colombia.

Hannan and Pillof (2006) use a proportional hazards model to estimate the conditional probability of being acquired for a large sample of American banks between 1996 and 2003. The authors use a competing risks model to differentiate between the risks that an institution faces of being acquired by an inside-market or an outside-market institution[3]. The main result is that acquisitions serve to transfer resources from less efficient institutions to more efficient ones.

In Colombia, the only existing related study is the one done by García-Suaza and Gómez-González (2009). The authors estimate a proportional hazards model and show, using a sample of Colombian financial institutions during the period 1990 – 2007, that institutions in good financial health are less likely to participate in an integration event. They also show that macroeconomic variables – economic growth and the Herfindahl index – are significant determinants of the probability of merging. However, they do not consider institutions participating actively and passively separately.

3. Data, Empirical Model, and Estimation Results

3.1 Data

In 1990 there were 80 financial institutions in Colombia. Around 30% of these institutions were commercial banks, and the rest were financial corporations and financial companies[4]. At the beginning of the 1990s a process of financial openness was undertaken in Colombia, and with it international banks settled in the country. In 1996 the total number of institutions increased to a number of 132. However, the important

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[3] For the case of mergers and acquisitions in the Colombian financial sector, this differentiation is unimportant, because all such processes occur between institutions operating in the same industry.
[4] In Colombia, although there are some differences between commercial banks and financial companies, due to liability composition and size, in practical terms both types of institutions serve very similar purposes and compete in the issuance of loans and deposits. The main difference can be found in demand deposits: while commercial banks can issue checking accounts, financial companies cannot. Nevertheless, financial companies can issue saving deposits and time deposits. Another difference is the required amount of initial capital: the minimum required capital to constitute a bank is almost three times as big as that needed to constitute a financial company. Nevertheless, initial capital requirements are small vis-à-vis the size of the intermediaries once they are operating (Gómez-González and Kiefer, 2009).

growth in the number of financial firms experienced during the first part of the decade was reverted with the financial crisis of the late 1990s. By the year 2000, the number of entities in the financial sector was reduced to one half, and financial intermediation shrunk. The reduction in the number of entities was especially noticeable in the group of financial corporations and financial companies, with more than a 60% reduction.

In the aftermath of the financial crisis there was an important recovery in financial intermediation, but the number of institutions continued decreasing. In 2007 only 44 institutions remained in the financial sector, and banks represented a 41% of these number (see Figure 1).
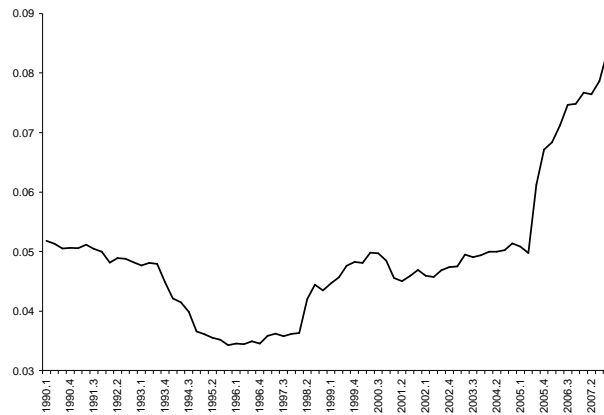
Figure 1. Number of financial institutions 1990 - 2007
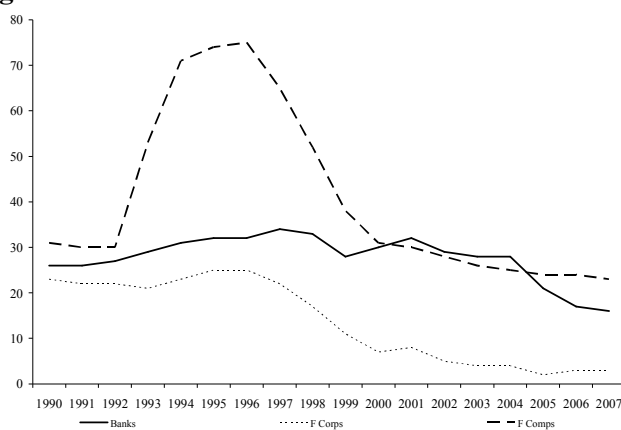
Source: Colombian Financial Superintendency and authors´ calculations.

As a result, since 1996 the Colombian financial sector has experienced an increase in concentration that can be observed in Figure 2, which presents the Herfindahl Index for the assets of the financial system. This increase in concentration obeyed two different reasons: i). an important number of failures of financial institutions during the period of financial crisis; and, ii). a considerable number of M&A that took place as safeguarding mechanisms during the financial crisis, and as processes of market expansion during the period of recovery.

Figure 2. Herfindahl Index 1990 – 2007

Source: Colombian Financial Superintendency and authors´ calculations.

During 1990 and 2007 a total of 124 M&A took place in the Colombian financial industry; 68% of these processes occurred among institutions belonging to the same type of institution, mainly banks. Figure 3 shows the time distribution of the integration events.

Figure 3. Time distribution of M&A
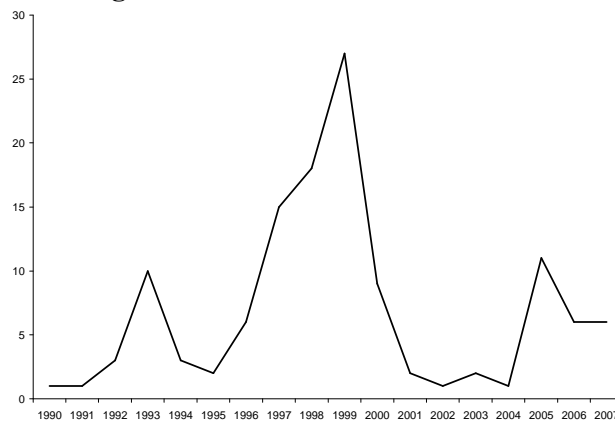
Source: Colombian Financial Superintendency and authors´ calculations.

It can be seen from Figure 3 that integration events were not evenly distributed in time. Between 1990 and 1996 there were 20 integration processes, between 1997 and 2000 – period of financial crisis – 75 events were counted, and between 2001 and 2007 29 events occurred.

In this paper the observation period is 1990 – 2007. The frequency of the data is quarterly, and all institutions are in the same fiscal year. Financial data was collected for each of the financial institutions considered for the empirical analysis. Following previous studies and theoretical expectations, the following financial ratios were considered in the explanation of time to participate in an integration process: size (SIZE), defined as the natural logarithm of assets; profitability (PROF), given by the ratio of annualized profits to average annual assets; solvency (SOLV), defined as the ratio of equity to assets; liquidity (LIQ), given by the ratio of short-term assets to short-term liabilities; leverage (LEV), defined as the ratio of total liability to total capital; and, efficiency (EFF), approximated by the ratio of operating expenses to average annual assets. These financial indicators are proxies of the variables traditionally considered in the literature.

Additionally, we considered two macroeconomic variables, to control for the stage of the business cycle and the degree of market concentration: GDP growth (GROWTH), measured as the annual rate of growth of GDP; and the Herfindahl Index of assets (HH), that not only controls for market concentration but also for the existence of possible inertial effects in merging processes[5].

The data set used to construct the variables consists of information in the balance sheets that financial institutions have to report to the Colombian Financial Superintendency.

3.2 Empirical Model

In this study, we estimate a competing risks model using survival analysis techniques, in which the risks of participating as an acquiring or an acquired firm are modeled

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[5] In order to test for possible multicolinearity problems, we calculated correlations between pairs of variables, for all the variables included in the estimations. We found that all such correlations were lower than 40% in absolute value.

separately. In duration models, the dependent variable is duration, the time that takes a system to change from one state to another. In the case of interest, duration is the time that takes for a financial institution to acquire another one or to be acquired by another one.

In this study, we use the semi-parametric specification proposed by Cox (1972) to characterize duration[6]. We do not use a parametric specification because the baseline hazard in our formulation reflects changes in the regulatory environment common to all the included institutions, and also changes in macroeconomic performance that may not be properly controlled by the macroeconomic variables included in the model. There is no reason to think these will correspond to a monotonic hazard, and indeed we find evidence it does not (see Figure 4).

Figure 4. Unconditional (no covariates) non-parametric hazard function
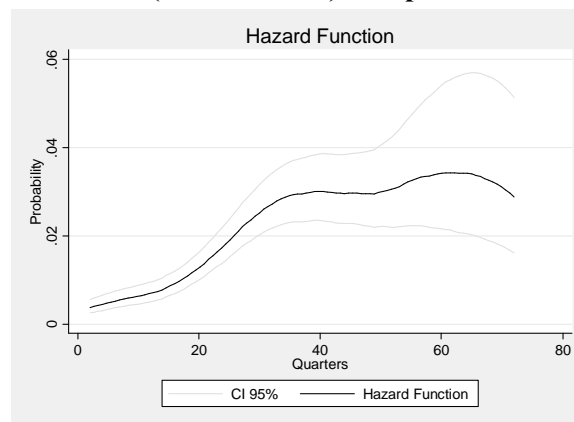
Source: Colombian Financial Superintendency and authors´ calculations.

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[6] Some empirical studies use parametric models to characterize the duration of a spell. Commonly used distributions are the exponential, the Weibull and the Gompertz. The exponential implies a constant hazard while the Weibull admits decreasing or increasing hazards. The Gompertz distribution allows non-monotonic hazard rates, but is not particularly flexible.

The pattern of integration for banks and other financial institutions was similar in percentage terms. That suggests that the survival functions of both groups might be similar. Figure 5 shows the Kaplan – Meier estimator of the survival function for both groups of intermediaries.

Figure 5. Kaplan – Meier estimator of the unconditional (no covariates) survival function by type of institution
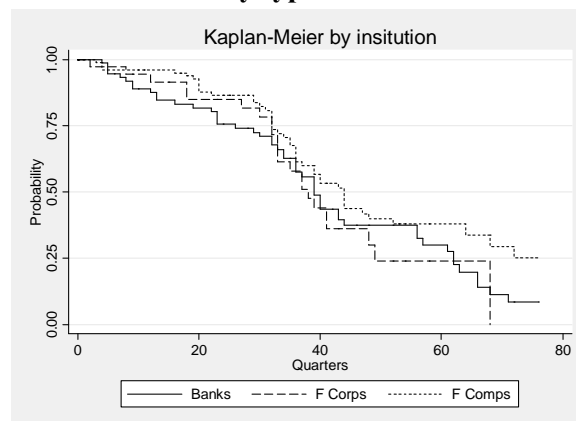
Source: Colombian Financial Superintendency and authors´ calculations.

These look similar. In order to corroborate that intuition, tests of equality of the survival functions were done. Table 1 shows the results of these tests. Note that these tests are crude and exploratory because they do not condition on the institution- specific financial variables. Nevertheless, they give us some confidence that pooling is appropriate. Therefore, in the rest of the paper we treat all the institutions as one group. The Kaplan-Meier survival function for the whole group of institutions is shown in Figure 6.

Table 1. Test for equality of the survivor functions

Test	Log Rank	Wilcoxon	Cox
chi2(2)	3.96	2.66	3.87
Pr>chi2	0.1378	0.264	0.1446

Source: Colombian Financial Superintendency and authors´ calculations.

Figure 6. Kaplan – Meier estimator of the unconditional (no covariates) survival function - pooled

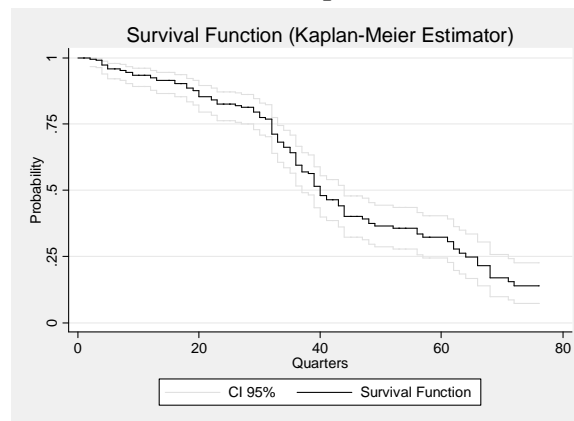Source: Colombian Financial Superintendency and authors´ calculations.

Our objective is to understand how bank-specific variables affected the conditional probability of participating in an integration event as an acquiring institution or an acquired one. Building on the above analysis indicating that conventional candidates for parametric models are inappropriate, this paper estimates a proportional hazards model in which no parametric form is assumed for the baseline hazard function. As shown below using a specification test, this assumption seems to be appropriate for the problem of interest.

For estimation purposes, we follow Cox (1972) and use the method of partial maxim likelihood. The key point of the method is the observation that the ratio of the hazards for any two individuals   and   depends on the covariates, but does not depend on duration. The intuition behind this estimation method is that without knowing the baseline hazard only the order of durations provides information about the unknown coefficients. Ties are handled by applying the Breslow method.

As it mentioned above, every institution at every point in time has the risks of participating in an integration process in an active and passive way. Mergers and acquisitions are considered in the literature as different integration processes. While a

merger is considered as a process of horizontal integration, an acquisition is considered as a process of vertical integration. However, in Colombia every integration process happening in the financial sector is considered as an acquisition and is catalogued that way by the regulator of the sector. Thus, we consider all integration processes here as acquisitions. Nevertheless, we differentiate between institutions that participate as the acquiring part from institutions participating as the part being acquired. In order to model appropriately the two competing risks we are considering in this study, we use a competing risks model using survival analysis techniques. While each institution is subject to both risks, researchers can observe at most the realization of one of them – the one with least duration –.

Suppose A represents the event of participating in an integration process as an active – acquiring – part, and B represents the event of participating in an integration process as a passive – acquired – part. Assuming both events are independent, the hazard function for each financial firm is given by

$$h(t) = h_A(t) + h_B(t) \qquad (1)$$

where $h_i(t)$ represents the hazard function for risk i of each institution, with $i = \{A, B\}$. The corresponding survival function in this case, $S(t)$, is given by the product of the survival functions corresponding to each of the competing risks

$$S(t) = S_A(t)S_B(t) \qquad (2)$$

In this context, the individual contribution to the likelihood function of a bank that entered into an integration process during the observation period is given by

$$L_i = f_i(T)S_{-i}(T) \qquad (3)$$

Where L_i represents the marginal contribution of an individual changing to state i during the observation period, where $i = \{A, B\}$, T represents the duration of the spell for the individual, f_i is the probability density function of migrating to state i, and S_{-i} represents the survival function of maintaining in a state different from i.

In the other hand, the marginal contribution of censured observations is given by

$$L_C = S(T) = S_A(T)S_B(T) \qquad (4)$$

where the sub-index C stands for *censored observation*.

The total individual contribution, L, is then given by

$$L = L_A^{\delta_A} L_B^{\delta_B} L_C^{1-\delta_A-\delta_B} \qquad (5)$$

where δ_i is an indicator function that takes value one when the individual takes state i, for $i = \{A, B\}$.

3.3 Estimation results

Before presenting the results of the competing risks model, it is useful to present the results of an estimation of a proportional hazards model in which the two competing risks are pooled in just one risk category, in order to have a benchmark. These results are shown in Table 2.

Table 2 presents results both for a proportional hazard model and for three commonly used parametric specifications. However, we focus attention on the results of Cox´s

specification[7]. All the estimated models are globally significant, according to likelihood ratio tests.

Table 2. Estimation results pooling both risk categories

Variable	Cox	Weibull	Gompertz	Exponential
SIZE	0.0936*	0.0904*	0.0878*	0.0845*
	(0.0233)	(0.0308)	(0.0328)	(0.0132)
PROF	-5.0023*	-1.1441*	-1.1482*	-1.1579*
	(1.0135)	(0.2135)	(0.2129)	(0.1754)
SOLV	-0.3489*	-0.3821*	-0.3860*	-0.3999*
	(0.0246)	(0.0520)	(0.0529)	(0.0443)
LIQ	-0.0100*	-0.0138*	-0.0140*	-0.0154*
	(0.0045)	(0.0013)	(0.0014)	(0.0016)
LEV	0.0029	0.0040	0.0041	0.0040
	(0.0030)	(0.0026)	(0.0027)	(0.0033)
EFF	0.0090*	0.0095*	0.0097*	0.0105*
	(0.0010)	(0.0005)	(0.0005)	(0.0006)
GROWTH	-0.0735*	-0.1004*	-0.1033*	-0.1106*
	(0.0136)	(0.0061)	(0.0041)	(0.0073)
HH	27.9838*	23.2929	13.4969	32.1357
	(12.2263)	(20.2818)	(22.8859)	(16.8953)
Constant		-9.0048	-6.8167	-6.7543
		(1.0521)	(1.3589)	(0.8566)

*Indicates that the covariate is significant at the 5% level.
Source: Authors´ calculations. Standard errors in parenthesis.

All models show that all included covariates, except for LEV and HH[8], are statistically different than zero. The signs of the explanatory variables are the same under all the specifications, and are the expected ones as identified in the related literature. In general, the results indicate that the probability of participating in an M&A process decreases in the institution´s financial health. In other words, these results suggest that if bank x is in better financial health that bank y, then the former is more likely to integrate with another institution than the latter. This result, standard in the related

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[7] We performed specification tests for the adequacy of the proportional hazards assumption (Schoenfeld´s residuals tests), both for each individual covariate and a global test. In all cases, we could not reject the hypothesis of proportional hazards.
[8] HH is significant under the proportional hazards specification only.

literature, is subject to change if the risks of acquiring and being acquired are modeled separately.

Table 2 also shows that larger institutions are more inclined to participate in an integration event than otherwise similar smaller institutions; HH has a positive effect though it is only statistically different from zero under the proportional hazards specification; and, economic growth has a negative incidence over mergers and acquisitions.

Figure 3 shows that although M&A´s occur during periods of economic expansion and economic contraction, the number of events vary substantially during the business cycle. Thus, it results interesting to test whether there is an asymmetric effect of growth during the cycle.

Table 3 exposes the results of the proportional hazards competing risks model, and tests for the existence of asymmetric effects of the economic growth variable during the cycle on the probability of participating in an M&A event.

All the estimated models are globally significant, according to likelihood ratio tests, and for all the models the proportional hazards assumption is validated according to the results of the Schoenfeld´s residual test individually and globally.

Considering the pooled model with asymmetric effects for the growth variable, we find that the signs and significance levels of individual covariates remains the same (compared to the pooled model presented in Table 2). Of special interest, the effect of economic growth on the probability of interest is negative both during expansions and contractions, but it is only significantly different from zero during periods of negative growth rate. This result suggests that increases in the growth rate tend to reduce the probability of integration events, but this effect is higher during moments in which the

economy is performing worse. This result indicates that the growth rate of GDP

excerpts a non-linear effect over the probability of interest.

Table 3. Estimation results of the competing risks model including asymmetric growth effects

Variable	Pooling	Pooling with asymmetric effect of growth	Acquired	Acquired with asymmetric effect of growth	Acquiring	Acquiring with asymmetric effect of growth
SIZE	0.0936*	0.1022*	-0.0487	-0.0492	0.3409*	0.3540*
	(0.0233)	(0.01948)	(0.1683)	(0.1671)	(0.0396)	(0.0352)
PROF	-5.0023*	-5.1133*	-2.9261	-2.7089	0.1771	0.0414
	(1.0135)	(0.8770)	(2.4377)	(2.2369)	(1.1908)	(13.6764)
SOLV	-0.3489*	-0.3228*	-0.0803	-0.0767	-0.4176*	-0.3968
	(0.0246)	(0.0582)	(0.5645)	(0.5725)	(0.1425)	(0.2267)
LIQ	-0.0100*	-0.0005	-0.0093	-0.0088	-0.0800	-0.0875
	(0.0045)	(0.0009)	(0.0066)	(0.0062)	(0.0861)	(0.0982)
LEV	0.0029	0.0023	-0.0224	-0.0221	0.0026	0.0024
	(0.0030)	(0.0023)	(0.1335)	(0.1334)	(0.0027)	(0.0024)
EFF	0.0090*	-0.0133	0.0094*	0.0090*	0.0024	0.0018
	(0.0010)	(0.0134)	(0.0014)	(0.0013)	(0.0016)	(0.0018)
GROWTH	-0.0735*		-0.0849*		-0.0789*	
	(0.0136)		(0.0269)		(0.0046)	
GROWTH +		-0.0020		-0.0163		0.0186
		(0.0427)		(0.0760)		(0.0612)
GROWTH -		-0.2015*		-0.1909*		-0.2361*
		(0.0287)		(0.0613)		(0.0298)
HH	27.9838*	25.1408*	35.8345*	30.2086*	19.7749	11.9258
	(12.2263)	(7.8761)	(3.0922)	(4.4515)	(17.9184)	(14.7537)

*Indicates that the covariate is significant at the 5% level.
Source: Authors´ calculations. Standard errors in parenthesis.

Table 3 shows that the significant determinants of the probabilities of acquiring and of

being acquired are different, as expected. In particular, while firm size and solvency

result significant determinants of the probability of being an acquiring firm, efficiency

is an important determinant of the probability of being acquired. Also, the concentration

index, that plays no role for acquiring firms, plays an important role in the probability of

being acquired.

Results suggest that a larger, more solvent entity is more likely to participate as an acquiring firm, while an inefficient firm has a higher probability of playing the role of an acquired firm in an integration process[9].

We also show that the effect of macroeconomic variables on the probability of participating in an M&A process respond to the stage of the economic cycle. Particularly, the effect of GDP growth is larger in periods of economic recession, for both cases. As discussed above, in the pooled case, this result is the expected. The Herfindhal Index is only statistically significant for the risk of being acquired, but in both cases is positive indicating that increments in market concentration increase both probabilities (evidence of inertial effects in M&A´s).

4. Concluding remarks

This paper studies the determinants of the probability of participating in a process of merging or acquisition for financial institutions in Colombia. We use survival analysis techniques and competing risks models to estimate the probability of participating in such processes as an acquiring or acquired firm. Using an especially rich database containing financial information of Colombian banks for the period 1990 – 2007, we find that both macroeconomic and microeconomic variables are important determinants of such probability.

However, there are differential effects for the acquiring firm and the acquired one. Firm size and solvency explain significantly the probability of playing the active role in an integration process. Meanwhile, efficiency is an important determinant of the probability of being acquired. Thus, we find evidence that supports the hypothesis that financial health plays an important role in M&A´s, but the role played by particular

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[9] A positive sign of the coefficient related to EFF means that firms with higher operational costs have a higher probability of participating in an integration event.

variables proxying for financial health is different when considering both risks separately.

We also show that the effect of macroeconomic variables on the probability of participating in an M&A process respond differently during the business cycle. Particularly, the effect of GDP growth is larger in periods of economic recession, for both cases.

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