

Corporate Mergers In A Developing Country: An Empirical Analysis Of The Merger Probability

Sandra Corredor Carlos Pombo and Adriana Corredor¹

Abstract:

Mergers and Acquisitions have been examined by a large number of studies; almost all concerned with M&A transactions in developed markets (see Weston & Weaver, 2001). Only few papers focus on emerging markets. One central issue is whether corporate government features in developing economies influence M&A dynamics. We explore the relationship between business group affiliation and the merger probability for a developing country's corporations. Unlike most existing research, which tries to predict takeover targets or estimate the abnormal stock returns from mergers, we focus on the acquiring firm merger motives. We address the issue empirically, using data for 193 corporations in Colombia. Logit regression models are used for explaining the acquiring firm merger probability. Controlling for classical merger determinants, this analysis shows that financial fundamentals, growth-resource imbalance and industry concentration leads the acquiring firms to participate in a market for corporate control. Our results confirm that Mergers & Acquisitions dynamics are dependent upon firm's growth, risk, leverage and liquidity. More interesting, we conclude that group affiliation, a distinctive corporate government feature of developing markets, plays a central role on the market for corporate control. This relationship is of particular interest in the M&A literature, since the study of corporate government issues that influence mergers is relatively rare in developing markets.

INTRODUCTION

This paper contributes to understand the role of corporate governance issues in emerging economies by the examination of the characteristics of the market for corporate control. Using data from acquiring and acquired firms in a developing country, we study the determinants of the probability of participating in a merger or acquisition process. We found that business group affiliation, risk, liquidity and profitability influence M&A decisions in non-regulated industries.

Sandra Corredor, Universidad de los Andes School of Management
stc@adm.uniandes.edu.co

Carlos Pombo, Universidad de los Andes School of Management
cpv@adm.uniandes.edu.co

Adriana Corredor²
Banco de la República de Colombia, acorrewa@banrep.gov.co

¹ Disclaimer: The views herein are those of the authors and do not necessarily represent the views of the Banco de la República or its Board of Directors

² Disclaimer: The views herein are those of the authors and do not necessarily represent the views of the Banco de la República or its Board of Directors

Firms in emerging economies appeared to make use of Mergers and Acquisitions (M&A) as an important strategy to achieve competitive advantage in their new and liberalized business environment. Furthermore, some features of these markets, such as the traditional and concentrated ownership structure in business groups, might be important to explain the differences in the dynamics and motives of M&A, as compared to their developed counterparts.

Evidence on mergers in emerging markets, at the firm level³, was provided by the studies from Alcalde & Espitia (2003) and Siriopoulus, Georgopoulus & Tsagkanos (2006). The first one reported the impact of the transaction costs, associated with the ownership structure of the merger targets, into the probability of being identified as an acquisition target in Spain⁴. Siriopoulus et al. (2006), based on a probability model, tries to explain why some firms are acquisition targets. This study rejects the Market for Corporate Control hypothesis for the Greek⁵ acquired firms and found that age, productivity and size are important variables to be considered in the probability of being acquired.

Our empirical study adds evidence on the effects of financial, group affiliation and industry concentration structure on mergers from a sample of 193 mergers that took place in Colombia from 1999 to 2003. The availability of firm-level data allows a comparison of the impact that this measurements have on both, the M&As probability and the performance after the integration. In order to identify the variables that influence the merger probability for the acquired firm, a logit model was used. Our findings point out that acquiring company's motives for mergers vary from the allocation of liquidity surpluses, to raises in market power, creation of financial synergies and risk reductions. In Colombia, as in other emerging markets (see Siriopoulus et al., 2006), bidders are typically big and mature as compared to both, their acquired counterpart and the average firm in their sector. Acquiring firms also have superior labor productivity and lower rates of growth and profitability. These results suggest that the average acquiring firm is attempting to grow and

³ Glen & Singh (2005) argue that there has been scarce recognition of the fact that economic development is carried out by firms, large and small; so it is important, and even more in emerging economies, to study the evidence and implications at the firm (not the aggregate) level.

⁴ This sample also includes acquisition targets (but in Spain) from 1991 to 1997; most of this period, Spain was a emerging market (until mid 90's)

⁵ The sample includes 30 Greek acquisition targets from 1989 to 2000. It is important to notice that Greece was an emerging market until 2001.

diminish its risk through the merging processes. In particular, business groups are trying to expand and integrate small -and vulnerable- firms into their bigger business units. Industry concentration has a positive effect on the merger probability. Most intra-business group mergers take place among firms in the same industry. Companies might be seeking the potential gains from reducing competition and intensifying entry barriers.

Many developed market studies -see Mueller (1995)- have demonstrated that firm efficiency and market for corporate control reallocations are main merger motives. Our findings point out that there is no evidence that supports the market for corporate control or the efficiency hypotheses for Colombia. On the other hand, our results support the synergy, industry disturbance, financial synergies and risk reduction hypotheses. This last set of hypotheses has been linked in the literature with imperfect capital markets, the kind of market that could be associated with a developing economy.

The first section will discuss the literature on the mergers motives; the second one describes the paper hypothesis. Data and the econometric issues are illustrated in the third part. Then the descriptive and regression results are discussed. At last there are some conclusions from the observations above.

1. LITERATURE REVIEW

Mergers and Acquisitions have been examined by a large number of studies (see Weston & Weaver, 2001), almost all concerned with M&A transactions in developed markets, especially in the US and the UK. However, there are relatively few papers focusing on the emerging markets features.

Some firm evidence, on non-financial sectors' M&As, for emerging markets (and relatively small economies) have been published for takeover target returns in Spain (Ocaña, Peña & Robles, 1997); trends in M&A for Mexico (D'Mello, 2000); industrial restructuring through M&A in Argentina (Chudnovsky & López, 2000);

multinational acquisitions in Eastern Europe (Rondinelli & Sloan, 2000); abnormal returns in Portugal (Farinha & Miranda, 2003); foreign direct investment through acquisitions in developing markets (Calderon, Loayza & Serven, 2004); the effects of mergers on technology in Spain (Marin & Alvarez, 2005); abnormal returns for Latin American tender offers (Fuenzalida, Mongrutm, Nash & Tapia, 2006); horizontal mergers and antitrust policy for Mexico (Avalos & De Hoyos, 2008); the acquiring firms' economic value added for the pre and post-merger periods in Colombia (Martinez & Lopez, 2003); mergers response to regulatory shocks in India (Agarwal & Bhattacharjea, 2006); the long term effects of takeovers in Thailand (Soongswang, 2007). These literature does not revise the probability of participating in a merger process, and do not take into account ownership concentration features -such as group affiliation- that may possibly change mergers dynamics.

Common topics on M&As literature include the measurement and analysis of wealth effects for targets and bidders around the announcement day (Jensen & Ruback, 1983); the estimation of merger synergies (Mueller et al 2003a, 2003b); the impact of different methods of payment (Shleifer & Vishny 2003); some efficiency issues (Mueller, 1980, 1995; Mueller et al 2003b); the long term performance (Agrawal & Jaffe, 1999); the free riding problems (Schleifer & Vishny, 1986); the managerial hubris (Roll, 1986); the agency problems (Jensen, 1986); the industry disturbance (Gort, 1969; Palepu, 1986); the effects of capital structure (Lubatkin, 1986) and the risk diversification and financial synergism (Choi & Philippatos, 1983).

A major result of these studies is that mergers create value for acquired firms, as their abnormal returns are typically high (20% for mergers according to Jensen & Ruback, 1983), while acquiring firms create small or no value for their shareholders (see Mueller 1980, 1995, et al. 2003 a and b). Some features have been proved to be different in emerging markets. Chari, Ouimet and Tesa (2004)

found that developed-market acquirers experience positive returns in transactions that involve an emerging-market target.

The disciplinary hypothesis, which argues that there exists a Market for Corporate Control, has been associated with low returns for bidders -who pay a premium over a less efficient company (the acquired)-. Positive returns for the acquirer -as those in emerging markets- are not supported by this hypothesis. On the other hand, merger premium might not be entirely explained by the ownership transfer, but by the control rights purchase. Business groups seeking for higher control rights could be more interested in mergers processes than other firms.

In countries with poor protection to the minority shareholders, as emerging markets countries, the costs of losing control rights is so high, in terms of private benefits, that the ownership is characterized to be highly concentrated, family owned or attached to a group of legally independent firms owned by the same family or group of families (La Porta, Lopez-De-Silanes & Shleifer, 1999). This property structure can make the difference in the market for corporate control characteristics. We argue that this is a major determinant of the merger probability that has been not taken into account on the traditional M&A literature.

As for business groups, Khanna & Palepu (1997, 2000) found that, in emerging markets, this kind of associations are common and helpful in replacing some market mechanisms present in advanced economies. Shleifer and Vishny (1986) point out the benefits of ownership concentration on improving the functioning of a takeover market. However, the emerging markets business groups -highly ownership concentrated- may create agency problems, especially when there are few instruments to protect minority shareholders (La Porta, et al, 1999). Studies like Gonenc's, et al (2007) found that, in Turkey, group affiliation improves the company's accounting performance, but not its stock market revenues. Lins & Servaes (2002) observed, for seven emerging markets, a discount of 15% (on average) for affiliated firms, rejecting the internal capital market efficiency

hypothesis. Bae, Kang and Kim (2002) conclude that in Korea, the acquirer's minority shareholders lose value in mergers, while controlling-affiliated shareholders benefits from the value created in other firms in its group.

2. HYPOTHESIS AND INDEPENDENT VARIABLES

Empirical evidence has shown that M&A yield zero or negative profits for the acquiring firm, therefore, alternative hypotheses must be suggested and proven to explain why this phenomenon continues to be the most common way of corporate integration. Five different hypotheses have been identified in the study of the literature: efficiency, synergies, managerial incentives, financial disturbance, and financial synergies. The first two hypotheses assume that the managers' incentives are aligned with the shareholders'; they both seek to increase the benefits through cost reductions or better prices. The next two hypotheses assume that managers prioritize their goals (growth) over the shareholders' (earnings)⁶, even to the point where they involve a certain degree of irrationality ('hubris') in their decision. The financial synergies hypothesis yields on the market imperfections and asymmetries of information. At last, we inquire about group affiliation, which has not been documented in the literature, and might be related to the developing economies' control rights market.

2.1. Hypothesis of Efficiency [HE]

This hypothesis pertains to cost reductions subsequent to the merger. The most analyzed efficiencies are those of scale economies, particularly in related mergers⁷. According to Mueller (1995-1980), potential earnings are higher for smaller firms, given that through mergers they are able to reach the minimum efficient size for their industry. Two benefits can also be identified: Finance cost reduction for the smaller firm, and variance reduction in returns for the acquiring

⁶ That is, since managers' incentives tend to be tied to the firm's revenue and growth, and not to the earnings.

⁷ Related mergers are horizontal mergers, i.e. where the acquiring and the acquired firms belong to the same sector.

firm⁸. Under the [HE] there will be an increase in the efficiency of the [AG] or the [AD], and two effects over the combined firm: Product prices will be lower and the produced quantities will be higher. The increase in quantities must be higher than that in another situation (Mueller, 1995); thus the fixed cost reduction, or marginal cost reduction will entail significant costs.

A marginal cost reduction will produce a price reduction in the case of a benefit maximizing firm. This implies, in turn, an increase in sales derived from the increase in quantities, and in earnings, as a consequence of the reduction in costs (Mueller, Gugler, Yurtoglu, Zulehner 2003b). If the increase in efficiency occurs by a reduction of fixed costs, an increase in earnings could be expected with no change, whatsoever, in sales⁹.

2.2. *Hypothesis of Synergies [HS]*

This second hypothesis suggests that companies merge looking for synergies, specifically increasing their market power. Mueller, et al. (2003a) states that, given an efficient market mechanism, these synergies should be shared equally amongst the firms AG and AD. In Cournot's classic oligopoly, the price variation is inversely proportional to the number of offerers, thus, and since cooperation is facilitated with a smaller number of firms in the market, additional earnings could be expected from related mergers (Mueller, 1995). Less evidently, unrelated mergers increase market power because they impose barriers upon entry to those firms that only operate in one production phase of the chain. This barriers are derived from the fact that, in order to evade predatory actions from rivals, any firm must operate in all or several of the production phases (Mueller, et al., 2003b); furthermore, mergers increase 'multi-market contact', which increases the cost of reducing prices in one of the firm's markets, therefore they also encourage cooperation, increasing the merged firm's market power.

⁸ Tax savings, a factor that could be the source of efficiency in unrelated mergers, was reviewed in Jayaraman, Khorana and Nelling, (2002). This factor is significant only in few cases (10% of the cases). Therefore, and given that the savings on taxes are a characteristic of hostile and leveraged takeovers (Mueller, 1995), which are not the case in Colombia (Rossi and Volpin, 2003), they will be considered as part of the financial synergies (fifth hypothesis).

⁹ An alternative way to measure efficiency changes, typical in literature, is to measure the variations in the firm's productivity; this ratio was contemplated in the empirical analysis (differences in measurements).

Contrary to the expected result in the [HE], an increase in market power would have higher prices at lower quantities as a result. Hence, for all types of mergers that comply with [HS] there must be a reduction in sales, caused by a reduction in quantities, which is more than proportional to the price increase. For this reason, the decrease in total costs (caused by the fall in quantities), generates an increase or stabilization in earnings¹⁰ (Mueller, et al. 2003b).

2.3. *Hypothesis of Managerial Incentives*

This hypothesis states that managerial incentives are not always aligned with the shareholders'. Other goals, such as the maximization of growth and construction of "private realms", may have an influence on managerial merger decision. A lower efficiency would result in a decrease in both sales and earnings. Below is an illustration of two of these hypotheses.

2.3.1. *Market for Corporate Control Hypothesis [MCCH]*

According to the [MCCH], managers seek to maximize the firm's growth, even at the expense of shareholders' benefits. A merger is the quickest and safest way to grow (Mueller 2003, 1995), and managerial incentives are proportional to the growth in revenue. The younger firms, industries of which show rapid growth rates, have sufficient opportunities to develop internally; whilst the more mature firms which are part of low growth industries, merge to increase in size (Mueller 1969; Jensen 1986).

In 1965 Manne suggested that the market for corporate control is an efficient instrument that aligns managers' and shareholders' goals, since incompetent managers are replaced by means of control transfers. Several authors have found their results to be consistent with this hypothesis: Earnings close to zero for the acquiring firm and high for the acquired firm¹¹.

¹⁰ This occurs because the firm is facing a demand with a negative and elastic slope; according to Mueller et al. (2003), this occurs when: Differentiated products are sold or, although they may appear as homogeneous, they differ (in service location), in a way such that they control the price; they do not operate in "atomic competitive" markets.

¹¹ Mandelker (1974); Jensen and Ruback (1983); Meeks (1977) in England. For further information, see Mueller (1995, pp 25-28)

The Market for Corporate Control Hypothesis [MCCH], one of the most debated merger causes in developed economies, seems to be less accurate explaining the M&As dynamic in emerging and relatively small economies. Siriopolus, et al (2006) found that acquired targets in Greece are big, efficient and mature firms; so that the [MCCH] doesn't hold. Alcalde, et al (2003) report no significant profitability or efficiency differences for acquired and acquiring firms in Spain. The manager discipline thru M&A is linked to hostile takeovers, common in developed economies, but rare in emerging markets. Fuenzalida, et al. (2006) found abnormal returns for about 8% to acquired firms in five Latin American countries; Farinha & Miranda (2003) calculated a 13% for Portuguese takeover targets; whereas studies in developed countries show higher returns, from 20% to 50% (Mueller, 1995). Nevertheless, Ocaña, et al. (1997) reported abnormal returns of 41% for the target firm in Spain.

2.3.2. *'Hubris' Hypothesis [HH]*

The 'Hubris' Hypothesis (Roll, 1986) also analyzes managerial incentives; it explains how the excessive optimism portrayed by some managers leads them to 'overestimate' the acquired firm's potential earnings. 'Hubris', from the Greek word for pride, have been found to be stronger in smaller mergers than in larger ones. The premium paid in an acquisition is not the reflection of potential earnings. The proof of this hypothesis is beyond the scope of this study¹².

2.4. *Hypothesis of Financial Disturbance [HFD]*

Gort (1969) suggests that a merger occurs when AG is willing to pay AD's shareholders more than they believe their firm is worth. The cause is the differences in the agents' expectations, explained by an increase in the dispersion originated from two collisions. Shifts in share prices and technological changes, both show an increase the variance of the value of the firm. Following Palepu

¹² Measurement of this type of managerial incentives has suggested serious methodological issues to researchers; in the case of Colombia, it is even more difficult, as there is not significant share information.

(1986), industry disturbance may be approached as the number of mergers within it, given that such measure contemplates the fact that acquisitions are typically concentrated in certain sectors¹³ subject to disturbance, thus increasing the probability of firm merging.

2.5. *Hypothesis of Financial Economies*

Miller (1977) states that in a perfect market, the capital structure policy is irrelevant to an individual firm. However, Lubatkin (1986) suggests that the changes in capital structure comprise a reason to merge.

2.5.1. *Hypothesis of Financial Synergies [HFS]*

Myers and Majluf (1984) stated that mergers between one firm with surplus liquidity and another with a shortage, creates value for both companies. Ratios:

- a. Changes to the capital structure: Changes to the leveraging of AG during and after the merger are significant.
- b. Complementarity of the capital structure: AG and AD must have different leveraging levels. Particularly, AG must be less leveraged than AD and other firms in the control group¹⁴.
- c. Growth-Resources Imbalance: Firms with an imbalance comprised of low growth and abundant financial resources must use M&A as a mechanism for expansion and investment. AG's show low growth, surplus liquidity and a capital structure that is not optimal (below indebtedness potential).

2.5.2. *Hypothesis of Risk Reduction [HRR]*

By a merger the AG firm can diversify, i.e. reduce its relative performance risk (Lubatkin, 1986). The [HRR] studied by Levy and Sarnat (1970), Amihud and Lev (1981) and Caves (1989), refers to the annulment of bankruptcy risk.

2.6. *Economic Group Affiliation*

¹³ Estrada (2005), states that evidence shows that some sectors are more dynamic than others in terms of mergers; an example of this is the financial sector, more specifically the banking sector.

¹⁴ The methodology used for construction of the control group is shown after.

Controlling for traditional -developed markets- merger determinants; we are going to prove that concentrated ownership on economic group structure have a significant effect on the corporate mergers.

Table 1 below explains the variables for the study of hypotheses. Each on explains the driver, the measurement method, expected sign and hypothesis.

Table 1. Analysis of the variables that affect the probability to merge.

ANALYSIS OF VARIABLES THAT AFFECT MERGER LIKELIHOOD (a)					
Variable	How to measure	Motivation	H ₀	Bibliography	Sign
Size [AG]	Natural log of Total Assets one year before the merger (t-1)	The size is considered a market power measure and an economies of scale indicator. Larger sizes increase market power, reduce operating uncertainty and foreign debt costs.	Control	Choi and Philippatos (1983, 1984); Lubatkin (1986)	(+)
Activity or Turnover [AD]	Work Capital Turnover (Sales / Work Capital)	Activity ratios show how efficiently AD is using its assets and liabilities (current) to generate sales. AG could be interested in an efficient AD that helps improve efficiency after the merger; in that case the relationship would be positive. Or using AD assets more efficiently. In this case, the sign would be negative, and it would also be an argument in favor of [MCCH]	Control	Adelaja, Nayga and Farooq (1999)	(?)
Growth [AD]	Assets Growth: $\frac{\text{Asset}_{\text{Year} + 1} - \text{Asset}_{\text{Year}}}{\text{AssetYear}}$	Authors like Goldberg (1983) and Lewellyn (1971) demonstrate the importance of the firm growth with respect to the acquisition likelihood. Low growth firms with large resources could be attractive targets for an acquisition; however, high growth firms with few resources can also call the acquiring party's attention.	Control	Adelaja, et al. (1999)	(?)
Dividends Policy [AG]	$\frac{\text{Dividends}_{\text{Year}}}{\text{Cash Flow}_{\text{Year}}}$	High dividend payments show an absence of investment opportunities, which imply a reduction in future cash flows. For AGs, a merger represents an investment alternative for these cash flows.	Control	Dietrich and Sorensen (1984) in Adelaja, et al. (1999)	(+)
Firm Age [AD]	Age of the acquired firm in the year of the merger	Experience accumulation as a result of dynamic learning could be appealing for acquiring parties. However, it is expected that in average, it is lower than AG's.	Control	Siriopoulos, et al. (2006)	(+)
Acquiring party as an economic group [AG]	Dichotomic variable. Affiliated = 1 if AG belongs to an economic group. Otherwise, it will be zero	Acquired firms will tend to resist absorption by an investment group because they sense that the offering party's motivation is merely financial. Shleifer and Vishny also associate hostile takeovers with investment groups as acquiring parties. Nevertheless, due to the importance of economic conglomerates in Colombia, it is expected that these firms are very active in the M&A dynamics.	Control	Adelaja, et al. (1999); Shleifer y Vishny (2003)	(?)
Liquidity [AG]	Net Liquidity ^(a) High liquidity dichotomic ^(b)	Merger likelihood should increase when firm AG has more resources to invest. Liquidity surpluses are a very strong managerial incentive in favor of M&A (Alternate uses of cash flow)	Control	Choi, et al. (1984)	(+)
Sector [AG]	D ₁ , D ₂ , D ₃ ... D ₇ = 1 if AG firm belongs to the sector	7 dichotomous variables were created to identify correspondence to one of the 8 sectors that are divided by economic group or activity	Control		(?)
Industry Growth [AG]	Average sales growth of the acquiring firm industry.	When firms are facing slow growth demand, mergers become the fastest and safest way to achieve economies of scale. In a rapid growth industry, the power market obtained through M&A decreases progressively with an increase in the number of firms. Hence, an inverse relation would result if [HS] is proven right.	[HS]	Gort (1969); Mueller (1995); Gugler, et al. (2003).	(-)

ANALYSIS OF VARIABLES THAT AFFECT MERGER LIKELIHOOD (b)					
Variable	How to measure	Motivation	H ₀	Bibliography	Sign
Entry Barriers [AG]	Entropy ^(c) Sector j:	Industry concentration measured with the entropy sector index is the proxy of entry barriers; the higher the barrier, the greater the potential revenues resulting from a competition reduction. Therefore, merger incentives will be increased.	[HS]	Gort (1969); Philippatos and Baird (1996)	(+)
Industry related size [AG]	Dichotomic variable =1 if firm is in the group of the 20% largest companies in the sector (in terms of assets)	Similar to previous variable, Pesendorfer (1998) studies industry related size, which has a direct impact on market power. In the M&A market, large businesses use their positions to capitalize on market imperfections and gain monopolistic power.	[HS]	Mandelker (1974); Pesendorfer (1998)	(+)
Profitability [AD]	Return on Equity (ROE) Net Profit / Equity	Profitability acts as a guideline for shareholders. It also affects merger likelihood. Less profitable firms can be attractive when it comes to resource re-allocation towards more efficient firms [MHCC], and the potential of possible earnings can be capitalized by replacing inefficient management. However, high AD returns may attract firm AG.	[MCCH]	Goldberg (1983) in Adelaja, et al. (1999); Ravenscraft and Sherer (1987)	(-)
Profitability [AG]	Return on Equity (ROE) Net Profit / Equity	If [MHCC] is proven right, firm AG should be more profitable than AD, so by re-allocating control from AD to AG, greater benefits can be achieved. On the other hand, following the benefit maximization principle, shareholders of profitable AG companies can oppose M&A. By having more profitable options, (even reinvestment in the same firm), these shareholders will not have incentives to pay the premium associated to the acquisition of the other company.	[MCCH]	Lubatkin (1986)	(+)
Maturity of the firm [AG]	Age of the acquiring firm at the time of merger	In more matured firms, whose industries show slow growth, managers will have incentives to merge because they will be able to maximize growth much faster.	[MCCH]	Mueller (1969); De Bondt y Thompson (1992)	(+)
Liquidity [AD]	Net Liquidity ^(a) Dichotomic High Liquidity ^(b)	When AD has better liquidity levels, its payment capability also increases. It may be desirable for AG since this implies that AD administrator is neither maximizing shareholders benefits, nor using cash and other short term assets efficiently, actions that could be taken by AG. Likewise, AG managers could be interested in providing immediate liquidity to shareholders.	[MCCH]	Palepu (1986) Adelaja, et al. (1999)	(+)

ANALYSIS OF VARIABLES THAT AFFECT MERGER LIKELIHOOD (c)					
Variable	How to measure	Motivation	H ₀	Bibliography	Sign
Industry Disturbance [AG]	Mergers in the sector (d) Mergers in the sector ratio (e)	The recent history of M&A is a factor that sends signals about possible merger waves in certain industries (where [HFD] applies). These 'disturbances' increase merger likelihood	[HFD]	Gort (1969); Palepu (1986)	(+)
Operating Leverage [AG]	Financial Leverage = Total Assets / Equity	M&A could be a source of financial synergies for low leveraged AG, whether the acquisition is being leveraged or AD has a higher debt (which is assumed by AG after the merger). Hence, merger likelihood should increase when leverage is low.	[HFS]	Lubatkin (1986)	(-)
Risk [AG]	Leveraged Beta ^(f) = $\beta_{unlev} * \left(1 + \frac{LongTermDebt}{Equity}\right)$	It has been stated that risk reduction is one of the main reasons for conglomerate mergers, in the absence of evident synergies. However, some authors argue that in efficient capital markets, said risk reduction does not benefit shareholders since they cannot control the desired risk level through their own portfolio.	[HRR]	Amihud and Lev (1981)	(?)
[AD] When variable is measured for the acquired firm					
[AG] When variable is measured for the acquiring firm					
Sign: The sign that precedes related hypothesis H ₀ for each variable					
Note: Refer to Annexes XX and XXX to see other variables					

(a) Net Liquidity = (Current Assets - Inventory / Total Assets)

(b) Dichotomic High Liquidity: Dichotomic variable = 1 if Net Liquidity of the firm is greater than the sector's average ^(a) ; otherwise, it will be zero

(c) Calculated entropy index is equal to zero when the industry is a monopoly, otherwise it will be negative. The more negative the entropy, the more competition in the sector. It is worth noting that $p_{i,j}$ = firm i share in sector sales j

(d) Mergers in the sector = Sum of the number of mergers that took place three years before the merger in CIIU sector (Review 2), three digits away from the firm

(e) Merger ratio in the firm's sector = (c) / Total firms in the CIIU sector (Review 2), three digits away

(f) Unleveraged beta by sectors was taken from professor Damodaran page (<http://pages.stern.nyu.edu/~adamodar/>), which was inquired on January 14, 2008. This beta is corrected by the firm's Leverage Ratio (Long Term Liability / Equity).

3. THE EMPIRICAL STUDY

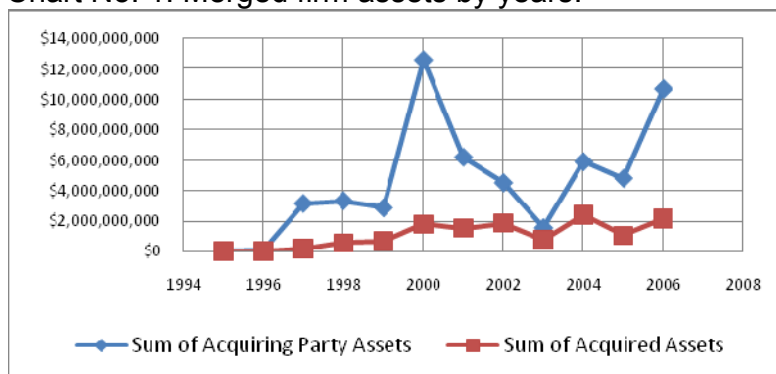
3.1. Data

The period of study comprises mergers in Colombia from 1996 to 2003, for a grand total of 522 mergers. The firms' financial statements and employment were obtained from the Superintendence of Societies [SSOC]. Information on the acquiring firms was extracted from three years prior to the merger [t-3], up until three years after [t+3], whilst for the acquired firms the information included was from t-3 to t-1. The unleveraged beta from the base built by Professor Aswath Damodaran¹⁵; and, the information on affiliation to a business group was collected from Pombo & Gutierrez (2007).

3.2. Descriptive Analysis

The substantial increase of merged assets are shown in Chart No. 1

Chart No. 1. Merged firm assets by years.



Source: Self preparation - Information SIC, SSOC.

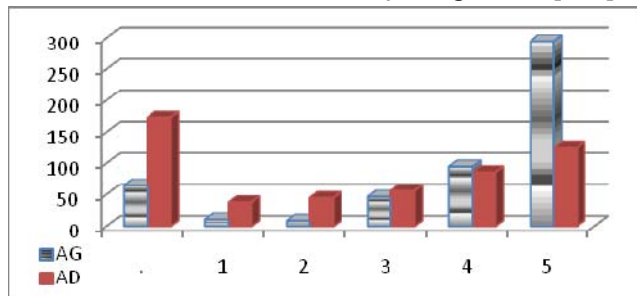
The total number of approved mergers, target population of the document, shows an important change in 2000, with a subsequent fall until 2003.

In 1999 and 2000 many companies were forced to file for bankruptcy or be absorbed in order to answer to their financial and equity liabilities.

Chart No. 2 shows that the AG firms in Colombia tend to be concentrated on the highest quintiles, by size measured as assets, of their sector. AD firms are distributed into lower quintiles (on average).

¹⁵ Database is available at <http://pages.stern.nyu.edu/~adamodar/>

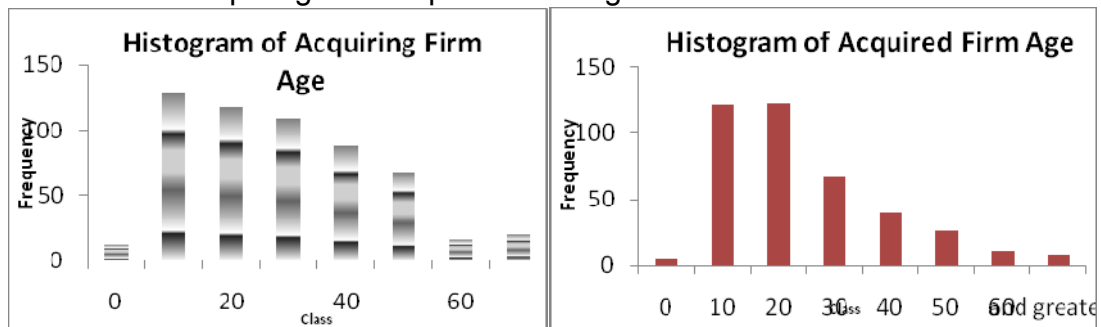
Chart No. 2 Quintiles of Acquiring firms [AG] and Acquired firms [AD].



Source: Own calculations, SSOC information
The observations "." correspond to mergers that do not have sectorial information.

Regarding the age of the firms (Chart No. 3), as expected, acquiring firms have more experience (number of years) than the acquired ones.

Chart No. 3. Acquiring and Acquired Firm Age.



Source: Own calculations.

As regards to the sectors of the sampled mergers, the manufacturing sector and the trade sector have the highest participation in M&A¹⁶ (see Table 3)

Table 3. Merger Frequency per sector of the sample – Firms [AG] and [AD]

	1999	2000	2001	2002	2003	Total	Total (%)
Agriculture, cattle farming, forestry and fishing	0	6	4	8	4	22	11.40%
Mine and quarry exploration	1	7	0	7	1	16	8.29%
Manufacturing industries	17	26	11	10	17	81	41.97%
Construction, electricity, gas and water	2	0	2	1	2	7	3.63%
Trade, hotels and restaurants	5	11	8	11	8	43	22.28%
Transportation, storage and communications	1	2	0	0	1	4	2.07%
Activities auxiliary to financial intermediation	0	4	6	4	4	18	9.33%
Entrepreneurial activities, teaching, health services and others	0	1	1	0	0	2	1.04%
Total	26	57	32	41	37	193	100.00%
Total (%)	13.47%	29.53%	16.58%	21.24%	19.17%		

Source: Own calculations.

¹⁶ The information does not correspond to the population; but to the sample, which is described in the following section.

3.3. Methodology

In order to compare the information from different years and firms, the variables used are financial ratios (units free). The following were calculated prior to the merger: Average of t-3 to t-1 (where 't' is the merger year); and after the same: average from t+1 to t+3. Other variables were included, such as affiliation to financial groups, age and industry concentration indices. Following Lubatkin (1986) and Mueller et al. (2003b), the maximum number of available observations is used¹⁷.

We select a *logit* over other models of dichotomous variable, following Alcalde & Espitia (2003), because in addition of not requiring normality in the errors – one of the most popular advantages – this type of model tends to make less type I mistakes than, for instance, a discriminating analysis.

i. Merger performance measures

In order to prove [HE] and [HS], following Mueller et al, (2003b), performance of the merged firm was compared to the performance forecast for the firms AG and AD, in the event that no merger had taken place. Earnings and sales of the merged firm were taken as the Earnings Before Interests and Taxes [EBIT] and Sales, respectively. The projection for these two variables was obtained as follows:

Sales:

$$S_{C_{t+n}} = S_{G_{t-1}} \frac{S_{SG_{t+n}}}{S_{SG_{t-1}}} + S_{D_{t-1}} \frac{S_{SD_{t+n}}}{S_{SD_{t-1}}}$$

$S_{C_{t+n}}$: Sales prediction for combined firms at t + n

$S_{G_{t+n}}$: AG firm sales at t + n (or t - n..)

$S_{D_{t-1}}$: AD firm sales at t - 1

$S_{SG_{t+n}}$: Median firm sales in the AG firm sector at t + n

$S_{SD_{t+n}}$: Median firm sales in the AD firm sector at t + n

¹⁷ The reason being, that the procedure used to protect the estimators against a potential bias by multiple mergers may introduce an even worse sampling bias, excluding the firms with experience in M&A (Lubatkin, 1986). In addition, all regressions of the study were run on Stata 9, and the option 'robust' was activated to correct by *heteroscedasticity*.

Earnings:

The changes in earnings ratios (EBIT) to total assets in the sector to predict the changes in earnings of the merged firms ($\Delta_{SG_{r+n}}$). The forecast earnings for the combined firms ($\Pi_{C_{t+n}}$).

$$\Delta_{SG_{r+n}} = \frac{\Pi_{SG_{t+n}}}{K_{SG_{t+n}}} - \frac{\Pi_{SG_{t-1}}}{K_{SG_{t-1}}} \quad \text{and} \quad \Delta_{SD_{r+n}} = \frac{\Pi_{SD_{t+n}}}{K_{SD_{t+n}}} - \frac{\Pi_{SD_{t-1}}}{K_{SD_{t-1}}}$$

$\Delta_{SG_{r+n}}$: Profits change for the median firm in AG's sector at t + n

$\Pi_{SG_{t+n}}$: Profits for the median firm in AG's sector at t + n

$K_{SG_{t+n}}$: Assets for the median firm in AG's sector at t + n

$$\Pi_{C_{t+n}} = \Pi_{G_{t-1}} + \frac{K_{SG_{t+n}}}{K_{SG_{t-1}}} K_{G_{t-1}} \Delta_{SG_{t-a,r+n}} + \Pi_{D_{t-1}} + \frac{K_{SD_{t+n}}}{K_{SD_{t-1}}} K_{D_{t-1}} \Delta_{SD_{t-a,r+n}}$$

$\Pi_{C_{t+n}}$: Profits prediction for the combined firms (as without a merge) at t + n

$\Pi_{G_{t-1}}$: Profits for the AG firm at t - 1

$\Pi_{D_{t-1}}$: Profits for the AD firm at t - 1

$K_{G_{t-1}}$: Assets for the AG firm at t - 1

$K_{D_{t-1}}$: Assets for the AD firm at t - 1

As part of the ex-post analysis, some changes (before and after t) in variables medians are studied.

Table 4. Variables to be studied in Performance Measures and expected sign

MEASURING MERGER PERFORMANCE: CHANGES IN VARIABLES					
Variable	How to measure	Motive	H ₀	Bibliography	Sign
Differences (Δ) in sales and forecasted and actual earnings after the merger [AG]	Changes in sales and forecasted earnings of the merged firm are compared against a sales and earnings forecast in the absence of a merger.	Relations proposed by different hypothesis can be summarized as follows : $\begin{array}{ccc} \Delta Sales > 0 & \Delta Sales = 0 & \Delta Sales < 0 \\ \Delta Profits < 0 & \text{Increase} & \text{Increase} & \text{Market power increase} \\ \Delta Profits < 0 & \text{Market power} & \text{Low efficiency} \end{array}$	[HE] [HS]	Gugler, Mueller, Yurtoglu, Zulehner (2003)	(?)
Change in productivity [AG]	Change in the Sales/Number of employees ratio before and after the merger	If AG is more efficient (and therefore, more productive) after the merger, it means that economies of scale were achieved through the operation, along with a cost reduction.	[HE]	Levine and Aaronovitch (1981)	(+)
Productivity [AG] and [AD]	Sales/Number of employees	If AG is more efficient (and therefore, more productive) than AD, one of the merger's underlying drivers is that AG (considers) it can use AD assets in a more profitable/productive way.	[HMCC]	Levine and Aaronovitch (1981)	(+)
Changes in Capital Structure [AG]	Change (Before and after t) in Leverage ratio (Total Assets / Equity) and Net Liquidity	Firms with financial slack are more encouraged to acquire firms in shortage of liquidity. This way, the merger will allow them to use their real debt capacity in order to achieve financial synergies. Hence, firm AG leverage should change with the merger.	[HSF]	Myers and Majluf (1984); Choi and Philippatos (1984); Bruner (1988)	(+)
Related or non related mergers	It is a dichotomic variable; when both companies have the same 3 digit CIIU, the merger is considered related (=1); otherwise, it is considered a non related merger.	The nature of the merger could alter probability of occurrence. Mergers can be horizontal (between competitors), vertical (value chain related) or conglomerate* based; when having a perfect acquisition market, firms AG should be indifferent to the type of merger. However, Shleifer and Vishny (2003) state that most of related mergers occur through payment by shares, which in turn would make them less likely (Adelaja, et. al, 1999). Furthermore, synergies are less quantifiable in conglomerate mergers, which would make them less likely as well. Therefore, after the merger, it is likely to find different returns according to the type of merger.		Lubatkin (1986); Caves (1989); Mueller (1995); Shleifer, et al. (2003).	(?)
[AD] When the variable is measured for the acquired firm					
[AG] When the variable is measured for the acquiring firm					
Sign: The sign preceding the hypothesis H ₀ that will be proven					
* The measurement has some limitations because AG and AD could be related in secondary activities (distribution, operation, etc)					

ii. Logit Model for AG: Analysis for each year with a complete sample.

Determinants for the mergers for each year were tested separately, to control possible changes of such determinants in time. The variables are described in Table No. 1; the t-3 to t-1 values are averaged in each case, except for the natural logarithm of the assets (which is for t-1).

All of the 193 acquiring firms in mergers were taken with full information and a Y=1 probability was assigned in the model corresponding to the merger year. In order to assign the probability Y=0 to a sample near to the population (Ohlson, 1980), all the available Tax ID Numbers at SSOC were collected for each of the years under analysis and the firms that (year by year): (1) did not participate in M&A processes between 1995 and 2006 and, (2) had complete information from t-3 to t+3, taking t as the merger year for the firms marked Y=1¹⁸. The following is the composition of the sample:

Table 5. Number of merged and unmerged firms by Economic Activity and Year.

Economic Activity Sector	1999		2000		2001		2002		2003	
	Y=0	Y=1	Y=0	Y=1	Y=0	Y=1	Y=0	Y=1	Y=0	Y=1
Agriculture, cattle farming, forestry and fishing	217	0	239	6	242	4	238	8	293	4
Mine and quarry exploration	54	1	56	7	53	0	64	7	74	1
Manufacturing industries	1157	17	1226	26	1210	11	1287	10	1378	17
Construction, electricity, gas and water	212	2	229	0	221	2	216	1	250	2
Trade, hotels and restaurants	801	5	880	11	930	8	1001	11	1128	8
Transportation, storage and communications	1	1	0	2	1	0	0	0	3	1
Activities auxiliary to financial intermediation	27	0	31	4	37	6	34	4	26	4
Entrepreneurial activities, teaching, health services and others	12	0	16	1	14	1	11	0	14	0
Total Sample	2481	26	2677	57	2708	32	2851	41	3166	37

Source: Author's calculations.

A Logit model was run for each of the years; dichotomous variables in the sectors were control parameter in all models.

4. RESULTS

i. Merger performance measures

The hypotheses of efficiency and the hypothesis of synergies are proven, following the Mueller et al. (2003b) methodology. This exercise provided

¹⁸ For example, if the model is being built for the year 2000 (t=2000 All of the mergers within the sample of 193 companies, and which occurred in the year 2000, are marked with Y=1. To determine the Y=0 firms, all of the Tax ID Numbers available at SSOC during the year 2000 are collected, the firms participating in mergers between 1995 and 2006 are eliminated; those with no complete financial information from 1997 (t-3) to 2003 (t+3) are eliminated. Note: The complete information criteria is the same for the Y=1 and Y=0; that same procedure is repeated every year (t=1999,2000,2001,2002,2003).

significant results only for the first year after the merger (t+1). Table No. 6 below shows these results.

Table No. 6 Actual Value (Sales and Earnings) vs. Forecast (Sales and Earnings)

Δ Sales [Real Value (after t) - Forecast Value (after t)]				
Moment	N	Actual Mean	Forecast Mean	T-statistic ? in means
t+1	161	407.68	445.61	-1.60 * (-)
t+2	176	416.68	465.73	-1.26 * (-)
t+3	177	468.17	470.01	-0.04 0

Sales in constant (1995) dollars

Δ Earnings [Real Value (after t) - Forecast Value (after t)]				
Moment	N	Actual Mean	Forecast Mean	T-statistic ? in means
t+1	191	54.01	37.68	1.31 * (+)
t+2	192	47.97	56.04	-0.98 0
t+3	191	57.64	61.58	-0.38 0

Earnings before interest and taxes and Assets in constant (1995) dollars

When comparing the difference in actual sales and earnings of the merged firm with regard to the sales and earnings forecast in absence of the merger, a negative difference is observed in sales, and a positive one in earnings.

As predicted by the theory of synergies, upon merging, these firms would be increasing their market power, given that the combined effect of decreased sales, along with an increase in earnings, would be explained by a reduction in produced quantities and an increase in prices that is less than proportional, which would cause a fall in sales, but also in costs.

The following four performance measurements have been analyzed with a median comparison test:

- Change in productivity: There is a positive and significant change of labor productivity after the merger (from 1.2 to 1.56) shows that the [AG] is far more efficient after integration and, therefore, may be encouraged by scale economies, which are reachable under this operation.

- Changes to the capital structure: According to [HFS], firms with surplus are encouraged to acquire firms with shortage of liquidity, thus by way of the merger they may come to the point where they use their actual indebtedness potential and reach said synergies (as fiscal shields). As shown in the third section, the leveraging level of [AG] rises from 2.2 (prior to t) to 2.5 (after t). This significant change is observed, along with an increase in profitability. When a merger occurs, the market value of the debt rises for the combined firm, thanks to a co-assurance effect; hence, shareholder value can be transferred to the debt holders. However, the increase in leveraging shown in the aftermath of the integration makes said transfer be reduced and even nullified.
- Related and Unrelated Mergers According to the hypothesis of Lubatkin (1986) and Mueller (1995), returns are different according to the type of merger. In Colombia, [RM] have a larger change in equity profitability than [URM], and the latter show far larger asset growth than the former. The nature of the merger does seem to determine the level of changes to the indicators in merged firms.
- Complementarity of the capital structure: [AG] is less leveraged than the [CG], and [AD] is significantly more leveraged than [AG]. This findings support the [HFS].

ii. Logit Model for AG: Analysis for each year with a complete sample.

Analysis of the mergers by this methodology proves that the variables size, liquidity and leveraging are significant for every year and have signs that are consistent and expected. According to the model, the probability of being an acquiring firm in Colombia grows with size and liquidity, and decreases with the level of leveraging.

AG are large sized firms, even with regard to the population registered in SSOC, and have high availability of resources. Part of the rationale of the merger decision for AG may be the investment of surplus cash flows in more profitable investment alternatives than the firm itself. This occurs because AD has better

profitability levels than AG; the return on equity [ROE] is significant for four of the five years of study, and has a negative sign. The probability to be AG grows when the firm is not profitable, has surplus indebtedness capacity and high levels of liquidity; this last feature is a distinctive one, given that if the marginal effects of size, liquidity, leveraging and profitability are observed, net liquidity is the variable that consistently has higher impact¹⁹ on the merger potential.

Given the above results, the [HFS] is confirmed, since the AG firm is not taking advantage of its indebtedness capacity and the tax benefits it brings.

Table No. 8 shows that in 1999 the variable that most increased the merger potential was liquidity, whilst the one that most decreased it was profitability. The risk, approximated by the leveraged beta, is significant and has a positive sign, given that the AG, in spite of not having a high default risk (low indebtedness levels) confronts a high systematic risk that, most likely and according to the [HRR], is attempting to be reduced by way of the mergers. Besides liquidity in the year 2000, the dichotomous variable²⁰ of sector 1 (Agriculture and Cattle rising) and the growth of sales of the sector of AG both have important effects on the probability. The sales growth sign, significant in 2000 and 2002, supports the [HS]; the merger probability increases for the firms that operate in industries with little growth, and which find in M&A the effective mechanism to increase their market power. This result is consistent with the findings in the t-tests which were calculated for performance measures, and is especially important during 1999 and 2000, when there was a change in dynamics of M&A, while the country was undergoing economic recession. This fact made it easier for the companies with certain levels of liquidity to acquire others that were possibly under-valued, in a way they were able to reduce the competition and invest in profitable firms, in debt, and that could have been avoiding the fall in default.

The business groups are very important agents in the activity of M&A in this development country. The Affiliate variable is a significant every year except for 2002. It was in 2000 and 2001 when the highest marginal effects were

¹⁹ In absolute values, compared to the marginal effects of other variables for the same year, and year by year.

²⁰ The marginal effect for a dichotomous variable is the change in $F(X_i)$ when moving from a value equal to zero to a value equal to one.

reported on merge potential; this could be a reflection of a conglomerate strategy, possibly related to the reduction of risk in times of crisis.

For every year of the study, disturbance as a measure of the number of mergers in the firm's sector, or as its frequency, has a positive effect on merge potential. [HFT] predicts that in 'disturbed' industries - or under disturbance - or with a high number of M&A operations, this trend remains, whether by a 'trend' or as a survival strategy -in this case- of the smaller firms. The only exception, in the effect sign, happens in 1999, when M&A activity in Colombia was still very incipient. Especially in 2001, the most important marginal effect was that of disturbance, which points out the persistence of the trends in M&A which had begun in 1999 and 2000.

The dividends to cash flow ratio in 1999 and 2001 had a negative effect on merge potential. This proves that companies splitting their cash flows amongst shareholders may be draining the liquidity which, otherwise, could be used for funding investment project such as, for instance, a merger. It is those companies that act as major profit withholders that have a larger probability to merge.

During 2002, the most important effects were disturbance and the sector 1 dichotomous variable (Agriculture). This is one of the most active sectors as far as competition policies are concerned in developing countries, given the impact its price changes has on society.

Beta is significant for the years 1999, 2002 and 2003. It has a positive sign, which is expected. It was especially during those years when the riskiest firms began to diversify through M&A. For instance, under the financial conditions of 1999 when the firms had higher liquidity levels, they purchased others to diversify and leverage upon tax breaks at low costs (low merger premiums).

Concentration in the industry is related in a positive way to the merge potential in 2000, 2002 and 2003. When the index comes near to zero, there is more concentration, hence there are higher barriers at entry; thus, potential earnings achieved upon reduction of the competition (by way of M&A) are higher.

Finally, Sensitivity and Specificity values are, in every case, above 80%, which proves a good adjustment. The best models, in terms of classification, are those in 2002 and 2003 (with 84.19% and 84.30% accordingly).

Table No. 8 below shows the results of the logit model with a complete sample for years.²¹

²¹ The results are robust running AG information as panel data, carrying out the transformation of its Log Odds Ratios.

Table No. 8. Logit Model results for each year with a complete sample.

Logit Model Results for Each Year Using a Full Sample										
Dependent Variable: Acquiring Firm (Y=1)										
	1999		2000		2001		2002		2003	
		dy/dx		dy/dx		dy/dx		dy/dx		dy/dx
Natural Log of AG Assets	0.992 *** (0.131)	0.0015	1.139 *** (0.116)	0.0045	0.991 *** (0.165)	0.0020	1.282 *** (0.149)	0.0019	0.794 *** (0.133)	0.0024
Net Liquidity	3.800 *** (1.414)	0.0056	3.665 *** (0.760)	0.0143	4.139 *** (1.180)	0.0084	4.389 *** -1.025	0.0065	2.556 *** (0.935)	0.0077
AG Operating Leverage	-0.240 *** (0.086)	-0.0004	-0.299 ** (0.129)	-0.0012	-0.523 *** (0.173)	-0.0011	-0.318 *** (0.065)	-0.0005	-0.236 ** (0.119)	-0.0007
AG Return on Equity	-0.545 *** (0.163)	-0.0008	-0.532 *** (0.158)	-0.0021	-0.964 ** (0.379)	-0.0020			-0.490 *** (0.130)	-0.0015
AG Affiliated	1.041 ** (0.432)	0.0026	0.733 * (0.400)	0.0041	1.781 *** (0.505)	0.0094			1.117 * (0.607)	0.0060
AG Leveraged Beta	0.531 *** (0.125)	0.0008					0.414 *** (0.132)	0.0006	0.020 *** (0.008)	0.0001
AG Dividends to Cash Flow Ratio	-0.294 *** (0.061)	-0.0004			-0.037 * (0.020)	-0.0001				
Mergers in the AG Sector	-0.107 *** (0.040)	-0.0002	0.055 ** (0.024)	0.0002					0.036 ** (0.018)	0.0001
Mergers ratio in the AG Sector					8.983 ** (4.124)	0.0182	7.719 ** (3.018)	0.0114		
Average sales growth in the AG Sector			-3.588 ** (1.548)	-0.0140			-2.064 *** (0.436)	-0.0031		
Entropy in Sector AG			0.559 ** (0.260)	0.0022			0.622 *** (0.194)	0.0009	0.546 ** (0.238)	0.0016
D ₁ Agriculture, cattle farming, hunting, forestry and fishing			1.937 ** (0.857)	0.0192	1.868 (1.245)	0.0093	3.425 *** (1.244)	0.0319	1.002 (1.018)	0.0047
D ₂ Mine an quarry exploration	0.286 (1.561)	0.0005	0.325 (0.952)	0.0015			-0.275 (1.379)	-0.0004	-1.911 (1.296)	-0.0027
D ₃ Manufacturing industries	0.466 (1.029)	0.0007	-0.271 (0.771)	-0.0011	-1.102 (0.907)	-0.0022	-1.893 (1.255)	-0.0029	-1.174 (0.799)	-0.0035
D ₄ Construction, electricity, gas and water	0.938 (1.241)	0.0021								
D ₅ Trade, hotels and restaurants	1.644 (1.175)	0.0036	-0.542 (1.004)	-0.0020	0.024 (0.997)	0.0000	0.872 (1.216)	0.0015	-3.037 (1.902)	-0.0084
D ₆ Transportation, storage and communications									3.208 *** (1.081)	0.0665
D ₇ Activities auxiliary to financial intermediation			1.600 (1.191)	0.0149	3.453 *** -1.054	0.0556	2.395 * 1.285	0.0141	2.201 * -1.340	0.0232
Constant	-22.270 *** (2.553)		-21.408 *** (2.401)		-21.973 *** (3.595)		-24.430 *** (3.235)		-15.687 *** (2.793)	
Maximum Verisimilitude (Log Likelihood)	-102.057		-175.299		-110.377		-121.740		-150.247	
LRI ⁽¹⁾	29.30%		34.89%		34.78%		43.43%		25.42%	
Sensitivity ≈ Specificity ⁽²⁾	82.45%		82.36%		83.27%		84.19%		84.30%	
Cut-off probability Y* ⁽³⁾	1.00%		1.70%		1.00%		1.00%		1.50%	

Note (a): Standard error in brackets -- Note (b): Multicollinearity tests were conducted for all models. VIF coefficients for all variables and years were lower than 10 -- * Significant at 10% ** Significant at 5% *** Significant at 1%

⁽¹⁾ The LRI (Likelihood Ratio Index) compares statistical analysis of maximum verisimilitude for the full model (Log L) and the one which only includes the constant (Log L₀). It is calculated as follows: LRI = 1 - (Log L / Log L₀)

⁽²⁾ Since Y_i is a dichotomic variable and the merger probability, F(x), given by Logit is a continuous variable, these two values cannot be compared directly. In literature the most common way of checking models accuracy is known as sample classification. The proportion of merged firms correctly classified by the model (Y_i=1 y F(x) ≥ Y*) is called Sensitivity, while the proportion of unmerged firms correctly classified by the model (Y_i=0 y F(x) < Y*) is known as Specificity.

⁽³⁾ The cut-off probability Y* is the criterion used to classify the firm as merged. Palepu (1986) finds Y* (optimal) by equalizing Type I Error proportions (merged firm classified as unmerged) and Type II Error proportions (unmerged firm classified as merged). In Y*, maximization of the correctly classified proportion from both populations occurs; hence, it is also the point where Sensitivity = Specificity

All years showed a correct model selection (additional significant independent variables could not be found). P- value for hat_sq in Linktest: 1999 (0.58); 2000 (0.25); 2001 (0.52); 2002 (0.43); 2003 (0.54).

5. CONCLUSIONS

A large number of studies calculate the probability of a firm to be acquired by another; notwithstanding, very few speak of the characteristics and variables that influence the firm to make the decision to go to the market in search for a merger. Through logit models, this study identified these variables for the a developing country's corporations.

The results show that the acquiring firms enjoy good financial standing (liquidity and indebtedness capacity) and large market power (given their size); these features enable the leveraging of acquisitions at a lower cost, absorbing the acquired firm's debt with a lower probability to default, and funding of investment opportunities of the acquired firm, which would otherwise not be implemented due to the lack of resources of the AD. Contrary to Miller's theory (1977), the firms in Colombia are seeking financial synergies; firms with high liquidity and few reinvestment opportunities, as is the case of Colombian AG, have larger merge potential. The changes to the capital structure are a strong incentive for mergers; as proven by Myers and Majluf (1984) in the United States, the debt percentage in the capital structure of the firms in Colombia increases after a merger. This indicates that AG adjusts its leveraging to reach the optimum point where they can make the most of their tax advantages.

This study, as well as that of Siriopolous et al. (2006) for Greece, the acquiring firms are known for their larger size and high labor and capital productivity. These features are common to relatively aged firms, which tend to look for younger firms with better growth rates and better profitability levels that additionally, in this case study, may acquire at low cost; the value of the AD tends to be affected by the situation of illiquidity and the country's economy; an example of this is the large number of M&A that took place in 1999 and 2000.

As in Weston & Mansinghka (1970), mergers in Colombia may be understood as a 'defensive diversification' strategy, used by mature firms that transform into conglomerates, or which are attempting to reduce their risk.

It is shown that acquiring firms, which have poor returns before the merger, improve their performance after the integration. Higher concentration rates at their sectors, achieved after mergers, allow them to increase their returns.

A financial crisis may be an incentive to participate in integration and consolidation processes; this enables firms to increase their market power and even take advantage of the benefits of diversification. When rivalry intensifies, i.e. at times of recession, it focuses on the industry level, since the pressure to eliminate uncertainty, derived from said rivalry, also increases. Therefore, the firms seek to increase their market power, goal which they may rapidly reach by way of M&A processes. The results for this study with both types of sampling, state-based and complete sample are consistent with the [HS]. Similarly, ex-post test for sales and earnings predicted versus actual earnings and sales support this hypothesis, which shows an increase in market power ($\Delta \text{Sales} < 0$ and $\Delta \text{Earnings} > 0$).

On the other hand, the growth of industry demand in Colombia is negatively related to the merger potential. This occurs because when there is high growth, the firms can easily find a minimum cost structure. Thus, companies are able to build new capacity (internal growth) and appeal, with less likelihood, to M&A (external growth).

Improvements after the merger are found to be concentrated on returns after financing (cost of interests and taxes), and not on the operation. Furthermore, they pursue typically managerial goals, such as growth acceleration, more than shareholder benefits.

Finally, the study suggests that there is no evidence in Colombia to support the [MCCH] or the [HE], characteristics of M&A processes in developed markets; notwithstanding, evidence supports the hypothesis of synergies, the hypothesis of financial synergies and the hypothesis of risk reduction, which are typically associated to imperfect markets.

Given the constraints of information in the Colombian market, some variables that reflect management motivations, such as the hostile attitude of AG and the multiple acquisition offers, were left out of this study. However, a good

extension of the investigation may include corporate government variables – boards of directors and share concentration - within the merger potential calculation.

REFERENCES

1. **Agrawal, A. & Jaffe, JF. (1999)**. "The post merger performance puzzle". Available at SSRN: <http://ssrn.com/abstract=199671> or DOI: 10.2139/ssrn.199671
2. **Alcalde, N. & Espitia, M. (2003)**. "The Characteristics of Takeover Targets: The Spanish Experience 1991-1997". *Journal of Management and Governance*, Vol. 7, pp 1-26
3. **Avalos, M. & De Hoyos, R. (2008)**. "An Empirical Analysis of Mexican merger Policy". *World Bank Policy Research Working Paper 4527*
4. **Bondt, W. & Thompson, H. (1992)**. "Is Economic Efficiency the Driving Force behind Mergers?". *Managerial and Decision Economics*, Vol. 13, pp 31-44
5. **Calderon, C., Loayza, N. & Serven, L. (2004)**. "Foreign Direct Investment and mergers and acquisitions: feedback and macroeconomic effects". *World Bank Policy Research Working Paper 3192*.
6. **Choi, D. & Philippatos, G. (1983)**. "An examination of merger synergism". *The Journal of Financial Research*, Vol. 6 (No. 3), pp 239-255
7. **Chudnovsky, D. & López, A. (2000)**. "Industrial restructuring through mergers and acquisitions: the case of Argentina in the 1990s". *Transnational Corporations*, Vol. 9, pp 33-58
8. **D'Melo, J. (2000)**. "An analysis of mergers and acquisitions in Mexico: 1985-1996". *International Journal of Public Administration*, Vol. 23, pp 1035-1059.
9. **Farinha, J. & Miranda, F. (2003)**. "Run-up, toeholds and agency effects in mergers and acquisitions: evidence from an emerging markets". Universidade do Porto, Faculdade de Economia do Porto, series CETE Discussion Papers.
10. **Fuenzalida, D., Mongrutm, S., Nash, M. & Tapia, J. (2006)**. "Tender Offers in South America: are abnormal returns really high?". *Estudios Gerenciales*. Vol. 22, pp 13-36.
11. **Gonenc, H., Kan, O. & Karadagli, E. (2007)**. "Business Groups and internal capital markets". *Emerging Markets Finance and Trade*, Vol. 43, pp 63-81
12. **Gort, M. (1969)**. "An Economic Disturbance Theory of Mergers". *The Quarterly Journal of Economics*, pp 624-642.
13. **Jensen, M. (1986)**. "Agency costs of free cash flow, corporate finance and take-overs". *American Economic Review*, Vol. 76, pp 323-329
14. **Jensen, MC. & Ruback, RS. (1983)**. "The Market for Corporate Control: The Scientific Evidence". *Journal of Financial Economics*, Vol. 11, pp 5-50
15. **Jensen, MC. (1993)**. "The Modern Industrial Revolution, Exit and Failure of Internal Control Systems". *Journal of Finance*, Vol. 48, pp 831-880
16. **Khanna, T. & Palepu, K. (2000)**. "Is Group Affiliation Profitable in Emerging Markets? An Analysis of Diversified Indian Business Groups". *The Journal of Finance*, Vol. 55, pp 867-891

17. **Khanna, T. and K. Palepu. (1997).** "Why Focused Strategies May Be Wrong for Emerging Markets." *Harvard Business Review* (75:4).
18. **La Porta, . Lopez-De-Silanes, . & Shleifer, . (1999).** "Corporate Ownership around the world". *The Journal of Finance*, Vol. 54, pp 471 – 517.
19. **Levy, H. & Sarnat, M. (1970).** "Diversification, Portfolio Analysis and the Uneasy Case for Conglomerate Mergers". *Journal of Finance*, Vol. 25, pp 795-802.
20. **Lubatkin, M. (1986).** "Mergers and the performance of the acquiring firm". *The Academy of Management Review*, Vol. 8, pp 218-227
21. **Manne, HG. (1965).** "Mergers and the Market for Corporate Control" *The Journal of Political Economy*, Vol. 73, pp 110-120
22. **Marin, R. & Alvarez, I.** "An assessment of the technology's impacts of mergers and acquisitions in Spain". International Conference on Policy Modeling. Istanbul, 2005.
23. **Martínez, G. & López, G. (2003).** "¿Generan valor las fusiones a las empresas colombianas?". *Estudios Gerenciales*, Vol. , pp.
24. **Mueller, D. & Sirower, M. (2003a).** "The Causes of Mergers: Tests Based on the Gains to Acquiring Firms' shareholders and the Size of Premia". *Managerial and decision Economics*, Vol. 24, pp 373-391.
25. **Mueller, D. (1969).** "A Theory of Conglomerate Mergers". *The Quarterly Journal of Economics*, Vol. 83 (No. 4), pp 643-659.
26. **Mueller, D. (1980).** *The Determinants and Effects on Mergers: An International Comparison*. Cambridge, Mass. Oelgeschlager, Gums & Hain.
27. **Mueller, D. (1995).** *Mergers: Theory and Evidence - Mergers, markets and Public Policy*. Mussati, G. *Studies in Industrial Organization*. Dordrech, Boston & London: Kluwer Academic.
28. **Mueller, D.; Gugler, K.; Yurtoglu, B. & Zulehner, C. (2003b)** "The effects of mergers: an international comparison". *International Journal of Industrial Organization*, Vol. 21, pp 625–653.
29. **Myers, S. & Majluf, N. (1984).** "Corporate financing and investment decisions when firms have information that investors do not have". *Journal of Financial Economics*, Vol. 13, pp 187-222
30. **Ocaña, P., Peña, I. & Robles, D. (1997).** "Preliminary evidence on takeover targets returns in Spain: a note". *Journal of Business Finance & Accounting*, Vol. 24, pp 145-153
31. **Palepu, K. (1986).** "Predicting Takeover Targets: A Methodological and Empirical Analysis". *Journal of Accounting and Economics*, Vol. 8, pp 3-35
32. **Roll, R. (1986).** "The hubris hypothesis of corporate takeovers". *Journal of Business*, Vol. 59, pp 197–216
33. **Rondinelli, D & Sloan, S. (2000).** "Multinational Strategic Alliances and Acquisitions in Central and Eastern Europe: Parthenerships in privatization". *Academy of Management Executive*, Vol. 14, pp 85-98
34. **Shleifer, A. & Vishny, R. (1986).** "Large Shareholders and Corporate Control". *Journal of Political Economy*, Vol. 94 (No. 3), pp 461-488.
35. **Shleifer, A. & Vishny, R. (2003).** "Stock Market driven acquisitions". *Journal of Financial Economics*, Vol. 70, pp 295-311
36. **Siriopoulos, C., Antonios, G. & Tsagkanos, A. (2006).** "Does the Market for Corporate Control hypotesis explain takeover targets?" *Applied Economics Letters*, Vol. 13, pp 557-561
37. **Weston, JF. & Weaver, SC. (2001).** *Merger and Acquisitions*. McGraw-Hill, New York.

38. **Lins, K. & Servaes, H. (2002).** "Is Corporate Diversification Beneficial in Emerging Markets". *Financial Management*, Vol. , pp 5-31
39. **Bae, K., Kang, J. & Kim, J. (2002).** "Tunneling or value added? Evidence from Mergers by Korean Business Groups". *The Journal of Finance*, Vol. 57, pp 2695-2740
40. **Sudarsanam, Holl & Salami (1996).** ". XX, Vol. ,pp
41. **Amihud & Lev (1999).** ". XX, Vol. ,pp
42. **Wright, Kroll, Lado & VanNess (2002).** ". XX, Vol. ,pp
43. **Rodriguez, V. (2001).** "Endogenous mergers and market structure". *International Journal of Industrial Organization*. Vol. 19, pp 1245-1261