

# Determinants of Ownership Concentration in Ecuador

*This article analyzes the potential factors that define ownership concentration in Ecuadorian companies. The study is based on accounting data from 674 companies for the 2007-2011 period, taken directly from the database of the Ecuadorian Superintendence of Companies. This is the first study of ownership concentration of its kind in Ecuador. The findings illustrate differentiated behavior for the ownership concentration of a majority shareholder and that of company managers. Also, that the level of company indebtedness affects negatively the ownership concentration of the majority shareholder, and confirm that the oldest firms show smallest shareholder concentration among its owners and management.*

*Keywords:* ownership concentration, corporate governance, indebtedness, firm size

*Track:* Corporate Finance

## 1. Introduction

Despite considerable international evidence of the benefits of corporate governance best practices, and despite the fact that Ecuador's Stock Exchange has attempted to promote its implementation in local companies through various awareness and training programs, even providing financing for implementation, there is no information to guide this implementation. This study aims to contribute to the research on corporate governance in Ecuador. Most academic literature relates corporate governance best practices to ownership structure (e.g., Jensen and Meckling, 1976; La Porta, López de Silanes, Shleifer, and Vishny, 1997). Except for the United States and the United Kingdom, most countries have a highly concentrated ownership structure (La Porta, López de Silanes, Shleifer, and Vishny, 1997). In various Latin American countries, it is reported a model of high concentration, with an average of 79% held by the five largest shareholders (OECD, 2004). In a study of companies listed on the stock markets of six Latin American countries, Chong and López de Silanes (2007) show that the average ownership concentration exceeds 58%, with Uruguay (at 78%) having the greatest concentration. Benavides (2005) shows that in five Latin American countries, the average ownership held by the three largest shareholders is 76.7%, and Clarke (2004) finds that in Chile, large corporations are controlled by shareholders, who have a stake of approximately 70% of voting shares. In Ecuador, however, there has been no information on this subject available to date. During recent years, the Ecuadorian Superintendence of Companies has initiated a process focused on improving the gathering of information about companies operating in the country. For the first time, there is public access to the database held by the Superintendence, which made possible the analysis of the ownership concentration of majority shareholders and management in Ecuador.

This study provides a better understanding of the ownership structure of Ecuadorian companies and their determinants<sup>1</sup>. Studies of ownership concentration in Latin America contain no data on Ecuadorian companies due to difficult or impossible access to information, so this research will become the stepping-stone for the future development of multiple studies on ownership structure in Ecuadorian companies.

## **2. Literature review**

### ***Ownership concentration***

The study of ownership concentration can be conducted from two complimentary perspectives: first, searching for the determining factors for a certain degree of concentration, and second, searching for the potential effects of concentration on performance<sup>2</sup>.

Bebchuck (1999) suggests in his rent protection theory that when the possibility of extracting private benefits becomes clearer, there is a tendency towards more ownership concentration. Thus, when the private benefits of control are significant, company founders are reluctant to adopt a dispersed structure that transfers this control to agents outside of their immediate surroundings. This is confirmed by Bim's (1996) study of Russian companies, in which he documents that the controlling shareholders take systematic steps to increase and consolidate their shares. The benefits of ownership concentration have been measured in various countries using the range of share-price premium in sales of controlling stakes compared to the price of other shares (Dyck and Zingales, 2001). Conversely, firms experience adverse effects from ownership concentration because a higher level of concentration prompts a higher level of monitoring (Gilson and Gordon, 2003). The State influences the balance of power between "insiders" and "outsiders" by incorporating the interests of various stakeholders in corporate governance, implying that controlling parties seek to establish lower levels of protection for minority shareholders by establishing alliances with agents compensated by greater labor rigidity, which allows both groups to extract private benefits. Finally, Van Der Elst (2001) states that ownership structure depends on the characteristics of the sector to which a company belongs and the identity of its owner, motivated more by rent seeking than by private benefits. Below, we analyze the four determinants of the ownership structure that have been discussed either theoretically or empirically in the literature.

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<sup>1</sup> The original research also includes the analysis of the potential effect on accounting performance.

<sup>2</sup> Due to space constraints, this article focuses only on the determinants of ownership concentration.

### ***Influence of company size***

In a study of the ownership structure of 511 American companies, Demsetz and Lehn (1985) document the fact that company size is negatively correlated to ownership concentration. On the one hand, the bigger the company, the greater the share quantity necessary to exert control, thus leading to a costlier and more difficult ownership-concentration process. On the other hand, risk-averse investors prefer to diversify into other companies/sectors. We therefore expect a negative correlation between size and ownership concentration.

### ***The influence of a company's financial leverage***

Leverage can be an important factor when deciding the optimal type of ownership structure for a given company (Pagano and Röell, 1998). Company shareholders have various alternatives when financing a firm. Generally, majority shareholders ponder both internal financing—be it with their own capital or third-party capital using debt—and external financing through capital markets. In the latter case, access to new financial resources implies a diminished share for the majority shareholder. Therefore, in a mechanical way, a higher level of indebtedness should be associated with greater ownership concentration. Conversely, in the context of agency theory (e.g., Jensen and Meckling (1976)), more leverage implies more control by creditors (the disciplinary effect of debt), reducing the need for concentrated ownership as a monitoring mechanism. In Ecuador, bank financing is the most common financing option, whereas the stock market is little used. On the one hand, the capital market is poorly developed. On top of this, there is a resistance to provide information to the public—a majority shareholder and controller usually feels much more comfortable dealing with only one creditor (the banking institution). Nevertheless, this choice is not without risk. Because the sole and/or majority shareholders are responsible for complying with credit obligations, their behavior is less aggressive in terms of credit conditions (amount, financing period, etc.). Given the explicit and implicit costs of debt, it should be expected that if management control is significant in our sample, the results will reflect a negative correlation between indebtedness and ownership concentration.

### ***The influence of environmental volatility***

As noted by Demsetz and Villalonga (2001), the volatility of company profits can influence the level of ownership concentration in a company through different channels. With respect to the risk diversification argument related to company size, the more variable the company's profit the greater the incentive to diversify

the risk, resulting in lower ownership concentration. Conversely, the owners of a company competing in a very volatile environment can especially benefit from the greater control and better monitoring derived from greater ownership concentration. Therefore, if we focus on the volatility of the environment or sector, it is to be expected that the less predictable the results and company profits, the greater the benefits of management control arising out of more concentrated ownership. With respect to the variability of company results, predictions are more difficult because two arguments with contradictory implications converge. On the one hand, the incentives for concentration diminish for risk-averse investors. On the other hand, a company with volatile results is more likely to be in a sector with greater uncertainty, where a positive correlation is expected between volatility and concentration.

### ***The influence of the legal environment (regulations)***

In countries with weak legal protections for minority shareholders (i.e., countries where capital markets are poorly developed), there are higher levels of ownership concentration. Richer countries usually follow the law and regulations more strictly than those with a lower national income. The correlation between economic and legal development, on the one hand, and legal development and minority shareholders protection, on the other, influence the degree of ownership concentration (Gilson and Gordon, 2003). Generally, there is a negative relationship between country regulations and ownership concentration. Although the degree of Ecuador's capital market development remains in its initial stages and the level of minority shareholder protection is deficient, it is worth analyzing the point to which the degree of regulation or supervision in a given sector or sectors influences the level of concentration of company ownership. As argued by Demsetz and Lehn (1985), systematic regulation restricts owners' available options, reducing their potential to extract private benefits and thus reducing incentives for ownership concentration. Simultaneously, regulation also provides a certain form of "subsidized" and disciplined oversight in terms of managing regulated firms. Therefore, more dispersed ownership can be expected in regulated industries. In addition to the effect of regulations on concentration, Demsetz and Lehn (1985) note that certain sectors in which administrators obtain benefits from managing a company (not necessarily monetary in nature) are more prone to ownership concentration. The telecommunications sector is a good example: the owner of a media group can obtain additional benefits associated with the power to influence public opinion. For these sectors, we expect to find a higher degree of ownership concentration.

### 3. Data analysis and methodology

#### *Data*

The database obtained contains more than 68,000 companies, which is the entire set of companies registered by the Ecuadorian Superintendence of Companies. Therefore, this is a true reflection of the company structure in Ecuador, as registered with the government control agency. The general information for each company has a cut-off date of December 31 for each of the years between 2007 and 2011. Active companies are those firms that are up to date in terms of reporting financial information or those that show a maximum delay of one year. After reviewing the database, it was determined that it was preferable to work with companies that had presented complete information for at least five consecutive years, i.e., from 2007 to 2011. Also to assure greater database consistency, we used different filtering parameters that left us 17,818 companies remained in the database. Using this base of 17,818 companies, three important criteria were considered along with their respective conditions according to Official Registry No. 335 of the Superintendence of Companies on the classification of Tier III companies (medium-sized companies). The criteria were: 50 or more workers, USD 1million or more in annual sales and USD 750,000 or more in assets. The main reason for choosing this final filtering criterion was to eliminate spurious observations that could contaminate or bias our conclusions ensuring that the companies in the study base were firms with real commercial activity because, in Ecuador, there are many real-estate companies with the sole purpose of owning and using real estate for the purpose of handling inheritance issues, quick transfers of property and tax issued. For this reason, choosing the criterion of company size defined as a medium-sized company or larger, we were left with 674 companies, clearly reflecting the issue that we intended to mitigate.

#### *Dependent variables*

The stake in a company determines the way in which company ownership is structured.

a) The stake of a given agent<sup>3</sup> (shareholder or administrator)  $i$  in period  $t$  according to his nominal ownership; both the share value and the value of equity are expressed in the same accounting units and defined as:

$$x_{it} = \frac{\text{Share Value}_{it}}{\text{Value of equity}_t}$$

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<sup>3</sup> The number is in the 0 to 1 range for each agent.

Based on this definition, the following measures of company ownership can be distinguished, taking as reference the study conducted by Demsetz and Lehn (1985), which considers the largest five shareholders.

b) The total percentage of ownership in period  $t$  of the main shareholder:

$$S1_t = \sum_{i=1}^1 x_{it}$$

c) The total percentage of ownership in period  $t$  of the five main shareholders:

$$S5_t = \sum_{i=1}^5 x_{it}$$

d) The total percentage of ownership in period  $t$  of the five main management officers:

$$M5_t = \sum_{i=1}^5 M_i x_{it},$$

Where  $M_i=1$  only if the share of the administrator is less than 0.02% of the total capital; in the contrary case, this equals 0. In other words, only management officers with a minimum of 0.02% of the shares are considered in each period<sup>4</sup>; that is:

$$M_i = 1 \text{ if } x_{it} \geq 0.0002$$

$$M_i = 0 \text{ in the contrary case}$$

e) Another way of measuring ownership concentration in a company is using a variation of the Herfindahl-Hirschman Index (HI), which is used to measure the degree of concentration in a given market. In the variation used in this study, calculations were made by squaring the shareholding owned by each shareholder and adding those amounts; the results of the index were subsequently subjected to an upper bound of 1 (total monopolistic control) and decrease if the ownership structure is more dispersed.

$$HI_t = \sum_{i=1}^N x_{it}^2$$

All these variables have a very limited temporal variation. Therefore, the method of ordinary least squares was chosen, taking the averages of five years for each company. Thus, we defined the average ownership by company and by shareholder group (independent shareholders and management) over the five sample years ( $AvS1, AvS5, AvM5, AvHI$ ). Finally, dependent variables are transformed, taking (when possible) logarithms to avoid them being bounded (as defined here, they take values between 0 and 1). Table 1 presents the correlation matrix of these variables together with the set of independent variables at the end of the article.

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<sup>4</sup> We use the same parameter value as in Demsetz and Villalonga (2001). The authors justified this minimum threshold based on the fact that “the empirical reality is that a person who is a professional member of the management team hardly ever holds enough shares to make him one of the five most important shareholder of a corporation”

### ***Independent variables***

As size variables, this study used the average value of total assets in the 2007-2011 period (AvAssets), replacing this variable with the total average number of workers in the 2007-2011 period (AvWorkers) to conduct a robustness analysis. The indebtedness variable (AvLeverage) is defined as the average of total financial debt to total assets in the 2007-2011 period. To capture as exogenously as possible company environment volatility, we use industry volatility (IND\_VOL), which was calculated by taking the standard deviation of the net profits of each company within each industry category and obtaining the weighted average, considering the degree of individual volatility participation in the industry as a whole. To conduct the robustness test, the volatility of net income variable was used (SD\_NI), defined as the standard deviation of net accounting profits for the 2007-2011 period. Demsetz and Lehn (1985) state that the legal environment can influence ownership structure, particularly in industries with stricter regulations, because pressure from regulators can lead to greater oversight of the company and, eventually, to a change in company management.

In the case of Ecuador, the effect of the legal environment on ownership structure is unknown. Companies belonging to more heavily regulated sectors are analyzed, and the impact of regulation on ownership concentration is investigated, with the expectation of a negative relation between these variables since more regulation incentivizes minority shareholder protection. However, this study expects to find a positive relation for those sectors (for example, telecommunications) where ownership accumulation results in extra benefits, which are not always monetary in nature, for the majority shareholder.

The level of industry regulation also plays a part in determining ownership concentration. This study included a dummy, which described whether the company was listed on the stock market (SM), assuming a value of 1 when the company was registered as a securities issuer with the Ecuador Stock Exchange in 2011 and zero if it was not. Also considered were four industrial sectors, which generally have a higher level of regulation and control, such as the financial sector (FIN), the healthcare sector (HEA) and the basic public-utilities sector (UTI). The sector of telecommunications and mean (COM) is used as an example of an industry in which ownership accumulation can provide the majority shareholder with power and capacity to influence, which is more than just a monetary benefit. All these variables were defined as dummies, assuming a value of 1 if the company belonged to the sector in question or zero if not.

There is evidence in the Asian context of a positive association between family control of a company and its age (Claessens, Djankov, and Lang, 2000b); company age is also used in multiple case studies of concentration as a control variable (Boeker, 1989; Chibber and Majumdar, 1999; among others), and thus, it is deemed important to include the variable company age (*Age*) as a control variable and was defined as the number of years since the company founding as of 2011.

### ***Model***

The relation between ownership concentration and its determinants is very complex (De Propris and Driffield, 2006) because these variables can have reciprocal causes (Demsetz, 1983) and their mutual interactions can be non-linear (Demsetz, 1983; De Propris and Driffield, 2006). Thus, the function relating these variables can be extremely complex. However, the idea of proposing a model does not require an exact simulation but merely a representation of the most relevant aspects of the phenomenon in a useful framework. Therefore, the proposed model seeks to represent, in a simplified way, the relationship among the variables using a linear regression model (ordinary least squares), considering as variables that influence ownership concentration the following: company size, level of indebtedness, environment volatility, level of sector regulation, whether the company is listed on the Stock Market as a securities issuer and company age.

$$y_i = \alpha + \beta_{Assets}AvAssets_i + \beta_{Leverage}AvLeverage_i + \beta_{INDVOL_i}IND\_VOL_i + \beta_{SM}SM_i + \gamma_{UTI}UTI_i \\ + \gamma_{FIN}FIN_i + \gamma_{HEA}HEA_i + \gamma_{COM}COM_i + \beta_{Edad}Age_i + \epsilon_i$$

Where  $i$  denotes each of the companies contained in the database. For ownership concentration  $y_i$ , the percentage of ownership for the majority shareholder ( $LA\nu S1$ ), of the five main shareholders ( $AvS5$ ), of the five main management officers ( $AvM5$ ) and the Herfindahl-Hirschman Index ( $LA\nu HI$ ) are used. As proxy for size, average assets ( $AvAssets$ ) is used. As proxy for volatility, the weighted standard deviation of profits ( $IND\_VOL$ ), average financial indebtedness ( $AvLeverage$ ), is used. Dummies for each of the sectors financial ( $FIN$ ), electricity, gas supply ( $UTI$ ), healthcare ( $HEA$ ) and telecommunications and information ( $COM$ ) are used. If it is a securities issuer since 2011 ( $SM$ ). Company age as of 2011 ( $Age$ ) is used. The constant is  $\alpha$  and  $\epsilon$  as error term.

## 4. Results

### *Descriptive analysis*

When reviewing the corporate structure of Ecuadorian companies, it was found that 65.28% of the companies had five or less shareholders; a smaller percentage than that of the initial filtered base of 17,818 companies, in which firms with up to five shareholders represented up to 86%. With respect to location, 80% of the companies were based in Quito and Guayaquil, Ecuador's two main cities and more than 80% of the companies conducted 7 out of the 20 types of business activities: agriculture, manufacturing, construction, wholesale and retail sales, transport, real estate and professional activities (A, C, F, G, H, L and M). The distribution of companies by business activity did not vary over time, with wholesale and retail sales (G) having the highest share of 24%. In general terms (except for the size criteria), the original debugged database preserved a very similar behavior to the one in the final database that was used to conduct the research.

As mentioned above, Ecuador's Stock Market is poorly developed, which can be seen with approximately 300 companies registered as securities issuers on the Ecuador Stock Exchange. However, the majority of these companies have not issued stocks; rather, they are issuers of debt through corporate bonds. That notwithstanding, it is equally worth mentioning that the number of companies issuing securities doubled from 141 in 2007 to 300 in 2011. The final debugged database of 674 companies was also used to analyze the ownership concentration of majority shareholders, finding that in 62.9% of companies just one majority shareholder had ownership of more than 50%. This percentage rose to 91.7% of companies when two major shareholders were considered, reaching a level of 95.5% of Ecuadorian companies with at least 50% of their ownership held by 5 main shareholders, S5 (p75=100%). These numbers speak of the highly skewed level of concentration in Ecuador, larger than the average reported concentration in other Latin American countries. This is going to limit the scope of our findings. When analyzing management participation, we find that in 40.3% of companies, an administrator held at least 50% ownership. When considering management officers with the largest stakes, in 54.4% of the companies, two management officers held at least 50%, and this percentage did not rise when adding a third, fourth and fifth administrator shareholder, but remained at 54.4%. Finally, on average, 18.95% of managers were "independent", i.e., they did not possess shares. The explanatory tables of the statistical analysis are attached in Appendix A: Statistics of the Final Filtered Database.

The concentration measures LAvS1, AvS5 and LAvHI had a relatively high correlation, over 40%, as expected. Nevertheless, this is a far-from-perfect correlation. The results<sup>5</sup> show a very high concentration with mean values of AvS1 and AvS5 between 0.66 and 0.93 with a standard deviation of these values relatively low, around 0.14 to 0.28. With AvM5, we observe that the distribution is biased to the left (p25=0, mean=30% and p75 = 56%); therefore, there is a group of companies where the owners and managers are combined. This is in line with prior analyses documenting that fewer than 20% of managers are independent.

The indebtedness variable is negatively correlated with LAvS1 and LAvHI, as predicted by the theory; with a very low percentage of indebtedness of 9%. Access to credit in Latin American countries is not broad, which could influence these percentages. In his research on Colombia, Brazil, Chile, Peru and Venezuela, Benavides (2005) reports an average indebtedness of 18% on assets, and Céspedes, González, Molina, (2008) show that Colombia and Venezuela have leverage levels below 15%.

With respect to the variables used to measure volatility, SD\_NI and SD\_Sales, they were also found to be highly correlated, at nearly 60%. They also both have high correlation levels with size variables, AvAssets and AvWorkers (between 41 and 67%). However, when the industry volatility variable IND\_VOL is introduced, this correlation diminishes considerably to 13%, and the correlation with size variables falls to minimum levels, an important argument that is justified by the use of this variable as an “exogenous” variable, rather than other volatility variables such as the uncertainty measure.

The age variable is negatively correlated with all ownership concentration variables up to nearly 25%, i.e., the older the company formation, the lower the ownership concentration or the more dispersed the share distribution. This is logical because, presumably, companies grow and must go to market to expand, or in an even simpler way, with the passage of time, new generations that inherit stock packages from company founders liquidate their positions in the market. Furthermore, as assumed, age is positively correlated with size (between 10 and 22%) and with a high correlation (53%) between the size variables of assets (AvAssets) and workers (AvWorkers). Tables 1 presents the correlation matrix.

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<sup>5</sup> Some of the tables of the paper are not shown due to space constrains.

### *Determinants of ownership concentration*

The negative relationship between company size and ownership concentration is supported by various studies, among them Demsetz and Lehn (1985), Pedersen and Thomsen (1997); however, when reviewing the effect of company size measured as total assets or total number of workers (explained below in robustness tests), it can be observed that for the analysis of majority shareholder ownership, the five majority shareholders and the Herfindahl-Hirschman Index, this was now a significant variable. This is most likely due to the high general level of ownership concentration prevalent in Ecuadorian companies. However, when an analysis is conducted on management shareholding, the variable AvAssets is significant at 1%, and it also has the same behavior as suggested by theory, that is, the relationship between size and ownership concentration is inverted. In other words, the larger the company in Ecuador, the lower the ownership concentration in management. In the correlation table, we also observe that the size variables have a close correlation to zero in all cases except when referring to the concentration of the five management officers with the largest shareholdings (AvM5), where the correlation is between 18 (for AvWorkers) and 24% (for AvAssets), both with a negative sign. This is consistent with the fact that managers of smaller companies are likely to be, in many cases, founder of the company, hence concentrating a high percentage of ownership. As the company becomes larger, the manager and the founder tend to become two different agents. This would explain why, naturally, the degree of management stock concentration decreases as the firm becomes larger.

For three out of four specifications of ownership concentration (LAvS1, LAvHI and AvM5), indebtedness is a significant variable at 1%. The sign is negative for the specifications of ownership concentration LAvS1 and LAvHI, but for ownership concentration for management AvM5, the relationship is positive. In other words, at a higher level of indebtedness, there is a lower level of ownership concentration among shareholders. This evidence is consistent with the disciplinary effect of debt: shareholders “delegate” to creditors (usually banks in the case of Ecuador) responsibility for oversight and management supervision. In the case of shareholders who are also part of the management team, the relation between concentration and leverage is, however, positive and significant at 1%. This can also be seen in the correlation table: despite the fact that this correlation is not very strong (5-13%), a change of sign between shareholders and management is present. This positive relation for the case of management may have its origin in the personal guarantees necessary to obtain credit: companies in which the owner or majority shareholder and the administrator are the same person can

offer better personal guarantees to the bank, which facilitates obtaining credit and, ultimately, leads to higher leverage. This argument can be expected to be particularly relevant in the case of Ecuador, where the debt market is poorly developed and the majority of credit is granted directly by banks.

Regarding to environmental volatility of the industry to which a firm belongs, the results do not show a relationship with ownership concentration in Ecuadorian companies. Industry volatility, measured by the weighted volatility of the profits of companies within an industry, does not have a significant effect on ownership structure, most likely because the risk and uncertainty of a specific industry are not enough to motivate changes in the composition of ownership stakes in Ecuador. This result can be explained by the limits of our time series. Since they include just 5 years, we cannot capture more than one economic cycle with significant probability, and the correlation of volatility between sectors is very high. This decreases the probability of finding significant differences among sectors. When reviewing the results for a relationship with a more regulated sector, we find that when ownership concentration of management shareholders is analyzed (AvM5), is the only case in which the relationship between ownership concentration and the company being listed on the Stock Market is clearly visible (significant at 1%) and in the same direction as our thoughts; that is, if the company is a securities issuer on the Stock Market, more disseminated shareholding in company management can be expected. This finding is reinforced by reviewing the results for the FIN, HEA and COM industries (significant at 5, 10 and 10 percent, respectively), whose behavior is similar to the companies listed on the Stock Market; this is true for companies with more regulations, such as those in FIN and healthcare, where lower ownership concentration in management is expected, with COM companies showing similar behavior. Although more ownership concentration was expected from companies in the COM sector due to the influencing power of their owners on the community, in the case of Ecuadorian companies, this does not apply, most likely due to continuous regulations that have been imposed on communications media owners in recent years, precisely because of their degree of influence on society. Finally, we observe that the control variable for age (Age) is negative and significant at 1% and in line with all the studies on ownership concentration—i.e., the older the company, the lower the ownership concentration or the more distributed shareholding, which is logical because, presumably, when companies grow, they must go to the market to expand, or even more simply put, with the passage of time, new generations inherit stakes in companies and then liquidate their shares.

### ***Results robustness***

As previously stated, when conducting analysis of ownership concentration for the majority shareholder, LAVS1, this variable decreases with company age and higher levels of indebtedness. However, it is not sensitive to company size, industry volatility and environment. These results are robust in the two additional scenarios when the size variable, total assets, is substituted for by the number of workers (AvWorkers) and when the weighted standard deviation of profits, used as a proxy for industry volatility, is substituted for by the standard deviation of net income for each company (SD\_NI). Similar results are obtained for ownership concentration measured by the Herfindahl-Hirschman Index (LAvHI). Thus, we observe that value decreases with company age and indebtedness and is not sensitive to any other variables<sup>6</sup>.

When an analysis is conducted of the ownership concentration of the five main shareholders (AvS5), company age maintains its role as an influencing variable (significant at 1%) but this does not happen for leverage. In line with the results reported before, we observe a different pattern when analyzing ownership concentration for company management ownership concentration (AvM5). Size is negative and significantly related to concentration whereas leverage, trading in the stock market (SM) and income volatility are positive and significantly related. The control variable age is negatively related to concentration for all concentration measures. It is significant at the 1% level. Each of these results confirms the data obtained from the original model and demonstrates the differentiation in existing behavior when company management is a relevant shareholder. Since the company's age and its assets are strongly correlated we run the same regressions dropping the variable Age. The results were still consistent with those previously obtained.

As argued by Demsetz (1983) and shown by Demsetz and Lehn (1985) and some of the subsequent studies, ownership structure is endogenous. We cannot rule out, therefore, that some of the results on the determinants reported in table 2 are actually spuriously driven by some endogeneity issue. We could claim that there is a *reverse causality problem*: in a country like Ecuador, where access to financial markets and borrowing is not as developed as in other financial markets, higher management concentration may be easily associated to a higher concentration of ownership in the hands of the company's founder. This confusion of personal and company's property may make borrowing more accessible to the firm, since the company's and

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<sup>6</sup> Due to space constraints some of the tables of the paper are not shown, this includes robustness table.

personal assets are indistinguishable and work as collateral, hence facilitating the bank loan. At the same time, we cannot discard the existence of some *missing latent variable* which may be driving simultaneously ownership concentration and some of the “independent” variables in the regression equation. We originally tried to approach this potential endogeneity problem by identifying some exogenous variable and running a two-step, Instrumental Variable (IV) regression. We soon had to drop this approach (followed, for instance, by Demsetz and Villalonga (2001)) since we were not able to find any truly exogenous instrument. Hence, after having worked with the basic ordinary least squares linear regression model, we decided to analyze the dynamic panel data, with the aim of exploring all the data, including the temporal variation that may exist for dependent and independent variables. All the ownership concentration specifications analyzed in this investigation project have endogenous persistence over time, which is not necessarily related to any of the explanatory variables from the model. Moreover, the independent variables can be endogenous—i.e., they are correlated with the residuals. Finally, the number of companies is far greater than the number of periods analyzed. Considering all these factors, we decided to use the Arellano-Bond mode. This model uses instrumental variables based on lags and differences of all the model variables and was specifically designed for panels with many individuals and few periods (Montero, 2010). From the initial model, we omitted the age (Age) and industry (UTI, FIN, HEA and COM) variables as they are perfectly correlated in time. Initially, the goal was to control the problem of endogeneity by introducing two-period lags; however, problems with collinearity, brought about by the small size of the sample in time, led to the use of one-step estimation. When using the Arellano-Bond dynamic panel data model, it is observed that ownership concentration measured by LS1, M5 and LHI depends strongly on ownership concentration from the previous period. Only when analyzing S5 this does not appear as a significant phenomenon. Comparing the results, it can be observed that on the one hand, working with panel data and using the Arellano-Bond methodology, company leverage ceases to be a significant variable. This seems to confirm endogeneity in the relationship between concentration and leverage, as we explain specifically with respect to the case of variable M5. In all cases, and for all concentration variables, the null hypothesis of no autocorrelation is rejected for the first-order first-differenced errors, as expected under the assumptions of independent and identically distributed errors. The null hypothesis (no autocorrelation), is accepted for the second-order differences, with p-values always above 0.16. The Wald test reject the hypothesis that all coefficients are simultaneously zero, with the exception of the measure S5. This result is also confirmed by the robustness test through substitution for the variable total assets by the number of workers.

## 5. Conclusions

In this study, we investigate the determinants of ownership concentration of 674 Ecuadorian companies during the 2007-2011 period, taken directly from the database of the Ecuadorian Superintendence of Companies. This is the first study of the characteristics of ownership concentration in Ecuador.

The results show that company size and a more regulatory environment for a given industry have a negative relationship to the degree of ownership concentration among managers of Ecuadorian companies, which is consistent with the other prior studies used as the basis for this research. However, none of these variables is significant when studying the ownership concentration of majority shareholders. The prior literature is also validated with respect to the proposition that the older the company, the lower the ownership concentration of its owners and management.

The level of indebtedness of an Ecuadorian company has a negative effect on the ownership concentration of the majority shareholder and a contrary effect on the concentration of management shareholders. Although company growth naturally bounds ownership concentration in managers, on its own, it does not lead to decreased ownership concentration among majority shareholders, who still possess, on average, a Herfindahl-Hirschman index of 59% and in whose companies the top-five shareholders possess, on average, up to 93%. These findings call for the implementation of active policies that guarantee the protection of minority shareholders. The results seem to indicate that financial leverage functions as an oversight alternative to the concentration of capital. This makes us think that any legislative initiative aimed at increasing protection for creditors and strengthening banks' inspection rights can have positive effects with respect to limiting capital concentration. It is interesting to note that in the case of management, the relationship is reversed: there is more concentration in companies with more leverage. This confirms, in our opinion, the differentiating effect that debt can have on shareholders and managers. We explain this positive relationship as a result of reverse causality: access to credit is easier and provided under better conditions for companies with a high ownership concentration among their manager-owners. Further development of the capital market in Ecuador should reverse this trend. The fact that companies listed on the stock exchange (who, presumably, enjoy more professional management, financing on a larger scale and separation between ownership and control) have a lower index of ownership concentration for their managers, supports this interpretation of the results.

Nevertheless, the underlying endogeneity in this type of study forces us to be very careful when interpreting its results. A company's leverage decision and listing on an exchange market are, in principle, endogenous decisions. These decisions can be influenced by various factors, which also affect decisions on ownership concentration. When we replace the least squares estimation with a dynamic panel data Arellano-Bond model, the results change drastically: the variables of company size (assets), indebtedness and Stock Market listing become statistically non-significant for all the measures of concentration studied, including concentration in management officers. In this case, the only significant variable is the lag of the dependent variable, with a positive sign. These results confirm the high level of endogeneity in the relationship between the degree of concentration and its potential determinants.

In summary, our study has documented that property in Ecuadorian firms is extremely concentrated, even by Latin American standards. This may well be an endogenous result, as pointed out by the lack of conclusive results from our robustness tests. Confronted with the lack of properly functioning and well developed debt and equity markets, firms remain largely in the hands of founders (who also act as managers), probably through a network of affiliated companies. Supporting this assumption, notice that the strongest results, in terms of magnitude and statistical significance, have been found when studying the concentration of company managers. In general, the companies referred to in this study are family companies managed by their founders, who must cede a portion of their original holdings when the company expands and grows. This just reinforces the endogeneity problem in our data and the limitations we face in dealing with it. We therefore conclude that, in the light of the documented evidence and the lack of conclusive and robust results, talking about optimal levels of concentration in Ecuador nowadays may be, as of today, premature. An immediate conclusion from our analysis is that the Ecuadorian authorities must enforce and monitor the disclosure of publicly available company information before more robust conclusions can be drawn.

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**Table 1: Correlation Matrix**

Below is a summary of the statistical results of each of the variables used. For ownership concentration, the following are used: the logarithm of the percentage owned by the majority shareholder (LAvS1), percentage owned by the five main shareholders (AvS5), percentage owned by the five main management officers (AvM5) and the logarithm of the Herfindahl-Hirschman Index (LAvHI); As a proxy for size, the following are used: average assets (AvAssets), average number of workers (AvWorkers); As a proxy for performance, the following are used: average ROA (AvROA); As a proxy for volatility, the following are used: standard deviation of net profits (SD\_NI), standard deviation of sales (SD\_Sales), weighted standard deviation of profits (IND\_VOL), average financial indebtedness (AvLeverage) and as dummy variables for every industry, financial (FIN), electricity, and gas industry (UTI), health care industry (HEA), telecommunication and information industry (COM) and if the company was a securities issuer in 2011 (SM); and company age (Age).

|            | LAvS1    | LAvHI    | AvS5     | AvM5     | Age      | SM      | AvAssets | AvWorkers | AvROA    | SD_NI   | SD_Sales | IND_VOL  | AvLeverage | UTI     | FIN     | HEA     | COM    |
|------------|----------|----------|----------|----------|----------|---------|----------|-----------|----------|---------|----------|----------|------------|---------|---------|---------|--------|
| LAvS1      | 1.0000   |          |          |          |          |         |          |           |          |         |          |          |            |         |         |         |        |
| LAvHI      | 0.6703*  | 1.0000   |          |          |          |         |          |           |          |         |          |          |            |         |         |         |        |
| AvS5       | 0.7748*  | 0.4086*  | 1.0000   |          |          |         |          |           |          |         |          |          |            |         |         |         |        |
| AvM5       | 0.0484   | -0.1423* | 0.1795*  | 1.0000   |          |         |          |           |          |         |          |          |            |         |         |         |        |
| Age        | -0.2478* | -0.1650* | -0.2545* | -0.1625* | 1.0000   |         |          |           |          |         |          |          |            |         |         |         |        |
| SM         | 0.0083   | 0.0245   | 0.0152   | -0.1425* | 0.0854*  | 1.0000  |          |           |          |         |          |          |            |         |         |         |        |
| AvAssets   | 0.0024   | 0.0196   | -0.0475* | -0.2422* | 0.2192*  | 0.2202* | 1.0000   |           |          |         |          |          |            |         |         |         |        |
| AvWorkers  | 0.0339   | 0.0034   | 0.0196   | -0.1865* | 0.1043*  | 0.2438* | 0.5340*  | 1.0000    |          |         |          |          |            |         |         |         |        |
| AvROA      | 0.0587   | 0.0830*  | 0.0600   | -0.0308  | -0.0982* | -0.0597 | -0.1596* | 0.0264    | 1.0000   |         |          |          |            |         |         |         |        |
| SD_NI      | 0.0334   | 0.0373   | -0.0380  | -0.1635* | 0.1337*  | 0.0408  | 0.6523*  | 0.4119*   | 0.1171*  | 1.0000  |          |          |            |         |         |         |        |
| SD_Sales   | 0.0630   | 0.0862*  | 0.0256   | -0.2060* | 0.0450   | 0.1834* | 0.6667*  | 0.5148*   | -0.0121  | 0.5982* | 1.0000   |          |            |         |         |         |        |
| IND_VOL    | -0.0642  | -0.0046  | -0.0605  | -0.0289  | 0.2554*  | 0.0343  | 0.1340*  | -0.0092   | -0.2185* | 0.1265* | 0.1970*  | 1.0000   |            |         |         |         |        |
| AvLeverage | -0.0795* | -0.1178* | -0.0532  | 0.1280*  | 0.0314   | 0.1243* | 0.0950*  | 0.0388    | -0.1714* | -0.0513 | 0.0003   | 0.1067*  | 1.0000     |         |         |         |        |
| UTI        | 0.0047   | -0.0439  | -0.0495  | -0.0719  | 0.1307*  | -0.0234 | 0.3137*  | 0.0455    | -0.0654  | 0.0457  | 0.0134   | -0.0909* | -0.0090    | 1.0000  |         |         |        |
| FIN        | -0.0055  | 0.0684   | 0.0148   | -0.0788* | -0.0441  | 0.0370  | -0.0310  | 0.0040    | 0.1712*  | 0.0174  | -0.0329  | -0.1079* | -0.0765*   | -0.0082 | 1.0000  |         |        |
| HEA        | -0.0441* | -0.0449  | -0.0704  | -0.0431  | -0.0499  | -0.0394 | -0.0593  | -0.0540   | 0.1041*  | -0.0180 | -0.0340  | -0.1667* | -0.0595    | -0.0126 | -0.0138 | 1.0000  |        |
| COM        | 0.0118   | 0.0287   | 0.0330   | -0.0616  | 0.0044   | -0.0408 | 0.0371   | 0.0344    | 0.0058   | 0.0689  | -0.0167  | -0.1735  | -0.0359    | -0.0130 | -0.0143 | -0.0220 | 1.0000 |

\* 5% significance level or higher

**Table 2: Determinants of ownership concentration**

|              | LAvS1                 | LAvHI                 | AvS5                  | AvM5                  |
|--------------|-----------------------|-----------------------|-----------------------|-----------------------|
| AvAssets (a) | 1.2200<br>(1.23)      | 12.4000<br>(1.59)     | 0.0289<br>(0.12)      | -3.2600***<br>(-5.21) |
| AvLeverage   | -0.4897**<br>(-2.21)  | -5.6041***<br>(-3.24) | -0.0775<br>(-1.44)    | 0.5802***<br>(4.17)   |
| IND_VOL (a)  | -0.0416<br>(-0.11)    | 3.2200<br>(1.13)      | -0.0024<br>(-0.03)    | -0.0661<br>(-0.29)    |
| SM           | 0.0665<br>(0.76)      | 0.6246<br>(0.92)      | 0.0222<br>(1.05)      | -0.1538***<br>(-2.81) |
| UTI          | 0.1447<br>(0.55)      | -1.8452<br>(-0.89)    | -0.0281<br>(-0.44)    | 0.0233<br>(0.14)      |
| FIN          | -0.1455<br>(-0.64)    | 2.5943<br>(1.46)      | -0.0046<br>(-0.08)    | -0.3009**<br>(-2.10)  |
| HEA          | -0.2333<br>(-1.55)    | -1.4471<br>(-1.23)    | -0.0816**<br>(-2.22)  | -0.1549*<br>(-1.63)   |
| COM          | 0.2712<br>(0.19)      | 0.9297<br>(0.81)      | 0.0293<br>(0.82)      | -0.1393<br>(-1.51)    |
| Age          | -0.0101***<br>(-6.67) | -0.0551***<br>(-4.63) | -0.0024***<br>(-6.54) | -0.0028***<br>(-2.99) |
| Constant     | -0.2754***<br>(-5.72) | 3.3678***<br>(8.96)   | 0.9981***<br>(85.17)  | 0.3900***<br>(12.87)  |
| R2           | 0.0758                | 0.0558                | 0.0771                | 0.1173                |
| N            | 674                   | 671                   | 674                   | 674                   |

t-test (in parentheses)  
\* 10% significance level  
\*\* 5% significance level  
\*\*\*1% significance level  
(a) All the coefficients must be multiplied by10<sup>-9</sup>

The ordinary least squares linear regression model is used:

$$y_i = \alpha + \beta_{Assets}AvAssets_i + \beta_{Leverage}AvLeverage_i + \beta_{INDVOL_i}IND\_VOL_i + \beta_{SM}SM_i + \gamma_{UTI}UTI_i + \gamma_{FIN}FIN_i + \gamma_{HEA}HEA_i + \gamma_{COM}COM_i + \beta_{Edad}Age_i + \epsilon_i$$

For ownership concentration  $Y_i$ , the percentage of ownership for the majority shareholder (LAvS1), of the five main shareholders (AvS5), of the five main management officers (AvM5) and the Herfindahl-Hirschman Index (LAvHI) are used; Return over assets (AvROA). As proxy for size, average assets (AvAssets) is used. As proxy for volatility, the weighted standard deviation of profits (IND\_VOL), average financial indebtedness (AvLeverage), is used. Dummies for each of the sectors financial (FIN), electricity, gas supply (UTI), healthcare (HEA) and telecommunications and information (COM) are used. If it is a securities issuer since 2011 (SM). Company age as of 2011 (Age) is used.

**Appendix A: Final depurated statistical database (674 firms)**

| NUMBER OF FIRMS IN % |         |         |         |         |         |
|----------------------|---------|---------|---------|---------|---------|
| No. Shareholders     | 2007    | 2008    | 2009    | 2010    | 2011    |
| 1                    | 3.12%   | 1.63%   | 1.19%   | 0.59%   | 0.15%   |
| 2                    | 40.80%  | 43.18%  | 43.18%  | 44.36%  | 45.10%  |
| 3                    | 20.47%  | 20.03%  | 20.18%  | 19.44%  | 19.14%  |
| 4                    | 0.00%   | 0.00%   | 0.00%   | 0.00%   | 0.45%   |
| 5                    | 0.00%   | 0.00%   | 0.00%   | 0.00%   | 0.45%   |
| 6-10                 | 19.29%  | 18.84%  | 18.99%  | 18.99%  | 18.40%  |
| 11-30                | 9.94%   | 9.94%   | 9.94%   | 9.79%   | 9.50%   |
| 31-9,999             | 6.38%   | 6.38%   | 6.53%   | 6.82%   | 6.82%   |
| Total                | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% |

| NUMBER OF FIRMS IN % |         |         |         |         |         |
|----------------------|---------|---------|---------|---------|---------|
| Location             | 2007    | 2008    | 2009    | 2010    | 2011    |
| Azuay                | 4.90%   | 4.90%   | 4.90%   | 4.90%   | 4.90%   |
| Guayas               | 34.42%  | 34.42%  | 34.42%  | 34.42%  | 34.42%  |
| Otros                | 13.35%  | 13.35%  | 13.35%  | 13.35%  | 13.35%  |
| Pichincha            | 47.33%  | 47.33%  | 47.33%  | 47.33%  | 47.33%  |
| Total                | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% |

| NUMBER OF FIRMS IN %       |        |        |        |        |        |
|----------------------------|--------|--------|--------|--------|--------|
| Economic Activity          | 2007   | 2008   | 2009   | 2010   | 2011   |
| A (agricultura)            | 14.39% | 14.39% | 14.39% | 14.39% | 14.39% |
| B (mining)                 | 2.08%  | 2.08%  | 2.08%  | 2.08%  | 2.08%  |
| C (manufacturing)          | 27.89% | 27.89% | 27.89% | 27.89% | 27.89% |
| D (electricity, gas)       | 0.74%  | 0.74%  | 0.74%  | 0.74%  | 0.74%  |
| E (wáter, sewerage)        | 0.74%  | 0.74%  | 0.74%  | 0.74%  | 0.74%  |
| F (construction)           | 4.90%  | 4.90%  | 4.90%  | 4.90%  | 4.90%  |
| G (wholesale, retail)      | 24.33% | 24.33% | 24.33% | 24.33% | 24.33% |
| H (transport, storage)     | 5.49%  | 5.49%  | 5.49%  | 5.49%  | 5.49%  |
| I (acomodation, food)      | 4.60%  | 4.60%  | 4.60%  | 4.60%  | 4.60%  |
| J (information, telecom.)  | 2.23%  | 2.23%  | 2.23%  | 2.23%  | 2.23%  |
| K (financial, insurance)   | 0.89%  | 0.89%  | 0.89%  | 0.89%  | 0.89%  |
| L (real estate)            | 0.45%  | 0.45%  | 0.45%  | 0.45%  | 0.45%  |
| M (scientific, technical.) | 2.82%  | 2.82%  | 2.82%  | 2.82%  | 2.82%  |
| N (administrative)         | 3.71%  | 3.71%  | 3.71%  | 3.71%  | 3.71%  |
| P (teaching)               | 1.93%  | 1.93%  | 1.93%  | 1.93%  | 1.93%  |
| Q (heath care, social)     | 2.08%  | 2.08%  | 2.08%  | 2.08%  | 2.08%  |
| S (other services)         | 0.74%  | 0.74%  | 0.74%  | 0.74%  | 0.74%  |
| Total                      | 100%   | 100%   | 100%   | 100%   | 100%   |

| NUMBER OF FIRMS       |      |      |      |      |      |
|-----------------------|------|------|------|------|------|
| SM                    | 2007 | 2008 | 2009 | 2010 | 2011 |
| Non securities issuer | 660  | 649  | 642  | 639  | 628  |
| Securities issuer     | 14   | 25   | 32   | 35   | 46   |
| Total                 | 674  | 674  | 674  | 674  | 674  |