



Research article

Corporate ownership concentration drivers in a context dominated by private SME's

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ARTICLE INFO

Keywords:

Ownership concentration
Board independence
Company-specific factors
Generalized linear model
Ordered logit model

ABSTRACT

This paper aims to ascertain how company-specific factors influence the corporate ownership concentration of Portuguese firms. The paper employs several different regression techniques: Generalized Linear Model, Ordered Logit, 2 Stage Least Squares, Ordinary Least Squares, Truncated and Constrained regression. Additionally, to test the model's prediction power, it conducts an in and out-of-sample analysis and used joint-rolling window regressions and dependent variables intervals partition to test the robustness of the model under different sample restrictions. Firm size, profitability, the number of subsidiaries, and bank concentration are positive determinants of ownership concentration, while an opposite influence is found concerning auditor qualification and the board of directors' size. Significant implications are provided for the policymaking in countries where capital markets are underdeveloped, and concentrated ownership is common to help the regulator determining the power of controlling shareholders. This study enriches the literature on the determinants of corporate ownership, being the first study to approach non-public companies. It adds novelty by incorporating new company factors which are scarce in ownership studies.

1. Introduction

The literature on the empirical study of the determinants of the business ownership structure has been scarce (e.g., [Pindado and de la Torre, 2008](#); [Panda and Kumar, 2020](#)). However, a vast theoretical body prevails (e.g., [Jensen and Meckling, 1976](#); [Jensen, 1986](#); [Shleifer and Vishny, 1986](#); [Golbe and Nyman, 2013](#)) that identifies a set of factors that can condition the concentration of property. The research carried out predominantly focused on large, listed companies and markets in different institutional/legal environments lead us to conclude that it is essential to study this issue further in the universe of smaller companies, namely in the Portuguese context.

From mere suppliers of capital to agents that can influence the government in decision-making, the paradigm shift means that the participation of investors in the shareholder structure assumes particular relevance ([Abdallah and Ismail, 2017](#); [Panda and Kumar, 2020](#)). [Aguilera and Crespi-Cladera \(2016\)](#) also mention that the ownership structure of companies can be compared between countries; however, government practices differ significantly for different concentrations of ownership.

Despite the intense and growing research that has been devoted to smaller companies in recent years, few studies have focused on

understanding the effect of business characteristics on ownership structure decisions, particularly when considering less developed markets, as concluded by [Panda and Kumar \(2020\)](#). Also, the vast majority of corporate finance theory has focused on the influence of the ownership structure to sustain companies' decisions. Nevertheless, as [Pindado and de la Torre \(2008\)](#) point out, there is little empirical evidence about the drivers of the business ownership structure.

This study aims to contribute to this field. Thus, its main objective is to study the effect of a set of business characteristics on the ownership structure of predominantly privately held companies and not on companies traded on the stock exchange, as has been done in recent studies (e.g. [Panda and Kumar, 2020](#)).

This work, while departing from the existing literature in this field, provides, in our view, important contributions to the compression of the effect of business characteristics on property structure decisions. First, it takes into account the main characteristics identified in the literature: the dimension/size ([Fassler and Vargas, 2016](#)), the profitability ([Panda and Kumar, 2020](#)), the leverage ([Fassler and Vargas, 2016](#); [Rossi and Cebula, 2016](#)), the number of subsidiaries ([Dhnadirek and Tang \(2003\)](#)), the gender diversity ([Gyapong et al., 2019](#)), quality of the audit ([AlQadasi](#)

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and Abidin, 2018), the board structure characteristics (Mak and Li, 2001; Bekiris, 2013), and the number of banks (Lin et al., 2012).

Furthermore, this paper approaches ownership concentration using a well-established metric as an Independence indicator that measures the various scale of share property and board independence.

To test the relationship between the business characteristics identified in the literature and, ownership concentration, different technical estimation models are used to assess the convergence of the significance of the variables. In line with relevant literature, we believe that dimension/size, profitability, leverage, number of subsidiaries, and gender diversity are directly related to ownership concentration. In turn, the quality of the audit, the board structure, characteristics, and the number of banks establish an inverse relationship. Our view is that a set of business characteristics can help explain ownership concentration. The idea is to evaluate its relevance, taking into account the heterogeneity of Portuguese companies.

Finally, the work employs several different regression techniques: Generalized Linear Model, Ordered Logit, 2 Stage Least Squares, Ordinary Least Squares, Truncated and Constrained regression. Moreover, to test the model's prediction power, it conducts an in and out-of-sample analysis and used combined rolling window regressions and dependent variables intervals partition to test the robustness of the model under different sample restrictions.

The results suggest that wealth restrictions and risk aversion (measured by company size) are not factors that prevent concentration of ownership and that profitability is an incentive to maintain/increase control. The increase in the number of subsidiaries has associated greater management complexity, requiring greater shareholder control and more efficient decisions. Banking concentration provides a more robust exchange of information, reduces information asymmetry problems and constitutes a supervisory mechanism. The auditor qualification suggests that in companies with better supervisory practices, the role of the controller loses relevance and the board of directors' size indicates that in companies with a higher concentration of ownership, the principal shareholders play a relevant role in management. The identification of these variables adds uniqueness when considering the determinants of ownership concentration.

The work is organized as follows: the second section summarizes the literature review on the variables that can explain ownership concentration, the third presents the sample and method, the fourth the results, and, finally, the conclusions.

2. Literature review

The ownership concentration in enterprises is given can be obtained by the share capital detained by the leading stockholder (Succurro and Costanzo, 2019). Research on the relevance of business characteristics in the ownership structure has been scarce (Panda and Kumar, 2020); however, some theoretical and empirical studies state that these effects may be relevant (Pindado and de la Torre, 2008). From the theoretical point of view, Golbe and Nyman (2013) identify as determinants of the degree of ownership concentration, the trade-off between the benefits that result from the relief of agency problems and the costs incurred by deviations from the optimum portfolio, the specific risk of a company, the size, and liquidity of the shares. Empirically, Cabeza-García and Gómez-Ansón, 2011 reported that the concentration of ownership depends on the sector's regulation, company size, and risk. At the same time, the change in the paradigm of investors, from mere passive agents, as suppliers of capital, to agents capable of influencing business management and the decision-making process, boosted the relevance of studying the structure of ownership in the financial literature (Panda and Kumar, 2020).

The works developed around this theme refer to a set of determinants or included in the studies, aggregated at different levels: country-specific factors (Aggarwal et al., 2011; Abdioglu et al., 2013; Panda and Kumar, 2020; Martinez-Garcia et al., 2020), of the industry (Qu, 2004; Frick,

2004; Panda and Kumar, 2020; Cabeza-García and Gómez-Ansón, 2011), and the company (Richter and Weiss, 2013; Lemma and Negash, 2016; Cabeza-García and Gómez-Ansón, 2011). La Porta et al. (1998) also note that countries where civil law presides present a higher ownership concentration.

Different levels of ownership concentration can make corporate management more malleable and able to respond quickly to a changing environment. However, diversity in corporate governance and how corporate governance is conceptualized are still hotly debated (AlQadasi and Abidin, 2018). The authors use the Bureau Van Dijk's (SABI, 2021) database to characterize the degree of independence of a company about its shareholders, explicitly evaluating the percentage of participation held by the main shareholder as an independent variable. In this way, and opposition to the dichotomous indicators makes it possible to evaluate the effect of different levels of control. Bodnaruk et al. (2017) assess how the different dimensions of family ownership combine to make family businesses worldwide attractive to foreign investors. They resorted to Bureau van Dijk for non-American companies and American private companies, collecting financial and ownership data. In turn, Nogueira and Kabbach de Castro (2020) measured the ownership structure by the voting power of the significant shareholder on the mergers and acquisition decision.

The higher the risk, the greater the incentive for supervision by large landowners; however, this decreases to very high levels of risk, thus establishing a non-linear relationship (Demsetz and Lehn, 1985). Cabeza-García and Gómez-Ansón, 2011 report that noisier environments are associated with a higher concentration of property. However, they argue that bigger shareholders are more prone to invest in less risky companies, and, so, the greater the risk, the lower the ownership concentration. For high levels of risk, investors hold only a portion of capital, which provides them with an efficient portfolio (Richter and Weiss, 2013). In turn, Gedajlovic (1993) does not identify any relationship between risk and concentration of ownership.

Profitability establishes a direct relationship with the concentration of ownership (Demsetz and Lehn, 1985; Panda and Kumar, 2020). The higher rate of profit makes it more effective to align the controller's interest with the company by the shareholding, and, according to Qu (2004), marginal alignment increases, which results in a greater concentration of ownership. In turn, Johnson et al. (2000) refer to the transference of assets and income from the company to the prominent owner in the form of personal benefits. In this line, Atanasov (2001) emphasizes that this transfer is made according to two different perspectives: the financial and the operational. The first occurs when there are changes in the capital structure that result in: i) the "liquidation" of the minority owners, for example, reducing their relative weight with capital increases or ii) the acquisition, for an amount below the market value of the part held by the minority owners. The second results from the regular activity of the company, allowing the controlling owner to enjoy private benefits, as a result of the preferential relationships established with some suppliers from which he obtains commissions and donations used for his benefit (Filatotchev and Mickiewicz, 2001). Between these two forms of expropriation, the first is the most penalizing for minority owners, as the company's future valuation is not shared equally by all; hence, in several countries, legal protection mechanisms are developed inhibiting this type of practice. However, expropriation linked to operational activity, being more difficult to control, continues to have some relevance (Gilson and Gordon, 2003). The ownership structure presents a strong influence of the company's insiders to confiscate minor shareholders (Qu et al., 2013; Zhang and Cang, 2021). When an owner holds a significant number of shares, agency problems are reduced, but not eliminated, to the extent that he can use his voting power for his benefit. If property and power are distributed asymmetrically, they lead the primary holder of capital to maximize their utility function and make decisions that do not consider the common interest by adopting opportunistic behaviors aimed at expropriating minority owners (Galve 2002; Andres, 2008).

Regarding the dividends, [Allen et al. \(2000\)](#) uphold that a more benevolent policy can be understood to encourage higher participation in companies' capital. [Fassler and Vargas \(2016\)](#) identify a positive relationship between dividends and the concentration of ownership, bearing in mind arguments of a tax nature, insofar as the nature of the ownership of large shareholders, specifically institutional, allows the tax deduction of dividends received. In this line, [Pindado and de la Torre \(2008\)](#) state that dividends positively influence the level of shareholder concentration in Spanish companies, in which the significant shareholders are generally other companies. [Rossi et al. \(2018\)](#) identify a U-shaped association amid dividends and concentration of ownership. In turn, [Jensen \(1986\)](#) states that managers use free cash-flows to benefit instead of distributing them as dividends because of ownership dispersion. According to [Jensen \(1986\)](#), the relevance of free-cash stems from the direct relationship that these establish with the manager's incentive to make investments that contribute to the company's growth beyond the ideal dimension. According to [Jensen \(1986\)](#), high Free Cash Flows are an incentive for managers to make investments that lead the company to grow above its optimum. The participation of managers in the company's capital constitutes a control mechanism for the realization of investments associated with Free Cash Flows. According to [Himmelberg et al. \(1999\)](#), Free Cash Flow establishes a positive relationship with the participation of managers in the company's capital, while [Pindado and de la Torre \(2008\)](#) identify an inverse relationship. In turn, [Bergström and Rydqvist \(1990\)](#) do not identify any relationship between the variables.

Regarding the relationship that the level of indebtedness establishes with the concentration of ownership, [Jensen \(1986\)](#) recommends that large owners prefer debt to equity since leverage is an essential instrument for controlling the discretionary behavior of managers. The debt amount and the ownership structure represent excellent internal mechanisms for controlling agency costs ([Rossi and Cebula, 2016](#)). The authors state that, given the hypothesis of active monitoring exercised by the largest shareholder, coupled with indebtedness, the conditions are met, allowing for better management control, originating a convergence of interests. From another perspective, before a higher ownership concentration, debt is an instrument to expropriate minority stockholders, allowing in a situation of entrenchment to obtain private's benefits. In this line, [Rossi and Cebula \(2016\)](#) identify a positive relationship between indebtedness and concentration of ownership.

However, [Demsetz and Villalonga \(2001\)](#), [Pindado and de la Torre \(2008\)](#) refer that if the debt allows some supervision of the activity of the managers, then greater leverage may be connected with more low levels of concentration. Consequently, the replacement hypothesis suggests an indirect connection among debt and the concentration of ownership. One of the main advantages of the control exercised by banking institutions, as large creditors, is reducing information problems ([Myers and Majluf, 1984](#)). The central bank plays a leading role in the company's creditors' consortium, acts as a supervisor, and is the guarantor of other creditors ([Morck et al., 2000](#)). In this line, [Lin et al. \(2012\)](#) state that credit institutions should consider the moral hazard and request that the lead coordinator maintains a more significant finance portion as motivation if the borrowing firm demands more due diligence and supervising. Conversely, expectation about the thorough scrutiny by banks, companies held by large shareholders may prefer to resort to the capital market rather than bank debt to avoid scrutiny by banking supervision ([Lin et al., 2013](#)).

In companies with concentrated ownership structures, principal shareholders have the power to dodge company wealth for their benefit and not to bear the consequences of their decisions by engaging in moral hazard activities ([Johnson et al., 2000](#); [Lin et al., 2012](#)). Many of these activities increase the risk of bankruptcy and the costs of financial difficulties ([Lin et al., 2011](#)). The increase in credit risk and the increased needs for supervision suggest that the number of credit institutions should be reduced ([Ivashina, 2009](#)). On the other hand, the increase in the number of credit institutions allows diversifying the exposure to risk among creditors ([Esty and Megginson, 2003](#)).

Larger companies have a higher market value, requiring a high amount of investment to acquire a fraction of capital, constituting an inhibiting factor of capital concentration ([Panda and Kumar, 2020](#)). A larger corporate dimension makes control activity difficult, prevailing an opposite association amid the size of the company and ownership concentration ([Qu, 2004](#)). Also, [Demsetz and Villalonga \(2001\)](#) refer to an inverse relationship amongst the company size and ownership concentration in American companies, a phenomenon associated with the risk aversion that results from the concentration of ownership. In this line of argument, are the works of [Van der Elst \(2004\)](#), [Pindado and de la Torre \(2008\)](#) and [Richter and Weiss \(2013\)](#). Wealth restraints and risk aversion have associated lesser levels of ownership concentration (it is expensive and risky to acquire sizable share capital from larger companies) ([Cabeza-García and Gómez-Ansón, 2011](#)). The relationship between the amount of investment and concentration of ownership can be explained using the hypothesis of the convergence of interests, which stems from the relationship that the management team establishes with the corporate structure. According to this hypothesis, the greater the insider equity ownership, the less conflict between shareholders and managers, and the more efficient investment decisions will be ([Pindado and de la Torre, 2008](#)). [Himmelberg et al. \(1999\)](#) state that the amount of investment is associated with insider ownership, as a higher amount of investment gives rise to greater directive discretion, which can be controlled with greater participation of insider ownership. Access to privileged information and the divergence between internal expectations and the market is a stimulus for managers to adjust their holdings to the company's future performance. In this sense, it is expected that the managers of companies with better investment opportunities hold a more significant share of capital ([Pindado and de la Torre, 2008](#)). [Denis and Sarin \(1999\)](#) refer to a positive effect of investment opportunities in insider ownership, [Mak and Li \(2001\)](#) do not identify any significant effect, and [Demsetz and Villalonga \(2001\)](#) refer to a negative relationship.

The literature refers to various government mechanisms to alleviate agency problems amid shareholders and managers and among main-stream and small shareholders, and the way ownership is shared between shareholders can alleviate or aggravate agency problems ([Saona and San Martín, 2016](#)). In this sense, [Omran et al. \(2008\)](#) refer that the concentration of ownership appears to respond to the weaknesses that result from reduced legal protection for investors. [Rapp and Trinchera \(2017\)](#) exhibit an opposite firm-level correlation amid ownership concentration and stockholder protection.

The management team's role in the company's corporate structure results in two hypotheses, the entrenchment hypothesis and the alignment of interest hypothesis. The first one says that companies are subject to expropriation by the controlling shareholders, or the managerial ownership can lead to managerial opportunism. Conversely, the alignment of interest hypothesis suggests that more extensive participation results in a more significant coincidence of interests amid controlling stockholders and other interested parties, or the managerial ownership in equity reduces managerial opportunism ([Razzaque et al., 2016](#); [Piosik and Genge, 2020](#)).

Based on the fact that the property held constitutes a strong motivation for the directors to maximize the company's value and reduce inefficient investment policies, we can affirm that value creation is more significant when the managers take part in the capital. However, this participation may have some limitations. On the one hand, a director who is not predisposed to taking risks makes decisions that do not always maximize the company's value, although they limit the risk, particularly when part of its wealth is linked to its income. On the other hand, the greater voting power held by the director's conditions supervises the remaining owners and the market, allowing opportunistic behaviors ([Fernández et al., 1999](#)).

A very significant volume of empirical research carried out around corporate governance has focused on the role of ownership and board structure characteristics as the dominant governance mechanisms. In contrast, government mechanisms are designed to mitigate agency

Table 1. Determinants of ownership concentration.

Authors	Factors	Independent variable	Impact	
Panda and Kumar (2020)	Pre-crisis (2000–01 to 2007–08)	Company	Firm-risks	Inverted U share
			Investment ratio	Negative
		Industry	Industry information asymmetry	Negative
	Post-crisis (2009–10 to 2016–17)	Company	Market size	Negative
			Investment ratio	Negative
		Industry	Industry information asymmetry	Positive
			Country	Stock market growth
		Country	Stock market grow	Negative
			Degree of governance	Negative
Fassler and Vargas (2016)	Company	Independent board	Negative	
		ROA	Positive	
		Size	Negative	
		Leverage	Negative	
		Bank relationship	Positive	
Pindado and de la Torre (2008)	Company	Debt ratio	Negative	
		Dividends	Positive	
		Investments	Positive	
		Insider Ownership	Positive	
		Size	Negative	
Qu (2004)	Country	Investor protection	Negative	
		Quality of laws	Negative	
		Development stock market	Negative	
	Industry (Bank)	Banking sector	Negative	
	Company	Size	Negative	
		Auditing practice	Positive	
		Issuance of preferred stocks	Positive	
		Interest rate	Negative	

conflicts between managers and shareholders (Bekiris, 2013). According to the agency theory, shareholders and managers have divergent interests, and managers are in the possession of more information about the firm's operations and financial performance than owners, which prevents owners of locating credible data, creating information asymmetries between shareholders and managers (Rönkkö et al., 2018; Zhang and Cang, 2021).

Denis and Sarin (1999) suggest that the determination of ownership and board structure characteristics results from a dynamic process. Insider ownership establishes a negative relationship with the independence of the board and a positive one with its dimension. Bozec and Dia (2017) evaluate the moderating role of ownership concentration in the connection amid board independence and audit fees. They conclude that when share capital concentration increases the hazard of expropriation (as the authors call the Principal-Principal problem), independent managers induce more account examination to complement their supervising role. The independent directors' confidence in the audit seeks to restrict the extraction of company resources by the dominant/controlling shareholder. Fraile and Fradejas (2014) pay special attention to the relationship between the ownership concentration and the board's composition. They report that, as the block stockholder's ownership increases, the number of necessary independents on the board decreases. However, once a certain level of stock participation by the block stockholders has been reached, independent directors should increase,

providing an indication to the market that minority interests are defended. Melón-Izco et al. (2020) analyze the association amid board independence and worthy governance practices highlighting the moderating outcome that dispersion of ownership has on this connection. They conclude that recommendations of good governance reveal, in general terms as positive relationships with ownership dispersion. In turn, Guerrero-Villegas et al. (2018) assess the consequence of supervising, providing resources, and management roles on the association amid ownership concentration and company performance. The authors state that the monitoring performed by directors leverage the impact that the concentration of ownership has on performance. Mak and Li (2001) suggest that the ownership structure and the board structure are determined endogenously, and the main features associated with them vary between companies.

The literature review (Butler, 2012; Gyapong et al., 2019) also identifies the relevance of gender diversity in the constitution of boards of directors. Gyapong et al. (2019) suggest that gender diversity can alleviate agency conflicts, making it possible to reduce the distribution of dividends and maintain resources under insiders' control. The critical mass theory also suggests that female elements take on a more relevant role in decision-making (Kristie, 2011). The presence of women on the boards of directors creates more significant pressure on their peers, increasing the supervision and efficiency of this body in resolving agency conflicts (Byoun et al., 2016). In turn, Adams and Ferreira (2009) refer that the directors exercise a more effective supervisory role and develop more outstanding auditing efforts, according to Gul et al. (2008). The female elements of the directors provide unique perspectives, experiences, and work styles for the board (Huse and Solberg, 2006). In addition to the internal control mechanisms identified in the previous paragraphs, the audit assumes a complementary supervisory role, its efficiency being conditioned by the governance characteristics adopted in the company (AlQadasi and Abidin, 2018). Among the different supervisory mechanisms, the audit shows a vital part in refining the excellence of accountancy data and allows dropping information asymmetries amid stockholders and management (Zhang, 2019; Zhang and Cang, 2021). Auditing, as an exogenous variable, means that in companies with better supervisory practices, the need to align the interests of the controllers becomes less critical. Thus, Qu (2004) identifies a negative relationship between audit quality and ownership concentration. Bozec and Dia (2017) evaluate the relationship between the independence of the board and the intensity of external audit in Continental Europe, concluding that they are negatively related to the concentration of ownership, suggesting that the composition of the board and the ownership concentration are substitutes in terms of management and monitoring. Vanstraelen and Schelleman (2017) and Haapamäki (2018) referee that the request for volunteer audits is associated with firm features like debt, proprietorship structure, and debt covenants. Khan et al. (2011) provide evidence that companies with diversified ownership must have more extensive and better quality audits. The tempering effect of ownership concentration on the association amid internal governance mechanisms and external audit is also assessed by AlQadasi and Abidin (2018). The authors conclude that firms with a greater concentration of ownership are less expected to choose external audits. Given the agency problems that the ownership structure may cause, the audit provides, on the one hand, to the majority shareholders, an instrument for supervising the investments made and for validating non-opportunistic behaviors. On the other, for the minority shareholders, protection against expropriation is carried out by the principal shareholders (Fan and Wong, 2005).

Finally, Dhnadirek and Tang (2003) refer to two channels through which investors keep the property concentrated. This situation occurs when investors hold shares in their name or, through a pyramidal structure, the individual holds the preponderance of the shares of a holding firm which, in turn, holds the biggest number of shares in a subsidiary. The ownership of the controlling companies is very concentrated, while the ownership of the subsidiaries appears increasingly diffuse, not allowing minority shareholders to access management

Table 2. Descriptive statistics.

Variable name	N	Missing	Mean	SD	Median	P95	Min	Max	Measure Unit	Description	Proxy
auditor_qualify	45256	4744	0.87	0.33	1.00	1.00	0.00	1.00	1 qualified; 0 no qualification	Auditors account qualification. If the auditors have made some remarks regarding the account is 1, and 0 otherwise.	Account credibility
bvindex_n	49892	108	6.97	2.62	9.00	9.00	1.00	9.00	Number (1–9)	Bureau Van Dijk independence indicator	Ownership concentration/ Board Independence (see Table 3)
Debt_to_equity	50000	0	149.91	994.69	36.86	524.47	-7133.59	16556.90	%	Debt to equity ratio, winsorized 80)	Capital structure/ agency costs
EBITDA	50000	0	0.85	8.56	0.13	2.38	-88.52	589.69	MMEUR	EBITDA	Instrument variable
Employees	50000	0	40.71	272.49	13.00	113.00	0.00	26559.00	Number	Last number of employees	Company Size/ dimension/
Male_Female_director	45962	4038	0.70	0.46	1.00	1.00	0.00	1.00	1 male; 0 otherwise	gender of main director	Gender
No_banks	50000	0	1.59	1.05	1.00	4.00	1.00	11.00	Number	Number of banks in the company relation	Bank concentration/ dependence
no_companies	49575	425	28.16	204.69	2.00	60.00	0.00	7395.00	Number	Number of the companies within his group	Group size/ management effort
No_managers	50000	0	4.64	5.17	3.00	14.00	0.00	169.00	Number	Number of managers	Agency costs
ROI_W	50000	0	17.15	70.67	11.10	73.80	-965.29	984.53	%	Operational result over capital employed	Performance
Subsidiaries	50000	0	0.65	3.42	0.00	3.00	0.00	156.00	Number	Number of subsidiaries (winsorized, 5)	Business dimension/size and management difficulty
Turnover	50000	0	6.95	70.50	1.54	18.43	0.67	9314.59	MMEUR	Turnover	Company Size/ Dimension
workingcapital	49500	500	0.35	62.50	-0.01	3.27	-1642.72	1911.75	%	Working capital on turnover, winsorized, 20)	Instrument variable

Note: to avoid outliers some of the variables are winsorized at some peak levels. Levels are reported in the Table.

bodies. [Espinosa-Méndez et al. \(2018\)](#) present two arguments for the pyramidal ownership structure in family businesses. The first one resides on the fact that the excess of control rights allows the controlling shareholder to obtain private control benefits in activities such as tunnels, maximizing the value of the base company. Otherwise, resources may be passed to the listed company to improve its performance or circumvent defaulting risk. [Aluchna and Kuszewski \(2018\)](#), in a study carried with Polish companies, report that the pyramidal structure is associated with a higher concentration of ownership.

[Table 1](#) below presents the results of the main empirical works on the determinants of ownership concentration.

3. Sample and method

This work uses [SABI's \(2021\)](#) data for the Portuguese companies whose turnover is above 650 thousand euros. The sample is near 50.000 companies of all sectors, excluding banks, and the data refers to 2019. The choice of the sample resides on the fact that Portugal shows a predominancy of small and medium companies (less than 50 million euro of annual turnover– according to Portuguese Decree-law no. 372/2007) and our sample indicates that 98% (49.116 in 50.000) of all companies are SME's. [Table 2](#) indicates all the variables' features.

In the following [Table 3](#), this work provides further details regarding the independence indicator. The data on ownership concentration came from Bureau Van Dijk's database. [Shehzad et al. \(2010\)](#), [AlQadasi and Abidin \(2018\)](#) also used Bureau Van Dijk independence indicator in their

work. The company's degree of independence regarding its shareholders is used as a proxy to the ownership structure.

As can be seen, most companies lie down on the high degree of ownership, 61% and on the medium degree (33%).

The base model to our estimation is:

$$Y_j = \alpha_j + \sum_{i=1}^{10} \beta_i x_i + \epsilon_j \tag{1}$$

where Y, is the Bureau Van Dijk independence indicator, β_i the parameters, x_i , the 10 covariates, and ϵ_j , the error term.

The covariates are: *auditor_qualify*, *Debt_to_equity*, *Employees*, *Male_Female_director*, *No_banks*, *no_companies*, *No_managers*, *ROI_W*, *Subsidiaries*, and the *Turnover*, as defined in [Table 2](#).

OLS procedure with robust errors ([Hair et al., 2010](#)) serves as the primary model. However, to test the trustworthiness and robustness check of our results, other models are employed.

Considering that the primary data relies on 3 degrees of our dependent variable, we use an adaptative truncated regression for $Y_j = 1, 4,$ and 9 as the most popular values of the dependent variable. This paper uses Truncation models applied before dependent variables with limited information about specific levels of the dependent variable or concentration of the variable on few numbers ([Park et al., 2008](#)). The inherent estimator has based on the maximum likelihood principle. We use an adapted truncated regression that assumes a normal distribution for the whole population as the error terms also present a truncated normal

Table 3. Independence indicator Bvindex

Bvindex classification	bvindex_n	Freq.	%	Cumul.	Interpretation
A+	1	1,708	3.42	3.42	A Low degree of ownership concentration; a high degree of Board independence
A	2	69	0.14	3.56	A Low degree of ownership concentration; a high degree of Board independence
A-	3	486	0.97	4.54	A Low degree of ownership concentration; a high degree of Board independence
B+	4	16,493	33.06	37.59	A Medium – low degree of ownership concentration; a medium - high degree of Board independence
B	5	15	0.03	37.62	A Medium - low degree of ownership concentration; a medium - high degree of Board independence
B-	6	297	0.60	38.22	A Medium - low degree of ownership concentration; a medium - high degree of Board independence
C+	7	313	0.63	38.85	A Medium-high degree of ownership concentration; a medium-low degree of Board independence
D	9	30,511	61.15	100.00	A High degree of ownership concentration; a low degree of Board independence
Total		49,892	100.00		

Table 4. Turnover intervals.

Turnover_group	min (Turnover) million eur	max (Turnover) million eur	Freq.	Percent	Cumula.
0	.67250868	9.9991596	45,541	91.08	91.08
10	10.004034	49.994656	3,575	7.15	98.23
50	50.06501	99.980127	488	0.98	99.21
100	100.18285	197.27302	239	0.48	99.69
200	203.79138	494.03798	102	0.20	99.89
500	509.50026	9,314.592	55	0.11	100.00

distribution. Recent examples of truncated regression applied to finance can be seen in the works of [Du et al. \(2018\)](#) and [Nourani et al. \(2020\)](#).

Another applied estimator is a GLM — Generalized linear models, Newton–Raphson (maximum likelihood) optimization with a Poisson distribution ([Dobson and Barnett, 2018](#)). Generalized Linear Models work well before residual errors if they are not normally distributed. GLM's assume that the outputs arise from a distribution that belongs to a family of distributions named the exponential dispersion model that includes Discrete distribution as the Poisson distribution and that this work applied, considering our discrete dependent variable ([Dunn and Smyth, 2018](#)). Recent works applying GLM to Finance include [Giudici \(2018\)](#)

and [Fisch \(2019\)](#). This last author presents robust linear estimation and GLM estimation results to increase the reliability of the analysis.

Having a dependent variable who orders the ownership concentration in a scale (categorical and ordered) an ordered logistic regression (OLR) may be one way to best estimate the coefficients of the covariates. Logit coefficient is log-odds units and cannot be read as regular OLS coefficients, but the significance is valid ([Gelman and Hill, 2007](#); [Greene, 2008](#)). [Angel \(2018\)](#) elaborate a recent work on an application of OLR to finance for robustness check.

This paper also applies a constrained linear regression (CLR) where we force a constraint where turnover and employees are linearly related to measuring the company's size or dimension. CLR allows to test an added overview of the model and assure robustness. The benefits of such a model were broadly indicated by [González-Rivera and Lin \(2013\)](#) in Interval-Valued Data for daily S&P returns.

Regarding the potential combinations of the ten covariates in explaining ownership concentration and agency costs, this works rely on combining all possible variables into 1023 regressions and measuring the fit's goodness by the adjusted R2. This procedure will able us to distinct the best explaining model.

The potential combinations are calculated as:

$$C(n, r) = \sum_{r=1}^{10} \frac{n!}{r!(n-r)!} = 1023 \tag{2}$$

In order to overcome any existing endogeneity (correlation of the regressors with the error term), this work ran a 2 stage least squares model using as instrumental variables the working capital and EBITDA to treat the eventual endogeneity problem of Turnover. This modeling uses the instrumental variables to estimate the values of the potential problematic estimator and afterward applies those values to calculate linear regression with ownership concentration (first and the second stage, respectively). If models are incorrectly specified, 2SLS generally presents better results ([Bollen et al., 2007](#)). Tests of the strength of the instruments (Wald test) reveals the adequation and those instruments.

The model is well specified, as can be concluded by the application of the Sargan (score) $\chi^2(1) = .391918$.

($p = 0.5313$) test and the Basman $\chi^2(1) = .391806$.

($p = 0.5314$) test, that allows not to reject the null hypothesis of the model being well specified.

We perform the Wu-Hausman $F(1,40835) = 9.14231$ revealing a potential problem of endogeneity ($p = 0.0025$), duly solved by the 2sls modelling ([Wu 1974](#); [Hausman 1978](#)).

On all estimations, no multicollinearity was encountered in the variables (Variance inflation factors less than 5, see [Table 6](#)), and this work used robust estimators to avoid heteroscedasticity.

After the estimations, we carried an out-of-sample analysis to investigate the prediction power of our model. Considering the similarity of the results, we used the best OLS estimation and appraised the model in an in-sample of only 16000 companies (out of 45000). We estimate the mean squared error (MSE) of the model. Then we used the model to predict for the rest of the population (out-of-sample of near 30000 observations) and compared the MSE of the prediction concluding for the robustness of our model as a predictor for ownership concentration. Results are presented in the result's section. A similar procedure can be found in [Reis and Pinho \(2020\)](#).

Additionally, we ran several estimations on a rolling window of 15000 companies, leading us to close to 30000 regressions and resulting R2, and a list of the accumulative number of significant variables on a stress test. Works such as [Kim and Lee \(2020\)](#) and [Reis and Pinho \(2020\)](#) used rolling regression to achieve optimal models. Results will be performed in the next section.

Finally, we split the database into turnover intervals, as [Table 4](#) explains in detail. Then we ran the best OLS model to see if there were any differences in the degree of ownership produced by changes in turnover size.

Table 5. Estimation results according to several models.

Variables	GLM	Ordered LOGIT	Truncated	OLS	Constrained	OLS best	Endog
Turnover	0.0000805* (0.0000326)	0.0111+ (0.00641)	0.000541+ (0.000304)	0.000694* (0.000313)	0.000328*** (0.0000420)	0.000742* (0.000308)	0.00262*** (0.000700)
Employees	0.0000307*** (0.00000803)	0.00145* (0.000634)	0.000273*** (0.0000727)	0.000279*** (0.0000769)	0.000328*** (0.0000420)	0.000272*** (0.0000769)	0.0000664 (0.0000898)
ROI_W	0.0000828** (0.0000292)	0.000439** (0.000157)	0.000532** (0.000201)	0.000568** (0.000198)	0.000569** (0.000199)	0.000451** (0.000171)	0.000498* (0.000202)
Debt_to_equity	0.00000279 (0.00000193)	0.0000160 (0.0000109)	0.0000173 (0.0000137)	0.0000192 (0.0000135)	0.0000196 (0.0000137)	0.0000230+ (0.0000119)	0.0000164 (0.0000142)
no_companies	0.000186*** (0.0000202)	Excluded	0.00183*** (0.000201)	0.00178*** (0.000205)	0.00178*** (0.000103)	0.00145*** (0.000157)	0.00174*** (0.000104)
subsidiaries	0.00214* (0.000991)	0.00379 (0.00600)	0.0198* (0.00828)	0.0140+ (0.00729)	0.0149** (0.00489)	0.0114+ (0.00648)	0.00910+ (0.00518)
Male_Female_director	0.00415 (0.00414)	0.0229 (0.0214)	0.0227 (0.0282)	0.0268 (0.0281)	0.0266 (0.0281)		0.0278 (0.0282)
auditor_qualify	-0.140*** (0.00645)	-0.748*** (0.0484)	-1.131*** (0.0459)	-0.957*** (0.0454)	-0.957*** (0.0447)	-0.906*** (0.0421)	-0.954*** (0.0448)
No_managers	-0.00756*** (0.000657)	-0.0513*** (0.00532)	-0.0522*** (0.00397)	-0.0514*** (0.00393)	-0.0511*** (0.00343)	-0.0453*** (0.00369)	-0.0526*** (0.00354)
No_banks	-0.0191*** (0.00216)	-0.124*** (0.0113)	-0.128*** (0.0144)	-0.127*** (0.0142)	-0.128*** (0.0136)	-0.154*** (0.0137)	-0.123*** (0.0136)
Constant	2.091*** (0.00847)		8.181*** (0.0585)	7.984*** (0.0580)	7.983*** (0.0572)	8.094*** (0.0503)	7.974*** (0.0575)
Observations	41252	41595	40549	41252	41252	44822	40847
R-squared			0.028	0.024		0.024	0.023
Adjusted R-squared			0.028	0.024		0.024	0.022
Pseudo R-squared		0.013					

Note: GLM means Generalized linear model, Ordered logit model, Truncated regression, Ordinary least squares, Constrained regression, Best OLS estimation out of 1023 full trials, and the 2 stage least squares model, as explained in the Method section. Models are homoscedastic, free of multicollinearity and free of serial correlation and endogeneity. Standard errors in parentheses; Values in bold mean the variables coefficients and respective p values + p < .10, *p < .05, **p < .01, ***p < .001.

Table 6. Variance inflation factors (VIF).

Variable	VIF	1/VIF
Turnover	1.55	0.644357
No_managers	1.51	0.661914
Employees	1.50	0.665908
Auditor_qualify	1.28	0.779420
Subsidiaries	1.13	0.884731
no_banks	1.12	0.896537
no_companies	1.06	0.941969
ROI_W	1.00	0.995721
Debt_to_equity	1.00	0.998773
Mean VIF	1.24	

The application of the different estimation models, the in-sample and out-of-sample forecasts, and the joint-rolling window regressions and dependent variables intervals partition, allow to confirm if the relevant variables were significant before the different models, partition databases and thus testing the robustness of the explanation model under different sample restrictions as well as its predicting ability.

4. Results

Table 5 presents the results of the several estimations. Dependent variable is the ownership concentration or board independence.

According to Table 6 there is no multicollinearity among the variables considering that all the regressors have a VIF lower than 10.

Considering all the estimations, results show, with reasonable certainty, that Turnover and the number of employees as variables

Table 7. Panel 1: Mean squared errors from out-of-sample and in-sample analysis. **Panel 2:** Mean Absolute Percentage Error (MAPE).

Variable	Obs	Mean	Std. Dev.	Min	Max
err_2	15,784	15.62	10.925	0	60,63
err_2	29,038	14.53	11.673	0	26,7

Variable	Obs	Mean	Max
In Sample	15,784	0,223	60,63
Out-of-sample	29,038	0,215	26,7

Panel-1: Note: In-sample of 15.784 observations and out-of-sample of 29.038, for the truncated regression with lower limit of 1 and upper limit of 10 for the Independence indicator/ownership concentration.

Panel-2: Note: MAPE is the error of the prediction calculated as the average difference between the fitted values and the sample.

characterizing the size of the companies show a positive relationship with the high degree of ownership concentration or lower board independence (alpha = 0,1%, 5% and 10% for Turnover, and almost every simulation with an alpha of 0,1% to the no. of employees). Greater the company implies less independence from the board, and agency costs are reduced. Contrary to the primary expectation, Portuguese companies are predominantly small does not entail that the shareholder structure is concentrated on one person. Instead, more prominent companies suggest a low number of shareholders. In this sense, our results are not in line with Qu (2004), Pindado and de la Torre (2008), Richter and Weiss (2013), and Cabeza-García and Gómez-Ansón, 2011 when referring to an inverse relationship associated with risk aversion resulting from the concentration of ownership.

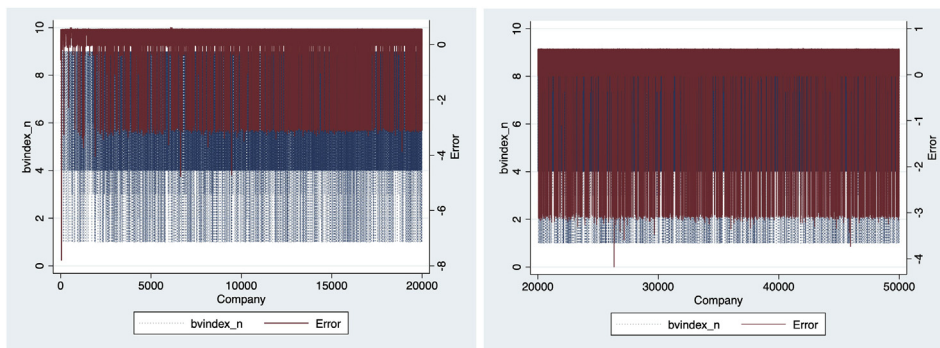


Figure 1. Prediction Error and sample values. Note: The first chart shows the prediction error over the in-sample analysis and the second chart for the out-of-sample. Y second axis is for the error.

Table 8. Rolling regressions. Panel 1: Summary statistics for the Adjusted R2 for 29,823 estimations for the Rolling Window of 15,000 companies. Panel 2: Significance of variables resulting of the regressions for a rolling window of 15,000 companies.

Variable	Obs.	Mean	Std. Dev.	Min	Max					
_adjR2	29,823	.0382094	.0082059	.0218283	.0510902					
Variable	N	Mean	P5	P25	Median	P75	P90	Min	Max	% obs signif
ts_turnover	29823	1.82	0.09	0.57	1.23	1.96	4.72	-0.47	11.07	33%
ts_roi	29823	1.17	0.21	0.63	1.14	1.53	2.13	-0.00	2.95	18%
ts_debt_equity	29823	1.52	-0.53	0.74	1.69	2.48	2.83	-1.12	3.39	50%
ts_empl	29823	0.14	-1.55	-1.32	-0.53	1.74	2.42	-1.71	4.64	28%
ts_subs	29823	3.02	-1.09	2.40	3.22	3.66	4.94	-2.88	5.73	93%
ts_managers	29823	-17.79	-23.58	-22.18	-20.01	-14.82	-7.33	-24.50	1.52	100%
ts_banks	29823	-6.24	-9.80	-7.91	-5.84	-4.87	-4.06	-10.37	-3.19	100%
ts_companies	29823	10.78	8.99	9.95	11.09	11.72	11.94	8.73	12.90	100%
ts_audit	29823	-10.94	-12.62	-12.13	-11.67	-10.70	-7.05	-13.06	-6.50	100%

Note: The prefix ts on variables mean the t-statistics that will allows to compute the last column with the percentage of regressions with that variables with a significance alfa of 5%.

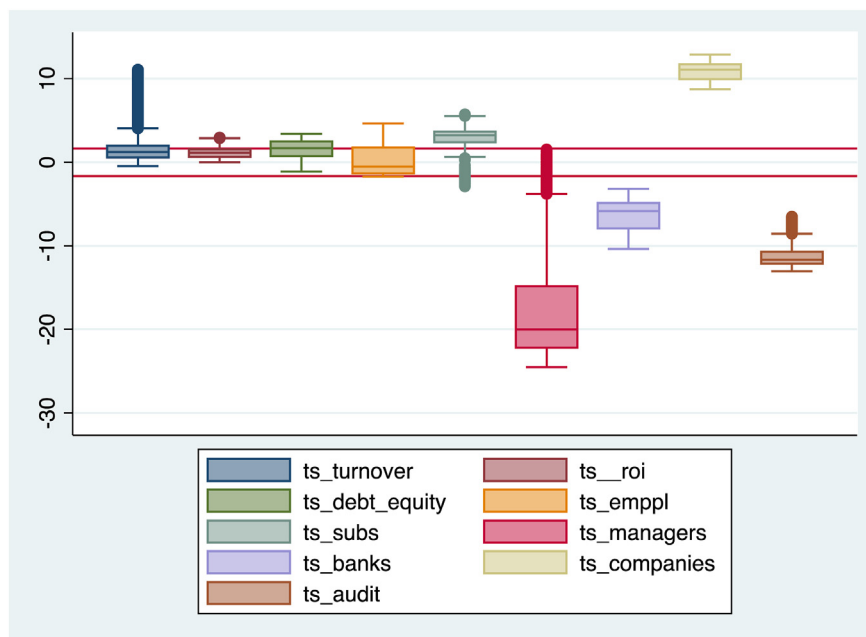


Figure 2. Graph box representing in the rectangle the in-between percentile 25 and percentile 75 for the critical values of T-statistic for a level of significance of 5%.

ROI, as expected, has a clear, direct relation with ownership concentration (alpha 5% in most cases). Portuguese companies have sharper supervision, cost control, investment, and tight financial criteria on lower

shareholder numbers, thus increasing investment return. In the most profitable companies, the principal owners would not be motivated to attract new investors but instead would seek to maintain or even increase

Table 9. OLS regression with Turnover intervals.

bvindex_n	Coef.	Robust Std. Err.	t	P > t	[95% Conf. Interval]
employees	.0001532	.0000364	4.20	0.000	.0000817 .0002246
No_subsidiaries	.0080726	.0061021	1.32	0.186	-.0038876 .0200329
ROI_W	.0003749	.0001709	2.19	0.028	.0000399 .0007098
Debt_to_equity	.0000241	.0000118	2.04	0.042	9.19e-07 .0000473
No. of managers	-.0615093	.0038402	-16.02	0.000	-.0690363 -.0539824
no_banks	-.1699623	.0137197	-12.39	0.000	-.1968532 -.1430715
no_companie	.0013507	.0001456	9.27	0.000	.0010653 .0016362
auditor_qualify	-.7412076	.043657	-16.98	0.000	-.8267762 -.6556391
turnover_group					
10	.7839275	.0601951	13.02	0.000	.6659442 .9019108
50	1.620693	.1267127	12.79	0.000	1.372334 1.869053
100	2.086812	.139429	14.97	0.000	1.813528 2.360095
200	2.037937	.2520282	8.09	0.000	1.543958 2.531917
500	1.636549	.3164448	5.17	0.000	1.016311 2.256786
_cons	7.992317	.0512204	156.04	0.000	7.891924 8.09271

Note: OLS with robust standard errors considering Turnover intervals. P-values lower than 0.05 are significant at an alpha of 5%.

control of the company (Fassler and Vargas, 2016). The results obtained are in line with Johnson et al. (2000) and Gilson and Gordon (2003) when referring to the transfer of private benefits to the main shareholder.

Financial gearing appears not to have a clear relation with ownership concentration, which does not validate the positive relationship advocated by Rossi and Cebula (2016) or the inverse relationship identified by Pindado and de la Torre (2008).

The number of companies within the group, or the number of the company's subsidiaries, as a measure of management complexity and dispersion, appears to have a clear positive association with lower board independence/higher ownership concentration (the relation is more precise and more significant on the number of companies within the group), in line with Dhnadirek and Tang (2003). Management complexity increases with the business dimension and complexity, leading to a higher control from shareholders for Portuguese companies. When facing a higher concentration of ownership, management is allowed to take faster decisions and potentially more accurate, avoiding agency costs, and for that reason permitting to control high degrees of business variety, complexity, and variety.

The gender of the prominent director (14 thousand women against 32 thousand men) does not have any influence whatsoever on board independence or share capital concentration. The results obtained do not allow validating the conclusions of Gyapong et al. (2019) that suggest that gender diversity allows reducing agency conflicts or the relevance attributed to female elements in the decision-making advocated by Kristie (2011). The auditor qualification has a negative connection with ownership concentration (high significance of $\alpha = 0,1\%$), suggesting that if accounts have some remarks (high probability of negative remarks), the odds are the shareholder capital will be dispersed. The results are contrary to the expected once concentrated ownership is related with more proximity with the management, and the asymmetry of the information with the auditors will be reduced. For example, Qu (2004) concluded that in companies with a better audit, the concentration of ownership is considered significantly higher than other firms.

On the other hand, various and dispersed shareholders with low share capital concentration mean more board independence but probably more distance from the company's auditors' lower information. With more shareholders, the possibility of contesting the accounts is more eminent, and thus the auditors may be impelled to point out all the possible remarks. With a low concentration of share capital, shareholders may not contest so often the auditor's reports, and for that reason, some irrelevant remarks may be made outside the report. According to AlQadasi and Abidin (2018), the audit plays a supervisory role, however, its efficiency is conditioned by the characteristics of corporate governance.

The number of managers as a proxy of agency costs and efficiency is again opposed to ownership concentration. This may be an indicator of control from the shareholder. Higher ownership concentration means lower board independence, lower agency costs, and this must be achieved with fewer managers, as the principal shareholders probably have a high degree of intervention in the management. On the opposite way, lower concentration usually asks for more managers as the agency costs may increase. Pérez-Calero et al. (2019) consider that ownership in the hands of managers and families has a negative relationship with the board's independence. Bank concentration is associated with higher ownership concentration. Active shareholders create more close relations with the long-term creditors and are more loyal to them as they may experience a more robust exchange of information benefiting from more credit in more cost-efficient conditions. Banking concentration favors access and reduces the cost of financial resources since it reduces the problem of information asymmetry and serves as a mechanism for business supervision (Kroszner and Strahan, 2001).

As described in the method section, the out-of-sample analysis allows us to conclude our model's predictive solid power. The MSE has been reduced for the out-of-sample analysis showing an improvement of the prediction model before the out-of-sample (Table 7, Panel 1).

As panel 2 in Table 7 show, the Mean Absolute Percentage error is 22,3% for the in sample and 21,5% for the out-sample analysis which illustrates that our estimations are close in average from their true value.

To reinforce the observation Figure 1 shows the error of the prediction in the in sample and the out-of-sample analysis. As it can be observed the error concentrates mostly on 0 but is more concentrated on the out-of-sample chart as most errors concentrate between 0,5 and -2.

We then proceed to regression-based upon a rolling window of 15.000 companies reaching almost 30.000 different models (Table 8 -Panel 1). Adjusted R2 are optimistically and above the average results of Table 5. Panel 2 in Table 8, in conjunction with Figure 2, shows that for sure the number of subsidiaries, the number of managers (board size), the bank concentration, the companies within the group, and the audit qualification indicate ownership concentration. The turnover, employees' number, size effect, and the ROI seem to have less significance before low companies' population. However, when the entire population is studied, then their significance arises to high levels.

Finally, in order to test any differences between the size in Turnover, we create several group intervals as indicated in Table 4. Table 9 shows that all scales of Turnover are associated positively with ownership concentration and no differences arise in the company turnover scale.

Combining the different estimation models, the in-sample and out-of-sample forecasts, and the joint-rolling window regressions strengthens

the relevancy of the significant variables before the different models, partition databases and, therefore, robust the explanation and forecasting power of the model under different sample restrictions.

5. Conclusion

Given the scarcity of literature directly related to the topic addressed in this article, we propose a new approach to the study of ownership concentration inducers. In addition, we provide empirical evidence for an economy like the Portuguese of the contribution provided by a set of business variables. The high corporate ownership concentration can be caused by different factors, in addition to those contemplated in this study. Psychological factors, such as the need for control, the corporate culture, the degree of protection of investors, can also condition the ownership structure.

Ownership concentration is a stable variable over time, a symptom that majority owners are reluctant to relinquish corporate control. Our findings, in line with our research hypothesis, confirm the relevance of a set of business characteristics to ownership concentration. According to the results obtained, we concluded that the ownership concentration is directly related to the size, profitability, the number of subsidiaries, bank concentration, and conversely, auditor qualification and managers' number. The positive relationship between size and ownership concentration suggests that block holders have more significant incentives to carry out the supervisory activity and reduce agency costs. The relation between profitability and firm ownership concentration indicates the inclination of owners towards firm performance. The increase in the number of subsidiaries is an incentive to pyramid structures and shareholding concentration. When a reduced number of banks play a relevant role, they reinforce the bond with the company, reduce asymmetric information and prevent speculative groups of investors from acquiring the majority of its shares. A negative association between audit quality and ownership concentration indicates that more significant shareholders are less likely to engage a higher auditory quality. Board number and independence are associated with more voluntary disclosure in those environments which are more proactive in disclosing information. Our results evidence a lower voluntary disclosure for more level ownership concentration. However, it must be noted that coefficient estimates on capital structure/agency costs and gender are statistically not different from zero. Our findings from the ownership concentration view provide an additional path to better fit together the pieces of the ownership structure puzzle.

The high ownership concentration is an obstacle to the development of capital markets, as it increases the risk of expropriation of potential investors. Under these circumstances, companies prefer to resort to indebtedness and resources to finance operating and investment activities. These circumstances can give rise to financing costs and higher business risk, to more developed markets, with negative impacts on profitability; it is an ownership and growth paradigm-myopia. Highly concentrated ownership reduces the market value of the company and limits its growth ability. Capital markets bring money, increase size, reduce financial burden, hedge publicity, and magnets potential new or adjacent businesses. Portuguese companies rely primarily on local banks with limited credit exposure and high-risk control to reduce the opportunity to embrace new businesses.

The articulation of ownership and control poses the problem of a corporate government agency in conflicts arising from a reference shareholder (majority) and minority shareholders, as opposed to the Anglo-Saxon system, centered conflict between shareholders and managers. One way of promoting the development of the capital market and ensuring better financing conditions will necessarily involve more excellent protection for investors.

This study identifies the main business drivers of ownership concentration, which would be helpful to research and for managers. At the same time, it contributes to corporate executives, investors and regulatory bodies. The high ownership concentration of Portuguese companies

gives rise to a supervised company centered on a reduced number of shareholders, which can negatively affect the interest of other investors. Management bodies must implement economic policies that attract more investments from institutional investors. Regulatory bodies should develop legislation that encourages the creation of transparent and robust systems of government.

The ownership concentration can be originated from several factors, in addition to those contemplated in this study. Psychological factors associated with the need for control, corporate culture, and investor protection are determinants of ownership concentration.

This study reveals that Portuguese companies have a high ownership concentration, closely controlled by some owners, hampering the interest of other investors. Therefore, policymakers must strengthen corporate governance and the efficiency of the capital market to attract new investors.

From our view, the following question is relevant: in what circumstances, business characteristics can contribute to the ownership structure, being an element that promotes organizational development. The geographical framework, insofar as it constitutes a limitation of the study, becomes, at the same time, an additional stimulus to extend it to another context.

Declarations

Author contribution statement

Pedro M. Nogueira Reis and António Pedro Soares Pinto: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Funding statement

This work was supported by National Funds through the FCT - Foundation for Science and Technology, I.P., within the scope of the project Ref^o UIDB/05583/2020. Furthermore, we would like to thank the Research Centre in Digital Services (CISeD) and the Polytechnic of Visueu for their support.

Data availability statement

The data that has been used is confidential.

Declaration of interests statement

The authors declare no conflict of interest.

Additional information

No additional information is available for this paper.

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