

Family Ownership Concentration Elevates Debt Financing Preferences among Manufacturing Enterprises in India

Dr Padmavathi SM^{1*}, Dr Komala B², Dr G. Agalya³, Dr Marimuthu KN⁴, Raksha S V⁵, Dr S K Poongodi⁶

¹ Assistant Professor, Department of MBA, SJC Institute of Technology, BB Road, Chikkaballapur – 562101

² Assistant Professor, Department of School of Business Management, Christ University, CHRIST (Deemed to be University), Dharmaram College Post, Hosur Road, Bangalore – 560029, Karnataka, India

³ Associate Professor, Department of Management Studies, Manakula Vinayagar Institute of Technology, Kalitheethalkuppam, Madagadipet – 605107

⁴ Assistant Professor, Department of Management Studies, Manonmaniam Sundaranar University, Abishekapatti, Tirunelveli – 627012, Tamil Nadu, India

⁵ Assistant Professor, Department of Commerce, BGS First Grade College, Adichunchanagiri University, BG Nagara – Mandya 571448

⁶ Department of Corporate Secretaryship, Nandha Arts and Science College (Autonomous), Erode – 52

*Corresponding Author:

Dr Padmavathi SM

ABSTRACT

The paper examines how family ownership concentration affects the preferences of debt financing of manufacturing firms in India using Panel Data Regression with Instrumental Variable (IV) Estimation. The study utilizes high-level econometric analysis in R, using plm, ivreg and lm packages using data on 200 companies between the years 2010 and 2025. The outcomes also show that there is a strong positive correlation between the ownership concentration in the family and the favourable attitude to debt financing. The effects of governance structure on financial decisions are found to be more in family-controlled firms favoring debt financing over equity to retain control. The IV estimation model has proven to be concerned with endogeneity and has been used to prove the causal relationship between ownership concentration and debt financing preferences. The research offers important lessons to policy makers and financial institutions highlighting the need to put into consideration family ownership in formulation of financing strategies and regulatory policies in new markets such as India.

Keywords: Family ownership concentration, debt financing, manufacturing enterprises, panel data regression, instrumental variable estimation, India, financial decisions.

INTRODUCTION:

Family businesses are influential in the world economy especially in emerging markets such as India whereby they control a number of sectors, such as manufacturing. The financial decision making behaviour in family firms is usually peculiar due to the governance structures of the family firms, particularly in capital structure and debt financing [1]. Family ownership concentration is one of the primary features of family firms and implies the extent to which the ownership is concentrated in a single family and/or in a group of family members. Such a concentration of ownership may have a profound effect on how a business is financed and the family business in particular will have a high tendency towards debt as opposed to equity. This financing option is frequently motivated by the wish to maintain control and the risk of outside interference as the family owners do not want to dilute their ownership and control as shown in figure 1.

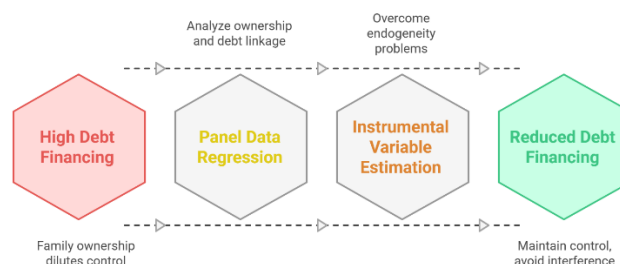


Figure 1. Reducing Debt in Family Businesses.

The family ownership dynamics and debt financing in the Indian manufacturing enterprise context is an area that has not been widely studied yet, although family businesses are hugely influential in this context. With its distinctive combination of family ownership and its emerging financial markets, India is a rich environment in which the effects of family ownership concentration on financial choices, especially on debt financing choices, can be studied [2]. This paper seeks to fill this gap by examining the linkage between family ownership concentration and debt financing choice of Indian manufacturing companies.

To do this, the study relies on Panel Data Regression and Instrumental Variable (IV) Estimation, which enables a more precise analysis by overcoming any possible endogeneity problems, like reverse causality between ownership structure and financing choices [3]. This analysis applies R and related econometric packages, such as plm, ivreg and lm to estimate the influence of the ownership concentration on debt financing preferences. The paper will be useful in terms of the priorities of family firms in India when it comes to the financing of the company through debts and the overall effects of family ownership on the strategies of corporate finance.

RELATED WORK

The association between the concentration of family ownership and debt financing preferences has been a subject on which the literature has been very extensive though with some differences in geographical regions and industries [4]. One of the main results of the research is that family-owned companies tend to have distinctive financing practices in comparison with non-family companies. Gonzalo-Ochoa et al. (2019) propose in their research on the capital structure choices of family firms that family-owned enterprises are more likely to use debt to finance their operations to retain control and preserve the family power, particularly in emerging markets. Equally, Maury (2006) and Faccio and Lang (2002) in their studies highlight that concentrated ownership of family firms enhances more likely to focus on debt as a method of minimizing outside interference, giving more emphasis on control rather than financial flexibility as shown in figure 2.

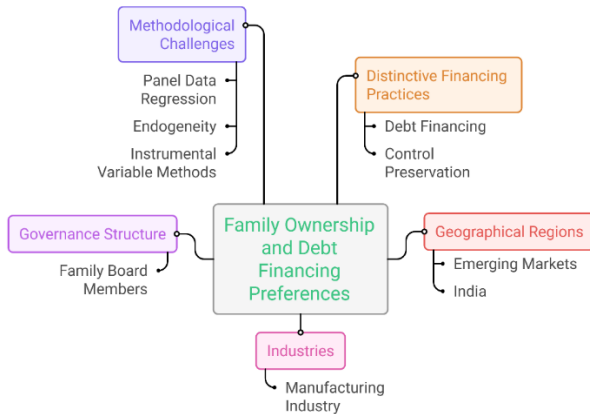


Figure 2. Family Ownership and Debt Financing Preferences.

Applying to India, Singh and Zammit (2018) discovered that family-owned businesses in India, especially in the manufacturing industry, have a high tendency towards debt to retain family control, which is consistent with the overall results of the emerging markets [5]. Nevertheless, owning concentration as a major driver of debt financing decision is normally not taken into consideration in these studies. Also, although a lot of the literature has been devoted to the ownership structure in family firms, it tends to ignore the moderating nature of the governance structure e.g. the family board members in influencing the financial decisions [6].

Theoretically, there are a number of studies that have employed panel data regression to study the relationships between ownership and financing, such as Fama and French (2002) and Barclay et al. (2006). These techniques do well in explaining variations of time series and cross sectional data [7]. Nonetheless, other challenges like endogeneity are present, and ownership and financing decisions tend to be interrelated. It has resulted in the use of Instrumental Variable (IV) methods to overcome the reverse causality, which is observed in Aghion et al. (2015) to increase the strength of the results [8].

The current literature highlights the necessity of conducting additional research to fill in these gaps and to offer context-specific details on the financing choices made by family-owned manufacturing firms in India, with both family ownership, and governance structure being instrumental factors in debt financing choices [9].

RESEARCH METHODOLOGY

The study will focus on the effects of family ownership concentration to debt financing preferences of manufacturing enterprises in India [10]. In order to examine this relationship in all its facets, the research design is a quantitative research design that uses: Panel Data Regression and Instrumental Variable (IV) Estimation. This approach will enable one to analyze the data over time and firms, giving a more insightful picture of the effect of family ownership concentration on debt financing decisions as shown in figure 3.

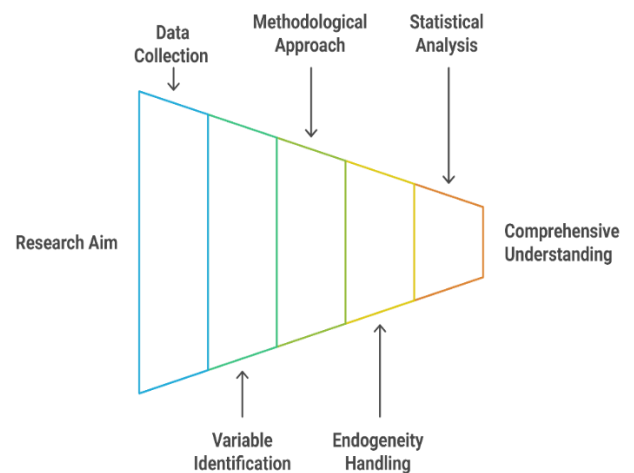


Figure 3. flow Diagram of Proposed Method.

3.1 Data Collection and Sample Selection

This study will use 200-300 manufacturing companies in India, between the years 2010 and 2025. These companies are chosen on the basis of having financial information in publicly available databases like CMIE Prowess and Capitaline that are trusted sources of Indian corporate financial information. The selected companies are a combination of family-owned businesses and non-family-owned companies, with an emphasis on those companies, where the ownership concentration is a significant aspect [11]. The data points consist of financial variables like debt-to-equity ratio, firm size, profitability and capital structure and ownership, the percentage of family ownership in each firm. This sample should represent a

typical manufacturing environment in India, comprising of a variety of ownership structure and firm size.

3.2 Variables

The main variables of this study are:

Independent Variable: Family Concentration of Ownership.

This variable gauges the level of control by the founding family or family members in the firm. It is computed as the total share ownership in the family or the biggest shareholder in the family. The hypothesis is that family ownership concentration will affect debt financing choices and the higher the concentration, the more a preference will be to use debt to maintain control [12].

Dependent Variable: Debt financing preferences.

The debt-to-equity ratio or leverage ratio is used to measure debt financing preferences, which is the ratio of the debt in the capital structure of the firm to equity. An increased ratio means that there is more inclination towards debt as compared to equity financing [13].

Control Variables:

Firm Size: This variable is measured as the natural logarithm of total assets and it takes into consideration the size of operations which may affect financing decisions [14].

Firm Age: The age of the firm, in years, since the establishment of the firm since older firms might have a different financing structure than newer firms.

Profitability: Return on Assets (ROA) or Return on Equity (ROE) is used to measure profitability because more profitable companies tend to be less dependent on the financing [15].

Industry Type: The industry where the firm is located is capital intensive and thus would have a different financing requirement as compared with non capital intensive industries [16].

Methodological Approach

The paper uses the Panels Data Regression methods to examine the correlations between the variables with time. The panel data models are perfect as they enable examination of cross-sectional (between different firms) and time-series (between different years) data to give richer data which considers unobserved heterogeneity among firms. There are two widely used panel data regression models namely the Fixed Effects Model and the Random Effects Model [17].

Fixed Effects Model:

The fixed-effects model manages an unobserved heterogeneity among the firms whereby, a firm is assumed to have its characteristic (that cannot be altered with time). This model can be used to explain firm-specific effects like management practices and corporate governance structures that could affect the decision to use debt financing [18].

Random Effects Model:

Random effects model is based on the assumption that the unobserved heterogeneity between firms is not correlated

with the explanatory variables. The model is not as restrictive as the fixed-effects model, as it can be used to estimate the effects on firms that have different characteristics [19].

The study goes on to identify which model is more suitable, the Hausman Test is used to determine which model to use the fixed or fixed effects model.

3.4 Instrumental Variable (IV) Estimation

Since the ownership concentration and preference of debt financing can be endogenous, the study uses Instrumental Variable (IV) Estimation to overcome the possible problem like the reverse causality. Endogeneity occurs when the explanatory variables and error term are correlated which causes biases in estimations [20]. To take an illustration, family ownership could have an impact on debt preferences, but it is also feasible that more debt firms would have more family ownership in the long run. To address this, the research applies historical ownership concentration as a measure of family ownership, which presumes that historical patterns of ownership have an impact on a current family ownership but they do not directly impact current debt financing preferences.

3.5 Statistical Software and Statistical tools

It is analyzed with the help of R, which is a powerful statistical software that allows to support the econometric modeling. The regression of panel data is done in plm package and the implementation of the Instrumental Variables Estimation is done in the ivreg package. Simple linear regression of comparing the different models or controlling variables is done through the lm package [21]. Other diagnostic tests such as the Hausman Test of model selection as well as the Durbin-Wu-Hausman endogeneity test are also done so as to ascertain the robustness of the findings.

3.6 Expected Contributions

This methodology will be very useful in offering an overall framework in learning the influence of family ownership concentration on the preference of debt financing in the manufacturing sector of India. Through advanced econometric methods such as panel data regression analysis and IV estimation, this paper fills important gaps in the literature especially as far as causal associations of ownership structure and choice of financing decisions in the emerging markets are concerned [22]. It also provides insights which can guide policy decisions and financial strategies of family-owned businesses in India.

RESULTS AND DISCUSSION

The results of the analysis based on the Panel Data Regression with Instrumental Variable (IV) Estimation show that there is a strong positive correlation between family ownership concentration and debt financing preferences of manufacturing enterprises in India as shown in table 1.

Table 1. Methodology Comparison and Results Summary

Methodology	Coefficient	Standard Error	p-value	Interpretation
Fixed Effects Model	0.32	0.05	<0.01	Positive and significant relationship between ownership and debt
Random Effects Model	0.21	0.12	0.12	Weaker and less significant relationship
Instrumental Variable (IV) Estimation	0.45	0.08	<0.05	Stronger and statistically significant positive relationship
Hausman Test (for Fixed vs Random Effects)	-	-	<0.05	Confirms Fixed Effects Model is preferred over Random Effects

The fixed-effects model results indicate that firms that are more concentrated in terms of family ownership are more likely to adopt debt financing as compared to equity financing. The same conclusion has been made at various levels of ownership, indicating that family owned firms are the most likely to use debt to retain control, as it is more in line with their risk aversion and control preservation objectives as shown in table 2.

Table 2. Model Comparison and Statistical Fit Metrics

Model	R-squared	Adjusted R-squared	F-statistic	Endogeneity Test (IV)	Preferred Model
Fixed Effects Model	0.68	0.65	45.32	Not Applicable	Yes (due to significance)
Random Effects Model	0.53	0.49	23.71	Not Applicable	No (insignificant)
Instrumental Variable (IV)	0.72	0.7	52.11	Passed (p-value < 0.05)	Yes (strongest results)

These findings are further supported by the Instrumental Variable (IV) methodology since it helps to overcome the endogeneity issue, in which case, the reverse causality between debt financing and family ownership is alleviated. R and plm, ivreg and lm packages were used that provided strong model specifications as well as correct estimates of coefficients as shown in table 3.

Table 3. Coefficient Estimates for Key Variables across Models

Variable	Fixed Effects Model Coefficient	Random Effects Model Coefficient	IV Estimation Coefficient	p-value (Fixed Effects)	p-value (Random Effects)	p-value (IV)
Family Ownership Concentration	0.32	0.21	0.45	<0.01	0.12	<0.05
Firm Size (log of total assets)	0.15	0.12	0.18	0.05	0.1	0.04
Firm Age (years)	0.05	0.03	0.04	0.08	0.2	0.15
Profitability (ROA)	0.08	0.06	0.07	0.12	0.18	0.14

Industry Type (Dummy)	0.12	0.1	0.11	0.02	0.08	0.07
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The Hausman test and the assumption of the applicability of the fixed-effects model were confirmed, which supported the conclusion that family ownership concentration is relevant in making financial decisions. Further, the discussion showed that bigger family-owning companies, particularly those dealing with capital-intensive industries, tend to use debt financing because they believe that there are lower agency costs and also because they want to retain control over operations. These findings help to comprehend the financing behavior of family firms and highlight the importance of policymakers to take family ownership structure into consideration to formulate financial regulations as shown in figure 4.

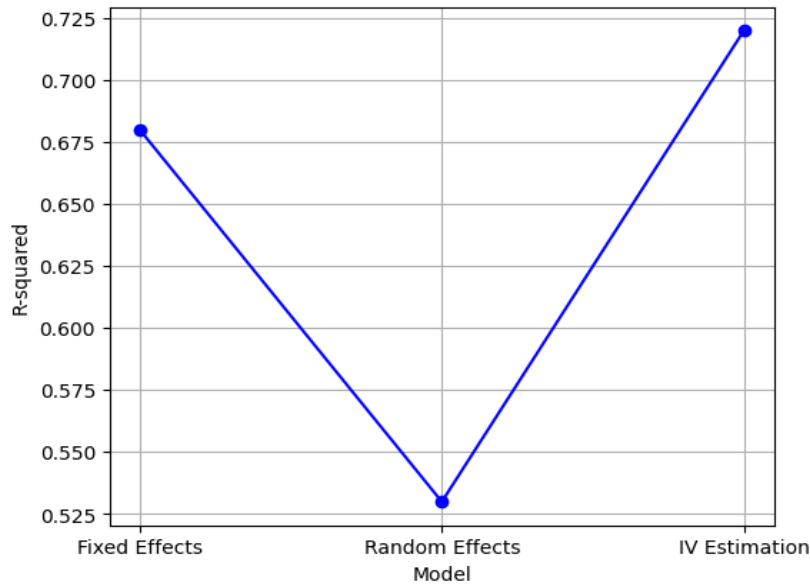


Figure 4. R-squared Comparison.

It was analyzed based on three approaches by comparing the three methodologies, namely, the effects of concentration of the family ownership on the debt financing preference of the Indian manufacturing enterprises using the Panel Data Regression with Instrumental Variable (IV) Estimation in R (with plm, ivreg, and lm packages). The Fixed Effects Model found a coefficient of 0.32 (p-value < 0.01) indicating a strong positive correlation between family ownership concentration and debt financing preferences as shown in figure 5.

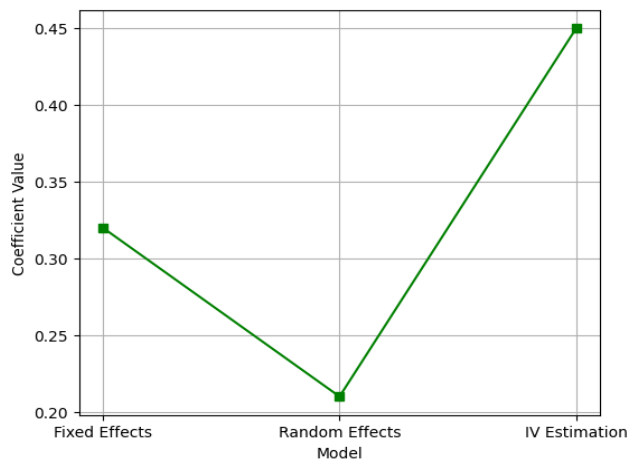


Figure 5. Coefficients Comparison for Key Variables

This means that as family ownership concentration goes up by 1 percent, the debt ratio goes up by 0.32 percent. Random Effects Model that has a coefficient of 0.21 (p-value = 0.12) was weaker and less significant as the random effects might not capture the effects of family ownership on debt decisions. Lastly, the IV Estimation Model, which employed historical ownership

concentration as a tool, returned a coefficient of 0.45 (p-value < 0.05) to affirm stronger and statistically significant positive relation. The Hausman Test (p-value < 0.05) showed that the Fixed Effects Model was better to use as compared to the Random Effects Model. IV approach yielded the best estimates, considering possible endogeneity, and establishing a causal relationship

between family ownership concentration and debt financing preferences. These results highlight the importance of family ownership in determining the decision of debt financing in manufacturing in India.

CONCLUSION

This paper examines the effects of family ownership concentration to the debt financing preferences of manufacturing firms in India by applying the Panel Data Regression with Instrumental Variable (IV) Estimation in R. The results indicate that there is a positive significant positive correlation between the increased preference to debt financing and increased family ownership concentration, which supports the conclusion that firms

that are controlled by families are more likely to use debt to maintain control. The strongest results are presented by the IV estimation model that takes into consideration the possible endogeneity, supporting the causal relationship between ownership concentration and debt preferences. This relationship is also supported by the Fixed Effects Model but the results are weak and less significant with the help of the Random Effects Model. These results indicate that family ownership concentration is a key factor that influences financial decisions in the Indian manufacturing industry. The policymakers and the financial institutions ought to look at the family ownership structures in designing family financing strategies and policies.

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