

# Determinants of capital structure of listed firms in Vietnam: A quantile regression approach

NGUYEN THI CANH

University of Economics and Law – canht@uel.edu.vn

NGUYEN THANH LIEM

University of Economics and Law – liemnt@uel.edu.vn

TRAN HUNG SON

University of Economics and Law – sonth@uel.edu.vn

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## ABSTRACT

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This study empirically examines the link between firm characteristics and leverage using the data of Vietnamese non-financial listed firms from 2006 to 2015. In addition to traditional panel data methods, we employ a conditional quantile regression that unveils the behavior of regressors throughout the leverage distribution. The results confirm the non-linear relationship between firm characteristics and leverage at different levels of debt.

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## 1. Introduction

There have been numerous studies on capital structure determinants with some consistence in which size, asset composition, growth opportunities, profitability, and non-debt tax shields are critical. Nonetheless, most empirical studies assume the same impact of explanatory variables across high and low debt levels. This is unlikely in light of the papers suggesting that highly leveraged firms tend to encounter higher borrowing costs, thus reducing their debt capacity dramatically (Peyer & Shivdasani, 2001). Lenders tend to perceive higher risk of bankruptcy, and can demand premium for such risk by asking for extra protection. As a result, conventional determinants may exert different effects on leverage, depending on the leverage levels of firms.

In fact, the potential non-linearity of the impacts of variables on capital structure decisions exists within the framework of major theories such as trade-off and pecking order. This study utilizes quantile regression (Koenker & Basset, 1978) to investigate the determinants of the capital structure of Vietnamese listed firms. Employing quantile regression uncovers insights into the non-linear relationship (if any) between the determinants and dependent variable, yielding much more useful information than standard OLS as well

as achieving robust results in the presence of heterogeneity and skewed distributions. To the best of our knowledge, such technique has not been applied to analyze the non-linearity aspect in capital structure decisions in Vietnam. Furthermore, understanding how firms react at different levels of indebtedness rather than just the central tendency helps us uncover whether managers are most concerned about liquidity risk or agency costs, the research of which is still silent in the context of Vietnam. Since each country holds with it diverse characteristics that may affect the way firms decide leverage ratios, the results of previous studies employing quantile regression for different debt levels could be different from those obtained in the context of Vietnam. The current study aims to find how firms in Vietnam react to these determinants at different debt levels and compare this with the findings from other countries. The following sessions cover literature review of widely known theories and determinants of capital structure, data and methodology, results, and finally implications from the research findings.

## 2. Literature review

Debt has several advantages. Generally, cost of equity is higher than cost of debt, given the tax benefits of debt (tax shield). In addition, debt can also encour-

age more efficient behavior from management since they are under supervision of lenders (Stulz, 1990). However, firms are not willing to adhere to high-debt policy because it comes with increased bankruptcy risk, triggering lenders' demand for higher loan premiums.

Trade-off theory takes into account market imperfections that Modigliani and Miller (1958) failed to include, such as taxes, bankruptcy risk, and agency costs. This theory argues for the existence of the optimal capital structure that maximizes firm value (Jensen & Meckling, 1976). The target leverage ratio is determined, considering benefits and costs of carrying debt. The theory implies the existence of potential non-linearity. Companies that are highly leveraged are closer to potential financial distress, sometimes even bankruptcy, so creditors can ask for protection to compensate for the risks involved. Moreover, creditors may impose restrictive clauses to safeguard their interests, which can result in higher borrowing costs for those companies. In fact, van Horne (1992) documented that bankruptcy likelihood is a non-linear function of leverage ratio, implying that bankruptcy costs can also have a non-linear effect on leverage decisions. All of these show that bankruptcy costs vary at different debt quantiles, and variables which proxy for this

kind of cost, as a result, can also have different impacts, depending on the debt quantiles.

Pecking order theory establishes the hierarchy of financing patterns. The highest preference is internally generated funds (such as retained earnings and operating cash flows). If these internally generated funds cannot afford the investment needs, then firms will borrow debt to its full capacity. Finally, only when debt capacity is exhausted will firms issue stock (Myers & Majluf, 1984). This sequencing of financing has its roots from the expected asymmetric information between investors and managers, making equity issuance much more costly (i.e. share undervaluation versus other sources of financing). This financing preference as well as each firm's debt capacity could also lead to a non-linear relationship with respect to debt-equity ratio.

Next is the discussion of the expected signs of conventional determinants on capital structure decisions.

Corporate tax rate: as predicted by trade-off theory, firms with higher tax rates are more likely to take on more loans to utilize tax shield. However, this reasoning holds only if firms do have a sufficient amount of taxable income to enjoy tax deduction from interest expense. Thus, tax

rate is expected to have a positive relationship with debt.

**Tangibility:** tangible assets can be used as collaterals in loan agreements. Under trade-off theory, firms with high collateralizable assets (high proportion of tangible assets) are more likely to enjoy lower costs of debt, so asset tangibility has a positive association with leverage ratio (Harris & Raviv, 1990; Booth et al., 2001). Tangibility is measured by the ratio of gross property, plant, and equipment to total assets. However, Harris and Raviv (1991) argued that firms with fewer tangible assets have to cope with asymmetric information problems, and according to PO's reasoning, those firms will have to borrow instead of issuing stocks. This implies that tangibility is negatively related to leverage ratio. It is worth noting that asset tangibility may be of higher importance in guaranteeing accessibility of finance for firms in developing countries than in developed ones, for higher agency costs in the former regions (Stiglitz & Weizz, 1981).

**Non-debt tax shield:** one of the main benefits of debt is tax deduction related to interest expense (tax shield). Consequently, firms may want to use debt to reduce the corporate income tax. However, other expenses that firms encounter also have the same benefit, such as asset depreciation expense, yet do not increase firm

insolvency risk. According to trade-off theory, a higher non-debt tax shield can act as a substitution for tax shield; hence, it should be inversely related to leverage (Ozkan, 2001; Huang & Song, 2006). Non-debt tax shield is measured by the ratio of depreciation expense to total assets.

**Growth opportunities:** in contrast with firms' tangibility, growth opportunities are in fact non-collateralizable assets. Trade-off theory asserts that firms with high value of intangible assets could face more obstacles in obtaining credit due to the asset substitution effect and high agency cost of debt (Titman & Wessels, 1988). Market timing theory suggests that since the high market-to-book ratio (a proxy for high growth opportunities) indicates that investors make favorable assessment of firm equity, managers are inclined to take advantage of such positive appraisal to raise equity. Therefore, both trade-off theory and market timing theory point to the same expectation that firms with higher value of growth opportunities will have less debt and issue more stocks.

On the contrary, pecking order theory predicts that as firms have larger growth opportunities and thus more investment opportunities, internal funds will not be sufficient to match the financing needs. That is why external debt is much needed. Under this theory, given the same level of

profitability, firms with more growth opportunities have a tendency to take on more debt. This variable is proxied by the ratio of market-to-book value of equity (Fattouh et al., 2005).

**Size:** under pecking order theory, smaller firms are prone to borrow more because it is challenging for them to issue stocks due to the high cost of information asymmetry associated with their size and also due to weaker cash flows (Titman & Wessels, 1988; Fama & French, 2002). Trade-off theory, on the other hand, contends that big firms enjoy easier access to capital markets and borrow at cheaper rates (Ferri & Jones, 1979) since they tend to have lower default likelihood thanks to diversified operations. Also, the weak form of pecking order theory agrees that information costs are lower for larger firms owing to better financial information. In fact, as shown by Observatory of European SMEs, inadequate company information is normally mentioned as a main contributor to hindering SMEs from bank finances. Most studies so far show a positive link between size and firm leverage (Okuda & Lai, 2010; Nguyen & Ramachandran, 2006 for Vietnamese firms), which strongly supports both trade-off theory and the weak form of pecking order theory. Size is measured by the natural logarithm of total assets.

**Profitability:** when firms' investment is

more profitable, they tend to have lower risk of financial distress. Nonetheless, high profitability and excess cash flows may trigger serious conflicts between managers and shareholders (Booth et al., 2001). As debt can act as a way to limit agency cost (e.g., managerial discretionary spending) (Jensen, 1986), firms could have higher demand for debts when having high profitability. Additionally, since firms with higher profitability are found to have lower risk of insolvency and thus lower distress cost, they can concentrate on extracting benefits from using debt—tax shield. Therefore, trade-off theory anticipates a positive linkage between debt and profitability.

In contrast, most empirical studies point to a negative relationship between profitability and leverage (Myers, 2001; Wiwattanakantang, 1999; Huang & Song, 2006; Okuda & Lai, 2010). This provides supports for pecking order theory, which suggests that the more profitability firms achieve, the higher the amount of internal funds, and the less debt firms need to finance new investments. Following the majority of papers, it is expected that profitability is negatively correlated with debt ratio. Therefore, we measure profitability as the ratio of EBIT (earnings before interest and taxes) to total assets. It is also possible that the cost of debt financing is higher for firms with larger debt ratios.

**Table 1**

Predicted signs of variables under trade-off theory and pecking order theory

Variable	Trade-off theory	Pecking order theory
Growth	-	+
Tax	+	
Size	+	-
Tangibility	+	-
Depreciation expense	-	
Profit	+	-

Besides firm-level determinants, other papers include control variables regarding macroeconomic conditions, such as inflation and GDP growth rate. Inflation has been found to have mixed effects on capital structure. Homaifa et al. (1994) revealed a positive link between leverage and inflation, accumulating the evidence that inflation helps erode the principal repayment and thus alleviate “genuine” cost of borrowing. According to market timing theory and trade-off theory, the cost of debt is lower as the inflation rate is higher, so inflation is expected to have a positive impact on leverage decision. Still, Booth et al. (2001) found no relationship between leverage and inflation. The impact of GDP growth rate on capital structure is not well determined either. Some findings, including those of De Jong et al. (2008), confirm a positive nexus between GDP growth and

leverage, which implies that in countries with high growth rates, firms are more willing to borrow to finance their investment, while Demirgüç-Kunt and Maksimovic (1999) explored a negative effect between these two variables.

According to Fattouh et al. (2005), highly leveraged firms may desire to stay far from upper debt constraint by using other sources of financing (e.g., stocks). Also, when firms reach their debt capacity (for highly leveraged firms), they might no longer be able to borrow more regardless of their size or collaterals. Thus, these determinants may have negligible effects at the highest quantiles while remaining influential at low and moderate debt ratios. Oliveira et al. (2013) argued that different debt quantiles are associated with different levels of bankruptcy and agency costs. For

example, lower debt quantiles are generally synonymous with lower bankruptcy cost, so determinants that encourage debt usage may prove significant to a larger extent than higher debt quantiles (due to higher bankruptcy costs).

Using quantile regression to investigate the indebtedness determinants for Brazilian firms between 2000 and 2009, Oliveira et al. (2013) confirmed that the effects of capital structure determinants vary depending on the debt quantile. The authors refer such results to the bankruptcy and agency costs linked to the amount of firm leverage. Sanchez-Vidal (2014) applied quantile regression to a study on company leverage in Spain from 2001 through 2011, verifying the heterogeneous effects of leverage determinants and that many factors could not stay significant given the case of highly-leveraged companies.

In conclusion, based on the findings of such earlier studies employing quantile regression as Sanchez-Vidal (2014) and Oliveira et al. (2013), there is a need to investigate the factors affecting capital structure decision in different contexts, where firms have high and low levels of debt. The present paper aims to analyze whether capital structure determinants change depending on firms' debt levels in Vietnam. Most investigations in Vietnam have taken into capital structure determinants (Tran & Tran, 2008; Le, 2013; Tran

& Ramachandran, 2006; Biger et al., 2008; Okuda & Lai, 2010) with estimation focusing merely on central tendency. Even though extant papers in this field in the country may have confirmed the impacts of several explanatory variables on firm leverage, those papers may not be able to unveil the importance of capital structure determinants in different contexts (e.g., high and low leverage). Therefore, our paper adds to the literature for Vietnamese firms by differentiating the behavior of regressors in accordance with the levels of firm indebtedness, and also serves as a comparison study with others conducted using quantile regression.

### 3. Data and methodology

As discussed above, it is expected that the effects of bankruptcy costs and agency costs are different in each leverage quantile, which can theoretically lead to changes in estimated coefficients in each quantile (Oliveira et al., 2013). This reasoning has found its support in several earlier studies employing quantile regression in Spain (Sanchez-Vidal, 2014), South Korea (Fattouh et al., 2003) and Brazil (Oliveira et al., 2013), as determinant effects differ according to the debt level analyzed. Our study is specialized in Vietnam, where, as in other emerging markets, bankruptcy and agency costs are likely to have larger impacts on capital

structure than in developed markets (Wellalage & Locke, 2014).

Nevertheless, some problems have still existed in other studies. Rajan and Zingales (1995) chose to exclude outliers by removing extreme quantiles (as well as so precious information), which may lead to biased estimates. Furthermore, traditional methods, such as OLS technique, yield much less information since they assume the same impact of explanatory variables across various quantiles of debt. Quantile regression is useful since it allows one to examine the entire distribution, rather than merely focus on the central part of leverage ratios, and therefore does not discard data. This will help evaluate the relative importance of explanatory variables, depending on quantiles. Also, this method does not discard data at extreme ends and stay robust to outliers (Hallock et al., 2010) and departures from normality and skewed tails (Mata & Machado, 1996). The technique to estimate coefficients under quantile regression is based on linear programming (Koenker & Basset, 1978). This study relies on quantile regression with bootstrapping method to compute standard errors of the estimator and confidence intervals (Buchinsky, 1995), which is shown to be robust and valid under many forms of heterogeneity. Quantile regression has also been applied to capital structure studies as in Fattouh et al. (2003)

for South Korean firms, Oliveira et al. (2013) for Brazilian firms, Wellalage and Locke (2014) for Sri Lankan firms, and Qiu and Smith (2007) for British companies.

Our data of firm-specific characters are obtained from Datastream for a sample of all non-financial firms listed in Vietnam over the 2006–2015 period. This is to exploit as much data as possible, and we drop data before the year 2006 due to its relatively small number of firms available. The data that have negative leverage (1 observation) are also eliminated. In addition, this study employs book leverage since market values fluctuate frequently, which probably prevents market ratios from becoming reliable indicators of financing policies (Frank & Goyal, 2009). Besides, Graham and Harvey (2001) showed that managers tend to focus on book values when determining capital structure. Based on the above discussion, we decide to use the following model to investigate capital structure determinants in Vietnam:

$$Lev_{it} = \beta_0 + \beta_1 * size_{it} + \beta_2 * prof_{it} + \beta_3 * growth_{it} + \beta_4 * ppe\_asset_{it} + \beta_5 * tax\_rate_{it} + \beta_6 * depre\_asset_{it} + industry\ dummies + year\ dummies + u_{it}$$

where:

*Lev*: dependent variable, measured by the ratio of book value of total debts to total assets

*size*: logarithm of the size of firm *i* in period



$t$ , measured by natural logarithm of total assets

*prof*: profitability, measured by the ratio of EBIT (earnings before interest and taxes) to total assets

*Growth*: proxy for the company's growth opportunities, given by their market-to-book value

*Tang*: tangibility of assets, determined as the proportion of tangible assets to total assets

*Depre\_asset*: measured as the ratio of depreciation expenses to total assets

*Tax rate*: measured by income taxes/pretax income

The specification also includes industry dummies and year dummies to control for some macro-economic determinants, such

as economic growth and inflation as previously discussed.

#### 4. Results

From the statistics in Table 2, it is clear that firm leverage spread is very wide. Maximum leverage is 97% while there are also firms with zero debt. The size of listed firms does not vary to a great extent while such other characteristics as tangibility, depreciation, tax, and growth opportunities do. These statistics initially provide the justification for the use of quantile regression, which is designed to deal with cases of extreme values.

**Table 2**

Descriptive statistics

Variable	Obs.	Mean	Std. dev.	Min	Max
lev	4438	0.2452	0.1971	0	0.9714
profit	4379	0.1031	0.1261	-5.3996	1.1414
tax	4161	18.8867	26.2357	0	1353.22
size	4471	19.8028	1.4319	15.2939	24.7605
ppe_asset	4469	0.2774	0.2156	0	0.9681
depre_asset	4274	0.0351	0.0341	0	0.5367
growth	3649	1.0880	1.0863	-24.86	22.23

Table 3 presents the correlation coefficients of pairs of variables. Firstly, growth and profitability are significantly negatively correlated with leverage, providing support for pecking order theory. Size and

tangibility are significantly positively related to leverage, which suggests the matters of agency costs and information asymmetry in capital structure decisions. Fi-

nally, it is unexpected that depreciation expenses are positively correlated with leverage, refuting the trade-off between non-debt and debt-related tax shield.

**Table 3**  
Correlation matrix

	lev	profit	tax	size	ppe_asset	depre_asset	growth
lev	1						
profit	-0.1993*	1					
tax	-0.0075	-0.0954*	1				
size	0.3856*	-0.0482*	0.0363*	1			
ppe_asset	0.2625*	-0.0162	-0.0514*	0.1184*	1		
depre_asset	0.0736*	0.1074*	-0.0534*	-0.0585*	0.4913*	1	
growth	-0.0984*	0.2624*	-0.0689*	0.0643*	0.0109	0.0582*	1

Note: \* denotes significance at 10%.

*4.1. Results with conventional panel data methods*

Table 4 shows the results of estimation using conventional methods (OLS, fixed effects, and random effects). Tests for the model selection (F test for selection between OLS and fixed effects model; Breusch Pagan test for selection between OLS and random effects model) suggest that OLS is the least preferred, and that fixed effects is more valid than random effects for the sample (Hausman test's results). Therefore, the present study will discuss the estimation results of fixed effects model in isolation. Tax is the only in-

significant variable among the six explanatory variables. Size, tangibility, and depreciation expense have the correct signs as expected under trade-off theory, but profitability and growth opportunities tend to behave as predicted under pecking order theory. This suggests that firms are likely to reduce debt financing if they are profitable and have much depreciation expense, yet are inclined to increase debts when possessing more collaterals (more tangible assets), and the case also applies to bigger firms. Additionally, when firms have more growth opportunities (more valuable investments to make), it seems that they will

take more debt, rather than equity, to finance their investments, which is consistent with pecking order theory.

**Table 4**

Regressions using OLS, fixed effects and random effects

Variable	OLS	FEM	REM
profit	-0.5634***	-0.3460***	-0.3954***
tax	-0.00004	0.0000473	0.000038
size	0.0507***	0.1333***	0.07856***
ppe_asset	0.2092***	0.1632***	0.1794***
depre_asset	0.0418	-0.2060**	-0.2446**
growth	-0.0090***	0.0073***	0.0056**
Prob>F (p_value)	0.000	0.000	0.000
F test (p_value)		0.000	
Breusch Pagan test (p_value)			0.000
Hausman test (p_value)		0.000	

Note: \*, \*\*, and \*\*\* denote significance at 10%, 5%, and 1% respectively.

#### 4.2. Results with quantile regression

The most interesting part of this study is particularized in Table 5. The table dictates how the sign and significance of coefficients of variables change as quantiles of debt vary. In general, the signs of the variables throughout the quantiles remain relatively similar to the results of fixed effects estimator, except for growth opportunities. Interestingly, at the lowest quantile (5%) it is clear that for firms that have marginal levels, all of the regressors are insignificant, suggesting that no theories may explain capital structure decisions for those firms.

This may be because low-debt firms are not willing to take risk, and are associated with less information asymmetry, so these two problems play no role in their capital structures. The decision to take on more debt or equity seems to be just a matter of preference of firm management.

The coefficients of the variables in higher quantiles are mostly in line with fixed effect model: profitability carries negative sign, while tangibility and size have positive links with leverage. Tax is not statistically significant at all quantiles, but depreciation still has a negative sign at high

debt quantile (95%), but carries a positive sign at 25% debt quantile. Growth opportunities have a completely opposite sign to that produced by fixed effects estimator at lower quantiles, which can be further discussed as below:

Firstly, as debt levels of firms get higher, the economic significance of profitability increases (from -0.4198 to -0.72144). This result implies that firms that have much debt try to stay safe by resorting to internal funds if available. For Brazilian firms, Oliveira et al (2013) also demonstrated that the absolute impact of profitability increases as firms have higher debt ratios (profit in most leveraged firms is used to reduce larger portions of debt compared to lower leveraged firms). Therefore, our paper, as well as Oliveira et al. (2013), provides concrete evidence to advocate pecking order theory, especially when firms have higher debt ratios.

Growth opportunities only affect capital structure decisions negatively at low to medium quantiles (25–50%): growth opportunities are associated with information asymmetry and also regarded as non-collateralizable assets, so they really restrict firm's debt capacity. However, at high debt levels (75–95%), it seems that lenders do not any longer worry much about the firm's prospect and indeed may share more concern over other aspects. This result is in

marked contrast with fixed effects estimator, which states that high-growth firms are more likely to take on debt. Oliveira et al. (2013) indicated that for Brazilian firms growth opportunities have a positive relationship with debt, and the estimates are also insignificant for the highest quantiles, while remaining positive at lower quantiles. This implies that for Brazilian firms that have low debt levels, growth opportunities generally increase debt for financing investment, but it may be difficult for high-growth firms to take on more debt if they are highly leveraged already.

Size remains significant and carries the same sign through almost all quantiles. This provides convincing support for the importance of information asymmetry between firm and lenders, and also bankruptcy risk (as larger firms are normally considered to face less risk). Nonetheless, the importance of size reduces as debt gets higher, which shows that in case of more risk, even large firms find it difficult to obtain further debt. This is consistent with Fattouh et al. (2008), who suggested that for Korean firms firm size is positively related to leverage at lower debt quantiles, but loses significance from 75% quantile and above, indicating that when heavily indebted, firms may no longer be able to take on more debt regardless of their size. Oliveira et al. (2013), on the other hand, argued that for Brazilian firms, the effect

of size on leverage is positive for lower quantiles and negative for higher quantiles.

Tangible assets are arguably critical for firms since they help raise firms' debt capacity. For Vietnamese ones, the importance of tangible assets keeps increasing as we move from low to high debt levels, except for just a tiny drop in the coefficient at the highest quantile. This piece of evidence strongly supports trade-off theory, emphasizing the importance of transparency and collaterals in improving firms' access to capital markets.

Our most interesting finding is that depreciation induces more debt when the debt level is low (at 25%), and then reduces debt when the debt level is high (at 95%). At the highest debt ratio (95%),

higher depreciation expense helps reduce debt as predicted by trade-off theory since depreciation can act as a substitution for debt, especially when the firm is already highly leveraged. At 25% quantile (low debt ratio), higher depreciation expense is associated with debt increase. Tran (2013) offered a potential explanation as follows: depreciation is high when firms have ample tangible assets that can be deposited as collaterals; high rates of depreciation also mean more assets that need to be replaced soon, which requires more financing for the replacement, which may come from debt. However, as firms are in danger of financial distress (high debt), depreciation becomes a financing source and is employed to substitute debt for firms' benefits.

**Table 5**

Quantile regression estimates

	5%	25%	50%	75%	95%
profit	-0.0154	-0.4198***	-0.5457***	-0.7014***	-0.7215***
tax	-3.47E-06	0.0000982	0.0000236	-0.0000841	-0.0002302
size	0.0025	0.0495***	0.0596***	0.0559***	0.0457***
ppe_asset	0.0080	0.1635***	0.2440***	0.2446***	0.2388***
depre_asset	-0.0150	0.3454***	-0.0338	-0.1921	-0.4970***
growth	-0.0002	-0.0174***	-0.0172**	0.0033	0.0056
pseudo R2	0.0056	0.1468	0.1921	0.2018	0.2126

Note: \*, \*\*, and \*\*\* denote significance at 10%, 5%, and 1% respectively.

## 5. Conclusion

This paper examines the capital structure determinants for non-financial listed firms in Vietnam from 2006 to 2015. The study differs from others related to the Vietnamese context in that it considers the non-linearity of the impacts of capital structure determinants given debt quantiles, since costs related to bankruptcy, agency, and information asymmetry may vary across different debt levels. The results confirm the non-linearity of conventional capital structure determinants, and particularly showcase the importance of profitability and depreciation as alternative financing sources and the ability of firm size and asset tangibility to increase debt for Vietnamese firms.

One major shortcoming is that lags of the dependent variable are not included as an explanatory regressor as in many dynamic models on capital structure, as well as macroeconomic variables. However, these drawbacks can be tolerated in order to facilitate the comparison with other similar studies that apply the quantile regression approach. For another, unit-root

test for stationarity of the data is not performed as we regard our data as being short, which is safe from the non-stationarity problem.

There are several implications from this study, which may emerge for the first time in the Vietnamese context. For firms that face very low debt, managers seem not to be so concerned about liquidity risk as well as information asymmetry costs. Profitability and depreciation expense serve as additional funding sources, especially at extremely high debt levels. Yet, the importance of profitability and firm size reduces as firms are in the highest debt quantile. Asset tangibility also helps much with firms' debt capacity as firms are highly leveraged. Therefore, Vietnamese enterprises should pay special attention when they employ sheer volume of debt since some factors (size and tangibility) may not maintain their importance in ensuring high debt capacity. Also, profits and depreciation can serve well to partly fund firms' operations under extreme debt conditions ■

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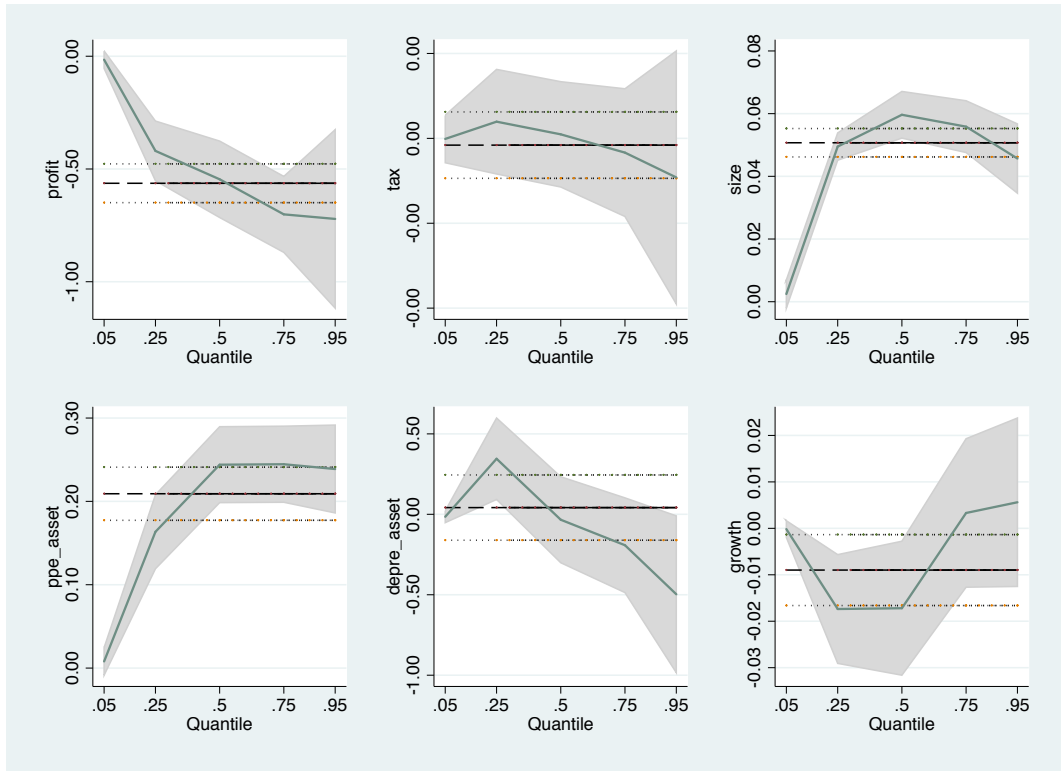
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**Appendix**



**Figure 1.** Coefficients of variables plotted across quantiles