

Firm leverage determinants of the role of market structure: BRICS vs. MINT

ET MUSASIWA

Supervisor - Prof K. Ojah



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Firm leverage determinants of the role of market structure: BRICS vs. MINT

Edmore T. Musasiwa

A Research Report submitted to the Wits Business School, University of the Witwatersrand, Johannesburg, in partial fulfilment of a Master of Business Administration (MBA) degree.

Johannesburg, February 2016 ©

Declaration

I declare that this research report is my own, unaided work. It is submitted in partial fulfilment of the requirements of a Master of Business Administration (MBA) degree in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this, or any other University.

Name of Student: Edmore T. Musasiwa

Signed: _____

Date: _____ **day of** _____

Dedication

I dedicate this work to my late parents Loice and Edson Tongesai Musasiwa.

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I would like to express my sincere appreciation to Professor Kalu Ojah for his guidance and patience as I put together this thesis. I would also want to show gratitude to the KZN Provincial Treasury for granting me a bursary to undertake this empowering programme. Furthermore, much appreciation is extended to my wife, Kudzai and my family for their support as I journeyed through this programme for the past two years. To my sister Angeline and her husband Joe Hundah, a big thank you for your support, again! To Simba Chitima and Edwell Chigangaidze, thank you so much for your invaluable assistance with my data collation. I would like to show appreciation to Claire Thibaud for providing proofreading assistance. Lastly, my profound gratitude goes to all my friends, family members and colleagues who continued to encourage me to soldier on.

Abstract

This paper contributes to the growing literature which examines the factors influencing financing decisions within corporates. Specifically, it investigates the effect of market structure on leverage in the BRICS and MINT economies. Both firm-level data from over 8100 listed companies and cross-country data of the BRICS and MINT economies, between 1994 and 2014, are used to examine the market structure and firm leverage nexus. Following previous work on the subject, panel data techniques are applied in assessing this relationship.

We begin by reaffirming the importance of the traditional firm-specific factors on leverage in the BRICS and MINT blocs. The results suggest that, when using total leverage as a dependent variable, growth opportunities and liquidity emerge important in explaining leverage across both blocs. However, with long-term leverage as a dependent variable, tangibility is more significant, particularly, in the BRICS bloc. We note that growth opportunities maintain their importance across the two blocs in fostering leverage. Also, within the BRICS countries, the effect of profitability on leverage appears significant in India and South Africa.

In the second phase of tests, macro variables are introduced. Across the two blocs, GDP and inflation effects are important in explaining the variation in leverage when total leverage and short-term leverage are dependent variables. In country regressions, both inflation and GDP present varied results. For instance, GDP seems to support higher leverage in the Chinese economy, while inflation negates debt financing in Russia and Nigeria.

In the third phase, the effects of market structure on leverage are examined. The results suggest that more developed and balanced market structures have weak nexus with firm leverage. In line with a priori expectations, the MINT economies are relatively less developed and much of their variation in leverage is influenced by this slanted market structure. MINT firms prefer more bank debt due to the relative lack of depth in their capital markets. On the other hand, the BRICS countries have more developed capital markets which seem to weaken the relationship between market structure and corporate leverage.

Finally, this relationship is tested across industry types. The results show that industry type is germane to the market structure and leverage relationship examination. Consequently, market structure influence becomes more varied across the blocs and the industry types. It is evident that the credit market is more important in supporting the variation in leverage within the MINT

economies, particularly for consumer discretionary, financials, industrials and materials industry types. Within the BRICS bloc, capital markets are more significant in the communications and utilities sectors.

1. INTRODUCTION

For decades, the effect of financial leverage on a firm's performance has drawn huge interest from financial economists. In spite of extensive research on the subject, the capital structure puzzle as posed by Myers (1984, p. 575), "*How do firms choose their capital structure?*", remains unresolved. In an attempt to solve the mystery, notwithstanding the seminal work by Modigliani & Miller, (1958), several studies have suggested frameworks such as the static trade-off agency and pecking order theories, among others, to be able to explain the variation of leverage in firms. To emphasise the extent of the unsettled debate, it is noted that the static trade-off theory suggests that optimal leverage is established when a firm attempts to balance its tax advantages of debt vis-à-vis potential bankruptcy costs (Kraus & Litzenberger, 1973; Miller, 1977). This view suggests that firms should have high leverage in their capital structure in order to maximise the tax advantage. On the other hand, the pecking order theory ignites anew the debate by suggesting that, when the requirement for external finance is apparent, management would rather take up debt to equity due to lower information costs related to debt (Frank & Goyal, 2003).

In the 1980s, the theories developed were predicated on information asymmetry to resolve the puzzle. The pecking order theory is one strand of literature that assumes information asymmetry and also suggests that firms do not have a target leverage ratio. More recently, a new pecking order theory was created using managerial optimism (Heaton, 2002). To reduce adverse selection, this theory suggests that firms resort to external equity capital, as a last resort, if retained earnings and debt are insufficient. Market timing is another approach which is also seen as a financial strategy of issuing equity when its value is high and repurchasing it at lower prices. By exploiting this strategy, Baker and Wurgler (2002) posit that managers could minimise the cost of capital.

Lately, the literature has shifted to attest that firm leverage is explained by firm- and country specific determinants. For example, many authors find that both country- and firm-specific factors have a major role in influencing firms' determination of leverage (e.g. Anderson, Mansi, & Reeb, 2003; Baker & Wurgler, 2002; Bancel & Mittoo, 2004; Delcours, 2007). Various theoretical frameworks have also been developed to explain capital structures across countries (e.g. Bancel & Mittoo, 2004; Booth, Aivazian, Demircug-Kunt, & Maksimovic, 2001; Rajan & Zingales, 1995).

Other studies find debt structure to be more important vis-à-vis the capital structure in African countries as more firms rely on debt to fulfil their external funding requirements (Ojah & Gwatidzo, 2009; Ojah & Pillay, 2009; Rajan & Zingales, 1995). In these economies, debt financing emerges as

the predominant choice as the equity markets are thinly traded. Other scholars also argue that, in these economies, preference for bank debt is a function of legal and political infrastructures as well as macroeconomic stability (Gwatidzo & Ojah, 2014).

Two major gaps are identified in the theory relating to capital structure. First, it is clear that not much is articulated on the importance of the market structure in explaining firm leverage. Similar studies on this aspect are those by Antoniou, Guney, and Paudyal (2008) and Rajan and Zingales (1995), which investigate the importance of market- or bank-based economies to capital structure in the G5 and G7 economies, respectively¹. As noted before, not much, if any, is articulated on the impact of market structure on leverage in developing and emerging economies. Second, following Miao (2005), MacKay and Phillips (2005) and Antoniou et al. (2008) who highlight the relevance of industry in capital structure, it is to add to the literature on the industry nuanced effects on the BRICS and MINT² economies. It is observed that theory has evolved from testing the above theories to investigating firm-, and country-specific determinants of leverage. This paper, seeks to enhance the literature, particularly by investigating the effect of market structure on leverage in the BRICS and MINT economies.

The hypothesis is that a more developed and balanced market structure will result in a weak nexus with firm leverage. This is because managers will have an option of either borrowing long-term debt from financial institutions or raising equity on the capital market. On the contrary, it is postulated that a less developed and slanted market structure will have a strong influence on the nexus with leverage. In this case, firms seeking external financing would be limited to banks as a source of long-term capital.

1.1 Purpose of the study

This study seeks to add to the existing body of knowledge on capital structure. Specifically, the determinants of firm leverage are investigated. We particularly test the effect of market structure on

¹ These are the only studies closest to our work and were based on advanced economies. No study, at least to our knowledge, explicitly focuses on the effects of financial market structure in emerging or developing economies.

² The BRICS acronym stands for Brazil, Russia, India, China and South Africa while MINT denotes Mexico, Indonesia, Nigeria and Turkey.

leverage in the BRICS and MINT economies, an area that has not received much attention in this subject. The paper also seeks to examine the industry nuanced effects on leverage in these economies. This analysis will be done by exploiting various econometric techniques on pooled data from BRICS and MINT economies.

1.2 Context of the study

This section defines key concepts, terms and institutions that will be discussed in this paper. Also contextualise the significance of the BRICS and MINT economies are contextualised.

1.2.1 Leverage

Leverage refers to the amount of debt in the capital structure of an institution. Modigliani and Miller (1963) and Miller and Modigliani (1966) show that the firm is value is related to leverage due to the interest deductibility of debt.

1.2.2 Market structure

This captures the level at which the financial system performs its financial intermediary roles. In economies that have a strong market inclination, such as the US, Canada and the UK, the capital markets are an important source of capital (equity) for companies. On the contrary, the bank-based economies, such as Germany, Italy, Japan, and France, also play an important role of supplying financing for companies in the form of long-term debt. Antoniou et al. (2008) argue that the orientation of a financial market, bank or capital market-based, has implications on the capital structure decision, as these two are the major sources of funding for firms.

1.2.3 BRICS countries

BRICS stands for Brazil, Russia, India, China and South Africa. Prior to 2010, this group of emerging economies excluded South Africa. Although these five countries' political and economic profiles are dissimilar, their growth and sizeable population have increased their influence in both regional and global political and economic affairs. In 2014, the population of these economies represented about 40 per cent of the world's population. Their economic output contributed about 20 per cent to the world's GDP. Table 2 below summarises some macroeconomic data for the BRICS economies.

Table 1: Selected macroeconomic statistics for BRICS countries in 2012

		GDP (constant 2005 US\$ billion)	GDP growth (annual %)	GDP per capita (constant 2005 US\$)	Trade (% of GDP)	Current account balance (% of GDP)	Inflation (annual %)
2012	Brazil	1 138	1.0	5 730	26.6	-2.4	5.4
2012	Russia	981	3.4	6 849	51.9	3.5	5.1
2012	India	1 389	4.7	1 123	54.7	-4.9	9.3
2012	China	4 517	7.7	3 345	51.8	2.6	2.7
2012	S. Africa	308	2.5	5 885	61.8	-5.2	5.6
	Average	1 667	3.9	4 586	49.4	-1.3	5.6

Source: World Development Indicators (2015)

1.2.4 MINT countries

This acronym refers to Mexico, Indonesia, Nigeria and Turkey. There is increased interest from especially economists and investors over this grouping. In this study, we examine the differences, if any, of the effects of leverage on bank performance and ultimately the stability of the banking system. Table 1 shows selected macroeconomic data for the MINT economies.

Table 2: Selected macroeconomic statistics for MINT countries in 2012

		GDP (constant 2005 US\$ billion)	GDP growth (annual %)	GDP per capita (constant 2005 US\$)	Trade (% of GDP)	Current account balance (% of GDP)	Inflation (annual %)
2012	Mexico	1 031	4.0	8 532	66.4	-1.3	4.1
2012	Indonesia	428	6.3	1 732	50.1	-2.8	4.3
2012	Nigeria	174	4.3	1 030	44.4	4.4	12.2
2012	Turkey	628	2.1	8 483	57.8	-6.1	8.9
	Average	565	4.2	4 945	54.7	-1.5	7.4

Source: World Development Indicators (2015)

1.3 Problem statement

The research problem is to investigate the effect that market structure has on financial leverage in the BRICS and MINT economies. Following Miao (2005), MacKay and Phillips (2005), Aggarwal and Zhao (2007) and Antoniou et al. (2008), it is further aimed to tease out the extent to which industry effects impact on influence of market structure on leverage, particularly in emerging economies. As argued by Modigliani and Miller (1963), the value of a firm is significantly driven by leverage due to

the tax deductibility of interest³. As can be seen, capital structure ultimately has an impact on firm performance, and managers need to be aware of the factors driving leverage in order to maximise shareholder wealth.

1.4 Significance of study

As mentioned above, a few studies have investigated the effects of financial structure on leverage. Those that exist (e.g. Antoniou et al., 2008; Rajan & Zingales, 1995) focus on advanced economies, particularly the G5 and G7 groupings. This study thus seeks to add to the existing body of knowledge on capital structure, with particular focus on the importance of market structure on leverage in the BRICS and MINT economies.

³ Also referred to as the debt-tax shield (e.g. Arzac & Glosten, 2005; Kemsley & Nissim, 2002; Miller, 1977).

2. LITERATURE REVIEW

2.1 Introduction

Even after the seminal work by Modigliani and Miller (1958), there is still no consensus on the factors that influence leverage. This seems to suggest the existence of other nuances which need further investigation. This section reviews some of the germane theories of capital structure, such as the (i) static trade-off, (ii) agency, (iii) pecking order, and (iv) market timing theories. It also reviews important literature on capital structure effects and the evolution of some of the antecedent arguments on the subject. Finally, this section concludes by exploring the prevalent firm- and country-specific determinants of leverage.

2.2 Capital Structure Theories

2.2.1 Static trade-off theory

The static trade-off theory has been applied by many scholars on corporate structure research. It states that managers' choice of debt is a function of benefits versus the costs of such financing. The free cash flow theory suggests that firms resort to equity issues if their current leverage ratio exceeds target. On the contrary, the choice of debt capital is triggered when a firm's leverage is below the target (also see, Huang & Ritter, 2005). Miller (1977) also documents that optimal leverage is established when a firm attempts to balance its tax advantages of debt against potential bankruptcy costs. This view suggests that firms should have high leverage in their capital structure in order to maximise the tax advantage. Given this assertion, the higher the firm size, tangibility and profitability, the greater the tax benefits of debt which, in turn, influences higher leverage for such firms (Jöeveer, 2013).

2.2.2 Agency theory

The agency theory proffers further support for the inclusion of debt in a firm's capital structure in order to minimise total agency costs. Jensen and Meckling (1979) propose that total agency costs are made up of two types of conflicts, namely between (i) shareholders and management, and (ii) shareholders and bondholders. Conflicts between managers and shareholders is best captured by the Jensen (1986) "*free cash flow hypothesis*". The *free flow hypothesis* arises when managers over-invest in unprofitable projects as their compensation and perquisites are linked to the number of investments and even the size of the firm. This agency problem can be curbed by limiting the

discretionary spending on wasteful projects by managers (Jensen, 1986; Stulz, 1990) through debt caveats. In addition, Fama and French (2002), Frank and Goyal (2009) and Jensen and Meckling (1979) argue that debt mitigates the principal-agent conflicts because it acts as a monitoring mechanism which instils discipline in management as they fear bankruptcy.

An agency cost of debt is another type of conflict that exists between shareholders and bondholders due to asset substitution or a risk shifting problem. This conflict-type arises due to shareholders using debt to invest in projects that are otherwise riskier than those currently held by the firm (Anderson et al., 2003). In this case, shareholders tend to gain more when the riskier projects pay off, while bondholders lose more if these investments fail (e.g., Jensen & Meckling, 1979). Similarly, the option pricing framework illustrates the source of conflict between these two groups. It suggests that shareholders take a long position in assets and exercise their option if the value of the asset is greater than exercise value – value of the debt claim (Anderson et al., 2003).

In order to avoid risk shifting, bondholders usually insist on debt covenants. However, the monitoring and enforcement mechanisms for preventing shareholders from pursuing risky investments are usually unsustainable. This results in bondholders requiring a higher premium as an insurance of the additional risk. While non-market finance enhances corporate governance through debt covenants, debt may exacerbate agency costs (Stulz, 1990). Larger and highly leveraged firms are more susceptible to such conflicts which may arise from the issuance of excessive dividends, asset substitution, under-investing and the issuance of senior debt, among others (Smith Jr & Warner, 1979).

The effect of ownership concentration on leverage becomes important when discussing the agency theory. Firms with highly concentrated ownership have reduced agency costs between shareholders and firm management, making equity issues easier (Merika, Theodoropoulou, Triantafyllou, & Laios, 2015). This negative correlation between ownership concentration and leverage is similar to findings by Tsionas, Merikas, and Merika (2012). Moon and Tandon (2007) observe that *free cash flow hypothesis* tendencies, where managers derive utility from excessive investment and unnecessary expenditure on organisational inefficiencies, are reduced significantly with higher ownership concentration. They find a more robust relationship between the ownership structure and leverage, especially in respect of companies with diminished growth opportunities. High leverage can thus be used to reduce wastage of free cash flow by managers due to greater likelihood of financial distress and liquidation (Grossman & Hart, 1982).

2.2.3 Pecking order theory

The pecking order theory is a parsimonious and descriptive model employed by many researchers to explain the variation in firm leverage (Frank & Goyal, 2003). It considers primarily retained earnings, debt and equity, respectively, as sources of finance that are available to the firm. In considering which source to employ, Myers (1984) observes that adverse selection influences firms' preferences to internal vis-à-vis external finance. This is in support of the pecking order theory which suggests that, if the requirement for external finance is apparent, management would rather take up debt to equity due to lower information costs related to debt (Frank & Goyal, 2003).

A myriad of studies find the pecking order to be relevant, particularly for high growth firms. However, Smith Jr and Watts (1992) and Helwege and Liang (1996) argue that the pecking order is not always followed. For instance, large companies with huge capital outlays can raise considerable sums of capital via an IPO. Furthermore, firms disregard the bank debt option in some cases, as a certain elitist status is bequeathed to the management of listed firms. Also, firms that are listed on the stock exchange exude some level of maturity that may be attractive to investors.

Many researchers have done a comparative analysis of the static trade-off and the pecking order theories in determining leverage. Leary and Roberts (2010) and Frank and Goyal (2003) interestingly find that the pecking order theory is less conclusive in explaining the firm's financing choice. Using a sample of US firms, De Jong, Verbeek, and Verwijmeren (2011) find that the pecking order theory better explains firms' debt issue decisions. However, they determine that the static trade-off theory emerges more important when repurchasing decisions are considered.

2.2.4 Market Timing Theory

Market timing is a financial strategy of issuing equity when its value is high and repurchasing it at lower prices. Baker and Wurgler (2002) posit that the major objective of such a strategy is to exploit temporary inconsistencies in the cost of equity when compared to other sources of capital. The ability of firms to alter the capital structure in such a manner makes market timing an important determinant of leverage. Other studies also find a positive long-run performance of equity and corporate finance decisions involving market timing.

Similar to Baker and Wurgler (2002), Huang and Ritter (2005) find that companies tend to fund a greater part of their financing deficit with net external equity when equity risk premium is lower. This theory dismisses the pecking order theory by suggesting firms resort to many equity issues before due consideration is given to retained income and debt issues, respectively. They also

observe that the market timing theory contradicts the static trade-off theory due to firms' slow adjustment towards the target capital structure.

2.3 Capital structure and firm efficiency

The effect of efficiency on leverage is, to a large extent, captured by two competing hypotheses – the *efficiency-risk* and the *franchise-value* one. Under the *efficiency-risk hypothesis*, firms tend to assume higher debt ratios, as higher levels of efficiency lower the expected costs of bankruptcy and financial distress. The *franchise-value hypothesis*, on the other hand, supposes that firms opt for lower debt ratios to shield economic rents accumulated from greater efficiency from the likelihood of liquidation (Berger & Udell, 2006). Margaritis and Psillaki (2007) define firm efficiency as the deviation from industry best practice production curve. Using quantile regression techniques, they find a positive relationship between firm efficiency and leverage.

2.4 Choice of capital and business cycles and market crashes

Some scholars have investigated the effects of the traditional determinants of leverage over business cycles. Merika et al. (2015) explore the preference of capital structure by observing the relationship between leverage and profitability over the four phases of the shipping business cycle. They identify a bi-directional positive association between leverage and profitability during the peak phase. Their finding augments previous research which attributed profitability to be the main driver of leverage. Merika et al. (2015) also posit that higher equity ensures profitability in all the business phases, adding to the inconclusive nature of the static trade-off theory. These authors also argue that better prospects may be realised when firms are able to predict a downturn and raise sufficient cash in the form of debt.

It would seem that industry type is important in determining leverage over business cycles. Campello (2003) finds that debt financing impacts negatively on sales growth in industries in which the rival firms are relatively unlevered, specifically in recessionary periods. He finds no relationship between leverage and high debt industries in all phases of the business cycle. Also, consistent with Chevalier and Scharfstein (1994), the effect of business cycles on leverage may not be directly observable, particularly when firms that are intricately dependent on external financing are able to predict recessions and respond timeously by cutting back on bank debt.

The financial market plays a very significant role in the provision of debt and equity capital. When the relationship is very strong between financial institutions and firms, the occurrence of financial

crises may cause bankruptcies for several highly levered firms. The Asian financial crisis of the mid-1990s led to the collapse of several firms that were dependent on external finance. Kim, Heshmati, and Aoun (2006) observe that, not only were firms innately dependent on external financing affected during the crisis, but highly levered firms incurred massive restructuring costs *ex post*.

The financial crises do not only result in liquidity challenges in the financial market, but may reveal other institutional and structural flaws in the economy. For instance, during the Korean crisis of 1997, “chaebol firms” with poor corporate governance practices such as concentrated shareholding in families, as well as those with voting rights that surpassed cash flow rights, experienced a decline in the value of their companies (Baek, Kang, & Park, 2004). In addition, these authors observe that firms that were exposed to the main banks experienced lower returns. During periods of financial turmoil, financing choices are severely constrained. The greatest worry becomes that of survival and lack of good corporate governance exacerbates the likelihood of bankruptcy.

2.5 Determinants of leverage

This section, reviews from the literature prominent factors influencing corporate leverage. The drivers are predominantly split into two groups - firm- and country-specific factors. Each of these will be discussed in return.

2.5.1 Firm-specific determinants

Table 3 summarises the firm-specific determinants of financial leverage prevalent in the literature (e.g., Frank & Goyal, 2009; Huang, 2006). The remainder of this section, we reviews other firm-specific determinants commonly tested in empirical studies. Most of the priori expectations of the factors are consistent with those captured by Huang (2006).

Table 3: Summary of determinants of capital structure as per literature

Factor	Definition	Theoretical predicted signs	Major empirical studies results
Profitability	Earnings before interest and tax / total assets	+/-	-
Size	Ln of sales	+/-	+
Tangibility	Fixed assets / total assets	+	+
Tax	Effective tax rate	+	+
Non-debt tax shields	Depreciation and amortisation / total assets	-	-
Growth opportunities	Tobin's Q	-	-
Volatility	Standard deviation of earnings before interest and tax	+/-	-
Managerial ownership	Shareholding of directors, supervisors and top management	+/-	+/-
Ownership structure	Institutional shareholding	?	?

Source: Huang (2006)

Notes: + denotes that leverages increases with this factor.
- denotes that leverage will decrease with this factor.
+/- denotes that leverage increases or decreases with this factor.
? denotes that no clear prediction from the literature exists.

- a) **Profitability** – Higher profitability minimises the probability of financial distress and its related costs. Frank and Goyal (2009) postulate that the tax and bankruptcy view will induce profitable firms to employ higher debt. The agency costs theory also suggests that variation in leverage may be explained by profitability ensured by the debt covenants. However, the pecking order theory presents a contrasting view with regards to preference of external finance. It is supposed that it is more likely for a profitable firm to use internal funds resulting in lower leverage, *ceteris paribus*.
- b) **Tangibility** – is a ratio of net fixed assets to book value of total assets. The value of fixed assets is a key factor for firms to obtain external financing. The fixed assets act as collateral enabling the firm to source financing at a cheaper rate (Rajan & Zingales, 1995).
- c) **Tax** – The impact of tax on the capital structure grew in importance after the study by Modigliani and Miller (1958). There is now consensus among researchers that the higher the effective tax rate, the higher the interest tax advantage as postulated in the static trade-off theory. It then follows that firms that wish to benefit from the tax-shield should increase their leverage. However, this is not always the case, as the presence of non-debt tax shields can influence lower leverage.
- d) **Size** – A number of studies use the natural log of total assets as a proxy for size (e.g., De Jong, Kabir, & Nguyen, 2008; Delcours, 2007; Frank & Goyal, 2009). Banks have a higher appetite to lend to larger and more diversified firms as they are less susceptible to bankruptcy. In some cases, these firms may have more bargaining power over external

financiers, resulting in more favourable costs. On the contrary, Huang (2006) observes a negative relationship between size and leverage which he argues emanates from greater economies of scale, thus reducing the need for large firms to issue long-term debt. Additionally, large firms tend to have less information asymmetry which may result in less debt in their capital structure.

- e) **Non-debt tax shields** – Non-debt tax shields are proxied by depreciation and amortisation expense, investment tax credits, and net operating loss carry forwards. Firms that have higher non-debt tax shields will, on average, have less leverage. Heshmati (2001) observes that companies take advantage of interest tax shields when there is adequate taxable income to incentivise the issuing of debt. In such a case, Kim et al. (2006), argue that the presence of other non-debt tax shields may result in lower optimal leverage.
- f) **Growth opportunities** – Frank and Goyal (2009) argue that there is a positive relationship between growth and the cost of bankruptcy. They further state that this will, in turn, reduce free cash flow problems, yet agency costs may escalate. As investor sentiment is buoyant about the firm's future growth opportunities, the static trade-off theory posits that leverage will reduce. The growth opportunities variable is proxied by different constructs as market value of total assets to book value of total assets (De Jong et al., 2008), geometric average of five-year sales growth to total assets (Delcours, 2007), Tobin's Q (Huang, 2006; Rajan & Zingales, 1995), and market-to-book ratio of equity (Booth et al., 2001).
- g) **Volatility** – is defined as business risk and is a proxy for the likelihood of bankruptcy and its priori expectation is negative to leverage. Various constructs are used to capture business risk such as the standard deviation of return on sales (Booth et al., 2001).
- h) **Liquidity** – is measured by total current assets to total current liabilities. In line with the pecking order theory, firms with higher liquidity are expected to accumulate less debt. On the other hand, a negative relationship is plausible as per the agency theory. Agency conflicts are more likely to arise when managers manipulate liquid assets in favour of shareholders (Deesomsak, Paudyal, & Pescetto, 2004). Work by Smith (2012) standardises current assets with total assets to proxy for the firm's liquidity.

2.5.2 Country-specific effects

In addition to firm-specific factors, other empirical studies suggest that country-specific effects are important in explaining the variation in leverage (e.g., Bancel & Mittoo, 2004; Jõeveer, 2013; Rajan & Zingales, 1995). In particular, Jõeveer (2013) finds that country-specific factors result in significant variation in leverage for listed and large unlisted firms. When contrasting the impact of the

categories of determinants (firm- and country-specific), Jõeveer observes that, for smaller companies, firm-specific determinants explain most of the variation in leverage. Country-specific factors that influence leverage significantly include, *inter alia*, real GDP, interest rates, taxes and inflation.

Gross domestic product (GDP) is a commonly used proxy to capture economic activity in the country. De Jong et al. (2008) find a positive relationship between GDP and leverage. This is inconsistent with observations by Kayo and Kimura (2011) and Jõeveer (2013) who find a negative relationship. In order to control for country size, GDP is also used to standardise many variables.

Jõeveer (2013) uses inflation and observes its negative relationship with leverage. It is noted that empirical results of inflation have been inconsistent. For instance, Frank and Goyal (2009) find a positive relationship between inflation and leverage. Interest rate is observed to have similar effects as the inflation rate (e.g. Deesomsak et al., 2004).

2.6 Conclusion of Literature Review

From the above review, it seems that the theory, still, fails to resolve the capital structure puzzle as posed by Myers (1984). Even though most work on the capital structure explores the relevance of the static trade-off, agency, pecking order, and market timing theories, their application was predominantly on developed economies. Two major gaps are identified in the theory relating to capital structure, which are translated to the following research questions.

2.6.1 Do the traditional determinants of leverage matter in BRICS and MINT economies?

Firstly, the nexus of the traditional determinants of capital structure to leverage in BRICS and MINT economies needs to be determined. These determinants are inclusive of both firm- and country-specific factors.

2.6.2 Effects of market structure on firm leverage in BRICS and MINT economies?

Next, the importance of the market structure in explaining firm leverage needs to be determined. Studies on this aspect; e.g. Antoniou et al. (2008) and Rajan and Zingales (1995), focused on developed economies. Not much, if any, is articulated on the impact of market structure on leverage in developing and emerging economies.

2.6.3 Does industry matter in determining leverage in BRICS and MINT economies?

Finally, following Miao (2005), MacKay and Phillips (2005), Aggarwal and Zhao (2007) and Antoniou et al. (2008) who highlight the relevance of industry in capital structure, the industry nuanced effects on the impact of market structure on leverage lack on the BRICS and MINT⁴ economies, thus we it is aimed to investigate them in this work.

⁴ The BRICS acronym stands for Brazil, Russia, India, China and South Africa while MINT denotes Mexico, Indonesia, Nigeria and Thailand.

3. RESEARCH METHODOLOGY

3.1 Empirical Model

This section presents the theoretical framework that is employed in this study. First, the consistency of traditional determinants of leverage in BRICS and MINT economies is reaffirmed. Second, we test the effect of market structure on leverage is tested. Third, it is aimed to tease out the effects of industry effects on the choice of financing. The theories narrated above assist in the determination of *a priori* expectations and sufficient tests assist in explaining major deviations.

This paper, hypothesises that a more developed and balanced market structure will result in a weak nexus with firm leverage. This is because managers will have an option of either borrowing long-term debt from financial institutions or raising equity on the capital market. On the contrary, it is postulated that a less developed and slanted market structure will have a strong influence on the nexus with leverage. In this case, firms seeking external financing would be limited to banks as a source of long-term capital. It is also hypothesised that the industry matters in the determination of leverage while controlling for firm- and country-specific effects.

In this study, panel data analysis is applied. Panel data techniques enable the capturing of both longitudinal and cross-sectional measures (Daskalakis & Psillaki, 2008). Hsiao (2003) identifies many advantages of using this technique, some of which are discussed hereafter. First, panel data analysis increases the number of observations which results in larger degrees of freedom. Second, it reduces co-linearity among the explanatory variables, thus improving their explanatory power. Third, the efficiency of the variables improves significantly, as indicated by a smaller standard error of estimate when using panel data regression, compared to the Ordinary Least Squares method (OLS) (Petersen, 2009).

The panel data methodology captures the dynamic effects of the variables which enable the determination of a more accurate behaviour of each explanatory variable. The importance of market structure, firm- and country-specific variables and industry effects on leverage is best captured using pooled methods. These techniques also eliminate microeconomic dynamics as promoted in a pure time series approach. This approach allows for an investigation of heterogeneity adjustment dynamics between different firms and even across countries (also see Bond, 2002).

The model that was used is similar to many studies on capital structure (e.g., De Jong et al., 2008; Islam & Khandaker, 2014; Nyamita, Garbharran, & Dorasamy, 2014). Based on the theory on leverage, the regression model can be illustrated as follows:

$$leverage = f(\sum market\ structure + \sum firm_specific\ factors + \sum macroeconomic\ factors). \quad (1)$$

This function can be represented more formally as follows:

$$Y_{it} = \alpha_0 + \sum_{k=1}^N \beta_k X_{kit} + \mu_{it} + \varepsilon_{it}, \quad (2)$$

where Y_{it} is a construct of financial leverage of firm i in year t . X denotes the explanatory variables of market structure, firm-specific and macroeconomic factors. μ indicates the unobserved factors, again for both firm-specific and macroeconomic, while α_0 represents the constant. β from $k = 1$ to N denotes the number of parameters to be estimated.

3.2 Variables

3.2.1 Dependent variable

Consistent with most studies, leverage is proxied by three constructs. First, book leverage (LEV) is calculated as book debt to total assets. For robustness, tests were run using short-term leverage (SLEV), which is short-term debt to total assets and long-term debt to total assets (LLEV). Other studies use market leverage which is defined as the book value of long-term debt to market value of total assets. De Jong et al. (2008) define market value of total assets as book value of total assets less book value of equity plus market value of equity. Frank and Goyal (2009) use book leverage as they argue that the high volatility in financial markets often reduces managers' confidence in financial leverage as a guide to organisations' corporate finance policies. Chen (2013) cites that managers' preference of book leverage is linked to the firm's assets versus its growth opportunities. Besides, book leverage can be utilised to include firms that are not listed (Brav, 2009).

Other scholars (e.g. Frank & Goyal, 2009; Knaup & Wagner, 2012) advocate use of market leverage as it shows a more realistic value of the listed firms' assets. Markets are more forward looking and thus market values give managers a more accurate futuristic view of their firms which are relevant to corporate finance decision making (Frank & Goyal, 2003, 2009).

Following studies by, for example, Booth et al. (2001), Hall, Hutchinson, and Michaelas (2004) and De Jong et al. (2008), we use long-term debt (LLEV) was used in the computing of the financial leverage. Other authors, such as Huang (2006), Jöeveer (2013), test both the long-term debt and

total debt as numerators of the leverage ratio. Caution is required when using total debt, as short-term debt is largely made up of trade credit which is influenced by different factors (De Jong et al., 2008).

3.2.2 Explanatory variables

This section, discusses the market structure, firm- and country-specific variables used in this study. To a large extent, the selection is influenced by the literature (for example, Beck, Demirgüç-Kunt, & Levine, 2010; De Jong et al., 2008; Frank & Goyal, 2003, 2009; Huang, 2006; Islam & Khandaker, 2014; Levine, 2002). Firstly, the market structure variables are discussed. Secondly, the firm-specific variables employed in this study are presented. Thirdly, the macroeconomic proxies are explained. This section is concluded by defining other control variables.

3.2.2.1 Market structure variables

3.2.2.1.1 Activity-based structure

Similar to Levine (2002), the stock value traded ratio (STVALUE) was used, which is equal to total value domestic equities traded divided by GDP to capture the activity in the stock market. A number of scholars also use this variable to proxy stock market liquidity (e.g. Allen, Qian, & Qian, 2005; Chinn & Ito, 2006). Alternatively, stock value turnover ratio (TURNOVER) is used which is trading relative to the market size (Levine, 2002). Alternatively, this variable may be used to proxy stock market efficiency. Bank credit (CREDIT) to the private sector, divided by GDP, is used to measure the activity in the bank-based market.

3.2.2.1.2 Size-based financial structure

Stock markets and banks play a pivotal role in providing capital for firms. Banks make up the most of part of financial systems, more so in emerging and developing markets (Beck et al., 2010). Stock market capitalisation to GDP (MKTCAP) captures the size of the equity market while private and public bond capitalisation depicts the value of outstanding securities issued by both private and public firms domiciled in the country to GDP. In this study, PUBOND denotes public bond capitalisation to GDP, while PVTBOND is equal to private bond capitalisation divided by GDP. Even though the bond market is either not present or is thinly traded, in many emerging and developing economies (Fostel & Geanakoplos, 2008; McCauley & Remolona, 2000), we assess its significance is assessed in BRICS and MINT countries. Levine (2002) uses total bank assets to GDP to capture the bank market size.

In order to examine the market structure effect on leverage, the section uses STTUNOVER_CREDIT_ASS under activity-based structure defined as stock turnover to private credit. A coefficient less than 1 signifies the importance of bank credit in determining leverage. On the other hand, a coefficient greater than 1 indicates the dominance of the stock market in determining leverage.

For the size-based analysis of the market structure, MKTCAP_CREDIT is used, defined as stock market capitalisation to private credit. A coefficient of greater than 1 signifies the importance of bank debt in determining leverage, while a value less than 1 depicts stock market dominance. An alternative form of this construct will include the public and private bond market MKTCAPBOND_CREDIT defined as total market and bond capitalisation to private credit.

3.2.2.2 Firm-specific variables

A myriad of proxies of the explanatory variables have been developed across different studies. In this study, profitability (PROFIT) is measured as operating profit to total assets⁵. Islam and Khandaker (2014) use earnings before interest, tax, depreciation and amortisation to total assets to denote profitability. As suggested by the pecking order theory, an inverse relationship between profitability and leverage is expected as firms prefer internal funds due to information asymmetry between management and external investors (Frank & Goyal, 2003; Islam & Khandaker, 2014; Myers, 1984). However, according to the static trade-off theory, profitable firms will prefer external debt to take advantage of the debt-tax shield (Jöeveer, 2013). Other scholars use different constructs to proxy for profitability. For instance, Chakraborty (2013) uses net annual cash flow to total assets, while Chang, Lee, and Lee (2009) use the ratio of operating profit to sales.

The ratio of fixed assets to total assets is used to proxy tangibility (TANG). Many studies using this variable indicated a positive relationship between tangibility and leverage. This is due to the minimum ease in which tangible assets can be used as collateral when firms seek debt financing. The agency theory is consistent with this relationship (Jensen & Meckling, 1979). Specifically, issuing long-term debt secured by tangible assets reduces agency conflicts. Other studies that test the relevance of tangibility to leverage are De Jong et al. (2008), Frank and Goyal (2009), and Chakraborty (2013). A slight variation is tested, specifically, by Islam and Khandaker (2014) who experiments with plant property and equipment to total assets.

⁵ Also see Huang (2006)

Tax (TAX) is taken directly from the financial statements. However, where it is unavailable, it is computed as taxation divided by profit before tax. Size (SIZE) is calculated as the natural logarithm of sales. Age (AGE) is calculated as the natural logarithm of the years since the firm was founded. This follows Jiménez, Lopez, and Saurina (2009) and Vithessonthi and Tongurai (2015), who use the same measure to proxy for the age of the firm.

Liquidity (LIQUID) is measured as total current assets divided by total current liabilities. Consistent with the pecking order theory, firms with higher liquidity are expected to accumulate less debt. On the other hand, a negative relationship is plausible as per the agency theory. Agency conflicts are more likely to arise when managers manipulate liquid assets in favour of shareholders (Deesomsak et al., 2004). The use of this variable is in line with other studies, such as De Jong et al. (2008). Other scholars, such as Smith (2012), standardise current assets with total assets to proxy for the firm's liquidity.

Non-debt tax shields (NDTS) is the ratio of depreciation and amortisation to total assets. Higher non-debt tax shields may result in less debt financing, due to the tax advantages already present. DeAngelo and Masulis (1980) argue that the tax benefits of depreciation are substitutable for debt advantages. As a result, firms with huge non-debt tax shields lack motivation to increase debt financing. Huang (2006) also finds a negative relationship between non-debt tax shields and leverage.

Growth opportunities (GROWTH) is the sum of the net book value of assets and market value of equity divided by total book value of assets (Chen, 2004; Deesomsak et al., 2004; Kayo & Kimura, 2011). Firms with high growth opportunities have an incentive to invest sub-optimally or accept projects with excessive risks which may result in conflict between shareholders and bondholders. The static trade-off theory suggests that firms with high growth opportunities derived from intangible assets will have less debt compared to firms with higher tangible assets (Chen, 2004). In this case, a negative relationship is expected between growth opportunities and leverage.

3.2.2.3 Country-specific variables

Gross domestic product (GDP) is a commonly used proxy to capture economic activity in the country. In this study, we use real GDP growth (GDP) is used to capture the extent of economic activity. Authors such as De Jong et al. (2008) find a positive relationship between GDP and the amount of debt in the capital structure. On the contrary, some researchers, such as Kayo and Kimura (2011)

and Jõeveer (2013), determine a negative relationship between GDP and the debt financing decisions.

Inflation rate (INFLATION) is measured as the rate of change of consumer price index. Jõeveer (2013) uses inflation and observes its negative relationship with leverage. It is noted that empirical results of inflation have been inconsistent. For instance, Frank and Goyal (2009) find a positive relationship between inflation and leverage. Interest rate (INTEREST) is observed to have similar effects as the inflation rate (e.g., Deesomsak et al., 2004), thus it is tested for their significance interchangeably.

3.3 Population and Sample

This study uses over 8100 listed firms from BRICS and MINT countries between 1994 and 2014. Bloomberg database is the main source of firm-specific data, while the World Development Indicators (WDI) database is exploited for country-specific data.

3.4 Limitation of the Study

The study is limited to an analysis of BRICS and MINT countries. It would have been interesting to observe the effect of a bigger sample of emerging economies. Also, with data permitting, future research may attempt to investigate the market structure-leverage nexus using a broader sample that includes unlisted firms. This will also increase the researcher's degrees of freedom as well as the reliability of the findings. In an attempt to balance the sample, some country-specific effects might be lost. For instance, the listed firms in China and India alone are innumerable, possibly leading to a masking of their peculiar effects.

4. RESULTS

This section presents the panel analysis estimates using over 8100 firms between 1994 and 2014. The tests results are presented in four tiers. The first set of results affirms the effect of firm-specific determinants on leverage in the BRICS and MINT economies. Second, the section summarises the findings of tests that include country specific determinants. Third, we present the results of the market structure-leverage nexus are presented. Finally, the results showing the importance of the industry in determining firm leverage are presented.

Table 4: Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
LEV	47432	22.951	20.579	-45.295	147.744
LLEV	48057	11.939	15.548	0.000	99.530
SLEV	46468	22.776	19.965	-37.684	99.997
mktcap_credit	42356	1.369	0.865	0.069	3.575
mktcapbond_credit	29150	2.018	1.079	0.135	4.480
stturnover_credit_ass	37750	89.842	51.852	2.960	285.367
Credit	51591	65.218	38.784	8.294	141.800
Stmktcap	42356	70.556	51.153	4.011	278.392
Profit	48838	0.045	0.087	-1.977	2.517
Size	48843	19.397	1.750	5.278	32.977
Tang	48832	31.970	23.221	0.000	133.485
Ndts	48834	2.436	2.881	-11.305	74.928
Liquid	45540	1.872	4.145	0.000	142.439
Growth	47967	101.891	96.001	-198.464	499.958
Inflation	50140	6.255	3.512	-1.408	17.863
Gdp	51557	6.100	3.939	-13.127	14.195

Table 4 presents the descriptive statistics for the variables used in this study. Table 5 shows that over 8100 firms were sampled. China, due to the sheer size of its economy, had the largest contribution of listed firms while Nigeria had the least, due its relative market size. Table 6 shows the sectoral distribution of our sample. Sectoral information assists in determining whether the industry matters in explaining the variation in leverage the BRICS and MINT economies.

Table 5: Distribution of firms by country

Country	Freq.	Percent (%)
BRICS	6805	83.71
Brazil	440	5.41
Russia	1689	20.78
India	1450	17.84
China	2485	30.57
South Africa	741	9.12
MINT	1324	16.29
Mexico	208	2.56
Indonesia	529	6.51
Nigeria	173	2.13
Turkey	414	5.09
Total	8129	100.00

Table 6: Distribution of firms by sector

Sector	Freq.	Percent	Cum.
Communications	165	2.03	2.03
Consumer Discretionary	1368	16.83	18.86
Consumer Staples	678	8.34	27.21
Energy	375	4.62	31.82
Financials	1238	15.23	47.05
Health Care	342	4.21	51.26
Industrials	1589	19.55	70.81
Materials	1377	16.94	87.75
Technology	575	7.08	94.83
Utilities	420	5.17	100.00
Total	8129	100	

Table 7 presents the pairwise-correlations between the variables. The table also confirms some of our *priori* expectations. The nature of these correlations justifies the basis for employing the different constructs of market structure.

Table 7: Correlation matrix

	LLEV	LEV	SLEV	mktcap _credit	mktcapbond _credit	stturnover _credit	credit	stmktcap	profit	size	tang	ndts	liquid	growth	inflation	gdp
LLEV	1															
LEV	0.6070*	1														
SLEV	0.6091*	1.0000*	1													
mktcap_credit	0.1267*	-0.0816	-0.0820*	1												
mktcapbond_credit	0.1916*	-0.0675*	-0.0697*	0.9441*	1											
stturnover_credit	-0.0611*	0.0122*	0.0127*	0.4340*	-0.5513*	1										
credit	-0.2169*	-0.0795*	-0.0795*	0.4642*	-0.6399*	0.3633*	1									
stmktcap	-0.0075	-0.1293*	-0.1296*	0.6846*	0.5578*	-0.1823*	0.1995*	1								
profit	-0.0385*	-0.0671*	-0.0600*	0.0438*	0.1065*	-0.1609*	-0.0340*	0.0660*	1							
size	0.1169*	0.0555*	0.0652*	0.0868*	-0.0173*	-0.0256*	0.1719*	0.0172*	0.0164*	1						
tang	0.3018*	0.1777*	0.1808*	0.0293*	-0.0053	-0.0530*	-0.0805*	-0.0488*	0.0511*	-0.0258*	1					
ndts	0.1076*	0.1566*	0.1557*	0.0156*	0.0793*	-0.1145*	-0.1477*	-0.0647*	0.1940*	-0.0228*	0.3253*	1				
liquid	-0.0692*	-0.1688*	-0.1719*	0.0341*	-0.0118	0.0555*	0.0244*	-0.0242*	0.0428*	-0.1108*	-0.0772*	-0.0387*	1			
growth	-0.2383*	-0.1591*	-0.1467*	0.1205*	-0.1373*	-0.0755*	0.1130*	-0.0490*	0.3419*	-0.0206*	0.0103*	0.1189*	0.1189*	1		
inflation	0.1232*	-0.0127*	-0.0140*	0.3144*	0.3866*	-0.2179*	-0.6521*	-0.0708*	-0.0279*	-0.1554*	0.0296*	0.0268*	-0.0221*	-0.1982*	1	
gdp	-0.0453*	-0.0166*	-0.0138*	0.1838*	-0.4570*	0.2508*	0.4603*	0.0811*	-0.0454*	0.0675*	0.0304*	-0.1326*	-0.0062	0.0382*	-0.3585*	1

Notes: * are significant at 5%

This study uses three different constructs for leverage. First is total leverage (LEV), which is the ratio of total debt to total assets. This is similar to the book leverage variable used by Rajan and Zingales (1995). Second is short-term leverage (SLEV), which is the ratio of short-term debt to total assets. The third form of the variable is denoted as long-term leverage (LLEV), which is a ratio of long-term debt to total assets. Table 8 summarises the extent of leverage in the different economies. All three leverage types are higher in the BRICS economies. The BRICS economies appear to be more attuned to using long-term debt to meet their external financing requirements. This may also indicate more robust institutional frameworks in these economies, resulting in better enforcements of legal agreements. Also, the lower total debt ratios in the MINT economies point to less developed non-bank debt markets.

Table 8: Leverage ratios (1994-2014)

Country	No. of firms	Leverage (LEV)		Short Term Leverage (SLEV)		Long Term Leverage (LLEV)	
		<i>Mean</i>	<i>Median</i>	<i>Mean</i>	<i>Median</i>	<i>Mean</i>	<i>Median</i>
Brazil	440	27.5	27.1	27.4	27.2	16.6	13.7
Russia	1689	21.2	14.6	20.9	14.7	9.7	1.5
India	1450	28.7	26.6	28.4	26.5	22.4	19.2
China	2485	20.8	17.2	20.8	17.2	6.4	1.8
South Africa	741	17.7	13.6	17.5	13.5	10.3	4.8
<i>BRICS Average</i>		<i>23.2</i>	<i>19.8</i>	<i>23.0</i>	<i>19.8</i>	<i>13.1</i>	<i>8.2</i>
Mexico	208	22.7	20.2	22.8	20.3	14.6	10.8
Indonesia	529	25.9	22.5	25.3	22.5	13.8	6.7
Nigeria	173	14.6	7.8	14.4	7.5	6.1	0.0
Turkey	414	23.2	18.8	22.9	18.9	8.7	3.0
<i>MINT Average</i>		<i>21.6</i>	<i>17.3</i>	<i>21.4</i>	<i>17.3</i>	<i>10.8</i>	<i>5.1</i>
<i>Sample Average</i>		<i>23.0</i>	<i>18.8</i>	<i>22.8</i>	<i>18.8</i>	<i>11.9</i>	<i>5.4</i>

4.1 Firm-specific effects

Table 9 summarises the analyses regarding firm-specific determinants for the entire sample. It was found that profitability negatively influences leverage for the BRICS and MINT economies. This finding is robust across all constructs of leverage. This is, however, contrary to most studies (e.g. Deesomsak et al., 2004; Frank & Goyal, 2009; Huang, 2006; Miller, 1977) which find that profitability positively influences leverage. The negative relationship confirms the pecking order theory, which suggests that firms with higher profitability would prefer to deploy internal funds to external debt (see e.g. Baltaci & Ayaydin, 2014). Also, this result contradicts the trade-off theory which gives a positive a priori expectation.

Table 9: Effect of firm specific determinants on leverage on entire sample

	LEV	SLEV	LLEV
Profit	-16.254*** (1.778)	-15.078*** (1.588)	-3.488*** (1.291)
Size	2.587*** (0.229)	2.676*** (0.226)	1.611*** (0.170)
Tang	0.096*** (0.014)	0.098*** (0.013)	0.097*** (0.012)
Ndts	0.180*** (0.063)	0.117** (0.058)	0.085* (0.048)
Liquid	-0.270*** (0.055)	-0.266*** (0.055)	0.076*** (0.020)
Growth	-0.047*** (0.002)	-0.044*** (0.002)	-0.025*** (0.001)
Constant	-21.510*** (4.523)	-23.617*** (4.489)	-19.628*** (3.356)
Observations	40,947	40,026	40,522
R-squared	0.114	0.115	0.053
Number of firms	7,481	7,437	7,456
F-test	193.6	196.1	95.26
Prob > F	0.000	0.000	0.000

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Size, tangibility and non-debt tax shields emerge positively related to leverage. This is consistent with other studies (see e.g. De Jong et al., 2008; Huang, 2006; Jöeveer, 2013) which identify size as a positive factor in influencing leverage. The larger the firm, the lower the likelihood of financial distress and agency costs. Larger firms are more likely to use debt to meet the financing

requirements when compared to smaller companies. On the other hand, this finding contradicts the pecking order theory which suggests that larger firms prefer internal resources. Rajan and Zingales (1995) and Titman and Wessels (1988) observe this negative relationship.

While this study notes a positive influence of asset tangibility on leverage (similar to Dang, 2013; Deesomsak et al., 2004; Frank & Goyal, 2009; Huang & Song, 2004), the pecking order theory observes a negative one. In line with the trade-off theory, firms with higher tangible assets are more likely to stave-off bankruptcy and financial distress costs, suggesting the positive relationship.

The non-debt tax shields' positive influence on leverage seem to suggest that the higher the non-debt tax shields, the higher the propensity to employing debt to meet external financing needs. Scholars such as Dang (2013) make a similar observation. However, Deesomsak et al. (2004) and Huang (2006) find that non-debt tax shields act as a replacement of the debt tax shield, thus a negative relationship with leverage is found.

Table 9 shows that both liquidity and growth are negatively significant in determining leverage. This is largely robust across the different constructs of leverage. This could arise as firms shun debt financing so as to mitigate against debt overhang effects and adverse selection costs of external debt (Smith, 2012). Similar findings are confirmed in other empirical studies (e.g. Deesomsak et al., 2004; Smith, 2012). When using long term leverage, akin to Gungoraydinoglu and Öztekin (2011), a positive relationship was found between liquidity and leverage.

The negative relationship found between growth opportunities and leverage is in line with the agency and static trade-off theories. This is due to the muted likelihood of corporate distress as firms expand from capitalising on growth opportunities. This observation is similar to Huang (2006), Antoniou et al. (2008), De Jong et al. (2008), Gungoraydinoglu and Öztekin (2011) and (Dang, 2013). Other scholars observe a positive relationship as firms seek to exploit growth opportunities using external debt (e.g. Chang et al., 2009; Chen, 2004; Daskalakis & Psillaki, 2008).

4.1.1 Firm-specific results – BRICS vs. MINT

Table 10 summarises the results for the regressions for specific determinants for BRICS and MINT. Profitability is negatively related to leverage across the two blocs. The elasticity is, however, more pronounced in MINT economies. Size, tangibility and non-debt tax shields positively influence leverage in both economies. The size and tangibility effects are more enunciated in BRICS firms, while the elasticity for non-debt tax shields is higher in MINT economies. Liquidity and growth are consistent across the two blocs, though the extent differs. On average, the liquidity coefficients are

higher in the MINT countries, suggesting that firms with higher liquidity opt to finance projects using their internal resources as per the pecking order theory (also see Ozkan, 2001). Comparatively, the negative effect of growth on leverage is attenuated in BRICS economies and this suggests that firms do not or cannot shorten debt maturity sufficiently to avoid underinvestment problems.

Table 10: Effect of firm-specific determinants on leverage – BRICS vs MINT

	BRICS			MINT		
	LEV	SLEV	LLEV	LEV	SLEV	LLEV
Profit	-15.262*** (1.919)	-14.823*** (1.781)	-3.214** (1.259)	-19.027*** (4.095)	-15.598*** (3.425)	-4.007 (3.620)
Size	2.802*** (0.247)	2.894*** (0.241)	1.923*** (0.191)	2.117*** (0.503)	2.200*** (0.506)	0.697** (0.347)
Tang	0.112*** (0.016)	0.116*** (0.015)	0.101*** (0.013)	0.059** (0.028)	0.054** (0.027)	0.092*** (0.024)
Ndts	0.136** (0.065)	0.063 (0.059)	0.055 (0.045)	0.273** (0.132)	0.219* (0.123)	0.160 (0.111)
Liquid	-0.252*** (0.066)	-0.243*** (0.066)	0.112*** (0.032)	-0.303*** (0.090)	-0.310*** (0.092)	0.002 (0.021)
Growth	-0.045*** (0.002)	-0.042*** (0.002)	-0.023*** (0.001)	-0.056*** (0.004)	-0.052*** (0.004)	-0.030*** (0.003)
Constant	-25.637*** (4.849)	-27.778*** (4.748)	-25.698*** (3.781)	-12.815 (10.019)	-14.917 (10.107)	-1.940 (6.882)
Observations	31,258	30,625	30,971	9,689	9,401	9,551
R-squared	0.119	0.122	0.057	0.108	0.103	0.048
Number of firms	6,170	6,130	6,147	1,314	1,310	1,312

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 11 presents the results of regression on the effect of firm-specific determinants on total leverage across countries. Chinese firms seem to have the most robust support for the pecking order theory. This is similar to Chen (2004) who also suggests that firms attempt to avoid underinvestment challenges as well as mispricing of new projects. Also, China's weaker corporate governance problems, coupled with lacklustre enforcement laws, see management shun debt financing to equity. More centrally planned economies with weak enforcement mechanisms induce firms to resort to equity financing.

Some studies analyse determinants of international capital structure and assume cross-country equality of firm-specific factors. In order to mitigate country specific effects, we conduct an analysis of these determinants per country. The country effects on firm-specific factors such as profitability,

firm size, tangibility, non-debt tax shields, liquidity and growth are summarised in Table 11. The results are mixed but consistent with the expectations of some capital structure theories. It is also note that, in some countries, one or more firm-specific determinants do not significantly explain the variation in leverage. For instance, under the BRICS bloc, only size, growth and liquidity are significantly related to the level of debt financing across all countries. The results are more varied for the MINT countries. Interestingly, it is observed that only growth opportunities matter in explaining leverage consistently across all countries.

Table 11: Effect of firm-specific determinants on leverage across countries - LEV as dependent

	Brazil	Russia	India	China	South Africa	Mexico	Indonesia	Nigeria	Turkey
profit	1.207 (4.424)	-13.024*** (4.177)	-14.054*** (4.166)	-32.945*** (3.665)	-5.869 (3.568)	-8.649* (4.989)	-26.562*** (6.214)	-4.527 (10.578)	-15.329** (7.488)
Size	1.890** (0.808)	3.284*** (0.791)	2.663*** (0.505)	3.111*** (0.339)	2.361*** (0.676)	5.561*** (1.099)	2.707*** (1.044)	3.618** (1.525)	0.759 (0.685)
tang	-0.011 (0.030)	-0.050 (0.032)	0.300*** (0.036)	0.147*** (0.030)	0.139*** (0.042)	0.160** (0.065)	0.113*** (0.042)	0.130* (0.071)	-0.020 (0.048)
ndts	0.185 (0.184)	0.089 (0.096)	0.214 (0.187)	-0.120 (0.159)	0.087 (0.137)	0.049 (0.168)	0.275 (0.218)	-0.162 (0.295)	0.438** (0.209)
liquid	-1.422*** (0.264)	-0.080** (0.034)	-0.230* (0.127)	-0.919** (0.383)	-0.844*** (0.275)	-0.686* (0.375)	-0.603** (0.277)	-0.787 (0.674)	-0.215*** (0.081)
growth	-0.032*** (0.007)	-0.078*** (0.008)	-0.061*** (0.006)	-0.031*** (0.002)	-0.050*** (0.007)	-0.032*** (0.008)	-0.072*** (0.007)	-0.025* (0.013)	-0.062*** (0.007)
Constant	-6.154 (16.953)	-32.524** (14.503)	-19.942** (9.712)	-31.063*** (7.322)	-24.006* (13.293)	-92.879*** (23.769)	-20.507 (20.488)	-53.357* (28.405)	16.431 (13.428)
Observations	2,408	6,747	7,061	10,392	4,650	1,828	3,481	900	3,480
R-squared	0.097	0.088	0.189	0.194	0.121	0.148	0.174	0.054	0.094
Number of firms	430	1,224	1,396	2,387	733	208	526	170	410
F-test	9.294	19.99	46.46	109.1	20.15	8.966	27.52	2.619	14.41
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.019	0.000

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

4.2 Firm- and country-specific effects

In order to investigate the impact of country-specific variables, we add GDP and inflation variables are added to the earlier specification. Table 12 summarises the results of these regressions on the entire sample. The relationship of firm-specific factors and leverage remain consistent as in previous models. A negative relationship is found between GDP and the level of corporate debt financing. This is similar to Kayo and Kimura (2011) and Jõeveer (2013) who also document positive and statistically significant results. In contrast, studies by De Jong et al. (2008), Gungoraydinoglu and Öztekin (2011) and Baltaci and Ayaydin (2014) observe that leverage increases with GDP.

Table 12: Effect of firm-specific and macro determinants on leverage on entire sample

	LEV	SLEV	LLEV
profit	-15.856*** (1.809)	-14.962*** (1.635)	-3.070** (1.330)
size	3.023*** (0.249)	3.090*** (0.248)	1.881*** (0.185)
tang	0.096*** (0.014)	0.099*** (0.013)	0.097*** (0.012)
ndts	0.238*** (0.066)	0.167*** (0.061)	0.102* (0.052)
liquid	-0.250*** (0.052)	-0.248*** (0.053)	0.085*** (0.022)
growth	-0.047*** (0.002)	-0.045*** (0.002)	-0.025*** (0.001)
inflation	0.063* (0.034)	0.076** (0.033)	0.014 (0.030)
gdp	-0.018 (0.023)	-0.010 (0.023)	-0.019 (0.019)
Constant	-30.409*** (4.944)	-32.194*** (4.934)	-24.820*** (3.711)
Observations	39,765	38,859	39,347
R-squared	0.120	0.121	0.054
Number of firms	7,432	7,388	7,406
F-test	147.5	149.5	70.12
Prob > F	0.000	0.000	0.000

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Other studies document that interest rate impact on leverage is captured by inflation (see Deesomsak et al., 2004). Accordingly, the study tested for inflationary effects on leverage.

Interestingly, and similar to Frank and Goyal (2009), it was observed that inflation positively influences leverage. Other studies, however, find a negative relationship between inflation and the level of debt financing, since inflation mitigates the advantages of debt as the bankruptcy costs increase during periods of high inflation through increase in interest rates (e.g., Baltaci & Ayaydin, 2014; Gungoraydinoglu & Öztekin, 2011; Jõeveer, 2013).

To identify the country-nuanced effects of firm-specific and macroeconomic variables, country-specific regressions were run. The results are summarised in Table 13. Among the BRICS countries, Brazil has the least number of significant determinants of leverage. The results suggest that only non-debt tax shields, liquidity and GDP are responsible for the variation in leverage. As in earlier studies, the effect of GDP is empirically inconsistent. For instance, under the BRICS bloc, GDP negatively and significantly influences leverage in Brazil and Russia, while in China the relationship is positive. As for the MINT economies, GDP emerges with a negative and statistically significant relationship with Turkey.

The effect of inflation is also not consistent across the countries. In Russia and Nigeria, a negative relationship is noted between inflation and leverage. On the other hand, Mexico depicts a positive and statistically significant influence of inflation on leverage. Even with the sign changes in the macroeconomic factors, the effect of firm-specific factors remains robust and consistent in all the model specifications.

Table 13: Effect of firm-specific and macro determinants on LEV

	Brazil	Russia	India	China	South Africa	Mexico	Indonesia	Nigeria	Turkey
Profit	4.573 (3.810)	-14.502*** (4.248)	-14.086*** (4.193)	-34.224*** (3.624)	-6.067* (3.570)	-8.665* (5.090)	-27.213*** (5.993)	-1.902 (10.503)	-15.486* (8.287)
Size	3.885*** (1.028)	3.372*** (0.884)	2.631*** (0.566)	3.595*** (0.373)	2.462*** (0.678)	7.761*** (1.341)	3.787*** (1.136)	3.255** (1.611)	3.603** (1.744)
Tang	0.001 (0.030)	-0.049 (0.032)	0.300*** (0.036)	0.143*** (0.030)	0.139*** (0.043)	0.113* (0.060)	0.094** (0.041)	0.127* (0.072)	-0.072* (0.040)
Ndts	0.782*** (0.183)	0.080 (0.097)	0.212 (0.188)	-0.121 (0.160)	0.093 (0.137)	0.345** (0.165)	0.239 (0.228)	-0.147 (0.294)	0.802*** (0.266)
Liquid	-1.294*** (0.252)	-0.087** (0.035)	-0.231* (0.127)	-0.907** (0.377)	-0.825*** (0.273)	-0.541 (0.354)	-0.537** (0.258)	-0.752 (0.650)	-0.137*** (0.052)
Growth	-0.033*** (0.007)	-0.077*** (0.008)	-0.062*** (0.006)	-0.030*** (0.002)	-0.050*** (0.007)	-0.047*** (0.009)	-0.066*** (0.007)	-0.025* (0.014)	-0.069*** (0.009)
Inflation	0.500*** (0.185)	-0.165** (0.079)	0.013 (0.097)	0.133** (0.053)	0.053 (0.090)	0.515*** (0.127)	0.544*** (0.108)	-0.371** (0.159)	-0.357* (0.213)
Gdp	-0.064 (0.093)	-0.067* (0.038)	0.034 (0.056)	0.519*** (0.104)	0.184* (0.102)	0.117 (0.110)	-0.799** (0.342)	0.067 (0.309)	0.110* (0.062)
Constant	-52.783** (21.779)	-32.345** (16.354)	-19.633* (10.621)	-45.911*** (8.366)	-26.785** (13.503)	-139.887*** (28.772)	-41.133* (22.782)	-42.852 (30.263)	-36.274 (35.550)
Observations	2,395	6,641	7,061	10,379	4,650	1,663	3,418	870	2,688
R-squared	0.134	0.092	0.189	0.199	0.121	0.189	0.183	0.062	0.146
Number of firms	428	1,219	1,396	2,387	733	202	526	170	374
F-test	12.23	16.33	38.76	88.71	15.09	9.371	21.21	2.833	12.80
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.000

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

4.3 Market structure impact

Table 14 shows that the effect of market structure on leverage is varied between the BRICS and MINT economies. As one would expect, bank-based markets favour leverage while market-based ones act to the contrary. This paper, summarises the effects of credit to the private sector (CREDIT) as proxy for bank-based effects, while market capitalisation (MKTCAP) captures the stock market dynamics. In further robustness tests, the effects of the bond market are examined.

The results suggest that the relationship between credit and leverage is bloc-dependent. For instance, within the BRICS countries, the credit-leverage relationship is negative and statistically significant while, for the MINT countries, a positive influence is noted. The negative linkage proffers evidence that BRICS firms tends to substitute debt with equity as the stock market development increases (also see Antoniou et al., 2008). On the other hand, the MINT result suggests that bank-financing significantly influences leverages as per the static trade-off theory. This theory suggests that the increase in debt level is triggered by management attempts to balance tax advantages against potential bankruptcy costs or when a firm's leverage falls below the target (see Huang & Ritter, 2005; Miller, 1977).

Within both blocs, it was that the stock market (MKTCAP) is negatively related to leverage. This result is in line with expectations that stock market development influences firms' preference to raise equity capital. The size of the coefficients again point to the difference in the level of development of the stock markets of the two blocs. It is important not to overstate the implications of these results, as other unobserved factors such as foreign direct investments, legal and political ones may be germane.

The use of the structure variable which proxies the development of both the bank- and equity market (MKTCAP_CREDIT) aids in determining which market is more dominant in a particular environment. In line with expectations, a negative coefficient is noted for both blocs. The sizes of the coefficients, however, show prominence of the bank-market in explaining leverage in the MINT economies. In addition, the relatively thinner equity and bond markets in MINT economies may also influence the choice of financing.

The bond market effects are captured by the MKTCAPBOND_CREDIT variable, which is a summation of the stock market and bond public capitalisation to private credit. Though not statistically significant, the stock and bond markets in MINT countries are relatively under-developed, hence bank debt explains much of the variation in their firms' capital structures. Finally, the structure

variable which captures market activity (STTURNOVER_CREDIT_ASS), though not statistically significant, bequeaths credence to the bank market in fostering high debt structures in MINT firms.

Table 14: Effect of market structure on LEV – BRICS vs MINT

Market structure variable:	Credit		stmkcap		mktcap_credit		mktcapbond_credit		stturnover_credit_ass	
	BRICS	MINT	BRICS	MINT	BRICS	MINT	BRICS	MINT	BRICS	MINT
<i>Market structure type</i>	-0.051*** (0.015)	0.135*** (0.026)	-0.013*** (0.003)	-0.067*** (0.018)	-0.783*** (0.188)	-2.966*** (0.460)	-0.463* (0.255)	-1.055*** (0.363)	-0.010*** (0.003)	-0.015 (0.014)
Profit	-15.043*** (1.962)	-21.127*** (4.183)	-18.556*** (2.299)	-14.322*** (4.371)	-18.631*** (2.302)	-15.847*** (4.294)	-19.806*** (2.729)	-20.902*** (4.387)	-19.252*** (2.629)	-16.136*** (4.238)
Size	3.251*** (0.281)	3.637*** (0.836)	3.066*** (0.284)	4.076*** (1.044)	2.931*** (0.281)	3.784*** (0.985)	3.148*** (0.334)	4.667*** (1.027)	3.432*** (0.328)	3.767*** (1.102)
Tang	0.107*** (0.016)	0.065** (0.026)	0.111*** (0.018)	0.047 (0.030)	0.113*** (0.018)	0.057* (0.029)	0.155*** (0.022)	0.094*** (0.035)	0.112*** (0.020)	0.053* (0.031)
Ndts	0.192*** (0.067)	0.356** (0.153)	0.222*** (0.083)	0.344** (0.146)	0.214*** (0.083)	0.303** (0.142)	0.269*** (0.098)	0.208 (0.165)	0.267*** (0.093)	0.327** (0.145)
Liquid	-0.251*** (0.067)	-0.230*** (0.064)	-0.319*** (0.083)	-0.224*** (0.071)	-0.320*** (0.083)	-0.218*** (0.069)	-0.842*** (0.233)	-0.173** (0.073)	-0.482*** (0.116)	-0.235*** (0.081)
Growth	-0.044*** (0.002)	-0.062*** (0.005)	-0.042*** (0.002)	-0.060*** (0.005)	-0.042*** (0.002)	-0.061*** (0.005)	-0.037*** (0.002)	-0.061*** (0.006)	-0.040*** (0.002)	-0.059*** (0.006)
Inflation	-0.027 (0.040)	0.388*** (0.076)	-0.012 (0.040)	0.300*** (0.078)	-0.004 (0.039)	0.257*** (0.083)	0.084* (0.046)	0.394*** (0.080)	-0.012 (0.041)	0.330*** (0.081)
Gdp	-0.061** (0.027)	0.062 (0.051)	0.029 (0.025)	0.069 (0.053)	0.046** (0.023)	0.119** (0.051)	-0.003 (0.048)	0.156*** (0.051)	-0.094*** (0.029)	0.087 (0.055)
Constant	-29.990*** (5.126)	-50.252*** (16.515)	-29.727*** (5.586)	-52.528** (20.884)	-27.321*** (5.558)	-44.984** (20.093)	-31.455*** (6.671)	-65.059*** (21.026)	-35.871*** (6.338)	-48.128** (22.541)
Observations	31,126	8,639	26,528	6,726	26,528	6,726	18,924	4,853	23,222	5,845
R-squared	0.122	0.144	0.121	0.123	0.121	0.131	0.150	0.139	0.125	0.121
Number of firms	6,163	1,272	5,849	1,135	5,849	1,135	4,255	908	5,381	1,062
F-test	109.5	31.58	91.39	19.41	91.94	22.12	78.52	17.70	79.39	18.49
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

In order to reduce the pooling effects of country-specific regressions, industry dummies were introduced. These tests reveal that industry effects are germane in the determination of corporate leverage. Interestingly, in Table 15, it is observed that the strength of some firm-specific factors diminishes due to the introduction of the industry dummies. This is similar to Aggarwal and Zhao (2007) who argue that markets examine firm leverage in the context of leverage trends in a particular sector.

Table 15 summarises industry effects on leverage in the BRICS and MINT. Similar to other studies (e.g. Antoniou et al., 2008; MacKay & Phillips, 2005; Miao, 2005), it is evident that the industry matters in determining firm leverage. In the BRICS bloc, it is found that market structure is a key determinant of leverage in consumer staples, financials, industrials, materials and utilities sectors. As for the MINT economies, market structure is a key determinant in consumer discretionary, industrials and utilities sectors.

Interestingly, it is clear that market structure is important in the utilities sector to both blocs but the sign of the coefficients are different. In the BRICS economies, it appears that the utilities sector is more dependent on the stock markets to meet their external financing requirements, while the MINT utilities favour bank debt. Given the magnitude of the financing requirement of utilities, the MINT result further suggests the muted level development of the equity markets in these economies.

Table 15: Effect of market structure (mktcap_credit) on LEV by sector – BRICS vs MINT

	Communications		Consumer Discretionary		Consumer Staples		Energy		Financials		Healthcare		Industrials		Materials		Technology		Utilities	
	BRICS	MINT	BRICS	MINT	BRICS	MINT	BRICS	MINT	BRICS	MINT	BRICS	MINT	BRICS	MINT	BRICS	MINT	BRICS	MINT	BRICS	MINT
Mktcap_Credit	1.845** (0.865)	-0.878 (2.179)	-0.661 (0.492)	-3.974*** (0.941)	-1.251** (0.546)	-2.997*** (1.146)	-1.783* (0.929)	-0.248 (2.773)	-1.317** (0.588)	-0.659 (0.997)	-0.049 (0.757)	-3.545 (2.362)	-0.860** (0.356)	-3.256*** (1.099)	-0.643 (0.489)	-4.000*** (1.201)	-2.108*** (0.766)	-4.275 (2.565)	0.560 (0.506)	-2.280 (5.512)
profit	-17.070* (9.750)	-18.291 (12.821)	-13.129*** (4.397)	-25.771** (12.706)	-14.437** (6.251)	-15.586*** (5.348)	-22.928*** (8.644)	-27.295 (17.453)	-10.865 (11.774)	6.950 (14.331)	-16.072* (8.759)	29.641 (22.708)	-28.295*** (4.818)	-14.546 (12.304)	-20.029*** (5.141)	-11.570 (8.327)	-17.206** (6.851)	-22.233 (25.758)	-18.766** (9.171)	-16.250 (53.598)
size	2.022 (1.255)	9.370* (4.670)	4.545*** (0.705)	2.819* (1.593)	2.846** (1.136)	4.503*** (1.541)	1.469 (1.114)	7.235* (4.169)	1.971** (0.789)	5.146*** (0.953)	3.179*** (1.126)	0.258 (7.197)	2.283*** (0.605)	0.705 (1.443)	2.818*** (0.648)	2.633 (1.593)	2.843*** (0.901)	7.799** (3.658)	6.488*** (1.084)	9.288** (3.841)
tang	-0.022 (0.099)	0.364*** (0.081)	0.183*** (0.045)	0.029 (0.052)	0.043 (0.053)	0.123* (0.066)	-0.018 (0.072)	-0.223* (0.123)	0.124** (0.060)	0.027 (0.072)	0.194** (0.092)	-0.241 (0.203)	0.099** (0.043)	0.076 (0.053)	0.119*** (0.036)	-0.060 (0.096)	0.124* (0.067)	0.132 (0.164)	0.021 (0.035)	-0.199 (0.109)
ndts	0.748*** (0.218)	-0.016 (0.237)	0.184 (0.179)	0.435* (0.245)	0.201 (0.266)	-0.119 (0.420)	-0.308 (0.188)	1.892* (1.074)	1.085** (0.468)	-0.384 (0.256)	-0.085 (0.570)	1.646* (0.885)	0.013 (0.148)	0.494* (0.280)	0.310 (0.208)	0.026 (0.341)	-0.010 (0.186)	0.095 (0.704)	0.143 (0.244)	-0.657 (1.107)
liquid	-0.954 (0.585)	0.125 (1.224)	-0.341** (0.166)	-1.316*** (0.453)	-0.525* (0.302)	-1.071*** (0.400)	-0.985** (0.389)	-1.063 (0.689)	-0.093 (0.113)	-0.026 (0.020)	-0.938* (0.480)	-6.950** (2.586)	-0.145* (0.082)	-0.622** (0.278)	-0.769*** (0.242)	-1.651*** (0.633)	-0.492* (0.288)	-0.441 (0.567)	-0.751** (0.374)	-5.172* (2.348)
growth	-0.022* (0.011)	-0.061** (0.026)	-0.042*** (0.004)	-0.052*** (0.011)	-0.039*** (0.006)	-0.052*** (0.009)	-0.033*** (0.008)	-0.014 (0.013)	-0.055*** (0.011)	-0.055*** (0.012)	-0.035*** (0.005)	-0.042*** (0.014)	-0.033*** (0.004)	-0.077*** (0.015)	-0.055*** (0.005)	-0.062*** (0.014)	-0.026*** (0.004)	-0.083*** (0.021)	-0.058*** (0.008)	-0.106*** (0.030)
inflation	0.604*** (0.225)	-0.734 (0.572)	0.220** (0.099)	0.268* (0.151)	0.173 (0.115)	0.248* (0.143)	-0.615*** (0.169)	-0.883* (0.496)	-0.197* (0.113)	0.477*** (0.134)	-0.017 (0.180)	0.247 (0.626)	0.009 (0.080)	0.100 (0.196)	-0.174* (0.102)	0.678*** (0.176)	0.263** (0.128)	-0.025 (0.394)	0.078 (0.141)	0.736 (1.019)
gdp	-0.099 (0.133)	-0.074 (0.304)	0.157** (0.065)	-0.028 (0.086)	0.164* (0.092)	0.234* (0.122)	-0.157* (0.094)	0.476 (0.332)	0.004 (0.084)	0.288** (0.131)	0.247* (0.129)	0.165 (0.291)	-0.092** (0.039)	0.096 (0.120)	0.047 (0.055)	-0.091 (0.111)	0.306** (0.128)	0.552*** (0.183)	0.130* (0.066)	0.146 (0.219)
Constant	-22.519 (27.268)	-166.808 (99.880)	-59.730*** (13.648)	-19.226 (30.728)	-22.407 (21.625)	-58.630* (31.520)	9.481 (23.425)	-104.031 (84.270)	-10.269 (16.334)	-88.583*** (19.951)	-33.466 (21.739)	36.760 (140.774)	-14.495 (11.536)	20.486 (29.003)	-18.707 (13.096)	-10.875 (33.044)	-31.360* (17.420)	-115.022 (68.732)	-99.385*** (21.510)	-121.746 (90.351)
Observations	451	196	4,538	1,398	2,092	995	1,240	208	3,173	1,497	1,182	187	5,602	1,002	5,048	1,065	1,788	124	1,414	54
R-squared	0.149	0.444	0.164	0.162	0.120	0.188	0.115	0.257	0.104	0.110	0.202	0.315	0.096	0.129	0.165	0.212	0.143	0.348	0.286	0.623
Number of tickercode	99	31	981	209	438	155	263	46	740	304	267	28	1,229	161	1,068	167	475	26	316	8
F-test	3.746	6.260	20.76	6.836	11.22	6.278	6.197	4.439	5.870	6.838	10.11	6.007	17.85	4.992	27.65	6.055	10.23	7.359	12.64	656.6
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

5. CONCLUSION

Prior literature shows that the capital structure puzzle, as posed by Myers (1984), remains largely unresolved. However, this work provides some insights to this puzzle, specifically on the influence of market structure on leverage. Using over 8100 listed firms and macro-data from BRICS and MINT economies, the study documents that a more developed and balanced market structure results in a weak nexus with firm leverage. In this case, the BRICS markets emerge as the more mature markets consequently indicating mixed results of the market structure effects. The use of industry dummies shows strong evidence of the market structure-leverage nexus.

Unlike previous studies, this study observes the effect of traditional firm- and country-specific determinants in these economies, largely supporting the literature. However, when comparing results to other studies, the puzzle appears somewhat unresolved. More importantly, the intra-country results of the tests show that the influence of variables on leverage is consistent. Conversely, macroeconomic determinants show mixed effects. This suggests the need for better understanding of the institutional factors, including political and legal variables which may temper the effect of macroeconomic factors.

This work provides some possible areas for future research on these emerging economies. Firstly, inclusion of unlisted firms may show more representative results of the market structure-leverage nexus. In this case, data limitation dissuaded such an approach. Secondly, an in-depth understanding of institutional factors in these economies may provide a better understanding of the leverage determinants.

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