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CAPITAL STRUCTURE AND FIRM PERFORMANCE: EVIDENCE FROM EMERGING MARKETS

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ABSTRACT

This paper investigates the impact of financial leverage on firm performance measured by ROA and ROE in publicly traded enterprises amongst the selected emerging markets, including Brazil, Russia, India and China. Additionally, the study also examines the association of debt equity choice with firm efficiency during a period of extreme distress which is noticeably thought-provoking when considering the emerging markets since debt markets were concerned to trigger for the financial crisis of 2008 penetrating the emerging economies.

This study employs data on large, publicly listed companies from the four largest emerging economies including Brazil, Russia, India and China in the period from 2003 to 2013 to observe the effect of financial leverage on firm performance. The thesis investigates whether firm performance is affected by debt equity choice and this relationship if exists persists the same during economic downturns or periods of extreme distress.

Empirical results reveals that financial leverage has significantly negative impact on firm performance in tested markets. However, during economic turbulence, this relationship varies from countries to countries. While China and India show that the link is more adverse during recessions, Brazil witnesses a contrary picture when higher level of debt facilitates firm performance during economic downtrends. Russia suggests insignificant relationship between leverage and firm performance measured by both ROA and ROE. Concerning firms experiencing financial distress, the test provides mixed results amongst economies.

KEYWORDS: financial leverage, firm performance, emerging markets, level of debt, capital structure.

I- INTRODUCTION

Debt financing has assumed a critical importance in a firm's choice of its capital structure. Aiming at maximizing its value, the firm is unrestricted to reach the choice of debt or equity in its capital structure. Therefore, it provokes a vexed question to many managers how to finance firms' overall operations, from issuing shares to increase equity, from short-term debt, from long-term debt, or a combination of debt and equity. In other words, what is the optimal capital structure for a firm to reach its ultimate goal?

It is over fifty years since Modigliani and Miller set a remarkable milestone in corporate finance with their theorem about cost of capital. Modigliani and Miller (1958) suggested that the capital structure of a firm does not affect to its market value based on assumptions that there is no corporate taxes, no agency cost, homogeneous investors' expectations of future cash flows, and efficient market for bonds and stocks. The underlying reason is that there is no benefit to borrowing due to no interest liability. As a result, firm would be indifferent to the source of capital. Five years later, in American Economic Association, Modigliani and Miller (1963) addressed the tax issue profoundly in their study. When taxes are included, the optimal capital structure might be complete debt finance due to advantage of using debt over equity as a source of capital since interest payment on the debt or cost of debt is exempted from corporate taxes. Consequently, firms could generate higher profit after tax by substituting debt for equity. More specifically, the firm value would increase by the interest tax shield (the marginal tax rate times debt). Additionally, Jeremias (2008) proposed an explanatory theory of maximizing use of debt, in which debt financing not only grants the benefit of tax advantage but also improves efficiency since high level of debt imposes constraints to firms. By contrast, Phillips and Sipahioglu (2007) suggested that low levels of debt constitute maximizing the firm value.

However, when concerning costs of financial distress in modern corporate finance, which are costs incurred in inability to meet firm's obligations including direct costs such as legal and administrative costs of liquidation or reconstruction, and indirect costs like loss of sales, impaired ability to obtain financing, or agency cost, it is difficult to determine the optimal capital structure. If financial distress is more costly than the benefit of using debt then firms with higher leverage will experience the greatest operating hazards in recession. Conversely, if financial distress reinforces firms by pushing efficient operating changes, which results in

more benefits than the costs of financial distress then higher levered firms will perform better than firms with less debt. Previous work of Opler et al. (1994) has investigated this for U.S. firms and found out that companies with more debt tend to lose market share in economic downturn.

The literature regarding the association of firm performance and the choice between debt and equity is immense; however, empirical evidence yields inconsistent results (Margaritis and Psillaki, 2010; Chathoth et al., 2007; Berger et al., 2006). It is thus crystal clear that firm financing decisions are rather intricate procedures and existing studies can only explain some certain facets of the entanglement of financing choices.

1.1.The purposes and hypotheses

This thesis aims to address the question of firm's efficiency associated with its financial leverage under international context to see whether the relationship between level of debt and firm performance is homogeneous across countries. Specifically, in this paper the data on publicly traded enterprises in the largest emerging economies, including Brazil, Russia, India and China (BRIC) over the period 2003-2013 are used to examine. In addition, the thesis also investigates the association of financial leverage with firm performance during a period of extreme distress in those countries. This matter is noticeably intriguing when considering the emerging markets since it was controverted that through debt markets the financial crisis of 2008 penetrated the emerging economies. Thus, the following hypotheses will be tested in this paper:

Hypothesis 1: the financial leverage affects firm performance in the selected emerging markets.

This hypothesis indicates that the choice of debt and equity affects firm's efficiency if the relationship is tested significantly. The question is how it affects the firm performance, positively or negatively. It also brings the next issue whether this relationship is still significant during economic recessions. The second hypothesis thus is examined as

Hypothesis 2: during economic downturn, the financial leverage significantly affects firm performance in the selected emerging markets.

It also raises an issue concerning costs of financial distress in modern corporate finance when costs incurred is inability to meet firm's obligations, it is difficult to determine whether more debt or less debt is better for firm performance. This as a result proposes the final hypothesis as

Hypothesis 3: the financial leverage has more significant impact on performance of financially distressed firms than of financially non-distressed firms.

1.2.Contribution of the thesis

This thesis aims to make several distributions to the existing literature. First, instead of focusing on a specific period, it investigates the link between firm performance and capital structure in a longer time span including the financial crisis period. This approach thus allows us to examine the impact of leverage on firm performance in both ordinary economics state and financial turmoil. Second, the thesis also considers the endogeneity problem, which emanates from reverse causality since profitable firms may prefer to higher level of debt. Finally, while determinants of the choice regarding capital structure under developed economies are well documented, the effects of level of debt on firm value in developing economies still remain somewhat ambiguous. This thesis thus aims to contribute to the literature by examining relationship between the choice of capital structure and firm performance in the largest emerging markets. Besides emerging markets as lucrative destinations for business expansion along with the saturation of developed markets, they provide a particular interesting context for investigating the impact of choice of debt and equity on firm performance since the emerging markets is different from developed economies regarding the firm behavior towards debt financing. In developed markets, firms are prone to persist in a particular type of debt; conversely, the choice of debt source in emerging markets is more dynamic. Firms in these markets may switch from public debt to private debt, which has a significant effect on choice of debt and equity. That in turn may create a more pronounced impact on firm performance.

1.3. Structure of the study

The reminder of this paper proceeds as follows. Chapter 2 discusses the literature review related to relationship between firm performance, capital structure and financial distress. Chapter 3 presents the theoretical background. Chapter 4 outlines the database, methodology and main variables. Chapter 5 discusses empirical models and results. Chapter 6 draws conclusion of the thesis.

II- LITERATURE REVIEW

Many previous studies has investigated if there is any relationship between firm performance and capital structure and if exists, whether this association is negative or positive. These papers have provided mixed results.

On one hand, it has been argued that firm performance is positively influenced by its level of leverage. It is explained that higher level of debt forces managers to maximize the value of firm and reduces manager discretions. This idea is derived from the agency cost theory where the interests of shareholders and managers are not ideally aligned. Debt might makes contribution into managing corporate agency conflicts since it is easier for shareholders to adjust debt ratio rather than to modify share of capital. Hubert de La Bruslerie et al. (2012) study French firms to support the idea that there exists an inverted U-shape relationship between level of debt and shareholder's ownership. Jensen et al. (1976) gave particular attention to the effect of agency cost resulted from conflict of shareholders and managers' interests, where managers tend to act in pursuit of maximizing their utilities. Free cash flow theory developed by Jensen (1986) has emphasized the disciplinary role of debt when higher level of debt reduced managers to invest in projects below cost of capital due to the pressure to generate cash flows to offset the debt liability. This is also consistent to several studies, such as Stulz (1990) and Grossman et al. (1982). Another possible reason is suggested by Modigliani and Miller (1963). When considering taxes, the optimal capital structure may be total debt finance due to tax advantage. The interest payment on the debt is excluded from tax liability. Thus, firms could gain higher earnings after tax by substituting debt for equity. Grossman and Hart (1982) also argued that if firms experienced financial distress and bankruptcy is costly for managers then higher level of debt could provide further incentives for manager to work more diligently and reduce managerial discretions. These findings indicate that regardless of bankruptcy costs, high leverage can add more value for firms.

According to Graham et al. (2015), unregulated US firms substantially increased their leverage ratio over the past century. The aggregate leverage from 1945 to 1970 more than tripled compared to before 1945, from 11% to 35% and reached 47% by the early 1990s. If in 1946, the median company had no debt, then in 1970, it had 31% total debt in their capital structure. Roden et al. (1995) has studied the capital structure in 48 U.S. companies from 1981-1990 and found out that higher levered companies perform better. Ghosh et al. (2000)

and Champion (1999) have also suggested the similar resutls, corporations with higher level of debt have efficient productivity. Victor (2013) has analyzed the effect of financial leverage on firm performance across countries to examine whether this effect varies from countries to countries. He has studied 10,375 firms in 39 countries and revealed that the effect of leverage on firm performance depends on the legal origin, the financial structure and development of countries. Regarding legal origin, the result has showed that in French civil law countries, highly levered firms perform better even when being suffered from economic downturn. This implies that the role of debt is predominant factor to reduce manger discretion. Related to agency cost problem, Jirapon and Gleason (2007) has studied the relationship between capital structure and shareholder rights and suggested the inverse association between them, which means that firms adopt higher leverage where strength of shareholder rights is restricted. Athur Korteweg (2010) also estimated the net benefits to leverage using panel data in the period from 1994 to 2004 and found that net benefits to debt are escalating for firms with low levels of debt but diminishing when very high level of debt. This implies that there is an existence of optimal capital structure. In this paper, he also pointed out net benefits can amount to 5.5% of firm value for the median firm in his sample. This means that if the firm reaches its optimal capital structure, its value can be worth 5.5% more than the value of the firm with no debt in its capital structure.

On the other hand, many debates around this relationship have been provoked. Myers (1977) has indicated that tax savings benefited by debt do not result in preference to higher leverage adopted by firms. Companies maintain 'reserve borrowing capacity' according to Modigliani and Miller (1963) and that there exists the law of diminishing returns when the tax increments reduce advantage of borrowings since higher level of debt is used, less certain the tax shields become. They also notice the personal taxes, which will alleviate the theoretical tax advantage of firm debt. Indeed, Miller (1977) has proposed a model in which tax advantage is totally irrelevant. Myers (1977) explains why it is rational for firms to restrict level of debt, even when there is a considerable tax advantage and capital markets are perfectly efficient by assuming that 'most companies are valued as going concerns and that this value reflects an expectation of continued future investment by the firm'. He also assumes that this investment is non-mandatory. The amount of investment depends on the net present values of future economic benefits it brings with. As a result, the firm value is affected by options to make further investments. Myers has pointed out that highly levered firms that act to maximize stockholders' value will implement a different decision rule from

ones that issue no debt. More risky debt outstanding decreases the firm value by adopting a suboptimal future strategy. More specifically, the existence of debt may alleviate firm's incentive to make optimal future investments. Thus, the optimal capital structure is a tradeoff between tax advantage of debt and costs of pursuing the suboptimal future investments.

It is also a subject of argument that financial distress is more costly than the benefits of debt and is a determinant of capital structure. While the direct costs incurred in financial distress are estimated as relatively small by many empirical evidences contributed by Altman et al. (2006) and Bris, Welch, and Zhu (2006), the indirect costs incurred are more significant. Opler and Titman (1994) has suggested that costs due to insufficient ability to obtain financing or loss of sale considerably affect to firm performance. The expected cost of financial distress is proportional with higher level of debt firms adopt since it may impulse managers to make decisions that are detrimental to creditors, and stakeholders. As a result, financial leverage has an inverse influence on firm performance. Kester (1986) has revealed a negative relationship between capital structure and firm performance with the sample of U.S. and Japanese companies. Similar findings have been documented by Arbabian and Safari (2009), Wald (1999) and Titman et al. (1988). Mahfuzah (2012) has carried out investigation in the sample of 237 Malaysian companies listed on the Bursa Malaysia main board to explore the relationship between capital structure and firm performance. The empirical results have revealed that capital structure has a negative impact on firm performance measured by ROE and ROA but when firm efficiency is measured by Tobin' Q, it shows the reverse true. Tobin'Q has a positive relationship with short term debt and long term debt at critical level. Alternatively, Majumdar and Chibber (1999) have pointed out that high levels of debt have negative impact on firm performance. In their study, they observed that while firm size, diversity, liquidity and inventory positively affect firm performance, age and industrial grouping have adverse impact on the corporate value. In the same vein, Gleason et al. (2000) studied firms in 14 European countries and found that there is a negative relationship between capital structure and firm performance.

However, firm performance in turn might also have an impact on choice of capital source. Berger and Bonarccosi di Patti (2006) has indicated that more efficient firms tend to generate higher earnings for a specific capital structure, which in turn is considered as buffer against portfolio risk. Consequently, they might be able to substitute equity to debt in their capital structure. This lays foundation for the efficiency risk hypothesis, more profitable firms

incline to choose more debt outstanding since high efficiency means lower costs of bankruptcy and financial distress. Conversely, it has been argued that firms that expect to maintain their good performance in the future would consider lower leverage to preserve the economic rents or 'franchise value' obtained by these efficiencies from the threat of liquidation, according to Demsetz (1973) and Berger et al. (2006). Thus, under the franchise value hypothesis, more efficient companies would prefer hoding more equity or lower level of debt in their capital structure due to income effect. Margaritis and Psillaki (2010) has analyzed this relationship and found out that more efficient firms incline to choose higher leverage due to lower expected costs of liquidation and financial distress. Chaiporn Vethessonthi et al. (2015) find out that the impact of financial leverage on operating performance is non-static and conditional on firm size. Specifically, they suggest for small companies, there is a positive relationship between leverage and firm performance but large firms show opposite link. Also Johnny Jermias (2008) indicates that this relationship is conditional on competitive intensity and business strategy. He confirms that cost of debt is higher for firms following product differentiation strategy than cost leadership strategy; as a result, competitive intensity negatively affects the leverage-performance association.

Since the empirical results vary from companies to companies and are affected by many other factors such as characteristics of firms, industry and countries, it is worth studying and examining how level of debt adopted by firms affects to their performance. Since there are many studies conducting research in this relationship in developed countries, this paper tests the relationship between the financial leverage and firm performance in emerging markets to see how is the impact of financial leverage to firm efficiency. Is the result drawn similar to previous works in developed countries?

III- THEORETICAL BACKGROUND

3.1 Traditional theories and optimal capital structure

3.1.1. Traditional theories

The traditional theories of capital structure primarily deal with the cost of capital, in which the market value of a company is generally determined by discounted the stream of future cash flows. A corporate finances its operating activities by raising money from shareholders or lenders. If it collects cash from shareholders, it is defined as equity financing. Its shareholders get no fixed return but instead, they receive a percentage of firm earnings depending on the fraction of capital they put in the firm, or dividend. The equity financing can be raised in two ways by issuing new shares of stock or retaining earnings. Otherwise, the firm can finance its activities by borrowing from lenders. Under this circumstance, it has to pay a fixed rate of interest and return the debt also. There are two sources of debt financing the firm can obtain, which are private debt and public debt. A firm's combination of debt and equity financing is called its capital structure.

The conventional theorems of capital structure fundamentally devote attention to the costs of debt and equity. Let's denote r_A is expected return on assets, which is defined as the ratio of the expected operating income and the total market value of firm's securities. Suppose that an investor finances all the firm's equity and holds all of the firm's debt so he is entitled to generate all the firm's income. Thus the expected return of his investments is equal r_A. It is known that the expected return on a portfolio is the weighted average of the expected returns on the individual holding. The expected return of the investor, according to Brealey, Myers, and Allen 2011: 425-430 therefore is equal to

r_A = (proportion in debt x expected return on debt) + (proportion in equity x expected return on equity) or

$r_A = \left(\frac{D}{D+E} \times r_D\right) + \left(\frac{E}{D+E} \times r_E\right)$, where

D is the firm's debt

E is the firm's equity

R_E and R_D is the expected return on equity and expected return on debt respectively;

The optimal capital structure is the mix of debt and equity where the weighted average cost of capital (WACC) is minimized, based on the research on capital structure conducted by Modigliani and Miller in 1958. The combination of equity and debt can be illustrated by the figure below, according to Brealey et al. (2011). They assumed that the cost of equity is often higher than the cost of debt so an increase in debt financing or borrowing at first can bring down the total cost of capital. However, excessive level of debt causes more risk for shareholders due to imposing heavier burden on paying interest payments, which in turn reduces shareholder's wealth and may increase possibility of financial distress. To offset the risk shareholders hold, the cost of equity is required to increase, which increase WACC or in other words, WACC is upward sloping. The relationship thus between level of debt financing and WACC is irrelevant making the optimal capital structure somewhat hypothetical.

Brealey et al. (2011) argues that there are many benefits when using the weighted average cost of capital approach to make a decision of cost of capital of a firm. It is a remarkable straightforward approach to confront an intractable problem. This approach employs a rational and logical methodology and is easily calculated, which may give rationale for its widespread acceptance by firms. Also this approach promptly responds to altering components of capital structure since it is built upon debt and equity. Minor changes in the capital structure, such as changes in the cost of debt or retained earnings will be manifested in corresponding adjustments in the overall cost of capital. Moreover, the weighted average cost of capital approach generates satisfactory results when the firm borrows at a normal or acceptable level of debt. This method however has received some criticisms. The most challenging thing probably arises when firms need to figure the marginal cost of capital with new projects and financing decisions. In this circumstance, the computed required return is employed in the new proposals. This causes the possibility that two firms with same size with different capital structures probably make different decisions on the same project. If the project is lucrative with regards of risk and return, it should be accepted to both firms.

Second, this approach is incapable of dealing with low profits. If a firm is facing with a period of low returns, the weighted average cost of capital will be imprecise. For example, if the cost of equity of a firm is 2% then it does not mean that it can accept projects at 2 % or higher. As experiencing such a low profits, the market value of the stock demonstrates either a liquidation value or speculation for future. This drives its shareholders to attempt pursuing

higher returns in another place. Therefore, if a firm is not attaining adequate profits compared to other firms, then the weighted average cost of capital approach will be inaccurate.

Finally, this method fails to tackle firms with extreme low-cost debt. Short-term debt is a crucial source for firms with financial distress. If the short-term liability is under payable account, it will not include in financing charges. If a firm heavily accounts for zero-cost or low-cost short-term liability then the overall cost of capital will be low. And if the firm employs this rate to determine required return rate, it will be inaccurate. Thus a firm that has large amount of short-term liabilities may apply a high return ratio. To maintain long-term liabilities in an attempt to minimize the risk and short-term liabilities, firms need to generate high profits.

The evolution of the optimal capital structure theory began with Modigliani and Miller (1958) who set a remarkable milestone in corporate finance with their theorem about cost of capital. They suggest that the capital structure of a firm does not affect to its market value based on assumptions that there is no corporate taxes, no agency cost, homogeneous investors' expectations of future cash flows, and efficient market for bonds and stocks. The underlying reason is that there is no benefit to borrowing due to no interest liability. The benefits of lower cost of debt are offset entirely by an increase in the cost of equity, which makes capital structure decisions irrelevant to the firm value. As a result, firm would be indifferent to the source of capital. The MM's argument that "choice of debt and equity is irrelevant is a perfect application of the law of conservation of value", Modigliani and Milller (1958). That is if we have two streams of cash flow, A and B, then "the present value of the sum of A +B is equal to the sum of present value of each stream cash or PV of A + PV of B". Regarding to MM's proposition I, it is suggested that firm value is determined by real assets, which are on the left-hand side of the balance sheet, not by the proportion of debt and equity issued to buy those assets. In other words, under the perfect market assumption, the choice of debt and equity is irrelevant when the firm value is the total of real assets. Alternatively, Proposition I might be expressed as Modigliani and Miller in a following formula:

V_{mkt}= EBIT/K_0, where

V_{mkt} is the market value of firm

EBIT is the earnings before interest and tax

K_0 is the average cost of capital

From this above formula, it is clear that Proposition I implies that the average cost of capital of any firm is irrelevant to its capital structure. Continuing their initial proposition, Miller and Modigliani study that the expected return of a share of stock is the sum of capitalization rate K_0 and a premium associated with the financial risk. The premium is calculated as the leverage ratio times the difference between K_0 and K_i. This can be expressed in formula as:

$K_e = K_0 + (K_0 – K_i)$ x debt-equity ratio, where

K_e is cost of equity

K_i is the interest rate for debt

In Proposition II, they focus on the impacts of financial leverage. Noticeably, the spread between K_0 and K_1 is the spread between the cost of capital and the returns on this capital. When a firm lowers its level of debt by offsetting an equivalent amount of equity, Modigliani and Miller claim that 'the total value of the firm remains unchanged, but the cost of equity rises since shareholders in a levered firm are expecting a higher return'. Proposition II thus addresses itself the impact of financial leverage, that is to increase earnings for shareholders rather than to grow the firm value.

Proposition III of Modigliani and Miller suggests that the lowest point from investment for a firm is the average cost of capital, K_0 and this is irrelevant to the type of security used to finance that investment. This conclusion holds the same view with the capital asset model, in which the investments should be made on or above the market line.

These above propositions of Miller-Modigliani however have faced several criticisms. One argues that the perfect markets are rather theoretical; they do not always exist indeed. Investors are sometimes intuitive, not always rational and firms do not always access sufficient information to make decisions. All capital markets are widely believed to have experienced inefficient periods implying arbitrage opportunities for some individuals and institutions. They exploit advantage of asymmetric information to identify discrepancies between intrinsic value and market value of assets.

Secondly, the Miller-Modigliani model is too simple since it does not take transaction costs into consideration. These costs have a significant impact on arbitrage opportunities. This prohibits investors to undertake arbitrage. Regarding this argument, there are some debates provoked. The presence of financial intermediaries with transaction costs eliminated

facilitates institutions and investors to purchase and sell securities to achieve their goal. One of the fiercest criticisms however may be that Miller and Modigliani ignored bankruptcy cost. They assumed that in a perfect market, a zero bankruptcy cost exists, which means that if a firm fails to run its business it can liquidate by undertaking sales of total assets at their market values without any legal or administration fees. In fact, if there is any threat to firm insolvency, firms with high level of debt possibly become less attractive to investors. This assumption thus is particularly restrictive since when a firm experiences financially distressed period, the legal costs for administering the liquidation are extremely huge. Paolo Giordani et al. (2011) argues that the higher level of debt a firm use, the higher possibility of bankruptcy the firm faces as illustrated in the below figure.

As shown in Figure 2, there is a non-linear relationship between level of debt and likelihood of bankruptcy. Last but not least, the most severe criticism perhaps lies in the failure to assume the corporate income taxes. Since taxes are calculated after interest is subtracted, the use of debt is less costly than equity financing, which could lead to an increase in total value of the firm.

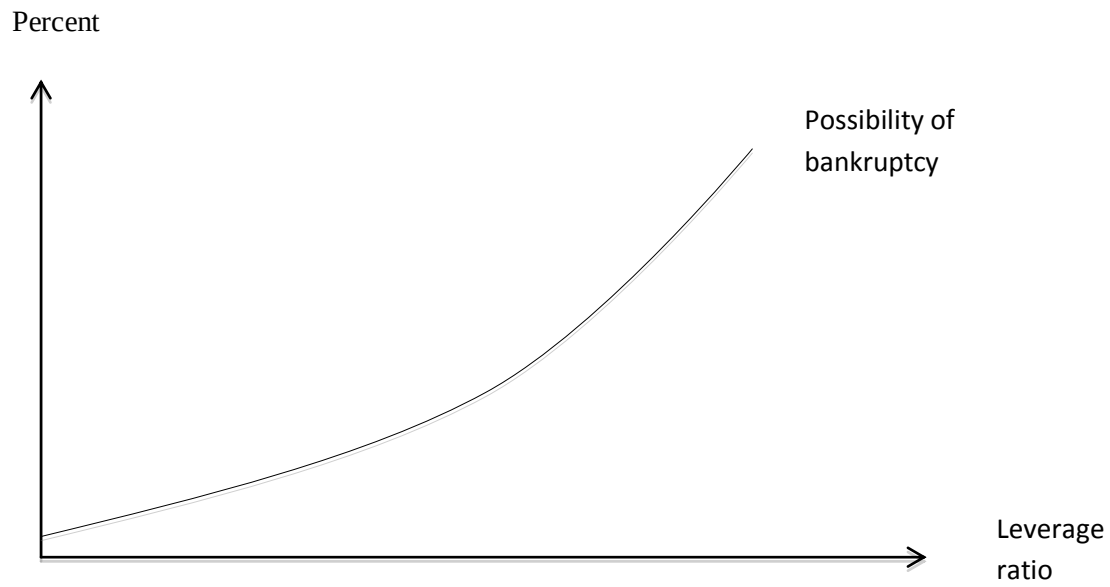

Figure 1. Relationship between level of leverage and likelihood of bankruptcy

Later, Modigliani and Miller (1963) present another theorem, in which the tax issue is addressed profoundly. When taxes are included, the optimal capital structure might be complete debt finance due to the advantage of using debt over equity as a source of capital since interest payment on the debt or cost of debt is exempted from corporate taxes.

Consequently, firms could generate higher profit after tax by substituting debt for equity. More specifically, the firm value would increase by the interest tax shield (the marginal tax rate times debt). Therefore, it implies that the firm value is maximized when the firm entirely finances by borrowing. In reality, however, this proposition is not sound since an increase in interest payments due to higher leverage to a certain point is likely to exceed the benefits of tax shield according to the law of diminishing returns, which might lead to an increase in cost of debt. Furthermore, Modigliani & Miller did not consider several indirect costs such as agency costs, bankruptcy costs or asymmetric information.

Indeed, Miller (1977) proposed a model in which tax advantage is totally irrelevant. He notices that the personal taxes will alleviate the theoretical tax advantage of firm debt. He argues that the taxes on shareholders' dividend completely reverse the benefit of tax exemptions from firm debt, which implies that firm-specific optimal capital structure is virtually illusionary in equilibrium.

3.1.2. Optimal Capital Structure

The optimal capital structure for a firm is the combination between debt and equity financing to achieve the maximum value of the firm's common stock in the marketplace. According to Brealey et al. (2011), if a firm finances its business by increasing level of debt; thereby increases the value of common stock then this kind of borrowing causes the firm to move towards the optimal capital structure point. Vice versa, if the firm's increase in level of debt financing leads to a decrease in the value of common stock then this action moves the firm away from its optimal point. The optimal capital structure is a point maximizing both the value of the firm and the value of common stock. This point based on the study of Brealey et al. (2011) can be expressed as:

$V_{max} = D_{mkt} + PS_{mkt} + CS_{mkt\,(max)}$, where (1)

D_{mkt} is the level of debt of the firm

PS_{mkt} is the preferred stock of the firm

CS_{mkt} is the common stock of the firm

Take a closer at this equation (1), it is clear that to maximize the value of the firm, the firm should consider maximizing the value of common stock of the firm. To see the rationale

behind this equation, the level of debt and the preferred stock of the firm is first taken into consideration. For a profitable firm, for example, the payments of interest for liabilities and dividends on fixed-return securities are steady and not likely to vary in the market in response to changes in profit of the firm. These two first components in the formula (1) instead fluctuate significant when there are substantial changes in interest rates of debt and preferred stock yield.

Therefore, under capital structure management, the firm value is maximized when the value of common stock is maximized. Secondly, it is noticed that the value of common stock is maximized on a per-share basis. A firm thus could increase its value by issuing additional securities. If this kind of financing however causes the reverse, then the firm moves away from its optimal point. As a result, maximizing the common stock value is recognized to maximize on a per-share basis. Finally, when determining the optimal point in capital structure, the levels of required return for the firm, K_0 and the shareholders, K_e should be concerned. These sections below will examine the optimal capital structure under the traditional theories following Denis Davydov (2014) when he discusses debt financing, firm performance and banking in emerging markets.

a. Fixed K_e theory

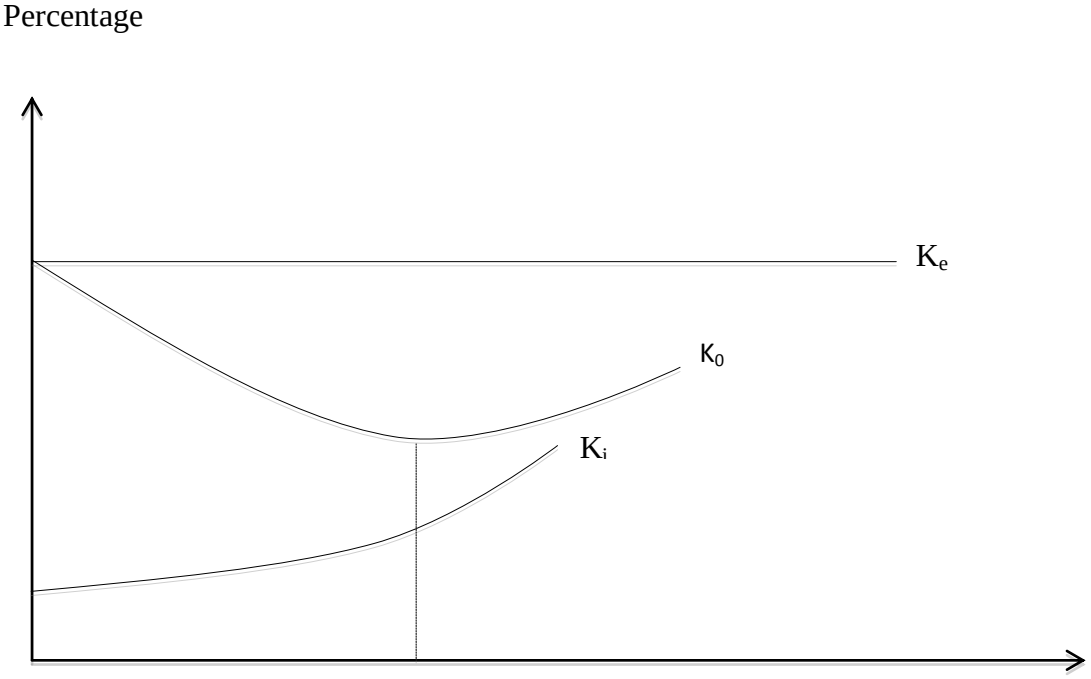

Figure 2. Fixed K_e theory

Under the fixed K_e theory, or fixed required return for a firm s' shareholders, the average cost of capital of the firm at first decreases as increasing the level of debt in the capital structure to some point then it begins to go up. It is explained that the average cost of capital declines since under the assumption of favorable financial leverage, when the firm increases higher level of debt, on the average, K_0 will drop. If the firm however keeps up higher level of debt, creditors shall perceive risk, which makes pressure on interest rates to increase. Until to some point, the incremental cost of debt, K_i will pass the initial required return for the firm K_0, thereby leads to an increase in K_0. This is illustrated in the Figure 2 above.

From the figure 2, it is clear to see the impact of additional debt in the capital structure regarding the average costs of debt, equity, and capital. Return to the main point, the goal of the firm is to increase the common stock value so under the fixed K_e theory, CS_{mkt} is expressed as ratio between earnings before taxes and K_e, or EBT/K_e, then to maximize the common stock value, the EBT should be maximized. This can reached when the firm increases its level of debt until the incremental debt K_i reaches the K_0. The illustration of this point is given in the Figure 3 below.

3.1.2.1 Fixed K_0 theory

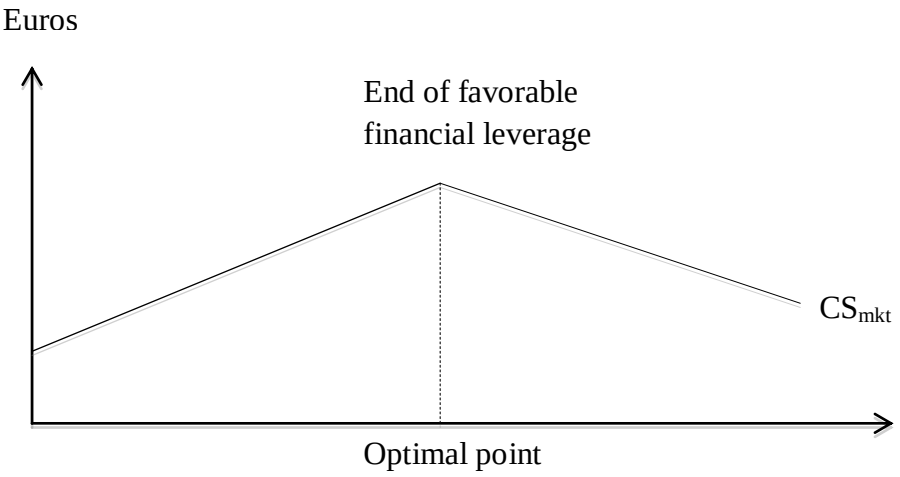

Figure 3. The optimal point in capital structure under fixed K_e theory

Under the fixed K_0 theory, the firm's average required return for shareholder first increases when additional level of debt then decreases when end of favorable financial leverage. If the firm continues to rise the level of debt, eventually K_i, K_e, and K_0 will be equal. When K_e reaches its peak, shareholders will start to undertake the sale of their stock since financial leverage is unfavourable. The shareholders who determine to sell their stocks afterwards will experience a decrease in stock value and then a drop in K_e. Figure 4 will depict this theory.

From the figure 4, it would seem that the optimal point in the capital structure is the point that maximizes K_e; that is where K_i is equal to K_0.

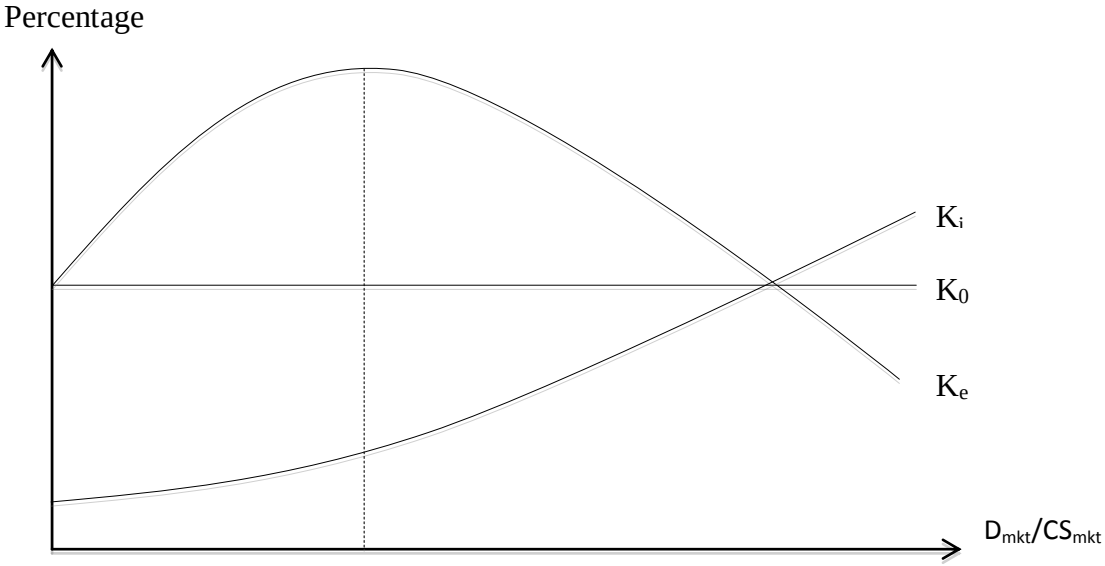

Figure 4. Increasing cost of equity capital under fixed K_e theory

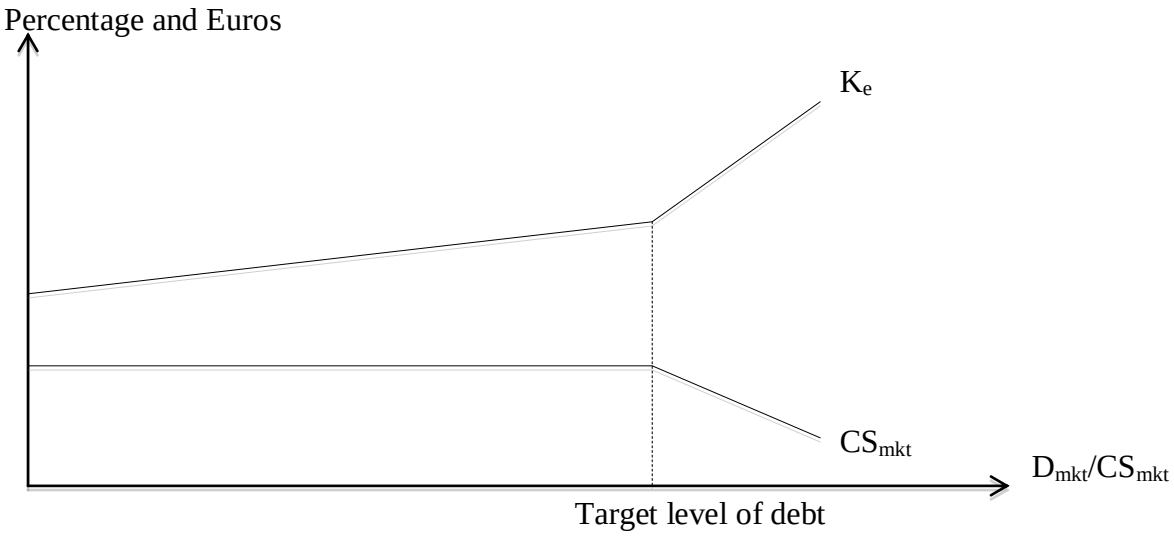

Figure 5. Fixed K_0 theory with no optimal capital structure

In fact, however, if the firm experiences a low level of debt, then K_e will not be high but if the firm has a higher level of debt, K_e increases to some point until investors perceive risk concerning in the capital structure, then this possibly lead to a decrease in common stock value. The fixed K_0 theory thus gives no optimal point in capital structure provided that the target debt level is not exceeded. Under the target level, additional debt causes a higher K_e for shareholders, but over the target level, the advantages of favourable leverage are offset by the risk perceived by investors. The figure 5 shows the overall view of optimal capital structure under fixed K_0 theory.

3.1.2.2 Varying K_e theory

Under varying K_e theory, the K_e increases when debt is added. The slope of the K_0 curve is dependent on the slope of the K_e curve. If K_e goes up dramatically with the additional level of debt then K_0 will increase as a result, which causes an upward sloping K_0but if K_e climbs more slowly, K_0 will first fall then start to soar, which lead to a U-shape function. These two cases can be shown in figure 6.

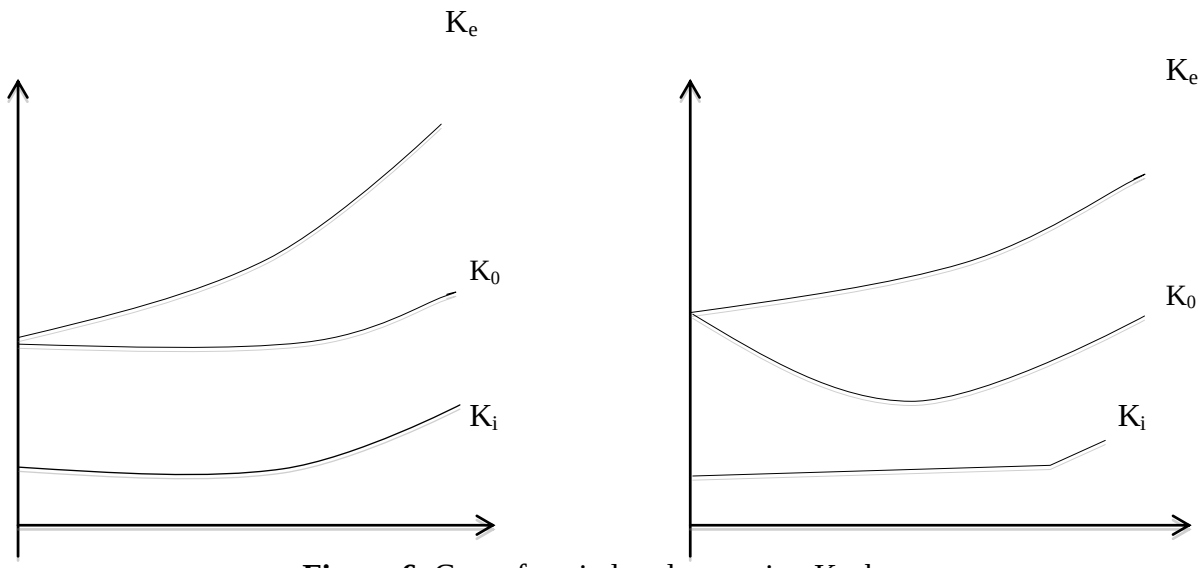

Figure 6. Cost of capital under varying K_e theory

Under the varying K_e theory, there are two stages required to determine the optimal point in the capital structure. First, it is necessary to determine whether the firm can gain benefits of facvourable financial leverage. If the K_e escalate significantly as additional debt is issued, a decrease in stock price causing a rising K_e will offset the benefits of leverage. Under such a circumstance, the optimal capital structure should have no debt.

In case of flat K_e function, the firm first obtains benefits of leverage then to some point, the additional debt leads to a rise in the K_e and the stock price starts to fall, which implies risk in the structure. The optimal point is where the firm gains maximum benefits of leverage. This can be illustrated in Figure 7.

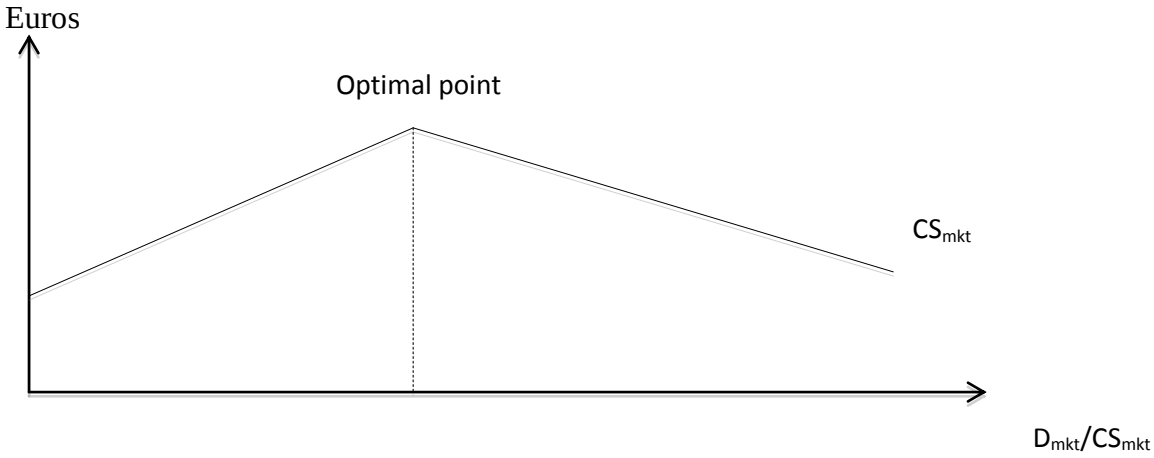

Figure 7. Optimal Capital Structure under varying K_e theory

In general, the conventional capital structure theorems provide three valuable conclusions. Firstly, under a perfect market context, firm would be indifferent to the source of capital. Secondly, when corporate taxes are included, the optimal capital structure is entirely debt finance due to tax shield so that firm can increase its value. In practice, however, 100% debt financing is to some extend difficult to achieve, unless it is impossible since a rise in interest payments due to higher level of debt to a certain point is likely to go beyond the advantages of tax shield according to the law of diminishing returns, which might result in higher cost of debt. Finally, the personal taxes will weaken the theoretical tax advantage of firm debt. This implies that the optimal capital structure is heterogeneous to each firm and there is no global equilibrium existent. These traditional theorems though lay the foundation for studying the capital structure still fail to explain the practical combination of debt and equity. Other

modern capital structure theories therefore are developed to explain the practical composition of capital financing. Section 3.2 and 3.3 present these modern theories in corporate finance.

3.2 The trade-off theory

The trade-off theory is extended study based on Modigliani & Miller (1963) preposition, which takes financial distress into account. Financial distress occurs when debt to creditors is default. MM preposition suggests that 'firms should be 100% debt financing' but in practice, it is impossible to achieve since creditors demand an offsetting cost of debt because higher level of debt might cause firms to fall into financial distress problem. To avoid default risk, creditors require compensation in advance in the form of higher interest rate for firm debt. This in turn leads to a decrease in stockholders' payoffs and also present value of their shares. The value of the firm thus can be defined as following Brealey et al. (2011):

Value of firm (V) = Value if all equity financed + PV (tax shield) + PV (costs of financial distress)

The trade-off theory therefore suggests the optimal capital structure as the trade-off between the tax advantages and the likelihood and costs of financial distress. If the level of debt is moderate, the probability of financial distress is low so the present value of financial distress is inconsiderable so the tax benefits dominate in such cases. However, when the level of debt is high, the probability of financial distress to a certain point will multiply with the increment of borrowings, which pushes up the cost of financial distress and in turn make it prevail over the tax shield. The theoretical equilibrium under this theory therefore is reached when the present value of tax shield is compensated by increases in the present value of costs of distress.

A study investigating more specifically a factor contributing into financial distress is first proposed by Kraus and Litzenberger (1973), in which they present that the optimal leverage is decided by a trade-off between the tax advantages of debt and the deadweight costs of bankruptcy. Firm bankruptcies occur when stockholders exercise their "right to default" when a firm is in financial distress. According to this theory, the firm value is reinforced when the marginal tax advantages exceed the marginal bankruptcy costs and the optimum point is defined as equilibrium between two factors. Myers (1984) further examines this relationship and presents the static tradeoff hypothesis. Myers suggests that firms propose a

target debt-to-value ratio then gradually approaches towards the target. The target debt ratios are not homogeneous for all firms. Safe firms with many tangible assets and much should target higher ratios. Conversely, for firms with low level of profit or much intangible assets should count primarily on equity financing. He also states that hazardous firms should borrow less, ceteris paribus. When the variance of the market value of the firm is high, the likelihood of default on debts increases so safe firms should borrow more before the costs of financial distress exceed the tax benefits of debt financing. Two conclusions drawn from Myers model are that the choice of debt and equity is not only static process but also can be adjusted over periods. In practice, however, the empirical tests of this hypothesis provides mixed results and those results are trivial due to the absence of retained earnings in the assumptions, which is the key to make capital structure decision.

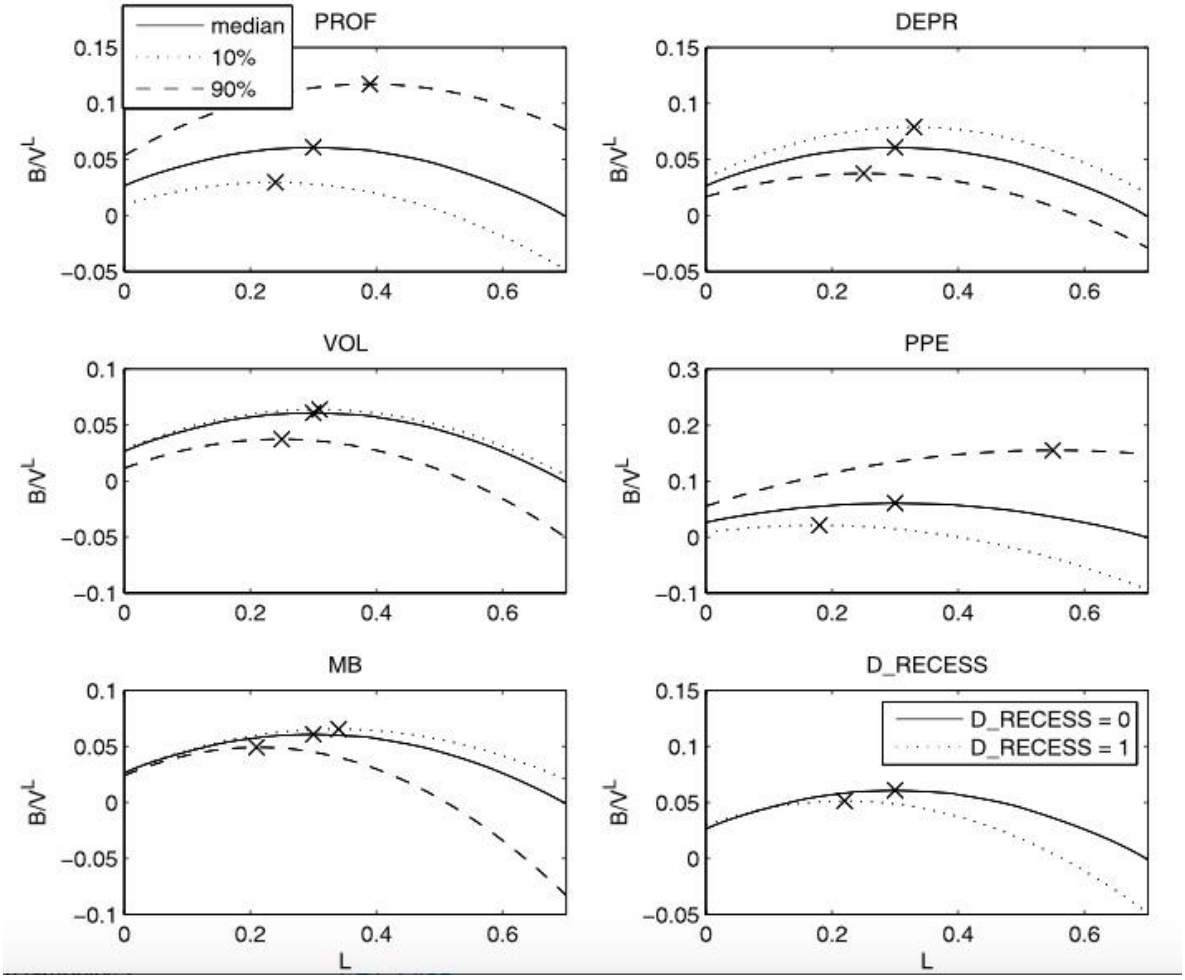

Figure 8. Net benefits to leverage (Source: Korteweg, The Journal of Finance, 2010)

Though the trade-off theory allows explaining variable capital structure equilibrium for many industries, it in fact has been revised and adjusted for over 40 years by accounting for some

other assumptions such as taxes, transaction costs or payout policy. It though still raises a concern about its reliability and practical use for modern corporate finance. In practice, Wald (1999) shows that the most profitable firms frequently borrow the least while the trade-off theory prognosticates exactly the reverse. According to the trade-off theory, profitable firms have more debt-servicing capacity, which implies stronger incentives to debt finance.

Arthur Korteweg (2010) analyzes the net benefits to leverage and shows that firms with low market-to-book ratio, high tangible assets ratio, low depreciation, high profitability and low volatility of earnings have higher net benefits at all leverage ratios. The optimal debt-equity ratio however varies systematically with firm characteristics. He also notices that firms with high levels of debt have lower net benefit during recessions in comparison with expansions. The optimal leverage ratio can be illustrated below according to Korteweg.

This above figure depicts the advantage of debt as a ratio of total firm value (B/V^L on the vertical axis) varies with the different levels of debt (L on the horizontal axis). According to Korteweg, this is estimated following the model of net benefits relative to firm value:

$$B_{i,t}/V_{i,t}^{L} = X'_{0it}\theta_0 + (X'_{1it} \,.\, L_{it})\theta_1 + (X'_{2it} \,.\, L_{it}^{2})\theta_2$$

The above quadratic specification captures the possibility of non-linear relationship between leverage and firm value as prognosticated by theory: the firm value may switch from positive to negative at higher levels of debt. The vector X_{0it}, X_{1it}, X_{2it} contains firm characteristics, including profitability, the fraction of intangible assets, and market-to-book ratios. The above figure shows that the law of diminish exists as the level of debt increases, net benefits increase but the marginal benefits decrease when higher level of leverage. This also implies the existence of optimal point of capital structure. These graphs measure the different optimal leverage in three scenarios such as median firm (in an economic expansion), firm at either its 10^{th} or 90^{th} percentile of the sample distribution. The optimal leverage ratio is marked with an "x" in the graphs. The figure shows that low market-to-book firms which have high profitability, low depreciation, low volatility of earnings, and high level of tangible assets attain higher net benefits at all level of leverage. The bottom-right graph illustrates the net benefits for a firm in recession compared to expansion.

While an optimal capital structure consensus fails to be achieved, much study is still examined, and on-going theories continue to be evolved to explain the practical choice of debt and equity.

3.3 The pecking order theory

An alternative model explaining the practical capital structure decision is the pecking order theory that takes asymmetric information into account. Asymmetric information is a term indicating that mangers know more about their firms' risk and values than outsiders do. Managers transfer information to investor through firm announcements of dividend policy. When managers expect their firms' stock prices to increase, announcements of higher dividend paid are made to signal investors as a good indication due to higher future earnings expectation. Asymmetric information exerts a significant impact on the choice of internal and external financing and of new issues of debt and equity securities. This results in a pecking order, a hierarchical allocation of capital sources, which is originally presented by Myers (1984). He suggests that firms commonly prefer internal finance rather than using external sources. It is argued that firms would rather choose internal financing than external financing to avoid issue costs such as administrative, underwriting costs or in some cases, costs occurred when the new securities are underpriced. Then debt financing dominates the equity financing if external sources are demanded. Firms issue new equity as a last resort when they exhaust debt-servicing capacity or in other words, they fall into financial distress.

An explanation for this choice is still due to higher costs of issuing new equity. Under the pecking order theory, there is non-existence of target debt-to-value ratio due to two kinds of equity, internal and external, one on the top of the hierarchical allocation and another at the bottom. The debt ratio varies from firms to firms, which reflects their cumulative requirements for external sources. The pecking order theory allows explaining why profitable firms commonly borrow the least, which is reverse true as the trade-off theory suggests. Higher profit implies higher retained earnings, which allows firms to generate the internal source to finance their operating and investing activities. Myers also notices that investors' reaction and managerial incentives create an impact on the choice between debt and equity. In the joint paper by him and Nicholas Majluf (1984), it is argued that due to symmetric information between internal users and outsiders, a firm can lure its attractiveness to investors by following the hierarchy order of capital sources. It is clear that if any project that generates positive present value, increases profitability and makes firms thrive then it would hardly be financed by issuing equity since the current shareholders would not rather slice up a

profitable “pie” to the new ones. Conversely, when the project may entail more risks and incur higher costs, then the current shareholders prefer reallocating this risk to the new ones.

The following section presents the pecking order models based on adverse selection and agency costs.

3.3.1 Adverse Selection

The most popular reason for explaining the pecking order theory is adverse selection originated by Myers and Majluf (1984) and Myers (1984). Before investigating the study of Myers et al. , it is essential to mention to Akerlof’s (1970) adverse selection argument of the reason behind the fact that prices of used cars are substantially lower than new cars’. The seller of a used car usually has advantage of information about the performance of the car to purchasers so buyers demand a discount to offset the lack of information resulting in the possibility that they may purchase an “Akerlof lemon”.

According to Myers and Majluf, the inside mangers know more about the firm value than investors. If the mangers decide external financing by equity, investors would question the reason behind it. Due to asymmetric information, there is high possibility that the market misprices a firm’s shares. The investors therefore require a higher level of return to offset the risk of “Akerlof lemon”, which means that if firms fail to persuade investors about its true performance then financing by equity has an “adverse selection premium”. Myers (2001) also suggests that “issuing overpriced shares would transfer value from new investors to existing shareholders”. This point results in a drop in share prices, which leads to higher possibility that potential profitable projects are compulsory to be rejected. This explains how asymmetric information makes rational investors require a ‘risk premium’, which causes financing by equity to become more expensive and less attractive when a firm considers financing instruments.

Cadsby et al. (1990) also points out, in the pooling equilibrium, the asymmetric information does not result in any lost in the project. However if the total assets of the firm are considerably greater than the net payoff of the project then the managers choose internal financing. Such kind of financing would avoid asymmetric information issue. However, adverse selection does not explain entirely the pecking order model. Regarding firm value, the pecking order model based on the adverse selection applies, firms prioritize debt

financing but when there is adverse selection about the risk, Halov and Heider (2004) argue that firms prefer equity financing rather than borrowing.

3.3.2 Agency theory

Regarding the agency theory, firstly it is essential to understand the agency problem where the interests of shareholders and managers are not ideally aligned. This idea was first developed by Jensen et al. (1976), who gave particular attention to the effect of agency cost resulted from conflict of shareholders and managers' interests, where managers tend to act in pursuit of maximizing their utilities. Elsas and Florysiak (2008) also agree that there is an incline that managers "hold cash excessively to avoid the supervisor of investors and this is a part of behavioral finance theory, in which agents behave irrationally". Thus, to bring down costs relating agency, Grossman and Hart (1982) argue that shareholders attempt to restrict the managers' access to internal funds, instead that, they impulse managers to raise external finance. Moreover, both Grossman et al. (1982) and Jensen (1986) agree that more debt is an instrument to discipline managers and decrease agency costs since the liabilities of interests are "binding than a pledge to pay dividends".

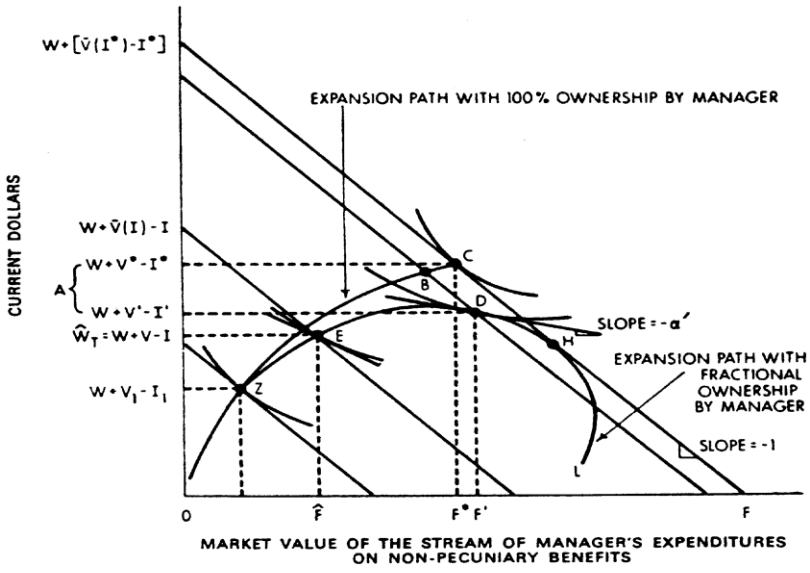

Figure 9. Determination of the optimal scale of the firm. (*Source: Jensen et al. 1976*)

The below figure presents the optimal scale of the firm when there is no monitoring. At point C, where investment is 100% internal funded by entrepreneur, the optimum investment is I*

and the perks benefit is F*. At point D, where external financing through equity is utilized, the optimum investment is I' and the perks benefits is F. The difference between internal and external financing is A measuring the gross agency costs. From this figure, Jensen et al. implies that preference to internal source of capital still prevails following the pecking order hierarchy.

3.4 Emerging Markets Finance

The majority of financial papers focus on studying and examining the empirical models in developed markets, predominantly in the U.S. market. Financially developed countries obviously are the most largest and efficient markets regarding information transmission, legislation system, and market liberalization. Researchers thus conduct the empirical tests of existing theoretical models employing data from developed markets. However, since the late 1980s, along with the dissemination of information technologies, the globalization has created a significant impact on facilitating free flows of goods, services plus capital mobility from countries to countries. Due to penetration of international trade, domestic financial markets are open to foreign investors and financial institutions, which makes a significant contribution to structural change in the emerging economies. It therefore arouses much interest amongst economist to observe the fast substantial growth and expansion in those markets. Due to higher volatility and returns, lucrative investment opportunities, and interdependencies with developed markets, the emerging economies such as China, Russia, Brazil and India have drawn much attention in the academic study. This section briefly reviews a few noticeable differences between emerging market and developed market and sum up recent issues in emerging financial market.

3.4.1 "BRICs"

The International Monetary Fund categorizes about 25 countries into "emerging economies" but the majority of them are quite small and less developed regarding financial markets. Researchers therefore in fact mainly focus on several economies that are the largest and play a role as the driving force of the economic growth in emerging markets.

In 2001, in "The World Needs Better Economic BRICs", a paper from Goldman Sachs's "Global Economic Paper" series, Jim O'Neil first coined the term "BRIC" implying four

most lucrative markets including Brazil, Russia, India, and China.

3.4.2. Current Economy

	GDP (PPP Weights[1]); 2000 US$bn	Share of World Total (%) (1)	GDP (Current Prices); 2000 US$bn	Share of World Total (%) (2)	Difference in Share (1-2)	Population (mns)	GDP Per Capita (current prices)
United States	9,963	23.98	9,963	33.13	-9.15	281.42	35,401
China	5,230	12.59	1,080	3.59	9.00	1,266.80	852
Japan	3,319	7.99	4,760	15.83	-7.84	126.87	37,515
India	2,104	5.06	474	1.58	3.49	1,002.14	473
Germany	2,082	5.01	1,878	6.25	-1.23	82.02	22,898
France	1,458	3.51	1,289	4.29	-0.78	58.89	21,890
UK	1,425	3.43	1,417	4.71	-1.28	59.50	23,810
Italy	1,404	3.38	1,077	3.58	-0.20	57.53	18,719
Brazil	1,214	2.92	588	1.96	0.97	167.72	3,507
Russia	1,120	2.70	247	0.82	1.88	145.49	1,696
Canada	903	2.17	699	2.33	-0.15	30.75	22,747
Mexico	890	2.14	574	1.91	0.23	97.36	5,901
Spain	797	1.92	560	1.86	0.05	39.47	14,190
Korea	770	1.85	457	1.52	0.33	47.27	9,678
Indonesia	696	1.68	154	0.51	1.16	210.49	730
Australia	523	1.26	382	1.27	-0.01	19.16	19,933
Taiwan	477	1.15	310	1.03	0.12	22.32	13,899
Turkey	437	1.05	203	0.67	0.38	67.38	3,007
Thailand	430	1.04	122	0.41	0.63	62.32	1,956
Netherlands	416	1.00	370	1.23	-0.23	15.86	23,334
World	**41,552**	**100**	**30,073**	**100**	–	6,073.00	4,952
of which: G7	20,555	49	21,082	70	-20	692.66	30,437
Euroland	7,231	17	6,027	20	-3	304.07	19,820

[1] US used as benchmark for computing GDP in PPP terms

Table 1. Size of the world (Source: Goldman Sachs, Building Better Global Economic BRICs, Global Economics, paper no: 66)

According to statistics from this paper, by the end of 2000, GDP in US dollar on a Purchasing Power Parity (PPP) basis, the aggregate size of "BRIC" share was about 23.3% of the world GDP, which was to some extend greater than both European Union and Japan. Amongst those emerging economies, China is even already larger than some individual G7 countries. At the same time, China contributes 3.6% of world GDP in US dollar, which is somewhat greater than Italy and Canada. Table 1 below shows the current GPD of 20 leading countries all over the world based on PPP and current prices basis by the end of 2000. As can be seen from the table, GDP of all four largest emerging economies exceeds GDP of Canada.

	PPP Weight (1)	Current GDP Weight (2)	Ratio (1/2)
China	12.59	3.59	3.51
India	5.06	1.58	3.20
Brazil	2.92	1.96	1.49
Russia	2.70	0.82	3.29
Total	**23.27**	**7.95**	

Table 2. GDP weight in BRIC (Source: Goldman Sachs, Building Better Global Economic BRICs, Global Economics, paper no: 66)

Table 2 takes a closer look on GDP weight in four largest emerging markets on both PPP and current price basis. It was also estimated that the aggregate size of GDP in BRIC even exceeds the cumulative value of the G7 countries by 2035. However, the financial crisis in 2008 has had a devastating impact on the leading countries in the world, which makes this prediction slightly optimistic. In fact, after financial crisis, the world has witnessed the recovery in BRIC countries, which somewhat is better than most of developed economies. This again reemphasizes the important role of those emerging economies. In another paper from Goldman Sachs, O'Neil et al. (2009) even have a more optimistic look on the economic growth in BRIC, and predicted that Russian economy will grow dramatically and exceeds Japanese economy.

Recently, according to statistics from World Bank, after financial crisis, the growth rates in BRIC economies have accelerated significantly and BRIC gradually become the driving force in the global economic recovery. Due to higher volatility and returns, lucrative investment opportunities, and interdependencies with developed markets, international investors move towards the emerging economies as a good source of diversification. Therefore, this thesis focuses on studying the emerging markets including Brazil, Russia, India and China.

IV- DATABASE AND METHODOLOGY

The empirical analysis in this thesis employs data on large, publicly listed companies from the four largest emerging economies including Brazil, Russia, India and China to observe the effect of financial leverage on firm performance. The data are obtained in the period from 2003 to 2013 from Bureau Van Dijk's ORBIS database, which creates a panel data. These firms will be catagorized into different sectors as capital structure of different industries varies and is subject to several specific regulations. Unleveraged firms and firms with insufficient financial information will be excluded from the sample.

Regression model with firm performance measurement as dependent variables and financial leverage as independent variables is run to examine relationship between capital structure and firm performance.

4.1. Measuring Firm Performance

Firm performance is measured by return on equity (ROE), return on assets (ROA). The ROE is calculated as net profit extracted from income statement dividing by total equity from balance sheet for each company. The ROA is calculated as net profit dividing by total asset obtained from balance sheet also.

4.2. Capital structure

Capital structure is decided based on firms' financial leverage, which is scrutinized through several types of debt ratios such as short-term debt ratio, long-term debt ratio and debt-equity ratio. Short-term debt ratio (STD) is measured as the current liabilities over total assets; long-term debt ratio (LTD) is measured as the non-current liabilities over total assets and total debt ratio (LEV) is calculated as the total liabilities over total assets.

4.3. Control Variables

According to Anderson and Reeb (2003), some control variables are included in the model to manage firm characteristics when measuring firm performance. They suggest that firm's size and its growth in total assets may affect to its performance. In other words, larger firms might be more beneficial. As a result, this study controls for the differences in firm's scale by including the size and growth variables into the model. The natural log of the book value of

total assets is used to measure firm size and changes in total assets are measured as firm growth.

4.4. Models

4.4.1. Firm performance and financial leverage

To examine the impact of leverage on firm efficiency, the regression equations for firm performance are formulated as follows:

$$ROE = \beta_0 + \beta_1 LTD_{i,t} + \beta_2 LEV_{i,t} + \beta_3 Size_{i,t} + \beta_4 Growth_{i,t} + \varepsilon_{i,t} \quad (1)$$

$$ROA = \beta_0 + \beta_1 LTD_{i,t} + \beta_2 LEV_{i,t} + \beta_3 Size_{i,t} + \beta_4 Growth_{i,t} + \varepsilon_{i,t} \quad (2)$$

In which,

$LTD_{i,t}$: long-term debt ratio for firm i at time t

$STD_{i,t}$: short-term debt ratio for firm i at time t

$LEV_{i,t}$: total debt ratio for firm i at time t

$Size_{i,t}$: size of firm i at time t

$Growth_{i,t}$: growth of firm i at time t

$\varepsilon_{i,t}$: the error term

Another model is also estimated to examine the impact of leverage on performance when considering the influence of year since ROA and ROE have changed through years. The model is quite similar with the model used in Martikainen et al. (2007) as followed:

$$ROE = \beta_0 + \sum_{y=2003}^{2012} \delta_y Year_i^y + \beta_1 LTD_{i,t} + \beta_2 LEV_{i,t} + \beta_3 Size_{i,t} + \beta_4 Growth_{i,t} + \varepsilon_{i,t}$$

$$ROA = \beta_0 + \sum_{y=2003}^{2012} \delta_y Year_i^y + \beta_1 LTD_{i,t} + \beta_2 LEV_{i,t} + \beta_3 Size_{i,t} + \beta_4 Growth_{i,t} + \varepsilon_{i,t}$$

where $Year_i^y$ is a dummy variable indicating a fiscal year from 2003 to 2013.

4.4.2. Firm performance and financial leverage during economic downturns

This paper also addressed the question of how financial leverage affects firm performance in industry downturns in different environments to see whether the costs of financial distress are greater than the potential benefits and this may vary across countries. Industries, which have been experienced downturn, are identified as "economically distress industries" if their median sales growth of the industries are negative.

To examine how the firm performance response to leverage in economic downturn, a dummy variable is included, DID takes the value of 1 if the median sales growth of the industry is negative and median stock return is below -30%, and 0 otherwise, using the Arello and Bond (1991). Thus, regression models are formulated as follows:

$$ROE = \beta_0 + \beta_1 LTD_{i,t} + \beta_2 STD_{i,t} + \beta_3 LEV_{i,t} + \beta_4 Size_{i,t} + \beta_5 Growth_{i,t} + \beta_6 DID + \beta_7 DID \times LEV + \varepsilon_{i,t} \quad (1)$$

$$ROA = \beta_0 + \beta_1 LTD_{i,t} + \beta_2 STD_{i,t} + \beta_3 LEV_{i,t} + \beta_4 Size_{i,t} + \beta_5 Growth_{i,t} + \beta_6 DID + \beta_7 DID \times LEV + \varepsilon_{i,t} \quad (2)$$

4.4.3. Financially distressed and non-distressed firms

The analysis so far focuses on the relationship between financial leverage and firm performance in two different types of firms, including financially distressed firms with high level of financial constraints and non-distressed firms based on the Altman's (1968) Z-score*. This final stage of the analysis deals with the issue of whether different extents of financial distress affect the association of financial leverage and firm performance. Financial distressed firms are identified with the Altman's Z-score when they are in the bottom third of the sample's Z-score distribution, whose Z-cores are lower than 1.42. That indicates there arehighly likely these firms go bankruptcy. Financially non-distressed firms are at the top third of the distribution, whose Z-score are higher than 2.46.

Z-score is Altman's (1968) Z-score and calculated as (1.2 x working capital + 1.4 x retained earnings + 3.3 x earnings before interest and taxes + 0.999 x sales) / total assets + 0.6 x (market value of equity/book value of debt).

V- EMPIRICAL RESULTS

5.1.Descriptive Statistics

Table 3.Descriptive Statistics– China

The table provides descriptive statistics of the main variables. Firm performance is measured by return on equity (ROE), return on assets (ROA), and Tobin's Q. The ROE is calculated as net profit extracted from income statement dividing by total equity from balance sheet for each company. The ROA is calculated as net profit dividing by total asset obtained from balance sheet also. Short-term debt ratio (STD) is measured as the current liabilities over total assets, long-term debt ratio (LTD) is measured as the non-current liabilities over total assets and total debt ratio, leverage (LEV) is calculated as the total liabilities over total assets. The natural log of the book value of total assets is used to measure firm size and changes in total assets are measured as firm growth.

	Firm Growth	**Leverage**	**Firm Size**	**Long-term debt ratio**	**Short-term debt ratio**	**ROE**	**ROA**
Mean	0.377	0.346	15.526	0.129	0.218	6.337	4.848
Median	0.178	0.347	15.313	0.089	0.201	7.950	4.350
Maximum	321.099	0.884	21.570	0.829	0.826	187.120	49.500
Minimum	-0.986	0.000	11.781	0.000	0.000	-6968.220	-46.770
Std. Dev.	4.736	0.163	1.387	0.129	0.135	104.027	5.158
Skewness	65.972	0.098	0.896	1.365	0.540	-64.091	-0.415
Kurtosis	4465.156	2.580	4.109	4.771	2.801	4289.779	15.706
Jarque-Bera	3910000000.00	42.11	872.40	2079.43	237.12	3610000000.00	31840.64
Probability	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Sum	1778.669	1632.931	73175.300	605.930	1027.001	29867.900	22847.900
Sum Sq. Dev.	105680.300	125.130	9070.327	78.117	85.747	50991836.000	125372.600
Observations	4713.000	4713.000	4713.000	4713.000	4713.000	4713.000	4713.000

Table 4. Correlation Matrix - China

	Firm Growth	**Firm Size**	**Leverage**	**Short-term debt ratio**	**Long-term debt ratio**
Firm Growth	**1.00**				
Firm Size	-0.01	**1.00**			
Leverage	-0.01	0.10	**1.00**		
Short-term debt ratio	0.00	-0.18	0.64	**1.00**	
Long-term debt ratio	-0.01	0.31	0.59	-0.24	**1.00**

Table 5. Descriptive Statistics – India

	Firm Growth	**Firm Size**	**Leverage**	**Long-term debt ratio**	**ROA**	**ROE**	**Short-term debt ratio**
	Firm Growth	**Firm Size**	**Leverage**	**Long-term debt ratio**	**Short-term debt ratio**	**ROA**	**ROE**
Mean	0.298	16.533	0.321	0.195	0.126	8.835	15.490
Median	0.187	16.463	0.325	0.168	0.105	7.760	15.370

Maximum	65.706	22.011	0.900	0.892	0.740	118.740	346.350
Minimum	-1.000	10.818	0.000	0.000	0.000	-23.870	-914.260
Std. Dev.	1.261	1.746	0.180	0.156	0.110	7.289	33.202
Skewness	41.905	0.147	0.073	0.752	1.299	2.254	-10.685
Kurtosis	2098.130	3.269	2.455	3.044	5.358	25.878	265.820
Jarque-Bera	643000000.000	23.289	46.589	331.029	1801.394	79540.810	10171837.000
Probability	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sum	1045.264	58047.350	1125.446	684.683	440.763	31019.390	54384.320
Sum Sq. Dev.	5580.545	10694.920	114.141	84.903	42.105	186506.200	3869226.000
Observations	3511.000	3511.000	3511.000	3511.000	3511.000	3511.000	3511.000

Table 6. Correlation Matrix – India

	Firm Growth	**Firm Size**	**Leverage**	**Short-term debt ratio**	**Long-term debt ratio**
Firm Growth	**1.00**				
Firm Size	0.00	**1.00**			
Leverage	0.01	0.04	**1.00**		
Long-term ratio	0.04	0.19	0.79	**1.00**	
Short-term ratio	-0.04	-0.20	0.52	-0.11	**1.00**

Table 7. Descriptive Statistics – Russia

	Firm Size	**Firm Growth**	**Leverage**	**Long-term debt ratio**	**Short-term debt ratio**	**ROE**	**ROA**
Mean	17.716	0.258	0.300	0.172	0.128	10.231	7.539
Median	17.743	0.172	0.284	0.141	0.091	10.370	6.360
Maximum	23.214	19.717	1.020	0.879	0.679	133.820	51.420
Minimum	13.094	-0.961	0.000	0.000	0.000	-324.580	-26.400
Std. Dev.	2.047	0.858	0.185	0.151	0.122	31.974	8.479
Skewness	0.125	16.114	0.489	1.214	1.524	-3.992	0.640
Kurtosis	2.543	349.136	2.837	4.579	5.570	36.732	6.029
Jarque-Bera	8.735	3892340.000	31.623	270.327	511.976	38702.420	348.301
Probability	0.013	0.000	0.000	0.000	0.000	0.000	0.000
Sum	13694.720	199.193	232.262	132.941	99.322	7908.780	5827.470
Sum Sq. Dev.	3234.024	568.132	26.326	17.625	11.517	789257.000	55499.340
Observations	773.000	773.000	773.000	773.000	773.000	773.000	773.000

Table 8. Correlation Matrix – Russia

	Firm Growth	Firm Size	Leverage	Short-term debt ratio	Long-term debt ratio
Firm Growth	**1.00**				
Firm Size	0.03	**1.00**			
Leverage	0.04	-0.36	**1.00**		
Short-term debt ratio	0.11	-0.39	0.56	**1.00**	
Long-term debt ratio	-0.04	-0.13	0.77	-0.11	**1.00**

Table 9. Descriptive Statistics – Brazil

	Firm Growth	Firm Size	Leverage	Long-term debt ratio	ROA	ROE	Short-term debt ratio
Mean	0.274	14.621	0.283	0.172	8.151	8.662	0.110
Median	0.130	14.633	0.276	0.151	7.600	11.915	0.080
Maximum	35.937	20.989	1.081	0.682	67.510	663.460	1.081
Minimum	-11.103	7.746	0.000	0.000	-45.820	-1794.710	0.000
Std. Dev.	1.314	1.971	0.166	0.140	8.075	78.317	0.100
Skewness	19.021	0.279	0.387	0.752	-0.035	-14.321	1.874
Kurtosis	478.724	3.413	2.889	3.037	9.255	299.659	9.610
Jarque-Bera	20934943.000	44.242	56.228	207.955	3596.908	8164676.000	5307.073

Probability	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sum	604.929	32253.670	623.239	379.862	17981.890	19108.860	243.376
Sum Sq. Dev.	3805.177	8567.674	60.527	43.311	143791.000	13524525.000	22.053
Observations	2206.000	2206.000	2206.000	2206.000	2206.000	2206.000	2206.000

Table 10. Correlation Matrix – Brazil

	Leverage	**Firm Size**	**Firm Growth**	**Long-term debt ratio**	**Short-term debt ratio**
Leverage	**1.000**				
Firm Size	0.055	**1.000**			
Firm Growth	-0.018	-0.009	**1.000**		
Long-term debt ratio	0.836	0.140	-0.027	**1.000**	
Short-term debt ratio	0.516	-0.118	0.010	-0.039	**1.000**

All the tables above provide descriptive statistics and correlation matrix of the main variables used in this thesis. As can be seen from those tables, the mean (median) of the variables "leverage" in all four countries are quite the same then the data in the samples is evenly divided around the mean. Additionally, the level of leverage is quite the same in Brazil, Russia and India, the median (mean) of leverage in these countries is around 0.28; except for China, the level of leverage is highest amongst them with median (mean) is approximately 0.35. The skewness of the variables "leverage" is quite small and the kurtosis of this variable is roughly 3 in all four countries so the distribution of data is symmetric (normal) around the mean. The same scenario can be found in the independent variable "long-term debt ratio" (low skewness, mean and median are quite the same, and kurtosis is about 3) so the data has normal distribution. In terms of control variables, the variable "firm size" in the selected countries has also quite the same mean and median, low skewness (less than 1) and kurtosis is slightly above 3 then the data can be regarded as normally distributed. The number of observations in China is 4713, while in India, Russia and Brazil, the sample has 3511, 733 and 2206 observations respectively. Regarding the correlation matrix, in all four countries, the correlation between firm size, firm growth and leverage is small. The correlation however between leverage and long-term debt as well as short-term debt is moderate. This is explainable since leverage includes long-term debt in it. In the next part, the multicollinearity test is run to check whether the correlation between leverage and long-term debt seriously affects the results.

Table 11. Multicollinearity test using variance inflation factor (VIF)

	ROA		**ROE**	
	Variable	**Centered VIF**	**Variable**	**Centered VIF**
Brazil	C	NA	C	NA
	LEV	1.006	LEV	1.052
	LTD	1.316	LTD	1.338
	Firm growth	1.000	Firm growth	1.000
	Firm size	1.313	Firm size	1.389
China	C	NA	C	NA
	LEV	1.562	LEV	1.565
	LTD	1.716	LTD	1.719

	Firm growth	1.000	Firm growth	1.000
	Firm size	1.124	Firm size	1.124
India	C	NA	C	NA
	LEV	2.787	LEV	2.836
	LTD	2.873	LTD	2.930
	Firm growth	1.003	Firm growth	1.003
	Firm size	1.061	Firm size	1.065
Russia	C	NA	C	NA
	LEV	2.928	LEV	2.804
	LTD	2.583	LTD	2.476
	Firm growth	1.019	Firm growth	1.020
	Firm size	1.228	Firm size	1.224

Table 11 shows the Variance inflation factor to quantify the intensity of multicollinearity in an ordinary least squares regression analysis. It produces an indicator to measure how much the variance of an estimated regression coefficient is inflated due to collinearity. As can be seen in this table, the test is run based on two models with ROA and ROE as the dependent variables. The VIFs for firm growth and firm size variables are quite small, just over 1 in all countries indicating that there is almost no correlation among those independent variables. With regard to leverage and long-term debt, VIFs are slightly higher. In China and Brazil, the figures are over 1 and in India and Russia, the figures are less than 3 implying there is a slight correlation between these variables but this level is still acceptable and does little affect the models examined.

5.2.Firm performance and Financial Leverage

Table 12. Firm performance and Leverage

Regressions are estimated using the model $ROE = \beta_0 + \beta_1 LTD_{i,t} + \beta_2 LEV_{i,t} + \beta_3 Size_{i,t} + \beta_4 Growth_{i,t} + \varepsilon_{i,t}$ and $ROA = \beta_0 + \beta_1 LTD_{i,t} + \beta_2 LEV_{i,t} + \beta_3 Size_{i,t} + \beta_4 Growth_{i,t} + \varepsilon_{i,t.}$ The dependent variable firm performance is measured by return on equity (ROE), return on assets (ROA). The ROE is calculated as net profit extracted from income statement dividing by total equity from balance sheet for each company. The ROA is calculated as net profit dividing by total asset obtained from balance sheet also. The independent variables are short-term debt ratio (STD) is measured as the current liabilities over total assets, long-term debt ratio (LTD) is measured as the

non-current liabilities over total assets and total debt ratio, leverage (LEV) is calculated as the total liabilities over total assets. The control variables are firm size, which is measured by the natural log of the book value of total assets and firm growth estimated by changes in total assets are measured as firm growth. Panel A describes the relationship between leverage and firm performance measured by return on assets (ROA). Panel B presents the link between leverage and firm performance measured by return on equity (ROE). *,**, &*** denote significance levels of 10%, 5%, and 1%.

	Variable	Coefficient	Std. Error	t-Statistic	Prob.
Panel A: ROA					
China	C	4.370	0.675	6.472	0.0000
	Long-term debt	6.516	0.632	10.315	0.0000
	Leverage	-10.499***	0.467	-22.466	0.0000
	Firm size	0.200	0.043	4.675	0.0000
	Firm growth	0.047	0.014	3.266	0.0011
India	C	14.032	1.117	12.563	0.0000
	Long-term debt	6.508	1.211	5.373	0.0000
	Leverage	-21.788***	1.030	-21.143	0.0000
	Firm size	0.029	0.066	0.437	0.6621
	Firm growth	0.207	0.090	2.291	0.0220
Russia	C	12.819	2.316	5.536	0.0000
	Long-term debt	6.760	2.466	2.741	0.0062
	Leverage	-18.379***	2.168	-8.477	0.0000
	Firm Growth	0.863	0.151	5.708	0.0000
	Firm Size	-0.083	0.122	-0.680	0.4963
Brazil	C	4.536	1.755	2.584	0.0098
	Long-term debt	17.916	2.308	7.763	0.0000
	Leverage	-15.907***	1.981	-8.029	0.0000
	Firm Size	0.295	0.118	2.494	0.0127
	Firm Growth	0.155	0.068	2.301	0.0215

Panel B: ROE

China	C	-12.972	12.095	-1.073	0.28350
	Long-term debt	45.265	11.379	3.978	0.00010
	Leverage	-57.058***	8.427	-6.771	0.00000
	Firm size	2.168	0.766	2.831	0.00470
	Firm growth	0.219	0.258	0.848	0.39640
India	C	26.188	5.376	4.871	0.00000
	Long-term debt	27.492	5.891	4.667	0.00000
	Leverage	-67.787***	5.032	-13.472	0.00000
	Firm size	0.332	0.319	1.041	0.29790
	Firm growth	0.793	0.432	1.835	0.06660
Russia	C	15.058	11.642	1.293	0.19610
	Long-term debt	39.107	12.532	3.120	0.00180
	Leverage	-54.396***	10.946	-4.969	0.00000
	Firm Growth	2.352	0.757	3.108	0.00190
	Firm Size	0.182	0.610	0.298	0.76600
Brazil	C	-39.499	12.255	-3.223	0.00130
	Long-term debt	84.725	18.664	4.540	0.00000
	Leverage	-98.874***	15.076	-6.558	0.00000
	Firm Size	4.213	0.850	4.957	0.00000
	Firm Growth	0.335	0.437	0.767	0.44320

Panel A presents the relationship between corporate performance and its leverage using return on asset (ROA) as the measurement of performance. The results show that the leverage has a negative effect on the firm performance. The negative coefficient in the variable "leverage" implicates that firms with higher level of leverage experience a loss in operating performance in comparison with more conservatively financed firms. The t-statistic of the variable "leverage" is very high in all four countries so this impact is considerably significant. Among four examined countries, the leverage in India is found to have the most

negative impact on its firm performance with the coefficient is up to approx. -21.8 and this impact is very significant. However, interestingly, the results reveal that long-term debt has a positive influence on firm performance in all four countries. This can be explained that higher level of long-term debt forces managers to maximize the firm value and thereby reduces manager discretions. Nevertheless, these effects are diminishing when firms are escalating the level of debt. It is probably reason why leverage has a negative impact on firm performance while long-term debt positively affects the firm value. It asserts the existence of optimal capital structure. Regarding control variables, table 11 shows that firm growth has slight positive impact on the firm performance in all four countries but firm size is found to affect ROA in only China and Brazil.

Consistently, Panel B also shows that the relationship between leverage and firm performance measured by return on equity (ROE) is negative. The coefficients are even higher when firm performance is measure by ROE. This effect is indicated as very significant since t-statistics is extremely high in all four countries. The same vein is found in panel B when long-term debt positively affects the firm performance but again it cannot be offset the negative effect caused by leverage. This again affirms the diminishing rule of level of debt financed by firms. In regards of the control variables, firm size has insignificant effect on the firm performance in India and Russia whereas it positively affects the corporate performance in China and Brazil. Russia is only the country that firm growth has a significant positive influence on ROE while in the other countries; there is no evidence of relationship between firm growth and ROE.

To investigate whether the multicollinearity is problematic in the model since leverage and long-term debt could probably be correlated, the long-term debt variable is omitted from the model. Table 13 shows that the relationship between level of debt and firm performance without observing the long-term debt in the data. The table has presented a consistent result with the above outcome. It reveals that leverage has a significant negative effect on the firm performance measured by ROA and ROE in both panels. More specifically, in Panel A, the influence of leverage still persists regardless of omitted “long-term debt” variable. In China, the level of debt significantly affects ROA with the coefficient of -9.3 in comparison of approx. -10.5 in the above table. In the same vein, in India and Russia, leverage detrimentally affects ROA with the coefficient of -17.36 and -8.64 respectively compared to approx. -21.8 and -18.4 respectively when long-term debt variable is included. Noticeably, in Brazil, there is a significant change when excluding long-term debt variable out of the model although it

still suggests there is an adverse effect on firm performance when increasing the level of leverage. The coefficient the new model shows a more moderate influence of debt on ROA with -2.43 in comparison with -15.9 in the previous model. The control variables, however, show a weaker link with the firm performance in comparison with the model with long-term debt included though these still significantly affect the firm performance at 1% level in all four countries except for firm size variable in India with coefficient of 1.

Table 13. Firm leverage and Firm Performance omitting long-term debt variable

Regressions are estimated using the model ROE = $\beta_0 + \beta_1 LEV_{i,t} + \beta_2 Size_{i,t} + \beta_3 Growth_{i,t} + \varepsilon_{i,t}$ and ROA = $\beta_0 + \beta_1 LEV_{i,t} + \beta_2 Size_{i,t} + \beta_3 Growth_{i,t} + \varepsilon_{i,t.}$ The dependent variable firm performance is measured by return on equity (ROE), return on assets (ROA). The ROE is calculated as net profit extracted from income statement dividing by total equity from balance sheet for each company. The ROA is calculated as net profit dividing by total asset obtained from balance sheet also. The independent variables are leverage (LEV) is calculated as the total liabilities over total assets. The control variables are firm size, which is measured by the natural log of the book value of total assets and firm growth estimated by changes in total assets are measured as firm growth. Panel A describes the relationship between leverage and firm performance measured by return on assets (ROA). Panel B presents the link between leverage and firm performance measured by return on equity (ROE). *,**, &*** denote significance levels of 10%, 5%, and 1%.

	Panel A: ROA			**Panel B: ROE**		
			China			
Variable	Coefficient	t-Statistic	Prob.	Coefficient	t-Statistic	Prob.
C	-0.463	-0.573	0.5663	-35.244	-2.068	0.0387
LEVERAGE	9.307***	-21.109	0	44.973***	-4.827	0
FIRM_GROWTH	0.035	2.323	0.0202	0.163	0.510	0.6104
FIRM_SIZE	0.549	10.585	0	3.678	3.360	0.0008
			India			
C	12.499	11.535	0	19.552	3.760	0.0002
LEVERAGE	17.360***	-28.007	0	-48.901***	-16.303	0
FIRM_GROWTH	0.234	2.580	0.0099	0.905	2.091	0.0366
FIRM_SIZE	0.113	1.747	0.0807	0.693	2.235	0.0255
			Russia			

C	-1.943	-0.666	0.5057	-10.739	-0.949	0.3429
LEVERAGE	8.642***	-5.235	0	23.523***	-3.603	0.0003
FIRM_GROWTH	0.720	2.117	0.0345	2.946	2.238	0.0255
FIRM_SIZE	0.672	4.422	0	1.547	2.627	0.0088
			Brazil			
C	2.644	1.553	0.1206	-53.303	-4.357	0
LEVERAGE	2.431***	-2.209	0.0272	49.811***	-4.999	0
FIRM_GROWTH	0.665	3.631	0.0003	0.632	0.507	0.6123
FIRM_SIZE	0.366	3.163	0.0016	5.192	6.110	0

Panel B shows the link between leverage and firm performance measured by ROE in when the long-term debt variable is left out. The coefficients still remain higher than compared to panel A. This is consistent to the results suggested in the previous model where the leverage also has an extreme adverse influence on firm performance in all four countries.

Table 14. Firm performance and financial leverage using dummies

Firm performance and financial leverage through years. Regressions are estimated using the model ROE = β_0 + $\sum_{y=2003}^{2012}$ $\delta_y Year_i^y$ + $\beta_1 LTD_{i,t}$ + $\beta_2 LEV_{i,t}$ + $\beta_3 Size_{i,t}$ + $\beta_4 Growth_{i,t}$ + $\varepsilon_{i,t}$ and ROA = β_0 + $\sum_{y=2003}^{2012}$ $\delta_y Year_i^y$ + $\beta_1 LTD_{i,t}$ + $\beta_2 LEV_{i,t}$ + $\beta_3 Size_{i,t}$ + $\beta_4 Growth_{i,t}$ + $\varepsilon_{i,t}$. DUMMY 1 to DUMMY 10 presents the period from 2003 to 2012. *,**, &*** denote significance levels of 10%, 5%, and 1%.

BRAZIL						
Dependent Variable		**ROA**			**ROE**	
Variable	Coefficient	t-Statistic	Prob.	Coefficient	t-Statistic	Prob.
C	3.142	1.841	0.0658	-44.753	-3.563	0.0004
LEVERAGE	-22.784***	-8.188	0.0000	-128.874***	-5.923	0.0000
LONG_TERM_RATIO	16.145	6.987	0.0000	91.024	4.688	0.0000
LEVERAGE*DUMMY_1	11.347	3.781	0.0002	-49.044	-2.066	0.0389
LEVERAGE*DUMMY_2	14.691	4.907	0.0000	64.874	2.699	0.0070
LEVERAGE*DUMMY_3	15.760	5.149	0.0000	71.767	3.074	0.0021
LEVERAGE*DUMMY_4	9.262	3.125	0.0018	47.091	2.035	0.0420
LEVERAGE*DUMMY_5	6.016	1.934	0.0532	7.355	0.310	0.7565

LEVERAGE*DUMMY_6	3.741	1.345	0.1787	27.327	1.256	0.2093
LEVERAGE*DUMMY_7	24.807	8.666	0.0000	48.208	2.163	0.0307
LEVERAGE*DUMMY_8	6.789	2.421	0.0156	41.256	1.877	0.0607
LEVERAGE*DUMMY_9	0.868	0.299	0.7652	3.741	0.176	0.8605
LEVERAGE*DUMMY_10	0.256	0.087	0.9306	9.249	0.430	0.6671
FIRM_GROWTH	0.685	3.843	0.0001	1.631	1.310	0.1905
FIRM_SIZE	0.381	3.308	0.0010	4.568	5.262	0.0000
	CHINA					
C	0.2844	0.3207	0.7485	-22.868	-1.205	0.2282
LEVERAGE	-14.679***	-18.9182	0	-82.133***	-4.931	0
LONG_TERM_RATIO	6.0956	8.4730	0	52.500	3.409	0.0007
LEVERAGE*DUMMY_1	3.8971	4.2270	0	28.304	1.433	0.1519
LEVERAGE*DUMMY_2	4.5976	5.2129	0	33.023	1.747	0.0806
LEVERAGE*DUMMY_3	2.8990	3.3584	0.0008	21.047	1.138	0.2553
LEVERAGE*DUMMY_4	3.8828	4.4971	0	27.373	1.477	0.1398
LEVERAGE*DUMMY_5	6.6535	7.6533	0.000	-34.126	-1.832	0.067
LEVERAGE*DUMMY_6	1.9877	2.3762	0.0175	16.166	0.901	0.3676
LEVERAGE*DUMMY_7	1.4078	1.6753	0.0939	15.705	0.872	0.3831
LEVERAGE*DUMMY_8	3.4462	4.0693	0.000	24.345	1.342	0.1797
LEVERAGE*DUMMY_9	2.6030	3.1211	0.0018	15.592	0.873	0.383
LEVERAGE*DUMMY_10	0.7604	0.9172	0.3591	5.885	0.331	0.7404
FIRM_GROWTH	0.0313	2.1011	0.0357	0.138	0.433	0.6651
FIRM_SIZE	0.5059	8.9612	0	2.968	2.457	0.0141
	INDIA					
C	9.812	8.423	0.0000	4.693	0.848	0.3967
LEVERAGE	-25.249***	-20.466	0.0000	-97.913***	-16.258	0.0000
LONG_TERM_RATIO	2.958	2.389	0.0170	7.940	1.339	0.1808
LEVERAGE*DUMMY_1	5.461	3.602	0.0003	18.525	2.541	0.0111
LEVERAGE*DUMMY_2	8.995	6.162	0.0000	56.819	8.085	0.0000
LEVERAGE*DUMMY_3	11.040	7.982	0.0000	73.305	10.990	0.0000

LEVERAGE*DUMMY_4	10.082	7.362	0.0000	72.401	11.037	0.0000
LEVERAGE*DUMMY_5	12.144	8.965	0.0000	74.415	11.488	0.0000
LEVERAGE*DUMMY_6	9.282	6.851	0.0000	55.496	8.568	0.0000
LEVERAGE*DUMMY_7	3.565	2.694	0.0071	40.776	6.430	0.0000
LEVERAGE*DUMMY_8	4.616	3.459	0.0005	47.046	7.354	0.0000
LEVERAGE*DUMMY_9	3.734	2.774	0.0056	39.758	6.177	0.0000
LEVERAGE*DUMMY_10	1.659	1.276	0.2019	24.248	3.875	0.0001
FIRM_GROWTH	0.174	1.947	0.0516	0.794	1.879	0.0603
FIRM_SIZE	0.272	3.939	0.0001	1.557	4.752	0.0000
	RUSSIA					
C	-2.170	-0.715	0.4747	-13.371	-1.148	0.2514
LEVERAGE	-14.538***	-4.064	0.0001	-28.607***	-2.056	0.0402
LONG_TERM_RATIO	6.681	2.233	0.0258	18.712	1.583	0.1137
LEVERAGE*DUMMY1	6.693	0.581	0.5612	61.566	1.393	0.164
LEVERAGE*DUMMY2	3.675	0.397	0.6915	8.349	0.235	0.8143
LEVERAGE*DUMMY3	13.997	2.677	0.0076	35.316	1.755	0.0796
LEVERAGE*DUMMY4	10.246	2.428	0.0154	38.549	2.369	0.0181
LEVERAGE*DUMMY5	6.678	1.905	0.0572	15.725	1.162	0.2455
LEVERAGE*DUMMY6	3.627	1.111	0.2668	-12.263	-0.970	0.3323
LEVERAGE*DUMMY7	0.714	0.223	0.824	0.920	0.073	0.9422
LEVERAGE*DUMMY8	-0.771	-0.243	0.8083	-29.320	-2.339	0.0196
LEVERAGE*DUMMY9	2.658	0.798	0.4249	6.113	0.476	0.6344
LEVERAGE*DUMMY10	-0.542	-0.167	0.867	-19.530	-1.562	0.1188
FIRM_GROWTH	0.682	1.947	0.0519	2.279	1.692	0.0911
FIRM_SIZE	0.673	4.282	0	1.623	2.689	0.0073

Table 14 examines the impact of leverage on firm performance during years from 2003 to 2013 using year dummies in emerging markets due to the fact that firm performance can vary from year to year. First, in panel A, Brazil is examined in the model and reveals that from 2003 to 2005, the coefficients are highly positive due to economic growth in Brazil in this

period. Noticeably, in 2009, the coefficient is very high, making the relationship between leverage and firm performance positive probably due to the global financial crisis beginning from 2008. The same picture is found in panel B except for the fact that in 2003, the coefficient is negative, making the association even more negative. China and India witness trivial changes throughout years in both Panel A and B. In Russia, the influence of variation in ROA and ROE through years is insignificant.

5.3.Firm performance and financial leverage during economic downturns

Table 15. Firm performance and financial leverage during economic downturns

Firm performance and financial leverage during economic downturns. Regressions are estimated using the model $ROE = \beta_0 + \beta_1 LTD_{i,t} + \beta_2 STD_{i,t} + \beta_3 LEV_{i,t} + \beta_4 Size_{i,t} + \beta_5 Growth_{i,t} + \beta_6 DID + \beta_7 DID \times LEV + \varepsilon_{i,t}$ and $ROA = \beta_0 + \beta_1 LTD_{i,t} + \beta_2 STD_{i,t} + \beta_3 LEV_{i,t} + \beta_4 Size_{i,t} + \beta_5 Growth_{i,t} + \beta_6 DID + \beta_7 DID \times LEV + \varepsilon_{i,t}$. The dependent variable firm performance is measured by return on equity (ROE), return on assets (ROA). The ROE is calculated as net profit extracted from income statement dividing by total equity from balance sheet for each company. The ROA is calculated as net profit dividing by total asset obtained from balance sheet also. The independent variables are short-term debt ratio (STD) is measured as the current liabilities over total assets, long-term debt ratio (LTD) is measured as the non-current liabilities over total assets and total debt ratio, leverage (LEV) is calculated as the total liabilities over total assets. The control variables are firm size, which is measured by the natural log of the book value of total assets and firm growth estimated by changes in total assets are measured as firm growth. Panel A describes the relationship between leverage and firm performance measured by return on assets (ROA). Panel B presents the link between leverage and firm performance measured by return on equity (ROE). A dummy variable, DID takes the value of 1 if the median sales growth of the industry is negative and median stock return is below -30%, and 0 otherwise, using the Arello and Bond (1991). *,**, &*** denote significance levels of 10%, 5%, and 1%.

	Variable	Coefficient	Std. Error	t-Statistic	Prob.
Panel A: ROA					
China	C	3.212	0.698	4.602	0.0000
	Short-term debt ratio	-6.784	0.631	-10.746	0.0000
	Leverage	-2.767***	0.552	-5.015	0.0000
	Leverage*Dummy	-2.093	0.336	-6.222	0.0000
	Firm Growth	0.045	0.014	3.165	0.0016
	Firm Size	0.273	0.044	6.184	0.0000
India	C	21.445	1.093	19.629	0.0000

	Short-term debt ratio	-8.970	1.280	-7.008	0.0000
	Leverage	-8.055***	0.721	-11.165	0.0000
	Leverage*Dummy	-3.086	1.044	-2.955	0.0031
	Firm Size	-0.562	0.063	-8.988	0.0000
	Firm Growth	0.300	0.104	2.879	0.0040
Russia	C	12.694	2.323	5.464	0.0000
	Short-term debt ratio	-6.591	2.484	-2.653	0.0081
	Leverage	-11.525***	1.561	-7.382	0.0000
	Leverage*Dummy	-0.807	2.006	-0.402	0.6874
	Firm Growth	0.861	0.151	5.692	0.0000
	Firm Size	-0.077	0.122	-0.631	0.5284
Brazil	C	5.495	1.708	3.218	0.0013
	Short-term debt ratio	-17.401	2.326	-7.480	0.0000
	Leverage	0.546	1.280	0.427	0.6696
	Leverage*Dummy	18.236	2.110	8.644	0.0000
	Firm Growth	0.728	0.179	4.071	0.0000
	Firm Size	0.214	0.115	1.861	0.0629
Panel B: ROE					
China	C	-15.039	12.538	-1.200	0.2304
	Short-term debt ratio	-45.736	11.409	-4.009	0.0001
	Leverage	-9.662	9.962	-0.970	0.3322
	Leverage*Dummy	-3.707	6.079	-0.610	0.5421
	Firm Growth	0.216	0.258	0.837	0.4027
	Firm Size	2.299	0.793	2.899	0.0038
India	C	30.502	4.571	6.673	0.0000
	Short-term debt ratio	-33.159	5.428	-6.109	0.0000
	Leverage	-25.064***	3.024	-8.289	0.0000
	Leverage*Dummy	-7.500	4.372	-1.716	0.0863

	Firm Size	-0.180	0.261	-0.690	0.4905
	Firm Growth	0.933	0.434	2.147	0.0318
Russia	C	14.569	11.681	1.247	0.2125
	Short-term debt ratio	-39.047	12.636	-3.090	0.0020
	Leverage	-15.808*	8.342	-1.895	0.0583
	Leverage*Dummy	4.439	10.305	0.431	0.6667
	Firm Growth	2.366	0.758	3.122	0.0018
	Firm Size	0.206	0.612	0.336	0.7369
Brazil	C	-39.616	12.530	-3.162	0.0016
	Short-term debt ratio	-95.895	19.462	-4.927	0.0000
	Leverage	-18.044	12.284	-1.469	0.1420
	Leverage*Dummy	26.615	17.116	1.555	0.1201
	Firm Growth	0.880	1.244	0.708	0.4792
	Firm Size	4.320	0.867	4.981	0.0000

Table 15 reveals the interdependence between level of debt and firm performance associated with economic downturns measured by median sales growth of industry and median stock returns. Panel A illustrating model measured by ROA provides mixed results. China and India show a negative relationship between leverage and firm performance, and this link is even more adverse during economic downturns. This identifies that companies financed by more debt other than equity obtain poorer performance during economic decline. In the same vein, Russia shows similar picture but the link is insignificant. In contrast, Brazil witnesses a significant positive link between leverage and firm performance during economic deteriorate periods. This suggests, in Brazil, during downtrends in economy, higher level of debt facilitates better for companies. Panel B observes inconsistent empirical results with Panel A. China and India still persist to show devastating relationship between leverage and firm performance during recession, it however is not significant. Russia and Brazil suggest a contradiction in trend when higher level of debt assists firms to achieve better performance but this independency is also trivial with low t-statistics.

5.4.Financially distressed and non-distressed firms

Table 16. Financially distressed firms and non-financially distressed firms

The table presents the estimates of Equation (1) and (2) for sub-samples of financially distressed and non-distressed firms based on Altman (1968) Z-score. The dependent variable firm performance is measured by return on equity (ROE), return on assets (ROA). The ROE is calculated as net profit extracted from income statement dividing by total equity from balance sheet for each company. The ROA is calculated as net profit dividing by total asset obtained from balance sheet also. The independent variables are short-term debt ratio (STD) is measured as the current liabilities over total assets, long-term debt ratio (LTD) is measured as the non-current liabilities over total assets and total debt ratio, leverage (LEV) is calculated as the total liabilities over total assets. The control variables are firm size, which is measured by the natural log of the book value of total assets and firm growth estimated by changes in total assets are measured as firm growth. Panel A represents the relationship between leverage and firm performance measured by ROA. Panel B shows the link between leverage and firm performance measured by ROE. *, **, &*** denote significance levels of 10%, 5%, and 1%.

Panel A: ROA					
		Z-score<1.42		**Z-score>2.46**	
	Variable	Coefficient	t-Statistic	Coefficient	t-Statistic
China					
	C	0.663	0.660	-0.139	-0.027
	Long-term debt ratio	5.610	6.684	5.266	1.708
	Leverage	-11.839***	-18.694	-13.971***	-5.386
	Firm growth	0.880	8.876	1.063	1.595
	Firm size	0.464	7.208	0.583	1.745
India					
	C	7.254	2.431	1.170	0.112
	Long-term debt ratio	-2.039	-0.594	-14.951	-1.707
	Leverage	-5.928*	-1.960	-5.263	-0.581
	Firm growth	1.849	3.055	2.318	1.225
	Firm size	0.168	0.926	0.729	1.175
Russia					
	C	12.833	2.096	-9.731	-1.386
	Long-term debt ratio	7.082	1.296	7.554	1.005
	Leverage	-18.473***	-3.555	-16.906**	-2.746

	Firm growth	9.185	5.206	0.814	0.918
	Firm size	-0.110	-0.315	1.216	3.407
Brazil					
	C	-14.380	-4.601	8.234	1.009
	Long-term debt ratio	0.000	-4.704	0.000	-0.892
	Leverage	-4.123*	-1.841	-6.010	-1.356
	Firm growth	2.059	6.606	3.503	1.399
	Firm size	1.651	7.394	0.109	0.179

Panel B: ROE

		Z-score<1.42		**Z-score>2.46**	
	Variable	Coefficient	t-Statistic	Coefficient	t-Statistic
China					
	C	-20.657	-0.832	-2.143	-0.147
	Long-term debt ratio	63.055	3.043	14.663	1.703
	Leverage	-81.242***	-5.193	-35.526***	-4.904
	Firm growth	4.274	1.746	3.850	2.069
	Firm size	2.907	1.831	1.280	1.372
India					
	C	19.326	1.915	10.513	0.119
	Long-term debt ratio	19.047	1.642	-193.955	-2.502
	Leverage	-34.619***	-3.384	-2.903	-0.038
	Firm growth	6.614	3.231	35.174	2.125
	Firm size	0.166	0.270	1.851	0.353
Russia					
	C	1.405	0.045	-38.806	-2.400
	Long-term debt ratio	36.249	1.309	19.905	1.150
	Leverage	-67.841**	-2.577	-23.444*	-1.653
	Firm growth	36.932	4.132	2.123	1.040
	Firm size	1.062	0.604	3.058	3.720
Brazil					

C	-111.934	-4.208	-4.799	-0.246
Long-term debt ratio	0.000	-2.230	0.000	-0.669
Leverage	-27.124	-1.546	-34.049***	-3.142
Firm growth	7.134	3.123	4.841	0.840
Firm size	8.963	4.718	1.789	1.216

The table above presents in details the link between leverage and firms with different financial status. The model is divided into two sub-groups, including firms with financial distress and financially non-distressed firms. Z-score is used to measure whether a firm is experiencing financial distress or not. Firms with Z-score< 1.42 are considered to be financially distressed firms and firms with Z-score> 2.46 are regarded as profitable firms. It is examined whether the impact of leverage on performance of two these groups of firms is similar or not.

Panel A illustrates the impact of leverage on the subgroups, where firm performance is measured by ROA. In China and Russia, higher level of debt devastatingly affects firm performance even though these firms are experiencing difficulties in finance or not. This impact is considerably significant when t-statistics exceeds 2.4 in both countries in both sub-groups. Brazil also witnesses the same vein, but at lower level of significance. India, in contrast, shows significant relationship between leverage and performance of firms experiencing financial distress while there is no link between leverage and profitable firms.

Panel B reveals the correlation between leverage and firm performance measured by ROE. Similar results with Panel A are found in China, Russia and Brazil. There is a negative correlation between level of debt and firm performance in both sub-samples. India still shows the same result when debt level negatively affects performance of financially distressed firms, but there is no suggestion regarding link between leverage and performance of non-distressed firms.

CONCLUSION

This study investigates the homogeneity of the relationship between financial leverage and firm's efficiency across emerging economy, including Brazil, Russia, India and China (BRIC). The literature regarding the link between firm performance and the choice between debt and equity is tremendous; however, empirical evidence yields inconsistent results. Chaiporn Vithessonthi et al. (2015) examine the relation between financial leverage and firm performance in non-financial firms in Thailand during the financial crisis 2007-2009 and find out that leverage is negatively associated with firm performance in the full sample. Noticeably, they reveal that the impact of debt is negative for domestically-oriented firms but positive for internationally-oriented firms. Moreover, they also point out that the influence of leverage on performance is dependent on firm size, while there is a positive relationship for small firms, the opposite context is found in large firms. Silvia Z. Islam et al. (2015) also investigate firm leverage in Australia mining and non-mining firms and suggest that mining firms inclines to follow pecking order model more closely than non-mining firms. This result shows difference in industry does matter for firms to make debt equity choice. Hubert de La Bruslerie et al. (2012) also suggest that leverage decisions also are influenced by shareholders' ownership when they study 112 firms listed on French stock market over the period 1998-2009 and assert that there is an inverted U-shape relationship between shareholders' ownership and debt equity choice. In addition, the thesis also investigates the association of financial leverage with firm performance during a period of extreme distress in those countries. Meanwhile, Kwangmin Park et al. (2013) find that higher level of debt is an efficient way to reduce free cash flows and improve firm efficiency since debt leverage alleviates the devastating effects of unrelated diversification on firm performance. In the context of many controversial results around target capital structure of firms, this paper examines how deviations from those targets affect firm efficiency in four largest emerging markets, including Brazil, Russia, India, and China (BRIC) and tests whether this association is vulnerable under context of financial crisis, and economic downturns which is noticeably intriguing when considering the emerging markets since it was found that through debt markets the financial crisis of 2008 penetrated the emerging countries. It also provokes an issue concerning costs of financial distress in modern corporate finance when costs incurred is inability to meet firm's obligations, it is difficult to determine whether more debt or less debt is better for firm performance. This study thus also examines the impact of financial leverage on performance of both distressed firms and non-distressed firms.

Emerging markets are always considered as promising land for business expansion compared with the saturation of developed markets. According to statistics from World Bank, after the financial crisis, the growth rates in BRIC economies have stimulated significantly and BRIC gradually become the driving force in the global economic recovery. Due to higher volatility and returns, lucrative investment opportunities, and interdependencies with developed markets, international investors move towards them as a good source of diversification. In developed markets, firms are inclined to adhere to a particular type of debt; on contrary, the choice of debt source in emerging markets is more flexible since firms in those economies may switch from public debt to private debt, which has a significant impact on choice of debt and equity. That in turn may create a more pronounced impact on firm performance. Therefore, they provide a particular interesting context for investigating the impact of choice of debt and equity on firm performance since the emerging markets is different from developed economies regarding the firm behavior towards debt financing, and volatility.

The empirical results indicate that the leverage has a negative effect on the firm performance in all four countries, which implies that firms with higher level of leverage experience a loss in operating performance in comparison with more conservatively financed firms. Amongst four examined countries, the leverage has the most negative influence on its firm performance in India. However, interestingly, the results implicate that long-term debt has a positive influence on firm performance in all four countries. This can be explained that higher level of long-term debt forces managers to magnify the firm value and thereby alleviates manager discretions. Nevertheless, these effects are diminishing when firms are intensifying the level of debt. It asserts the existence of optimal capital structure. Regarding control variables, the study also shows that firm growth has slight positive impact on the firm performance measured by ROA in all four countries but firm size is found to affect ROA in only China and Brazil. When firm efficiency is measured by ROE, firm size has insignificant effect on the firm performance in India and Russia whereas it positively affects the corporate performance in China and Brazil. Russia is only the country that firm growth has a significant positive influence on ROE while in the other countries; there is no evidence of relationship between firm growth and ROE.

Regarding the interdependence between level of debt and firm performance associated with economic downturns this paper provides mixed results when ROA is employed in the model. China and India indicate a negative relationship between leverage and firm performance, and this link is even more pessimistic during economic decline. Russia shows similar trend but

the link is insignificant. In contrast, Brazil shows a significant positive link between level of debt and firm efficiency during economic deteriorate periods. This suggests, in Brazil, during downtrends in economy, higher level of debt facilitates better for companies. When firm performance is measured by ROE, the paper also observes inconsistent empirical results. China and India still remain to show devastating relationship between leverage and firm performance during recession, it however is not significant. Russia and Brazil suggest a contradiction in trend when higher level of debt assists firms to achieve better performance but this independency is also trivial with low t-statistics.

Finally, considering the link between leverage and firms with different financial status measured by Z-score. This thesis illustrates the impact of leverage on the subgroups, where firm performance is measured by ROA. In China and Russia, higher level of debt has a devastating influence on firm performance even though these firms are experiencing difficulties in finance or not. Brazil shows similar context, but at lower level of significance. India, in contrast, shows significant association between debt and efficiency of firms experiencing financial distress while there is no link between leverage and profitable firms. When ROE is used as measurement for firm performance, consistent results are found in China, Russia and Brazil when level of debt has a negative impact on firm performance in both sub-samples and India remains to suggest leverage adversely affects profitability of financially distressed firms, but there is no suggestion regarding link between leverage and performance of non-distressed firms.

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