Does State Ownership Really Matter for Capital Structure in Selected G20 Economies across the Development Spectrum?

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ABSTRACT

This study investigates the effect of state ownership on the capital structure decisions of enterprises. For this purpose, financial and accounting data from 252 state-owned and 6,503 non-state owned firms in selected G20 countries has been gathered for a period of 2011-2015. Our analysis is motivated by the lack of this evidence for such an important group of economies. The group, collectively, not only fall in the top 33 global economies, but their members also forms and constitute G-7, BRIC (Brazil, Russia, India and China), G-4 (Brazil, Germany and India) and N-11 (Indonesia, South Korea and Turkey). Pooled regressions estimated using OLS techniques are performed to study the relationship between ownership and capital structure across G20 countries. Beside the effect of ownership structure, we also investigate and quantify the effects of several firm specific variables on capital structure of firms in selected G20 countries. Results indicate that state ownership is positively associated with leverage in all the selected G20 countries. However, this phenomenon changes when countries are considered according to their income levels. We find that state-owned enterprises in high income countries carry more debt, while the opposite is true for lower middle-income countries. Estimated coefficients of the other determinants of the capital structure show that tangibility and size positively affect the leverage. While, profitability and growth have a significant negative affect on the leverage. The association between firm specific determinants and leverage were found to be consistent, irrespective to their level of income and according to trade-off and pecking order theory. However, results were found to be divergent when effects of various firm specific variables were compared between state and non-state-owned enterprises across the development spectrum. Hence, our analysis shows that firm

specific variables and ownership structure are important determinants of capital structure in selected G20 countries and across the development spectrum.

Our results provide a number of policy and managerial implications. We showed and learned that state ownership is a significant factor affecting company's capital structure decision. However, this association of state ownership with capital structure decision is not same across the development spectrum. The implication is that in counties with better legal environment, developed financial markets and more stable economic conditions, state owned enterprises are likely to take more debt. On the other hand the negative influence of state ownership in lower middle income countries implies that governance in these economies is poor and state institutions carry less debt.

Keywords: Capital structure, Level of development, Non-state-owned enterprises, Profitability, Size, State-owned enterprises, Tangibility

ÖZ

Bu çalışma, kamuya ait işletmelerin sermaye yapısı kararları üzerindeki etkisini araştırmaktadır. Bu amaçla, seçilen G20 ülkelerindeki 252 kamuya ait ve 6.503 özel işletmenin finansal ve muhasebe verileri 2011-2015 dönemi için toplanmıştır. Bu konunun seçilme nedeni, bu kadar önemli bir ekonomi grubu için bu yönde bir çalışma olmayışıdır. Seçilen ekonomiler yalnızca küresel düzeyde tepede bulunan 33 ekonomi arasında değil, üyeleri G-7, BRIC (Brezilya, Rusya, Hindistan ve Çin), G-4 (Brezilya, Almanya ve Hindistan) ve N-11'de de (Endonezya, Güney Kore ve Türkiye) yer alan ülkelerden oluşmaktadır. G20 ülkelerinde şirketlerin mülkiyet sahipliği ve sermaye yapısı arasındaki ilişkiyi incelemek için en küçük kareler (OLS) teknikleri kullanılarak regresyonlar gerçekleştirilmiş ve tahminler yapılmıştır. Bu çalışmada mülkiyet yapısının etkisinin yanı sıra, G20 ülkelerindeki firmalara özgü değişkenlerin sermaye yapısı üzerindeki etkileri de araştırılmıştır. G20 ülkelerinden seçilen işletmeler için sonuçlar, işletmelerin kamuya ait olmaları ile finansal kaldıraç arasında pozitif bir ilişki olduğunu göstermektedir. Ancak bu tespit, ülkeler gelir seviyelerine göre değerlendirildiğinde değişmektedir. Yüksek gelirli ülkelerde kamuya ait işletmelerin daha fazla borç kullandığını ve bunun düşük orta gelirli ülkeler için tam tersi olduğu, yani daha az kredi kullandıkları görülmüştür. Sermaye yapısının diğer belirleyicilerinin tahmini katsayıları, firmaların duran varlıklarının ve büyüklüklerinin finansal kaldıraç oranını istatistiksel olarak anlamlı ve olumlu yönde etkilediğini göstermektedir. Öte yandan, kârlılığın ve büyüme oranının kaldıraç (borçlanma) üzerinde önemli olumsuz etkileri olduğu bulunmuştur. Firmaya özgü belirleyiciler ve kaldıraç arasındaki ilişkinin, gelir seviyelerine bakılmaksızın, dengeleme (trade-off) ve hiyerarşi (pecking order) teorilerine göre tutarlı olduğu

bulunmuştur. Bununla birlikte, bu sonuçlar ülkelerin gelişmişlik düzeyi dikkate alındığında kamuya ait işletmeler ile özel işletmeler arasında farklılıklar göstermektedir. Dolayısıyla, analizimiz, şirketlere özgü diğer değişkenlerin yanı sıra, mülkiyet sahipliliği yapısı ve gelişmişlik düzeyi, seçilen G20 ülkelerindeki sermaye yapısının önemli belirleyicileri olduğunu göstermektedir.

Sonuçlarımız şirketlerde kamu sahipliliğinin sermaye yapısı kararlarını etkileyen önemli bir faktör olduğunu göstermektedir. Bununla birlikte, kamu mülkiyetinin sermaye yapısı kararıyla ilişkilendirilmesi ülkelerin gelişmişlik düzeyine göre farklıklar göstermektedir. Buna göre, daha iyi yasal çevreye, gelişmiş finans piyasaları ve daha istikrarlı ekonomik koşullara sahip gelişmiş ülkelerde, kamuya ait işletmelerin daha fazla borç alması beklenmektedir. Diğer taraftan, düşük orta gelirli ülkelerde işletmelerde kamu sahipliliğinin olumsuz etkisi, bu ekonomilerde yönetişimin zayıf olduğu ve kamu işletmelerinin daha az borçlanabileceği anlamına gelmektedir.

Anahtar Kelimeler: Duran varlıklar, Ekonomik gelişmişlik düzeyi, Kamuya ait işletmeler, Karlılık, Özel işletmeler, Sermaye yapısı, Şirket büyüklüğü

DEDICATION

To My Family

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LIST OF ABBREVIATIONS

COUNTRY   Country Dummies

DO   Ownership Dummy

G20   Group of Twenty

GDP   Gross Domestic Product

HI   High Income

IMF   International Monetary Fund

INDUSTRY   Industry Dummies

L   Leverage

LMI   Lower Middle Income

M&M   Modigliani and Miller

Max   Maximum

Min   Minimum

N-11   Group of Eleven Countries

Non-SOES   Non- State Owned Enterprises

OECD   Organization for Economic Co-operation and Development

OLS   Ordinary Least Squares

ORBIS   Comparable Company Data Base

ROA   Return on Assets

SD   Standard Deviation

SIZE   Firm Size

SOEs   State Owned Enterprises

T   Tangibility

TQ   Growth

UMI	Upper Middle Income
UNCTAD	United Nations Conference on Trade and Development
US	United States
YEAR	Year Dummies

Chapter 1

INTRODUCTION

1.1 Background

Capital structure is one of the most important corporate financial decisions. Firm managers make various decisions in order to avoid financial crisis and take out firm from deficit condition. These may include capital restructuring specifically debt restructuring. Brounen, Jong, & Koedijk (2005) state that capital structure of a firm shows use of debt, equity, or any other intermediate security to finance a particular business activity.

The capital structure irrelevance theory of Modigliani & Miller, (1958), which is credited with providing the foundation of modern finance, was later extended via a more appropriate set of assumptions that evolved to result in the advancement of stronger theories, among which are trade-off theory (Modigliani & Miller 1963; Jensen & Meckling 1976; Miller 1977) and the pecking order theory by Myers & Majluf (1984). Following theoretical exposure to capital structure, researchers examined capital structure decisions in both developed (Rajan and Zingales, 1995; Bauer, 2004; Brounen, Jong, and Koedijk, 2005) and developing countries (Bancel & Mittoo, 2004; Pacheco & Tavares, 2016). These studies provide mixed empirical evidence in support of both trade-off and pecking order theories. In contrast, Jensen & Meckling (1976) argue that agency cost and ownership structure also have important effects on a firm's capital structure decision. While many studies have

tested the theories of corporate financial decisions, very few have used cross country comparisons, specifically in terms of institutional differences such as ownership (Booth et al., 2001; Faccio, Masulis & McConnel, 2006). The relevance of capital structure theory in terms of ownership still needs further investigation, principally for SOEs and non-SOEs in countries at different stages of economic development (High income, Upper middle Income and Lower middle Income). This is particularly important for emerging economies, which are in the process of transforming. Hence, the question of how the ownership of firms affects capital structure in these economies relative to developed economies requires further attention. Accordingly, this study estimates the effects of ownership structure on the capital structures of firms in selected G20 with respect to their level of economic development measured in-terms of per capita income.

1.2 Motivation

The idea that private ownership can perform inherently better in terms of profitability, efficiency and constructing optimal debt than public ownership is not new. Rajan & Zingales (1995) showed the link between ownership and capital structure decisions. The study was followed by a stream of literature presenting how a firm can benefit from state ownership[1]. These benefits include easy access of politically connected and state-run enterprises to debt financing (Johnson & Mitton, 2003; Dinc, 2004; Khwaja & Mian, 2005; Le & Tannous, 2016), government contracts (Goldman, Rochall, & So, 2010) and government aid (Faccio, Masulis, & McConnel, 2006). This study extends the existing literature by estimating and comparing the effect of state ownership on the capital structure decisions of firms in selected G20 economies with respect to their level of economic development

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[1] In this study, an enterprise is considered state-owned when state owns more than half of the shares of the firm.

measured in-terms of per capita income. Our analysis is motivated by the lack of this evidence for such an important group of economies. The group, collectively, not only fall in the top 33 global economies, but their members also forms and constitute G-7, BRIC (Brazil, Russia, India and China), G-4 (Brazil, Germany and India) and Next-11[2] (Indonesia, South Korea and Turkey). Hence, understanding the likely effects of state ownership of firms on their capital structure decisions for G20 is extremely important not only for them but also for other such group of countries and individual economies at the same of economic development.

Data of the state-owned enterprises (SOEs) to show their contributions to an economy over a period of time is not available. Random reported instances of their contributions show that SOEs accounted for 20 percent of global investment and 5 percent of global employment in 2006 (Robinett, 2006). The total value of SOEs in OECD economies, having eleven G20 countries, is US$1.2 trillion, accounting for their 15 percent of GDP in 2009 (OECD, 2011). With respect to other countries, the contribution of SOEs to GDP was 15 percent in Africa, 8 percent in Asia, 6 percent in Latin America (Robinett, 2006), 50 percent in Central Asia (Kikeri & Kolo, 2006), and up to 40 percent in Indonesia (Abubakar, 2010). Similarly, their contribution to a particular sector is even more phenomenal and, in some instances, could potentially have monopolistic powers. For example, state banks accounted for more than half of the value of banking sector in China and India in 2010 while their value in Argentina, Brazil, Indonesia, the Republic of Korea, Poland, Russia, and Turkey is between 20 to 50 percent (World Bank, 2014). In China, India and Russia, about 25 percent of the top 100 multinational corporations were state-owned in 2006

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[2] Next-11 countries constitute a diverse group of emerging economies including Bangladesh, Egypt, Indonesia, Iran, Mexico, Nigeria, Pakistan, the Philippines, South Korea, Turkey and Vietnam.

(UNCTAD, 2007). Finally, SOEs controlled 75 percent of the global oil reserves and production (Economist, January 23, 2010). These statistics show state ownership as an important economic phenomenon in low, middle and high income-countries including emerging economies. The phenomenon of state ownership instead of shrinking has expanded over years and we are unaware of their role in capital structure decisions of firms. Particularly we do not know the likely effects of state ownership on capital structure of firms located in -middle and upper middle income countries as compared to high income countries in G20 economies. This is the main focus of our analysis presented in this study. Investigating the likely effects of state ownership on capital structure in G20 economies becomes more important since it is a diverse group and includes two lower middle, five upper middle, and eleven high income economies. We have not only estimated but also compared the effects of state ownership on capital structure decisions across the development spectrum among G20 economies.

1.3 Objectives

Our objective is to empirically investigate the effect of state ownership on capital structure decision across the development spectrum among G20 countries. The definition and taxonomic framework for development differs in the literature. International Monitory Fund (IMF) categorizes countries into developed and emerging and developing countries using real GDP. World Bank on the other hand categorizes countries on the basis of per capita income. Countries, having US$ 1025 and less per capita income are considered low income, US$ 1026-4035 lower middle income and US$ 12476 high income. A comparison of both the definitions shows that most of the middle-income and some of the low income countries are considered as emerging economies by the IMF. In the context of G20, IMF categorizes

Argentina, Brazil, China, Russia, India, Indonesia, Korea, Saudi Arabia and Turkey as emerging and Germany, Italy and France as developed economies. World Bank categorizes India and Indonesia as lower middle income, Argentina, Brazil, China, Russia and Turkey as upper middle income and France, Germany, Italy, Republic of Korea and Saudi Arabia as high income. This study uses the definitions of World Bank while estimating and comparing the effect of ownership structure on capital structure across these economies. Specifically the following questions are raised in this study:

i.   Does state ownership of enterprises affect their capital structure decisions?

ii.   Is the effect of state ownership of enterprises on capital structure decisions similar across the development spectrum?

iii. Is the effect of firm specific variables of SOEs and non-SOEs on capital structure are same across the development spectrum?

While answering these questions, we contribute to the existing literature in the following ways. First, in addition to examining the effect of some common firm specific variable on capital structure, we estimate the effect of state ownership on capital structure decisions of selected G20 countries, a group of diverse economies. Thus, this study provides empirical evidence from a cross country study in an area that has been inadequately researched. Second, this effect is not only estimated but also compared among lower middle, upper middle and high income countries. Third, specific hypotheses are statistically tested about the effect of firm specific variables of SOEs and non-SOEs on capital structure among lower middle, upper middle and high income countries.

This thesis consists of six chapters. Introduction and motivation to this research are already presented in chapter one. Chapter two presents literature review. The variables used in the analysis and hypotheses about their effect on capital structure are also presented and defined in chapter two. Chapter three present data, methodology and models. It is followed by results and their discussion in chapter four. Chapter five presents conclusions and policy implications.

Chapter 2

LITERATURE REVIEW

This chapter provides the theoretical background and literature review, based on capital structure theories. The chapter discusses trade-off, pecking order and agency theory and provides empirical evidence from earlier findings around the world. This is followed by a detail discussion of capital structure and ownership nexus. Finally, hypotheses are developed following the predictions of three theoretical models mentioned above.

2.1 Theoretical models

2.1.1 Trade-off theory

The debate of independence of capital structure from firm value originated with the irrelevance theorem of Modigliani & Miller, (1958). The theory assumes perfect capital market, an absence of taxes, no bankruptcy risks and no liquidation cost. Modigliani & Miller (1963) revisited their original theory and revised it by incorporating market friction such as corporate tax in it. They found that deduction of interest from corporate profit can reduce firm's payable corporate taxes thereby increasing firm's value. Thus, Modigliani & Miller (1963) showed that capital structure does matter for firm's value. Miller (1977) introduced personal income tax to the Modigliani & Miller, (1963) model. This extended model suggests that firms issue debt as long as marginal benefit (or tax shield benefit) at corporate level is greater than its marginal cost at personal level, until both are equal.

Myers (1984) further extended the theory by adding bankruptcy cost to the model. He showed that optimal capital structure of firm occurs at a point where the benefit (tax shield advantage) offset the cost (bankruptcy cost) associated with debt financing. This is called trade-off theory.

According to Myers (2001), shareholders and debt holders conflicts arise if there is a risk of default. Debt holders show no interest in the value or income of the firm if debt is totally secured or is free of default risk. However, if there is a chance of default then firm managers also act for shareholders' interests. As a result shareholders attain benefits at debt holder's expense. The managers can transfer value from debt to shareholders in number of ways. They can pay cash to shareholders by borrowing more. They may cut back equity financed capital investments. Similarly, they may postpone immediate bankruptcy by obscuring financial problems from the creditors. However, debt holders should have to be aware of all these temptations while writing debt contracts. Bankruptcy and agency costs are the basics of trade off theory. Trade off theory postulates that firms rely on debt until tax benefit shield from one additional dollar are equal to the costs that results from increased probability of financial distress. According to this, firms strive for a target debt to equity ratio which indicates that they seek for some form of optimum capital structure that can maximize its value. Using particular combination of debt and equity financing is a firm specific strategy adapted by managers to improve its performance (Gleason et al., 2000). Bancel & Mittoo (2004) empirically investigates 87 firms across 16 European countries and suggests that Financing is determined by cost and benefits trade-off. Similarly, Graham and Harvey (2001) conducted study for US firms found evidences that support this theory.

2.1.2 Pecking-order theory

In contrast to trade-off theory, pecking order theory suggests that internal financing should be preferred over debt financing. This theory asserts that due to asymmetric information firms exhibit a preferred hierarchy in financing decisions. The idea is that firm should prefer internal financing first because it carries lowest asymmetric information; the second preference is to use debt if external funds are needed, followed by issuing equity such as convertible securities, preferred and common stocks (Myers & Majluf, 1984; Chang *et al.*, 2014). Therefore the theory implies that as profit increases, the debt ratio for a firm should decrease due to availability of internal financing. Earlier empirical evidence on the theory was provided by Titman & Wessells, (1988) & Rajan and Zingales, (1995). They suggest that firms having profit higher in past were able to have lower debt ratio.

2.1.3 Agency theory

Jensen (1986) highlighted that debt financing plays important role in growing organizations for two reasons: 1) it reduces the availability of free cash flow which reduces the managers' spending on their private benefits; and 2) shareholders and management are motivated to take part in organizations affairs because of the threat of bankruptcy. These are some of the reasons of increased efficiency of organizations. This reasoning of Jensen can be applied to the state owned enterprises as the managers of state owned enterprises are found to be more entrenched and can engage in corporate perks under a capital structure having low debt. Jensen & Meckling (1976) argued that firms should also consider agency cost while selecting optimal capital structure. Agency costs generally spur because of the conflict between equity and debt investor. If a firm is highly levered, than shareholder gains

at the expense of debt holder, while the later can protect its interest by monitoring firm's manager, resulting in raising the agency cost.

2.1.4 Capital structure theories: Empirical evidence

In literature, two main approaches are used by researchers to obtain evidence on factors that affect capital structure decisions. The most common approach adopted by majority of authors seeks to explain capital structure of firm in the context of factors that are considered important usually using cross sectional regression model (Beattie & Davie, 2006). Thomson (2003) on the basis of an informal analysis of twenty papers across several countries highlighted that the key characteristics of firms that are likely to be in relation to leverage ratios across wide range of environments are firm size, profitability, investment opportunities and asset tangibility. These determinants are almost similar across countries and are as predicted by existing theories of capital structure.

Antoniou, Guney, & Paudyal (2008) studied capital structure of US, UK, France, Germany and Japanese firms and find evidences supporting both trade off and pecking order theory. Margaritis & Psillaki (2007) examined 12,240 firms operating in New Zealand and shows evidences that are in consistence with trade off theory. Beattie et al. (2006) report evidences that supports both trade off and pecking order theory by conducting research survey in which they studied capital structure of listed UK firms. Donaldson (1961) emperically examined large US corporations and reports that while making financing decisions firms in US follows a Hierarchy of funding sources. He was the first who report the main theme for pecking order theory. Frank & Goyal (2009) examined capital structure of publically traded US firm's from 1950 to 2003 and finds that some version of trade off model is followed in making capital structure decisions. Scott & Johnson (1982) reports that US firms

have target debt ratios and they accept the optimal capital structure notion thus supports trade off theory.

Graham & Harvey (2001) empirically examined US firms and illustrated that US firms set some target leverage ratios in order to maintain financial flexibility and give moderate importance to implications of tax system thus emphasize less on financial distress. Similarly, their attention towards interest cost of debt is too moderate. From this, one can conclude that it follows the postulations put forwarded by trade off theory. However on the other hand, he also reports that US firms gives no significant importance to agency cost/benefit and corporate control. They issue debt when recent profits are insufficient and select equity financing when affected by market valuation. From this it is clear that pecking order theory is too followed by US firms. Similarly, Brounen et al. (2005) examined firms across UK, Netherlands, France and Germany and find evidences that supports both trade off and pecking order theory.

As compare to developed countries relatively little research work of firms' capital structure decision has been carried out in developing countries (Shah and Khan, 2007). The differentiating point between developed and developing countries is that in developed countries firms mostly go for long term debt whereas in developing countries firms usually rely on short term debt (Booth et al., 2001). Eldomiaty & Ismail (2008) provide empirical evidences that support pecking order theory for firms operating in Egypt. Huang & Song (2006) empirically investigates 1200 listed Chinese firms and report evidences that are in accordance with postulations of both trade off and pecking order theory. Gurcharan (2010) investigated the capital structure of four Asian developing countries firms and reports that profitability and growth is negatively related to debt ratios. While size is positively associated with debt ratio. Their finding shows that these determinants in developing countries are

almost similar and their associations with leverage are according to trade off and pecking order theory. Qureshi, Akhtar, & Imdadullah (2012) examined Pakistani firms and highlighted that firms follow pecking order theory in making capital structure decisions. Sheikh & Wang (2011) examined the capital structure of Pakistani firms and suggest that earnings volatility, profitability, liquidity and asset tangibility are negatively related to leverage ratios while firm size is having positive association with leverage. Thus their findings are in accordance with the predictions of the trade-off theory and pecking order theory.

2.1.5 Capital structure and ownership nexus

Arguments for the existence of performance and capital structure differences between state and non-state owned enterprises have been developed in the following way. Although, agency conflict and cost between manager and shareholder can be reduced through debt financing but at the same time as ownership structure varies, a principal-agent issue arises. Property-right over the enjoyment and disposal of assets are less protected in state owned enterprises because of the absence of corporate control in market. Also, the owner's incentive to monitor managers reduces, because capitalization of future outcome into current share price is inhabited or restricted (Putterman, 1993). Alchian (1977) argued that differences in behaviour of state owned and non-state owned enterprises are not because of differences in objectives but because of the differences in specifying individual rights, that how cost and benefit will be distributed among the shareholder or the participants of the company. These arguments based on property rights and agency theories are just a subset of broader view in literature. Sheshinski & López-Calva (2003) support the idea of poor efficiency of state owned enterprises in the light of agency theory, under managerial and political perspectives. From managerial perspective, it is very hard to observe

and monitor the management behaviour of state owned enterprises compared to non-state owned enterprises because state owned enterprises are not market players. Also, in case of state owned enterprises, debt is considered as a public debt which is traded under different conditions and that is why the debtors cannot play a significant role in the decisions making of the state owned enterprises. From political perspective, state owned enterprises managers make efforts to achieve their political prestige and political career on the shareholder(s) cost generally called empire building hypothesis. Hence, state owned enterprises managers tend to invest in such projects which may be profitable or not because of two reasons. First, managers have political support in managing larger companies. Secondly, comparative to soft budget constraint the fear of bankruptcy is non-credible under state ownership. Kornai (1980) argues that because of soft budget constraints, state owned enterprises can borrow as much as they can without the fear of bankruptcy cost. In addition state owned enterprises enjoy financing their new project at favorable rates or even they can borrow directly from state (Dewenter & Malatesta, 2001). If any new project fails, it will be the responsibility of central government to rescue the firm using tax payers' money. In case of bankruptcy issue, government will try to save firm otherwise authorities have to deal with political costs including facing labour union problems, explaining public why the entity failed, etc. Boycko, Shleifer, & Robert (1996) argued that inefficiencies caused by agency issues in state owned enterprises are related more to politicians then managers. Politicians use state owned enterprises for their personal interest in order to gain more political benefit. Therefore, management engages in empire building instead of maximizing the shareholder wealth. Sometimes, citizens in a democracy cannot find it easy and neither have incentives to control the state owned enterprise managers.

A number of studies have provided mixed empirical evidence in terms of superiority for private ownership and public in terms efficiency, profitability and optimality of capital structure. Huang & Song, (2006) empirically examined the effect of state ownership on capital structure decision of 1200 Chinese firm's over the period of 1994 to 2003. By using ordinary least square estimation methods, the results of their analysis shows that state owned enterprises has no significant impact on capital structure. Boardman & Vining (1989) carried out a study on the performance of five hundred largest corporations of the world outside the United States for the year 1983. The companies they evaluated belonged to several nationalities and operated in mining and manufacturing sectors, classified by ownership structure as state owned, privately owned and mixed enterprises. They found strong evidence that mixed and state owned enterprises were significantly less profitable and less efficient then private companies. Qian et al. (2009) carried out a study on the determinants of capital structure for 650 Chinese listed companies over the period from 1999 to 2004. They found that state ownership is positively associated with firm leverage. Majumdar (1996) evaluated the difference in performance of state owned enterprises, mixed enterprises and privately owned enterprises in Indian market over period of 1973 to 1989. They found the similar results as that of Boardman & Vining (1989). Li et al. (2009) examined the role of institutional development and ownership structure in debt financing of Chinese firms. There result shows that effect of state ownership on leverage and firm's access to long-term debt is positive. Dewenter & Malatesta (2001) carried out a study of 500 largest non-U.S. firms to compare the performance of state owned enterprises and private owned enterprises in terms of profitability, efficiency and capital structure for three separate periods (1975, 1985 and 1995). They found that state owned enterprises were significantly less profitable

then private enterprises and used more leverage then private firms did. Ting & Lean (2011) investigated the cross sectional variation in leverage between government linked and non-linked publically listed companies in Malaysia. By using a balanced panel data for the period 1997 to 2008, their results revealed that government linked companies has higher short term and long term debt ratio than non-government linked companies. They attributed those differences to capital structure between government listed companies and non-government listed companies. Fraser, Zhang, & Derashid (2006) investigated the link between political patronage and capital structure by analyzing 257 Malaysian firms from 1990-1999. Three different proxies were used for capturing political patronage such as percentage of direct government equity ownership of firm, percentage of equity owned by institutional investors, and informal ties a firm may have with most powerful politicians. Their study showed a significantly positive link between three proxies of political patronage and capital structure. They also found debt to total asset ratio averaging 15.3 percent for government firms, which was higher than the average of 13.7 percent for private firms. Dong, Liu, Shen, & Sun (2010) empirically examined the relationship between political patronage and long term debt, by analyzing 876,353 Chinese firm-year observation during the 1998-2007 period. They used two political variables to explain political patronage (state owned and legal person institutional ownership). They found from their analysis that long-term debt ratios tended to be higher for firms with more government ownership stake (state owned) than the legal person institutional ownership. Chang et al. (2014) examine the effect of state ownership on the capital structure decision of Chinese listed firm. There result shows a negative effect of state ownership on capital structure decision of firms. Zhengwei (2013) examined the effect of corporate ownership on corporate capital structure by

analyzing a panel data of 82 Chinese firms for a period 1998-2007. Their empirical results showed that there were structural differences in capital structure of state owned and non-state-owned enterprises. They also found that the private firms faced higher financing fraction in operating new projects but had more incentives to adjust toward optimal capital structure and to maximize the shareholders wealth.

Most of these studies are conducted to investigate impact of ownership on the profitability and efficiency of state owned and non-state owned enterprises and is mostly carried in European Union and other advanced countries ignoring G20 and emerging economies. Unlike other studies this study aims to investigate the differences in capital structure of state owned and non-state owned enterprises for selected G20 countries, which is then followed by using the definition of World (upper middle income, lower middle income and high income countries). This study also aims to investigate how the trade-off and pecking order hypothesis changes as the owner ship structure changes in different set of economies..

2.2 Leverage, determinants of capital structure and hypotheses

2.2.1 Leverage

Based on the theories of capital structure presented above, this study considered leverage as the dependent variable. Leverage can be defined as the ratio of the book value of firm's total debts to total assets (Graham & Harvey, 2001) or value of total debt divided by market value of total assets (Flannery & Rangan, 2006; Frank & Goyal, 2009). This study uses the first definition of leverage as many managers claim that following equity movements to rebalance capital structure have high adjustment costs. The theory also identifies other exogenous variables including firm size, profitability, tangibility, growth (Rajan & Zingales, 1995 & Öztekin, 2015) and state

ownership (Dewenter & Malatesta, 2001) that affect capital structure that is leverage of a firm. A description of these variables is presented in Appendix Table 1.

2.2.2 State ownership

In a perfect world, ownership of a firm does not matter. The traditional microeconomics theory, under the paradigm of perfect competition, does not consider ownership as an important dimension of a firm for its performance. The absence of transaction cost in perfect competition eliminates the role of ownership and every firm is supposed to maximize profit. However, no market is perfect as information and other asymmetries and externalities, leading to transaction cost, typically exist. Government intervenes to fix these market failures and imperfections and at times becomes a culprit of furthering these. However, irrespective of this philosophical debate, it is observed that government intervene in markets and state ownership can be witnessed all over the world irrespective of the development level of a country.

In imperfect competition along the decreasing average cost curve, given the demand and marginal revenue functions, economic theory argues against the existence of more than one firm but government intervene in such natural monopolies on efficiency grounds. In such situations, agency theory becomes extremely relevant and important to understand the conflict between principals and agents in the context of a State-Owned Enterprise (SOE). Wright et al. (2005) consider it the replacement of contract between private owners and employees with agency relationship between the state and employees. The state-employees contract faces incentive issues (Young et al., 2014) and a conflict of principal-agent exist in SOEs (Jensen & Meckling, 1976). During this conflict, state is the majority while common citizens are the minority shareholders, resulting in the tide swings in the employees' favour in the

form of incentives at the expense of common citizens. Economist (2012) reports that employees of the SOEs feel entitled to help themselves by steeling. There are other avenues where SOEs are favoured as well. For example, Dewenter & Maltesta (2001) and Kornai (1980) reported that SOEs can finance new projects at favourable rates or they can borrow directly from the state without any fear of bankruptcy. If the SOEs fail to make the project successful the central government can rescue the firm via the use of tax payers' money otherwise the authorities must face political cost and labour union problem in the case of bankruptcy. A number of studies provide empirical evidence that state ownership has more advantages than private ownership in terms of efficiency and optimality of capital structure (Dewenter & Malatesta, 2001; Fraser, Zhang, & Derashid, 2006; Ting & Lean, 2011; Dong et al., 2014;). However, these studies ignore the development aspect of the country where SOEs are located. Typically, government institutions are strong in high income countries, making SOEs more responsible and efficient to perform as governments are considered accountable for the use of taxpayers' money. This may not be the case for low-income countries, where governance as well as other institutions is week. This study tests the following hypotheses to understand the role of ownership in capital structure decision.

H_1 *State ownership does not determine leverage in selected G20 countries.*

H_2 *State ownership does not determine leverage in high income countries.*

H_3 *State ownership does not determine leverage in upper middle-income countries.*

H_4 *State ownership does not determine leverage in lower middle-income-countries.*

2.2.3 Tangibility

Tangibility is measured as the ratio of net tangible assets to total assets. Tangibility is considered as an important determinant of capital structure. Tangible assets have lower expected distress cost because outsiders can easily value the tangible assets as compared with intangible assets from an acquisition. Firms usually prefer debt financing as with equity some costs are associated that are known to managers only (Myers & Majuf, 1984). Furthermore, shareholders of highly leveraged firms are having an advantage of investing sub-optimally so as to expropriate wealth from debt holders of firms (Jensen & Meckling, 1976; Myers, 1977). However, creditors (debt holders) can limit the activities of shareholders by forcing the firm to tender tangible assets as collateral before providing debt, but it is impossible in case of raising funds for those projects whose collateralization is not possible. This is in accordance with trade off theory which postulates that tangible assets acts as collateral and in the event of financial distress it provides security to lenders. Hence, trade off theory predicts a positive relationship between leverage and tangibility (Frank and Goyal, 2009). Huang & Song (2002) showed that leverage ratio is positively correlated with asset tangibility. The same has been confirmed by (Marsh, 1982; Long & Malitz, 1985; Friend & Lang, 1988; Wald, 1999; Chang & Wong 2004; Frank & Goyal, 2009). Contrary to this, pecking order theory postulates an inverse relationship between tangibility and leverage, since tangibility lowers information asymmetry. Pecking order theory postulates that firms that present less portion of asset tangibility in their balance sheet are sensitive to information asymmetric problems. As a result these firms will rely more on debt financing in case when external financing is sought (Harris & Raviv, 1990). Sometimes managers tend to consume more than optimal level of pre-requisites which may result in negative association of leverage

and collateralizable assets (Titman & Wessel, 1988). This illustration has been observed for firms in Turkey, Pakistan, India and Brazil by Booth et al. (2001). With respect to trade-off theory, we expect positive effect of tangibility on leverage because firms with higher tangible assets reduce direct cost of bankruptcy as well as lower the risk of lenders. The following hypotheses are tested for understanding the role of tangibility in capital structure decision.

H_5 *Tangibility does not positively determine leverage in selected G20 countries.*

H_6 *Tangibility does not positively determine leverage in high income countries.*

H_7 *Tangibility does not positively determine leverage in upper middle-income countries.*

H_8 *Tangibility does not positively determine leverage in lower middle-income-countries.*

H_9 *The effect of tangibility of SOEs and non-SOEs is same on leverage in high income countries.*

H_{10} *The effect of tangibility of SOEs and non-SOEs is same on leverage in upper middle-income countries.*

H_{11} *The effect of tangibility of SOEs and non-SOEs is same on leverage in lower middle-income countries.*

2.2.4 Firm size

The value of assets measures a firm's size. Rajan & Zingales (1995) and Fama & Fench (2002) argue that larger firms have stable cash flows. These firms are also typically more diversified, resulting in lower bankruptcy probability. This argument is in accordance with predictions of trade-off theory which postulates that large firms should rely more on debt financing. Transaction costs related with debt is also low for large firms. Furthermore, agency costs faced by large firms are also low because

of accurate and transparent financial information. Similarly, these firms are subject to lower bankruptcy cost because of their diversified nature. Most of the Studies had reported positive association between size and leverage (Rajan & Zingales, 1995; Deesomsak, Paudyal, & Pescetto, 2004; Chang et al., 2014; Öztekin, 2015). This is contrary to the pecking order theory which envisages a negative association between these due to less asymmetric information which makes the firm to prefer equity financing instead of debt. Furthermore, large firm have older history of retained earning addition to their capital structure and are also well known. So, firms will not be highly leveraged because of more retained earnings additions (Frank & Goyal, 2009). With respect to trade of theory, we expect a positive effect of size on leverage, as larger firms are more diversified and there for are having lower financial distress and bankruptcy cost. To study the role of firm size in capital structure decision, the following hypotheses are tested.

H_{12} Firm size does not determine leverage in selected G20 countries.

H_{13} Firm size does not determine leverage in high income countries.

H_{14} Firm size does not determine leverage in upper middle-income countries.

H_{15} Firm size does not determine leverage in lower middle-income-countries.

H_{16} The effect of firm size of SOEs and non-SOEs is same on leverage in high income countries.

H_{17} The effect of firm size of SOEs and non-SOEs is same on leverage in upper middle-income countries.

H_{18} The effect of firm size of SOEs and non-SOEs is same on leverage in lower middle-income countries.

2.2.5 Profitability

The ratio of earnings exclusive of interest and taxes to total assets is considered profitability. Trade-off theory expects that the use of debt by the firm is followed by higher profitability as it provides the opportunity to a firm to shield income from taxation. Firms with greater profitability possess lower risk because of their frequent cash flow from business which in turn reduces financial distress cost i.e. cost of bankruptcy. Profitable firms with higher level of leverage have an opportunity to save more tax which is in the advantageous for shareholders thus depict leverage benefit. Agency theory claims that profitable firms can face free cash-flow problems, and as a result use leverage to control their managers (Jensen, 1986). Rajan & Zingales (1995) report positive relationship for firms in UK. Similarly, Margaritis & Psillaki, (2007) also suggest the positive association of profitability and leverage. Long & Malitz, (1985) also suggest that leverage and profitability is positively related but this relation is statistically not significant. To the contrary, pecking order theory suggests that profitable firms have less leverage because they generate higher cash flows and therefor prefer use of internal funds (retained earnings) over debt or equity financing. Most of the empirical studies around the world support that leverage of a firm decreases with profitability (Titman & Wessels, 1988; Harris and Raviv, 1991; Bauer, 2004; Chen, 2004; Tong & Green, 2005; Huang & Song, 2006)). With respect to information asymmetric, we expect that a negative effect of profitability on leverage, as high profitable firms will prefer internal financing over external. The following hypotheses are tested for investigating the effect of profitability in capital structure decision.

H_{19} *Profitability does not determine leverage in selected G20 countries.*

H_{20} Profitability does not determine leverage in high income countries.

H_{21} Profitability does not determine leverage in upper middle-income countries.

H_{22} Profitability does not determine leverage in lower middle-income-countries.

H_{23} The effect of profitability of SOEs and non-SOEs is same on leverage in high income countries.

H_{24} The effect of profitability of SOEs and non-SOEs is same on leverage in upper middle-income countries.

H_{25} The effect of profitability of SOEs and non-SOEs is same on leverage in lower middle-income countries.

2.2.6 Growth

Growth proxies for investment opportunities and we measure growth option by Tobin's Q. it is the ratio of market capitalization to total assets (Barclay & Smith, 1995). According to Frank & Goyal (2009), growth opportunity reduces free cash problems; increases financial distress cost and pushes a higher value to stakeholder co-investment. Thus, trade off theory suggests an inverse relationship between growth and leverage. Furthermore, according to agency theory, firms usually tend to expropriate wealth from creditors or debt holders (Myers, 1977; Jensen & Meckling, 1986). Greater growth opportunities allow the firm to sub-optimally invest in projects and because of asset substitution effect they may expropriate wealth from debt holders to shareholders. Thus a conflict between shareholders and debt holders may arise due to ongoing growth opportunities. From this negative relationship between debt and growth opportunities is expected. Most of the studies have supported a negative association between growth and leverage (Rajan & Zingales, 1995; Wald, 1999; Booth et al. 2001; Huang & Song, 2006; Lemmon & Zender, 2010).While according to pecking order theory firms having higher growth should

hold more debt overtime keeping profitability constant suggesting a positive relationship. Tong & Green (2005) and Pandey (2011) have reported positive association between growth and leverage. With respect to agency and trade-off theory, we expect a negative effect of growth on leverage. The following hypotheses are tested for while estimating the effect of growth of a firm on capital structure decision.

H_{26} *Growth of a firm does not determine leverage in selected G20 countries.*

H_{27} *Growth of a firm does not determine leverage in high income countries.*

H_{28} *Growth of a firm does not determine leverage in upper middle-income countries.*

H_{29} *Growth of a firm does not determine leverage in lower middle-income-countries.*

H_{30} *The effect of growth of SOEs and non-SOEs is same on leverage in high income countries.*

H_{31} *The effect of growth of SOEs and non-SOEs is same on leverage in upper middle-income countries.*

H_{32} *The effect of growth of SOEs and non-SOEs is same on leverage in lower middle-income countries.*

Chapter 3

DATA, METHODOLOGY AND MODELS

This chapter describes data, enlightens the superiority of panel data and provides details about sample panel data used in the study. Additionally, the chapter presents the research methods adopted in the study and explains the regression analyses.

3.1 Panel data

The data set used in this study is panel or longitudinal data, which is collected from different companies in selected G20 counties over multiple time periods. Panel has the dimension of both aspects of cross-sectional and time-series data. The cross-sectional aspect shows that observations comes from multiple unit at a single point in time, while time-series aspect is a set of observations collected by the successive measurement of the same unit over a time period. The advantage of panel data is that the study of multiple units over multiple time periods results in increased number of observations, followed by increased degree of freedom, allowing researchers to include more explanatory variables in their model (Verbeek, 2008). This helps to control for collinearity among the explanatory variables. Furthermore, panel data estimation considers all cross section units as heterogeneous which helps in getting unbiased results (Baltagi, 2001). Hence, panel data shows how individuals or companies change over time, while cross-sectional data provides information about individuals at a particular point in time (Wooldridge, 2002).

3.2 Sampling

This study includes 12 (Argentina, Brazil, China, France, Germany, Italy, India, Indonesia, Russia, Republic of Korea, Saudi Arabia, and Turkey) countries from G20 countries. We selected publically listed state-owned and non-state-owned firms in these countries. Other countries in G20 (Australia, Canada, Japan, Mexico, South Africa, United Kingdom and United states) were excluded from sample because of the unavailability of information on state-owned firms. Annual financial and accounting data of 252 state-owned and 6,503 non-state-owned firms are extracted from Orbis. Our sample includes a period of five years from 2011 to 2015, based on the latest available data. Data of the state-owned enterprises before 2011 were only available for a subset of our sample while the data availability of the selected firms after 2015 becomes random. The period of 2011-2015 provides a balanced panel for all the selected firms that is both state and non-state enterprises. We excluded all the financial enterprises and utilities providing firms from our sample because their debt level is driven by regulation. Zhengwei (2013) argues that the liabilities of such firms are not comparable to the debt liabilities debt of other firms. This gets us a sample of 1,260 observations of state-owned and 32,515 observations of non-state-owned firms.

Following World Bank, this study classified the selected G20 countries into high income (France, Germany, Italy, Republic of Korea and Saudi Arabia), upper middle income (Argentina, Brazil, China, Russia and Turkey) and lower middle income (India and Indonesia) countries in order to analyze and compare the impact of ownership on capital structure decisions of firms in these economies. The detail of the number of firms selected from each country is given in Table 1.

Table 1: The number of state and non-state owned enterprises selected in the sample countries

Country	World Bank Classification	Number of SOEs	Number of non-SOE
Argentina	UMI	1	32
Brazil	UMI	3	107
China	UMI	167	1567
France	HI	3	464
Germany	HI	6	374
India	LMI	28	1983
Indonesia	LMI	13	300
Italy	HI	1	138
Republic of Korea	HI	2	1210
Russia	UMI	18	74
Saudi Arabia	HI	9	82
Turkey	UMI	1	172
All countries		252	6503

3.3 Regression analyses and models

The research methodologies employed in this study to perform regression analyses for the panel dataset are ordinary least square method. There are three main estimation techniques for analyzing a panel data: fixed effect, random effect and Ordinary Least Squares (OLS). The typical fixed effect cannot be applied for estimation since it does not account for time invariant variable such as ownership dummy, the main focus of this study. Since this study tests a number of hypotheses, therefore, we use OLS to estimate and compare the effect of ownership on capital structure decisions across the development spectrum. The estimated OLS models are corrected for heteroscedasticity.

3.3.1 The Estimated Model

In the light of the discussion presented in the previous chapter it is postulated that Leverage (L) is determined by tangibility (T_{icsy}), size $(\ln A_{icsy})$, profitability (ROA_{icsy}) and growth (TQ_{icsy}) of firm i in country c of sector s in year y. This study focuses on highlighting differences in state and non-state-owned

enterprises, therefore a dummy, DO_{ics}, equals to one if a firm is state-owned and zero otherwise is also included in the model. The empirical model is given as follows:

$$L_{icsy} = \alpha_{icsy} + \gamma_1 T_{icsy} + \gamma_2 \ln A_{icsy} + \gamma_3 ROA_{icsy} + \gamma_4 TQ_{icsy} + \gamma_5 DO_{ics} + \delta_c + \delta_y$$
$$+ \delta_s + \mu_{icsy} \qquad\qquad (1)$$

where δ_c, δ_s and δ_y represent country, sector and year specific fixed effects respectively, ln represents natural logarithm and μ_{icsy} represents error term assumed to be randomly distributed with mean zero and homoscedastic variance. The parameter γ_5 shows the effect of ownership on the capital structure of a firm. Particularly, it is the intercept shifter of a state-owned firm as compared to the base case of non-state owned enterprises. Equation 1 is our base model and statistical significance of γ_5 answers the first question raised in introduction and tests the first hypotheses.

In order to answer the rest of the two questions and hypothesis - *H₂, H₃ and H₄*, three steps are carried. First, dummy variables representing different income-based categories of countries that is lower middle-income (*LMI*), upper middle-income (*UMI*), and high income (*HI*) are created. Second, these dummies are then interacted with the state ownership dummy (DO_{ics}) as follows to create dummies representing SOEs and Non-SOEs in LMI, UMI and HI.

$$SOELMI_{ics} = DO_{ics} * LMI$$
$$SOEUMI_{ics} = DO_{ics} * UMI \qquad\qquad (2)$$
$$SOEHI_{ics} = DO_{ics} * HI$$

Hence, $SOELMI_{ics}$ is a dummy, equals to unity if an *i*th firm in *s* industry in a country *c* in lower-income countries is state-owned and zero otherwise. Other

dummies can be interpreted similarly. These dummies are added to our Base Model

and the resultant equations are presented below.

$$L_{icsy} = \alpha_{icsy} + \eta_1 T_{icsy} + \eta_2 \ln A_{icsy} + \eta_3 ROA_{icsy} + \eta_4 TQ_{icsy} + \eta_5 SOEHI_{ics} + \delta_c$$
$$+ \delta_y + \delta_s + \mu_{icsy} \tag{3}$$

$$L_{icsy} = \alpha_{icsy} + \eta_1 T_{icsy} + \eta_2 \ln A_{icsy} + \eta_3 ROA_{icsy} + \eta_4 TQ_{icsy} + \eta_5 SOEUMI_{ics} + \delta_c$$
$$+ \delta_y + \delta_s + \mu_{icsy} \tag{4}$$

$$L_{icsy} = \alpha_{icsy} + \eta_1 T_{icsy} + \eta_2 \ln A_{icsy} + \eta ROA_{icsy} + \eta_4 TQ_{icsy} + \eta_5 SOELMI_{ics} + \delta_c$$
$$+ \delta_y + \delta_s + \mu_{icsy} \tag{5}$$

Equations 3, 4 and 5 are our Model-1, Model-2 and Model-3, respectively. These

models are used to test the effect of state ownership across the development

spectrum, providing a complete test of the first hypothesis.

Third, to test the second set of hypothesis for each of the firm specific variable in

selected G20 countries and across the development spectrum further two steps are

taken. In the first step the ownership dummy (DO_{ics}) is interacted with each of the

firm specific variables (Tangibility (T), size (lA), Profitability (ROA) and Growth

(TQ)) as follow.

$$SOET_{icsy} = T_{icsy} * DO_{ics}$$

$$SOEA_{icsy} = lA_{icsy} * DO_{ics} \tag{6}$$

$$SOEROA_{icsy} = ROA_{icsy} * DO_{ics}$$

$$SOETQ_{icsy} = TQ_{icsy} * DO_{ics}$$

where $SOET_{icsy}$, $SOEA_{icsy}$, $SOEROA_{icsy}$ and $SOETQ_{icsy}$ represent tangibility,

logarithm of assets, ROA and Growth of state-owned enterprises. Similarly, slope

shifters of the exogenous variables for non-SOEs ($NSOET_{icsy}$, $NSOEA_{icsy}$,

$NSOEROA_{icsy}$ and $NSOETQ_{icsy}$) are created and the base model is augmented with these as follows.

$$L_{icsy} = \alpha_{icsy} + \pi_1 SOET_{icsy} + \pi_2 NSOET_{icsy} + \pi_3 SOE\ln A_{icsy} + \pi_4 NSOE\ln A_{icsy}$$
$$+ \pi_5 SOEROA_{icsy} + \pi_6 NSOEROA_{icsy} + \pi_7 SOETQ_{icsy}$$
$$+ \pi_8 NSOETQ_{icsy} + \delta_c + \delta_y + \delta_s$$
$$+ \mu_{icsy} \qquad (7)$$

This is our Model 4. In the second step, to test the effect of SOEs and non-SOEs' firms specific variable on leverage in lower, upper and higher income countries, the dummies of development spectrum ($SOELMI_{ics}$, $SOEUMI_{ics}$ and $SOEHI_{ics}$) are intersected with each of the exogenous variable following the same process as given in equation 6 to slope shifters of each variable for lower and upper middle and high income countries. The base model is augmented with these slope shifters and is called Model 5, presented below.

$$L_{icsy} = \alpha_{icsy} + \lambda_1 SOET_{icsy} + \lambda_2 NSOET_{icsy} + \lambda_3 SOEHT_{icsy} + \lambda_4 NSOEHT_{icsy}$$
$$+ \lambda_5 SOEUT_{icsy} + \lambda_6 NSOEUT_{icsy} + \lambda_7 SOELT_{icsy} + \lambda_8 NSOELT_{icsy}$$
$$+ \lambda_9 SOE\ln A_{icsy} + \lambda_{10} NSOE\ln A_{icsy} + \lambda_{11} SOEH\ln A_{icsy}$$
$$+ \lambda_{12} NSOEH\ln A_{icsy} + \lambda_{13} SOEU\ln A_{icsy} + \lambda_{114} NSOEU\ln A_{icsy}$$
$$+ \lambda_{15} SOEL\ln A_{icsy} + \lambda_{16} NSOEL\ln A_{icsy} + \lambda_{17} SOEROA_{icsy}$$
$$+ \lambda_{18} NSOEROA_{icsy} + \lambda_{19} SOEHROA_{icsy} + \lambda_{20} NSOEHROA_{icsy}$$
$$+ \lambda_{21} SOEUROA_{icsy} + \lambda_{22} NSOEUROA_{icsy} + \lambda_{23} SOELROA_{icsy}$$
$$+ \lambda_{24} NSOELROA_{icsy} + \lambda_{25} SOETQ_{icsy} + \lambda_{26} NSOETQ_{icsy}$$
$$+ \lambda_{27} SOEHTQ_{icsy} + \lambda_{28} NSOEHTQ_{icsy} + \lambda_{29} SOEUTQ_{icsy}$$
$$+ \lambda_{30} NSOEUTQ_{icsy} + \lambda_{31} SOELTQ_{icsy} + \lambda_{32} NSOELTQ_{icsy} + \delta_c$$
$$+ \delta_y + \delta_s + \mu_{icsy} \qquad (8)$$

Chapter 4

EMPIRICAL RESULTS

This chapter provides empirical results. descriptive statistics, correlation matrices and estimation results of our study. First, we provide the descriptive statistics for selected G20 countries across the development spectrum and the Pearson's correlation matrix. Second we present the results of Ordinary Least Square regression for SOE's and non-SOE's in selected G20 countries across the development spectrum. In the last we tested joint hypothesis for the same effect of firm specific variables on leverage.

4.1 Descriptive statistics

Table 2 presents yearly means of leverage, tangibility, profitability, Growth and size of state and non-state-owned enterprises in all selected G20 countries. The table reports the number of observation, mean, median and standard deviation (SD) values. It shows that on average leverage for all the selected years is significantly higher for state-owned (56 percent) as compared to non-state owned (48.3 percent) enterprises. Among the explanatory variables the yearly average of tangibility, profitability and size are significantly higher for state-owned as compared to non-state-owned enterprises. While the yearly average of Growth is significantly lower for state-owned as compared to non-state-owned enterprises. The SD value of Size and growth is higher for both state owned enterprises and non-state owned enterprises, indicating a wide variation in growth and size across the companies.

Table 3 presents yearly means of leverage, tangibility, size, profitability and growth of state owned and non- state owned enterprises in selected G20 countries. The table reports mean, median and standard deviation (SD) values. On yearly basis, leverage of state-owned enterprises is statistically significant and higher than non-state-owned enterprises in all years. Tangibility of state-owned enterprises is statistically significantly higher than non-state-owned enterprises in all the years.

Table 2: Comparison of means of the variables for selected G20 countries

Ownership	Variables	N	Mean	Median	SD
SOEs	Leverage	1260	0.561***	0.579	0.221
	Tangibility	1260	0.953***	0.980	0.088
	Size	1260	14.636***	14.551	1.770
	Profitability	1260	0.048***	0.042	0.090
	Growth	1260	0.815***	0.455	1.026
Non-SOEs	Leverage	32515	0.484***	0.500	0.224
	Tangibility	32515	0.935***	0.984	0.118
	Size	32515	12.023***	12.118	2.146
	Profitability	32515	0.040***	0.037	0.098
	Growth	32515	1.064***	0.552	2.233

*, ** and *** show significance at 90, 95 and 99 percent levels, respectively

The profitability of state-owned enterprises is significantly higher than non-state owned enterprises in 2011, 2012 and 2013. Size of state-owned enterprises, measured in terms of the value of assets, is significantly higher than non-state-owned enterprises in all years. The SD of size is higher in all the years for both state and non-state owned enterprises showing a wide variation in size across the companies.

These results are consistent with and complement results of previous studies. For example, Liu, Tian & Wang, (2011) show that SOE's in China have higher leverage compare to non-SOE.

We also categorized the selected G20 countries according to World Bank classification in upper middle income, high income and lower middle income countries. Table 4 presents mean averages of leverage and other firm specific variable for state owned and non- state owned enterprises across different level of income.

Table 4 reports the number of observation, mean, median and standard deviation (SD) values. On average in high income countries leverage of state owned enterprises is significantly higher than non- state owned enterprises. Among firm specific determinants tangibility, size and profitability of state owned enterprises are significantly higher than non- state owned enterprises. The value of standard deviation is normal for all other variable except size, indicating a wide variation in size across the companies. In upper middle income countries leverage, tangibility and size of state owned enterprises are significantly higher than non-state owned enterprises. Whereas, growth ratio of state owned enterprises is significantly less than non-state owned enterprises. In lower middle income countries leverage, size and of state owned enterprises are significantly higher than non-state owned enterprises. The higher standard deviation of growth and size for both state and non-state owned enterprises indicates a wide variation in growth and size across companies. It is also important to mention that state owned enterprises in high income countries carry more leverage compare to upper middle income and lower middle income countries (57.9, 56.4 & 53.9 percent).

Table 3: Comparison of yearly means of the variables for selected G20 countries

Variables	Ownership		2011	2012	2013	2014	2015
Leverage	SOE	Mean	0.559***	0.564***	0.559***	0.559***	0.564***
		Median	0.564	0.583	0.579	0.580	0.598
		SD	0.220	0.225	0.221	0.223	0.219
	Non-SOEs	Mean	0.485***	0.487***	0.484***	0.483***	0.480***
		Median	0.507	0.505	0.502	0.498	0.492
		SD	0.222	0.223	0.224	0.225	0.226
Tangibility	SOE	Mean	0.959**	0.953**	0.951**	0.951**	0.950**
		Median	0.982	0.980	0.978	0.980	0.979
		SD	0.072	0.081	0.095	0.096	0.096
	Non-SOEs	Mean	0.939**	0.936**	0.935**	0.933**	0.929**
		Median	0.985	0.983	0.983	0.983	0.983
		SD	0.114	0.117	0.117	0.120	0.124
Size	SOE	Mean	14.465***	14.576***	14.678***	14.743***	14.716***
		Median	14.334	14.467	14.574	14.629	14.628
		SD	1.763	1.749	1.767	1.773	1.794
	Non-SOEs	Mean	11.923***	12.003***	12.049***	12.071***	12.068***
		Median	11.992	12.086	12.142	12.181	12.181
		SD	2.089	2.113	2.153	2.176	2.195
Profitability	SOE	Mean	0.067**	0.053*	0.050**	0.042	0.028
		Median	0.053	0.045	0.042	0.035	0.035
		SD	0.088	0.092	0.090	0.088	0.087
	Non-SOEs	Mean	0.051**	0.043*	0.037**	0.037	0.034
		Median	0.045	0.038	0.034	0.033	0.031
		SD	0.101	0.093	0.098	0.099	0.099
Growth	SOE	Mean	0.827	0.751	0.693**	0.828**	0.975**
		Median	0.453	0.412	0.397	0.495	0.544
		SD	1.241	1.042	0.791	0.899	1.083
	Non-SOEs	Mean	0.890	0.911	0.981**	1.148**	1.392**
		Median	0.497	0.494	0.515	0.625	0.694
		SD	1.654	2.525	2.355	2.106	2.378

*, ** and *** show significance at 90, 95 and 99 percent levels, respectively

Table 5, 6 and 7 reports yearly mean, median and standard deviation of high income, upper middle income and lower middle income countries. Leverage of state owned enterprises is significantly higher than non-state owned enterprises in high and upper middle income countries for all years. Size of state-owned enterprises, measured in

terms of the value of assets, is significantly higher than non-state-owned enterprises in all years (table 5, 6 & 7). While the yearly average of Growth is significantly lower for state-owned as compared to non-state-owned enterprises in all years for upper middle income countries (table 6).

Table 4: Comparison of means of the variable for HI, UMI and LMI countries

Ownership	Variables	N	Mean	Median	SD
High Income					
SOEs	Leverage	105	0.579***	0.604	0.274
	Tangibility	105	0.948***	0.989	0.077
	Size	105	14.440***	14.339	1.985
	Profitability	105	0.052**	0.043	0.128
	Growth	105	0.916	0.574	1.229
Non-SOEs	Leverage	11340	0.491***	0.507	0.208
	Tangibility	11340	0.899***	0.969	0.147
	Size	11340	12.399***	12.113	1.942
	Profitability	11340	0.031***	0.038	0.103
	Growth	11340	0.872	0.546	1.330
Upper Middle Income					
SOEs	Leverage	950	0.564***	0.587	0.217
	Tangibility	950	0.950***	0.972	0.082
	Size	950	14.736***	14.590	1.754
	Profitability	950	0.042	0.039	0.083
	Growth	950	0.755***	0.416	0.901
Non-SOEs	Leverage	9760	0.468***	0.475	0.220
	Tangibility	9760	0.936***	0.963	0.091
	Size	9760	13.140***	13.046	1.422
	Profitability	9760	0.046	0.040	0.078
	Growth	9760	1.437***	0.844	2.876
Lower Middle Income					
SOEs	Leverage	205	0.539***	0.539	0.212
	Tangibility	205	0.968	0.998	0.116
	Size	205	14.272***	14.174	1.674
	Profitability	205	0.071***	0.060	0.093
	Growth	205	1.041	0.619	1.369
Non-SOEs	Leverage	11415	0.491***	0.518	0.241
	Tangibility	11415	0.969	1.000	0.094
	Size	11415	10.694***	10.635	2.161
	Profitability	11415	0.045***	0.032	0.107
	Growth	11415	0.937	0.372	2.279

*, ** and *** show significance at 90, 95 and 99 percent levels, respectively

Table 5: Comparison of yearly means of the variables for HI countries

Variables	Ownership	N	2011	2012	2013	2014	2015
Leverage	SOE	Mean	0.580**	0.587**	0.573*	0.581**	0.573**
		Median	0.593	0.618	0.609	0.601	0.604
		SD	0.292	0.288	0.274	0.297	0.241
	Non-SOEs	Mean	0.494**	0.493**	0.493*	0.491**	0.483**
		Median	0.514	0.510	0.508	0.504	0.497
		SD	0.204	0.208	0.209	0.211	0.210
Tangibility	SOE	Mean	0.947	0.945	0.947	0.950	0.952*
		Median	0.990	0.986	0.990	0.988	0.990
		SD	0.085	0.080	0.076	0.078	0.074
	Non-SOEs	Mean	0.902	0.899	0.899	0.899	0.897*
		Median	0.970	0.970	0.969	0.967	0.969
		SD	0.145	0.147	0.147	0.148	0.150
Size	SOE	Mean	14.398***	14.478***	14.516***	14.416***	14.393***
		Median	14.667	14.662	14.575	13.971	14.096
		SD	2.074	2.021	2.001	2.009	2.013
	Non-SOEs	Mean	12.315***	12.397***	12.456***	12.427***	12.401***
		Median	12.016	12.087	12.161	12.148	12.129
		SD	1.930	1.940	1.941	1.947	1.952
Profitability	SOE	Mean	0.062	0.058	0.054	0.036	0.049
		Median	0.049	0.049	0.031	0.045	0.034
		SD	0.135	0.129	0.134	0.160	0.083
	Non-SOEs	Mean	0.037	0.031	0.025	0.028	0.032
		Median	0.043	0.038	0.035	0.036	0.037
		SD	0.103	0.102	0.109	0.107	0.095
Growth	SOE	Mean	0.879	0.915	0.994	0.922	0.870
		Median	0.592	0.574	0.596	0.492	0.564
		SD	1.217	1.332	1.430	1.304	0.916
	Non-SOEs	Mean	0.787	0.795	0.859	0.887	1.034
		Median	0.479	0.513	0.556	0.561	0.641
		SD	1.125	1.060	1.387	1.278	1.691

*, ** and *** show significance at 90, 95 and 99 percent levels,

Table 6: Comparison of yearly means of the variables for UMI countries

Variables	Ownership	N	2011	2012	2013	2014	2015
Leverage	SOE	Mean	0.562***	0.567***	0.562***	0.559***	0.568***
		Median	0.566	0.588	0.587	0.596	0.602
		SD	0.211	0.219	0.218	0.216	0.222
	Non-SOEs	Mean	0.466***	0.474***	0.467***	0.467***	0.466***
		Median	0.479	0.483	0.477	0.474	0.464
		SD	0.228	0.223	0.219	0.214	0.215
Tangibility	SOE	Mean	0.954	0.952*	0.948	0.949**	0.947***
		Median	0.973	0.970	0.972	0.971	0.972
		SD	0.073	0.069	0.088	0.089	0.090
	Non-SOEs	Mean	0.946	0.941	0.938	0.932	0.922
		Median	0.969	0.964	0.962	0.960	0.957
		SD	0.080	0.084	0.085	0.093	0.108
Size	SOE	Mean	14.516***	14.650***	14.788***	14.881***	14.844***
		Median	14.333	14.467	14.589	14.707	14.730
		SD	1.741	1.729	1.749	1.756	1.786
	Non-SOEs	Mean	12.931***	13.049***	13.165***	13.257***	13.297***
		Median	12.807	12.925	13.058	13.183	13.271
		SD	1.395	1.401	1.418	1.431	1.435
Profitability	SOE	Mean	0.063	0.047	0.043	0.039	0.021**
		Median	0.052	0.043	0.037	0.029	0.029
		SD	0.075	0.082	0.084	0.077	0.091
	Non-SOEs	Mean	0.062	0.048	0.042	0.043	0.034**
		Median	0.053	0.040	0.037	0.035	0.031
		SD	0.081	0.070	0.076	0.075	0.084
Growth	SOE	Mean	0.699***	0.639*	0.634***	0.776***	1.026***
		Median	0.381	0.370	0.341	0.451	0.544
		SD	0.869	0.808	0.693	0.855	1.162
	Non-SOEs	Mean	1.082***	1.194*	1.235***	1.462***	2.212***
		Median	0.702	0.688	0.766	0.984	1.380
		SD	1.909	4.040	2.854	1.842	3.009

*, ** and *** show significance at 90, 95 and 99 percent levels,

Table 7: Comparison of yearly means of the variables for LMI countries

Variables	Ownership	N	2011	2012	2013	2014	2015
Leverage	SOE	Mean	0.534	0.538	0.538	0.546	0.538
		Median	0.520	0.558	0.541	0.543	0.513
		SD	0.228	0.219	0.208	0.217	0.198
	Non-SOEs	Mean	0.492	0.492	0.491	0.490	0.488
		Median	0.521	0.520	0.520	0.517	0.509
		SD	0.233	0.235	0.241	0.246	0.249
Tangibility	SOE	Mean	0.985	0.965	0.964	0.964	0.963
		Median	0.999	0.998	0.998	0.996	0.995
		SD	0.052	0.126	0.129	0.131	0.127
	Non-SOEs	Mean	0.971	0.969	0.969	0.968	0.968
		Median	1.000	1.000	1.000	1.000	1.000
		SD	0.090	0.094	0.095	0.096	0.094
Size	SOE	Mean	14.261***	14.287***	14.250***	14.272***	14.289***
		Median	14.332	14.101	14.135	14.178	14.174
		SD	1.722	1.706	1.697	1.662	1.666
	Non-SOEs	Mean	10.672***	10.718***	10.689***	10.705***	10.685***
		Median	10.635	10.661	10.637	10.615	10.630
		SD	2.117	2.134	2.160	2.187	2.206
Profitability	SOE	Mean	0.089**	0.078**	0.081*	0.057	0.050
		Median	0.067	0.061	0.064	0.059	0.045
		SD	0.112	0.108	0.087	0.083	0.065
	Non-SOEs	Mean	0.055**	0.050**	0.045	0.040	0.036
		Median	0.039	0.036	0.032	0.027	0.024
		SD	0.112	0.100	0.103	0.109	0.113
Growth	SOE	Mean	1.394*	1.187	0.812	1.018	0.795
		Median	0.810	0.619	0.476	0.773	0.516
		SD	2.225	1.602	0.747	0.844	0.714
	Non-SOEs	Mean	0.828	0.786	0.884	1.140	1.045
		Median	0.372	0.308	0.316	0.432	0.450
		SD	1.837	1.733	2.618	2.821	2.170

*, ** and *** show significance at 90, 95 and 99 percent levels,

4.2 Correlation matrix

Table 8 shows the correlation between leverage and other firm specific variables in the selected G20. There is a significant correlation between leverage and other firm specific covariates. The correlation is positive and statistically significant between size and leverage, while tangibility, profitability, and growth are significantly negatively correlated with leverage. The degree of correlation is quite low indicating no multicollinearity issues. However, the association between leverage and another variable is estimated without controlling for the fixed effects, a limitation removed in regression analysis discussed next.

Table 8: Correlation matrixes selected G20 countries

All selected G20 countries

Variables	Leverage	Tangibility	Size	Profitability	Growth
Leverage	1				
Tangibility	-0.037***	1			
Size	0.282***	-0.187***	1		
Profitability	-0.230***	0.049***	0.119***		
Growth	-0.192***	-0.032***	-0.065***	0.129***	1

*, ** and *** show significance at 90, 95 and 99 percent levels, respectively.

Table 9 shows the correlation between leverage and other firm specific variables in the selected G20 countries according to World Bank classification. There is a significant correlation between leverage and other firm specific covariates in high income, upper middle income and lower middle income countries. The correlation is positive and statistically significant between size, tangibility and leverage, while

profitability and growth are significantly negatively correlated with leverage. The association between leverage and firm specific variable is consistent across high, upper middle and lower middle income countries   However, the association between leverage and another variable is estimated without controlling for the effect of other variables, a limitation removed in regression analysis discussed next.

Table 9: Correlation matrixes for HI, UMI and LMI countries

Variables	Leverage	Tangibility	Size	Profitability	Growth
High Income					
Leverage	1				
Tangibility	0.129***	1			
Size	0.310***	-0.138***	1		
Profitability	-0.223***	0.060***	0.159***	1	
Growth	-0.291***	-0.041***	-0.163***	0.094***	1
Upper Middle income					
Leverage	1				
Tangibility	0.055***	1			
Size	0.384***	-0.066***	1		
Profitability	-0.306***	-0.010	0.047***	1	
Growth	-0.171***	-0.068***	-0.237***	0.073***	1
Lower Middle income					
Leverage	1				
Tangibility	0.004	1			
Size	0.330***	-0.183***	1		
Profitability	-0.191***	0.029***	0.177***	1	
Growth	-0.173***	-0.016*	-0.006	0.210***	1

*, ** and *** show significance at 90, 95 and 99 percent levels, respectively.

4.3 Estimation results

Each column in Table 10 below refers to a different set of regression. All the regression models in our study reveals a good model fit with significant F statistics and R squared and adjusted R squared. The base model shows the impact of ownership and other explanatory variables on leverage in selected G20 countries. The regression results show that state ownership have significant positive effect on leverage. This contrasts with the results in Table 2, where the differences in leverage of state-owned and non-state-owned enterprises are statistically significant. Hence, the effect of state ownership on leverage does not change when effect of the other exogenous variables is controlled. The model shows that state-owned enterprises carry 1.3 percent more debt comparatively to non-state-owned enterprises and that the ownership does matter. The base model indicates that SOEs are more levered because of their easy access to loans and other public resources. This finding is consistent with other studies i.e. Dewenter & Malatesta, 2001 and Li et al., 2009.

Among firm specific variables tangibility and size have statistically significant and positive effect, while profitability and growth have negative effect on leverage. These results are consistent with the majority of previous studies including Booth et al., 2001, Jong et al., 2008 and Fan et al., 2012. Given these results we fail to accept the null hypothesis in respect of these variables. Therefore, in the case of these variables, trade-off theory stands. Such positive and statistically significant impact support the theoretical proposition that higher tangible assets and firm size helps in reducing the bankruptcy cost. The negative effect of profitability on leverage yields support to the information asymmetric theory implying that a firm prefers internal over external financing. The negative effect of growth on leverage supports the

agency theory suggesting that a firm having higher growth opportunities should keep leverage low so that it does not give up profitable investment opportunities due to wealth transfer from shareholders to creditors.

Countries are further classified into high and upper middle and lower middle income countries to not only estimate but also compare the effect of selected exogenous variables on leverage. Countries are classified according to their per capita income as per World Bank guidelines (Models 1 to 3, Table 10). Results show that the effect of state ownership on leverage is positive and statistically significant in high income countries (Model 1), while in lower middle income countries its effect is negative and statistically significant (Model 3). These findings are similar to Dewenter & Maltista 2001; Firth et al., 2014; Nhung and Okuda, 2015. In high income countries, state-owned enterprises carry 6.40 percent more debt than non-state owned enterprises, while lower middle-income-countries state-owned enterprises carry 8.1 percent less debt than their counterpart. The effect of state ownership on leverage in upper middle income countries is statistically insignificant. The analysis uses a more recent data that considers the liberalization move of the World Bank in developing countries. Countries are encouraged to privatize the state owned enterprises that have created inefficiency and losses to these economies rather than benefits. It is argued that privatization will lead to more efficiency gains through addressing the principal-agent problem associated with state ownership. Hence, over the years, governments in the lower-income countries have reduced leverage of state-owned enterprises to facilitate their privatization.

Table 10: The effect of different variables and ownership on leverage estimated using OLS

Variables	Base Model	Model 1	Model 2	Model 3
	G20 (Selected countries)	HI	UMI	LMI
Tangibility	0.087***	0.003	0.132***	0.146***
	(7.600)	(0.210)	(5.930)	(6.190)
Size	0.044***	0.033***	0.062***	0.044***
	(66.200)	(32.330)	(39.290)	(46.770)
Profitability	-0.617***	-0.498***	-0.955***	-0.519***
	(-38.940)	(-22.740)	(-25.700)	(-20.730)
Growth	-0.010***	-0.032***	-0.002	-0.011***
	(-6.500)	(-7.610)	(-1.960)	(-6.670)
SOEs	0.013*			
	(2.270)			
SOEs of HI		0.064***		
		(3.290)		
SOEs of UMI			0.007	
			(1.090)	
SOEs of LMI				-0.081***
				(-5.920)
Constant	-0.069***	0.185***	-0.430***	-0.078*
	(-3.770)	(7.250)	(-11.770)	(-2.450)
Fixed Effects				
Country	216.590***	89.210***	62.950***	171.570***
Industry	24.170***	14.020***	22.510***	25.750***
Year	7.460***	1.070***	19.050***	0.86
Summary Statistics				
No. of Observations	33775	11445	10710	11620
F-Statistics	213.500***	110.900***	102.500***	123.600***
R-Squared	0.241	0.275	0.316	0.248
Adj. R-squared	0.240	0.272	0.313	0.246
RMSE	0.196	0.179	0.183	0.209

*, ** and *** show significance at 90, 95 and 99 percent levels, respectively. All standard errors are robust. Leverage is the ratio of the book value of firm's total debts to total assets. Tangibility is the ratio of net tangible assets to total assets. Size is the natural log of total assets. Profitability is the ratio of earnings before interest and taxes to total assets. Growth is equal to the ratio of market capitalization to total assets. SOEs is a dummy equal to unity if and enterprise is state owned. HI represents high income countries. UMI represent upper middle income and LMI represent lower middle income countries

Estimated coefficients of the other determinants of the capital structure show that it has been positively and statistically significantly affected by tangibility in upper and lower middle-income countries, while it has been positively affected by size in high, upper and lower middle income countries. Positive association between leverage and tangibility is according to trade off theory which states that firm with more tangible assets prefer debt financing rather than equity. These results are consistent with earlier findings (Myers & Shyam-Sunder, 1999; Frank & Goyal, 2003; Gaud et al., 2005; Lemmon, Roberts & Zender, 2008; Hovakimian & Li, 2011). The positive relationship between size and leverage indicates that firms having higher size are more diversified and consequently their default risk is lower. This was predicted using the trade off theory. The empirical result is consistent with earlier findings (Maris & Elayan, 1990; Dessi & Robertson, 2003; Cassar & Holmes, 2003; Deesomsak, Paudyal & Pescetto, 2004). The coefficient of profitability is significantly negative and consistent with asymmetric information theory regardless the level of income of a country. This indicates that firms with higher profits will prefer internal financing than using debt. The result of profitability is consistent with earlier findings (Harris & Raviv, 1991; Rajan & Zingales, 1995; Myers & Shyam-Sunder 1999; Fama & French, 2002; Frank & Goyal, 2003; Gaud et al., 2005; Frank and Goyal, 2009; Jong et al., 2008; Hovakimian & Li, 2011; Lemmon, Roberts & Zender, 2008. The coefficient of growth is negative in all models supporting the agency theory. Overall, firms with higher future growth opportunity do not give up profitable investment and therefor prefer to have low leverage. The negative relationship between growth and leverage is also consistent with earlier findings (Barclay, Morellec & Smith, 2001; Deesomsak et al., 2004).

However, the results for firm specific determinants of leverage in Table 10 are estimated without the consideration of ownership. An important question arises; do these determinants of leverage differ with respect to ownership (SOEs vs. non-SOEs). Considering classification of countries according to their level of income, we test the hypothesis that each of these four determinants of leverage for SOEs and non-SOEs are equal using F-test. The estimates for firm specific determinants of SOEs and non-SOEs are provided in Table 11 and the test of the hypotheses is presented in Table 12.

Table 11 shows how the association between firm specific determinants of capital structure changes when the ownership structure of a firm changes. Model 4 shows no change among firm specific determinants of SOEs and non-SOEs for all the selected G20 countries. Size and tangibility of both SOEs and non-SOEs have a statistically significant positive effect, while profitability and growth of SOEs and non-SOES have a negative effect on leverage. As countries classification changes according to level of income, the results of Model 5 does not vary much from the results of Model 4, except that tangibility of non-SOEs in high income countries have significant negative effect on the leverage. The negative effect in high income countries for non-SOEs reflects lower asymmetric information.

Table 11: The effect of variables interacted with ownership on leverage across the development spectrum and G20 countries.

Variables	Model 4	Model 5		
	G20(Selected Countries)	HI	UMI	LMI
Tangibility of SOEs	0.251***	0.177	0.540***	0.06
	(5.990)	(1.210)	(9.190)	(0.880)
Tangibility of Non-SOEs	0.081***	-0.033*	0.107***	0.219***
	(7.040)	(-2.190)	(4.860)	(9.610)
Size of SOEs	0.036***	0.026**	0.039***	0.054***
	(14.170)	(3.040)	(10.920)	(12.030)
Size of Non-SOEs	0.044***	0.031***	0.064***	0.046***
	(66.280)	(30.580)	(40.740)	(48.260)
Profitability of SOEs	-1.078***	-0.464*	-1.052***	-1.246***
	(-10.850)	(-2.450)	(-8.130)	(-7.690)
Profitability of Non-SOEs	-0.598	-0.492***	-0.918***	-0.516***
	(-37.790)	(-22.450)	(-24.600)	(-20.440)
Growth of SOEs	-0.036***	-0.091***	-0.040***	-0.005
	(-5.000)	(-4.290)	(-4.770)	(-0.720)
Growth of Non-SOEs	-0.010***	-0.032***	-0.002*	-0.011***
	(-6.460)	(-7.710)	(-2.010)	(-6.550)
Fixed Effects				
Country	216.490***	122.910***		
Industry	23.980***	22.550***		
Year	7.670***	11.550***		
Summary Statistics				
No. of Observations	33775	33775		
F-Statistics	207.420***	169.300***		
R-Squared	0.243	0.263		
Adj. R-squared	0.243	0.262		
RMSE	0.195	0.193		

*, ** and *** show significance at 90, 95 and 99 percent levels, respectively. All standard errors are robust. Leverage is the ratio of the book value of firm's total debts to total assets. Tangibility is the ratio of net tangible assets to total assets. Size is the natural log of total assets. Profitability is the ratio of earnings before interest and taxes to total assets. Growth is equal to the ratio of market capitalization to total assets. HI represents high income countries. UMI represent upper middle income and LMI represent lower middle income countries.

The results pertaining to joint hypotheses are presented in Table 12. For the selected G20 countries, the study fails to accept the null hypothesis implying that the effect of firm specific coefficients of SOEs and non-SOEs is not the same on leverage (model 6). However, this result changes when countries are classified according to income level (model 7). The effect of all the firm specific variables on leverage between SOEs and non-SOEs is same except growth in high income countries. Whereas results for lower middle income countries show that the effect of tangibility, size and profitability on leverage between SOEs and non-SOEs is not same. In the case of upper middle-income countries, the hypothesis of same effect of exogenous variables on leverage in SOEs and non-SOEs is only accepted for profitability. These hypotheses testing highlight the role of size and tangibility in the light of trade-off theory in mitigating the bankruptcy costs. As the sample for high income countries include four developed countries (France, Germany, Italy and Republic of Korea) which have better bond market structure legal enforcement and protection of creditors compared to other developing countries included in upper and lower middle income countries. These results reflect that private and public sector enterprises are practicing the rule of law in high income countries which may not be the case in upper and lower middle income countries.

Table 12: Testing of the joint hypothesis

Hypothesis	Model 6	Model 7		
	G20 (Selected Countries)	HI	UMI	LMI
The effect of tangibility of SOEs and non-SOEs is same on leverage	16.810***	2.080	55.190***	5.430**
The effect of size of SOEs and non-SOEs is same on leverage	8.310***	0.330	50.650***	3.450*
The effect of Profitability of SOEs and non-SOEs is same on leverage	22.900***	0.020	0.990	19.840***
The effect of Growth of SOEs and non-SOEs is same on leverage	12.330***	7.520**	19.830***	0.570

*, ** and *** show significance at 90, 95 and 99 percent levels, respectively. Leverage is the ratio of the book value of firm's total debts to total assets. Tangibility is the ratio of net tangible assets to total assets. Size is the natural log of total assets. Profitability is the ratio of earnings before interest and taxes to total assets. Growth is equal to the ratio of market capitalization to total assets. HI represents high income countries. UMI represent upper middle income and LMI represent lower middle income countries.

Chapter 5

CONCLUSION AND POLICY IMPLIFICATIOS

This study investigates the effect of state ownership on the capital structure decisions of firms in selected G20 economies. We further categorize these economies into high, upper middle and lower middle income countries using World Bank definition. Annual financial and accounting data of 252 state-owned and 6,503 non-state-owned firms for a period of 2011 to 2015 are used in the analysis. We employed OLS with country, year and industry as fixed effects to estimate the effect of state ownership on capital structure. Our results indicate that state ownership is positively associated with leverage in all the selected G20 countries. These results are in line with Dewneter & Maltesta (2001) and Konrai (1980).

The study also investigated differences between SOEs and non-SOEs across the development spectrum due to institutional differences in the countries. We conclude that state-owned enterprises in high income countries carry more debt than non-state-owned enterprises whereas state-owned enterprises in lower middle income countries carry less debt compared to non-state-owned enterprises. Dewneter & Maltesta (2001) & Konrai (1980) find the same trend for high income countries. We argue that SOEs debt levels should be higher compared to non-SOEs in high income countries, as these countries are developed having strong governance and economic conditions and provide soft budget constraints to their public enterprises, which may not be the case in lower middle-income countries. We also conclude that the effect of firm

specific variables on capital structure of SOEs and non-SOEs is not same across the development spectrum. For example, the effect of tangibility of SOE on leverage is different from non-SOE. Hence, firms' specific variables of SOEs are inherently different than Non-SOEs and their financial behavior is also different. Their financial behavior is more consistent with trade-off and pecking order theories but yet a further research is needed to develop a unified theory of SOEs.

Our results provide a number of policy and managerial implications. Similar to Dewneter & Maltesta (2001) & Konrai (1980), we showed and learned that state ownership is a significant factor affecting company's capital structure decision. However, this association of state ownership with capital structure decision is not same across the development spectrum. We observe that state ownership is positively associated with leverage in high income countries and the opposite is true for lower middle income countries. The implication is that in counties with better legal environment and more stable economic conditions, state owned enterprises are likely to take more debt. On the other hand, the negative influence of state ownership in lower middle income countries implies that governance in these economies is poor and state institutions carry less debt. These institutions could be potentially used for political purposes and influenced with corrupt practices (Faccio, 2010). Secondly, unlike other studies, we provide evidence that the effect of firm specific factors on capital structure decision of state-owned and non-state owned is not the same. Also, non-state owned enterprises lack an incentive to use debt tax shield to maximize the benefit to shareholders and therefore a more active financial leverage strategy can be used to maximize their market value. Hence, one policy model will not cure all the evils and separate policy programs needs to be developed for state and non-state

enterprises.   While this study has used the available data of all the state owned enterprises, however, not all data is available for all state-owned firms. Data availability can improve our understanding of the capital structure decisions of state-owned enterprises.

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APPENDIX

Variables definition

Variable Name	Definition	Expected Sign
Dependent Variable		
Leverage	Total debts divided by total assets	
Independent Variables		
Tangibility	Fixed assets divided by total assets	+
Firm size	Total assets	+
Profitability	Earnings before interest and taxes divided by total assets	-
Growth	Market capitalization divided by total assets	-
Dummy Variables		
State ownership	When state owns more than half of the shares of the firm	-/+
SOEs High Income	When State owns more than half of the shares of firms in high income countries.	-/+
SOEs Upper middle Income Countries	When State owns more than half of the shares of firms in upper middle income countries.	-/+
SOEs Lower middle Income Countries	When State owns more than half of the shares of firms in lower middle income countries.	-/+