Foreign Ownership, Financial Constraints and Financing Decisions: Evidence from Ghana and China

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ABSTRACT

Firms play a pivotal role in every economy. Therefore their financial standing should be of great concern to policy-makers, as this may directly affect the overall performance of the economy. Corporate finance literature however suggests that market imperfections resulting from conflicts of interest and informational asymmetries, between different economic agents, limit firms in their ability to finance investment projects. Yet, the extent to which firms are limited depends greatly on their size, ownership, exporting status, risk level and even location. In fact, many studies believe that unless by some policy directives pertaining to a particular country, foreign, exporting, large, less risky and firms in developed regions will under normal circumstances be less financially constrained than their counterparts, domestic, non-exporting, small, more risky and firms in undeveloped regions respectively. For domestic firms, some evidence exists that their financial constraints can be alleviated by the entrance of foreign firms.

In this thesis, we try and incorporate as many of these determinants as possible bearing in mind data availability. As a result, in the first part of this study, we address the issue of financial constraints of foreign and domestic firms as well as crowding out effects of domestic firms in Ghana. To the best of our knowledge, no study has attempted to address this particular issue on Ghana. We then move a step higher in the second part of our study by considering this same topic in China but then looking at it using firms with different degrees of foreign ownership. Not only do we do this, but we also carry out regional analysis in this respect. All these are made possible by the quality of dataset that we use in our analyses. Again, to the best of our knowledge, no study has addressed this issue on China in this manner. In the last part of our study, we take a different turn altogether and examine mainly the sensitivities of both long-term debt and short-term debt to cash flow and collateral respectively for globally-engaged firms (foreign-owned and exporting firms) as well as firms in the coastal and non-coastal regions of China.

We find very interesting results from these analyses. With regards to evidence on firm financial constraints in Ghana, we find that domestic firms

are more financially constrained than foreign firms and that foreign firms' presence has no impact on domestic firms in Ghana. For the results on China, while we find no difference between the financial constraints of purely domestic firms and joint ventures, we find that wholly-foreign owned firms are less financially constrained than purely domestic firms. We however find that the presence of foreign firms help alleviate purely domestic firms from their financial constraints. For the regional analysis, estimates based on this suggest firms in the coastal region are less financially constrained than firms in the non-coastal region.

Regarding the sensitivities of both short-term debt and long-term debt to cash flow and collateral, whilst we find that highly globally engaged firms have a higher sensitivity of long-term debt to cash flow than non-globally-engaged firms, we find that globally engaged firms' short-term debt have a lower sensitivity to collateral than non-globally engaged firms. As for the regional analysis, our result show that both the short-term debt and long-term debts of firms in the coastal region have a higher sensitivity to collateral and cash flow respectively than the sensitivities of short-term debt and long-term debt to cash flow and collateral of firms in the non-coastal region.

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Chapter 1

1. Introduction

1.1 Background

Firms, especially manufacturing firms play a pivotal role in every economy as an economy's development is determined mainly by the growth and productivity of its firms. The important role played by manufacturing firms in developing and emerging economies has received a great deal of attention over the past years. Not only are manufacturing firms important for the proper functioning of the business sector, but they also provide employment and promote growth in the economy. In order to play their role effectively in the future, there is the need for researchers and policy makers to identify this role and constantly revise their financial positions to develop the best financial and economic environment to harness these benefits. As a result, how they finance themselves should be of prime focus.

More often, firms incur substantial up-front costs which they can profitably recoup after realizing sales revenues. These may either involve costs that may be paid once upon entry into the industry (like sunk cost) or recurrent fixed per-period costs (for example, advertising costs). Unfortunately, firms are not always able to meet these financial needs which make the issue of finance central to any investment decision. Extant literature has contended that a major obstacle to firms' investment is financial constraint and the situation is even worse for firms in small open economies (for example, Aghion et. al.2004). This means that retained earnings or cash flow are often not enough to meet the financial needs of firms and they routinely have to rely on external financing for their operations. External financing may either come in the form of bank loans, trade credits or equity. Yet, Banerjee and Duflo (2005)'s survey evidence on many less developed countries shows that borrowing interest rates are often too high (60% or above) even though deposit rates are less than half as much, and defaults are rare. This puts a great constraint on the borrowing capacity of firms. Why exactly should credit constraints matter for firm development? As well known, credit constraints of firms affect them directly

by preventing their expansion and subsequently growth. However, the effect of credit constraints goes beyond capital markets and the firm. Acemoglu (2001) for instance provides empirical evidence on Western Europe to argue that credit constraints may contribute greatly to unemployment as they limit the extent to which new firms can be created. This problem of credit constraint can be solved if we were operating in the world suggested by Modigliani and Miller (1958).

Modigliani and Miller (1958) argued that in the presence of perfect information, firms could easily substitute external capital with internal capital to finance their investment activities, because there was no difference between these two. Consequently, changes in internal capital will not affect firms' investment decision, leaving all firms financially healthy.

Following Modigliani and Miller's (1958) seminal paper, economic theory has persistently shown that while the situation in a perfect informational world may serve as an important benchmark in theory, in the real world, capital market imperfections may exist, due to asymmetric information. This has led many scholars to believe that firms may be heterogeneous in their financial constraints. As a result, models of heterogeneous firms have, in the last few years, been at the hub of most theoretical and empirical developments in international finance. Theoretical arguments concerning agency costs fall in line with why firms may be heterogeneous in their degree of financial constraints. Underlying these arguments is the idea that, in the presence of capital market imperfections, asymmetric information about borrowers' type and the likelihood of debt repayment creates a wedge between the interest rate on borrowing and the lending rate, with the former being higher. This translates into an "external finance premium" for firms that borrow, that is, external finance becomes relatively more expensive than internal finance (Bernanke and Gertler, 1995). The external finance premium is likely to be higher for some categories of firms; small, young, risky and domestic firms (Gertler andGilchrist, 1994); Guariglia and Mateut ,2010). Accordingly, due to the higher external premium for these firms, their investment levels are more likely to be affected when there is a change in their internal finance as they cannot easily substitute external finance for internal finance.

Fazzari, Hubbard and Petersen (FHP, hereafter) (1998) were the first to introduce heterogeneity in the empirical analysis on the link between investment and financing constraints. They interpret higher sensitivities of investment to cash flow as evidence of higher financial constraints faced by firms. The idea behind this interpretation is that if firms find it too expensive to access external finance, then their investment activities will depend greatly on their amount of internal finance; therefore, a reduction in their internal finance will significantly affect their investment. Several papers have supported this approach (see Bond and Van Reenan, 2002; Hubbard, 1998). However, FHP (1998)'s study did not go without a challenge as some studies have found contrasting results (see Kaplan and Zinagales, 1997, 2000; Cleary, 2006[1]).

More recently, the issue of firm heterogeneity, financial constraints and investment has been extended to firms that are globally engaged. Campa and Shaver (2002) for instance, show that exporters in Spain are less financially constrained than non-exporters. Also, Castaneda (2002) shows that Mexican firms that are export - oriented faced a higher financial constraint than non-exporting firms before the 1995-2000 financial paralysis. Focusing on ownership and financial constraints, Harrison and McMillan (2003), Mickiewicz et.al (2004) and Arbelaez and Echavarria (2002) all find that foreign-owned firms have less binding financial constraints than domestic firms in Ivory Coast, Estonia and Colombia respectively. Guariglia and Mateut (2010) combine the ideas in the previous literatures and show that financial constraints are less binding for globally engaged firms in the U.K (i.e. exporters and foreign owned firms) than firms that are not globally engaged. Not only are foreign firms considered to be less financially constrained than domestic firms but they are also seen to have more debt than domestic firms.

There are good reasons for supposing that financial constraints might be lower for globally engaged firms than firms that are not globally engaged and there also very good reasons to suppose that globally-engaged firms may be more leveraged than non-globally engaged firms: Foreign firms find it easier to access the domestic financial market because they enjoy less bankruptcy risk

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[1] According to these studies, it is not always true that a monotonic relationship exists between financial constraints and investment-cash flow sensitivities.

and adopt international standards faster than their domestic counterparts (Harrison and McMillan, 2003). Moreover, having access to both the domestic and international credit markets can make foreign firms less likely to face financial constraints. Desai et al. (2004b) also point out that foreign firms may receive financial help from their parent company. For exporting firms, because they also depend on demand from foreign countries, they are less prone to the domestic cycle, making them less subject to those financial constraints caused by tight monetary policy and recessions at home[2]. This provides a more stable cash flow for exporters compared to their non-exporting counterparts, and then makes the exporters more financially healthy (Campa and Shaver, 2002; Garcia-Vega and Guariglia, 2008)[3]. Finally, a firm can only be an exporter if it is able to meet its sunk cost. Therefore, being an exporter also gives an indication that the firm is productive enough to be able to generate enough profits to recoup the sunk cost that needs to be met when entering the international market for the first time (Robert and Tybout, 1997). This increases the probability that the firm will be able to pay off its external debt, and further reduces the financial constraints that the exporting firm faces. In summary, most of these papers conclude that firms that are globally-engaged are relatively less financially constrained than firms that are not globally-engaged.

With regards to the differences in the leverage behaviour between foreign firms and domestic firms, Doukas and Pantzalis (2003) for instance argue that the business and financial risk of foreign firms are usually lower than that of domestic firms because of the diversifications in their operations. Extending their argument, they further state that the foreign exposure foreign firms have allows them to utilise debt financing more as they can use foreign debt as hedging instrument against foreign exchange risk and take advantage of the shortfalls in the macroeconomy of the host country.

How then can domestic firms be alleviated from financial constraints? Scholars have assumed that the credit constraints of domestic firms will disappear with the influx of foreign investment. According to Harrison et al. (2004), for instance, foreign investment can be seen as a form of equity finance

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[2] This argument relies on the assumption that business cycles are not perfectly coordinated across countries.
[3] A more stable cash flow gives lenders the assurance that the firm will be able to pay off its debts.

in which local firms could tap in. In fact some scholars like Aghion et.al. (2004) have also suggested that credit constraints for firms could be eliminated with higher levels of development and this includes opening up the economy to foreign investors. By opening up the economy, foreign investors can bring in scarce capital to meet the needs of the constrained local firms.[4] Foreign Direct Investment (FDI) is increasingly being recognised as a relevant aspect in economic development. More and more countries are striving to create a favourable environment to attract FDI. As a result, attraction of FDI has become an integral part of the policies of many economies, especially in developing economies where capital is greatly limited. In the 1990's for instance, (FDI) became the largest single source of external finance for developing countries (Trevino and Mixon, 2004). In 1997, FDI contributed to about half of all private capital and 40 percent of total capital flows to developing countries (Trevino and Mixon, 2004).

In recent times, policy makers, especially in emerging markets and developing countries have gone beyond creating a more liberal environment, to providing substantial public subventions to influence the location decisions of these investors. These incentives included lowering income taxes or granting income tax holidays, import duty exemptions, and subsidies for infrastructure. While the efficacy of such incentives is often doubted, most countries have still resorted to these incentives as a way of promoting FDI[5]. The idea behind these incentives often stems from the belief that foreign investment generates positive externalities in the form of technological transfer and they often bring in scarce capital to support domestic firms. Are the actions of these countries then necessarily justified?

Some authors (see Fieldstein, 2000 for instance) including anti-globalists have argued that foreign firms will monopolise domestic financial markets and destroy local producers. This fear of being crowded out complicates the structuralisation process in many transitional and developing

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[4]See also Stiglitz (1998), who argues that foreign investment brings additional capital.

[5] Both Ghana and China have in recent times directed their policies towards FDI attraction. For instance, as part of its policy, Ghana was able to increase its net foreign direct inflows from 14 million dollars in 1990 to about 106.5 million dollars in 1995 and further to about 144.97 million dollars in 2000. By 2000, it had increased its FDI inflows to about 970 million dollars (WDI, various years). Also in China, prior to 2008 they were also given exemption from corporation tax for two years after which they were allowed to pay taxes at a reduced rate of 50%[5]. In addition to the above benefit, they enjoy duty free imports of components and supplies (Naughton, 2007).

countries. These scholars further argue that even though spillovers exist, more efficient foreign firms may draw demand from the domestic financial markets making domestic firms less attractive, so the negative competitive effect may outweigh the positive spillovers. Other studies (Caves, 1996; Blomstrom et al., 2000) argue that the likelihood that foreign firms will "crowd out" local companies is larger in developing than in developed countries, because of a higher technological gap that exists between domestic and foreign firms. These results often raise doubts about the significance of FDIs and whether FDIs incentives are indeed justified.

The role of incentives in promoting FDI has increasingly been the focus of many studies but their relative advantages and disadvantages have never been clearly understood. Indeed, as much as some spectacular successes have accompanied the attraction of FDIs in some cases, in other cases, there have been some failures associated with providing incentives to attract FDIs.

At the end of this study, we believe that policy makers of both countries will find this study a helpful tool in the design, implementation and administration of such incentives. Not only are we concerned about the impact of FDI on domestic firms on the host countries, but this may also provide important implications for the managers of FDIs as it affects their bargaining position and reputation in host countries.

1.2 Motivation and Methodology

To provide more insight into these issues, the study seeks to answer the following questions: 1) Are domestic firms more financially constrained than foreign firms? If the answer to this question is yes, then what can domestic firms learn from foreign firms to be able to reduce their financial constraints, 2) is there any evidence for crowding out effect and, 3) are foreign firms' short-term debt and long-term more or less sensitive to cash flow and collateral? Our main contribution is mainly empirical.

First, the study uses data to assess the financing behavior of firms and derive critical results for two countries that have not been highly researched into, namely China, a country at an intermediate level of development that has

a potential of becoming an instrumental player in the world economy, and a low income country, Ghana, to see whether the results are portable across countries. Second, we observe whether the stylized facts observed from the studies of other countries could also apply to only these markets or whether they had more general applicability. Third, firms in both countries appear to be most susceptible to financial shocks, even though that of China is expected to be milder. Considering that firms are constrained in these countries, negative shocks to cash flow can curb their investment activities. We do these in the first and second parts of our study, that is, in Chapters 3 and 4 of this thesis. Since we are conducting our study on countries with different institutional, legal and financial environment, our study affords us the opportunity to see if these differences account for the differences in results. We therefore proceed to compare the results we have for Ghana and China in our main conclusion.

Whilst the literature has mainly focused on the role of state ownership of firms (see for example, Dewenter and Maletesta, 2001) and of banks (see for example, Sapienza, 2004), many firms in developing and emerging economies are now either privately owned, joint ventures or foreign investors. These different ownership structures may bring about different governance mechanisms within the firms. Based on this argument therefore, research on foreign firms is warranted. In a part of this study, we will build a model of investment and financing that tries to incorporate heterogeneous firms. In all of these studies we adopt an approach similar to that of McMillan and Harrison (2004) but we add several distinctly new contributions. Like McMillan and Harrison (2003), we estimate a structural model based on the Euler equation for investment and use the Generalised Method of Moments (GMM) to examine the extent to which firms are financially constrained and whether incoming FDI alleviates domestic firms' financial constraints.

For our analysis on Ghana, we classify firms into whether they are domestic or foreign. Different from McMillan and Harrison (2003), most of our foreign firms represent individual foreign firms whose owners are foreigners but have lived most of their lives in Ghana. This therefore means that the types of foreign firms we consider are not necessarily FDIs. We provide further insights on these categories of firms in the next chapter. To the best of our knowledge, no study has actually looked at foreign firms of this

caliber. It is our belief that results on this will further expand our understanding on foreign ownership and their operations.

However, for our analysis on China, we provide fresh evidence on firms with different degrees of foreign ownership by including a third, category, Joint Ventures. The reasons why we do this is that, first, the dataset makes this segregation possible. Second, including Joint Ventures will bring out the main relationship between foreign ownership and financial constraints, and third, being a Joint Venture in China is likely to place you in an advantageous position as both the foreign investor and the Chinese partner are likely to benefit: On one hand, the foreign investor is likely to benefit from the government support, land and access to suppliers while on the other hand, domestic firms could take advantage of knowledge spillovers, and access to foreign capital. This could mean that Joint Ventures are likely to face less financial constraints. As a result classifying part of Joint Ventures as domestic firms and part of them as foreign firms may lead to serious aggregation problems as the results of Joint Ventures may not be particularly singled out. Prior studies on financial constraints have neglected this fact. Bridging this gap then becomes our second contribution to literature. In both the studies on Ghana and on China, we further investigate whether foreign firms' presence are able to crowd out domestic firms.

After carrying these analyses separately, we then proceed to compare the results of China to that of Ghana, but this is done at the latter stage of this study, that is, in the conclusion. This brings us to the third contribution of our study to literature. Previous studies have concentrated on individual countries but have not provided any comparative studies. Our aim is to find out where firms in a developing economy stand in terms of financial constraints and crowding out compared to firms in an emerging economy. We also seek to find out if there are any lessons Ghana could learn from China to be able to converge to the level of economic performance China has at this point in time. If indeed we find there are any lessons to be learnt from China, our aim will be to suggest some policy implications for Ghana.

There are various reasons why we base our studies on China and Ghana. First, for China, after more than 20 years of economic reforms, the number of state-owned enterprises is gradually receding in the economy and

being eclipsed by foreign firms and firms with private ownership (Li.et al. (2009)). China is now among one of the top destinations for FDI in the world. It has accounted for about a third of gross FDI flows to all emerging countries and about 60% of these flows to Asian emerging economies (Prasad and Wei, 2005). The rise in the number of foreign firms has to some extent changed the Chinese corporate setting from a much localized setting into a more global setting. Second, China is among the countries with the highest FDI inflows in the world, so there should be a sufficient foreign presence to address my questions. Thirdly, both wholly-foreign and joint ventures now exist together in China, which makes it easier and particularly important for such a study to be carried out. Until about a decade ago, wholly-foreign owned firms were not allowed to enter the Chinese market. They had to invest mainly in large and well-functioning state-owned enterprises in the form of joint ventures. Fourth, China, until 2008, had various policies in place which encouraged foreign inflows. This included a total eradication of their corporate tax in the first three years of their establishment and a 50% reduction in the subsequent years. Our objective is to find out whether the policies were warranted as our study falls within this period. Fifth, turning to the financial system of China, it is dominated by a large underdeveloped banking system mainly controlled by the four largest state-owned banks. The government still directs the banks to lend to the state-owned enterprises and provide lending rates and reference borrowing, paying less attention to financial considerations. This makes the financial system an interesting case to study. Finally, being a model for countries that started transition later, the results might be generalised to other countries in transition.

For Ghana, despite the manufacturing firms' importance, no study has actually looked at their financial constraints based on foreign ownership, let alone the foreign firms of our caliber. Second, in recent years (that is, from 2001-present), there has been a tremendous increase in the number of banks and other financial institutions in Ghana. In about 1995, the number of banks was only seven. This number rose to about fourteen in 2000 and twenty in 2005[6], and by 2007, the Bank of Ghana had licensed about twenty three banks

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[6]The evidence of number of banks was taken from a survey conducted by Price water house coopers in 2010.

to operate in the economy. Our aim is to find out if the increase in the banking density has had any impact on the availability of credits to firms, especially domestic firms who have been well-known in other countries to face financial constraints. Thirdly, Ghana has enjoyed tremendous growth in recent times. From an average growth rate of about 4.6% in the 1990s and hovering around that same figure in some part of 2000, its growth rate surged to about 7.3% in 2008. Given this increase, our aim is to find out if the increase in growth could be attributed to expansion of credit in the immediate preceding periods before 2008 to firms in the economy, especially domestic firms. Third, the government of Ghana has had widespread economic liberalization in a bid to attract FDI inflows and solve the problem of economic stagnation and decline. This has led to a tremendous increase in the amount of FDI in Ghana. For example FDI net inflows increased from about 67.8 million dollars in 1970 to about 970 million dollars in 2007. Our main concern is whether Ghana is justified in attracting such a tremendous amount.

Our fourth contribution to literature is that we examine the capital structure of firms with different degrees of foreign ownership in China. The question we mainly address is, "do firms with a higher degree of foreign ownership have their leverage ratios being more sensitive to cash flow and collateral than firms with a lower degree of foreign ownership? In doing this, we also try to incorporate as many determinants of capital structure as we can in our model bearing in mind data availability. We set up some hypotheses for this in Chapter 6 to explain how this should work and test these hypotheses. With this particular section, we divide firms into three groups: These include Purely Domestic Firms, Joint Ventures and Wholly-Foreign Firms. Like the study on firm financing constraints in China described above, we have included Joint Ventures in this study to single out their possible leverage behaviour. As far as we are concerned, Li et al. (2009) is the only study that has considered foreign ownership in the literature of capital structure on China. Yet, their study involves, 1) a different category of firms, that is, foreign-owned, private and state-owned firms, and, 2) they just investigate the capital structure of the individual firms and neglect the possibility that the determinants may vary across the different groups. Explaining the hypotheses set in this particular chapter in brief, for the same reasons highlighted above on why foreign firms

could a priori be considered as less financially constrained than domestic firms, many theoretical arguments support the view that foreign firms' debt ratios should be different from that of domestic firms (see Doukas and Pantzalis[7], 2003 and Desai et al. 2004). We use both long-term debt and short-term debt ratios as our leverage ratio measures. With regards to the sensitivities of short-term and long-term debt to cash flow, whilst we expect the sensitivity of short-term debt to cash flow to be lower for Wholly-Foreign firms than Purely Domestic firms, we expect the sensitivity of long-term debt to cash flow to be higher for WF firms than Purely Domestic firms. For Joint Ventures, they may swing either way. To summarise briefly our reasons, because most foreign firms are usually affiliated internationally, it is often argued that their activities allow them to create extensive internal markets that are likely to provide them with cheaper financing than the external markets (Doukas and Pantzalis, 2003). This means that if internal markets function properly, one would expect foreign firms to depend more on internal financing than external financing. However, this argument in our opinion will apply to short-term debt which is usually used to finance short-term projects according to the maturity matching principle[8]. This is because with short-term projects being relatively cheaper than long-term projects, the large pool of internal financing readily available to foreign firms should be enough to cater for their short-term projects. Bearing this in mind therefore, any increase in cash flow should reduce the amount of short-term debt drastically for WF firms, making the sensitivity of short-term debt to cash flow lower for WF firms than that of purely domestic firms.

For long-term projects which are supposed to be financed by long-term debt, also according to the maturity matching principle, we do not expect internal financing to be sufficient to cover this. This is when the efficiency and performance of firms can count towards receiving external financial assistance. In this regard, WF firms are in a better position to be able to secure more external financing because of their better credibility. Several authors (Lewellen, 1971; Williamson, 1975, 1986; Myers and Majluf, 1984; Shleifer

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[7] It is worth-mentioning that this particular study is not just on foreign firms but specifically related to multinationals. Therefore, as a matter of cautioning, although all multinationals are foreign firms, not all foreign firms are multinationals.

[8] According to this principle, short-term debts are used to finance short-term assets whilst long-term debts are used to finance long-term assets. For more insight about the maturity matching principle see Myers (1977).

and Vishny, 1992; Stein, 1997) provide support to this by stating that diversified corporations create internal capital markets, which are less prone to asymmetric information problems and, hence, they can sustain higher levels of debt. From this, we expect the sensitivity of long-term debt to cash flow to be higher for Wholly Foreign firms than Purely Domestic firms. As for the sensitivities of both short-term debt and long-term debt to collateral, we hypothesise that the sensitivities of both short-term and long-term debts to collateral should be lower for Wholly Foreign firms than Purely Domestic firms. One main reason accounts for this. First, because foreign firms are mainly 'alien' to the host economy, there exist some difficulties in the gathering and processing of information, making monitoring of foreign firms more expensive than monitoring of domestic firms (Doukas and Pantzalis, 2003). This means that WF firms that have little or no association with the host economy and are more susceptible to information asymmetries will be required to produce a higher value of collateral than local firms. Given that foreign firms' assets consist mainly of intangibles compared to tangibles (see Ethier, 1996 and Ethier and Horn, 1990), when the collateral of Wholly Foreign firms increase for instance, both short-term debt and long-term debt will increase but not as much as that of Purely Domestic firms.

Next in our analyses, we consider the financing decisions of exporting and non-exporting firms. Apart from the contribution of Foreign Direct Investment (FDI), exports also contribute greatly to the Chinese economy. As indicated above in section 1.1, exporting firms are presumed to have sufficient financing to cater for their short-term projects because of the processes they have to undergo before they are able to export. They may however require more financing for their long-term projects. This therefore means that, like Wholly- Foreign Owned firms, exporting firms' short-term debt should be less sensitive to cash flow and their long-term debt should be more sensitive to their cash flow. The opposite is true for non-exporting firms. Again as explained in section 1.1, exporting firms because of the nature of their operations are endowed with more intangible assets. Therefore, using the same explanation provided for Wholly-Foreign firms, we expect both their sensitivities of long-term debt and short-term debt to be lower for exporting firms than non-exporting firms. We carry out similar analysis as we do for firms with different

degrees of foreign ownership. Specifically, we examine the sensitivities of both long-term and short-term debt to cash flow and collateral respectively, bearing in mind the other determinants of long-term and short-term debts for exporting and non-exporting firms. This is an innovation in this field of study. To the best of our knowledge, no study on capital structure, whether on China or in the rest of the world has ever looked at exporting and non-exporting firms. This is one of the things that make this study very unique. By doing this, we do not only get fresh results in this area of study but we are also able to compare these latter results with that of different degrees of foreign ownership. This will enable us draw conclusions about the financial behavior of globally- engaged firms.

Despite the importance of firms in the growth and development of developing economies, until recently, work on capital market imperfections and foreign ownership have been based on anecdotal and survey evidence. Very little empirical work has been done in developing countries[9]. One main reason for this is the difficulty in finding very detailed firm-level data for these countries. Even where some evidence exists, there is still some difficulty in explaining because these surveys are mainly done by institutions that give out loans such as the World Bank (Harrison and McMillan, 2003). This actually pushes some firms to say that they are financially constrained when they are actually not financially constrained. Our work becomes possible because relatively new and comprehensive panel surveys are now available for the chosen countries.

1.3 Dataset

Therefore, in order to investigate the relationship between financial constraints, firm ownership and crowding out in Ghana, we use data from a survey conducted by a team from the Centre for the Study of African Economies (CSAE) at Oxford University in collaboration with the Ghana Statistical Office (GSO). For Ghana these areas span the four largest urban centers in the country: This dataset contains comprehensive panel data set on a sample of

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[9] With the exception of Harrison and McMillan (2003), Harrison, Love and McMillan (2004) and Poncet and Hericourt (2008).

firms within the Ghanaian manufacturing sector. It was collected in five rounds over the period 1992 to 1998. The first three rounds were annual surveys, referred to as Waves I – III, as part of the Regional Program on Enterprise Development (RPED) organised by the World Bank. The fourth and fifth rounds of the data each cover two year periods. Firms that exited during the survey were replaced by other firms in the same sector that also had similar characteristics. The data was collected by a team from the Centre for the Study of African Economies (CSAE), University of Oxford, the University of Ghana, Legon and the Ghana Statistical Office. These surveys with a panel structure as well as the financial situation of firms will help provide more insight into the financing constraints for enterprises. One main limitation of this dataset is that it lacks a lot of financial variables and it is believed that this is mainly due to the reasons why the dataset was collected: It was mainly collected for to analyse issues about labour.

For the work on China, we use a panel dataset from the ORIANA database. This database contains unique information on the financial position for public and private companies in the Asia-Pacific region. It is relatively new, comprehensive and underused. It is exclusive to Bureau van Dijk Electronic Publishing (BvEP) and combines data from various sources. BvDEP contains (where available) 24 balance sheet items, 25 profit and loss items and 26 standard ratios. In this dataset, all state-owned enterprises and other types of enterprises with annual sales of more than 650,000 US dollars are found in it. These firms operate in the manufacturing and mining sectors and cover all the 31 provinces in China. Also containing 110, 770 observations and over 20,000 firms, we believe it is the largest and most representative dataset in existence. It spans through the period 2000-2007.

1.4 Summary of Main Findings

We find some very interesting results for our study using both datasets. For the work on financial constraints and crowding out on Ghana, we find that domestic firms are more financially constrained than foreign firms, but then foreign firms' borrowing has no impact on domestic firms' financial constraints. Although the former result is consistent with Harrison and

McMillan (2003), the latter is not. Also for the evidence on financial constraints on Chinese firms, while we find that purely domestic firms are more financially constrained than purely foreign firms, we find that joint ventures are not any different from purely domestic firms as far as financial constraints are concerned. As for the test of crowding out, we find results contradictory to what Harrison and McMillan (2003) find. Whilst Harrison and McMillan (2003) find that private domestic firms' financial constraints are worsened by foreign firms' presence, we find that private domestic firms' financial constraints are rather relieved by foreign firms' presence. This emphasises the importance of institutional differences and shows that certain situations are only peculiar to certain countries. With regards to our work on capital structure, whilst we find the sensitivity of short-term debt to cash flow and collateral respectively to be lower for purely foreign firms than purely domestic firms, we find the sensitivity of long-term debt to cash flow to be higher for purely foreign firms than purely domestic firms. For joint ventures, we find no difference between their sensitivities of both short-term debt and long-term debt to cash flow and collateral and that of purely domestic firms. The results for exporting and non-exporting firms are similar to that of the results for firms with different degrees of foreign ownership. Specifically, while we find the sensitivity of short-term debt to collateral to be lower for exporting firms than non-exporting firms, we find the sensitivity of long-term debt to just cash flow to be higher for exporting firms than non-exporting firms. This means that globally-engaged firms behave in a similar way as far as the sensitivities of the different leverage ratio measures to cash flow are concerned. As for the regional analyses, we find that the sensitivities of both short-term and long-term debt to cash flow and collateral respectively are higher for firms in the coastal region than firms in the non-coastal regions.

1.5 Structure of Thesis

The rest of the thesis is structured as follows. In Chapter 2, we include a literature review on firm financial constraints. This literature review is intended to serve both Chapter 3 and the Chapter 4. In Chapter 3, we provide a study on the financial constraints of domestic and foreign firms as well as a test on the

crowding out effect of firms in Ghana. Also as part of this study, we provide a background study on Ghana's financial system and the trend of FDI. In Chapter 4, we examine the same issues as in Chapter 3 but focus on the Chinese economy. Unlike Chapter 3, our data on the Chinese economy gives us the flexibility in investigating this issue on firms with different degrees of foreign ownership. Therefore, we are able to include joint ventures in our study. Also in this chapter, we brief ourselves on the Chinese economy by highlighting some important aspects of its financial system and FDI inflows. Given the high quality of our data and its disaggregated nature, we are also able to investigate this same issue in the regional context. Chapters 5 and 6 take a slightly different path but still focus on the Chinese economy. We turn to the issue of capital structure and foreign ownership. Therefore, in Chapter 5, we include its separate literature review. Regarding the main contents, we specifically investigate the leverage behaviour of firms with different degree of foreign ownership. Apart from this, we also investigate how the relationship between capital structure and its financial determinants vary across different ownership groups, exporting status and location. All these are done in Chapter 6. Chapter 7 concludes the thesis with a summary of our findings, some synthesis of the work on financial constraints of firms in the Ghanaian and Chinese economies, limitations of our study, policy implications which can be drawn from our study and some possible extensions to the study.

Chapter 2

2. Literature Review on Local Firms, Foreign Firms and Financial Constraints[10]

2.1 Introduction

The impact of financial constraints on investment decisions has been of much interest to economic researchers over the past decade. Empirical work on the relationship between financial constraints and investment has given controversial results, which have consequently led to a never- ending debate on the relationship. Fundamental to this line of thought is that capital market imperfections in credit and equity markets create a wedge between external and internal financing. If financial constraints do not exist, changes in internal financing should not have any influence on investment. In that respect, internal financing can be easily substituted with external financing which is more costly in the presence of informational asymmetries.

2.2 Explaining the Presence of Financial Constraints Using Investment-Cash Flow Sensitivity

Fazzari, Hubbard and Peterson (FHP, 1988) were the first to provide a seminal paper on the monotonic relationship between investment-cash flow sensitivities and financial constraints. They split U.S manufacturing firms into three groups based on an a priori measure of financial constraints (dividend payout ratio), and compare the three different categories' responsiveness of investment to cash flow. They find that the firms with low dividend payout policy (that is, firms which are a priori likely to be financially constrained), have their investment exhibiting higher sensitivities to cash flow than firms that pay out higher dividends, meaning that low dividend payout firms are actually more financially constrained.

Kaplan and Zingales (KZ, 1997) criticize the work of FHP(1988) by reclassifying the 49 low dividend firms (Class 1firms) that FHP(1988) classify

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[10] This literature review serves Chapters 3 and 4.

as financially constrained into 5 groups. According to them, although firms facing financial constraints should respond more to internal financing than unconstrained firms, it is not automatically true that a monotonic relationship would exist between financial constraints and investment-cash flow sensitivities. They classify the 49 low dividend payout firms based on the qualitative information in annual reports, quantitative information in the companies' financial statements and notes that describe the firms' financial status with where they plan to source funds from for future investment. Based on this information, the firms' degrees of financial constraints are determined. Their results show that the firms that are a priori likely to be financially constrained have their investment being less sensitive to cash flow than those that are a priori less likely to be financially constrained; these results contradict FHP(1988)'s study.

In a response to KZ (1997), FHP (1998) argue that the classification scheme employed by KZ (1997) is not credible: it is complicated and relies on managers statements which may not necessarily be true. FHP (1998) also argue that KZ (1996)'s may reflect econometric problems[11].

2.3 Investigating the Existence of Financial Constraints Using Ownership Structure

A vast literature emerged afterwards with papers supporting either one of the above studies. However, most papers that evolved criticised the use of the dividend pay-out ratio as the basis for classifying firms into more or less financially constrained. Following this various studies emerged using different forms of classifications for firms. An almost unexplored dimension of this research area is the impact of foreign ownership on the firm's financial constraints, and also, the effects that foreign firms' borrowing from the local markets may have on domestic firms' financial constraints. Despite the importance of this issue, only few empirical studies have addressed it.

Harrison and McMillan (2003), for instance, examine the differential effect of financial constraints on purely domestic firms and firms with foreign

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[11] 'Q' = the ratio of capital to the replacement of capital but KZ(1997) use the ratio of market value of assets to book value of assets.

ownership. Although classifying firms into size, age, dividend payout ratios etc. have been the focus of most studies in this field, Harrison and McMillan (2003) introduce a new criterion for firm classification: domestic and foreign ownership. By employing data from Ivory Coast for 399 firms over the period 1974-1987 and augmenting the standard Euler investment model with financial variables, they specifically test whether both domestic and foreign firms face the same level of credit constraints and whether foreign borrowing crowds out domestic firms out of the local financial market. Following Whited (1992) the financial variables they use are coverage ratio, measured by *interest/interest +profit and the ratio of debt to asset.* These measures indicate the indebtedness of firms, and the firms' lack of collateral respectively. A high coverage ratio (or debt/asset ratio) implies the firm is highly indebted and therefore financially constrained. They also control for the lag of the dependent variable and its square and lagged sales over fixed assets. Their results indicate that financial constraints are more binding for domestic firms than for foreign firms. They then interact the financial variables with a measure of foreign firms' borrowing on the local capital market and interact the same financial variables with foreign sales. They nest both interaction terms into the same investment equation to properly investigate whether (1) foreign firms' borrowing on the local market exacerbates local firms' financial constraints, and (2) if they do, what may be the driving force. Their results indicate a positive and significant relationship between investment and the interaction term that contains the financial variables and foreign borrowing. Meanwhile, the interaction term with foreign sales and the financial variables remain insignificant, implying that foreign borrowing increases the sensitivity of the financial variables to investment.

Harrison, Love and McMillan (2004) also examine the issue of whether capital transaction restrictions, in particular, Direct Foreign (FDI) impact negatively or positively on firms' financial constraints. By using a panel of 40 countries covering about 7000 firms from 1988-1998, they also use the Euler investment equation augmented by a financial variable. Rather than using coverage ratio and debt/asset, they choose to use cash stock to proxy for financial constraints. They interact the FDI variable with cash stock and control for a number of factors like the lag of the dependent variable, the ratio of sales

to capital and fixed effects. Their results show that FDI reduces firms' financing constraints, a result which contradicts the earlier findings of Harrison and McMillan (2003) which show that foreign ownership worsens the financial constraints of domestic firms. In order to introduce heterogeneity into their sample, they split the sample into G7 and non G7 countries. Their results show that FDI eases the financing constraints of the non-G7 countries, while the G7 countries are not financially constrained at all. Splitting the sample into firms with foreign assets and those without foreign assets suggests that firms without foreign assets face more financial constraints than multinationals, as the coefficient on FDI interacted with cash is only significant and negative for firms without foreign affiliation.

In a related paper, Rutkowski (2005), first investigates whether domestically-owned firms in Central and Eastern Europe face higher credit constraints than foreign-owned enterprises, and second, if domestic enterprises' financial constraints are caused by incoming FDI. He undertakes this study using two alternative firm-level regression methods. The first, which is more direct, takes the ease of accessing the loan as the dependent variable (one for short-term loans and one for long-term loans), while the second approach, which is more indirect, tests if the relative level of investment is explained by some other financial indicators. Using data from the second edition of the 'Business Environment and the Enterprise Performance Survey (BEEPS II), this study provides evidence that domestic firms face higher credit constraints when applying for short-term loan than foreign-owned firms. The study also finds that FDI reduces foreign firms' financial constraints without increasing the constraint faced by domestic enterprises.

In a panel study of manufacturing firms in Estonia over the period 1985-1995, Mickiewicz, Bishop and Varblane (2004) examine the link between financial constraints and investment. They test the hypothesis that the impact of financial constraints on firm investment does not differ across firms with different ownership status and size. One unique thing about this study is how financial constraints are interpreted. Rather than looking at the statistical significance of the financial variable in an investment equation, their main way of interpreting financial constraint is through the signs of the proxy for the degree of financial constraint; a positive sign on the proxy for financial

constraint implies that the firm is financially constrained and vice versa. Although they use the investment Euler equation as used by previous studies, they do not introduce any borrowing constraint into the Euler equation. They first estimate a basic investment model using the Euler equation with cash flow (measured by net sales/ previous year's capital), some dummies and previous year's investment/capital and its square (i.e. $inv\_capital_t$ = constant + $inv\_capital_{t-1}$ + $inv\_capit\_sq_{t-1}$ + $netsal\_cap_{t-1}$ + year_dummies + sectoral_ contrasts + E_{it}). Their results indicate a negative relationship between cash flow and investment implying that financial constraints are absent. This result is however not robust to the introduction of heterogeneity across different categories of firms into the equation in terms of ownership structure and firm size as the earlier results are altered. By splitting the sample into foreign and domestic firms and small and large firms respectively and interacting the cash flow variable with them, the results indicate a positive relationship between domestic firms and cash flow, and between the reciprocal of employment (small firms) and cash flow (small firms), which implies that a smaller percentage of foreign ownership (or firms of small size) makes a firm prey to financial constraints. According to their results, the absence of financial constraint initially found was based on the assumption of firm homogeneity in their estimation. They also find great evidence for financial constraints of firms which possess both characteristics of low foreign participation and small size.

2.4 Classifying Firms into whether or Not they are Globally-Engaged to Test for Financial Constraints

Guariglia and Mateut (2010) look at the same issue of financial constraint and investment from a different perspective; digress from the use of fixed investment models augmented by financial variables by earlier studies and use inventory investment regressions to find evidence of financial constraints. Using a total of 9381 U.K. firms, their sample was taken from 1993-2003. Their contribution to literature in this field is in two folds. a)To investigate whether firms which are globally engaged (measured by exporting firms and firms with a high share of foreign ownership) exhibit lower/no sensitivity of inventory investment to financial constraint indicators compared to their counterpart

firms which do not export or are domestically owned and b) classify firms using two different criteria based on traditional firm characteristics which divide firms into healthy and financially constrained firms and on global engagement status. Firms which fall below 75% of the distribution of sales, risk and age are classified as financially constrained whiles those with their distribution above are healthy. For global engagement the classification is based on firms' ability to export and ownership status.

By modifying Kashyap et al's (1993) Mix Variable (bank loans/bank loans +commercial paper), the financial variables they employ in the inventory equation is the ratio of short term debt to the sum of short term debt and trade credit (MIX1) and the ratio of the firm's short term debt to its current liabilities (MIX2), which is broader and takes into account other alternative sources of finance such as loans from insurance and financial companies, corporate bonds and commercial paper. This also differentiates this study from other studies in this field which have mainly relied on coverage ratio, cash flow and cash stock as proxies for financial variables. A positive and significant level of the mix variable implies financial constraint while a negative and insignificant mix variable implies firms are less financially constrained.

Using an error correction model, Guariglia and Mateut (2010) find that inventory investment of firms which are financially healthy, based on the traditional criteria, exhibit lower sensitivity of inventory investment to the mix variables whiles financially constrained firms exhibit higher sensitivities. In particular, they find that the coefficients of the mix variables of the financially healthy firms are insignificant statistically and negative whiles those of the constrained group are significant and positive. Inventory investments of firms with global engagement (that is, those who export or have some foreign ownership) are less responsive to the mix variable than the inventory investment of those without global status implying that these firms are more financially constrained. In order to investigate whether global engagement mitigates financial constraints, constrained firms are split into those with global engagement and those without. Results reveal statistically significant coefficients for the mix variables for firms without global involvement but lower sensitivity of inventory to the mix variable for firms with global engagement. Consequently, participating in global activities attenuates

financial constraints. Their work therefore supports McMillan and Harrison (2003). Also, their results show that inventory investment is more responsive to firms which are relatively small, younger and more risky.

In Guariglia and Bridges (2008)'s study, they examine whether global engagement may protect firms from financial constraint based on the failure probability of a firm, using a panel of 9420 newly established U.K firms from 1997-2002 with a probit model. They diversify the model by splitting firms based on their global status. Like Guariglia and Mateut (2010), this classification of global engagement is based on two dimensions, exports and ownership so that firms who export and those with foreigners having a greater share are considered globally engaged and the opposite is true for domestic firms. They augment the probit model for survival probabilities with financial variables. The financial variables they use in this study are collateral; measured as the ratio of tangible assets to total assets, and leverage; measured by short term debt/total assets. The probability of a firm to fail is measured by a company whose position in a given year is in receivership, liquidation or dissolved.

According to them, if global engagement protects firms from financial constraints, then the probability of firms to fail should be less responsive to the financial variables for globally engaged firms. On the other hand, firms without global status would have their probability of failure responding sharply to financial variables. In order to capture the effect that financial variables have on the survival probability of a firm, they interact the financial variables with globally engaged firms and purely domestic firms. In their first estimation, they consider globally engaged firms (that is, firms that export and/or are foreign owned) jointly without splitting the firms into those that export and those that are foreign owned. Their results show that financial variables'(leverage and collateral) have greater effects on firm's probability to fail for purely domestic firms than firms with some global status meaning that global engagement alleviates firms from financial constraint and consequently 'death '.The signs of the coefficients of the financial variables also support theory. A higher collateral and lower leverage are associated with low failure probabilities of firms. Using the Cox proportional hazard model and the random effect logit model does not change the results. In order to investigate whether the initial

findings would hold for the individual dimensions of global engagement they consider in their studies, they estimate another logit equation with each of the two dimensions in the same equation interacted with each of the financial variables but the results does not change. In addition, introducing old firms into the sample (that is firms before 1996) does not change their results.

2.5 Examining the Link between Investment and Financial Constraints In Periods of Currency Crises

Desai, Foley and Forbes (2004) investigate the link between financial constraints and investment in a unique way, by looking at how firms with multinational affiliates and local firms respond differently to large depreciation of a currency. Using a sample of 25 emerging markets from 1991-1999, their results indicate that in the years of and after depreciation, firms with foreign affiliates increase sales, assets and investment more than local firms. In their view, currency crises can either make firms very competitive on the international market by promoting exports, or increase firm's indebtedness due to large borrowing from foreign sources without corresponding adjustment of capital structure. Hence, the effect of financial constraint on firm investment in periods characterising depreciation can be seen through these two ways. In order to examine why differences exist in the response of multinationals and local firms to currency crises, they examine the impact of depreciation on relative changes in operating profitability which measures competitive benefits, and leverage (current liabilities/ long term assets), measuring financial constraints. Their results indicate that the operating profitability of both domestic and foreign-owned firms respond in the same way to currency crises, but the leverage of local firms responds more to currency crises than multinationals', suggesting that local firms' inability to increase investment in times of currency crises is due to financial constraints.

In a similar study, Blalock et.al (2008) examine whether capital imperfection restrains firms from investing during currency crises. Using data from the Republic of Indonesia's Budan Pusal Statistik, they find that the value-added and employment for exporters increased after the 1997 Asian

crisis, implying that, Indonesian exporters took advantage of the devaluation process. However, their results show that only exporters with foreign ownership increase their capital significantly. This suggests that financial constraints prevent domestic firms from benefiting from the terms of trade.

In our study, we investigate the financial constraints of foreign and domestic firms and the test whether domestic firms in Ghana and China are crowded out by foreign owned firms. Different from the aforementioned studies, our analysis on Ghana investigates the financial constraints of foreign and domestic firms using a totally different category of foreign firms. These foreign firms may not necessarily be FDIs as seen in previous studies.

Most of these firms are owned by foreigners who have lived in the country for so many years and have established themselves within the country. They are mostly from Asian origin. The firms under investigation are mostly firms that have been passed on from one generation to another. Owners of these firms have formed networks with their colleagues and can also receive some form of assistance from home. As a result, we believe that results from this study will be able to confirm whether being foreign-owned is what makes the difference.

As for or analysis on China, we investigate this same issue using firms with different degrees of foreign ownership. All the studies reviewed above divide firms into either domestic or foreign. This does not allow a complete capturing of the financial constraints of joint ventures. We fill in this gap by specifically dividing firms into three; purely domestic, joint ventures and wholly-foreign owned firms. By this we are able to separate joint ventures from purely domestic firms and wholly-foreign firms to capture the financial constraints of firms with different degrees of foreign ownership. In addition to this, we carry out regional analyses to find out whether the level of financial constraints of firms differs across the different regions of China. No study has done this as far as we are aware. We start our analyses in the next chapter on Ghana.

Chapter 3

3. Foreign- owned Firms and Financial Constraints: Evidence from the Ghanaian Manufacturing Sector

3.1 Introduction[12]

The Ghanaian economy has in recent times been doing pretty well with unprecedented growth, both from commodity booms and improved macroeconomic management. It managed growth of over 6% and inflation of just over 10% for a number of years. From an average growth rate of about 4.4% in the early 1990s, its average growth rate increased by just about 0.1% in the late 1990s. The economy started picking up in the early 2000s when its average growth rate surged to about 5.6%. Interestingly, in 2008 for instance, despite the high food prices and the soaring crude prices that hit the economy, it still was able to maintain some growth resilience as the officially recorded growth rate was about 7.3%[13]. This growth rate was even higher than the rate for 2007.

This increase in the GDP growth rate translated into a higher real per capita GDP growth rate of 4.8% up from 4.1% in the same year. Considering the sectoral growth rates, the industrial sector, comes second after the service sector. Whilst the growth rate for instance for the industrial sector was about 8.1% in 2008 (a rise of about 0.7% in 2007), the growth rate for the service sector was about 9.3% (a rise of about 1.1%). In terms of industrial output, the manufacturing sub-sector has mainly been its major contributor. From 1990 to 1999, it accounted for about 58.2% of industrial output. For its share in GDP, it appears to be on the same line with the construction sub-sector, both contributing large shares to GDP as far as the industrial sector is concerned. Further, out of the GDP growth rates that have been stated above, the manufacturing sector has been one of the major contributors as far as the

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[12] All figures in this section unless indicated otherwise come from the State of the Ghanaian Economy, various editions

[13] See figure 3.A1 in appendix for details

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contribution of the industry sub-sector is concerned. It has been moving alongside with the construction sub-sector. In the early 1990s, its share of real GDP was on average about 8.6%, compared to the mining and the construction sub-sectors that contributed on average 1.4% and 2.9% respectively. It then increased its contribution to about 9.1% in the late 1990s. However, its contribution fell to about 8.6% in the early 2000s and further to about 7.9%, lagging behind the construction sub-sector in 2008[14].

Despite the manufacturing sector's valuable contribution to the economy, figures indicate that it has been experiencing the least growth rate compared to the other sub-sectors. Its growth rate hovered around 2.2% on average in the 1990s compared to an average growth rate of about 6% in the construction sector. Between 2000 and 2008, though its growth rate increases to an average of about 5.9%, it still couldn't match the construction sector. The construction sector had an average growth rate of about 7.3%.[15]

An interesting question to pose is why the sector is not growing. Can it be attributed to financial constraints then? From the State of the Ghanaian Economy (various years), the amount of credit to the manufacturing sector (at 2006 Ghana cedis) decreased from 647.7m Ghana cedis in 1993 to about 375.25m Ghana cedis in 1997. In 2000, it increased to about 1528.359m Ghana cedis. It however declined again to 890.94m Ghana cedis in 2004 and further to about 619.68m Ghana cedis in 2008. This situation is likely to cause firms to be constrained financially. The case might even be worse for domestic firms who are basically limited to the domestic credit market. Foreign firms located within the country can at least have some credit from the international market, other foreign companies or even their parent companies in the case of multinationals if the domestic credit market fails them. Even if credit is made available on the domestic market, foreign firms are likely to have better access to these credits unless some specific directives exist in the economy for domestic firms. In the case of Ghana, however, this is not so. Banks lend only to firms using financial consideration and not by political consideration.

Following this argument, many developing nations often set out policies to attract foreign investors to help relieve their domestic firms of their

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[14]See figure 3.A2 in appendix for details
[15]See figure 3.A3 in appendix for more details.

financial constraints. But does this effectively occur? Essentially, if these foreign investors come in with scarce capital and generate technological spillovers, they may provide support to domestic firms. This may in turn promote economic growth and development in the host country.

With these benefits in mind, Ghana is now beginning to attract significant levels of FDI as new policies are aiming at making foreign investment an integral part of the macro economy. For instance, net foreign direct inflows increased from about 14 million dollars in 1990 to about 106.5 million dollars in 1995 and further to about 144.97 million dollars in 2000. By 2007, it had increased to about 970 million dollars (WDI, various years)[16]. As to whether just attracting foreign investment into the country would generate a non- trivial impact on the whole economy is one argument on its own.

When foreign investors come in to borrow from the domestic financial institutions, then, because they typically have good reputation and are considered more productive and less risky, they become a better bet for financial institutions. As a result, they are able to compete effectively with domestic firms and deprive them of the limited capital available (crowding out effect). Limiting the situation to Africa, most African developing countries have not been able to enjoy the benefits of having a stable investment inflow. Expectations that Foreign Investment could be a channel through which economic growth and development could take place have not been fully achieved; Ghana could be no exception. The latter argument could explain the lack of impact of FDI on growth.

Bearing these arguments in mind therefore, the overall impact of foreign investment on domestic firms, and for that matter, the whole economy depends on which of the two outweighs the other. Perhaps, the insignificant impact of foreign investment on Ghana's economy can be attributed to the fact that the crowding out effect dominates the benefits of attracting foreign investment

Using data from the Centre of the Study of African Economies (CSAE), we examine whether, first, domestic firms in Ghana face more financial constraints than foreign firms, and, second, whether foreign firms' borrowing from the local financial market worsens the financial constraints of domestic

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[16] WDI represents World Development Indicators.

firms. It is worth-noting that this dataset which covers the period 1991-1997 marks the period after financial development in Ghana. By undertaking this study, we may be able to examine the impact of financial development on the economy as we expect more investible funds to be available to firms due to the increase in the number of banks. Although this dataset is the only most comprehensive firm level dataset on Ghana, it lacks a lot of financial variables: Thus, making it difficult to carry out a lot of financial analyses. We combine ideas from Whited (1992) Bond and Meghir (1994) Gilchrist and Himmelberg (1998), Love (2000) and McMillan et al (2003), to construct a model that relates adjustment costs in different periods. We test the predictions of this model using, an Euler Equation augmented with the financial variable, debt. As in other investment literatures, we interpret the coefficient of debt as the degree of financial constraints faced by firms. Basically, a significant coefficient of debt will mean the firm is financially constrained. Conversely, an insignificant debt variable will imply that, when there is a change in debt, the firm can substitute it with another form of finance, making it financially healthy. In the context of the Euler equation, if firms are not financially constrained, then changes in debt should not affect future investment. We show how the coefficient varies across different groups of firms classified into foreign-owned and purely domestic. We also explore whether borrowing by foreign firms worsens the financial constraints of domestic firms by introducing the variable, share of foreign borrowing which we interact with debt.

As far as we are aware, there are only few empirical studies that have tackled this issue. Alexander Rutkowski (2005) for instance, investigated the impact of foreign firms' borrowing from the local capital markets on domestic firms' financial constraints by focusing on Central and Eastern European Countries (CEEC). Harrison and McMillan (2003), also, investigated this issue by concentrating on Ivory Coast, but, may not provide a full picture about what happens in Africa. We therefore examine this same issue in another African country: Ghana. By doing this, we will contribute to existing literature in two ways. First, we will be able to make generalisations about the impact of foreign firms' borrowing on the financial constraints of domestic firms in West Africa. Second, we will also be able to make a direct comparison between these two economies as similar techniques, variables and methodologies will be applied.

Our choice of Ghana for this study is motivated by two main reasons. First, as far as we are aware, virtually no study has examined this issue in Ghana. We consider this study somewhat important in the context of Ghana. This is because in recent times, the government has been making policies to attract foreign investment as it believes foreign investment could be a channel through which growth could be achieved. Therefore, the outcome of this study will help the government determine whether these policies are worth implementing. Second, our dataset offers us the opportunity to examine this issue using another form of foreign ownership which is not the same as the traditional FDI, but which we believe could be interesting to investigate. One interesting and clear distinction can be made between our study and that of Harrison and McMillan (2003). In our dataset, foreign- owned is not directly equivalent to FDI as traditionally understood and described by Harrison and McMillan (2003). Foreign-owned in our dataset refers mostly to ownership by individual foreigners that are not originally from Ghana. These individuals often belong to the Lebanese and Asian communities who play a very significant role in business in Ghana. Many of them have become third and fourth generation Ghanaian citizens and own most of the big supermarkets in Ghana. Majority of the hotels, restaurants and fast food companies are owned and run as joint ventures between Ghanaians and Lebanese, and Ghanaians and some Asian communities, especially China and India.

Essentially, because of their networking with their communities, these firms which may either be fully owned by foreigners or may be joint ventures may have access to various forms of financing, making them relatively less credit constrained than domestic firms. Yet, they may be more credit constrained than the traditional FDI since their source of external financing may be restricted to either their own communities or the domestic market as they do not have parent companies. In this chapter, we assume that ownership by individual foreigners serves as a representative for FDI and can capture important features of the differences in the financial constraints behaviour of foreign and local firms. If these firms who are not actually FDIs are, one, less financially constrained than the domestic firms, then, we can tell a good story about foreign ownership.

Using this group of foreign-owned firms and domestic firms in our analyses, we find results consistent with Harrison and McMillan (2003). Specifically, we find that domestic firms face a relatively higher degree of financial constraints than foreign firms. However, contrary to Harrison and McMillan (2003), we find that, domestic firms' financial constraints are not affected by foreign firms' borrowing. For policy purposes, we recommend that Ghana's recent attempt to attract foreign investment should be encouraged in a way, as these foreign firms do not negatively affect domestic firms. In attracting them, the economy could derive other benefits that foreign investors provide such as technological spillovers.

The remainder of this chapter is organised as follows: Section 2 provides an overview of Ghana's Financial System and Foreign Direct Investment in Ghana. In section 3.3, we describe the data. In section 3.4, we present the various approaches to testing for the existence of financial constraints, our categorisation method and the variable measurement. We present the methodology and descriptive statistics in sections 3.5 and 3.6 respectively. We show our results in section 3.7 and provide robustness check. In section 3.8, we conclude and provide some recommendations for policy.

3.2 An Overview of Ghana's Financial System and Foreign Direct Investment

3.2.1 Ghana's Financial Sector

3.2.1.1Pre- Financial Sector Reforms Era
Prior to Ghana's independence, its colonial masters imposed its power on the financial sector. In 1875, the British government successfully monetized Ghana (then known as Gold Coast). During this period, they tried to restrict the use of currency in Ghana to just the British currency. For example, in 1880, a demonetization exercise was carried out to allow the lawful withdrawal of all other currencies in use in order to limit the currency to just gold and British sterling. This led to the establishment of the Government Savings Bank in 1888. The British Bank of West Africa with its headquarters in Nigeria

extended its territories to Ghana in 1896. In 1917, the Barclays Bank (formerly known as the Colonial Bank) was established to encourage competition in the banking industry.

Problems which the native people faced in accessing credit as a result of the so called "discriminatory practices" exercised by the foreign commercial banks as well as the high collateral demands, together with the fact that certain sectors in the economy regarded as important needed specific financial institutions to take care of their needs motivated the government to set up its own commercial and development banks. The Bank of the Gold Coast (now Ghana Commercial Bank) was then set up in May 1953 as a native bank to further boost the activities of the two commercial banks already in operation. Massive pressure mounted on the colonial government by the native people led to the establishment of the Bank of Ghana on March 1 1957, a few days before Ghana gained independence. To Ghana, the establishment of the Central Bank meant that it had gained financial independence. Upon the request of the local people the Bank of Ghana was given the total mandate to implement policies which were deemed fit to promote growth in the economy.

Later, three commercial banks, The National Investment Bank, Agricultural Development Bank and the Bank for Housing and Construction were set up to support the activities of the Ghana Commercial Bank. In 1975, the National Savings and Credit Bank, known previously as the Post Office Savings Bank and the Cooperative Bank were established to provide credit to small-scale borrowers.

Ghana's desire to develop rapidly after independence led to the implementation of certain policies in the economy that resulted in financial repression later on. The government owned all the banks which were established and even possessed about 40% equity in the two expatriate banks which were already in existence. The Bank of Ghana controlled extensively interest rates, and credits were allocated to specific sectors in the economy. These policies were designed to achieve some desired level of investment, ensure proper allocation of credits among various sectors of the economy, and to keep interest rates generally low. Unfortunately, the policies implemented could not achieve the targets set. Rather, the economy faced financial repression with interest rate hitting negative levels.

Worse of all, to reduce the amount of money in circulation, in 1979, the government imposed a 30% tax on all cash holdings outside the banking system below five thousand cedis and a 50% tax on the cash holdings above five thousand cedis. In addition, in the early 1980s, the Central Bank, withdrew all fifty cedi notes from the system and replaced them with smaller denominations. Those from whom the fifty cedi notes were withdrawn did not receive any compensation immediately. When compensation was due, most of them had misplaced their receipts.

In short, this period witnessed severe financial repression and people lost confidence in the banking system. Most of the policies implemented could not achieve the targets set. The supply of credits including those to the priority sector was reduced and all the banks but the ones with foreign shares went bankrupt. The severe financial repression together with the loss of confidence that had subjugated the financial system in the Ghanaian economy led to the implementation of reforms in the latter parts of the 1980's. It was not until the initiation of the Financial Sector Adjustment Program (FINSAP) that it was realized that the financial sector was extremely distressed.

3.2.1.2 Financial Sector Reforms
The financial reforms which took place in Ghana constituted institutional restructuring, improvement in the legal and regulatory framework for banking operations, and interest rate liberalization.

3.2.1.2a Public Sector Banks Restructuring
The reforms of the financial system started with restructuring of the public sector banks in 1989. Their focus was on the balance sheet as most banks before the reform took place had gone bankrupt.

3.2.1.2b Financial and Managerial Restructuring
Major restructuring took place during the reforms. The organizational structure that took place consisted of both management and financial restructuring of the banks. With regards to management, there was reshuffling in most of the banks especially at the management level. Financial restructuring according to Sowa

(2003) involved mainly recapitalization of the banks with equity injection where liquidity was low. Banks' balance sheets of non-performing assets were also cleaned up.

3.2.1.2c Institutional Restructuring

The structure of the financial system was changed. New institutions were set up to shake-up the financial system. Some banks were merged and some sold out. Actually, five banks and twenty non- bank institutions were set up under FINSAP. For example, in 1991, the Security Discount Company (SDC) was established mainly to eradicate the monopolistic power of the Consolidated Discount House which was established in 1987. Many more rural banks were created. It was speculated that the commercial banks had been unable to extend its activities to the rural area. The main aim of creating the rural banks was to fill the gaps created by the commercial banks.

3.2.1.2dCapital Market

FINSAP brought to fore the Ghana Stock Exchange. The Ghana Stock Exchange listed 12 companies and one Government Bond when it started its operations in November 1990. The value of listed shares amounted to 43 billion cedis in 1992 as compared to 30 billion cedis in 1991. According to Sowa (2003) ever since the inception of the Ghana Stock Exchange, the market has mobilized about 140 billion cedis and US 4.8 million dollars through equities and bonds and the number of listed companies has risen to 21.

3.2.1.2eInterest Rate Liberalisation

Under the Structural Adjustment Program, market forces were allowed to determine interest rates freely. Government involvement in interest rate determination was cut off. The deregulation of interest rates began with the eradication of the maximum and minimum deposit policy in September, 1987. Subsequently, the commercial banks were given the mandate to set up their own rates in March, 1989 following the eradication of minimum lending rate in February, 1988. By 1990, the policy that allowed the agric sector to have

access to a compulsory lending of about 20% was also abolished. Contrary to the pre-reform era, the reform was able to move both Treasury bill rate and real lending rate from negative to positive.

3.2.1.3 Operations of Ghana's Financial Sector

Ghana's financial sector is characterised by both formal and semi formal financial institutions. The formal financial institutions include banks and co-operative societies, and the semi-formal financial institutions include susu groups, susu collectors and money lenders.

Currently, the banking sector in Ghana is made up of the Bank of Ghana, eight Commercial Banks, three Development Banks, three Merchant Banks and one hundred and thirty-three rural banks. Apart from the rural banks, the distribution of the other banks is skewed towards the urban areas, which are mainly found in the southern part of the country. For instance, out of the thirteen districts in the Northern Region, seven of them have no banks. This gives the available banks a large client base. The banks are characterised by relatively high value and longer duration loans, which call for a lot of bureaucratic processes and collateral. As a result, the majority of the people in the rural areas and the northern part of the country engage in semi-formal financial practices.

Susu groups are mainly savings groups. A modified form of the susu group is the Rotating Savings and Credit Association (ROSCA). The ROSCA is made up of a group of individuals who come together and make regular contributions to a common fund, which is then given as a lump sum to one of the members in each cycle. This means that a member will lend money to other members of the group through his regular contributions to the fund. The total amount collected in each cycle is given to each member in turn. The person who gets the lump sum in each cycle is determined either by common consensus, lottery, or bid. By consensus, the members normally decide to give the total amount to the one who needs the money most. Where they ballot, members who have already received the lump sum contribute, but do not participate in the lottery till the cycle ends. With bidding, the highest bidder

takes the lump sum minus the bid. ROSCA's are flexible and can easily be used in both the rural and urban areas.

The Susu collectors agree on how much savers would want to save with the savers themselves, and visit them at regular intervals for collection. They deposit the money at a bank, invest the money in their businesses or lend it to others for a period of time. At the end of the period, the susu collectors return the savers' deposit less a small commission. The Ghana Co-operative Susu Collectors Association oversees the activities of susu collectors.

The moneylenders are usually the rich farmers or traders who lend out their own funds or have access to credits from the banks. They usually have good knowledge of their borrowers and so discourage fraud. Their focus is not mainly on how borrowers use the money they borrow but on their ability to repay the loans. As opposed to the formal financial services, the semi- formal financial services have low transaction cost, door-to-door services, and the ability to adjust to changing circumstances.

In Ghana, people may also borrow from informal sources such as friends, relatives and religious groups. These often accrue no transaction costs and do not take any formal contractual form. By establishing a cross-border relationship with foreign firms, domestic firms can expand their credit options. This may in turn enhance the growth of domestic firms and the economy as a whole. Quite recently, Ghana's policies have been geared towards attracting foreign investment.

3.2.2 FDI Trends and the Macroeconomic Environment in Ghana

Ghana, a country endowed with natural resources looked very promising and bright when it gained independence. Disappointingly, it has been unable to attract significant FDI flows. When Ghana gained independence in 1957, a socialist policy was adopted with the intention of narrowing the gap between the rich and the poor in the country. This initially put the economy at the fore front of Sub- Saharan African countries in terms of economic growth. Unfortunately, this policy was misconceived and its positive impacts remained unsustainable.

By 1960, the economy had already started experiencing some downturns in its macroeconomic indicators. From 1966-1969, Ghana's

economy was revitalised when policy-makers at the time solicited the assistance of the IMF. Among the policies implemented were divestiture, devaluation and trade liberalisation. Macroeconomic mismanagement coupled with political instability which characterised the country in the 1970s and early 80s pushed the economy into severe crisis. In fact, for the short period between 1972 and 1981, four different military governments took over the country.

Turning to the macroeconomic environment, the highest GDP growth rate was registered in 1973 (15.25%) and this trickled all the way to negative (-12.85%) rate in 1975, recording the lowest GDP growth rate in that period (Aryeetey et al., 2004).Annual inflation hovered around double-digit figures and, by February 1984, it had reached 126% (Bank of Ghana Statistical Bulletins, various issues). During this same period, the country was heavily indebted and financed its indebtedness through banks and seignorage leading at negative interest rates (Aryeetey et al., 2004). This discouraged savings and consequently reduced investment. These problems faced by the economy arose from high crude oil prices, over protection of local industries and low incentives given to agricultural producers. To worsen the already existing predicament, Ghana found itself in a prolonged drought in 1983 and because the economy is primarily agricultural and agriculture is mainly rain fed, the economy was pushed into total economic decay.

Obviously, it is expected that the state of the Ghanaian economy during this period would have serious repercussions for foreign investment. Generally speaking, Ghana's historical record of Foreign Direct Investment has not had a positive steady pattern, possibly due to poor economic management. In 1970, Ghana's annual FDI inflow was just about $68 million, which dwindled slowly over the subsequent years, and eventually fell drastically to about $-25 million in 1976, recording the worst performance ever from 1970 till date. Perhaps, the low FDI value in 1976 followed from the low GDP growth rate recorded in 1975 (Investment Policy Review, 2003). By the early 80s, policy makers had undoubtedly lost grips of the economy so to speak.

Admitting the situation the nation found itself in, policy makers once again sought the help of multilateral agencies for a revival in the economy. As a result, in 1983, the Economic Recovery Program (ERP) was initiated under

the auspices of the World Bank and the International Monetary Fund (IMF). The reform was targeted mainly at making the economy a market-oriented one and the private sector, the main driver of the economy.

Expectedly, from the time the ERP was launched, things started working well for the economy. Policies implemented during this period put the economy on a somewhat sound footing. Recorded values for real GDP have remained positive after the ERP. Even though inflation did not depart from its double-digit value immediately after the launch of the ERP, records show that it remained low relative to the pre-ERP periods. For example, the highest average annual inflation recorded after the ERP and before the 1990s was 48.75% and this was in 1984 (Bank of Ghana Statistical Bulletin, 1994 annual report).

However, the impact of the ERP on FDI was not immediate, as the economy did not experience any upsurge in foreign inflows during the early part of the ERP. This was because foreign investors had totally lost confidence in the economy and were unsure about how committed the government was going to be to the reform. One main objective of the ERP was divestiture. When privatisation of State- Owned Enterprises (SOEs) began in 1988, 55 SOEs were initially privatised, with the liquidation of 31 firms following thereafter (Investment Policy Review, 2003). The privatisation program which took off in the 1990s resulted in the sale of more than 300 of about 350 SOEs. Foreign investors were actively involved in the program as few domestic investors had adequate capital to participate in the program except as partners with foreign investors.

The year 1994 recorded the highest amount of foreign direct investment setting an unprecedented record of $233 million (Investment Policy Review, 2003). This was mainly due to the partial sale of the Ashanti Goldfields Corporation (AGC) to a South African Company, Lomin. This brought Ghana to the fore front of FDI recipients in Africa. In addition, the government, upon embarking on the Structural Adjustment Program in 1988, recognised that attracting foreign investors required an enabling environment and therefore passed a new investment law in 1994. This law was primarily aimed at relaxing previous stringent investment policies, which had stifled and thwarted investment in Ghana.

One cannot also rule out the importance of the impact of political stability on foreign investment. After, twenty years of military rule, Ghana moved into democracy in 1992. But of course foreign investors would not immediately respond by trooping into the country, unless they were certain that the sound political conditions are sustainable. Perhaps, this partly explains the FDI rocketing in 1994.

In 1996, the government offloaded its 30% share in Ghana Telecom to Telekom Malaysia. Ghana however could not sustain its position after 1996 and early part of 2000 as the government had by then sold off all its shares in the largest firms and had difficulty in relinquishing its stakes in the remaining firms. As a result, the country struggled to fall within the first twenty FDI recipients in Africa. It seems like everything was going wrong for the country during this period. The state of the Ghanaian economy was in total lapses during this period, in particular in the late 1990s. [17]Interest rates were generally too high (annual average real interest rate in 1997 was 20.15%), with the currency depreciating at a faster rate ($1 U.S – 2250 cedis in 1997 and $1 U.S – 7312.23 cedis by 2001). Average annual inflation in the late 90's and early 2000's compared to the early 90's was high (average annual inflation from 1990 -1994 was 23.1%, whiles that of 1995- 2002 was over 30%).

Following the severe drought that occurred in 1998, Ghana, because of its reliance on the Akosombo Dam as its main source of energy for both industrial and domestic purposes faced power dearth leading to power rationing in the country. At some point, it had to import energy from Ivory Coast. This had a serious impact on industrial production and on the growth of the economy as a whole. In short, the macroeconomic environment was unstable, and hence, Ghana became an unattractive location for new foreign investors as it experienced its economic crises.

The macroeconomic performance of the country has seen significant improvements in recent times. A growth rate of about 5.8% was recorded in 2004, with inflation declining to about 11.8%, from about 23.6% at the end of 2003, and the cedi depreciating modestly at just about 2.2%. In accordance with this, the level of FDI in the country is picking up gradually as FDI

[17]Figures on this page are derived from the Bank of Ghana Statistical Bulletin (Annual Report, 1997-2004)

increased by about 14% from 2003 to 2005 indicating the importance of macroeconomic stability for such inflows.

3.2.3 Ghana's Business Environment[18]

Upon embarking on the Structural Adjustment Program (SAP), Ghana deemed it necessary to create a conducive atmosphere for investment to take place. This led to the establishment of the Ghana Investment Promotion Centre Act, 1994, replacing the Investment Code 1985 (PNDC 116) and the Free Zone Act, 1995 (Act 504).The Ghana Investment Promotion Centre (GIPC) is the main government agency that oversees foreign direct investment in Ghana.

The Ghana Investment Promotion Centre law governs investment in all sectors except minerals and mining, oil and gas, which are governed by Minerals and Mining Act, 1986, Petroleum and Production law of 1984 respectively, and the free trade zones set up in 1996. The law eliminates discrimination against foreign investors in relation to taxes, prices, access to foreign exchange, imports and assures them of capital repatriation. However, the right to engage in petty trading, taxi services with less than 10 cars, gambling and lotteries, beauty salons and barber shops is reserved to Ghanaians.

Setting up a business in Ghana requires one not just to abide by the rules and procedures of GIPC ,but also, by those set by at least four more agencies, which include the Registrar General Department, Internal Revenue Service, Ghana Immigration Service and Social Security and National Insurance Trust. The amount of bureaucracy involved together with having to fulfill the requirements of these entire agencies make the process of establishing a business in Ghana cumbersome. Besides, although the length of time taken to set up a business in Ghana has improved, it still takes longer compared to the world average. An average of about 85 days is required to set up a business in Ghana, exceeding the world's average (48 days) more than one and a half times[19]. This lengthy time period may deter potential investors from operating in the country. The first condition that foreign investors are required to satisfy regards financing. A minimum of $10, 0000 is required to set up a

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[18] This section draws from various issues (1996-2003) of Quarterly Investment Report of the Ghana Investment Promotion Centre.
[19] Source: Index of Economic Freedom.

joint venture with a Ghanaian, and a minimum of $50, 000 to set up a purely foreign-owned company, which should at least employ 10 Ghanaians. These minimum amounts can include cash, goods or equipment.

Ghana, because of its richness in natural resources attracts countries that have the desire to benefit from its national resources. More than half (about 70%) of the foreign investments that take place in Ghana are involved in natural resources (gold, aluminium, bauxite, timber diamond, manganese, oil and natural gas exploration). This is followed by the manufacturing sector. Due to its relatively stable and business-friendly environment, some multinationals often use Ghana as a regional production hub for West African countries. Particularly, this is in food, aluminium and plastic products, (e.g. Cadbury's Ghana Limited, a U.K company and Nestle Ghana Limited, a Swiss Company). The U.K and the U.S.A were the traditional sources of FDI flows in Ghana. Although the U.K ranks high in terms of the number of projects in Ghana, in terms of investment value, it only comes after Malaysia, the U.S and Switzerland (Ghana's Investment Policy Review, 2003).

Other foreign investors also engage in the service sector, particularly banking (Fidelity Bank, Standard Chartered Bank, Barclays Bank etc.) and communication. According to the Investment Policy Review (2003), there are now about 17 foreign banks and a number of leasing and loan companies. Lebanese and Asian communities play a very significant role in business in Ghana. Many of them have become third and fourth generation Ghanaian citizens and own most of the big supermarkets in Ghana. Majority of the hotels, restaurants and fast food companies are owned and run as joint ventures between Ghanaians and Lebanese and Ghanaians and some Asian communities, especially China and India. A vast difference exists between these firms owned by Asians and multinationals. Unlike the Asian companies that are usually family businesses, multinationals that exist in Ghana have parent companies in their home countries that oversee their activities. Nevertheless, compared to the number of multinationals in Ghana, the economy of is dominated by the Asian companies.

3.3 Data

This study elicits data from surveys conducted by the Centre for the Study of African Economies (CSAE) as part of the Regional Program on Enterprise Development (RPED) organized by the World Bank. The dataset is a firm level panel, which includes observations on 288 manufacturing firms in Ghana from diverse sectors located in some of the main cities (Accra, Kumasi, Takoradi and Cape Coast). The data covers the period 1991-1997 and this period is categorized into 5 waves depending on the period of survey. With the exception of waves 4 and 5 which cover two years each (1994 – 1995 and 1996 – 1997 respectively), all the other waves each cover one year. The original sample of 200 firms, which were the first surveyed in 1992, was drawn on a random basis from firms contained in the 1987 Census of Manufacturing Activities. The firms' panel was broadly intended to represent the size distribution of firms across the major sectors of Ghana's manufacturing industry. These sectors include food, bakery, textile, wood, garment, furniture, metal products and machinery

It is worth-noting that some of the firms exited from the sample before the end of the Survey and these firms were replaced by firms with the same characteristics in terms of size, location and sector. As a result this sample has a weakly balanced structure with the number of waves associated with each firm ranging from 1 to 5.

We apply outlier rules by excluding all observations that fall within the 1% tails of all the variables used in the estimation. Firms with no identification numbers were also dropped from the sample. Firms with zero debt and formal borrowing were also excluded from the sample. All these adjustments left the study with a sample of 182 over the five different waves.

3.4 Approaches to Testing for the Existence of Financial Constraints and Categorisation Method.

3.4.1 An Evaluation of the Different Approaches to Testing For the Existence of
Financial Constraints

Empirical studies on investment and financial constraint utilized neoclassical models, (that is, the Q and Accelerator Models) to isolate the effect of financial constraints on investment for different groups of firms (see for example Fazzari et al, 1998). The accelerator model explains investment using current and lagged changes in sales growth. Although the accelerator model did not perform badly, it lacked a convincing theoretical background.

Tobin's Q is a ratio of the market value of a firm to its replacement cost of capital, which measures a firm's incentive to invest in capital. It is often called Average Q and can be shown to be a "sufficient statistic" for investment[20]. But of much importance to a firm's investment decision which is based on convex adjustment cost is Marginal Q (ratio of the marginal revenue product of capital to its marginal cost). Because marginal Q is unobservable, it is normally proxied by average Q. However, these two measures would only be equivalent under extreme conditions. Hayashi (1982) highlights the conditions (perfect competition in the product market, linear homogeneity etc) under which these two measures would be equivalent. Even if these conditions are met, capital market imperfection would create a wedge between the market valuation and insider's valuation of the marginal return on capital. Any attempt to use one as a proxy for another may result in measurement errors. Because empirical studies make use of average Q instead of marginal Q, the Q model has been criticized for its error in measurement (see Carpenter and Guariglia (2008)[21] and Cummins et.al. (2006)[22]).

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[20]See Chirinko (1997) for more details.

[21]Carpenter and Guariglia (2008, pg. 2-3) argue that the use of the Q approach is based on the idea that investment opportunities, which are forward looking, can be captured by equity market participants who are also forward looking. They argue that in the presence of asymmetric information, a gap may exist between firm's outsiders' and insiders' information. Hence, Q will capture outsiders' evaluation of opportunities. They therefore develop another measure of Q that reflects both the outsiders and insiders' information.

[22]Cummins et. al.(2006) also argued that information asymmetries drive a wedge between market-based and true Q. They develop another proxy for a firm's intrinsic value based on analysts' earnings expectations.

Secondly, the theoretical definition of marginal Q implies that it should summarize the effects of all factors that affect investment. However, variables like sales, output and measures of internal funds still have explanatory power when they are used as additional regressors (Erickson and Whited (2000)). Particularly, estimates of the coefficient of cash flow (a very common measure of internal funds) are larger and significant in investment equations for firms that are a priori classified as financially constrained. This problem, therefore, has several implications for the Q model. According to Erickson and Whited (1992 p.1029), if measured Tobin's q is a perfect proxy for marginal Q and the econometric assumptions are right, then Q theory is "wrong". Another possibility is that, if the Q theory is "right" and measured Tobin's Q is a perfect proxy, then some of the econometric assumptions are wrong. Alternatively, if both the Q theory and the econometric assumptions are right, then, measured Tobin's Q is a poor indicator for marginal Q. Several papers have also pointed out other problems associated with the Q theory approach (see Gomes (2001) for example).

The Euler Equation for investment serves as an alternative for the neoclassical formulations as it allows a by-pass of the empirical shortfalls associated with the neoclassical approaches. But like the neoclassical approaches, it allows an incorporation of financial variables directly into the model. The advantage of including a variable that explicitly captures credit constraints is that it is no longer necessary to reject the model in order to find evidence of credit constraints, nor is it also relevant to assume that the rejection of the model also implies the presence of financial constraints (Harrison et. al, 2003). By this method also, it is possible to point out the specific impact of foreign borrowing on the inter-temporal allocation of domestic firms' investment (Whited, 1992). Finally, since the coefficient on cash flow is no longer the critical variable of interest for pointing out evidence of financial constraints, the issue that cash flow may be capturing profitability instead of financial constraints can be ruled out in our analyses.

3.4.2 Categorization Method
All firms generally face some form of financial constraints but the degree to which firms face financial constraints is what this study is concerned with.

While some studies have found that financial variables are significant in investment equations for constrained firms, others have found the opposite but the bottom line of all these empirical studies is that the investments of different groups of firms respond differently to financial variables.

In order to address the issue of firm heterogeneity, it is important to find variables that are observable to split the sample into sub-samples of financially constrained and unconstrained firms. Investment and financial constraint studies have seen a number of classifications. Fazzari et al. (1988) group firms according to their ability to pay out dividends. The notion behind this classification is that if a firm is relatively financially sound, it should be able to issue new shares or secure external financing to pay out dividends. Whited (1992) for instance, also groups firms according to bond rating. While some studies split their sample according to interest coverage ratio, other studies also classify firms based on size, age and risk[23].

The type of classification employed in this study takes into account the criticisms leveled against the use of bond ratings and dividend pay-out ratio as basis for classifying firms, and also the variables available in the dataset. Thus, firms are classified, first according to ownership structure, and second, as a robustness test for financial constraints, according to firm size.

Under ownership structure, firms are classified into the broad sub groups, foreign-owned and purely domestic. One shortfall of this dataset is that it does not provide the share of foreign ownership in the firms. Therefore, we classify firms with any positive degree of foreign ownership as foreign- owned, and those without any foreign ownership as purely domestic. The level of employment is used as a proxy for firm size in this study. We compare firms that fall within a particular wave and a particular industry. Thus, we classify all firms that fall within the bottom 75% of the distribution of size of firms operating in the same industry as firm 'i' in a particular wave as *small*. We represent *small* by a dummy = 1 if a firm falls within that category and 0 otherwise. Those that fall above 75% of the distribution of the size of firms operating in the same industry as firm 'i' in a particular year are considered *large*. *Large* is represented by a dummy equal to 1 if a firm falls within this category and 0 otherwise. Hence, small firms are considered a priori more

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[23] For example Whited (1992)

financially constrained while large firms are considered a priori less financially constrained. As a robustness check against this classification criterion, the sample considers a different cut-off point for small and large firms. All firms that fall within the bottom 90% of the distribution of size are considered small and those that fall above the 90% of the distribution of size are considered large. The reason behind this classification is that foreign and large firms are more established, are likely to have sufficient collateral and a long historical record which eases credit checks. These firms also might have built a good relationship with lending institutions over time. As a result they are generally more likely to access the external capital market easily relative to small and domestic firms.

Therefore, in the presence of asymmetric information, foreign and large firms would face a relatively lesser degree of external financial constraints than small and domestic firms.

3.4.3. Variable Measurement

The study uses total investment, debt, and output, borrowing by foreign firms on the local capital market and ownership dummies. In the dataset, these variables are measured as follows: Apart from wave 1 in which investment in plant and equipment is used as a proxy for Total Investment, in all the other waves total investment is the sum of three categories of investment; investment in plant and equipment, investment in land and investment in buildings[24].

As measured in the dataset, the firm's aggregate debt equals the sum of the firms' total borrowing from formal and semi formal financial institutions and total borrowing from informal sources, over the previous 12 months less, informal lending by firm to different categories of recipients over the previous 12 months. Informal lending here consists of the aggregate of any loans made by enterprises in the last year to suppliers, clients, employees, other enterprises, relatives and friends and others.

Capital Stock is measured as the replacement value of a firm's total capital. Output measures the value of firm's total production during the

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[24] It must be noted that very few firms invested in land and buildings in the last four waves. We therefore do not expect the different definitions of investment in wave 1 and all other subsequent waves not to have any impact on the results.

previous year. All variables are deflated using the GDP deflator, and 1998, is used as the base year to convert them to constant values[25].

Next, a variable representing credit rationing is required to capture the effect that amount of credit taken by foreign firms has on domestic firms. However, a major shortfall of the dataset is that it does not contain any such variable. Since most of the foreign-owned firms in Ghana at the moment are being managed by second or third generation of foreigners, they have eventually become local firms. We therefore assume that both foreign and domestic firms borrow from just the local capital market, and follow Harrison and McMillan (2003) to construct a measure of foreign borrowing which is defined as:

Where FOSD represents foreign-owned firms' share of debt, 'i' represents firm, 'd', industry and 't', time. We also assume that a firm borrows the same percentage as the amount of foreign ownership it has[26].

3.5 Model Specification and Estimation Technique

3.5.1 Model Specification

From the analysis in section 3.4.1, this study chooses to utilize an augmented Euler Equation in the context of a dynamic investment model. The version of the Euler equation model employed here combines ideas from the studies developed by Whited (1992), Bond and Meghir (1994), Gilchrist and Himmelberg (1998), Love (2000) and Harrison and McMillan (2003) and it is as follows: A firm 'i' is assumed to maximize the present value of its future profits subject to capital accumulation and external financing constraints. According to this model, the firm borrows an amount , at time t , and pays an interest on its debt. Inflation is given by . The credit constraint is

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[25] The GDP deflators are from the World Bank Database.
[26] Although this assumption seems very restrictive, given that our ownership categories does not include any joint ventures, this may pose serious problems in our estimation results.

introduced either as a non negative dividend constraint or as a ceiling on borrowing, . R_{it} represents net revenue, refers to the variable factor inputs, , the price of investment good, the price of output, the nominal discount factor between periods t and $t+j$, δ, the rate of depreciation, $F($ the production function gross of adjustment costs, $G($ the adjustment cost function and (.) the expectations operator conditional on information available in period t.

The firm therefore maximizes:

subject to the following constraints:

   i.

   ii.

   iii.

   iv.

   v.

The first constraint represents the capital stock constraint; the second, implies that a firm's borrowing should not exceed some maximum amount; the third, restricts debt to be at least 0; the fourth, defines net cash flows; and the fifth, imposes a non-negativity restriction on dividends. By solving the first order condition for this optimization problem, McMillan et al. (2003) arrive at an Euler equation that characterises the optimal investment path and relates marginal costs in adjacent period. This Euler equation which also shows that liquidity constrained firms will reserve investment today for investment tomorrow is given by:

$$\overline{}$$

$$\overline{} \qquad \overline{}$$

To find empirical proxies for $\Omega_{i,t}$ (the shadow value of financial constraints), and also the derivative of net revenue with respect to I and K, we follow Bond

and Meghir (1994) who assume an adjustment cost function that is linearly homogeneous in investment and capital. Based on this assumption they show that the derivatives of net revenue with respect to I and K can be written as:

$$\text{—} \qquad \text{—}$$

$$\text{—}$$

$$\text{—} \qquad \text{——} \qquad \text{—}$$

$$\text{—}$$

In a perfect capital market where there are no credit constraints (i.e, where $\Omega=0$), combining equations (3.4) and (3.5) gives:

$$\text{—} \qquad \text{—} \qquad \text{—} \qquad \text{—} \qquad \text{—}$$

where I is the firm's total investment, K_{it}, capital stock of firm i at time t, Y, the firm's previous year's output, B, the firm's previous year's debt, C, cash flow and e_{it}, the idiosyncratic component. The study incorporates fixed effects, (s_i), and year dummies, (y_t) into the model. The individual fixed effects capture all the firm specific effects that are time invariant such as differences in managerial ability, product demand etc., while the year dummies control for business cycle fluctuations. "All things being equal", an increase in a firm's previous year's output (Y) increases its future investment. Accordingly, we expect output to have a positive coefficient in the specifications above. Similarly, an increase in previous year's investment — should increase current investment. As a result, we expect a positive relationship between previous year's investment and current investment.

To test for the presence of credit constraint, equation (3.6) will have to be modified to include a proxy for Ω. We will proxy for Ω using debt, and augment the Euler equation in (3.4) with this variable.

After manipulations, the basic equation we arrive at is:

$$- \qquad - \qquad - \qquad -$$

$$- \qquad -$$

In a world where firms are free from financial constraints, debt should have no significant impact on future investment. A statistically significant debt variable (B), however, implies that firms are financially constrained. In a world of imperfect information, debt should impact significantly on future investment if firms face financial constraints and the relationship should be positive, meaning that financially constrained firms will postpone investment today for investment tomorrow.

Next, to explore how financial constraints affect different groups of firms, we allow the effect of the coefficient of $-$ in equation (3.7) to vary between domestic and foreign firms. A firm is considered to be foreign if it has some degree of foreign ownership and it is represented by a dummy equal to 1 and 0 otherwise. We consider a firm to be domestic if it is purely domestic. This is represented by a dummy equal to 1 if a firm falls within this category or 0, otherwise. This leads us to estimating a second equation given by:

$$- \qquad - \qquad - \qquad -$$

$$- \qquad -$$

$$-$$

We focus on the coefficients associated with the interaction terms, *foreign*debt* and *domestic*debt*. Like Fazzari et al. (1998), we interpret the coefficients associated with each type of firm as their degree of sensitivity of

investment to financial constraints. If the coefficients on the interaction terms are statistically significant then the firms are considered more financially constrained firms. We therefore expect the coefficient associated with the interaction term *domestic*debt* to be statistically significant. As a robustness check, debt is interacted with small and large firms and once more, the relationship is expected to be stronger for small firms. We expect the coefficients of the variables in the basic specification to maintain their respective signs in this equation.

To investigate how foreign firms' borrowing from the domestic capital markets affects domestic firms' financial constraints, we single out domestic firms' investment from the dataset and examine the impact of the share of foreign borrowing interacted with $-$ on them. We estimate a third equation, which is as follows:

$$ - \qquad - \quad - \quad - \quad - \quad - $$

$$ - $$

Thus, in this equation, $-$ represent domestic firms' investment. The parameter of interest here is . If the share of borrowing by foreign firms worsens the financial constraints of domestic firms, then, we expect to be positive and significant. On the other hand, if foreign firms' borrowing from the local financial market relieves domestic firms of financial constraints, then, should be negative and statistically significant. If is insignificant, then the share of foreign borrowing has no impact on domestic firms' investment. We expect all the other variables which were found in the baseline specifications to maintain their respective signs stated above.

3.5.2 Estimation Technique

In a dynamic investment model, investment depends on its own past realisation. The past realisation of investment is likely to be correlated with the fixed effects present in the error term. This violates one important assumption

(exogeneity of regressors) necessary for consistency of Ordinary Least Squares (OLS) estimators. Particularly, it increases the coefficient estimate of the lagged investment variable and attributes explanatory power which belongs to the firm's fixed effects to it. This makes OLS an inappropriate method for dynamic models.

An alternate estimator is the Within Group estimator. This method applies a mean-deviations transformation to each variable, and the mean is calculated at the firm level. OLS is then applied on the transformed data. Even though this approach will eliminate the fixed effects, the dynamic panel bias will not be eliminated. The lagged dependent variable will still correlate with the error term in the transformed model.

To expunge fixed effects and at the same time avoid dynamic panel bias, two transformations are often used. These are (1) The First Difference Generalised Method of Moments (GMM) Approach, proposed by Arellano-Bond (1991) and (2) The Forward Orthogonal Deviation GMM approaches, proposed by Arellano- Bover (1995)/ Blundell-Bond (1998). Both methods are defined for panel analysis. According to Roodman (2006), the methods are used in the following cases: When, (1) there are few time periods but many observations; (2) the dependent variable depends on its own past realisations; (3) there are fixed individual effects; (4) there are independent variables that are not strictly exogenous; (5) the functional relationship is linear and (6) there are serial correlation and heteroskedasticity within individuals, but not across them. We are at least sure that assumptions 1 to 5 apply to our model above. These two approaches could serve the purposes of our model if the assumptions underlying them were the only basis for selecting our technique. To select the most appropriate technique, the dataset being utilised and how each method is used must be considered.

The difference GMM approach subtracts previous observations from contemporaneous ones. This approach, however, magnifies gaps in unbalanced panels (Roodman 2006, p.19). If for example an observation is missing at time t then changes in that observation at both times t and $t+1$ will be missing. It is therefore possible for one to construct a dataset that would completely disappear in first differences (Roodman 2006). Given the study's already

limited sample size, this technique may not be feasible as the sample size is supposed to be maximised as much as possible.

The forward orthogonal deviation method, on the other hand, subtracts the mean of all future available observations of a variable from the contemporaneous observations. No matter how many gaps the dataset has, it is computable for all observations except the last for each individual. This minimises data loss (Roodman 2006, pg 19). Thus, our preferred econometric transformation is the forward orthogonal deviation GMM approach.

Recent research has revealed that lagged levels will be weak instruments for contemporaneous differences especially for variables that are close to a random walk. Blundell and Bond (1998), combine the differenced equation with a level's equation to form a system of GMM estimator which uses lagged levels as instruments for contemporaneous differences and lagged differences as instruments for contemporaneous levels. Instead of using the differenced equation, we apply the forward orthogonal deviation method to System GMM. The System GMM in this case augments the simple forward orthogonal deviation method by estimating simultaneously in forward mean differences and in levels, two equations being distinctly instrumented. We therefore use the two-step variant of the System GMM. Since two-step estimates are more efficient than the one-step estimator in System GMM, but have standard errors that tend to be severely biased downwards (Arellano and Bond 1991; Blundell and Bond 1998), we apply a finite sample correction derived by Windmeijer (2000) to the two-step estimator to correct the bias and still gain the efficiency it provides. Of course, the legitimacy of this approach hinges on the validity of the instruments used in this study.

A necessary assumption for the validity of instruments in GMM estimation is that the instruments should not be endogenous. Since our independent variables are previous year's variables, we use the 2nd and 3rd lags of each of our explanatory variables as instruments. To check whether our model is correctly specified, the Hansen test, Difference- in -Hansen test and the second order autocorrelation *(m2)* test are used. The Hansen test is a test for over identifying restrictions, which, under the null of instrument validity, is asymptotically distributed as a chi- square with degrees of freedom equal to the number of instruments less the number of parameters. The difference-in-

Hansen test checks the validity of a subset of the instruments. Under the same null of joint validity of all instruments, this test is distributed as a chi-square with degrees of freedom equal to the number of added instruments. The *m2* test checks whether the lagged variables used as instruments in the differenced equations are valid for the specification. It is asymptotically distributed as a standard normal under the null of no second order autocorrelation.

3.6 Descriptive Statistics in the Form of Mean Values for Debt and Investment

Table 3.1 below reports the mean values of investment and debt for the full sample as well as the different sub samples. As indicated in the categorization section above, the sample split is along the lines of ownership structure. Different classes of firms face different degrees of financial constraints in the presence of asymmetric information. As discussed in McMillan et.al. (2003) and Colombo (2001), because foreign firms have a lower risk of going bankrupt, it is easier for them to access domestic banks. In addition, Desai et al. (2004b) also highlights that foreign firms because of their affiliation abroad may not be limited to just the domestic banks for external finance. They can have access to credit through their parent companies as well as international banks. All variables are scaled by capital stock to account for the cross-sectional differences across the different groups of firms.

The sample includes more domestic firms than foreign firms. From 3.A1, just about 17.86% of the observations in this sample are foreign firms while 82.14% of the firms are domestic; domestic firms are hypothesized to be more financially constrained. The distribution of the sample of firms across industries is not widely dispersed. About 22.14% of the sampled firms are found in the food and bakery industry, 26.79% in the garment and textile industry, 23.53% in the chemical, machine and metal industry, and 27.53% in the furniture and wood industry. From Table 3.A2, a greater percentage (26.69%) of foreign firms can be found in the wood and furniture industry.

Table 3.1 above shows the mean investment and debt of foreign and domestic firms. From Table 3.1, it is evident that domestic firms have a mean investment to capital ratio higher than foreign firms.

Table 3.1: Mean of Foreign and Domestic Firm -Years Expressed in Percentages

Variable	Domestic firms		Foreign Firms	
	No of observations	Mean	No of Observations	Mean
Investment	641	10%	119	8.9%
Debt	622	11.3%	108	9.2%

Note: All variables are divided by capital stock

The percentage mean investment to capital ratio for foreign firms is 8.9%, while that of domestic firms is 10%. This implies that domestic (i.e. firms that are a priori conjectured to be financially constrained) are growing and so invest more than foreign firms. Table 3.1 also shows that domestic firms are more indebted than foreign firms. The percentage mean debt to capital ratio of foreign firms is about 9.2%, while that of domestic firms is 11.3%.

Table 3.2: Percentage of Foreign and Domestic Firms and Type of Financial Source

Type of Ownership firms	Informal Borrowing	Formal Borrowing	Retained Earnings
Domestic Firms	29.74%	12.11%	39.47%
Foreign Firms	11.69%	24.68%	40.26%

Table 3.3 below shows that domestic firms account for 92.62% of total informal borrowing, 82.87% of all retained earnings and 70.77% of formal borrowing, while foreign firms account for 7.83% of informal borrowing, 29.23% of formal borrowing and 17.3% of retained earnings.

Table 3.3: Percentage of each Financing Source Used by the Different Types of Firm -Years

Type of Ownership by firms	Informal Borrowing	Formal Borrowing	Retained Earnings
Domestic Firms	92.62%	70.77%	82.87%
Foreign Firms	7.38%	29.23%	17.13%

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This means that while domestic firms rank informal borrowing as their major source of financing, foreign firms rank borrowing from formal sources as their major source of financing.

3.7 Discussion of Results

3.7.1 Main Estimation Results

Table 3.4 column (1) below reports the GMM estimates of Equation (3.7) that tests the degree of financial constraints for all the firms. From column (1), the coefficient on *lagged cash flow* is negative and statistically significant, implying that a 1% increase in cash flow today reduces *future investment* by 2.88%. This is expected as firms with high *cash flow* today are very liquid and will find no reason to postpone investment today for tomorrow. The coefficient on lagged output is statistically significant and positive. In particular, if firms' output increases by 1% today, future investment will also increase by 0.8%. The coefficient of *debt* shows the degree of financial constraints faced by firms. The coefficient of *debt* is significant and positively related to future investment which means that, all firms in the sample face some degree of financial constraints and will therefore postpone investment today for tomorrow due to liquidity problems. Particularly, the coefficient shows that firms will reduce current investment and increase future investment by 12.3% if there is a 1% increase in their debt. The Hansen tests support the choice of instruments as well as the validity of the model. The second order autocorrelation *(m2)* test is also satisfied with the model.

We estimate equation (3.8) which distinguishes between foreign and domestic firms and show the results of our estimation in column (2) of table 3.4. As indicated above, in equation 3.8, we allow the coefficient of *Debt* to vary between foreign and domestic firms. We focus on these two coefficients. Our results reported in Table 3.4 indicate that domestic firm years are more financially constrained than foreign firm years. The coefficient of *Domestic* (B/K)$_{ijt}$* is in fact positive and statistically significant while that of *Foreign* (B/K)$_{ijt}$* is not significant. Mainly, while we find that as domestic firms' financial constraint increases by 1% they defer current investment and increase *future investment* by about 5.6%, we find no such impact for changes in the financial variable of foreign firms on future investment.

Both *lagged cash flow* and *lagged output* remain statistically significant and maintain their respective signs. Again, the Hansen test and the second order autocorrelation test are both satisfied with the choice of the model and instruments. These results which are in line with Harrison and McMillan (2003) and Mickiewicz et al. (2004), suggest that foreign ownership plays a significant role in relieving firms of their financial constraints.

Table 3.4: GMM Estimates Testing the Degree of Financial Constraints

Dependent Variable: (Investment/Capital Stock)	All Firms (1)	Distinguishing Between Foreign and Domestic Firms (2)	Test For Crowding-Out Effect (3)
Lagged(Investment/Capital Stock)	-0.032 (-0.358)	0.035 (0.283)	0.019 (0.152)
Lagged(Investment/Capital Stock)2	0.007 (0.585)	-0.004 (-0.186)	0.001 (0.029)
Lagged(Cash flow/Capital Stock)	-0.029** (3.344)	-0.005* (1.936)	-0.007** (2.589)
Lagged(Output/Capital Stock)	0.008*** (3.102)	0.001* (1.783)	0.002* (1.808)
Lagged(Debt/Capital Stock)	0.123*** (4.707)		0.149*** (4.127)
Foreign*Lagged(Debt/Capital Stock)		-0.024 (1.020)	
Domestic*Lagged(Debt/Capital Stock)		0.056* (1.881)	
Share of Foreign Borrowing			0.229 (1.077)
Share of Foreign Borrowing* Lagged(Debt/Capital Stock)			-0.469 (1.507)
N	504	504	432
AR(2)	0.863	0.591	0.674
Hansen Test	0.926	0.608	0.674
Difference-in- Hansen Test	0.616	0.433	0.512

Notes: Estimation was done using GMM forward orthogonal deviation method. Small, is a dummy that takes the value 1 for firms i in wave t if the firm falls within the bottom 90% of the distribution of employment and 0, otherwise. Large, is a dummy which takes the value 1 for firm i in wave t if the firm falls within the highest 90% of the distribution of employment and 0, otherwise. The first and second order serial correlation tests are asymptotically distributed as N (0,1) under the null of no serial correlation. The Hansen Test is a test of over identifying restrictions, distributed as a chi − square under the null of instrument validity. Time Dummies were included in the estimation as both regressors and instruments. We also used the third lag of all variables in the regression as well as that of the variable, value-added as instrument. For column 2, our results do not change significantly if we include the constituent terms of the interactions.

In column (3) of Table 3.4, we report the estimates of equation (3.9), which tests for the presence of a crowding out effect in the financial market. We single out domestic firms from the sample in order to identify the impact of the *share of foreign borrowing* on domestic firms' investment. We find that *Lagged Cash flow, Lagged output* and *lagged debt* remain statistically significant and maintain their expected respective signs. At this point, our main focus is on the coefficient (β_6) associated with the variable *Share of Foreign Borrowing*Debt*. The results indicate that β_6 is statistically insignificant, implying that borrowing by foreign firms from the domestic capital market has no impact on the financial constraints of local firms: domestic firms' future investment is not responsive to the interaction term, *Share of Foreign Borrowing*Debt*. This shows that the financial constraints faced by domestic firms in Ghana are not a result of foreign borrowing. Our results contradict Harrison and McMillan (2003) who focus on Cote d'Ivoire and find that domestic firms' financial constraints are worsened by foreign firms' borrowing.

3.7.2 Robustness Check

Since domestic firms are usually small and foreign firms are usually large, we carry out robustness checks using small and large firms. We use employment level as our proxy for size and test whether small firms are more financially constrained than large firms. We classify all firms that fall below the 75th percentile of the distribution of employment levels as small and represent it by a dummy equal to 1, and 0 otherwise. All firms that fall above the 75th percentile of the distribution of employment levels are classified as large, and we represent this by a dummy equal to 1 and 0, otherwise. We find that small firms are more financially constrained than large firms. We next investigate whether our results are robust to changing the cut off points. We therefore classify all firms that fall below the 90th percentile of the distribution of size as small and those that fall above the 90th percentile of the distribution as large. Our results in Table 3.A3 columns 1 and 2, however, do not change: We find that the coefficient of debt interacted with the *'small' dummy* is significant; while the coefficient interacted with the *'large' dummy* is not. This

means that our results are not sensitive to changing the cut-off points for small and large firms: small firms are more financially constrained than large firms.

We also carry out OLS estimation to justify our use of the GMM technique. From Table 3.A3 column 3, the OLS estimation draws the same conclusion as the GMM estimation. The OLS estimation shows that the variable of interest, *share of foreign borrowing*, is not significant. While in the GMM estimation the lagged dependent variable is not significant, OLS estimation attribute some explanatory power to this variable. This clearly indicates that using OLS estimation create some bias in dynamic panel estimation by attributing explanatory power to the lagged dependent variable which does not actually belong to it.

3.8 Conclusion and Policy Recommendation

In this paper, we have investigated whether the financial constraints of local firms in Ghana are exacerbated by foreign firms that invest in the country. Using a panel of 182 firms and, an Augmented Euler Equation framework, we have found that (1) domestic firms are more financially constrained than firms with some percentage of foreign ownership, and, (2) foreign firms' borrowing from the local capital markets has no impact on the financial constraints of domestic firms. Since this period marks the era after financial development, what we believe is that, the development of the financial sector has created enough investible resources, so much so that if domestic firms are willing and have the ability to borrow, they could have access to credits. Why domestic firms are financially constrained then? A possible explanation we offer is that, although a lot of funds have been made available through the development of the financial sector, domestic firms do not have the needed resources to be able to tap into these investible resources. At least from this study, we have become aware that foreign firms' borrowing does not impact negatively on domestic firms' financial constraints. Therefore, policies geared at attracting foreign investors should be encouraged; domestic firms could benefit in other ways such as technological spillovers from foreign firms.

Although our results have established significant facts about Ghanaian manufacturing firms and have suggested important policy implications, we acknowledge two caveats on our study. The first is that we neglect the potential

effects of investment irreversibility when testing for capital market imperfections hypothesis. Authors like Guariglia et al (2010) have argued that investment irreversibility may make investment unresponsive to a financial variable even for firms that face binding constraints on external finance. Therefore, failure to control for irreversibility may affect the conclusions of our results.

The second caveat to this study is that we do not take into account the effect of uncertainty on investment. While one strand of literature on this implies that increased uncertainty reduces investment given the irreversibility of investment projects and the consequent option value of delaying expenditures, the other strand suggests that increased uncertainty raises investment where the marginal product of capital is an increasing function of prices and increases in the variance of prices will increase the expected return (see Lensink and Murinde, 2007 for more details). Though these variables may be significant in our analyses, we tried to focus on our questions and including these will divert the study's focus.

Appendix 3

Definition of Variables Used:

Total Investment: Sum of investment in plants and equipment, investment in land and investment in buildings.

Debt: Sum of the firms' total borrowing from informal sources over the previous 12 months less informal lending by firms to different categories of recipients over the previous 12 months.

Informal Lending: Consists of aggregate of any loans made by enterprises in the last year to suppliers, clients, employees, other enterprises, relatives and friends.

Capital Stock: Measured as the replacement value of a firm's total capital.

Output: Measures the value of a firm's total production during the previous year.

Foreign: Dummy equal to 1 if a firm has any degree of foreign ownership and 0, otherwise.

Domestic: Dummy equal 1 if a firm is purely local and 0, otherwise

Table 3.A1: Percentage and Frequency of Domestic, Foreign, Small and Large Firm Years.

Type of Firm	Frequency	Percentage
Purely Domestic	883	82.14
Foreign	192	17.86
Small	627	73.51
Large	226	26.49

Table 3.A2: Percentage of Foreign and Domestic Firm Years Found in Each Industry

Industry	Foreign Firms	Domestic Firms
Food and Bakery	17.65%	82.35%
Garment and Textiles	14.93%	85.07%
Machines, Metals, Chemicals and SSRI	11.07%	88.93%
Furniture and Wood	26.69%	73.31%

Table 3.A3: Results for Small and Large Firms as well as OLS Results

Dependent Variable: Investment/Capital Stock)	Distinguishing Between Small and Large Firms, using 90% as cut -off point	Distinguishing Between Small and Large Firms Using 75% as cut-off point	OLS Results
Lagged(Investment/Capital Stock)	0.030	0.031	0.173*
	(0.253)	(0.266)	(2.246)
Lagged(Cash flow/Capital Stock)	-0.006**	-0.005**	-0.004
	(-1.889)	(-2.110)	(-0.718)
Lagged(Investment/Capital Stock)2	-0.003	-0.003	-0.026*
	(-0.154)	(-0.146)	(-2.319)
Lagged(Output/Capital Stock)	0.001*	0.001*	0.001
	(1.785)	(1.800)	(0.784)
Small*Lagged(Debt/Capital Stock)	0.053**	0.060**	
	(1.850)	(2.218)	
Large*Lagged(Debt/Capital Stock)	0.001	-0.008	
	(0.014)	(-0.179)	
Lagged(Debt/Capital Stock)			0.039
			(0.830)
Share of Foreign Borrowing			0.145
			(0.884)
Share of Foreign Borrowing* Lagged(Debt/Capital Stock)			-0.052
			(-0.274)
N	504	504	432.000
AR(2)	0.580	0.674	
Hansen Test	0.614	0.674	
Difference-in- Hansen Test	0.480	0.512	

Figure 3.A1: GDP Growth Rate (%) (1991-2008)
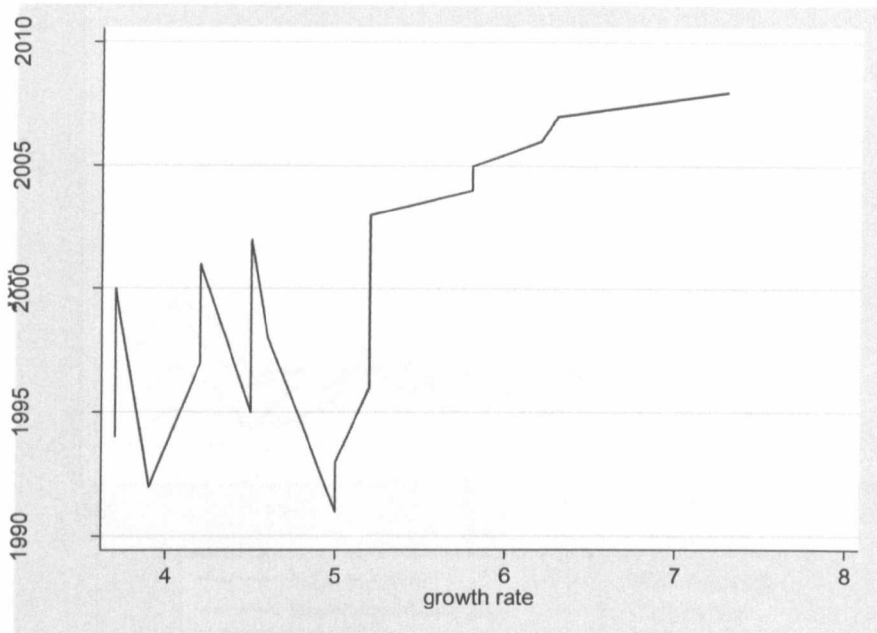
Source: Ghana Statistical Service

Figure 3.A2: Share of Industry and Subsectors in Real GDP (%) (1991-2008)

Source: Statistical Service, Accra.

Figure 3.A3: Growth Rates of Industry and Sub-Sectors (1991-2008) (%)

Figure 3.A4: Allocation of Credit by Sector (%) (1991-2007)

Allocation of Credit by Sector (%), 1992-2007
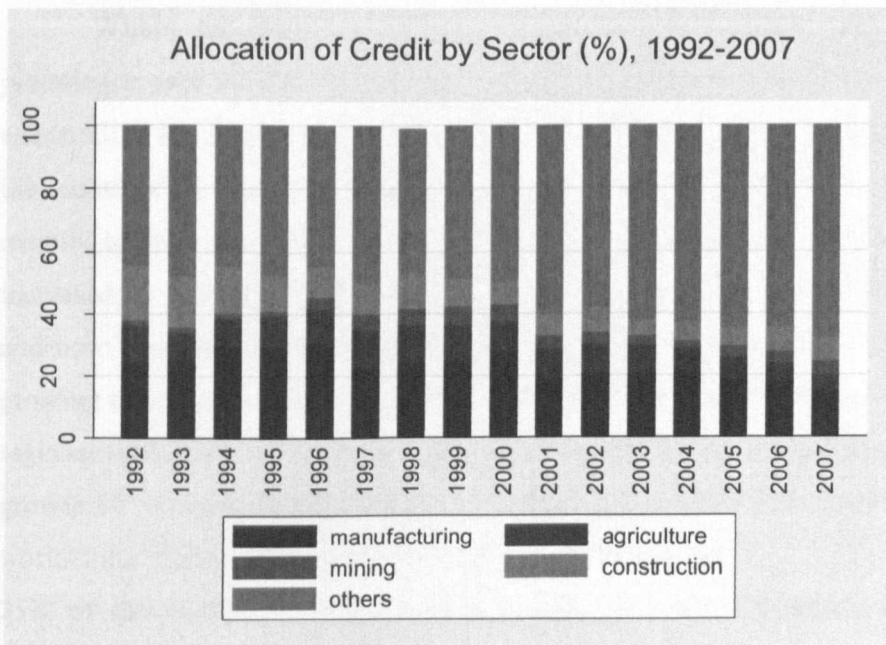
Chapter 4

4 Financial Health and Foreign Ownership: Evidence from Chinese Manufacturing Firms

4.1 Introduction[27]

China is the fastest growing economy in the world, and has for the past 30 years maintained an average annual GDP growth rate of over 10%. According to IMF statistics, the country's purchasing power parity per capita income in 2009 was $6,567, placing it in the 99th position out of 178 economies. Undoubtedly, the industrial sector has been the major contributor to GDP out of all the sectors. In fact in 2009, whilst the industrial sector contributed about 48.6% to GDP, the agricultural and the service sectors contributed about 10.9% and 40.5% respectively to GDP.

Within the industrial sector, the manufacturing sector has gained precedence over all the other sectors. Its contribution to the industrial sector and to GDP has been overwhelming. While it contributed about 43% to GDP, the construction sector contributed only about 5.6% in 2007[28]. China's manufacturing sector has expanded tremendously in the last five years. It increased in November 2009, to 55.7 from 55.4 in October (Lazarro, 2009), and now ranks 4th in the world after the US, Japan and Germany. The fast growing nature of its domestic market, worldwide demand for Chinese goods, together with the cost advantage it offers to manufacturers are stimulating the growth of its manufacturing sector. For example, it has a 50% share of the world-wide camera market, a 30% share of the market for air conditioners, a 25% of the washing machine market, and 20% of the refrigerator market

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[27]All figures in this section, unless, otherwise stated are taken from the China Statistical Yearbook, Various Years.

[28]This situation has prevailed in China for a long time, even as far back as 1978. For instance in 1978, the contribution of the manufacturing sector to GDP was about 44% while that of the construction sector was around 3.8%. Its contribution hovered around 40% until 1983, when it dropped to about 39.9%. Meanwhile, during this period, the contribution of the construction increases to about 4.5%, although this percentage is nowhere close to that of the manufacturing sector. Then in 1993, it rose back to over 40% while that of the construction sector increased to about 6.4%. Since then, its contribution has been maintained around 40%.

(Business in China III). The most recent manufacturing statistics in the economy show that the sector has become a magnet for foreign investment.

China is now aiming at overtaking the US in manufacturing adjusting for inflation and the exchange rate. Considering that their share of world manufacturing output grew more than four times between 1990 and 2007, a great mishap would have to occur for them not to become the world's leading manufacturer. In fact, most economists are now beginning to agree that China's manufacturing sector is an engine not only for GDP growth in the Asian hemisphere, but global economic growth as well. Given the impressive expanding nature of the manufacturing sector and its tremendous contribution to GDP, it is thus important for us to examine how they have been able to achieve this.

Although, a number of factors could account for this[29] in this paper our interest lies in the issue of finance. In fact, it is clear that from the outset that the manufacturing sector has been more able than other sectors to secure external finance. From 1985 until now, it has maintained its lead in capturing external finance. For instance, in 1985, credit to the manufacturing sector amounted to 1160 million yuan compared to about 267 and 416.6 million yuan worth of credit that went to the construction and agricultural sectors, respectively. Although credit to all sectors has increased over the years, that to the manufacturing sector has experienced the biggest increase. It increased from about 16526.6 million yuan in 1997 through to about 20190.5 million yuan in 2002 and, in 2007 reached 33627.5 million yuan. Meanwhile, over the same period, the construction and agricultural sectors have only managed to increase their credits to 1591 and 3314.6 million yuan, respectively (1997), 2748 and 6884.6 million yuan, respectively (2002), and in 2007 it respectively reached 3744.8 and 15428.2 million yuan. It is therefore not surprising that the manufacturing sector keeps booming.

What we seek to examine in this study is whether this credit has been spread evenly amongst all firms or whether it is concentrated within a few firms. Some firms should clearly be capable of gaining access to more external credit than others. For instance, large firms are often seen as being in a better position to secure external credit than small firms. In addition, it is often

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[29]These include good infrastructure, good incentives and good institutional development.

assumed that foreign firms are less financially constrained than their domestic counterparts. That is, like large firms they are able to easily substitute one form of finance for another[30].

In this paper, we focus on foreign firms. We do this by focusing on firms with different degrees of foreign ownership. Of course, we appreciate that foreign firms may receive financial assistance from international sources. Yet, we cannot rule out the fact that they may also participate in the domestic financial market, considering that they may find it cheaper to borrow locally than from abroad.

Not only can they benefit from the local financial market within the Chinese economy. They also have other benefits. Besides receiving financial assistance from international sources and having easy access to international banks, prior to 2008 they were also given exemption from corporation tax for two years after which they were allowed to pay taxes at a reduced rate of 50%[31]. In addition to the above benefit, they enjoy duty free imports of components and supplies (Naughton, 2007). They are therefore likely to have a cost advantage compared to other firms, reducing their overall level of financial constraints.

Another interesting part of the Chinese economy is that, its Purely Domestic firms are not left out in its promotion policies for firms[32]. These firms, and especially the state-owned enterprises, also benefit from a historically biased financial system where most investible funds are directed at them rather than at their potentially more productive private counterparts[33]. If this benefit impacts positively on them, it will mean that domestic firms who are mainly made up of state-owned enterprises are also more likely to have a

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[30] Refer to section 1.1, Chapter 2 and Chapter 3 of this thesis for an extensive explanation to this.

[31] Because tax incentives are usually designed to encourage foreign investment, they seldom come without any restrictions attached. For instance, China requires that the tax discount given to foreign firms be reinvested to increase the capital base of the firm or launch another firm. This must be done for at least five years. If the reinvested amount is withdrawn within five years, the firm has to pay back the taxes (UNCTAD, 2000)

[32] It is important to note that state-owned enterprises dominate our classification of Purely Domestic firms.

[33] Allen et al. (2005) document that the private sector in China dominates both the state and the listed sectors, in terms of output size and growth trend. They show that between 1996 and 2002, the private sector grew at an annual rate of 14.3%, while the combined state and listed sector only grew at 5.4%. Dollar and Wei (2007) also report that domestic private firms have higher marginal and average returns to capital than state-owned enterprises. According to Linton (2006), large SOEs sit at the pinnacle of privilege and financial access. They obtain a disproportionate share of funding from all sources within the economy. Private firms, domestic and foreign alike which in the last five years have played a critical role in China's growth face substantial capital access barriers.

cost advantage. Consequently, we would expect domestic firms' financial constraints to be less binding as well. From the above pieces of evidence, whether any of these firms will be more financially constrained than the others will depend on which firms are benefitting most from the designated policy. The diversities in its policies outlined above for different firms are why we choose to study China. A number of studies have investigated the financial constraints of foreign and domestic firms. These include Harrison and McMillan (2003), Mickiewicz et al. (2004) and Arbelaez and Echavarria (2002) for the Ivory Coast, Estonia and Colombia, respectively.

However, the above-mentioned papers on foreign ownership and financial constraints have not provided evidence on the link between financial constraints and firms with specific degrees of foreign ownership[34]. Harrison and McMillan (2003), for instance, define a firm as domestic; if it has less than 50% of foreign capital, and foreign, if it has 50% of foreign capital or more, using some a priori criteria[35], overlooking the possible heterogeneity that may characterize foreign firms. Based on this classification, they concluded that foreign firms are less financially constrained than domestic firms. This means that previous analyses have shut out the contributions of Joint Ventures. In this study, we consider Joint Ventures as an important category that needs to be defined separately. Including them with either Purely Domestic or Wholly-Foreign Firms is equivalent to saying that these firms share the same characteristics in terms of financial constraints which may not necessarily be the case and may yield false conclusions.

Our study differs from the aforementioned papers in the following way. We aim at providing, for the first time, a detailed analysis on the link between financial constraints and firm ownership. Specifically, using the ORIANNA dataset on the Chinese manufacturing sector which covers the period 2000-2005 we group our firms into the following three categories: 1) Purely Domestic (PD) firms(firms with no foreign capital), 2) Joint Ventures (JV) (firms with between 0 and 100% of foreign ownership) and 3) Purely Foreign

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[34] To the best of our knowledge, Djankov (1999) and Greenaway et al. (2008) are the only studies in the area of international economics that have considered foreign ownership as a continuous variable. However, while, the former looks at the relationship between foreign ownership and labour productivity growth with firms from Georgia, Kazakstan, the KyrgyzRepublic, Moldova, Ukraine and Russia, the latter considers the relationship between foreign ownership and corporate performance in China.

[35] For instance, Girma et al. (2001) focus on firms in the UK and define a firm as foreign owned if the country of origin of its holding company is not the U.K.

Owned firms (WF). This form of classification is based on the 1971 Equity Joint Venture Law of China. This law does not place any equity limit on foreign investment. Rather, the law is planned to apply to all Joint Ventures. Thus, a foreign firm could have a 99% equity position under this law.

We follow the approach of Harrison and McMillan (2003) to investigate this issue, but as mentioned we include JV firms in our analysis. We believe that the foreign and domestic components in JVs may either move their financial constraints towards WF firms or PD firms depending on whose influence is greater. The ORIANA dataset contains rich information on JVs, making it easy for our study to be conducted. Like Harrison and McMillan (2003) we introduce an external financial constraints measure (debt to asset ratio) which reflects a firm's indebtedness in the investment Euler equation. We also utilise cash flow as an additional financial variable in the investment equation. The idea behind using two financial variables is to examine whether different measures of financial constraints yield similar results. Like Fazzari et.al. (1998), we interpret a higher sensitivity of investment to these financial variables as an indication of higher financial constraints.

Our results show significant differences in the financial constraints of our different classification of firms. Specifically, using both cash flow and debt as our measures of financial constraints, our results show that firms are relatively less financially constrained compared to their Purely Domestic counterparts. This implies that although PD firms in China may have better links i.e., through political connections and a better legislative and regulatory treatment, they still cannot compete with Wholly Foreign firms who clearly have better managerial practices. In addition, the tax incentives that foreign firms receive potentially put them ahead of domestic firms. For PD firms, despite the benefits they receive from the local banks, they are still unable to catch up with the Wholly Foreign firms. For JVs, their domestic component seems to be failing them and this makes them unable to meet the standards of Wholly Foreign firms. These results somehow fall in line with Harrison and McMillan (2003)'s finding that domestic Ivorian firms are more financially constrained than their foreign counterparts and reflect some similarities in the financial and institutional systems of different countries. The results also have important implications for the elimination of the tax incentive policies for

foreign firms prior to 2008. Since Wholly Foreign firms in China are relatively less financially constrained, then, the abolition of the incentive may be helpful in reducing PD firms' financial constraints as competition may be less keen for them, but it may be harmful for JV firms.

Recognising that firms may have certain peculiar characteristics because of the region they may be located in, we divide the firms according to the regions in which they are located (coastal and inland regions) and carry out a similar investigation. We find that firms are heterogeneous in their financial constraints across different regions. Specifically, using both measures of financial constraints, we find that firms in the coastal region are relatively less financially constrained compared to their counterparts in the non-coastal region. These results are not surprising as they reflect the developmental gap that has long existed between the coastal and the non-coastal regions: the coastal region is relatively more developed and therefore has higher financial development as well as a larger market size.

The next thing we do is to compare the financial constraints of different firms in the different regions. Like the full sample, while we find only Wholly-Foreign Firms to be relatively less financially constrained than PD firms, and JVs to be equally financially constrained as PD firms when we use the ratio of total liabilities to assets, we find significant differences among the financial constraints of firms when we consider cash flow as a proxy. Using cash flow, our results specifically show that both JVs and Wholly Foreign Firms are relatively less financially constrained than PD firms. The situation appears to be very different in non-coastal region. Firms tend not to differ in their financial constraints when both total liabilities over assets and cash flow are considered.

Overall, the results for the entire manufacturing sector suggest that being fully foreign-owned helps reduce the financial constraints of firms. Therefore, from our results above, if domestic firms are seen to be financially constrained, it will be important for them to learn the managerial practices from purely- foreign owned firms.

Indeed, China has attracted much attention from countries willing to do business in other countries and for the past few years, it has experienced a remarkable growth in its Foreign Direct Investment (FDI). The reasons for this

have been outlined in many papers[36]. From an almost isolated economy, it by-passed the U.S.A in 2004 to become the world's largest recipient of FDI and it is now the largest recipient of FDI amongst developing nations. China's recent accession into the WTO may further increase its already impressive FDI inflows.

These FDIs have contributed greatly to the Chinese economy. For instance, with close to zero contribution towards industrial output in 1978, foreign enterprises accounted for about 16% of the total industrial output in 1999 (NBS 2000). Some studies have revealed that China's private companies rely on FDI for financial support, as they find difficulties in obtaining funds from the financial institutions that are mainly state-owned (see for example, Poncet and Hericourt, 2008). Du and Girma(2008) also point out that, while the state budget, bank loans and self-fundraising accounted for 8%, 20% and 17% respectively of the total finance of foreign invested firms operating in the manufacturing sector between 1999 and 2002, foreign capital accounted for 55% of the total finance. This suggests that foreign firms depend much on foreign capital and create space in the domestic financial market for domestic firms. From the above pieces of evidence, it can be said that the development of China's private sector which is the main engine of growth depends to a large extent on its ability to attract FDI.

While there has been an increasing body of literature dealing with FDI in China, very few have commented on their impact on domestic firms, especially through the financial market. The few that have tackled this in China include Poncet and Hericourt (2008). Using a firm-level data on 1300 domestic companies in China, Poncet and Hericourt (2008) find that cross-border relationships with foreign firms helps private domestic firms to by-pass both the financial and legal obstacles that they face. Poncet and Hericourt (2008) however base their work on Harrison and McMillan (2003). Harrison and McMillan (2003) investigate the impact of foreign firms' borrowing on domestic firms using a panel of Ivorian manufacturing firms. Contrary to the

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[36] OECD (2000/4) indicates that China's large market size, abundant but cheap labour cost, preferential policies for foreign investors and rapid economic growth after the reform period has contributed to FDI tripping China's economy. Zhang (2000) also provides evidence that both U.S and Hong Kong FDI are induced by China's large market size. Liu et.al (1997), Dees (1998) and Wei and Liu(2001) also find that China's cheap labour cost and relatively large volumes of exports play a significant role in attracting foreign firms.

findings of Poncet and Hericourt (2008), Harrison and McMillan (2003) find that domestic firms' financial constraints are worsened by foreign firms' presence. Additionally, we test the notion of the soft budget constraints in China by splitting firms into private and state-owned enterprises. Our results show that only private PD firms are financially constrained but purely domestic state-owned enterprises are not. Following Harrison and McMillan (2003), we first test whether purely domestic private firms are financially constrained and further investigate the impact of foreign firms' borrowing on the financial constraints of purely domestic private firms if they are found to be financially constrained. Again, unlike Harrison and McMillan (2003) and Poncet and Hericourt (2008) who carry out the test on private firms that have less than 50% of foreign ownership, we carry out our test on PD firms (i.e. firms with no foreign ownership).

Our results suggest that only purely domestic private firms are indeed financially constrained but purely domestic state-owned enterprises are not. This supports the widely-held notion that state-owned enterprises in China benefit from selective credit policies. We also find that the financial constraints faced by purely domestic private firms can be alleviated by the presence of foreign firms. These results contradict Harrison and McMillan (2003) who find that domestic firms' financial constraints are greatly worsened by the presence of foreign firms but support the work of Harrison et.al. (2004). Therefore, it appears that the on-going structural changes and liberalisation may be helpful to the Chinese economy.

The rest of the study is organised as follows: Sections 4.2 and 4.3 describe the financial system and foreign direct investment in China. In section 4.4, we present the data and summary statistics. We present our baseline specification and econometric technique in section 4.5. Section 4.6 shows the estimation results and robustness checks. We conclude and recommend policies in Section 4.7.

4.2 China's Financial System

In this section, we highlight some important features of the Chinese financial system that will prove useful in understanding our analysis. We first look at the trend and then go on to describe the sources of finance for firms in China.

4.2.1 Evolution of China's financial system (1978-2006)

China's financial system has been more of an evolutionary experience than a revolutionary one. Before China's economy opened up in 1978, its financial system was overwhelmingly controlled by the government. Its banking system was operated by the People's Bank of China (PBOC), which functioned as an accounting subsidiary of the Ministry of Finance. The roles of a central bank and commercial bank were not differentiated among different banks; both roles were performed by the PBOC. This meant that the banking system essentially consisted of a mono-bank. It accepted deposits, apportioned credits to various production sectors and issued currency. In addition, it virtually controlled all the investment decisions of companies and state-owned enterprises, how they apportioned their funds and distributed their profits. As enterprises sent their profits to the government after deducting just a small portion, the government in turn financed their investment activities from its budget. Thus, the PBOC merged individual economic activities with government budgetary activities.

When the reforms began in 1978, the government adopted a market-oriented financial system to liberate enterprises. This led to the introduction of two major reforms in 1983 and 1984. In 1983, the State Council gave the PBOC the mandate to operate as a central bank. At the same time, four state-owned banks were developed to take up the commercial roles which were being performed by the PBOC, with each having its own tasks and duties to perform. These were the Agricultural Bank of China (ABC), established in 1979 for the rural and agricultural sector, the Bank of China (BOC), also established in 1979 for foreign exchange market, the People's Construction Bank of China (PCBC), established in 1981 for long-term investment, and the Industrial and Commercial Bank of China (ICBC), established in 1984 for the industrial sector. Other financial intermediaries outside the 'Big Four' state-owned banks emerged and grew rapidly. For instance, a network of Rural

Credit Cooperatives emerged under the supervision of the ABC. Similarly, the urban areas were also proliferated by Urban Credit Cooperatives. Other non-bank financial intermediaries were also set up. All these new financial intermediaries performed the roles of commercial banks; accepting deposits and granting loans. This increased competition in China's banking industry while at the same time increasing inflation. As savings deposits increased, the system of budgetary appropriation was gradually replaced with the granting of loans by the four state-owned state owned commercial banks. However, these four state-owned commercial banks could only make loans based on the quota given by the PBOC.

To further promote the activities and growth of enterprises seeking to make profits, especially the non-state enterprises, the government established a corporate tax system in 1984 to replace the system where all profits were returned to the government after deducting a small portion. Almost all enterprise profits were taxed, rather than being sent to the government. The other remarkable thing that happened during this period was the elimination of grants by the government and this was replaced by the allocation of working capital and investment funds through the banking system. The decade, however, ended with financial decay as inflation increased tremendously. The government therefore took measures to control for inflation and brought the financial reforms to a halt. For example, the government merged many Trust and Investment Corporations and again brought them under the control of the PBOC.

A second phase of the financial reforms started in the 1990s when the famous "Southern Tour" by the then Chinese leader, Deng Xiaoping, moved the economy into another boom. This period saw significant increases in Foreign Direct Investment (FDI), the establishment of new state-owned commercial banks and the entrance of four foreign–owned insurance companies in Shangai, in 1992.

Another remarkable event that occurred early in this period was the establishment of China's stock market. In 1990 and 1991, China set up stock exchanges in Shangai and Shenzhen. Although these exchanges were controlled heavily by the government, the establishment of the Chinese stock market undoubtedly promoted the transition from the socially-planned system

to a market-oriented economy, as individuals became shareholders of listed firms. Today, the stock market has become an alternative source of finance for investment in China, although not very significant.

During the mid 1980's and early 1990s, although the role of the PBOC had been distinguished from the state-owned specialised commercial bank functions, the banking sector was nevertheless still manipulated by the central planning system (Lu and Yu, 1998), leading to inefficiencies in the banking sector. The Central Bank restricted the activities of the banking sector using interest rates and reserves. For instance, the PBOC set limits on deposits and loans and commercial banks had to operate within those bounds. In addition, all financial service providers needed approval from the central government before establishment. Firms that had private owners were either not approved or were given heavy restrictions which made it difficult for them to set up their businesses. Most of the financial companies were owned by the government. Because the government controlled almost all the financial companies in China, it appointed the managers. But in most cases, managers were not appointed on the basis of experience or knowledge of the financial sector. The government exercised control over the financial sector mainly to serve its own interest. In China, these interests included placing ageing government officials in positions and serving the State- Owned Enterprise sector (Xinghai Fang, 2001).

The financial institutions themselves were also to blame for the inefficiencies in the financial system. Poor management by the officials of the financial institutions was also a cause of the lapses in the financial sector. Because most of the top officials had been placed by the government, they felt accountable to no one apart from the government. They made autocratic decisions which were sometimes not so good for the institution. Before, banks and insurance companies invested in almost all types of businesses.

Unfortunately, during this period, the priorities of bank officials were diverted. Their interests were now in building cosy offices for their top officials and training centres equipped with a lot of recreational facilities. Bank officials gave out loans to people in exchange for political and monetary favour. Hence, some loans were misallocated. Officials in the banks were mainly underpaid and since pay increases correlated positively with status in

the institution, most people focused on promotion, rather than expansion (Xinghai Fang, 2001).

To support the reforms that took place during this period, the National People's Congress passed a central bank law, a commercial bank law and a company law in 1995. These laws were mainly passed to consolidate the role of the central bank and to allow private banks to be established. The promulgation of these laws led to the restructuring of the four major state-owned banks. These banks were relieved of their roles of making government policy-directed loans. Meanwhile, three policy banks for agriculture, foreign trade and domestic infrastructure were set up to take over the role of the commercial banks in making these policy-directed loans.

Three decades after China's economic reforms, China has seen tremendous improvements in it financial sector as its financial sector has been experiencing rapid growth. Its accession to the World Trade Organisation (WTO) in 2001 as its 143rd member increased its momentum for sustaining the market-oriented and financial reforms it had adopted in the previous two decades. In order to fulfil the requirements of the WTO, China made a number of concessions and commitments. The WTO agreement required increased competition in Chinese banking and insurance industries. The agreement also called for equal national treatment for foreign banks in China's local banking industry. So far, it has been able to fulfil its WTO banking requirements. Indeed, by 2008, there were about 76 foreign banks. Apart from allowing foreign banks to extend local currency business with Chinese companies to seven more cities in 2005, the minimum operating capital required for a foreign bank branch to transact business using local currency was reduced from about $63 million to about $50million[37]. In addition, by the end of 2006, China's banking industry had its total assets standing at 43.9 trillion yuan; an increase of about 79.5% from 2002. Beginning in 2007, China had almost 20,000 legally recognized banking institutions, 104 securities firms and 68 licensed foreign securities institutions. Non-performing loans decreased by about 17.06% from 2002 to 2006 (Kiedel, 2009).

Although China has been able to modernise its financial system, its financial system is still immature and the challenge still remains for it to make

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[37] Source: AFX News Limited

its financial system comparable to other modern financial systems. It still contains traits of the socialist planned system. The markers of China's financial immaturity include the system's opaque corporate client base, whether state-owned or private, its unstable consumer-credit client base, inefficient governance in the financial institutions themselves, immature regulatory bodies, ineffective legal and judicial institutions and inadequate accounting standards and institutions (Keidel, 2009).

4.2.2 Sources of Finance for Enterprises in China

China's financial system has characteristics which are similar to the financial system of other developing economies at their initial phase of financial development. Firms consistently rate access to credit as one of the greatest impediments to their operation and growth (World Bank Group, 2008). There are four important sources of finance for enterprises in China. These include Government Budgetary and Extra Budgetary funds, Bank loans, Self-Raised Financing and Foreign Direct Investment.

Government Budgetary and extra budgetary funds refer to a proportion of the central and local government's budget meant for capital investment. The Government obtains funds from tax revenues and appropriates land from farmers which are auctioned to various potential investors to finance state-owned enterprises. Nevertheless, the system of budgetary appropriations is gradually phasing out. For example, on average, the proportion of firms getting state budgets reduced from 33% in 1998 to 6% in 2005, and, over the same period, the average percentage of state budget out of total firms' capital also dropped from 21% to 3%[38]. This is against the background that state-owned enterprises have recently been redirected to banks for loans for which they have to pay the total cost of borrowing from their accounts.

By far, the two most important sources of finance for firms in China are bank loans and self-raised finance. The banking sector dominates the other institutions in China's financial sector. This means that the success and performance of the whole financial sector greatly depends on the way the banking sector allocates credit. Yet, it is characterized by pervasive

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[38] Figures are based on Du and Girma's (2007) study.

government control. This has given rise to inefficiencies in the banking sector. For instance, as at 2004, the NPL stood at about 15% of GDP, but these cannot be accounted for, as no independent auditing has been undertaken. In terms of allocation of savings to firms, bank loans have disproportionately focused on state-owned enterprises; approximately 80% of the total loans from the state-owned banks are given to state-owned enterprises while less than 10% go to the private sector[39].

Moreover, firms in China face discriminatory interest rates. While lending rates are low for the firms that have easy access to the banking sector (about 6% per year), the excluded firms have to face different rates. For example, in Beijing's club market for small private firms, the one year lending rate is about 18%[40]. In addition, while urban credit co-operatives are the primary source of formal finance for urban collectives and private firms, rural credit co-operatives supply loans to rural private firms. Because private firms in China have restricted access to external financing they rely mainly on internal financing to finance their investments whilst state-owned enterprises that are able to access bank loans more, rely mainly on bank finance. Over time, the use of bank loans as a source of finance for firms has reduced. For instance in 1998, 50% of firms had bank loans but this dropped to about 25% in 2005[41]. During that same period, the average ratio of bank loans to total capital provided to firms declined from 22% to 9% (Du and Girma, 2007), implying that firms made use of other sources of finance. Self-raised finance comprises of firms' finance from equity, bonds issued by individual enterprises, credit associations, money lenders, credit cooperatives, rotating savings, and credits from friends and families. Apart from equity and bonds issued by individual enterprises, the remaining sources of self-raised finance are classified as informal financial institutions. The size of the total self-financing of all firms has been growing at an average annual rate of 14% over the period 1994-2002 (Allen et al., 2005). Self-financing is also the most important source of finance for different types of firms. For instance, about 90% of the total financing for individually owned companies come from self-

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[39] Source:Du and Girma(2007)
[40] Source: Xinghai Fang (2001)
[41] Figures are based on Du and Girma's (2007)'s study. The figures are based on the dataset used in that study.

fundraising (Allen et. al, 2005). Even for state or quasi-state-owned companies, self-financing contributes between 45% and 65% of their total financing (Allen et. al, 2005).

The securities market is capable of producing an alternative source of financing for enterprises. Equity capital raised for Chinese firms in 2000 was about 18 billion dollars (Fang, 2001). This means that the securities market can play a significant role in the allocation of credits to firms. Nevertheless, almost all the listed companies are state-owned. Unlike the banking sector, one good thing about the listed companies in China is that they are required to deliver reports on their performance at least twice a year. Since these reports are delivered to the investing public, there is a guarantee that the reports will give a true reflection of the company. This makes auditing easier in the listed companies. It is also crucial to note that, due to the underdevelopment of the stock and bond markets, equity and bond issuance make-up only a minor share of total self-fundraising (Allen et al., 2005).

One cannot rule out the importance and size of the informal financial sector. The roles that money lenders, credit groups, unregistered private banks, families and friends play in financial intermediation are very significant. However, not many studies focus on them. But anecdotal evidence shows that such informal financing sources that are not officially approved are very pronounced in China. Borrowing from relatives and friends does not involve any formal written contract. It is mainly built on trust; which means that lenders will only lend to people they are familiar with. In addition to the informal associations, there are also unregistered private banks and money lenders who act as banks. Indeed, several researchers including Tsai (2002) and Allen et.al (2005) have argued that such curb market financing has played an important role in financing private enterprises who find difficulties in accessing the formal financial system. It is however important to note that curb market lending has its negative side. It comes at a higher cost. Their interest rates are usually above the state mandated interest rates.

FDI inflows, whose recent trend is in continuous growth, represent another increasingly important source of capital which, as shown by Héricourt and Poncet (2007), may help alleviate non-state firms from the financial and legal pressures they face in the domestic financial markets. Du and Girma

(2009) point out that 14% of firms' total financing come from FDI. This figure is quite substantial. Given the contributions of FDI in alleviating the financial constraints of firms, it is necessary that we describe in detail the sources of FDI and the pattern it has followed over time in China. We do these in the section that follows.

4.3 Foreign Direct Investment in China

4.3.1 Sources of FDI Inflows in China

China's source of FDI has been very unbalanced. While the Asian countries in total (Macao, Hong Kong and Taiwan) dominate the source of its FDI, the industrialised countries' role (apart from U.S and Japan) has been very minimal. Out of the total FDI that came into China in 2006 for instance, 33.07% came from Hong Kong and Macao, 3.39% from Taiwan, 11.85% from U.S and Japan, 9.80% from Singapore and the Republic of Korea, and 4.90% from Great Britain, Germany and France (National Bureau of Statistics, 2007). An interesting question is why China, a top destination for FDI, has been unable to attract significant amounts of FDI from industrialised nations. A number of papers outline the possible causes of this. Chen et al., (2000) for instance argue that political uncertainty led the U.S for instance to reduce its investment in China.

However, out of the total amount of FDI that comes from its Asian neighbours, there remain some uncertainties about how much of this capital is actually channelled by foreigners and how much comes from the Chinese investors located in the Asian countries. This brings to bear the issue of round-tripping. In China, domestic firms may register as foreign firms from nearby regions (Macao, Hong Kong and Taiwan) so that they can take advantage of the preferential treatment given to FDIs in terms of fiscal and other incentives (Huang 2003). These benefits include tax holidays and administrative support. It has been established that excluding data from these neighbouring areas reduces FDI in China significantly. For instance Bajpai and Dasgupta (2004) noted that net FDI inflows into China reduced from roughly $40.7 billion to $20.3 billion in 2000 when the neighbouring areas were excluded.

4.3.2 Trends in FDI Inflows in China

China's approach in attracting FDI has been very gradual, perhaps due to a lack of experience and the unwillingness by both the Chinese government and foreign investors to fully commit themselves to a new course.

The initial stage of the "open door policy" was a learning phase and primarily experimental. This was reflected in the low FDI inflows (an average of about $1.8 billion (OECD, 2000)) that tripped the economy during the initial phase of the reform and China's reluctance to open up its economy fully to an unknown course. Inward FDI was concentrated in the four Special Economic Zones (SEZ) in Guangdong and Fujian provinces, and the best a foreign investor could have was the establishment of a joint venture, mainly co-managed enterprises where the foreign firms provided capital and the Chinese government provided factories, equipment and labour. As China began to experience the success of inward FDI (in the late 80s), it promulgated more preferential measures to consolidate its position on attracting FDI.

Although foreign firms could not completely own a firm, they were allowed to have co-funded enterprises. The Hainan Island and fourteen other coastal cities across ten provinces were opened up. It also set up a dual track corporate income tax model to attract more foreign investment. Accordingly, it created a system whereby foreign firms and domestic firms operated under different tax legislation. This moved the economy's modestly recorded FDI levels during the initial stage to higher FDI levels (an annual average of about $US 2.1 billion) during the period 1984-1991. The period also characterised the second phase of the "opened door policy". With foreign investors becoming more comfortable and informed about the situation in China, and the government's continual effort to formulate policies to favour foreign investment, many foreign investors, especially the wholly foreign funded ones emerged.

Following Deng Xiaoping's Southern Tour in early 1992, China witnessed a further surge in its FDI inflows. Between 1997 and 1999, China experienced a downturn in its FDI inflows. The following reasons accounted for the reduction in FDI inflows to China.

1) The financial crises that hit its Asian neighbours in 1997 led to a reduction in their FDI inflows to China.

2) Labour was no longer cheap as most parts of China, especially the coastal provinces experienced wage increment

3) A reduction in China's economic growth.

In recent times however, China has been able to attract so much FDI (its contracted value amounted to about 63,020,530 in 2006 (NBS, 2006)) that it no longer requires any more measures to attract them. As a result, it has in 2008 ended its long-standing tax breaks to foreign companies by including a flat 25% tax rate for all firms. This puts domestic firms into an advantageous position as they will now be on a level playing field with the foreign firms. As stated earlier, foreign firms were not allowed to pay any company tax in the first two years of their operations and after two years they were only allowed to pay 50% less whilst domestic firms were paying the full rate.

We carry out a formal test in the subsequent sections on whether the benefits enjoyed by foreign firms before 2008 together with the opportunities they have for being foreign-owned distinguishes their financial constraints from the financial constraints of firms that are not foreign-owned.

4.4 Data and Summary Statistics

4.4.1 Data Description

We construct our dataset from the ORIANA Dataset published by the Bureau Van Dijk Electronic Publishing. It contains profit and loss, and balance sheet information on about 23,865 firms from the period 2000 to 2005. These firms come from about 30 provinces which have been broadly classified into two regions: coastal and non-coastal regions[42]. We focus our analyses on the manufacturing sector. Out of the total number of observations in the dataset 85.2% of them belong to the manufacturing sector.

To control for the influence of possible outliers, we drop all observations that fall within the 1% tails of the distribution of all the variables used in the regression[43]. We are then left with 80,512 observations in the

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[42] The coastal region include Beijing, Fujian, Guangdong, Hianan, Hebei, Jiangsu, Liaoning, Shandong, Shanghai, Tianjin and Zhejiang provinces while the non-coastal region embodies Anhui, Heilongjian, Henan, Hubei, Hunan, Jiangxi, Jilin, Shanxi, Chongqing, Guangxi, Guizhou, Neimenggu, Ningxia, Qinghai, Shaanxi, Sichuan, Xinjiang, Yunnan provinces.
[43] These cut-off points remove all observations with extremely large values that resulted from measurement and coding errors.

manufacturing sector. The panel is unbalanced, and therefore allows firms to enter and exit during the period of survey. Thus, in this particular dataset, the number of years that firms appear in the dataset ranges from 1 to 6 years, and on average, firms appear for 5 years in the dataset. By allowing for both free entry and exit in the dataset, the use of the unbalanced panel partially reduces potential selection and survivor bias.

To investigate whether domestic firms and joint ventures are crowded out in the financial market in China, we will need the variable share of foreign borrowing. A limitation of our dataset is that it does not contain the variable that can capture credit rationing. For this reason, we follow Harrison and McMillan (2003) and construct a measure of the share of debt by foreign firms which is defined as:

Where FOSD represents foreign-owned firms' share of debt 'i' represents firm, 'd', industry and 't', time. This measure captures the level of borrowing by foreign firms in sector j at time t and measures the importance of the foreign presence. We assume here that a firm borrows the same percentage as the amount of foreign ownership it has. Although this would work perfectly for the two extreme firms, that is purely foreign-owned and purely domestic firms, one may think that a problem may arise when we consider JVs. We however argue that lenders, be it foreign or local, will take into account the proportion of domestic or foreign component before giving out loans. So for instance, a JV that has a greater proportion of foreign ownership stands the chance of receiving a higher proportion of foreign credits than a firm with a smaller proportion of foreign ownership.

The dataset contains a variable, foreign capital, which is continuous, and measures the fraction of paid-in capital contributed by foreign investors. We use this variable to represent foreign ownership. Its continuous nature allows us to divide firms into three categories. If the fraction of paid-in capital for a firm is 0, we classify it as purely domestic, if it falls between 0 and 1, it is classified as a joint venture, and if it is 1, we classify it as wholly foreign. We check the robustness of this measure in what follows.

4.4.2Summary Statistics

According to our classification, about 56.9% of the firms are made up of PD firms, 20.29% JV firms, and 22.82%, WF firms. Most of the firms are concentrated in the coastal region, which contains about 74.97% of the firms compared to the non-coastal, which has about 25.03%. In addition, foreign firms are also more concentrated in coastal region than the non-coastal region. Out of the total number of WF firms in the dataset, 97.13% of them are found in the coastal region and 2.85% in the non-coastal region. A lot of JV firms are also found in the coastal region. While 87.59% of them are found in the coastal region, 12.4% of them are found in the non-coastal region. We attribute the concentration of both WF firms and JV firms in the coastal regions mainly to good infrastructural facilities and promotional policies towards foreign investors. Focusing on the provincial distribution of the different types of firms, Guangdong has the highest percentage of WF firms and JV firms. Out of the total number of WF firms in the sample, Guangdong has about 45.88% of them. JV firms are also concentrated there. They have about 19.51% of the total JV firms.

In our sample, there are about more than twice as many private firms that are domestic than there for state-owned enterprises that domestic in the coastal region. While private firms make up 27.94% of the total number of PD firms, state-owned enterprises make up just about 11.54% of the total percentage of PD firms. In the non-coastal region on the other hand, 25% of the total PD firms are state-owned, 18.16% of them are private.

Next, we present the descriptive statistics of the main variables used in the regression as well as some other variables of interest. We particularly look at the relationship foreign ownership has with each of the variables and go on to look at the same relationship with regards to specific regions. Column 1 of 4.1 shows the mean values of the various variables for PD firms; columns 2, and 3 of Table 4.1, the mean values of the variables of JV firms and wholly-foreign firms respectively. From Table 4.1, the relationship between cash flow and foreign ownership is not clear cut. *Cash flow/Capital Stock* tends to be highest for JV firms, followed by wholly-foreign firms and then PD firms. This means that firms with some level of foreign ownership are able to generate

higher profits and are more able to pay off their expenses than firms with no foreign ownership.

Liquidity is measured by the ratio of firms' current assets to its current liabilities. It increases monotonically with foreign ownership. The higher the value of a firm's liquidity, the higher the firm's trading activity. From Table 4.1, we can conclude that WF firms have the highest trading activity and the highest ability to meet immediate and short-term obligations as they have the highest mean value for liquidity. They are followed by JV firms and then PD firms.

Like *liquidity*, the mean *Sales/Capital Stock* tends to increase as foreign ownership increases. Hence, Table 4.1 shows that increasing the share of foreign ownership in a firm increases its sales and hence its profit.

Investment/Capital Stock also seems to be constant across the various groups. All three groups are not different in the level of investment they are able to undertake.

Collateral measures the ratio of tangible assets to total assets. The higher the ratio, the more dedicated firms are, and the less likely they are to default on a payment. PD firms have the highest mean value for collateral implying that they are in a better position to secure loans than all other firms. This is not surprising as in China the government lends support to PD firms. JV firms tend to have the least mean collateral.

We measure *Debt* as the sum of current and non-current liabilities. Following Guariglia and Bridges (2008), the relationship between *Debt* and financial constraints can be interpreted in two ways: either a firm with a high level of debt is more financially constrained or it is very healthy and can afford to borrow a lot. JV firms have the highest *debt/capital stock* on average while PD firms have the lowest debt/capital stock.

Coverage ratio is defined as interest/interest+profit. It measures how indebted firms are. It also measures the ability of a firm to meet its debt obligations satisfactorily and thus shows some aspects of the firm's financial health. While a high coverage ratio means the firm finds it difficult to meet its debt obligations, a low coverage ratio implies the firm finds it easier. Table 4.1 reveals that coverage ratio declines as foreign ownership increases meaning

that PD firms are less able to satisfy their debt obligations compared to WF firms.

The *Borrowing ratio* is measured as the ratio of interest payment to cash flow. It shows how much the firm relies on cash flow to finance its interest payment. From Table 4.1, WF firms seem to rely less on their cash flow to pay for their interest implying that they are capable of securing other means of funds for their interest payments. PD firms on the other hand depend more on cash flow to service their interest.

Interest Burden, another indicator of a firm's indebtedness, is measured as the ratio of interest payments of the firm to its total liabilities. Specifically, it explains how much of a firm's liabilities are made of interest payment. Hence, a firm with a high interest burden has a greater chunk of its liabilities made up of interest payments and the opposite is true for firms with low interest burden. In this case, PD firms have the highest mean interest burden while WF firms have the lowest.

Table 4.1 also shows the descriptive statistics of each of the variables of the various groups of firms in the different regions. From Tables 4.1 (columns 4 and 7) we see that PD firms in the coastal region are more indebted than the same group of firms in the non-coastal region. This is made evident from the fact that PD firms in the coastal region have a higher debt/capital stock (2.56) on average compared to their counterparts in the non-coastal region (2.2).

Table 4.1: Mean Values of the Various Variables for Firms in the Manufacturing Sector with Different Degrees of Foreign Ownership

Variable	Ownership Type			Regions Coastal			Non-Coastal		
	Purely Domestic Firms	Joint Ventures	Wholly-Foreign Firms	Purely Domestic Firms	Joint Ventures	Wholly-Foreign Firms	Purely Domestic Firms	Joint Ventures	Wholly-Foreign Firms
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Cash flow/Capital Stock	0.25	0.39	0.35	0.29	0.40	0.35	0.18	0.31	0.36
Debt/Capital Stock	2.4	2.5	2.35	2.56	2.55	2.36	2.22	2.18	1.98
Coverage Ratio	0.26	0.18	0.07	0.26	0.17	0.07	0.27	0.20	0.13
Investment/Capital Stock	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.03	0.04
Sales/Capital Stock	5.59	6.4	7.02	6.57	6.69	7.08	3.9	4.38	5.12
Borrowing Ratio	0.74	0.6	0.1	0.7	0.61	0.1	0.8	0.52	0.02
Interest Burden	0.03	0.02	0.01	0.03	0.02	0.01	0.03	0.02	0.02
Liquidity	1.31	1.57	2.06	1.34	1.57	2.07	1.27	1.56	1.75
Collateral	0.38	0.34	0.36	0.36	0.34	0.36	0.4	0.38	0.42
Number of Observations	47000	16808	18434	29699	14697	17893	17301	2111	541

This trend cuts across the other types of firms i.e., the mean debt/capital stock values for WF firm–years and JV firms tends to be greater in the coastal region than in the non-coastal region.

However, the same cannot be said for cash flow/capital stock. While cash flow/capital stock tends to be higher for PD firms and JV firms in the coastal region compared to the non-coastal region, WF firms in the non-coastal region have higher cash flow/capital stock than the same group in the coastal region.

Although coverage ratio for each of the regions declines as foreign ownership increases, it tends to be higher for each of the various groups of firms in the non-coastal regions than the coastal regions. This suggests that firms in the non-coastal regions spend a lot of their earnings on interest payments. Table 4.1 also shows that firms in the coastal region have higher sales than firms in the non-coastal region, suggesting that firms in the coastal region are more likely to make higher profits than those in the non-coastal region. This explains why the coverage ratio of the firms in the coastal region is low even though their debt levels are high.

The mean investment/capital stock tends to be generally higher in the coastal region for all the three types of firms than the same types of firms in the non-coastal region. While investment/capital stock tends to increase with foreign ownership in the coastal region, the situation seems somewhat different in the non-coastal region. JV firms in the non-coastal region tend to invest more than the other types of firms. Though the amount of cash flow spent on interest payment declines as foreign ownership increases in each of the regions, firms in the non-coastal region spend a lot of their cash flow on interest payments than firms in the coastal region, implying that firms in the non-coastal region have limited access to finance. The same applies to interest burden. This confirms what was seen with coverage ratio. PD firms in the coastal region have a higher trading activity than the same type of firms in the non-coastal region. The same applies to JV firms and purely foreign firms. The mean liquidity values in 4.1, columns 4-9 shows this. Generally, for each of the two regions, the mean liquidity value increases as foreign ownership increases. Firms in the non-coastal region have higher mean collateral values than firms in the coastal

region. This is not surprising as a lot of government support is directed to the non-coastal region.

Although the descriptions above give an indication about the relationship between foreign ownership and the different variables, it does not provide us with the opportunity to fully explain the relationship between future investment, financial constraints and foreign ownership. We thus extend our formal analyses by estimating equations to show which types of firms are more financially constrained, and the impact of foreign firms' borrowing on domestic firms' financial constraints.

4.5. Baseline Specification, Econometric Technique and Results

First, we show the baseline investment equation and the subsequent equations that we use for our investigation, and then in the next sub-section we discuss the econometric technique used in the study.

4.5.1 Baseline Specification
In this sub-section section, we present the baseline specification of the model used in this study. We utilise the version of the Euler Equation Model based on studies developed by Whited (1992), Bond and Meghir (1994), Gilchrist and Himmelberg (1998), Love (2000) and Harrison and McMillan (2003). This leads us to estimate (4.2) in the presence of asymmetric information.

$$\text{—}$$

$$\text{—} \qquad \text{—} \qquad \text{—} \qquad \text{—}$$

Equation (4.2) tests for financial constraints for all firms. I_{it} is the firm's total investment at time t, K_{it}, capital stock of firm i at time t, Y_{it}, the firm's previous year's output, B_{it}, the firm's previous year's debt, C_{it}, cash flow, and e_{it}, the idiosyncratic component. The study includes fixed effects, (s_i), and year dummies, (y_t) into the model. The individual fixed effects capture all the firm specific effects

that are time invariant such as differences in managerial ability, while the year dummies control for business cycle fluctuations.

In a situation where firms are financially healthy, *debt* should not have any impact on *future investment* or at best the relationship should be negative. Conversely, *debt* should have a positive and significant relationship with future investment if firms are financially constrained.

Similarly, in equation (4.2), output should also have a positive relationship with future investment. But we expect *cash flow* to display a negative relationship with *future investment* if firms are not financially constrained: an increase in cash flow today enables firms to invest today rather than tomorrow. Further, to test whether private firms are typically discriminated against in terms of lending in China, we estimate equation (4.1) separately for Purely Domestic Private Firms and Purely Domestic State-Owned Enterprises.

Following Harrison and McMillan (2003), to investigate which types of firms face more financial constraints, we use *PD* (Purely Domestic Firms) as our reference category. We then interact debt with *JV* (Joint Ventures) and *WF* (Wholly-Foreign Firms) and compare the coefficients of JV and WF Firms to our reference category. This makes the coefficients of the interaction of *JV* and *Debt* and *WF* and *Debt* relative coefficients. We do same with *cash flow*. This gives us:

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—   —   —
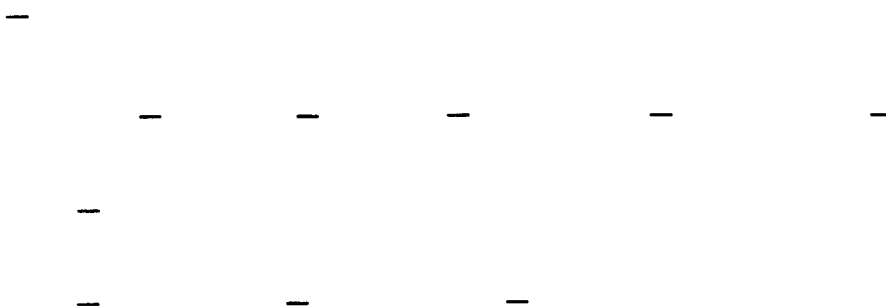
A positive and significant debt or cash flow coefficient of any of the types of firms (i.e. JV and WF firms) implies that relative to PD firms, that firm is more financially constrained. A negative and significant coefficient implies the opposite.

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As explained above, all other variables are expected to maintain their respective signs. We also carry out estimations in which only debt and only cash flow are interacted with the three ownership categories for robustness checks.

Next, we examine foreign firms' borrowing impact on the financial constraints of purely domestic private firms. To be able to investigate this, we follow Harrison and McMillan (2003) and estimate equation (4.4) below for purely domestic private firms.

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The coefficients of interest here are B_7 and B_8. If B_7 is positive and significant, then the share of foreign borrowing increases future investment and we conclude that, Purely Domestic Private Firms' financial constraint is being worsened by foreign firms' borrowing. On the other hand, if B_7 is negative and significant, then the presence of foreign firms is able to relieve purely domestic private firms from financial constraints. If B_7 is insignificant, it implies that foreign firms' presence does not affect the particular type of firm. The same explanation can be applied to B_8. Again, we expect all other variables to maintain their respective signs.

4.5.2 Econometric Technique

In dynamic panel analyses like the ones presented in the equations above, the error term cannot be considered independent of the dynamic term's distribution. This violates one of the assumptions of Ordinary Least Squares (OLS) making it impossible for it to be used. As a result, Instrumental Variable (IV) with an appropriate set of instruments is needed. However, empirical work is often confronted with heteroskedasticity of some form. Although the consistency of the

estimated coefficient is not affected by heteroskedasticity, the standard errors are. This brings us to use the Generalised Method of Moments (GMM): GMM addresses heteroskedasticity of unknown form (Roodman, 2006).

A consistent GMM Estimator is one that has instruments that are valid, and its error term is free from serial correlation. To determine this, we use two tests proposed by Arellano and Bond (1991) and Hansen (1972): the *m2* test and the *J* statistics respectively. The *m2* test tests for second-order autocorrelation of the residuals, and is asymptotically normally distributed under the null hypothesis of no second–order serial correlation. This test checks whether our model has been correctly specified and whether the lagged instruments are valid. The *J* statistic tests for over identifying restrictions, and it is asymptotically distributed as a chi-square with degrees of freedom equal to the number of instruments less the number of parameters. The null hypothesis is that the instruments are valid[44]. In both tests accepting the null hypothesis authenticate the model.

We use the Two-Step variant of the Forward Orthogonal Deviation GMM. We use the two-step variant because it is asymptotically more efficient than the one-step. However, the reported two-step standard errors tend to be severely downward biased (Arellano and Bond 1991; Blundell and Bond 1998). To compensate for this problem, we use Windmeijer's (2005) finite sample correction.

The Forward Orthogonal Deviation method also helps preserve sample size. It subtracts the forward mean value of observations belonging to the same group for each of the observations in that particular group. This means that with the forward orthogonal deviation method only the last observation in each group is dropped.

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[44]In large samples, the Sargan test tends to reject the null of instrument validity irrespective of the choice of instruments. As a result, we do not depend on it (see Greenaway et.al (2008)).

4.6Estimation Results and Robustness Checks

4.6.1 Estimation Results for All Firms

In this section, we estimate equations 4.2, 4.3 and 4.4 in Section 4.5.1 and carry out robustness checks. We first estimate Equation 4.2, which tests the financial constraints of all firms and present the results in Table 4.2 column 1. The results in Table 4.2 column 1 show that all firms in China are financially constrained. The coefficient on *Debt/Capital Stock* which measures the extent of financial constraints is positive and significant implying that a 1% increase in *Debt/Capital Stock* allows firms to postpone investment today for investment tomorrow, thereby increasing future investment by 0.2%.

In addition, the positive and significant coefficient on *Cash flow/Capital Stock* re-emphasises the financial constraints faced by firms. A 1% increase (decrease) in *Cash flow/Capital Stock* leads to a 2% increase (decrease) in future investment. A priori, cash flow/capital stock should have a negative relationship with future investment if capital markets are perfect. The positive relationship we find between cash flow/capital stock and future investment implies that capital market imperfections are so pronounced in China, thus making the availability of internal finance so important to manufacturing firms. This finding fits in well with the situation in China where the financial system allocates investible funds to inefficient firms rather than channelling resources to firms with profitable investment opportunities.

An interesting result crops up with *Lagged (Investment/Capital Stock)*. Although *Lagged (Investment/Capital Stock)* affects future investment and therefore displays a significant coefficient, it shows a negative relationship with future investment. Most firms in China have been seen to be engaging in de-investment when going through financial crises. This may partly explain the negative sign. The results show that a 1 unit increase in lagged investment reduces future investment by a magnitude of 0.06. However, this result reflects exactly what pertains in China as Poncet et.al. (2008) who also find a negative effect of

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lagged investment. *Sales/Capital Stock* is not significant. The *Hansen* and the AR (2) tests are both satisfied.

4.6.2: Estimation Results for Firms with Different Degrees of Foreign Ownership

Table 4.2 column 2 presents the results of the test of financial constraints for different categories of firms in the manufacturing sector. The results in column 2 show that on average JV and WF firms invest about 2% and 5% respectively more than PD firms. The financial variables on average are also both significant and positive, reinforcing the point that all firms face some level of financial constraints on average. Particularly, cash flow and debt show that firms postpone current investment for future investment by 2% and 0.3% when cash flow and debt respectively increase by 1%. When these financial variables are interacted with JV and WF, the results show that there are differences in the degree of financial constraints of some of the firms.

From column 2, using cash flow and debt, the coefficient of WF firms is negative and significant implying that WF firms are relatively less financially constrained than the reference category, PD firms. Specifically, the coefficients of the interaction between WF firms and cash flow, and WF firms and debt point out to the fact that relative to PD firms, a 1% increase in debt reduces the future investment of WF firms by about 2% and 0.4% respectively. These results are not surprising. Foreign firms have been perceived as having better managerial practices, making them more efficient. Their high level of efficiency may enable them to have access to some other external financing, making them less dependent on their cash flow.

Consequently, changes in their cash flow may not have significant impact on their investment. As for JVs, using both debt and cash flow, however, they do not seem any different from PD firms. They are both more financially constrained. We are again not surprised by these results. The domestic component of JVs seems to be pulling them down. As a result, they are unable to fully utilise the better managerial practices of their foreign components. The results presented above

clearly show that WF firms are relatively less financially constrained irrespective of the measure of financial constraints used but JV are not different from PD firms in their financial constraints.

Table 4.2: GMM Estimates Using Foreign Capital

Dependent Variable: (Investment/Capital Stock)	Test of Financial Constraints For				
	All Firms	Firms in the Manufacturing Sector	Firms in Different Regions	Firms in the Coastal Region	Firms in the Non-Coastal Region
	(1)	(2)	(3)	(4)	(5)
Lagged(Investment/Capital Stock)	-0.06***	-0.09**	-0.07***	-0.07***	-0.05**
	(0.01)	(0.04)	(0.01)	(0.01)	(0.02)
Lagged(Investment/Capital Stock)2	-0.02	0.22***	0.21***	0.24***	0.08
	(0.017)	(0.08)	(0.05)	(0.06)	(0.10)
Lagged(Cash flow/Capital Stock)	0.02***	0.02***	0.04***	0.02**	0.03***
	(0.002)	(0.01)	(0.01)	(0.01)	(0.01)
Lagged(Sales/Capital Stock)	0.00006	-0.00004	0.0003	0.0002	-0.0004
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0005)
Lagged(Debt/Capital Stock)	0.002***	0.003***	0.01***	0.004***	0.003*
	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)
Lagged(Cash flow/Capital Stock*JV)		-0.006		-0.01	-0.01
		(0.01)		(0.01)	(0.02)
Lagged(Cash flow/Capital Stock*WF)		-0.02***		-0.02*	-0.012
		(0.01)		(0.01)	(0.02)
Lagged(Debt/Capital Stock*JV)		-0.002		-0.002	0.0034
		(0.001)		(0.001)	(0.004)
Lagged(Debt/Capital Stock*WF)		-0.004***		-0.005***	-0.001
		(0.001)		(0.001)	(0.0042)
JV		0.02*		0.03*	-0.02
		(0.14)		(0.02)	(0.02)
WF		0.05***		0.06***	-0.03
		(0.01)		(0.01)	(0.02)
Lagged (Debt/Capital Stock*Coast)			-0.01***		
			(0.002)		
Lagged (Cash flow/Capital Stock*Coast)			-0.03***		
			(0.01)		
Coast			0.08***		
			(0.03)		
Constant		0.009	0.001	0.001	0.02***
		(0.006)	(0.01)	(0.01)	(0.01)
N	46758	43803	44280	33599	10204
AR(2) Test z	2.36	1.03	2.34	2.02	0.77
Hansen J	chi2(41)=172.86	chi2(83)=248.01	chi2(42)=237.64	chi2(87)=262.32	chi2(64) = 96.60

Notes: Estimation was done using GMM forward orthogonal deviation method. PD, JV and WF represent purely domestic, joint ventures and wholly foreign firms respectively. Reported estimates are the coefficients of each of the variables. The t statistics are reported in parenthesis. *** means significant at 1%, ** significant at 5% and *, significant at 10%. The first and second order serial correlation tests are asymptotically distributed as N (0, 1) under the null of no serial correlation. The Hansen Test is a test of over identifying restrictions, distributed as a chi – square under the null of instrument validity. Time Dummies were included in the estimation as both regressors and instruments. We also used two or more lags of all variables in the regression as well as that of the variable.

We attribute the difference in the results to the fact that *JV* firms because of their domestic component find it difficult to obtain external finance.

With the exception of *Lagged (Investment/Capital Stock)^2*, which is significant in this specification, all the other variables maintain their signs and are still statistically significant. The AR (2) test is also satisfied in this case.

Next, we discuss the differences that have existed between China's coastal and non-coastal regions and examine whether that has affected different firms' financial constraints.

4.6.3 Regional Disparities in Firms' Financial Constraints and the Crowding Out Test

The disparities among the regions in China have been in existence for a long time. Yet, these differences were not so evident until China opened up in 1978. Early post-1978 development policies favoured the coastal region, a reversal of an earlier policy geared towards moving industries into the inland regions. This is because the terrain of the coastal region made it a suitable location for development. Therefore, development policies during the 1970s and 1980s limited FDI to certain coastal cities, accounting partly for the regional inequalities today. These disparities in the development across provinces and competing economic interests pitted provinces against one another and dampened interregional trade. Lack of integration among provinces became especially pronounced in the 80s and 90s when interior provinces tried to prevent manufactured goods from the coastal province from coming in and raw materials like coal and cotton from leaving the province to the coastal provinces. Interior provinces therefore set up local industries to process their raw materials in order to generate profit and revenue from taxes.

In an attempt to bridge the gap created between the coastal and inland regions, a new western development initiative was adopted recently by the government to steer investment and development to China's poor western provinces. Nevertheless, the government's hope that the effect of FDI will trickle down to the inland regions is taking time. Restructuring however is expected to intensify as China has entered the WTO. Its accession into the WTO may allow domestic firms to enter markets in provinces outside their

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localities. Until that has been done, significant differences will continue to prevail between the two regions. Consequently, differences in the level and pace of development and the region-specific policies may cause firms in the two regions to differ in their levels of financial constraints.

In the light of this, we investigate whether firms in the different regions of China have different degrees of financial constraints and whether these differences that exist in the different types of regions are reflected in the types of firms that face financial constraints. To this effect, we estimate equation 4.3 but replace the ownership dummies with regional dummies and present our results in Table 4.2 column 3. Our reference category is the non-coastal region. Our results indeed show a difference in the degree of financial constraints of firms in different regions and this is irrespective of the measure of financial constraints used. In particular, the coefficient of the interaction between coast and cash flow and coast and debt are significantly negative, indicating that firms in the coastal region are relatively less financially constrained than firms in the non-coastal region. Again, we are not surprised about these findings. What it simply means is that the discrepancies in the infrastructural and institutional development in both regions also have important implications for firms' financial constraints. The question now is why is liquidity constraint more binding for firms in the non-coastal region than in the coastal region? The administrative and structural barriers together with the poor institutional and infrastructural development in the non-coastal region may explain this. In the non-coastal region, inadequate formal financial institutions coupled with the small market size in the non-coastal region compared to the coastal region could be major contributory factors. For instance, in the non-coastal region, the local authority makes stringent policies to protect firms that produce for local consumption and these are usually domestic firms. This means that domestic enterprises that produce for the local market in the non-coastal region receive distinctive protection from the government compared to other firms. Some local authorities in the non-coastal region go as far as to forbid bank lending to the outside private firms (Steingress and Vanderbussche, 2008).

Given this situation, only a restricted number of firms are likely to receive financial assistance from formal financial institutions. The coastal region on the other hand seems somewhat different. Policies are more flexible,

making it easier for firms to enter. Since most firms do not produce for local consumption[45], they are not protected by region-specific policies. Therefore, the most efficient firm has the easiest access to external finance when its cash flow reduces. Secondly, special incentives are granted for investment in the Special Economic Zones (SEZ) which is mainly located in the coastal region. For instance, the rate of income tax levied on production-oriented foreign investment enterprises in this zone is about 15%. In addition, reduced income tax rates are granted for foreign investments in the Economic and Technological Development Zones (ETDZs), which are mostly located in the coastal region (UNCTAD, 2000). This policy is likely to enhance the financial health of firms in this region.

Table 4.2 columns 4 and 5 give the results for the financial constraints of different types of firms in the coastal and non-coastal regions respectively. From Table 4.2 column 4, the coastal region appears to be moving in the same direction as the entire manufacturing sector. The coefficients on the interaction of cash flow and debt with WF firms' dummy are both negative and statistically significant. This implies that WF firms are less financially constrained than PD firms. Particularly, the results show that if the financial constraints of WF firms increase by 1%, they will postpone investment today and increase future investment by about 2% and 0.05% less than how much PD firms will increase their future investment using cash flow and debt respectively. These results imply that, indeed, better managerial practices brought forth by foreign firms have a positive impact on their financial constraints in the coastal region. PD firms may have better political links which may enable them have access to some level of finance, but they are still unable to catch up with the WF firms. In addition, we can also attribute the low financial constraints faced by WF firms to the special incentives granted to foreign invested firms in the coast. JVs are however not different from PD firms. They are both equally financially constrained. Though JVs also have some proportion of foreign capital in them, the tax incentive alone cannot help offset their financial constraints. The influence brought forth by their domestic component also has a part to play.

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[45] About 66.3% of firms produce for the export market in the coast.

The situation is rather different in the non-coastal region. From table 4.2 column 5, both the coefficients of the interaction between cash flow and the ownership dummies and the interaction of debt and the ownership dummies indicate that there exists no difference among the financial constraints of the different types of firms. Well, the only reason for these results is that no such incentive exists for any firm. As a result, no firm is given special treatment.

4.6.4 Estimation Results for Soft Budget Constraints

To test the notion of soft-budget constraints in China, we test equation (4.3) separately for private PD firms and purely domestic state-owned enterprises and report the results in Table 4.3 above.

Table 4.3: Soft Budget Constraint Test

Dependent Variable: (Investment/Capital Stock)	Test of Financial Constraints of Purely Domestic Private Firms (1)	Test of Financial Constraints of Purely Domestic State-Owned Firms (2)
Lagged(Investment/ Capital Stock)	-0.05	-0.04**
	(0.02)	(0.09)
Lagged(Investment/ Capital Stock)^2	0.0002	0.01
	(0.004)	(0.02)
Lagged(Cash Flow/Capital Stock)	0.01**	-0.002
	(0.01)	(0.03)
Lagged(Sales/Capital Stock)	-0.00004	0.002*
	(0.001)	(0.001)
Lagged(Debt/Capital Stock)	0.002*	-0.01*
	(0.001)	(0.003)
N	6453	4136
AR(2)z	1.26	0.89
Hansen Test	chi2(41)=54.55	chi2(32)=35.89

Notes: Estimation was done using GMM forward orthogonal deviation method. Reported estimates are the coefficients of each of the variables. The t statistics are reported in parenthesis. *** means significant at 1%, ** significant at 5% and *, significant at 10%. The first and second order serial correlation tests are asymptotically distributed as N (0,1) under the null of no serial correlation. The Hansen Test is a test of over identifying restrictions, distributed as a chi-squared under the null of instrument validity. We also used two or more lags of all variables in the regression as instruments.

Table 4.3 columns 1 and 2 show that while purely domestic state-owned enterprises are not financially constrained because the coefficient for cash flow for them is not significant and even that for debt is negative, purely domestic private firms are financially constrained. In effect, using debt, if purely domestic private firms' financial constraints increase by 1%, future investment will increase by about 0.02%. The difference between the SOEs and the Private

Firms as far as financing is concerned rests on the considerations given to the SOEs by the banks. The evidence provided can re-emphasise this point.

4.6.5 Test for Crowding Out

Next, we investigate the impact of the share of foreign borrowing on purely domestic private firms by estimating equation (4.4), and we present the results in Table 4.4. Here, our variables of interest are *Lagged (Share of Foreign Debt*Debt/Capital Stock) and Lagged (Share of Foreign Debt* Cash Flow/Capital Stock).*

Table 4.4: Test for Crowding Out

Dependent Variable(Investment/ Capital Stock)	Crowding Out Test for Purely Domestic Firms		
	All Firms (1)	Domestic Purely State-Owned Enterprises (2)	Purely Domestic Private Firms (3)
Lagged(Investment/ Capital Stock)	-0.07***	-0.04	-0.08**
	(0.01)	(0.03)	(0.03)
Lagged(Cash flow/ Capital Stock)	0.04***	0.07**	0.14**
	(0.01)	(0.04)	(0.05)
Lagged(Investment/ Capital Stock)^2	0.24***	0.27	0.41***
	(0.06)	(0.22)	(0.14)
Lagged(Sales/Capital Stock)	0.0005*	0.0005	0.001
	(0.0003)	(0.002)	(0.001)
Lagged(Debt/Capital Stock)	0.04**	0.02	0.01*
	(0.002)	(0.01)	(0.01)
Lagged(Share of Foreign Debt)	0.03*	0.14**	0.28
	(0.02)	(0.07)	(0.20)
Lagged(Share of Foreign Debt*Debt/Capital Stock)	-0.01**	-0.05	-0.04*
	(0.04)	(0.03)	(0.02)
Lagged(Share of Foreign Debt*Cash flow/Capital Stock)	-0.07*	-0.13	-0.49***
	(0.03)	(0.11)	(0.18)
N	24658	3828	6047
AR(2) z	1.92	0.8	1.17
Hansen Test	chi2(68)=195.13	chi2(46)=62.66	chi2(37)=35.25

Notes: Estimation was done using GMM forward orthogonal deviation method. Reported estimates are the coefficients of each of the variables. The t statistics are reported in parenthesis. *** means significant at 1%, ** significant at 5% and *, significant at 10%. The first and second order serial correlation tests are asymptotically distributed as N (0, 1) under the null of no serial correlation. The Hansen Test is a test of over identifying restrictions, distributed as a chi – square under the null of instrument validity. Time Dummies were included in the estimation as both regressors and instruments. We also used two or more lags of all variables in the regression as well as that of the variable

As already stated in Section 4.1, private firms find it difficult to access credit from the banks because loans are seldom made on the basis of economic considerations. Rather, they are made on the basis of political consideration. As a result, foreign capital may prove useful to them by enhancing their financial status. To investigate this, we carry out a crowding out test by estimating

equation (4.4) for domestic private firms. Table 4.4 columns 1 and 2 report the results for all PD firms, Purely Domestic State-Owned Enterprises and Purely Domestic Private Firms respectively.

Our results from Table 4.4 column1 using both cash flow and debt show that all PD firms' financial constraints are relieved by the presence of foreign firms. Since we have shown in our previous analyses that purely domestic state-owned enterprises are not financially constrained, we believe that these results are mainly driven by the impact of the share of foreign borrowing on purely domestic private firms. This is confirmed by the results in Table 4.4 column 2. The results in Table 4.4 column 2 shows that purely domestic private firms' financial constraints are alleviated by the presence of foreign firms when both cash flow and debt are considered. The coefficient of the share of foreign debt*cash flow/capital stock and share of foreign debt*debt/capital stock are significant and negative for only purely domestic private firms. This means that private domestic firms that suffer from lending bias on China's financial market can have access to an alternative source of financing through foreign direct investment. How then are they able to relieve them of their financial constraints? As indicated by Guariglia and Mateut (2010), foreign firms because of their large size and less risky characteristic will find it easier to compete with the purely domestic private firms on the local financial market. In addition to their easy access to the capital from the local financial market, they find it easier to borrow from the international financial market compared to the local market.

If borrowing from the international market and from abroad turns out to be cheaper for foreign firms[46], then, foreign firms will borrow more from the international market, creating space in the domestic financial market for the purely domestic private firms. Moreover, foreign firms after receiving finance from the international financial market may make available the funds in the local financial market, creating a large pool of resources for domestic private firms to tap. Private Domestic firms will also benefit from technological spill-over which can also help to reduce their overall financial constraints. That said, our findings can be readily connected with the findings of Poncet and

[46] According to a report submitted by the World Bank Beijing office, the situation whereby foreign firms may have limited access to domestic direct finance occurs very often in China.

Hericourt (2008). Using debt however, we find that foreign firms have no impact on private domestic firms' financial constraints. Here again, it is evident that a difference lies between using debt and using cash flow.

4.6.6 Robustness Check

4.6.6.1 Using Alternative Specifications

As a robustness check to the results presented above, we estimate equation (4.3) by interacting the three ownership dummies with just cash flow in one specification and in another specification with just debt. Table 4.A1 columns 1 and 2 respectively present the results for these specifications. From Table 4.A1 columns 1 and 2, we confirm that WF are less financially constrained than PD firms in both cases JVs and PD firms are not different in their financial constraints. They are both more financially constrained.

In an attempt to clarify our results, we use a different set of classification which is based on how much foreign capital a foreign firm should have to be able to qualify for the tax incentive. In China, if a firm has over 25% of foreign capital it qualifies for tax incentive. Therefore, in this new classification, all firms that have 25% or less foreign capital are classified as PD firms. We then divide those who qualify to benefit from the tax incentive policy into two: those with between 25% and 75% foreign capital who now become our JVs and those with above 75% foreign capital who now become our WF firms. We present these results in table 4.A2. Our results still show that WF firms are less financially constrained than PD firms but JVs are not different from PD firms in terms of financial constraints.

4.6.6.2 Using Registration as a Measure of Foreign Ownership

It is possible for our initial measure of ownership (based on the fraction of paid-in-capital by different investors) to suffer from miscoding. Consequently, we check the robustness of our results by considering registration as another measure of foreign ownership. For this reason, we replace our PD, JV and WF dummies with dummies which correspond to purely domestic firms (PDR), joint ventures (JVR) and wholly foreign firms (WFR) on the basis of their registration codes.

Using this new measure of foreign ownership, our data shows that 63.17% of the firms are registered as purely domestic, 19.07% as JV firms and 17.67% are purely foreign firms. These percentages are similar to the percentage of firms in each group using foreign capital. We report the results of our estimates in Table 4.A3. Most of the results here confirm the results of foreign capital. Table 4.A3 column1 reports the results of the test of financial constraints of the different types of firms. The results confirm the initial finding obtained using the fraction of paid-in capital. Using debt and cash flow, we find that all firms are financially constrained. By testing for the degree of financial constraints faced by different types of firms, our results in Table 4.A3 column2 also yield similar outcome as when foreign capital was used. The only difference is that using registration as the basis for classifying firms and debt as a measure of financial constraints, there seems to be no difference among the financial constraints of the different types of firms. However, like foreign capital, cash flow shows that both JV and WF Firms are relatively less financially constrained than their counterparts PD firms. Again, similar to the results obtained using foreign capital, the results in table 4.A3 column 3 shows that manufacturing firms in the coastal region are relatively less financially constrained than their counterparts in the non-coastal region.

4.6.6.3 Using Provincial Dummies to Construct the Share of Foreign Borrowing

In China, firms may have some peculiar characteristics because they are located in particular provinces. Recognising this, we construct a new measure of share of foreign borrowing and this time instead of constructing it by year and industry; we replace our industry dummies with provincial dummies to verify whether the estimates of equations (4.3) and (4.4) in section 5 are robust. That is,

Where FOSD= Foreign-Owned Share of Debt, i=firm, d=province and t=time. We report our results in Table 4.A3. The results from Table 4.A3 confirm the

results in Table 4.2. From Table 4.A3 column1, both WF firms and JV firms are relatively less financially constrained than PD firms. The results provided in Table 4.2 for the separate regions are also confirmed: Manufacturing firms in the coastal region are relatively less financially constrained than those in the non-coastal regions.

4.7. Conclusion and Policy Recommendations

In this study, we have used a large unbalanced panel of over 20,000 manufacturing firms over the period 2000-2005 and a dynamic investment model to investigate which group of firms is more financially constrained in China. We have done this by dividing firms in the dataset into three different groups: Purely Domestic, Joint Ventures and Purely Foreign- Owned firms. We have also included two measures of financial constraints in one specification to check the consistency of our results. Evidence suggests that while Wholly-Foreign firms have a relatively lower degree of financial constraints compared to Purely Domestic firms, Joint Ventures' financial constraints may not be different from that of Purely Domestic Firms. They are equally more financially constrained. These results have at least two implications. First, to some extent, we can conclude that having some degree of foreign ownership does indeed impact positively on manufacturing firms' financial health. Second, the results also suggest that irrespective of the political links enjoyed by Purely Domestic Firms in China, Wholly Foreign Firms are able to combine their better managerial practices with the special incentives they received from the Chinese government to be in a better financial standing than, Purely Domestic Firms.

By acknowledging that firms may differ in their financial constraints based on the regions in which they are located, we split the sample into two different regions (coastal and non-coastal). Results from these sub-samples indicate significant differences between the financial constraints of firms in the coastal region and the non-coastal region. We have shown explicitly in our results that firms in the coastal region are relatively less financially constrained than firms in the non-coastal region. These results can be attributed to the different institutional structures that exist in different regions. Further investigations into which types of firms are relatively less financially

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constrained in each region reveals that while different firms in the coastal region tend to tow the same lines as different firms in the entire manufacturing sector, in the non-coastal region, no significant difference exists between the financial constraints of the Purely Domestic, Joint Ventures and Wholly-Foreign Firms. We attribute these results to the special tax incentives given to foreign firms in the coastal region. Overall, our results suggest that WF firms are mostly less financially constrained relative to Joint Ventures and Purely Domestic Firms. It also suggests that firms may be heterogeneous across regions. By implication, our results suggest that the withdrawal of the tax incentives given to foreign firms in 2008 may improve the financial constraints of Purely Domestic Firms and this may be more pronounced in the coastal region. Domestic Firms will now have an urge over Foreign Firms as the benefits of foreign firms are being reduced. Joint Ventures are however likely to suffer the most as despite the tax incentive provided them, they are still financially constrained. Looking at it from the perspective of the non-coastal region, firms with some Wholly Foreign firms will have their financial status deteriorated more as all firms have been found to be equally financially constrained.

We have also examined the assertion that loans made by the Chinese financial system are mainly made on the basis of political consideration rather than economic consideration. We have done this by investigating whether purely domestic private firms face more financial constraints than purely domestic state-owned enterprises. Indeed, our results provide support to the notion of the soft-budget enjoyed by SOEs. Following these results, we have provided a further check on whether purely domestic private firms can have an alternative source of finance from foreign firms. Our results suggest that foreign firms are able to relieve purely domestic private firms in China of their financial constraints.

These findings allow us to predict the effect of policies geared towards attracting foreign direct investment on private domestic firms in China and also allows us to make specific policies for specific regions. From the outcome of this study, we recommend that specific policies should be made for specific regions in terms of offering assistance to firms as the types of firms that are considered relatively more financially constrained are different. For instance, if

the government wants to close the gap that occurs in the financial constraints of the various ownership groups, it needs to eliminate the tax incentive policies for wholly-foreign firms in the coastal regions to make them equal with purely domestic firms and joint ventures in terms of financial constraints. On the other hand, if the government wants to put domestic firms in an advantageous position, then it can just provide more incentives for the purely domestic firms in the coastal region to reduce their financial constraints. For the various regions, we recommend the Chinese government to give equal incentives to all regions in order to bridge the gap between firms in the coastal and the non-coastal regions. We also recommend more reforms in the financial sector to allow private firms that are mainly the engine of growth to have easy access to external credits. Until this is done, we recommend that government policy geared towards promoting FDI should be encouraged as FDI helps relieve private purely domestic firms of their financial constraints. We interpret our findings as evidence in favour of the FDI policies.

This study contributes greatly to the emerging literature on the association between firm heterogeneity and financial constraints, as it carries the analysis using a current dataset on a country with different characteristics in different regions. Furthermore, it contributes to Chinese and other literatures on financial constraints by specifically analysing for the first time the issue of financial constraints with respect to different ownership groups in general, and across different regions.

Appendix 4

Definition of Variables Used in the Study

Ownership Variables

PD: dummy variable equal to 1 if the share of the firm's total capital owned by foreign investors is 0, and 0 otherwise.

JV: dummy variable equal to 1 if the share of the firm's total capital owned by foreign investors is greater than 0 but less than 100%, and 0 otherwise.

WF: dummy variable equal to 1 if the share of the firm's total capital owned by foreign investors is 100%, and 0 otherwise.

PDR: dummy variable equal to 1 if the firm registered as purely domestic, and 0 otherwise

JVR: dummy variable equal to 1 if the firm registered as either a contractual joint venture or an equity joint venture (registration codes 210 or 220 or 310 or 330), and 0 otherwise

WFR: dummy variable equal to 1 if the firm registered as a wholly-foreign firm (registration codes 230 or 330), and 0 otherwise

Other variables

Liquidity: ratio of current assets to current liabilities

Collateral: ratio of a firm's tangible assets to its total assets.

Borrowing Ratio: ratio of a firm's interest payment to its cash flow.

Interest Burden: ratio of interest payment to total liabilities of the firm.

Coverage Ratio: ratio of interest payment to interest payment plus profit.

Debt: the sum of current and non-current liabilities

Sales: firm's total sales both domestic and overseas

Table 4.A1: GMM Estimation Results Using Single Financial Variables

Dependent Variable(Investment/Capital Stock)	Financial Constraint Test for Different Firms Using Just Debt (1)	Financial Constraint Test for Different Firms Using Just Cash flow (2)
Lagged(Investment/Capital Stock)	-0.07*** (0.01)	--0.09** (0.04)
Lagged(Investment/Capital Stock)^2	0.21*** (0.05)	0.23 *** (0.09)
Lagged(Sales/Capital Stock)	0.0002 (0.0002)	0.0001 (0.0002)
Lagged(Cash Flow/Capital Stock)	0.015*** (0.003)	-0.03*** (0.007)
Lagged(JV*Debt/ Capital Stock)	-0.001 (0.001)	
Lagged(WF*Debt/ Capital Stock)	-0.003*** (0.001)	
Lagged(JV*Cash Flow/Capital Stock)		-0.02 (0.01)
Lagged(WF*Cash Flow/Capital Stock)		-0.02*** (0.01)
Lagged(Debt/Capital Stock)	0.0028*** (0.0007)	0.002*** (0.0008)
JV	0.007 (0.012)	0.03** (0.01)
WF	0.022** (0.009)	0.05*** (0.01)
Constant	0.018*** (0.004)	0.009 (0.006)
N	43803	43803
AR(2)z	2.25	1.03
Hansen	chi2(77) = 294.63	chi2(65) = 393.09

Notes: Estimation was done using GMM forward orthogonal deviation method. PD, JV and WF represent purely domestic, joint ventures and wholly foreign firms respectively. Reported estimates are the coefficients of each of the variables. The t statistics are reported in parenthesis. *** means significant at 1%, ** significant at 5% and *, significant at 10%. The first and second order serial correlation tests are asymptotically distributed as N (0,1) under the null of no serial correlation. The Hansen Test is a test of over identifying restrictions, distributed as a chi-squared under the null of instrument validity. We also used two or more lags of all variables in the regression as instruments.

Table 4.A2: GMM Estimation Results Using a Different Set of Classification

Dependent Variable(Investment/Capital Stock)	Test of Financial Constraints For Different Types of Firms in the Manufacturing Sector (1)	Test of Financial Constraints For Different Types of Firms in the Coastal Region (2)	Test of financial Constraints For Different Types of Firms in the Non-Coastal Region (3)
Lagged(Investment/Capital Stock)	-0.08**	-0.07***	-0.03
	(0.04)	(0.01)	(0.02)
Lagged(Investment/Capital Stock)^2	0.20**	0.24***	0.08
	(0.09)	(0.06)	(0.10)
Lagged(Cash flow/Capital Stock)	0.02***	0 .02**	0.03***
	(0.01)	(0.01)	(0.01)
Lagged(Sales/ Capital Stock)	0.00002	0.0002	-0.0002
	(0.0003)	(0.0002)	(0.005)
Lagged(Debt/ Capital Stock)	0.003***	0 .004***	0.004*
	(0.001)	(0.001)	(0.002)
Lagged(Cash flow/Capital Stock*JV)	-0.006	-0.007	-0.00005
	(0.02)	(0.01)	(0.03)
Lagged (Cash flow/Capital Stock*WF)	-0.18**	-0.02*	-0.02
	(0.007)	(0.01)	(0.02)
Lagged(Debt/ Capital Stock*JV)	-0.001	-0.002	0.005
	(0.001)	(0.001)	(0.003)
Lagged(Debt/ Capital Stock*WF)	-0.003***	-0.005***	0.003
	(0.001)	(0.001)	(0.003)
Lagged(Debt/Capital Stock*Coast)			
JV	0.02	0.03*	-0.03
	(0.01)	(0.02)	(0.02)
WF	0.03***	0.06***	-0.03
	(0.01)	(0.01)	(0.003)
Constant	0.01*	0.001	0.02***
	(0.01)	(0.008)	(0.005)
N	44380	33599	10204
AR(2) z	1.24	2.02	0.98
Hansen Test	chi2(82)=248.24	chi2(87) = 262.32	chi2(87) = 259.05

Notes: In this estimation we define Purely Domestic (PD) as any firm with a foreign capital of less than or equal to 25%, Joint Venture (JV) as any firm with foreign capital between 25% and 75% and Wholly Foreign Firm as any firm with above 75% of foreign ownership.

Table 4.A3 GMM Estimation Results Using Registration

Dependent Variable(Investment/Capital Stock)	Test of Financial Constraints of All Firms (1)	Test of Financial Constraints For Different Types of Firms in the Manufacturing Sector (2)	Test of Financial Constraints For Firms in Different Regions (3)	Test of Financial Constraints For Different Types of Firms in the Coastal Region (4)	Test of financial Constraints For Different Types of Firms in the Non-Coastal Region (5)
Lagged(Investment/Capital Stock)	-0.06***	-0.08**	-0.07***	-0.11***	-0.02
	(0.01)	(0.04)	(0.01)	(0.04)	(0.06)
Lagged(Investment/Capital Stock)^2	-0.02	0.20**	0.21***	0.27***	0.07
	(0.02)	(0.08)	(0.05)	(0.1)	(0.15)
Lagged(Cash flow/Capital Stock)	0.02***	0.03***	0.04***	0.02**	0.01
	(0.002)	(0.008)	(0.01)	(0.01)	(0.03)
Lagged(Sales/ Capital Stock)	0.0001	-0.00003	0.0003	0.0003	0.001
	(0.0002)	(0.0002)	(0.0002)	(0.0003)	(0.001)
Lagged(Debt/ Capital Stock)	0.002***	0.004***	0.01***	0.003**	0.005*
	(0.001)	(0.001)	(0.002)	(0.001)	(0.003)
Lagged(Cash flow/Capital Stock*JVR)		-0.02		-0.01	-0.005
		(0.01)		(0.02)	(0.03)
Lagged (Cash flow/Capital Stock*WFR)		-0.02***		-0.02*	-0.05
		(0.009)		(0.01)	(0.04)
Lagged(Debt/ Capital Stock*JVR)		-0.003		-0.003	0.003
		(0.002)		(0.002)	(0.004)
Lagged(Debt/ Capital Stock*WFR)		-0.004**		-0.003	-0.005
		(0.002)		(0.002)	(0.006)
Lagged(Debt/Capital Stock*Coast)			-0.01***		
			(0.002)		
Lagged (Cash flow/Capital Stock*Coast)			-0.03***		
			(0.01)		
JVR		0.05***		0.05***	0.03
		(0.01)		(0.01)	(0.03)
WFR		0.06***		0.06***	0.06
		(0.01)		(0.01)	(0.04)
Coast			0.08***		
			(0.03)		
Constant		0.004	-0.04*	0.002	0.01*
		(0.006)	(0.02)	(0.008)	(0.01)
N	46758	44260	44280	33908	10352
AR(2) z	2.36	1.38	2.34	0.76	1.19
Hansen Test	chi2(41)=172.86	chi2(79)=449.8	chi2(42)=237.64	chi2(79) = 424.06	chi2(71) = 92.75

Notes: Estimation was done using GMM forward orthogonal deviation method. PDR, JVR and WFR represent purely domestic, joint ventures and wholly foreign respectively firms based on registration. Reported estimates are the coefficients of each of the variables. The t statistics are reported in parenthesis. *** means significant at 1%, ** significant at 5% and *, significant at 10%. The first and second order serial correlation tests are asymptotically distributed as N (0, 1) under the null of no serial correlation. The Hansen Test is a test of over identifying restrictions, distributed as a chi-squared under the null of instrument validity. We also used two or more lags of all variables in the regression as instruments.

Table 4.A4: Soft Budget Constraint Test Using Registration

Dependent Variable(Investment/Capital Stock)	Test of Financial Constraints of Purely Domestic Private Firms (1)	Test of Financial Constraints of Purely Domestic State-Owned Firms (2)
Lagged(Investment/ Capital Stock)	-0.07 (0.13)	-0.07* (0.04)
Lagged(Investment/ Capital Stock)^2	-0.0002 (0.01)	0.007 (0.02)
Lagged(Cash Flow/Capital Stock)	0.07** (0.04)	-0.01 (0.03)
Lagged(Sales/Capital Stock)	-0.004 (0.002)**	0.01* (0.004)
Lagged(Debt/Capital Stock)	0.01*** (0.01)	0.003 (0.01)
N	4444	2802
AR(2)z	0.68	0.87
Hansen Test	chi2(16)=11.14	chi2(34)=35.42

Notes: Estimation was done using GMM forward orthogonal deviation method. Reported estimates are the coefficients of each of the variables. The t statistics are reported in parenthesis. *** means significant at 1%, ** significant at 5% and *, significant at 10%. The first and second order serial correlation tests are asymptotically distributed as N (0,1) under the null of no serial correlation. The Hansen Test is a test of over identifying restrictions, distributed as a chi-squared under the null of instrument validity. We also used two or more lags of all variables in the regression as instruments.

Table 4.A5: Crowding Out Test Using Registration

Dependent Variable(Investment/ Capital Stock)	Crowding Out Test for Purely Domestic Firms (1)	Crowding Out Test for Purely Domestic State -Owned Enterprises (2)	Crowding Out Test for Purely Domestic Private Firms (3)
Lagged(Investment/ Capital Stock)	-0.07***	-0.04	-0.08
	(0.01)	(0.03)	(0.03)
Lagged(Cash flow/ Capital Stock)	0.04***	0.07**	0.10**
	(0.01)	(0.04)	(0.04)
Lagged(Investment/ Capital Stock)^2	0.27***	0.27	0.39***
	(0.07)	(0.22)	(0.13)
Lagged(Sales/Capital Stock)	0.0004	0.0005	0.001
	(0.0003)	(0.002)	(0.001)
Lagged(Debt/Capital Stock)	0.01***	0.02	0.01
	(0.002)	(0.01)	(0.01)
Lagged(Share of Foreign Debt)	0.03	0.14**	0.16*
	(0.02)	(0.07)	(0.09)
Lagged(Share of Foreign Debt*Debt/Capital Stock)	-0.01***	-0.05	-0.02
	(0.040)	(0.03)	(0.02)
Lagged(Share of Foreign Debt*Cash flow/Capital Stock)	-0.05*	-0.13	-0.33**
	(0.03)	(0.11)	(0.16)
N	26077	3828	6047
AR(2) z	2.38	0.8	1.24
Hansen Test	chi2(68)=194.66	chi2(46)=62.66	chi2(32)=42.93

Notes: Estimation was done using GMM forward orthogonal deviation method. Reported estimates are the coefficients of each of the variables. The t statistics are reported in parenthesis. *** means significant at 1%, ** significant at 5% and *, significant at 10%. The first and second order serial correlation tests are asymptotically distributed as N (0, 1) under the null of no serial correlation. The Hansen Test is a test of over identifying restrictions, distributed as a chi – square under the null of instrument validity. Time Dummies were included in the estimation as both regressors and instruments. We also used two or more lags of all variables in the regression as

Table 4.A6: Estimation Results Using Provincial Dummies to Construct Share of Foreign Debt

Dependent Variable (Investment/Capital Stock)	Test of Financial Constraints For Different Firms (1)	Test of Financial Constraints For Purely Domestic Private Firms (2)	Test of Financial Constraints For Firms in Different Regions (3)	Financial Constraint Test for Purely Domestic State-Owned Enterprises (4)
Lagged(Investment/ Capital Stock)	-0.06*** (0.01)	-0.05 ** (0.02)	-0.07*** (0.01)	-0.06 (0.25)
Lagged(Investment/ Capital Stock)^2	0.22*** (0.05)	0.0002 (0.004)	0.21*** (0.05)	0.01 (0.03)
Lagged(Sales/Capital Stock)	0.0002 (0.0002)	-0.00004 (0.001)	0.0003 (0.0002)	0.003 (0.003)
Lagged(JV*Cash flow/Capital Stock)	-0.02*** (0.01)			
Lagged(WF*Cash flow/Capital Stock)	-0.02*** (0.006)			
Lagged(JV*Debt/Capital Stock)	-0.0004 (0.001)			
Lagged(WF*Debt/Capital Stock)	-0.002** (0.001)			
Lagged(Cash flow/Capital Stock)	0.02*** (0.004)	0.01*** (0.01)	0.04*** (0.01)	0.03 (0.04)
Lagged(Debt/Capital Stock)	0.003*** (0.001)	0.002*** (0.001)	0.01*** (0.002)	-0.01* (0.004)
JV	0.01 (0.01)			
WF	0.03*** (0.01)			
Lagged(Coast*Cash flow/Capital Stock)			-0.03***	
Lagged(Coast*Debt/Capital Stock)			(0.01) -0.01***	
Coast			(0.01)*** 0.08	
Constant	0.02*** (0.004)		-0.04*** (0.02)	
N	43803	6453	44280	4136
AR(2) z	2.26	1.26	2.34	0.45
Hansen Test	chi2(95) =307.97	chi2(41) = 54.55	chi2(42)=237.64	chi2(11) =7.84

Notes: Estimation was done using GMM forward orthogonal deviation method. PD, JV and WF represent purely domestic, joint ventures and wholly foreign firms respectively. Reported estimates are the coefficients of each of the variables. The t statistics are reported in parenthesis. *** means significant at 1%, ** significant at 5% and *, significant at 10%. The first and second order serial correlation tests are asymptotically distributed as N (0,1) under the null of no serial correlation. The Hansen Test is a test of over identifying restrictions, distributed as a chi – square under the null of instrument validity. Time Dummies were included in the estimation as both regressors and instruments. We also used two or more lags of all variables in the regression as well as that of the variable.

Chapter 5

5 Global Engagement and Financing Decisions

5.1 Theories of Capital Structure and Literature Review

5.1.1 Theories of Capital Structure

Capital structure, which can also be referred to as the financial structure of a firm, is defined as the relative amount of debt and equity that a firm uses to maintain itself. A firm's capital structure is of great relevance since it determines the firm's ability to meet the needs of its stakeholders. In addition, an appropriate choice of capital structure also helps the firm to operate effectively within the competitive environment in which it functions.

One cannot talk about capital structure theories without referring to the landmark paper of Modigliani and Miller (1958). Their irrelevance theory of capital structure decisions for firm value has long-served as the reference point for all theoretical and empirical discussions on capital structure. The no-arbitrage results that they obtain suggest that in the absence of taxes, transportation costs, etc., the value of a firm is not affected by capital structure decisions. Their theory therefore rules out the relevance of any form of capital market imperfections.

In the real world however, capital markets are not perfect. Transactions costs and taxes exist. Therefore, taking capital market imperfections into account, various controversies have arisen among finance scholars when it comes to the issue of capital structure. Yet, researchers have so far not reached any consensus on this issue. Some have been major proponents of the 'Pecking Order Theory' while others have been in support of the 'Trade - Off Theory'. These are the two most influential and classical theories of capital structure. More recently, two other theories have emerged, namely, the 'Behavioural Finance Theory' and the 'Market Timing Theory'. Below we outline these competing theories and explain in detail how they are linked to capital structure.

5.1.1.1 The Trade-Off Theory (TOT, hereafter)

This theory predicts that when corporate income tax is included in the original irrelevance theorem (see Modigliani and Miller, 1963), it creates a benefit for using more debt by serving as a shield earnings from taxes. According to the theory, if we assume away any offsetting cost of debt, firms would use 100% debt-financing. This prediction is however extreme. To avoid this strong prediction, an offsetting cost is assumed and this cost is inevitably bankruptcy. Hence, a relevant aspect of this theory is that on one hand, there is an advantage to financing with debt, the tax benefits of debt, and on the other hand, a cost of financing with debt also exists, the cost of financial distress including bankruptcy and non-bankruptcy costs of debt. It follows that the marginal benefits of using more debt reduces as debt increases while the marginal cost increases. To this end, the TOT posits that firms maximize their value when the benefits that stem from debt (tax shield and the reduction of free cash-flow problems) equal the marginal cost of debt (bankruptcy cost and agency costs between shareholders and bondholders). In other words, it assumes that firms maximize their value at an optimal debt ratio by weighing the benefits and costs of debt. This is what the static trade-off theory considers.

An extension to the static model is that, firms will rebalance towards their targets when shocks cause deviations from the optimum level. The adjustment process is expected to be instantaneous and complete in a frictionless world. However, in the presence of transaction costs, the adjustment process will be incomplete. This is the suggestion brought forth by the dynamic trade-off theory. Unfortunately, there has been no agreement on the speed of adjustment. While Fama and French (2002) and Huang and Ritter (2005) argue that the rate of the adjustment process is slow, Jalilvand and Harris (1984) and, Flannery and Rangan (2006) argue in favor of a fast adjustment process. The implication for a slow speed of adjustment is that firms do not have target leverage or even if they have, it is considered unimportant. By contrast, a fast speed of adjustment implies that the optimal capital structure is determined by the trade-off between the cost and the benefit of debt.

As explained above, the TOT can be explained by the agency cost problem and the tax-based theories. We will discuss in detail below one after the other the main drivers and explain how these drivers are linked to the TOT.

5.1.1.1a Tax-Based Theory

Graham (1996), Graham (2000) and Green, Murinde and Suppakitjarak (2002) believe that tax benefits have an important effect on the financing decisions of firms. Underlying this belief is that, firms are allowed to deduct interest on debt from their profit before paying corporate taxes. But this is not the case if firms have to use equity. Payments associated with equity such as dividends are not tax deductible. This suggests that firms would want to use more debt to take advantage of the benefits derived from using debt: As more debt is used, the after tax advantage to the owners also increases. In other words, using debt instead of equity enables firms to pass on greater returns to the investor by reducing payments to the government.

Nevertheless, while there exists some tax benefits associated with using much debt, the interest payments accrued to investors as income are taxable. This can deter investors from holding more corporate debt. For instance, Miller (1977) and Myers (2002) both point out that, as firms hold more debt, a great deal of enticement is needed for investors with higher tax brackets to receive more of their income in the form of interest payment. In addition, Fama and French (2002) argue that debt usage has two offsetting effects on optimal capital structure. The tax deductibility of interest pushes firms to use more debt while the higher personal income tax rates prevent investors from using more debt. This implies that the tax benefits arising from the usage of debt are likely to be counterbalanced by a high tax on interest income.

Another cost associated with the increase in the use of debt is the bankruptcy cost. Bankruptcy costs are the costs incurred when the increased costs of financing with debt increases the probability of default. Hence, any costs associated with bankruptcy will be a disincentive to issue debt (see Kraus and Litzenberger, 1973). However, bankruptcy in itself does not have to be expensive

if the value of the firm is transferred appropriately to the bondholders. Unfortunately, this is usually not the case. More often than not, there are numerous costs associated with financial distress and these are usually grouped into direct and indirect costs. The direct costs include payments to third parties and wasted time and effort, whilst the indirect costs include the cautious behavior of customers, the timely demand for payment by their suppliers and the departure of many talented employees.

5.1.1.1b Agency Cost Theories

An agency relationship occurs when one or more individuals (which we term principal) employ one or more individuals (that is, agent) to perform some services and delegates managerial authority to the agents. The main relationships are those between shareholders and managers, and those between debt holders and shareholders. However, these relationships are not always smooth. Agency cost theories are based on conflict of interest. Indeed, the pioneers of agency cost theories, Fama and Miller (1972) and Jensen and Meckling (1976), identify two types of conflicts: conflict between creditors and shareholders and conflicts between managers and shareholders.

5.1.1.1.b1 Conflicts Between Managers and Shareholders

The agency cost theory suggests that managers who have been given the mandate to control decision-making processes of a firm will put their self-interest first at the expense of corporate shareholders. Among the things that they would want to concentrate on is the consumption of more perquisites such as corporate jets, plush offices and increasing the size of the firm (Harris and Raviv, 1991). Agency conflict can be very significant in firms because managers often own little or no percentage of the shares in the firm, which means that shareholders' goal, will not be maximized.

We compare the behavior of a manager when he owns the company exclusively with his behavior when he sells a percentage to outside investors.

They, for example, managers want to invest in activities that will improve the size of the firm. Consider a firm that is managed by the owner. The manager who is also the owner will aim at maximizing his personal welfare. This means that the manager will have to trade off things like leisure and perquisites against personal wealth. The moment some percentage of the firm is sold to the outside investor, the conflict of interest is generated by the divergence between manager's interest and the outside share holder's interest. The manager now believes that less of any more wealth that is accrued to the firm will now come to him and will therefore want to pursue his own goals. As a result, the managers will rather want to pursue their own goals. They will now decide to consume more leisure and perquisites, the cost of which will now be borne by the outside investor. By doing this, they are able to improve their own status and enhance their job security. Therefore, the lower the share of the owner-manager, the higher the tendency for him to appropriate larger amounts of corporate finances in the form of perquisites.

To avoid this problem, certain measures such as punishment and incentives should be instituted in the firm. However, these measures can only be effective if shareholders are able to discern the actions of managers. Unfortunately, in most cases shareholders are not able to do this. Another way of solving this problem is provided in Jensen and Meckling (1976). They argue that if manager's ownership of the firm increases, they will act in the interest of the firm. In addition, they believe that increasing the use of debt by a firm reduces the free-cash flow available to the firm and prevents managers from undertaking unnecessary expenditure that will only enhance their status.

5.1.1.1. b2 Conflict between Shareholders and Debt Holders

The second agency conflict is between debt holders and shareholders. Debt holders are entitled to interest and principal payment of debt as well as the company's assets when it goes bankrupt. Shareholders on the other hand own and control the firm. On the basis of a firm's riskiness and its existing capital structure decision, debt holders lend capital to the firm. Debt holders tend to benefit more when a project is successful. They still receive their original return which was based on the initial low risk rate in the event of success. In the event of a failure, however,

the debt-holders will have to share in the losses. Due to this asymmetry in risk-sharing, shareholders have an incentive to take up risky projects that have high returns while debt holders prefer low -risk projects. This creates a conflict between shareholders and bond holders.

5.1.1.2 The Pecking Order Theory (POT, hereafter)

This theory which has its roots in the literature provided by Donaldson (1961) was clearly expressed by Myers and Majluf (1984) and Myers (1984). The underlying rational is most often derived from informational asymmetries between firm insiders and outsiders. The theory holds that firms generally prefer inside financing to outside financing. According to Goyal and Murray (2003), equity is subject to serious adverse selection, debt has minor adverse selection problems while retained earnings are free of adverse selection problems. Hence, an investor will require a higher rate of return on equity than on debt. From the point of view of the insiders of a firm, retained earnings have no cost while debt has a lower cost associated with it than equity. As a result, this theory predicts that firms follow a hierarchical pattern in financing sources such that internal financing is always preferred to external financing and borrowing is preferred to issuing risky assets (Small Stock, 2009). This preference order is expected to be followed irrespective of shocks. An important implication of the POT is that no optimal capital structure exists. Rather, it assumes that observed leverage is the result of net cash flows (cash earnings-investment outlays). That is, it predicts that when investment exceeds retained earnings, debt grows, but debt declines when investment falls below retained earnings. Thus, the existence of adjustment behavior distinguishes the trade-off theory from the pecking order theory.

As indicated above, the POT can be explained by asymmetric information. Below, we explain in detail how asymmetric information is linked with this particular theorem.

5.1.1.2. a Asymmetric Information

Asymmetric information is based on the pioneering work of Myers (1984) and is viewed as intrinsic to the firm. Myers (1984) argues that, if managers have superior knowledge about investment opportunities and the value of the firm's risky securities than the market, the market penalizes the issuance of securities. In other words, investors become aware of this and quickly discount the prices of these securities when they are announced. In anticipation of these price discounts, managers might forego profitable investment opportunities. To avoid these distortions in investment decision, firms may have a strong desire for internal finance (Myers, 1984) as internal finance is believed to be insensitive to the information advantages by insiders, have a cost advantage over external finance and also involves no asymmetric information. It further states that high growth firms may reduce leverage and use more of retained earnings for current investment in an attempt to avoid issuing equity when investment exceeds cash earnings. If for some reason they exhaust all internal finance and require external finance, debt is used and when that is also completely exhausted, they issue equity. The theory therefore predicts that companies should fall on stock issuance only after cheaper alternatives have been used up.

5.1.1.3 Other Theories

Two other theoretical ideas that compete with the trade-off and the pecking order theories are *Behavioral finance* and the *Market-Timing* Theories. However, these theories have not been highly researched into. Below we explain in detail what they mean and how they differ from the POT and the TOT.

5.1.1.3.a The Market-Timing (or Windows of Opportunity) Theory

With the publication of Baker and Wurgler's (2002) article which relates capital structure to past market-to-book ratios, the market timing theory has increasingly challenged the two already established theories; POT and TOT. According to this theory, the first order determinant of a corporation's capital structure, that is, the

proportion of debt and equity in their liabilities is the relative mis-pricing of these instruments at the time the firm needs to finance investment. According to their explanations, firms issue equity when market prices are overpriced using the corresponding window of opportunity. This theory shows that a firm issues new stock when its market value is greater than the book value.

Therefore, corporate executives issue securities depending on the relative costs of equity and debt, and this has long-lasting effects on the capital structure decisions of firms. That is, firms are not really bothered about whether they finance their investment decisions with equity or debt. Their choice of financing at any point in time is based on whether that form of financing is more valued by financial markets. This means that firms with high growth and investment opportunities have high market values and often issue equity, leading to low leverage ratios.

Taking a careful look at this theory, we can consider it as part of the behavioural finance literature as it does not explicitly explain why asset mispricing should exist, or why firms would be able to tell when there is mispricing. Instead, it assumes this mispricing simply exists and even goes ahead to make a rather strong assumption that, firms find it easier to detect this mispricing than the markets. It can be deduced from the above explanations that the market timing theory and the POT have different implications for the relationship between market values and debt ratios. In addition, neither theory predicts any optimal capital structure like the TOT.

5.1.1.3.b Behavioral Finance Theory

This theory evolved in response to the difficulties faced by the traditional finance theories (that is, Capital Asset Market Pricing (CAPM), The Modern Portfolio Theory (MPT) and the Arbitrage Pricing Theory (APT)). While the traditional theories assumed that investors are rational and consider all available information in their decision- making process, behavioural finance theories argue that investment choices are not always made on the basis of rationality. It deviates from the traditional finance theories by relaxing the two assumptions made by them. That is, to them, (1) agents do not update their beliefs and, (2) agents do not

follow the normal processes in making investment choices. According to this theory, agents are too optimistic or overconfident, pessimistic and fear regret, bias towards how often things come into mind or finally, bias towards making judgments under uncertainty using certain reference points. For example, if managers are overconfident, the theory predicts that they will invest in projects that appear beneficial to them but at the same time value-reducing. Although some models based on expectations argue that the assumption of irrationality can be done away with through the process of arbitrage, behavioural finance theories argue that there are limits to how arbitrage can work and the limitations allow investor irrationality to have impact on prices. They do this by demonstrating that, strategies required to correct the mis-pricing can be expensive and highly risky.

To emphasise their point on investor irrationality and their decision-making process, proponents of behavioural finance theories make use of cognitive psychology, together with the bias that arise when people form beliefs and preferences. Thus, the two main building blocks of behavioural finance are limits to arbitrage and psychology.

In the section that follows, we discuss some theoretical and empirical studies of capital structure and relate them to the various theories

5.2 Earlier Studies on the POT, TOT, Market-Timing and Behavioural Finance Theories.

5.2.1 Theoretical Work

Much of the theoretical work we discuss in this study is based on the POT and the TOT. The empirical work however comprises all theories on capital structure.

5.2.1.1 Theoretical Models Based on the POT

An attempt to introduce into economics the model of private information has clearly led to the emergence of a number of approaches to explaining capital

structure. According to these theories, managers or insiders are presumed to be better informed about some characteristics of the firm's return pattern. Using one set of approach, Myers (1984) and Myers and Majluf (1984) maintain that capital structure is designed to eliminate the inefficiencies associated with firms' investment decisions that arise from imperfect information. Another stream, engineered by Ross (1977) and Leland and Pyle (1977), explain that, the decision by a firm to choose some form of capital structure gives a particular indication to outside investors the information of the insiders. Based on these two broad headings that explain the POT, we discuss the various studies under them in the following sub-section. Under each approach, we discuss the studies of the main proponents followed by subsequent studies that have emerged from these main advocators.

5.2.1.1a The Issue of Investment and Capital Structure

In their highly influential work, Myers and Majluf (1984) proved that if investors have less knowledge about the value of the firm's asset compared to the amount of information available to managers, then the price of equity on the market may not reflect the true price. If firms decide to issue new equity to finance their new investment projects, new investors may under-price the value of the firm to the extent that they may benefit more than the NPV of the project, leading to a net loss to existing shareholders. Considering this situation, the project will be rejected even if it had a positive NPV. According to their model, this whole issue of underinvestment can be by-passed if the firm chooses to fund its investment project with a less costly security like internal funds or risk-free debt. To better understand why firms may decide to avoid this investment project, this paper considers the situation below:

A firm has some assets in place but also has to raise additional cash to finance part or all of some valuable investment project and therefore considers issuing common stocks for this project. They make the following assumptions:

- Firms have information that investors do not have, and that both managers and investors are aware of this fact. How much information managers can

release to investors is not immediately known. What is known is that it is costly to transmit information.

- The firm has one existing asset and one investment opportunity, I.

- The investment can be financed by either issuing stocks, using cash balances or selling marketable securities. They refer to the sum of cash and marketable securities as financial slack (S).

- The net present value of the investment opportunity is reduced if it is delayed.

If $S<I$, the firm would have to issue stocks of $E= I-S$ to be able to proceed with the investment project. Also, it is not possible for the firm to take part of the project, which

means that it has to finance all or nothing.

- Capital markets are perfect. There are no transaction costs in issuing equity.

Stockholders are passive. That is, they do not adjust to the firm's issue-invest decision.

Based on the above assumptions, they consider a three-period ($t=-1$, $t=0$ and $t=1$) model. At $t=-1$, there is perfect information. Both the market and the insiders have the same information. At $t=0$, management updates itself on the value of the firm's assets and investment opportunity but the market is unaware of this information until $t=1$.

- The expected future value of the firm's asset at the starting period, that is $t=-1$, is

$A=E$ (A). The distribution of A denotes the updated asset value at $t=0$. Management's updated estimate at $t=0$ is a, the realization of A. The NPV of the investment project is $B=E$ (B). Similarly, the distribution of B represents the asset's possible updated NPV at $t=0$ and management's updated estimate at $t=0$ is b, the realization of B. The values of a and b are

assumed to be positive, implying the presence of limited liability. Managers maximize the intrinsic value of old shares based on the issue-invest decision and knowledge of the realization of a and b. This means that the interest of old shareholders are upheld at the start of $t=0$. P'=market value at $t=0$ of old stockholders' shares if stock is issued and P= market value at $t=0$ if stocks are not issued. As already indicated, since stockholders are passive, new issues of stocks go to a new group of investors. The model therefore assumes that 0 is less than or equal to S and S is less than 1 so that at all cost the project must either be fully or partially financed by stock issues.

- If the firm does not issue stocks despite its knowledge of the true values of a and b, it is not able to invest and so $V^{old} = S+a$. However, if it issues and invests, $E=I-S$ and

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The issuance will benefit old stockholders only when $S+a$.   ————

Put in words, the above equation implies that, if a firm issues stocks, then old shareholders will benefit if and only if the share of the assets in place and slack going to new stockholders is less than the share of increase in the firm value that the old stockholders experience. These equilibrium conditions imply that firms may forfeit good opportunities if they refuse to sell stocks to raise funds.

From the above, an important prediction from Myers and Majluf (1984) is that the decision to issue and invest causes the prices of stocks to reduce. The decision not to issue stock will serve as a good signal for the value of the firm while the decision to issue stocks will serve as a bad signal for the value of the firm. Before the announcement of an equity issue, the firm's market value fully reflects the prior belief about the firm type. Just upon an announcement of an equity release, investors become skeptical about the firm type and reduce the value of the firm. Another implication is that the new project will have the tendency of

being financed by internal sources of funds or risk-free debts. Lastly, these underinvestment problems are likely to be more severe for firms with high informational asymmetries. To sum up, the model of Myers and Majluf (1984) provides explanations for behavior of firms in their financing decisions, including the reason why firms rely on internal finance, and prefer debt to equity if they require external finance. Following Myers and Majluf (1984)'s study, a number of studies have provided extensions to their idea.

Krasker (1986) for instance, modifies the work of Myers and Majluf (1984) by looking at how much to invest rather than deciding on whether to invest or not. Like Myers and Majluf (1984), Krasker (1986) assumes that the amount of new shares issued by a firm affects the firm's stock price in the presence of asymmetric information. The announcement of an equity issue leads to a fall in the share price. According to them, firms' decision to issue stocks sends a signal to the market that the firms' current assets are overvalued and this reduces their price. By extending Myers and Majluf (1984), Krasker (1986) allows the firm to also decide on the size of investment project, how much stocks to issue and whether the firm should issue stocks or not.

Unlike Myers and Majluf (1984), Krasker (1986) use a two-period model with a firm having both existing assets and investment opportunities. In the first period, managers decide on the amount of new stock to issue to finance new investment. However, the value of the firm's existing assets and investment opportunities that managers can observe is unknown to them in the first period and investors can only observe in the second period. Further, he assumes that the firm's market value equal its expected value conditional on the market information. The size of the issue is assumed to be continuous.

Based on these assumptions, the model predicts that for firms that issue stocks, stock prices will be negatively correlated with the size of the issue. Further, the model predicts that when we restrict information asymmetries to the value of the existing assets, the greater the uncertainty about existing asset's value, the higher the stock prices. Despite his slight deviation, his work confirms the results

of Myers and Majluf (1984) and further shows that the larger the stock issues the worse the signal and the fall in the firm's stock prices.

Narayanan (1988) and Heinkel and Zechner (1990) also modify Myers and Majluf (1984) by assuming that although information asymmetries exist for the value of the new investment project, there is perfect knowledge on the value of the firm's asset-in-place. They both show that there can be overinvestment, i.e., it is possible for some negative NPV projects to be undertaken. Their reasoning behind this is that it is difficult to separate firms completely by their NPVs when the only indication which is easily observable is whether the project is undertaken. Therefore, the equilibrium value of any firm represents the average value of all firms in the market. This means that even firms with projects that have low NPVs will benefit from selling overpriced equity. The results will thus be a negative cut-off point NPV, where all firms with a project NPV above that cut-off point will accept the project. Unlike Myers and Majluf (1984), Narayanan (1988) assumes that debt is risky. According to him, firms would have to raise extra capital to cater for their investment since the amount required for undertaking the investment project exceeds the available retained earnings. He observes two scenarios: In one, the firm is only able to issue risky debt while in another; the firm can only issue equity to finance the project. Narayanan (1988) shows that the existence of 'lemons' (that is, bad firms) characterizes both situations in the market. However, compared to markets that issue debt, lemons dominate the markets that issue equity. From his model therefore, the prediction is that the cut-off level is higher when projects are financed by debt issues.

The outcome of Narayanan (1988) suggests that managers should finance their investment with debt in periods when their firms have been undervalued, and equity when their values are overvalued. This makes it easier for outsiders to assume that only overvalued firms will issue equity. Outsiders will therefore be reluctant to buy equity when it is issued which will force the firms to either finance investment projects with debt or forfeit them. The ability of the equity issues to provide a signal about the firm's value results in a pecking order pattern for firm-financing. Since project acceptance means more debt can be issued, debt

issues become good news. That is, the firm's stock prices increase. This outcome contradicts what is seen in Myers and Majluf (1984).

Heinkel and Zechner (1990) add to Narayanan (1988) by stressing that apart from the new debt issues, existing debt issues make investment less attractive by increasing its cut-off level. Therefore, compared to equity financing, new debt (Narayanan, 1988) or existing debt (Heinkel and Zenchner, 1990)is able to reduce better the problem of over-investment. In their study, it is important to note that debt does not provide any signal since it is issued before firms receive private information. To them, it is possible to substitute internal funds for debt. What seems very important and common in both Narayanan (1988) and Heinkel and Zenchner (1990) is that acceptance or rejection of a project serves as a signal in the market. They explain this idea by saying that if issuing security was the only signal for outsiders, then even firms with a negative NPV could mimic the high quality firms by issuing the same security and investing the returns in Treasury bills.

Brennan and Kraus (1987), Noe (1988) and Constantinides and Grundy (1989) all criticise the POT. These studies develop certain financial choices that a firm may make when it is confronted with the situation outlined in Myers and Majluf (1984). Their main conclusion is that, firms do not always prefer to issue debt over equity and that the problem of underinvestment could be dealt with using a better set of financing choices. Brennan and Kraus (1987) present a model similar to that of Heinkel (1982), in which the firm's choice of debt ratio provides a signal of firm value since the distribution of firm earnings is characterised by a single unknown parameter. The difference that lies between Heinkel (1982) and Brennan and Kraus (1987) is that while Heinkel(1982) takes the security type as known and shows that a fully revealing equilibrium exists for a particular type of information asymmetry, Brennan and Kraus (1987) develop certain properties which the securities must have to be informative for general types of information asymmetry.

Brennan and Kraus (1987) initially consider a general situation in which a firm has some private information about its type, which is the joint probability

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distribution of earnings on existing assets and on a new investment project. The new project which is to be financed by the sale of securities to uninformed investors is assumed to be indivisible. They use the following assumptions throughout their analyses.

1) The firm selects its financing instruments that maximises the difference between the price it receives for the package of securities it sells, the true information, value of the securities based on the constraints that it raises, K, and the amount needed for the investment which is known by all.

2) Securities are traded in competitive markets, and investors have rational expectations.

While assumption (2) seems standard, assumption (1) is equivalent to saying that the firm maximises the true information value of the securities held by its original shareholders. This assumption overlooks any agency problems and matches with the idea that the boards of directors upon selecting a financing strategy are much concerned with the interests of all existing shareholders. This makes this study consistent with the managerial aim in Heinkel (1982) but contrary to what Constantides and Grundy (1989) propose in their study which we will review later on in this section. Brennan and Kraus (1987) distinguish between financing and security. According to them, securities are the basic claims traded in capital markets while financing is the complete set of financial decisions announced by a firm at a point in time. Consistent with assumptions (1) and (2), they believe that the aggregate net claim (the difference between the payoffs due to security holders) issued under every financing is priced at its full value. With this, they establish that the real equilibrium value is characterised by a "lemon property"; with each financing strategy being chosen by the worst type of firm for that particular financing strategy. This creates some form of awareness for investors in pricing the aggregate net claim issued under the financing. If this does not happen, there will be avenue for firms to cheat. The existence of a revealing equilibrium then turns into a worst-case financing for each firm type, and that depends on the set of financing available and the set of possible firm types. This is where Myers and Majluf (1984)'s study differs from this particular study. Myers and Majluf

(1984) does not show a set of financial options but shows that a firm that is limited to equity issue may reject some NPV projects or may even carry out a project with a negative NPV. In the case of Brennan and Kraus (1987), a firm can make a worst-case financing and properly price it. Therefore, only positive NPV projects will be undertaken. Negative NPV projects will not be undertaken. In sum, with their model, no firm is able to mimic another. Good firms receive a fair deal on both their debt issues and debt repurchases. Bad firms also do not imitate good firms because repurchasing of their debt at full value may represent overpayment. This cost of overpayment is more than the benefit they will receive from selling overpriced equity. As a result, in equilibrium, both types of firms issue equity and accept the positive NPV project.

Constantinides and Grundy (1989) present a model of financial signaling in which the amount of investment made by the firm and the decision to repurchase stock by inside equity holders serve as signals for a single unknown parameter of the distribution of earnings. They allow firms to issue any form of security and to repurchase existing stocks. The first objective of this study is to examine the forms of financing that help management to signal its information to the market and allow management to accept a project even if its NPV is positive. The second objective of their study is to investigate how repurchasing stock together with the issuing of a senor security allows managers to relay their information to the market and accept a project which has a positive NPV. A notable difference between this study and Myers and Majluf (1984) is that managers are assumed to have some shares in the firm whose true value they maximize. In their model, management announces the firm's new investment and its mode of finance. Its claim may be of any form. Their investigation sheds light on why firms issue straight debt or convertible debt.

5.2.1.1b Signaling with a Fraction of Debt

In the preceding section, capital structure turned out to partly resolve the problems of over-investment and under-investment. In this section, we discuss models in which investment is assumed to be given whilst capital structure serves as a signal for private information.

The study provided by Ross (1977) can be seen as a pioneering work in this area of research. In this particular model, managers have private information on the true distribution of firm returns, but such information is hidden from investors. The return distribution for firms is ordered by first order stochastic dominance. Whilst managers benefit if the firm's securities are more highly valued than the market, they tend to lose more if the firm goes bankrupt. Higher debt levels provide a signal of higher quality to investors. Since expected marginal bankruptcy cost for any debt level is likely to be higher, low quality firms have no incentive to mimic high quality firms by issuing more debt. He proposes a simple model that illustrates the relationship between signaling and managerial incentive structure in the financial market. His first assumption is that of a perfect market assumption; That is, financial markets are free of taxes and transaction costs, and are competitive. This assumption rules off any form of monopoly power in the financial market demand and each participant acts as if demand is perfectly elastic at the given prices. He also assumes that the market consists of two types of firms, H and L, and at time 0 and time 1, H firms will have a total value of h with L firms having a total value of l. In this model $l>h$. To simplify the model further, he assumes that pricing in the market is risk neutral.

In a world of perfect information, where investors can tell which firms are of type H and which are of type L, their respective values at time t=0 will be given by

and

Where r is the sure rate of interest. According to this model, the valuations stated above are not affected by the choice of financing of the firm.

In an imperfect world, investors can distinguish between various types of firms. If q is the proportion of H firms, and investors all act as if any firm has a q chance of being an H firm, the returns h and l depend on the current information available.

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Based on the available information, firms in the model have a q chance of being a type H firm and a $(1-q)$ chance of being a type L firm. This means that firms will have the same value which is,

$V_0 = qh + (1-q) l/1+r$ with V_0^H.

This result follows the proposition of the Modigliani and Miller which state that valuation will be unaffected by the mode of financing.

A way to break out of the constraint that binds the value of H and L is to assume that the manager plays a significant role in decision-making processes. If the manager of a firm makes decisions at time 0, the financial signals become valid and the problems of moral hazard can be avoided. Managers are also assumed to have perfect information about the type of firm. Assuming that managers choose D, which denotes the face value of the debt issued by a firm at time $t=0$, and the expected value at date one, minus a penalty P for bankruptcy. We indicate V_O (D), the value assigned to the firm at date 0 by the market if the debt level is D. We denote the manager's objective function by $(1-\gamma)$ V_o (D) + $(t/2-PD/t)$. The parameter γ is considered a weight. The expected pay off at period 1, given the manager's information is expressed as $t/2$. Ross (1977) expresses the probability of bankruptcy as D/t. If investors are tempted to believe that $t=\alpha$ $(D)/2$, putting this into the objective function and taking the derivative with respect to D gives the first order condition. In equilibrium, investors are able to tell the difference between t and D, i.e., if D (t) is the best choice of debt as a function of the firm type, t, of the firm. If this is the case, then α $(D(t))$ $\equiv$ Substituting this into the first order condition and solving the differential equation resulting from this gives D (t) = ct^2/P $+b$, where c and b are constants.

Heinkel (1982) examines a model similar to that of Ross (1977). The only difference is that Heinkel (1982) does not assume first order stochastic dominance of firm returns. Rather, the returns are assumed to be distributed in such a way that, higher quality firms have higher overall value but lower quality bonds, which implies higher equity value. This means that any firm that attempts to mimic another type of firm in the market will only gain from overvaluation in one security and lose from the undervaluation of another security. In equilibrium, the

situation is such that the gains and losses balance. To mimic a firm with high value, a lower value firm should issue more underpriced debt and reduce the amount of overpriced equity. Likewise, to mimic low quality firm high quality firms should issue less overpriced debt and more underpriced equity. The fact that higher quality firms have higher total value, the result that they issue more debt is consistent with Ross (1977)'s result.

5.2.1.2 Earlier Theoretical Studies Based on the TOT

5.2.1.2a Studies Based on Agency Cost

Over the last decade, a major proportion of the effort devoted by researchers has been directed to models in which capital structure is determined by cost which arise through conflicts of interest. The main proponent in this area of research is Jensen and Meckling (1976), but they build on earlier work provided by Fama and Miller (1972).

According to Jensen and Meckling (1976), there are two types of conflicts; conflicts arising between managers and shareholders and conflicts arising between equity holders and debt holders. Conflicts between managers and shareholders arise because managers do not hold 100% of the residual claim. As a result, they do not take up the entire gain from their activities, yet, when there are losses, they bear the entire cost. For instance, managers can transfer resources to their own benefits by consuming perquisites. If the manager decides to stay away from these activities, he loses entirely. This drives managers to indulge more in these pursuits and neglect any form of activity that would maximise firm value. This means that if the proportion of the manager's share increases, these inefficiencies are likely to reduce. Assuming the investment of a firm is constant; increases in the proportion of firm financed by debt increases the manager's share of the equity. In addition, as stated by Jensen (1986), since debt makes a firm pay out cash, the amount of free cash flow available for the manager to spend on perquisites declines. This is what makes debt financing rewarding. Between debt holders and equity holders, conflicts arise because the debt contract gives equity holders the chance to undertake inefficient and risky investment.

Jensen and Meckling (1976) therefore argue that capital structure can be maximized by trading off the agency cost of debt against the benefit of debt. A number of implications can be drawn from this study. First, in industries where opportunities for asset substitution are more restricted, for instance the banking industry and mature industries, firms within will have higher leverage. Second, firms with high cash flow should choose to use more debt because that will reduce the amount of free cash flow available for managers to use as perquisites. Several studies have followed Jensen and Meckling (1976) and each of these papers can be grouped under one of the two headings provided by Jensen and Meckling (1976). Below, we review these papers that have explained the agency cost theory through the two sub-headings propounded by Jensen and Meckling (1976), conflict between equity holders and managers, and conflict between equity holders and debt holders.

5.2.1.2a1 Conflicts between Equity holders and Managers

In this section, we review papers by Harris and Raviv (1990a) and Stultz (1990). These two papers share a common ground on manager and equity holder conflict but can be differentiated in the way in which they explain the way the conflicts arise. Not only do they differ in this way but they can also be distinguished in the way they explain how debt can be used to mitigate the conflict and in the disadvantages of using debt.

In both Harris and Raviv (1990a) and Stultz (1990), managers are seen to be in a disagreeing position over how the business should be operated. For instance, in Harris and Raviv (1990a), managers are seen as wanting to continue with existing business operations even when investors have reached a point where they would prefer liquidation. In Stultz (1990) however, managers always want to invest cash even if paying out cash is more beneficial to investors. Both contracts can be solved by debt but in different ways. In Harris and Raviv (1990a), the problem can be resolved by using more debt to force liquidation. A larger debt level makes default more likely and therefore quickens liquidation. Without defaulting, existing management would still want to continue in their operations

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even when the assets are considered worthless. When a firm defaults, investors make the liquidation decision and this decision is assume to be an improved one. However, they spend resources carrying out the liquidation investigation. Therefore, the optimal capital structure is reached in Harris and Raviv (1990a) when there is a tradeoff between improved liquidation and investigation cost.

In Stultz (1990), the conflict can also be resolved by using debt payment to reduce free cash flow. Debt payment as well known uses up a lot of free cash flow. This reduces the funds available for profitable investment. This is what Stultz (1990) classifies in his model as the cost of debt. The best capital structure in this study is reached when there is a trade-off between the benefit of debt in preventing worthless investment against the cost of debt in preventing investment in projects that are worthy. As a result, like in Jensen (1986), firms that are fast growing and have so much prospects in investment opportunities can have low debt whilst those in developed, but slow-growth industries have high debt. In addition, he argues that managers will normally not want to apply the optimal debt levels but will only want to do so if they foresee any takeover. This means that firms that are likely to be taken over will have more debt, all other things being equal, whilst firms that are not likely to be taken over soon will have low debt levels. We now move on to studies based on the next type of conflict.

5.2.1.2a2 Conflicts between Shareholders and Debt holders

In this subsection, we review two papers that use reputation to solve the problem of asset substitution. These papers show how managers would want to carry out safe projects because of their reputation. These studies are Diamond (1989) and Hirshleifer and Thakor (1989).

In Diamond (1989), a firm because of its reputation has to assure debt repayment and therefore has to choose projects that will ensure that. There are two types of investments that are possible in this instance; a safe, positive NPV project, and a risky negative NPV project. The project which is considered risky has two different payoffs, success or failure. Interestingly, these two types of projects need the same level of initial investment that has to be funded by debt. A firm can be of

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any of the following types; one that can only access safe projects, one that can only access risky projects, and one, that can access both. Since investors cannot tell the difference between these firms easily, their lending rates show what they think of the project chosen by firms on average. According to this study, returns from safe project will be enough to pay the debt holders but returns from the risky project can only pay the debt holders if the project succeeds. Due to the asset substitution problem, the firm will choose the risky project because of myopic maximization of share value. Nevertheless, if the firm can let lenders believe that it undertakes safe projects, its lending rate will be low. As a firm's default history is the only thing that is most observable to lenders, a firm can build up its reputation over time by carrying out only safe projects and not defaulting. This means that, the better a firm's credit history, the lower is its borrowing cost. Hence, mature and well-developed firms find it prudent to choose safe projects to prevent them from losing their reputation. This means that, young firms without good reputation may end up choosing risky projects. If they are able to withstand this without default, they can move on to safe projects. This implies that firms with good credit ratings do not often default and therefore have lower cost of debt than firms with shorter track records.

Hirshleifer and Thakor (1989) examine a manager who has to choose between two projects. Each of these projects has two outcomes; success or failure. A firm is considered to be a failure if it fails in both projects. In the shareholders view, the project which is highly risky but has high return gives both high expected returns and high returns if it is successful. Assuming that success on the two projects is the same, the manager's labour market can only differentiate between a successful project and a failed one. This means that whilst managers would want to maximise the possibility of success, shareholders' preference is geared towards high returns. Even if the project is safe but has a high chance of succeeding, the manager will still select it against the wish of shareholders. As a result if lenders realise managers are able to take their own decisions, the firm is likely to attract more debt than otherwise because of its reputation. By implication,

this study further argues that managers that are targeted to be taken over soon are even in a better position to accrue more debt than other firms.

In the above section, we have summarised and reviewed various leading studies of the eminent theories of capital structure. Following these models, other researchers of modern finance theory have used empirical evidence to test whether the pioneering models can explain what happens in the real business world. Previous studies on capital structure focused extensively on the factors that affect the financing behavior of U.S firms and U.K firms.

Below, we review various studies on the US and the UK and try to link them to the theories of capital structure.

5.2.2 Empirical Work on Capital Structure

5.2.2.1 Empirical Testing Based on the Market Timing Theory

In this section, we consider various literatures that have been linked to the Market Timing Theory. These literatures under this section are mainly empirical. As explained earlier in this section, when a firm realises that its shares are cheap, it may decide to take that opportunity to misprice its shares by issuing equity. As to whether the timing is right and the influence this will have on capital structure will last is of great interest to many economists. This study was first shown in Taggart (1977) and later developed by Marsh (1982). Both studies were in the context of time series. Baker and Wurgler (2002) later developed this idea in the cross-sectional sense.

We review these three leading literatures below.

5.2.2.1a Studies Based on the U.S

Taggart (1977) improves on previous studies[47] by developing a new model which allows for balance sheet interrelationships. On their balance sheet, financial assets appear on the right side while real assets appear on the left. This separates firm's

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[47] See for example JafTee (1971), White (1984) who aggregate financing sources into long-term and short-term categories. See also Bosworth (1971) who separates equations for bond issue, stock issues, changes in short-term debt and changes in liquid assets. Even though these studies identify that the sources and uses identity place a constraint on the coefficients, none of them allows for the possibility of balance sheet interrelationships entering the error term.

financial sources from their real uses of funds. Also on the right side, they place liquid assets and negate it because they consider it as a source of funds. They then take the total net assets to be the net of liquid assets. In any period, changes in the balance sheet items are constrained by the sources and uses identity:

Where   Net Assets,   Change in Net Capital Stock,   Change in Net Working Assets,   and   =Changes in Short and Long-Term debt respectively,   Change in Equity and   LIQ= Change in Liquid Assets. Each period's change in equity can be decomposed into gross stock issues, stock retirements or retention of earnings:

Where GSTK= Gross Stock Issues, RE= Retention of Earnings and SRET= Stock Retirements. Combining these two equations above, the sources and uses identity can be rewritten as:

This equation is the basic identity upon which the model is built. As   A-RE is considered exogenous, in each period, the firm is faced with choosing which of the five right-hand variables it should make changes to when they are confronted with external finance deficit. If firms require more capital, they can either increase the book value of their permanent capital or increase their temporary capital. Changes in permanent capital will be shown by the stock-adjustment equation:

Where $PCB^*=NK$ (net capital stock) + NWA (net working assets). PCB^* is the target value of long-term debt plus equity, PCB_{-1} is the lag of PCB, RE refers to the retention of earnings and RT, the interest rate timing conditions. Movement in targets is expected to exert some influence on permanent capital flows in the above equation but RT impact on it in an opposite manner. According to Taggart (1977),

firms that expect long-term interest rates to decline may prefer to borrow on short-term basis rather than on long-term basis while waiting for interest rates to decline. Therefore, the desired debt-equity ratio PCB is given by:

(LDM / STOCK)*=b, where *b* is determined by the trade-off between tax savings and expected bankruptcy costs. This represents the market value target. They carry out a transformation to give them the book value for long-term debt target and the resulting equation is:

LDM=LDBTi/i'. Combining the last two equations, they formulate *LDBT*=B stock (i/i'),* where stock is the market value of equity, *i* is the current interest rate on long-term debt and *i'* is the average contractual interest rate on long-term debt. *LDBT* is influenced by both permanent capital target, and desired split of *PCB* between long-term debt and equity. While long-term debt issues are influenced by interest rate timing conditions, bond issues are affected by the timing of bond issues. They proposed an adjustment equation for LDBT given by:

$$(\qquad\qquad) +$$

LDBT represents long-term debt level, LDBT* is the target level of long-term debt, $LDBT_{-1}$ is the lag of *LDBT,* PCB is permanent capital, *PCB*,* the target value of long-term debt plus equity, RE is the retention of earnings, *RT* is the interest rate timing variable and *STOCKT,* the stock market timing variable. This equation implies that long-term debt issues will be stirred up by a deviation of actual *LDBT* from its target level, *LDBT*,* and also by a deviation in permanent capital and these two may have contrasting influences. From the equation above, if the target long-term debt level increases faster than the assets in place, bond issues will be controlled by the immediate need for permanent capital. By drawing on and modifying data from the Federal Reserve Flow of Funds from 1957 Q3 to 1972Q4, he finds that firms with a debt/equity ratio below the target, issue more debt and less stock. He also finds that firms issue more of both bonds and stocks when permanent capital is below target. However, the speed of adjustment to permanent

capital they find is slow, implying that liquid assets and short-term debt are important in absorbing short-run fluctuations in external finance deficit.

Baker and Wurgler (2002) however provide cross-sectional studies on this particular theory. Their main empirical test follows this cross-sectional regression:

$$- \; = a + b \; - \qquad + c \; - \qquad d \; \longrightarrow \quad + e \; \underline{} \qquad +$$

The dependent variable is book leverage. This study is mainly interested in the coefficient, b, which is on the firm's external finance weighted average market-to-book ratio. It measures how much capital the firm raises when its M/B is high. The rationale behind this is that, if timing was necessary, then firms that were able to raise capital when their stock price was high should have equity dominating their capital structure. Most importantly, the market timing variable uses information not more than one year which allows the pure M/B effect to be visible through the effect of c. Starting with all Compustat firms appearing at any point between 1968 and 1995, they study this sample in IPO times, implying that they study it in subsamples that hold the number of years since the IPO constant. The whole sample includes 2839 observations on firms at the first fiscal year end after IPO 2652 observations on firms in the next fiscal year. By this, the authors are able to conclude that the coefficient b distinguishes the impact of past market timing attempts from those which result from cross-sectional differences in M/B ratios. According to these authors, their market timing variable is the most powerful predictor of both market and book leverage and that, its explanatory power increases as time increases. Based on these results, Baker and Wurgler (2002) conclude that managers want to raise capital when market values are higher than book values and this has long-term effects on capital structure that is observable.

A major criticism of this study is that the M/B that they use to measure mis-valuation is based on public information when managers themselves have access to private information and could instead use that. However, Jenter (2005) supports the use of the M/B ratios as according to them, it can be used to give information on insider trading. Specifically, Jenter (2005) provides information about different patterns in executive trading patterns around SEOs, but finds that

more selling takes place among firms with high M/B ratios. Yet other studies have still criticised Baker and Wurgler (2002). According to these studies, their market timing variable reflects the firm's growth opportunities better than the single variable M/B.

Kayhan and Titman (2007) recognises this and therefore separates Baker and Wurgler's (2002) into two: the true market timing variable and its long term average M/B ratio. According to them, this latter measure should not have much to do with market timing but may have information about market timing. They find that Baker and Wurgler's (2002) study was largely influenced by the average M/B ratio other than their market timing component of their variable.

Another study that criticised Baker and Wurgler's (2002) study was that provided by Leary and Roberts (2005). They argued that when firms find it expensive to rebalance their capital structure, the long-term effects of market timing becomes weaker. The first question Leary and Robert (2005) ask in their study is whether equity issuers and non-equity issuers have different leverage ratios over time. They equate firms by size and M/B ratios and then separate them into issuers and non-issuers. They find that though issuing firms have low leverage compared to their corresponding non-issuers but all the effect disappear within four years. They use the Baker and Wurgler (2002) finding for part of the sample split for the cost of issuing debt. Their first measure was based on Altinkilic and Hansen's (2000) empirical model of debt underwriter which gives room for both fixed and variable cost component. They also use two other measures; one which measures financial distress cost and another, which measures distress. Leary and Roberts (2005) find that although the Baker and Wurgler (2002)'s coefficient is usually significant in every estimation; it is even much stronger when firms have high adjustment costs.

5.2.2.1b A Study based on European Countries

Marsh (1982) develops a descriptive model that focuses on how firms select between financing instrument (debt and equity) using logit analysis for a sample of 748 issues of equity made by UK companies over the period 1959-70. The study particularly highlights the following questions: whether companies behave as if they have target debt ratios; whether their composition of debts have similar

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targets; whether their choice of instruments are influenced by market conditions and their past share price; and finally, whether other factors such as firm size and operating risk have any effect on the choice of financing instruments. In his study, he provides an answer to how accurate one can be in predicting whether the firm will issue debt or equity. They assume that a company's choice of financing instrument depends on the difference between its current and target debt ratios in the following way:

Pr(

Where Pr (represents the probability that company j will issue equity at time t given that it will make an issue of equity or bonds, and,

+ S are the respective company's targets and actual debt ratios. They assume a model of the form to cater for the fact that is unobservable. From this equation, represents a vector of explanatory variables, , the corresponding vector of coefficients, and , a stochastic error term. Combining both equations above, their model becomes:

Pr (

This equation means that the probability that firms will either issue equity or bonds depends on a number of explanatory variables such as, company size, risk etc. His results show that in choosing between debt and equity, firms are more influenced by market conditions and past history of security prices than by the company's existing financial structure. They also provide evidence to show that they have target levels in mind for both long-term debt ratio and the ratio of short-term debt to total debt when choosing their financial instruments and that these target levels depend on firm size, bankruptcy risk, etc. Both studies considered above are mainly panel, that firms issue equity after stock prices increase.

5.2.2.2 Empirical Testing of the POT and the TOT

5.2.2.2a Studies based on the U.S

Jalilvand and Harris (1984) focus on U.S corporations by examining the issuance of long-term debt, short-term debt and equity, maintenance of corporate liquidity and the payment of dividends. They characterize the firm's financial behaviour as partial adjustment to long-term financial targets. Using data from 1966-1978, they estimate firm-specific, time-varying speeds of adjustment. Their study postulates that the financial and dividend decisions of the corporation should be seen as part of a simultaneous and interdependent process. Their main aim is to test the TOT. The actual thing they do in their study is to relax the perfect market assumption made by previous studies. According to them, the relaxation of this assumption leads to a number of issues. First, the presence of market imperfections imply that the value of the firm can be affected by financing decisions and that, firms may have long-run target financial structures which are influenced by factors such as bankruptcy costs, agency costs, etc. Second, market imperfections may prevent firms from adjusting instantly to their long-run targets in every period but rather, it encourages them to adjust partially. Third, market imperfections may lead to interdependencies among the corporation's decisions.

They focus on the determinants of period by period adjustments to financial targets and on interdependencies between different financial decisions as the adjustment takes place and allow the speeds of adjustment to vary by firm and over time depending on the factors that might affect the cost and benefits of adjustment. Based on the stylised facts, the firm's sources and uses identity at time t is given by:

where ΔA_t represents investment, E_t, earnings from past investment and financing; LD refers to long-term debt, SD refers to short-term debt, CP, common and preferred stocks excluding retained earnings; and $LIQA$, liquid assets. Based on the variable definitions, the equations describing the adjustment model for firm i at time t can be written as:

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where *RLD*, *RLQA*, *RSD*, *RCP*, and *RDIV* reflect measures of total external financing need of firm *i* at time t; *, the target level of a variable; and and , the adjustment coefficients. Equation (2) represents the financial rationale of the model. It has two basic parts. The first part states that the firm adjusts to the difference between its target level of long-term debt and the level of debt at the start of the period, so that complete adjustment to a firm's target would require the adjustment coefficient to be equal to one. However, in the real world adjustment is costly and so firms are expected to adjust partially. The second part shows that the difference between two levels of external financing *(RLD)* influences the use of debt. They break it into the firm's total external financing need if it adjusts instantly and the amount of long-term financing required for complete adjustment to the long-term debt target. In equation form, this is given by:

One distinct feature of their model is that they allow for differences in the adjustment to vary among firms over time. In addition, they hypothesise that, size, management expectations about interest rates as well as expectations about stock will affect the speed of adjustment. Using a sample of 108 manufacturing firms covered by the Expanded Compustat Industrial File, their results show specific patterns. Specifically, they find that firms seem to build up long-term debt, short-term debt, draw down the stock of liquid assets or issue new stocks in response to their financing needs. In addition, they find that larger firms adjust faster to the target long-term debt than smaller firms but then these same larger firms appear to adjust more slowly to target equities in response to the remaining financing needs compared to smaller firms. Their results provide more plausible coefficients than those of Taggart (1977).

Vogt (1994) sheds further light on the relationship between cash flow and investment. Different from other studies, his work establishes a testable empirical hypothesis that distinguishes between asymmetric information and the free cash flow interpretations. Mainly, he examines whether cash flow is important in a firm's investment decision because managers waste free cash flow or because firms face excessive external financing cost arising from asymmetric information. According to his study, each of these theories predict that firms not paying dividends should have the strongest relationship between cash flow and investment spending, while those paying dividends should show the weakest relationship. The main difference between the two hypotheses is the predicted interaction between the firm's Q value and the influence of cash flow on investment spending. The study first develops the theoretical implications for both the free cash flow and pecking order explanations for the equilibrium level of Tobin's Q. According to his study, if the cash flow/investment relationship arises from the free cash flow theory, then, cash flow should be very important in financing the investment of firms with low Q values. On the other hand, firms with high Q values are expected to rely heavily on cash flow if the Pecking Order Theory explains the relationship between cash flow and investment. He estimates a reduced form model of capital spending behaviour similar to that of Fazzari and Petersen (1993). The equation used in the study shows the proportion of capital spending to the beginning of period capital stock of fixed plants and equipment (I/K) as a function of: (1) cash flow divided by beginning-of-period gross plant and equipment (CF/K), (2) the change in the firm's cash divided by beginning-of-period gross plant and equipment (DCASH/K), (3) sales divided by beginning-of-period gross plant and equipment (SALES/K), (4) beginning-of-period Tobin's Q (Q). First, since Δ CASH/K is an endogenous variable, he uses a two-stage least squares model to estimate it as a function of the following instruments; (1) the beginning-of-period stock of cash, C_{t-1} /K, (2) CF/K, (3) SALES/K, and (4) Q. To allow for time and firm invariant intercepts he employs a fixed-effect model. Direct estimation of the intercepts is eliminated by centering the data on their time-series and cross-sectional means. Using data from 359 manufacturing firms in the U.S from the

years 1973-1990, he finds results consistent with earlier findings. Specifically, he finds that CF/K and DCASH/K have a statistically significant impact on capital spending. He also finds a negative coefficient on DCASH/K, indicating that firms draw down their stock of cash in order to finance additional fixed investments. The estimates of SALES/K and Q also have the correct signs as predicted by the accelerator theory. In order to show whether the strength of the cash flow effect varies with dividend policy, they separate firms according to the average dividend-pay-out pattern. They classify firms as low dividend pay-out if they have an average dividend-to-income ratio of 0.10 or less over the sample period; Medium pay- out firms have an average payout rate of less than 0.35 and more than 0.10; and high-payout firms are firms with payout rates greater than 0.35. He finds that the parameter estimates on DCASH/K and CF/K all have the proper sign and are statistically significant.

To confirm the predictions of the PO and FCF hypotheses, the magnitude of the parameter estimates increases as the long-run payout falls. To him, one way to identify the causes of the cash flow/investment relationship is to examine the prediction of each hypothesis about the effect that cash flow-financed capital spending has on Q. In order to measure this effect, an interaction variable (CF/K×Q) is created and added to the equation. Based on this, if the parameter estimate on (CF/K×Q) is positive, the results support the PO hypothesis. If the parameter estimate however is negative, the results support the FCF hypothesis. The reasoning behind this result can be seen from the interpretation of the parameter estimate on the interaction term as a cross-partial derivative. His results show a negative and significant coefficient on the interaction term. This result indicates that the impact of cash flow on capital spending rises as Q falls, thus supporting the FCF hypothesis. He also reports results based on the pay-out groups. He finds that the sign of the parameter estimates of the interaction term varies according to groups. For low pay-out firms, capital spending is negatively and strongly influenced by the interaction term, which is consistent with the FCF hypothesis. Medium pay-out firms have a positive but insignificant parameter estimate on the interaction term, while it is negative for high pay-out firms but

only marginally significant. This results imply that the negative relationship between the magnitude of the CF/I relationship and Q found in the aggregate data is concentrated in the firms paying out low or no dividends. This provides further evidence for the FCF hypothesis. In the case of research and development spending, results are more consistent with the pecking order hypothesis. The reason he gives is that its intangible and high risk nature may make research and development more susceptible to asymmetric information effects than fixed plant and equipment spending. These results together suggest that the effect that cash flow-financed investment has on firm value depends on asset size, dividend behavior, and the type of investment spending.

Shyam-Sunder and Myers (1999) are among the first to test the POT theory directly. They compare the static trade-off models and the pecking order theory using a sample of 157 firms from 1971-1989. Their study has two objectives. The first is to show that while both have the ability to explain the time series of issuing debt and retirement, the pecking order provides the dominant explanation. Second, they carry out simulations to show that the static trade-off theory has little statistical power against the pecking order theory. According to them, even when a firm's financing is limited to the pecking order, it will still adjust towards a long-run target. They examine debt financing patterns through time. Their test is based on the assumption that under the Pecking Order model, a substantial amount of inter-temporal variation in net debt issue (D) should be explained by a single variable, the deficit in funds *(DEF)*. They show that a regression of debt financing on the firm's deficit of funds should produce a coefficient close to 1 under the Pecking Order Model. They use this simple model:

where i represents firms, t represents time, e_{it} is an error term, and a_{po} and b_{po} are parameters. Using data on 157 U.S manufacturing firms from 1971-1989, they find results supporting this hypothesis. They however admit that the ability of their test is bias against an alternative model of capital structure, the Static Trade-off model. From this, Shyam-Sunder and Meyers (1999) believe that the data favours the

Pecking Order Model. Their results were attacked from two different directions. The first attack came from Frank and Goyal (2003).

Frank and Goyal (2003) extend the work of Shyam-Sunder and Myers (1999) by using a longer time period and a larger cross-section of firms and show that their results were bias towards firms that are already established and that small firms rely more on equity finance than that suggested by Shyam-Sunder and Myers (1999). They noted a very serious problem when Shyam-Sunder and Meyers (1999) nested both the POT and the TOT in a joint specification. They realised the POT fails to dominate and their conclusions were rather negative. Using over 50, 000 firm-year observation over the period 1971-1998, they examine the extent to which debt ratios change when a component of a firm's financing deficit changes. They examine the relative importance of the factors that have been outlined in previous studies. Contrary to Shyam-Sunder and Myers (1999) who examine the unit coefficient on the total leverage deficit, Frank and Goyal (2003) test for the leverage deficit on each of the constituents of leverage deficit. They consider the seven main factors that have been proven by other studies to affect leverage decisions of firms. These are size, expected inflation, profitability, collateral, market-to-book ratios, industry median and dividend payout policy. Their main measure of leverage is total debt to market value of assets. In their study, they divert from the use of cross-sectional regressions and adopt a more direct approach by examining how often and in what situations firms issue and repurchase equity. The main questions they address are whether all the variables are equally reliable, whether they can replace some of the factors with other common factors, how important the factors which have been excluded are and how these factors can be linked with the various theories. They use data from CRSP and Compustat over the period 1973-2002 on a large number of U.S firms. Their results essentially reject the explanation provided by the Pecking Order theory about the frequencies of debt issuance and under what situations equity is issued. Unlike the Pecking Order Theory that assumes that investment are first financed by retained earnings , then debt before equity, Frank and Goyal (2004) find that equity issuance is a commonplace. Their explanation for the breakdown of the Pecking Order Theory

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is that there are ways to reduce the costs associated with equity issuance as well as asymmetric information problems.

The second attack came from Chirinko and Singha (2000) who argue about Shyam-Sunder and Myers' test. According to them, the new test of the POT introduced by Shyam- Sunder and Myers (1999) is mis-specified since the POT is inherently non-linear. They pick on Shyam-Sunder and Myers (1999) results and short-comings for their study. They argue that if the favourable assumption about the proportion of equity finance is maintained, Shyam-Sunder and Myers (1999) test are unable to explain situations where the ordering hypothesis is violated. They criticise Shyam-Sunder and Myers (1999) based on a number of facts. Their estimated equation is based on 157 U.S. firms during the periods 1971-1989. First, they consider the situation in which firms first rely on internal funds and then move on to equity and then to debt. According to them, this usually happens when there are either some hidden costs associated with debt or certain benefits associated with equity issuance. In this instance, they expect the test by Shyam-Sunder and Myers (1999) to reject the Pecking Order Model. Unfortunately, the estimates of Shyam- Sunder and Myers (1999) lent credence to the validity of the Pecking Order theory. The second argument raised by Chirinko and Singha (2000) is that in situations where fixed proportions of debt and equity are issued, the Pecking Order model is supposed to be rejected, but Shyam-Sunder and Myers (1999) find their results being consistent with it. Based on these facts, Chirinko and Singha (2000) suggest that the Shyam-Sunder and Myers (1999)'s empirical evidence fails to evaluate both the Pecking Order and the Static Trade-Off Models. They suggest that alternative test should be employed in identifying the determinants of capital structure to be able to effectively distinguish among competing theories.

Minton and Wruck (2001) take a different turn all together on this and focus on the issue of financial conservatism by studying firms that continuously adopt the policy of low leverage (financial conservatism). To identify persistence over time, they measure financial policy over five-year time periods. They classify a firm as financially conservative if its annual ratio of long-term debt to total assets

is in the bottom 20% of all firms for a continuous period of five years. On the other hand, they classify another group of firms as control firms if they have been in operation for five consecutive years but do not meet their definition for low leverage. They use data on both the CRSP and Compustat on U.S firms from 1974-1998. Their main estimation technique is the logit regression analysis. They find that financially conservative firms adopt a Pecking Order style financial policy.

Fama and French (2002) use data on 3000 U.S firms over the period 1965-1999 to test the trade-off and the pecking order predictions about debt and dividends with target-reverting models which are different from the models applied by Shyam-Sunder and Myers and Frank and Goyal. Their work also differs from previous work because they consider a large number of firms. Their results show that the trade off and the pecking order models share many predictions about the debt and dividends, but can be distinguished at two points where each of the two suffers a limitation; the TOT failing to explain why more profitable firms have lower book leverage, and the POT, failing to tell us why small low- leverage growth firms issue large equity. Finally, they find that when the two theories are considered, it is difficult to tell which theory their results support.

5.2.2.2b Studies Based on European Countries

Miguel and Pindado (2001) evaluate the capital structure of Spanish firms in a dynamic context. Similar to previous studies, they provide additional information on the empirical evidence of capital structure. To them, this makes it easier for them to make comparisons with other countries. To test the validity of the TOT, they adopt a target adjustment model which makes it easier for them to explain the firms' debt in terms of their previous and target debts. The dependent variable they use is the ratio between the market value of long-term debt and the market value of equity plus the market value of long-term debt. Their explanatory variables are non-debt tax, financial distress costs, cash flow, free cash flow and they include factors to capture institutional characteristics. Their results show that transaction cost is borne by Spanish firms when they adjust their previous levels to a target level. However, compared to the studies on the U.S firms, the transaction cost they

find is far lower. They also find results consistent with previous literature on the signs and the explanatory power of the main variables used. For instance, they find that while the debt ratio is inversely related to cash flow, non-debt tax shields and financial distress costs are directly related to it.

Benito (2003) like most studies on capital structure, examine the two most popular theories on capital structure decisions. His work is distinct from other studies in that it compares two countries operating under different financial systems; a bank-based (Spain) financial system and a market-based (U.K) financial system. They draw on Fama and French (2002) in comparing the empirical implications of the two competing theories, but relax the assumption of exogeneous regressors and present two separate evidences on this issue for firms operating under different financial systems. Their study is addressed by using two firm-level data sets; The Spanish data are from the Central Balance Sheet Database of the Bank of Spain and cover 6417 companies over the period 1985-2000 while the U.K data are derived from the Datastream Database of accounts listed on the London Stock Exchange and covers 1,784 quoted non-financial companies over the period 1973 to 2000.

They adopt the model:

Where i=firms, t= years, B/A is the book leverage of the firm (debt relative to total assets, A), CF/K= firms' cash flow, I/K is the firms' fixed investment, Q=Tobin's Q and ln S = log real sales of the firm. Using the system GMM estimator, his results on the Spanish firms support the Pecking Order but goes against the trade-off model; higher cash flow is associated is associated with lower debt. Further evidence provided by his study on both Spanish and U.K firms largely support the Pecking Order theory. Investment is positively related to debt. From these evidences provided, he believes that his study provides a stronger support for the pecking order model than that of Fama and French (2002).

Haan and Hinlopen (2003) examine the financing decisions of 150 Dutch firms for the years 1984 to 1997 by considering internal finance and three external finance measures: bank borrowing, bond issues and share issues. This makes their work different from other studies. Specifically, they test which theory best applies to their data. The variables they use include liquidity and profitability defined as liquid assets over total assets and earnings over total assets respectively, issuance timing, flotation cost, size and tax. Using a multinomial logit model, they find that both the Pecking Order and the Trade-off theories are relevant in explaining the financing choices of Dutch firms. Further, they examine which ordering of financing choices is suitable for the data by estimating separate ordered-probit analysis. They find results close to the pecking order hierarchy; their sampled firms prefer internal financing over bank loans, bank loans over share issues, and share issues over bond issues. The only difference between this and the pecking order has to do with reversal of the latter two arrangements. This they attribute to the underdevelopment of the Dutch bond market.

Graham (2000) examines whether the tax benefits of debt has any impact on corporate financing decisions. He primarily focuses on calculating a new measure of the tax benefits for debt that gives information on both the marginal tax rate and the entire tax benefit function. He diverts from the traditional approach of measuring tax benefits (i.e. the product of the corporate tax rate and the amount of debt) and rather measures tax advantage of debt by integrating to determine the area under the tax benefit function. He also uses the tax rate functions to determine whether firms are aggressive in their debt usage and this is done by looking at the point where marginal benefits begin to decline in the tax benefit function. The study uses data from the three annual Compustat tapes; full coverage, primary, secondary and tertiary, and research from 1973-1994. He then compares this new measure of aggressiveness to variables that measure the cost of debt to evaluate the behaviour of firms. His results are surprising. He finds that large, profitable, liquid, instable industries use debt conservatively.

Titman and Wessels (1988) address the problem associated with finding appropriate measures for unobservable measures that determine capital structure.

They use profitability, collateral, volatility, size, industry classification, uniqueness, growth and non-debt tax shields as indicators for capital structure and measure financial leverage as long-term, short-term and convertible debt divided by market and by book values of equity. They use different measures for leverage because the coefficients in previous studies seem to be responsive to the type of leverage measure used in previous studies. Their source of data is the Annual Compustat Industrial Files and it runs through the period 1974-1982. They divide the sample period into three sub-periods each and calculated the sample averages over these periods. Using the linear structural model, their results indicate that firms with unique or specialised products have relatively low debt ratios. They also find that smaller firms use significantly short-term debts than long-term debt. However, their work does not support most previous studies that predict that debt ratios are related to a firm's expected growth, non-debt tax shields, volatility, or collateral value.

In recent times however, researchers have opened up their research on capital structure models to include other economies to allow comparisons between countries. Particularly, Rajan and Zingales (1995) focused on the G-7 countries and found their financing decisions to be similar to that of the U.S. In a completely different dimension, Wald (1999) examined the characteristics of firms that are unique across countries. His results suggested that institutional differences were important in explaining the financing behavior of firms in different countries. The outcome of Wald (1999)'s study led many researchers to divert their research from the experience of developed countries with many similar institutional features to developing economies which may have different institutional characteristics. Booth et al. (2001) was the first to examine the factors that affect the capital structure model of developing countries. Using data from 10 developing countries, they examined whether the factors that were responsible for explaining capital structure theory in developed countries could also be used to explain the capital structure theory of developing countries. Their results showed that firms' capital structure in developing countries were similar to that of firms in developed countries. However, their results highlighted institutional differences across

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different countries suggesting that while capital structure theories can be applied in both developed and developing countries, attention needs to be paid to the institutional differences of different countries. But Booth et al. (2001)'s selection of countries were based on those that were market-oriented with institutional features similar to that of developed countries.

5.2.2.2c Studies Based on China

Chen (2004) is the first study that explores the determinants of firm –level capital structure in China. He lays down some groundwork for further research on China. His main focus is to test whether, and how closely the determinants of Chinese capital structure support the Western finance theory. He uses total leverage and long-term leverage as his dependent variables and includes size, profitability, growth opportunities, tangibility, earnings volatility and non-debt tax shields. Using data from the annual report of 88 publicly listed Chinese companies over the period 1994-2000, he finds that certain factors that can be used to explain capital structure decisions of firms in the Western economies are also relevant in China. Interestingly, he comes out with new evidence. Specifically, his results reveal that neither the trade-off theory nor the pecking order theory seen in the Western economies is sufficient enough to explain the capital choice preference of Chinese firms. Rather, he suggests a new pecking order theory –retained earnings, equity and debt financing. He explains that in China, management prefers equity financing to debt financing because the former is not binding.

More recent authors have shown less interest on how capital structure affects firm value. Rather, their emphasis have been on how capital structure affects on ownership and government structures which in turn influences the strategic decisions of top management (Hitt, Hoskisson and Harrison, 1991). These decisions will in turn impact on the overall performance of the firm (Jensen, 1986). Lately, the main issue for a firm's capital structure is how to resolve conflicts which arise between managers and owners (Jensen, 1989).

Huang and Song (2006) for instance study more than 1000 Chinese listed firms using a dataset that contains market and accounting information. Their data covers the period 1994-2000. Their results show that leverage of Chinese firms is

positively related to firm size, non-debt tax shields and fixed assets, but negatively related to profitability. Moreover, they find that ownership structure affects the leverage decisions of firms. Contrary to the results of other countries, they show that leverage of Chinese firms is positively associated with volatility and that long-term debt is much lower for these firms. Their results mostly provide support for the static trade-off model.

Li, Yue and Zhao (2009) use manufacturing firm-level data in thirty 2-digit SIC industries from the National Bureau of Statistics covering the periods 2000-2004 to examine the debt maturity choices and the capital structure of Chinese firms. They explore the role of ownership structure and institutional development in debt financing of non-publicly traded Chinese firms. They use the *ratio of total liabilities to assets* as the dependent variable and *firm size, profitability, asset tangibility, asset maturity* and *industry concentration* as explanatory variables. First, they find that, firm size and asset maturity are positively related to leverage, whereas profitability and asset tangibility are negatively associated with leverage. From this, their results therefore provide results for both the static TOT and the POT. With regards to their findings on ownership, they find that firm financing decisions are affected by ownership and governance structures. Particularly, leverage increases with state ownership but decreases with foreign ownership. They also show that there are differences in the way ownership and institutions affect small and large firms: Small firms are more likely to be squeezed out of the long-term debt market than large firms. They also split firms into different regional institutional development and find that regional differences matter for firms' leverage decisions. Specifically, they find that firms in more developed regions are found to be associated with lower long-term debts than firms in less developed regions.

In a more recent study, Qian, Tian and Wirjanto (2007a) try to prove the results obtained in Chen (2004) and Huang and Song (2006) using a sample of 650 companies and over a more recent time period, 1999-2004. They use three estimation methods: pooled OLS, LSDV/fixed effects and random effects. In all three specifications, they include industry dummy variables. They then perform a

sequence of specification test to obtain a well-specified static panel data regression for capital structure of Chinese listed companies. After a number of specification tests, they focus their attention on the random effects model. They find that while firm size, tangibility and ownership structure are positively associated with firms' leverage ratio, profitability, non-debt tax shields, growth and volatility are negatively related to firms' leverage ratio. Most importantly, they find that ownership structure plays an important role in a firm's leverage ratio. In particular, non-circulating shares are seen to have a significantly positive effect on a firm's total leverage ratio.

Bhabra, Liu and Tirtiroglu (2008) study the capital structure decisions of listed firms in China between the period 1992 and 2001. They adopt an approach similar to Demirguc-Kunt and Maksimovic (1999) and Booth et al. (2001), but extend their ideas. Specifically, they test the monitoring role of various categories of ownership structures, with different monitoring abilities and legal rights, on the sampled firms' long-term debt ratios in an environment where significant external corporate control market exists. Using data from the Annual Reports of the Listed Companies in China and the statistics yearbook issued by the Shanghai and Shenzhen Stock Exchanges, they use profitability, growth, tangibility firm size and ownership shares as their explanatory variables. They find that Chinese firms use little long-term debt, which is positively (negatively) related to firm size and tangibility (profitability and growth). They also find that the state's legal person shareholders and foreign investors' ownership positions exert significant linear and non-linear effects on sampled firms' capital structure.

In spite of the fact that the above-mentioned authors have studied some aspects of the financing behaviour of firms in China, all of these studies assume that capital structure is static. But firms' decision about their capital structure is dynamic. Following this argument, Qian, Tian and Wirjanto (2007b) formulate a dynamic capital structure model which allows for incomplete adjustment of a firm's debt level in a given period towards a target level. Using a panel data set of stock market and accounting data for 650 publicly listed Chinese companies over the period 1994-2004, they specifically examine the determinants of publicly listed

Chinese companies. They use six key variables that have been used in previous studies; firm size, tangibility, non-debt tax shields, growth opportunities and volatility. In addition to these variables, they include an important determinant unique to Chinese companies, namely, non-circulating shares. For their dependent variable, they use the book value of total debt to assets. They incorporate industry dummies as well as firm-specific effects. Their results show that publicly listed Chinese companies adjust towards an optimal level of debt ratio but the process is slow. They also find that while firm size, tangibility and ownership structure are positively related to firms' debt ratio, profitability, non-debt tax shields, growth and volatility are negatively related to firms' leverage ratio.

Du, Guariglia and Newman (2009) also study the capital structure behaviour of privately owned small and medium-sized enterprises in a dynamic context. They focus on small and medium-sized enterprises because most empirical studies on capital structure and firm size have been largely based on large firms. This has been as a result of lack of comprehensive firm-level data on small and medium-sized enterprises. In order to fill in this gap in the literature, they use a relatively large, new, and underused dataset conducted by the Chinese National Bureau of Statistics to examine the capital structure determinants of these firms. The final numbers of observations they use consist of 65, 551 private unlisted SMEs and this data runs through the period 2000 to 2006 and covers all provinces of China. In addition, they consider social capital as an additional determinant of capital structure. As their dependent variable, they use short term leverage, long-term leverage and total leverage. For the estimation on short-term leverage and total leverage, they use GMM and for the estimation on long term leverage, they use the Tobit Estimation method. Like Chen (2004), they find that neither the TOT nor the POT provides a complete explanation for the financing decisions of Chinese SMEs. Rather they find that social capital is an important determinant of SMEs' leverage decisions. Particularly, they find that investment in social capital is positively related to firms' short-term debt, but negatively related to its long-term debt. Their results imply that expenditure on entertainment is

relevant for firms that require short-term financing from financial institutions, but not very relevant for firms that want long-term financing.

It is important to note that all the studies on capital structure presented above apart from Du et al (2009) and most of the studies on the other countries have used data on listed firms. For the studies on China, although information on listed firms is easy to come by, very few firms in China are listed. As a result, using listed firms in the analysis on capital structure limits the understanding on how Chinese firms actually behave in their leverage decisions.

Secondly, none of these studies considered above apart from Li et al. (2009) have recognised the importance of foreign ownership in their analyses, leaving out the possibility of firm heterogeneity as far as ownership is concerned. However, Li et al. (2009) focuses not only on foreign ownership but on private firms and state-owned enterprises. They also concentrate on how on average, leverage relates to these types of firms. Consequently, the possibility that the relationship between leverage and the financial determinants vary according to foreign ownership is not considered.

Clearly, there is room for additional empirical work on the determinants of capital structure, especially with respect to examining foreign ownership. Our study does this by addressing some potential shortcomings observed in previous empirical studies with our test procedures and choice of datasets.

First, we analyse the financial determinants of capital structure across firms with different degrees of foreign ownership. We divide into three, Purely Domestic (PD), Joint Ventures (JV) and Wholly-Foreign Firms (WF). Our division is based on the fraction of paid-in capital provided by the various investors. We provided a detailed description of the way we divide the firms in the section of Methodology. Second, unlike the previous studies on China outlined above, we focus our study on unlisted firms. Unlisted firms represent a true reflection of Chinese firms as many firms in China, especially the foreign ones are unlisted. By doing this, our results have the potential of revealing what actually pertains in China as far as firms' leverage decisions are concerned. Third, we use the same dataset to investigate how the different types of firms behave as far as different

debt maturities are concerned. The same types of firms are likely to behave differently in their leverage levels when we consider different types of debt. Therefore, in this same study, we use both short-term debt and long-term debts. Thirdly, we allow the relationship between leverage and the different determinants of capital structure to vary across firms with different degrees of foreign ownership. We also consider the capital structure of exporting and non-exporting firms. None of these firms have uncovered this aspect in this field of study.

Like Li et.al. (2009), we believe that institutional differences may account for the differences in the capital structure of firms. Therefore, by extending Li et al. (2009), we examine the capital structure of firms belonging to different regions of China. Similar to the process carried out with foreign ownership, we allow the different financial determinants of capital structure to vary across firms located in different regions. This was not considered in Li et al. (2009). Given these contributions, our study does not attempt to throw out the ideas of earlier studies but rather incorporate those ideas into improved analyses of capital structure.

Chapter 6

6 Our Application to China

6.1 Introduction

China's success in economic growth has been one of the most remarkable events that have ever taken place in the world economy. Having a GDP per capita of about 186.44 US dollars at constant year 2000 prices just about some three decades ago, China has successfully become a thriving economy with a GDP per capita of about 1791.26 US dollars at constant year 2000 prices[48], and an average growth rate of about 9% in recent times[49]. This rapid growth has been fostered by many things among which exports and foreign investment have played significant roles. Foreign Direct Investment (FDI) stock, for instance increased about 30 times from the early 1980s to 2005. In addition, despite the slow development of its financial system, in 2004, the country overthrew Japan as the third largest exporter in the world, behind only Germany and the US, all credit to a real export growth of more than 500% from 1992 to 2007 (Amiti and Freund, 2008). Furthermore, Chinese exports increased more than ten times, from US$25 billion in 1984 to US$383 billion in 2003 (Silva-Ruete, 2006). By 2003, China's export growth rate was seven times higher than the export growth rate recorded by the world as a whole. Indeed, its export products that were in high demand worldwide increased from about 20% in 1987 to 60% in 2003 (Silva- Ruete, 2006).

Given the contributions of exporting firms and FDI to the Chinese economy, it is important to know whether they are in a good financial position. The financial position of these firms can be determined by their capital structure[50]. According to Cassar (2004), the capital structure decisions of firms have important implications for their performance and their ability to be successful and survive for investment and future development. However, firms in developing countries'

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[48]World Development Indicators, World Bank (various years).
[49] Source: China Compendium of Statistics 1949-2004.
[50]Capital structure is defined as the relative mix of equity and debt used to finance a firm (Myers, 1994).

inability to secure adequate funds have been cited as a great obstacle to firm development and investment (Harrison and McMillan, 2003). This notwithstanding, if an economy is operating well without any government intervention, one would expect certain types of firms to have more leverage than others. In this case, it is only natural to expect firms with a clean and healthy balance sheet to be more levered than those with a poor balance sheet. For instance, as most foreign firms, large firms and exporting firms have been seen to be high performers, more efficient and have a higher cash flow (see Bellak, 2004, Girma, Kneller and Pissu, 2005 and Fazzari, Hubbard and Petersen, 1988 respectively), they are more likely to be more levered than small firms, non-exporting firms and domestic firms.

Concentrating on foreign ownership and exporting status respectively, there are several reasons why one would expect these types of firms to have higher leverage ratios than domestic firms and non-exporting firms. First, foreign firms have access to more sources of capital than domestic firms as a result of the international nature of their operations. Specifically, they can receive credit from their parent companies, shielding them from credit constraints (Desai et. al., 2004). Therefore, considering that financial markets are not integrated foreign firms can raise more capital through foreign debt financing and at more favorable terms than domestic firms. Thus, access to external sources of financing should result in higher debt ratios for foreign firms than domestic firms. The second reason for expecting foreign firms to display higher debt ratios than domestic firms is that foreign firms can use foreign debt as a hedging instrument against foreign exchange risk. Because foreign firms have higher levels of foreign exchange exposure than domestic firms, it is expected that they make greater use of debt financing than domestic firms[51] (Doukas and Pantzalis, 2003). Third, since the operations of foreign firms are usually diversified industrially, the business and financial risk of foreign companies is expected to be lower in comparison to that of domestic firms (Doukas and Pantzalis, 2003). This would tend to reduce the cost of debt and as a result raise foreign firms' leverage. Fourth, because they also have

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[51]Kedia and Mozumdar (1999) show that firms with high exposure of aggregate of foreign exchange tend to issue more foreign currency denominated debt.

a lower bankruptcy risk and adopt international standards faster, they find it easier to receive assistance from domestic banks (Colombo, 2001; Harrison and McMillan, 2003). Fifth, even on the domestic financial market, foreign firms are presumed to be less risky because of their diversified nature and larger and are therefore able to have more access to compete effectively and gain more access to the financial market, leading them to having a greater debt ratio than domestic firms if the financial system is not bias (Harrison and McMillan, 2003).

For exporting firms, because they depend on demand from foreign countries, they are less tied to the domestic cycle, and less prone to those financial restrictions caused by contractionary monetary policy and recession in the exporting country[52]. This results in a more stable cash flow for exporters than non-exporters which in turn allows them to easily access the external financial market (Campa and Shaver, 2002; Garcia-Vega and Guariglia, 2008)[53] and therefore have a higher leverage. Finally, the fact that a firm is an exporter also just provides a signal that the firm is sufficiently productive to generate enough profits in foreign markets to recover the sunk costs that need to be met when entering foreign markets for the first time (Roberts andTybout, 1997). This increases the probability that the firm will be able to service its external debt, and further allows exporting firms to have more access to credit and thereby hold more leverage.

Nevertheless, most economies especially the socialist ones do not operate without government intervention, and China is no exception. Its financial sector is characterised mainly by a bank-based system, where State-Owned Banks play an important role in it. These state-owned banks are usually directed by the government to divert resources from the most efficient firms (private firms; domestic and foreign alike) to SOEs which are generally considered less efficient. Second, according to the People's Bank of China and the BIIS Paper (44), regulations on the Foreign Exchange System of the People's Republic of China impose a limit on foreign firms' external borrowing. Furthermore, the difficulty of operating with foreign currency makes it difficult for firms to borrow from international sources. All these places certain restrictions on the foreign firms

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[52]This argument only holds if business cycles are not perfectly coordinated across countries.
[53]A more stable cash flow gives lenders assurance that the firm will be able to pay what is due it.

located within the Chinese domain and therefore make China an interesting case to study.

China has gradually been changing into a market-oriented economy over the past two decades, and there's now a growing recognition of private firms, especially the foreign ones. Consequently, the government has instituted many policies to support this important reformation. However, there is a growing concern that private firms in China still face problems with finance. Therefore, even without any thorough investigations, we can immediately tell that heterogeneity exists in the financial behaviour of firms in China. Yet, based on the arguments presented above, it is indeed difficult to tell which type of firm will have a higher debt ratio. This raises a question about what the determinants of capital structure of Chinese firms are - an important concern in improving policies aimed at supporting the manufacturing sector.

Relatively few studies have looked at the financing behavior of firms in China. In 2004, for instance, Chen examines the determinants of capital structure focusing on listed firms. His results suggest that the variables that explain the capital structure decisions in the Western world are also relevant in explaining the capital structure of firms in China. In addition, his results bring forth an important revelation. He finds that both the trade – off theory and the pecking order theory are limited in explaining capital structure decisions in China.

In recent times, most finance authors have diverted their attention from how capital structure affects firm value. Rather, they now emphasise how the capital structure of a firm can be influenced by ownership or governance structure which will in turn influence the strategic decision of top management (Hitt, Hoskisson and Harrison, 1991). These decisions will then have an impact on the general performance of the firm (Jensen, 1986). Considering ownership therefore, Huang and Song (2006) use a dataset containing 1000 Chinese listed companies from 1994 to 2000. They report that ownership affects leverage. Li, Yue and Zhoa (2009) study the debt maturity choices of SOEs, private firms and foreign firms in China from 2000-2003. They present evidence suggesting that leverage increases with state and private ownership but decreases with foreign ownership. Du et.al

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(2009) also examines the determinants of capital structure of Chinese privately owned small and medium-sized enterprises. They consider social capital as a determinant of capital structure. Using a panel of 65,551 firms over the period 2000-2006, they find that investment in the building and maintenance of social capital is positively associated with short-term debt, but negatively associated with long-term debt, while asset structure gives the opposite results. Although these studies have related ownership to capital structure, they have examined firm financing behavior in a static context[54] and have not looked at firms with different degrees of foreign ownership. They have also focused on listed firms[55]. Yet, listed firms do not reflect the true nature of firms that exist in the Chinese setting. Mainly, SOEs are listed in the Chinese economy. Therefore, we consider the sample chosen by the above mentioned studies as somewhat unrepresentative of firms in the Chinese economy.

We in our study focus on unlisted firms which indeed reflect the nature of the bulk of Chinese firms. Identifying the factors that affect the capital structure of unlisted Chinese firms is relevant because China is considered the largest developing and transitional economy with institutional features that are likely to be unique. Particularly, China's corporate bond market is underdeveloped; Chinese firms encounter high agency cost, low bankruptcy risk (probably due to the fact that most of the firms are state-owned) and have low income tax rate. All these features imply that the trade off theory cannot apply to Chinese firms. And the characteristics within the Chinese economy make a study on the Chinese economy attractive.

Secondly, to the extent that foreign firms are becoming a predominant part of the Chinese economy, it has become very necessary to pay particular attention to how they are being financed. One cannot do that by lumping them together and comparing them to other firms. They need to be divided into smaller groups for us to effectively study their financial pattern and direct specific policies towards them. Until now, no study including the ones on the Chinese economy listed above

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[54] Du et.al (2009) is the only study that has looked at the financing behaviour of firms in a dynamic context. They however focus on small and medium-sized enterprises and not firms with different degrees of foreign ownership.
[55] Apart from Du et al(2009)

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has provided any evidence on this. Different from the aforementioned studies, we categorize firms according to their degree of foreign ownership. Specifically, we divide firms into three (Purely Domestic (*PD*), Joint Ventures *(JV)* and Wholly-Foreign (*WF*)) using the amount of paid-in foreign capital invested in them and carry out dynamic analyses. This will enable us tell the exact relationship between leverage and foreign ownership. Our inclusion of JVs in general in the first place is motivated by the fact that, this group, by having both the domestic and foreign component may allow them to benefit from both the government support given to domestic firms and the benefits from their international operations. Thus, they may either end up having a higher debt ratio than *PD* and *WF* firms, or towing the lines of one the firms (that is, PD or WF) depending on which firm's effect is greater.

Another unique thing that we seek to examine is how the financial determinants of capital structure vary across different ownership groups. As a result, we concentrate on cash flow and collateral. Considering cash flow for instance, WF firms are presumed to have a larger pool of cash flow compared to PD and JV firms. Also with collateral, firms with some degree of foreign ownership are presumed to be more endowed in intangible assets than tangible assets. Differences in these endowments are expected to reflect in the leverage behavior of the different types of firms. As much as this classification enables us to consider the financial decision-making of firms with different ownership types, it also gives us the opportunity to look at how the different financial determinants of capital structure distinctively vary across firms with different degrees of foreign ownership. We do not argue in this paper that the other determinants do not vary with ownership but for the sake of the simplicity of our study we focus on only the financial variables. Our results, we believe, will judge the success of the on-going reforms in the Chinese financial sector.

Finally, we present a dynamic model rather than a static model. Several reasons could support the use of a dynamic the use of a dynamic model. First, capital structure decisions are dynamic in nature and should therefore be treated as such. Assuming the adjustment process to be without any cost is rather unrealistic. This makes a dynamic model more general. Second, estimating a static model

eliminates the effects of the previous period's debt on that of the current period if the coefficient of the lagged dependent variable is not zero. Not using a dynamic model may result in large errors which may cast doubts on the authenticity of our results. Further, in capturing the dynamics of capital structure adjustment, we are able to model movements towards optimal debt ratios.

Next, following Bridges and Guariglia (2008)'s classification of firms[56], we compare the financing behavior of exporting firms and non-exporting firms. In light of the growth-enhancing opportunities created by exporting firms in China together with the famous proposition that firms that export are more efficient and fast growing (e.g. Bernard et.al, 2003; Clerides et al,1998), it is only fair to consider how they finance. Furthermore, the results we obtain together with the results for firms with different ownership groups may offer us the opportunity to draw conclusions about the behaviour of foreign affiliated firms (that is foreign-owned firms or exporting firms).

Finally, we provide new evidence in the literature of capital structure by conducting inter-regional studies within one country to find out how regional characteristics and institutional development affect firm-financing behavior. Studies conducted by Rajan and Zingales (1995), La Porta et al. (1997), Demirguc-Kunt and Maksimovic (1998, 1999) and Fan et.al (2006) provide evidence that the development of a country's legal and institutional system is relevant to the decisions over firms' capital structure. The aforementioned studies have related this argument across countries. What remains uncovered in this area of research is the fact that firms in different regions in a particular country may exhibit different capital structure characteristics if wide disparities exist in the development of the regions in which they are located. We fill in this gap by exploring how firms in different regions of China make their capital structure decisions. By conducting inter-regional studies within a particular country, we are able to by-pass the problems of country differences arising from accounting procedures, availability of different forms of finance, etc in different regions.

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[56]Guariglia and Bridges (2008) however studied the exporting and non-exporting firms' financial constraints.

In carrying out our analyses, we use both short-term debt and long-term debt to investigate whether different firms will behave in different ways as far as these two types of debts are concerned. The dataset we use is the ORIANA Dataset on China which covers the period 2000-2005. Our results reveal some interesting pattern. Specifically, while we find the sensitivity of short-term debt to cash flow and collateral respectively to be lower for WF firms than PD firms, we find the sensitivity of long-term debt to cash flow to be higher for WF firms than PD firms. JVs are however not different from PD firms in terms of how both their long-term debt and short-term debt are sensitive to collateral and cash flow. We attribute this latter finding to the domestic component in JVs that seem to dominate the foreign effect. Like WF firms, we find the sensitivity of short-term debt to cash flow and collateral to be lower for exporting firms than non- exporting firms, but the sensitivity of long-term debt to cash flow to be higher for exporting firms than non-exporting firms. These results imply that globally engaged firms behave in a similar way when it comes to making decisions on finance, so do non-globally engaged firms.

Secondly, we find that all the factors that affect capital structure in other countries also affect the Chinese economy, with some supporting the trade-off theory and some the pecking order theory. Like Chen (2004), we also conclude that neither the trade-off theory nor the pecking order theory is able to fully explain the capital structure of Chinese firms. Concerning firms in different regions, we find that on average, firms found in the coastal region have both less short-term debt and long-term debt. We however find the sensitivity of both long-term and short-term debts to both cash flow and collateral to be higher for firms in the coastal region than firms in the non-coastal region.

The rest of the Chapter is structured as follows. Section 6.2 gives a brief explanation on the transformation of capital structure in China's Transitional Economy. In sections 6.3, we present the dataset. In Sections 6.4, we show how we measure our variables and present our summary statistics respectively. We provide the model specification as well as estimation technique and results in sections 6.5 and 6.6. In section 6.7, we conclude and recommend policies.

6.2   The Transformation of Capital Structure in China's Transitional Economy

Key to economic transition from state socialism is a transformation of firm borrowing strategies. When a firm is in transition, it gradually reduces its dependence on state capital and begins to borrow from alternative sources. This transformation of the financial relationship between the state and firms reduces the monopolistic control of the state over firms and ends the system of bargaining between the state and firms that can weaken restructuring by softening budget constraints (Kornai 1986, Naughton 1995). Reforming the relationship between the state and firms also improves financial market development by making firms independent and encouraging firms to borrow from external sources (Walder 1995). This then leads to appropriate allocation of resources, makes privatization easier and prevents capital flights (Demirgucs-Kunt and Levine 1996, Ratcliff 1980 and Mizruchi and Stearns 1994).

Prior to the reforms in China, firms were mainly state-owned and received financial support from agencies controlled by the state. Loans were being authorized and allocated by the State Council in addition to its role as the issuer of currency. Constraints on firms were not wholly binding as the financial relationship that existed between the state and the firms allowed the state to cover extra expenses by firms which in turn created soft-budget constraints for firms. As owners of firms, the state used its monopoly powers to redistribute funds obtained from profitable firms to non-profitable firms. Although this process assured loss-making firms of their survival, it mounted unnecessary pressure on both state resources and on firms to increase their output (Kornai 1986). The state's main objective was therefore far from profitability. Rather, it aimed at maintaining full-employment. At the beginning of the reforms in 1978, China began to execute extensive economic and industrial reforms which also covered firm financing. First, the role of the People's Bank of China (PBOC, hereafter) was separated from that of the Ministry of Finance. Now, the PBOC no more performed the dual role of monetary policy and credit allocation, but instead it had the sole role of implementing monetary policy and regulating exchange rates. Following this

disintegration of roles, four specialized banks (The Industrial and Commercial Bank, the Agricultural Bank, the People's Bank, and the Construction Bank) were established to cater for particular sections of the economy and gradually they were permitted to take up the role of accepting deposits and granting loans aside their specialized roles. Firms then applied for funds and their requests were granted based on the quality of their application.

However, because these banks were mainly state-owned, their lending practices often reflected government policy rather than the banks' financial objective (Goldie –Scott 1995, Yi 1994). The deliberate attempt by the state to reduce its direct financial support to firms encouraged these firms to seek other sources of funding. The firms began borrowing from non-state sources and this increased steadily during the mid-1990s (Xu 1998, Yi 1994). It was during this period that managers realized that the decision about their capital structure was their main responsibility. Managers adopted western standards of calculating Retained Earnings and this became meaningful to them and affected how they borrowed. Unfortunately, in China, retained earnings were considered equivalent to state funds as they were appropriated and used for other purposes by state officials other than reinvestment. Consequently, these funds were not easily disposable. Loans from other external sources were however disposable. Whereas loans from domestic banks were easier to obtain and considered less risky because they were backed by the state, loans from other sources such as domestic firms and foreign institutions were more risky because lenders did not have enough information about potential borrowers. As a result, the use of bank loans became increasingly important. Despite the risk associated with lending by wholly- non state sources, the sizable financial gains by lenders as well as the independence enjoyed by borrowers encouraged greatly this form of external finance.

Although retained earnings were not in the hands of managers, it served as a measure of firms' financial health to potential investors and lenders as information on it turned out to be widely available and credible. Therefore, in the early period of the reforms, the higher your retained earnings, the better your financial position and the greater the external funds borrowed. In addition, during

the transitional period, changing sources of uncertainties also affected borrowing. The sources of uncertainty moved from supply shortages to other sources. The state stopped supplying inputs to firms and these firms started relying on markets for supplies. Unfortunately, the development of these markets was uneven and this made it difficult for firms to locate creditors, suppliers and customers. Moreover, firms now had to compete with other firms for resources (Naughton 1995). Uncertainty in this manner led firms to imitate each other's financial strategies. For instance, prior to reforms in China, issuing public debt was not a common practice for firms. But issuing public debt became more pronounced during the reform period possibly because they were imitating other firms. Aside uncertainty, uneven market development also influenced firm financial behavior. The state encouraged development in the coastal and southern regions creating wide divergence in the development of both regions. Resources were readily available to firms in the more developed regions. Historical differences leading to a divergence in the development of different regions may explain the behavior of firms in the different regions of China. This was because external funds were not readily available in the poorly developed areas of China. For this reason, firms in this area relied heavily on bank loans which were easier to come by.

Having given a brief overview on the evolution of firms' capital structure in China, we now move on to carry out our analysis on the nature of the capital structure for different types of firms.

6.3 Dataset

Our principal source of information is constructed from the ORIANA Database published by Bureau Van Dijk. It contains profit and loss and balance sheet information on over 20,000 firms, covering over 100,000 observations from 1998-2005. These firms operate in different industries and cover 30 provinces in China. In this study, we focus on the manufacturing sector only. Because information on ownership started in 2000, we drop all observations that fall within the years 1998 and 1999.

Finally, in order to deal with potential outliers, we drop all observations that fall within the 1% tails of the distribution of all variables used in the regression analyses. This leaves us with a final panel of about 19,292 firms covering 81,112 annual observations for a period of 6 years. With the final dataset, firms appear 5 years on average, making the dataset unbalanced. The use of unbalanced data partially frees firms from survivor bias and potential selection as it allows firms to enter and exit the panel. All the firms in the dataset are unlisted. The dataset also contains regional information that allows us to divide the firms into two different regions; the coastal and the non-coastal regions. By this information, we will be able to carry out regional analyses, making it easier for us to identify the differences that exist between firms in different regions.

We identify five different types of ownership in our dataset: state, collectives, private, domestic and foreign. From these ownership groups, we classify firms into three; according to the degree of foreign capital invested in it. Therefore, if a firm has no foreign capital, it is considered *PD (PD);* if it has between 0 and less than 1 it is considered a Joint Venture *(JV);* and if it has foreign capital of 1, it is *Wholly-Foreign (WF).* Additionally, the dataset also contains information about firms' export participation. Based on this information, we classify firms as exporting or non-exporting. We represent exporting firms by a *dummy=1* if a firm exports and, 0 otherwise, and non-exporting firms by a *dummy=1* if a firm does not export and 0 otherwise.

6.4   Variable Measurement, Hypothesis Testing and Summary Statistics

6.4.1   Variable Measurement

To establish the empirical design of our research, we explain the variables that affect firms' capital decisions and their expected relationship with the indicators of capital structure. Various alternative definitions of leverage have been employed by many literatures. In most studies, they are usually in some form of debt ratio. They differ according to whether book measures or market values are used or whether total debt, short-term debt or long term debt is considered (Murray and

Goyal, 2003). Some authors (see Welch, 2004) have even used interest coverage ratio. Most studies have used a single measure of leverage, the most widely used measure being total debt to assets. Since some of the of capital structure theories have different implications for the use of different debt measures and different predicted coefficients of the explanatory variables in the predicted model (Titman and Wessels, 1988), rather than using total debt, we employ two alternative indicators of financial leverage in this study: Short-term debt ratio and long-term debt ratio. We measure a firm's short-term debt ratio as its short-term liabilities including trade credits divided by its total assets, and long-term debt ratio as the ratio of its long-term liabilities to total assets. The ratio of liabilities to assets is equivalent to the traditional measure leverage, debt-to-equity ratio, which has been the main way of measuring leverage ratio in most textbooks. Below, we describe the two forms of debt mainly utilized in our study.

6.4.2   Short-Term Debt versus Long-Term Debt Financing in China

Even though the debt market is experiencing rapid growth in China, it is still difficult for companies to have access to long-term financing from the relatively undeveloped corporate bond market. This situation suggests that while short-term debt from banks represents the most dominant source of financing for firms in China, the role of long-term debt in financing firms has been limited. Linking this to our data, while all the firms in the dataset have some amount of short-term debt, just about 60% of the firms in the dataset have some amount of long-term debt. Being specific, the firm with the smallest amount of short-term debt has a debt of about 912.7 yuan while the firm with the largest amount of long–term debt has a debt of about 117641.4 yuan.

Further, 25% of the values of short-term debt are equal to or less than 35314.13 yuan, and about 75% of the values of short-term debt are equal to 66673.98 yuan. For long-term debt, the firm-year with the largest amount of long-term debt has a debt of about 60595.8 yuan. 25% of the values of long-term debt are less than or equal to 0 and about 75% of the values of debt are less than or equal to 9618.86 yuan. Firms in China use more short-term debt because they cannot afford the high issue cost of long-term debt. This situation is especially

worse for unquoted firms, as they find it easier to issue short-term debt due to informational asymmetries[57]. For long-term debt, Chen (2004) explains that firms in China have less long-term debt because first, the bond market is underdeveloped, second, firms prefer equity finance due to substantial capital gain, and third, due to problems in corporate governance and lack of enforcement of company laws, individual shareholders are not protected. As Chen (2004) puts it, share capital has become a 'free' source of finance. Therefore, managers prefer to use equity rather than debt because the former is not binding.

6.4.3 Determinants of Capital Structure and Hypothesis Testing

6.4.3.1 Determinants of Capital Structure[58]

Based on previous work (Harris and Raviv, 1991, Rajan and Zingales 1995, and Booth et al. 2001), we examine the major firm characteristics that determine capital structure in order to establish a theoretical framework.

Firm size, measured by log of real sales or assets has been seen as a major determinant of capital structure. The relationship between size and leverage is mixed. Size may be positively (Marsh, 1982; Friend and Lang, 1988) or negatively (Rajan and Zingales, 1995) related to leverage depending on whether the TOT or the POT is considered. As pointed by Jensen (1986) for instance, professional managers (who are not owners) may have objectives other than maximizing profits, such as the desire to have power and improve their status. This leads them to deriving personal benefits from expanding beyond the optimal firm size, thereby increasing leverage. This idea supports the TOT theory. On the other hand, the POT predicts a negative relationship between leverage and size of firms. As is well known, larger firms tend to be more profitable and hence have more retained earnings. Firms that tend to have higher retained earnings will prefer to use more of it than debt because using retained earnings is relatively cheaper. Therefore, we expect lower leverage use as a firm gets larger. Titman and Wessels (1998) and

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[57]See Mitchell (1991).
[58]Most studies (for eg. Miguel and Pindado, 2001) have included non-debt tax shield as a determinant of capital structure. This variable, although an important determinant, was not statistically significant in any of our estimations. We therefore excluded it from our analyses.

Benito (2003) for instance, find a negative link between debt and firm size. We test the validity of these two competing theories by examining the relationship between size and leverage.

Cash flow/Total Assets represents a firm's profitability. The TOT predicts a positive relationship between profitability and leverage. The more profitable a firm is, the more likely it is for it to have access to debt because it is less likely that that firm will default payment. Also profitable firms can avoid taxes when they use more debt. Petersen and Rajan (1994) for instance find a positive relationship between profitability and debt ratio. On the other hand, the POT predicts that a firm with a higher profitability will use less leverage as it will be relatively cheaper for the firm to use its greater available internal funds to finance its investment. Titman and Wessels (1988) and Barton et.al (1989) find that firms with higher profits use relatively lower debt ratios. Focusing on specific leverage ratio measures, Cassar and Holmes (2003) and Hall et.al (2004) all find negative relationship between profitability and both short-term and long-term debts. We examine these two conflicting predictions by looking at the relationship between cash flow and leverage.

Collateral measured as the ratio of a firm's tangible assets to its total assets and shows the level of tangible assets that can be used by the firm when it decides to borrow, has an impact on debt maturity. As collateral captures the proportion of tangible assets to total assets it suffers minimal percentage losses in liquidation. It is able to reduce information asymmetries and agency problems because it secures the interests of lenders when problems arise either from lack of information or conflicts of interest between the internal and external parties. To this effect, it is expected that some form of matching assets and liabilities will take place where long-term assets will be financed by long-term debt and short-term assets will be financed by short-term debts. The idea behind the matching principle is that on one hand, debt with a maturity shorter than the maturity of assets is considered risky because the asset might not have yielded the necessary profit to pay off the debt. On the other hand, debt with a maturity longer than the maturity of assets is also risky because the debt would have to be paid after the asset ceases to yield income.

As a result, firms try to match asset and liability maturities. If the T.O.T is correct, then, we should expect a positive relationship between collateral and leverage ratio because firms with high collateral can easily have access to external finance. According to Bradley et.al. (1984), firms that invest greatly in tangible assets are able to present these assets as collateral, making it easier for them to secure more debt at a relatively cheaper cost. Likewise, the P.O.T predicts a positive relationship between collateral and leverage. Harris and Raviv (1991) posit that the problem of information asymmetry will be minimized if borrowers are able to produce collateral which can be valued. Firms with more collateral can have access to more debt as that may cover up for the asymmetric information and moral hazard problems. Other studies specifically provide evidence of a positive relationship between asset structure and long-term debt and a negative relationship between asset structure and short-term debt (see Van der Wijst and Thurik, (1993); Jordan et. al (1998); Hall et. al (2004)). But Chen (2004) argues that the relationship between collateral and leverage can be negative if the firms have closer relationships with their lenders.

Also looking at the relationship between collateral and specific types of debt, we expect tangible assets to have a positive relationship with long-term debt ratio and a negative relationship with short-term debt ratio. This is in accordance with the maturity-matching principle which suggests fixed (tangible) assets to be financed with long-term debt and non-fixed assets to be financed with short-term debt. In this study, we test the validity of this prediction.

We measure *growth opportunities* as either the change in the log of real sales or the change in the log of real assets. Myers (1977) posits that firms with higher growth opportunities will have low debt ratios. According to him, higher growth opportunities can intensify moral hazard problems due to agency costs and further lead to the problem of asymmetric information. The reason is that the benefits which will be realized by the firms from the higher growth opportunities will be enjoyed by the shareholders and not the lenders. In addition, firms with higher growth opportunities will have less debt as they will prefer retaining their debt capacity because they might need to borrow more in future (Titman and

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Wessels, 1988). On the other hand, the P.O.T predicts that if a firm requires meeting its higher growth opportunities, it needs to borrow more to supplement its internal finance. Therefore, firms with higher growth opportunities will be characterized by higher debt ratios. Marsh (1982) provide evidence to show that firms characterized by higher growth opportunities display relatively higher debt ratios.

We examine these two competing theories by looking at the relationship between growth opportunities and leverage.

6.4.3.1   Hypothesis Testing

6.4.3.1a   Hypothesis Testing for Firms with Different Degrees of Foreign Ownership and Exporting Firms.

As mentioned in the introduction, we limit our focus on how the financial variables vary with firms with different degrees of foreign ownership. Following this, we focus our attention on collateral and cash flow.

Foreign firms are usually considered more efficient and may even be able to operate across different countries compared to domestic firms[59]. Their high efficiency together with their ability to operate in different countries enables them to be more profitable which in turn creates a large pool of cash flow[60]. Also, because foreign firms are usually affiliated internationally, it is often argued that their activities allow them to create extensive internal markets which are likely to provide them with a larger base of internal financing. This large amount of cash flow provides them with a cheaper source of finance and a lower cost of capital compared to external markets. Due to the extra premium on external credit in general, if internal markets function properly, firms would prefer to use internal finance to external finance for short-term assets. However, this argument in our opinion will apply mainly to short-term debt which is primarily used to finance short-term projects according to the maturity-matching principle. This is because with short-term projects being relatively cheaper than long-term projects, the large

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[59] See Bellak (2004) who finds that foreign affiliates generally perform better than domestic-owned firms.
[60] See for instance Harrison and McMillan (2003) who argue that foreign firms are more profitable than domestic firms.

pool of internal financing created through the activities of foreign firms should be just enough to cater for their short-term debt. This means that although a decline for instance in cash flow will make purely foreign firms increase their debt, they may not increase it by a greater proportion compared to the amount of increase for PD firms. This will mean that WF firms' sensitivity of short-term debt to cash flow is expected to be lower than PD firms' sensitivity of short-term debt to cash flow.

For long-term assets which may require more money we do not expect the available internal financing to be sufficient enough to cover this. This is when the efficiency and performance of firms can count towards accessing external financing. Foreign firms because of their high cash flow would be in a position to borrow more and will therefore borrow more to support their retained earnings. Indeed, several authors like Stein (1997), Williamson (1975) and Shleifer and Vishny (1992) support this claim by stating that diversified corporations create internal markets which are less prone to asymmetric information problems and, hence, they can sustain higher levels of debt. Although both situations for short-term debt and long-term debt can also apply to JVs because they have some components of foreign ownership in them, their domestic component may push them to behaving like PD firms if this effect proves greater. Therefore, it is unclear as this point how sensitive JVs' leverage ratio will be to changes in cash flow.

With regards to exporting and non-exporting firms, exporting firms are considered more diversified and therefore may be more profitable than non-exporting firms. This empirical regularity has been incorporated in the recent theoretical models provided by Melitz (2003) and Helpman, Melitz and Yeaple (2004). According to these models, firms self-select to become exporters. This is because only firms with productivity level above a certain cut-off point will find it worthy and profitable paying the sunk cost to enter the export market. Following this Girma, Kneller and Pissu, (2005) argue in their study that exporting firms are more efficient than non-exporting firms. Similar to the argument made for foreign ownership; this means that, for the short term assets of exporting firms, their internal finance may be enough to finance it. On the other hand, their high level of

profitability will allow them to secure long-term debt faster and easily to be able to finance their long-term assets. Therefore, exporting firms will not change short-term debt as much as non-exporting firms will do when cash flow changes. This means that like WF firms, whilst exporting firms' short-term debt's sensitivity to cash flow is expected to be lower than that of non-exporting firms, their long-term debt's sensitivity to cash flow is expected to be higher than that of non-exporting firms. All these lead us to the following hypotheses:

Hypothesis 1: The sensitivity of short-term debt to cash flow is likely to be lower for WF firms than PD firms. However, the sensitivity of long term debt to cash flow is likely to be higher for WF firms than PD firms.

For JVs it is unclear whether the sensitivity of both their long-term debt and short-term debt to cash flow will be higher than, lower than or even similar to that of PD firms.

Hypothesis 1a: Similarly, we expect the sensitivity of short term debt to cash flow to be lower for exporting firms than non-exporting firms, and the sensitivity of long-term debt to cash flow is likely to be higher for exporting firms than non-exporting firms.

Next, it is important to note that the asset structure conditions of a firm matters for its capital structure. In addition, because foreign firms especially the WF ones are mainly 'alien' to the host economy, there exist some difficulties in the gathering and processing of information, making monitoring of foreign firms more expensive than the monitoring of domestic firms (Doukas and Pantzalis, 2003). This means that WF firms that have little or no association with the host economy and are more susceptible to information asymmetries will be required to produce a higher value of collateral than local firms. This implies that WF firms will require more tangible assets to secure themselves. Yet, there exists empirical evidence that shows that foreign firms are endowed with a substantial amount of intangible assets compared to domestic firms (Ethier, 1996; Ethier and Horn, 1990). Naturally, intangible assets are associated with more information

asymmetry than tangible assets of a firm, and therefore, we will normally expect leverage ratios to have lower sensitivity to collateral for foreign firms (especially WF firms) compared to domestic firms (Lee and Kwok, 1988; Burgman, 1996; Chen et.al., 1997, and Doukas and Pantzalis, 2003).

Hypothesis 2: The sensitivities of both short-term and long-term debt to collateral should be higher for WF firms than PD firms.

Again, it is unclear at this point how sensitive long term debt and short-term debt will be to cash flow compared to PD firms.

With regards to exporting and non-exporting firms, exporting firms like foreign firms are presumed to have more intangible (fixed) assets than tangible assets because of the complexity of their nature. According to Braunerhjelm (1996), the decision to export depends strongly on intangible assets, which is used to differentiate the product from its competitors. Given that collateral is measured by the ratio of tangible assets to total assets, we also expect the sensitivity of both long-term debt and short-term debt for exporting firms to be lower for exporting firms than non-exporting firms. Our next hypothesis therefore is:

Hypothesis 2a: The sensitivities of both short-term debt and long-term debt to collateral should be lower for exporting firms than non-exporting firm.

6.4.3.1b Regional Hypothesis

The differences in financing pattern across the regions of China reveal differences in institutions within the regions. In particular, firms in less developed regions are likely to have higher monitoring cost and lower performance than firms in more developed regions. For instance, Qin et al. (2010) illustrates that on average, firms located in high FDI intensity regions (i.e. the coastal region) have a higher level of performance than firms located in low FDI intensity regions (i.e. the non-coastal region). In addition, they also find that the relationship between intangible resources and firm performance is positive for firms located in high FDI intensity regions; while the relationship is negative for firms located in low FDI intensity regions. Our dataset confirms this by showing a higher cash flow for firms in the

coastal region compared to firms in the non-coastal region and more intangible assets for firms in the non-coastal region. This is clearly shown in the section that follows. To further buttress this point, Demirguc-Kunt and Maksimovic (1999) for instance show that better legal rules and better creditor protection are associated with more long-term debt financing. Moreover, according to Li et al. (2009), lenders involved in economic criteria in their lending have strong incentives to provide loans with short maturities. Under the recent bank reforms in China, banks have started applying economic considerations in their lending decisions and therefore are highly motivated to monitor debtors. All these imply that firms in the coastal region are likely to employ more leverage than firms in the non-coastal region. Following these, our next hypothesis therefore is:

Hypothesis 3: The sensitivities of short-term debt and long-term debt to cash flow and collateral respectively should be higher for firms in the coastal region than firms in the non-coastal region.

Table 6.1: Summary of Variables used and their Expected Signs under Alternative Theories

Variable	P.O.T	T.O.T
Firm Size	-	+
Cash flow	-	+
Collateral	+(-)	+ (-)
Growth Opportunities	+	-

6.4.4 Summary Statistics

The sample appears to over represent PD firms: About 57.44% of the total number of firms in the sample is PD, while the rest of the firms are almost equivalently shared between Wholly-Foreign firms and JVs (21.97% and 20.59% respectively). Out of the total number of state-owned enterprises in the dataset, about 95.6% of them are PD while the remaining 4.4% of them have formed collaboration with wholly-foreign firms.

Considering exporting and non-exporting firms, the sample tends to be evenly distributed across them. While about 57.55% of the firms in the dataset

export, an almost equivalent percentage of 42.45% of the firms do not export. A greater number of WF firms engage in the export market than PD firms. Whereas about 86% of the total number of WF firms export, less than half of the total number of PD firms (about 41.45%) engage themselves in the export market. Also, the percentage of total JVs who export is quite substantial and cannot be overlooked (it is about 72%). Overall, whilst most firms with foreign ownership produce mainly for the international market, most PD firms primarily serve the local market.

Dealing with specific regions, more firms, irrespective of their ownership category are concentrated in the coastal region (75%) than in the non-coastal region (25%). However, compared to PD firms, it appears that more of the firms with foreign ownership have established themselves in the coast: About 97.06% of the total number of wholly-foreign firms in China are located in the coast, 87.51% of *JVs* are also located in the coast while about 63% of PD firms are located in the coast. Conversely more PD firms are located in the non-coastal region than the other types of firms. While about 37% of PD firms are located in the non-coastal region, about 12.5% of JVs are located in the non-coastal region and only about 3% of wholly-foreign firms are located there. The gradualist approach adopted for opening up, together with the good geographical nature of China's coastal region explains the uneven distribution of firms, especially for foreign firms in China.

Turning to exporting firms in the different regions, more than 7 times the total number of firms in China's manufacturing sector that export is found in the coastal region. This, together with the above-mentioned percentage for foreign firms located in the coast implies that most globally engaged firms, (that is firms that have some-degree of foreign ownership/ export) are located mainly in the coastal region. In the coastal region, most firms produce essentially for the international market (about 66%) whereas most firms in the non-coastal region produce purposely for the domestic market (about 70%). Undoubtedly, Table 6.2 below shows that irrespective of the region in China, a greater percentage of WF firms and JVs produce for the international market although the percentage of

foreign-owned firms (that is, JVs and WF firms) that produce for the export market is greater in the coastal region than in the non-coastal region.

Next, in this section, we carry out summary statistics on the variables used in the study. In this study, we make use of four financial variables; Current Liabilities/Total Assets, Non-Current Liabilities/ Total Assets, Cash flow/Total Assets and Collateral. The first two variables are indicators of a firm's general indebtedness, cash flow/total assets can be interpreted as an indicator of the availability of internal finance, or as a measure of a firm's profitability and collateral, the firm's ability to repay its loans. Whereas current liabilities/total assets takes into account all the firm's short-term debts including trade credits, non-current liabilities accounts for all the firm's long-term debts. Both measures indicate the proportion of firms' asset financed through short and long-term debts respectively. On one hand, a high leverage suggests that firms are indebted because they have been incapable of making repayments, thereby accumulating their debts. But on the other hand, a high leverage could signify firms' ability to attract external finance as firms in good financial standing can easily receive external finance because they are believed to be more credible.

Table 6.2: Percentage of Different Firms That Export and do not export in the Entire Economy and in the Different Regions of China

Region	Entire Economy		PD		JV		WF	
	export	non-export	export	non-export	export	non-export	export	non-export
	57.26%	42.74%						
Non-Coastal Region			28.38%	71.62%	41.69%	58.31%	44.47%	55.53%
Coastal Region			49.08%	50.92%	75.47%	24.53%	87.04%	12.96%

Source: ORIANA Dataset

Notes: Purely Domestic refers to PD Firms, JV, Joint Ventures and WF, Wholly-Foreign Firms.

Table 6.3 reports sample means of the variables used in the analysis for different ownership categories and for exporting and non-exporting firms in the sample. As

far as the debt measures are concerned, PD firms represent the category with the highest average debt (current liabilities/total assets and non-current liabilities/assets). In fact, the average debt seems to be decreasing with increase in foreign ownership, though the difference does not appear significant. That notwithstanding, these same firms (that is, PD firms) appear to have the lowest average *cash flow/capital stock*. Their high level of indebtedness might be attributed to the ease with which they are able to secure loans from banks and the lending bias that has historically favored them[61], while their low level of cash flow on average signifies their inability to manage funds and generate internal funds. Not surprisingly, firms with foreign ownership have higher average cash flow and lower leverage measures, implying that they mostly follow the pecking order theory: They use less debt because their internal finance base is larger.

Collateral is also highest on average for PD firms, followed by WF firms, and then JVs. In reality, this does not often happen unless some kind of intervention exists. Perhaps this may throw more light on the support given to PD firms and further explain why *PD Firms* are highly indebted on average. JVs are the largest in terms of average real assets. *PD firms* follow when real assets are used to measure firm size: At first glance, the results for firm size may appear strange, but in the context of China, this is expected as PD firms are larger than WF firms again due to the backing they receive from the state. From 6.3, looking at growth opportunities, it is evident that all the different types of firms with different degrees of foreign ownership have almost similar growth opportunities on average: Differences in these average growth opportunities between these types of firms are negligible. Focusing on firms that export and those that do not export, exporting firms, like foreign firms (WF and JVs), have lower average debt measures compared to their non-exporting counterparts. Considering that most firms that do not export are PD firms, it is only normal that they follow similar patterns as the PD firms. The ability of exporting and non-exporting firms to

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[61] Compared to the percentage of joint ventures that are state-owned (2%) more Purely Domestic firms are state-owned (about 17%), therefore, we conclude that Purely Domestic Firms are to be more influenced mainly by what goes on with the state-owned enterprises.

generate internal finance is however similar. In line with the previous literature[62], the summary statistics in Table 6.4 show that exporters are generally larger in terms of real assets.

Table 6.3: Comparison of the Mean Values of Variables among Different Types of Firms

Variable	P.D (1)	J.V (2)	W.F (3)	M.D PD and JV (4)	T ratio	M.D PD and WF	T ratio (5)	M.D JV and WF	T ratio (6)
Current Liabilities/Total Assets	0.54	0.50	0.48	0.03	17.39	0.06	29.86	-0.02	10.11
Non-Current Liabilities /Total Assets	0.09	0.05	0.03	0.03	32.83	0.06	56.28	-0.02	-21.32
Real Assets	1355	1650.83	973.16	-297.35	-12.82	380.32	18.75	-677.67	-28.38
Cash Flow/Total Assets	0.07	0.09	0.09	-0.02	-33.23	-0.02	-26.95	0.005	-4.61
Collateral	0.37	0.34	0.36	0.03	19.11	0.01	7.60	-0.2	9.47
Growth Opportunities	0.12	0.10	0.11	0.02	4.98	0.01	1.51	0.01	2.91
No. of Observations	45431	16722	17848						

Notes: Purely Domestic refers to PD, JV, Joint Ventures, and WF, Wholly-Foreign. Current Liabilities/Total Assets represents Short-Term Debt Ratio; Non-Current Liabilities/Total Assets represents Long-Term Debt Ratio. M.D represents Mean Difference. Columns 4, 5 and 6 show the mean differences and the t statistics of PD and JV firms, PD and WF firm years and JV and WF firms respectively.

Table 6.4: Mean Values of Exporting and Non-Exporting Firms with their Sample T Test with Unequal Variance for Mean Difference.

Variable	Non-Exporting (1)	Exporting (2)	Mean Difference (3)	T- test statistic (4)
Current Liabilities/Total Assets	0.53	0.51	0.01	8.61
Non-Current Liabilities/Total Assets	0.08	0.06	0.02	28.42
Real Assets	1165.4	1460.9	-295.51	-17.86
Cash Flow/Total Assets	0.08	0.08	-0.004	-6.19
Collateral	0.38	0.35	0.03	22.91
Growth Opportunities	0.11	0.11	0.01	2.71

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[62] See Bernard and Jensen (1999), Greenaway et al. (2007), Berman and Hericourt (2008).

The difference between the average growth opportunities of exporting and non-exporting firms appears to be insignificant. In sum, the results in Tables 6.3 and 6.4 show that globally engaged firms (that is, JVs, WF and Exporting Firms) are relatively less indebted on average and have higher cash flow/total assets, compared to the firms that are not globally-engaged.

Next, we compare the average values of all the variables used in the regression across the different regions and this can be found in Table 6.5 below. While the average current liabilities/total assets tend to be higher for firms in the coastal region than those in the non-coastal region, average non-current liabilities/total assets are higher for firms in the non-coastal region than in the coastal region. In fact, the t-ratio ratios (-6.6 and 49.8 respectively for short-term and long-term debt ratios) show that they are very different. This is rather surprising. According to Demirguc and Kunt (2002), compared to firms in developed areas (in the Chinese case, the coastal region), firms in undeveloped areas where the legal system is inefficient (that is, in this context the non-coastal region of China) are expected to have a more restrictive access to long-term debt as asymmetric information is likely to be greater there. Perhaps, this is so because firms in the non-coastal region have been unable to honour their short-term debts obligations, causing it to build up into long-term obligations. Moreover, firms in the non-coastal region may benefit from incentives given by the government to develop these regions (see Goodman, 2004).

Another surprising finding is that firms in the non-coastal region have significantly higher average collateral values than firms in the coastal region. Compared to the mean value of collateral for firms (0.35) in the coastal region, firms in the non-coastal region have a mean value of 0.3 and the t-ratio (31.9) shows a significant difference between these two average values. As expected Cash flow/Total Assets is higher on average for firms in the coastal region than firms in the non-coastal region[63]. This is confirmed by the high t-ratio (-40.47) in

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[63]The coastal region is noted for its larger market size. Therefore, our results are not strange.

Table 6.5. The coastal region is more developed and more concentrated, thus, creating a large market size for goods and services. This in turn increases profitability. In addition, as indicated earlier, most foreign firms in China are located in the coastal region. These foreign invested firms in the coastal region benefit from tax incentives. This helps reduce the total cost of the firm and thereby increases their profitability. It must however be noted that no such incentive exists in the non-coastal region.

Table 6.5: Comparison of the Mean Values of Variables in the Different Regions of China

Variable	Region		Mean Difference	T-Ratio
	Coastal	Non-Coastal		
Current Liabilities/Total Assets	0.52	0.50	-0.01	-6.61
Non-Current Liabilities/Total Assets	0.05	0.10	0.05	49.82
Real Assets	1469.1	1988	519.04	20.9
Cash Flow/Total Assets	0.08	0.06	-0.02	-40.47
Collateral	0.35	0.39	0.05	31.93
Growth Opportunities	0.11	0.09	-0.03	-10.94
No. of Observations	62750	20552		

Notes: Current Liabilities/Total Assets represents Short-Term Debt Ratio, Non-Current Liabilities/Total Assets represents Long- Term Debt Ratio.

Next, we carry out correlation analyses to give us a fair idea on the relationship among the variables and present the results in the appendix. As known, correlation analyses just show the relationship between the dependent variable and each of the explanatory variables separately. However, to identify whether an explanatory variable really has an impact on the dependent variable, we need to establish that, in the presence of the other explanatory variables a particular explanatory variable will have an impact on the dependent variable. To do this, we specify the model, carry out regression analyses and present the results in the next section.

6.5 Model Specification, Methodology, and Econometric Technique

6.5.1 Model Specification and Methodology

Dynamic adjustments of actual capital structures should be included into an empirical model, when adjustment costs keep firms away from their desired debt ratio, at least in the short-run (Leary/Roberts 2005).

As discussed earlier, at any time t, there exists a gap between the target debt level and the actual debt level. This is because firms face some adjustment costs if they have to adjust to the target level. Hence, if we carry out the estimation with just the determinants of capital structure and leave out the effect of adjustment cost, then, our model will not be specified appropriately. To avoid this, we follow Miguel and Pindado (2001) and build up a model to include firms' transaction cost. According to this model, firms follow a target adjustment model for which

$$- \hspace{8cm} 6.1$$

where Y_{it} and Y_{it-1} are the actual debt levels in the current and previous periods respectively, and Y_{it}^{*} is the firm's target debt if we assume no transaction cost when moving to a new debt level. We measure the transaction cost by the coefficient α. Hence, if transaction costs are zero, that is $\alpha=1$, then, $Y_{it} = Y_{it}^{*}$ and the firms automatically adjust their debt level to the target debt level.

On the other hand, if $\alpha=0$, then $Y_{it}=Y_{it-1}$, and this implies that firms remain in the previous year's debt levels because transaction costs are so high. Where values of α are between 0 and 1, the higher the value of α, the easier it is for firms to adjust to their target debt levels. Expanding Equation (6.1), the actual debt level becomes:

In section 6.4.3.1, we outlined the determinants of the target debt level, D_{it}, of a firm. Putting this in the form of an equation, we have,

Where Y_{it}^{*} = can either be target current liabilities/assets, long term liabilities/assets, *CF/A*= cash flow/assets for firm *I* at time *t*, *coll*= collateral, *growth*=growth opportunities, *i*=firm and *t*=time.

By nesting Equation (6.1) into Equation (6.3), we have

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Where = time specific component accounted for by time dummies, = firm specific component of the error term and u_{it} = idiosyncratic term[64].

Equation (6.4) represents the basic equation we use for this study. An important arguments raised in Myers(2002) is that different types of firms are affected by different factors in different ways, implying that a reduction in each of the determinants is likely to affect the leverage measures of different firms in different ways. If this argument is valid, fitting a single model for firms with different ownership degrees will cause aggregation problems. For this reason, we follow the ideas expressed in Li et al. (2007) and Cull et al. (2009)[65] and include dummies representing *JV* and *WF*, but in our case we interact these dummies with the financial variables, collateral and cash flow[66]. Our reference category is *PD*

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[64]It is very necessary to include firm specific components in all specifications, given that levels of leverage may vary across firms. As put by Qian et al. (2009) for instance, capital intensive manufacturing firms may have high debt while mining companies are generally seen to have low debt.

[65] Li et al. (2009) and Cull et al. (2009), classify firms into private, state-owned and foreign.

[66]As a passing note, we are not arguing that the impacts of the other explanatory variables do not vary with ownership, export status or region. However, our study is interested in what happens when the financial variables are interacted are allowed to vary according to groups. It is worthy of mentioning that, we carry out another estimation which is not included in this study with all the explanatory variables interacted with the various groups, but our main results do not change.

firms. The purpose of this exercise is to examine whether differences exist in the way the factors of firms with different degrees of foreign ownership affect access to debt. Nesting this idea into the model expressed in Equation (6.4) leaves us with

$$— \qquad —$$

$$—$$

For firm i in year t, Y^*_{it} can be short-term debt ratio or long-term debt.

Indeed, the use of interaction terms prevents us from running separate regressions on sub-samples for firms with different degrees of foreign ownership. Thus, we are able to gain degrees of freedom and avoid problems of endogenous sample selection (Guariglia, 2006). Using this same approach, we also consider firms that export and those that do not export. We therefore replace the ownership dummies with a dummy equal to 1 if a firm exports and 0 otherwise. In this instance, our reference category becomes non-exporting firms. Generally, we expect firms with some form of global engagement to tow along the same lines as well as firms with no form of global engagement.

Next, using the same justification as above, we examine whether differences in regional development matter for firms' leverage decisions when their respective capital structure determinants change. Again, we replace all ownership dummies in equation (6.4) with a dummy for the coastal region. We would naturally expect firms in the coastal region which is presumed to be more developed to have more long-term debt than to short-term debt.

6.5.2 Econometric Technique
To estimate the equations above, we consider different estimation techniques and select the most appropriate one for the study. Further, researchers are interested in the speed of adjustment, which is given by one minus the estimated coefficient on the lagged dependent variable in the partial adjustment model. Panel data offers us the opportunity to observe the dynamic behavior of the capital structure decisions

of firms. Therefore, in a dynamic panel model as presented in Equation (6.3), using static panel-data methods (For e.g. OLS and Fixed Effects) will produce estimates that are inconsistent and bias because the lagged measures of leverage are likely to be correlated with the error term. While OLS will underestimate the speed of adjustment, Fixed Effects methods will provide overestimated coefficients of the speed of adjustment. Another estimation problem, not necessarily specific to the dynamic specification, arises because the shocks that affect the leverage of firms are also likely to affect some of the explanatory variables, such as cash flow and firm size (bi-causality problems). Furthermore, it is likely that some of the explanatory variables are correlated with past and current values of the idiosyncratic component of disturbances.

The problems described above require an instrumental variables (IV) estimation method, where the lagged dependent variable and endogenous regressors are instrumented for. Therefore, we apply the dynamic panel data estimator suggested by Arellano and Bond (1991). They prove that Generalized Method of Moments (GMM) estimation provides consistent parameter estimates by utilizing instruments that can be obtained from orthogonality conditions that exist between the lagged values of the variables and the disturbances. Specifically, Equation (6.3) is estimated in first differences using GMM, whereby the levels of all right-hand side variables at the second lag are used as instruments. Using instrumental variables also accounts for the problem that, delays may arise between the decision to change the capital structure and the actual execution. We rely on Arellano and Bond (1991) and Arellano and Bover (1995)'s Forward Orthogonal GMM Technique. We use the forward orthogonal method because it prevents magnification of gaps in the dataset. That is, if a firm has an observation missing, the forward mean does not also become missing. We make use of the two-step variant of the GMM. The one-step variant makes a strong assumption about the error term. It assumes no autocorrelation and heteroscedasticity. Thus, its test statistics and the parameter estimates may be subject to heteroskedastic problems. To correct this, the two-step variant constructs a consistent estimate of the variance-covariance matrix of the moments conditions based on the first-step

residuals and then re-estimate the regression. The two-step method however does not go without a problem. Its standard errors tend to be downward biased in small samples (Blundell and Bond, 1998). We use the Windmeijer (2005) method to correct the standard errors of the two- step GMM. All coefficients are adjusted for heteroscedasticity.

The GMM technique in general makes use of instrumental variables that are correlated with the explanatory variables but independent of the error term. The two-step GMM Technique is consistent if there is no second or higher order serial correlation between the error terms. To check this, Arellano and Bover (1995) propose a test, m_2 (or m_n, where n is a number greater than 2) for the lack of second or higher order serial correlation. These tests are asymptotically distributed as a standard normal under the null of no second or n- order serial correlation of the residuals[67]. In our case, we make use of the m_2 and m_3 tests because our instruments are dated $t-2$ and $t-3$ in our all our specifications. This means that the m_2 and m_3 tests will be used to check the specification of the model and the legitimacy of the variables. By using instrumental variables, we are able to by-pass certain basic problems such as simultaneity bias and measurement error problems. To check whether the instruments used are valid, Sargan (1958) proposes a test of over-identifying restrictions under the null that the instruments are valid. However, Sargan (1958)'s test may give misleading results if the sample size is very large, implying that we cannot rely completely on it. This is similar to what Benito (2003) describes in their study. According to him, when samples with very large cross-sectional dimension are used in estimation, this test tends to over-reject the null hypothesis of instrument validity (see also Blundell et al., 2000).

Next, a careful look at the data reveals that much of the observations of long-term debt are zero, suggesting a censored distribution. This means that all the values within a certain range are given a fixed value, in this case zero. Following Bhabra et al (2008), we proceed to assess the relationship between capital structure and the interaction of the different degrees of ownership and all the explanatory

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[67] If the un-differenced error terms are *i.i.d.*,then the differenced residuals should show first-order but not second or higher-order serial correlation. It is important to note that the *m2* and the *m3* tests do not allow us to distinguish between bad instruments and model specification.

variables in accordance with the Random Effect Tobit Model. We impose a lower limit on the recorded long-term debts. To be able to interpret our coefficients, we obtain the marginal effects after estimation. Because we have included the lag of our dependent variable as an explanatory variable, there is bound to be endogeneity. We therefore carry out an Instrumental Variable Tobit regression model. We compare the two to see if there are any differences. We use the second lag of the dependent variable as an instrument for the Tobit Model.

6.6. Estimation Results

6.6.1 GMM Estimation Results for all Firms

To be able to attain full understanding in our research question, we start our investigations by considering the leverage behavior of firms in the entire manufacturing sector. Table 6.6 column 1 shows the GMM estimates for all firms in the manufacturing sector using short term debt. In this estimation, we use 2 to 3 lags of all the variables used in the estimation as instruments. From column 1, we find that cash flow is negatively significant at 10%. Specifically, a manufacturing firm's short-term debt level will decline by about 13.6% when its cash flow increases by about 1%. This means that all manufacturing firms substitute short-term debt ratio for internal finance. In other words, they find it relatively cheaper to use cash flow than short-term debt and therefore will only use short-term debt after cash flow has been fully exhausted. This follows the idea proposed by the POT. For this reason, with regards to cash flow, all firms follow the POT.

Like cash flow, collateral is also significant and negative for all manufacturing firms. In particular, when the value of collateral declines by 1%, short-term debt ratio increases by about 21%. This could be explained in two ways: First, it could so mean that most manufacturing firms have a very good relationship with their lenders: hence, making it easier for them to borrow from them even when they have a low collateral value. Secondly, from section 6.5, our measure of collateral was given by the ratio of tangible assets to total assets. This means that the asset liability maturity principle can provide certain suggestions for

our results. According to this principle, short term debts are used to finance non-fixed assets to reduce the level of risk. As a result, we expect collateral to have a negative relationship with short-term debt since collateral is measured as the ratio of tangibles to total assets. The negative sign associated with collateral support both the POT and the TOT.

The coefficient for size is significant but positive at the 10% level of significance. Particularly, as a firm grows larger by 1%, its short-term debt increases by about 0.7%. This outcome implies that larger firms that are more diversified are likely to have a lower probability of bankruptcy and are therefore able to secure more leverage. Therefore, our test for size reveals the TOT to be supreme. For lagged short-term debt, our results in column 1 shows that it is positive and significant. The significant results obtained for this coefficient implies that manufacturing firms in China bear some level of transaction costs when they decide to adjust their debt level in the previous period to the target level in the current period. This in a way justifies our use of a dynamic model rather than a static one which has been used by most Chinese studies on capital structure. The transaction cost which equals about 47% is even higher than that of the US. This means that firms adjust at a rate of about 53% (given by 1 minus the coefficient of the lagged dependent variable) to their long-term debt target level. Following this, we can conclude that firms in China take about one and a half years to adjust to their target debt levels. Comparing this transaction cost to that of other countries in Europe, that found for China is higher. For instance, in a study provided by Miguel and Pindado (2001), they find a transaction cost equivalent to about 20%, a percentage inferior to that found in this study. Nevertheless, the transaction cost found for the Chinese manufacturing firms can be said to be higher than that of the US which ranges between 0.3 and 0.4[68].

This result has two important implications. First, it shows that the public debt of the Chinese economy is now increasing, giving good indications that the bond market is experiencing a certain level of development. This implies that the ongoing financial reform is becoming a great success. Second, the high transaction

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[68] The values obtained are: 0.383 (Jalilvand and Harris, 1984), 0.304 (Auerbach, 1985), and 0.410 (Shyam-Sunder and Myers, 1999).

cost also re-enforces the existence of high informational asymmetries in the Chinese economy compared to other economies.

6.6.2 GMM Estimation Results for Firms with Different Degrees of Foreign Ownership using Short-Term Debt

Next, we move on to our main point of investigation. We control for heterogeneity among different types of firms and compare their leverage behaviour. As explained above, we divide the firms into different degrees of foreign ownership; PD, JV and WF, and interact these dummies with the financial variables (cash flow and collateral). Our base group is PD firms, meaning that all our coefficients on the financial variables are relative coefficients.

The GMM estimates can be found in columns 2 and 3 of table 6.6. The estimates from column 2 are from a dynamic model whilst the estimates from column 3 are from a static model. We concentrate first on column 2, estimates of the dynamic model. From table 6.6 column 2, we find that ownership tends to play an important role in the financial decision of firms. Controlling for all the other explanatory variables, the results show that in China's manufacturing sector all firms can at least have some amount of short-term debt. However, it appears that on average, the amount of short-term debt that *WF firms* have holding all other factors constant is about 8% less compared to the short-term debt of PD firms. With regards to *JVs*, there is actually no significant difference between how much short-term debt they and *PD firms* have on average. In justifying our results, we must not forget that PD firms are made up of both private PD firms and SOEs with the effect of SOEs likely to dominate the private firms' effect. Bearing this in mind therefore, Sapienza (2004) argues that state-owned banks tend to lend to large enterprises. In China, many large firms are state-owned enterprises. The double role played by the Chinese government as the owner of SOEs and also the four largest commercial banks make PD firms relatively less risky. In Flannery's (1986) model, borrowers with private information that they have relatively low risk choose short maturities to avoid paying a market premium on long term debt that reflects the probability of future credit problems that exceeds these borrowers' expectations.

Conversely, those with private information that they have relatively high risk choose to borrow long term because the market premium reflects a probability of credit problems that is below their expectation.

Table 6.6: GMM Estimates for Short-term Debt of Firms with Different Ownership

Dependent Variable: Short-Term Debt/Total Assets	All Firms	Dynamic model for Different Types of Firms	Static Model for Different Types of Firms
	(1)	(2)	(3)
JV		-0.05	-0.08***
		(0.04)	(0.03)
WF		-0.08***	-0.03
		(0.03)	(0.03)
Lagged(Short-Term Debt/Total	0.47***	0.45***	
	(0.01)	(0.01)	
Cash flow/Total Assets	-0.14*	-0.11	-0.47***
	(0.08)	(0.15)	(0.10)
Cash flow/Total Assets*JV		-0.19	-0.08
		(0.21)	(0.15)
Cash flow/Total Assets*WF		-0.28*	-0.32**
		(0.18)	(0.15)
Collateral	-0.21***	-0.30***	-0.33***
	(0.03)	(0.05)	(0.04)
Collateral*JV		0.09	0.07
		(0.08)	(0.06)
Collateral*WF		-0.16**	-0.11*
		(0.07)	(0.07)
Size	0.01*	0.0002	-0.01
	(0.004)	(0.004)	(0.01)
Growth	0.03	0.04**	0.11***
	(0.02)	(0.02)	(0.02)
Constant	0.30	0.39***	0.75***
	(0.03)	(0.03)	(0.04)
N	67055	63355	63355
AR(2) z	5.27	5.06	-1.52
AR(3) z	1.26	1.06	-1.25
Hansen Test	chi2(25)=65.50	chi2(61)=85.39	chi2 (112)=1708

Notes: Estimation was done using GMM forward orthogonal deviation method. PD, JV and WF represent PD, joint ventures, and wholly foreign firms respectively. We use two to three lags of all the variables as instruments for our estimation. Reported estimates are the coefficients of each of the variables. The standard errors are reported in parenthesis. *** means significant at 1%, ** significant at 5% and *, significant at 10%. The first and second order serial correlation tests are asymptotically distributed as N (0, 1) under the null of no serial correlation. The Hansen Test is a test of over identifying restrictions, distributed as a chi – square under the null of instrument validity. Time Dummies were included in the estimation as both regressors and instruments.

This means that on average, firms with some degree of domestic ownership are likely to have more short-term debt than WF firms. These results are consistent with that provided by Li et al. (2009).

Accounting for the sensitivities of short-term debt to each of the financial variables for the three types of firms, we find consistent results using both financial variables. Specifically, we find that the sensitivity of short-term debt to cash flow and collateral respectively is lower for WF firms than PD firms. For the sensitivity of short-term debt to cash flow, the specific estimate is 28% and for the sensitivity of short-term debt to collateral, the specific estimate is 16%. We rationalise the higher sensitivity of short-term debt to cash flow for WF firms by arguing that because WF firms are generally considered more efficient, and hence more profitable, they would want to use more of their retained earnings to finance their short-term assets. This will imply a greater reduction in short-term debt since cash flow is relatively cheaper to use. Our result is thus consistent with Hypothesis 1.

With regards to the sensitivity of short-term debt to collateral, as explained in section 6.5, WF firms are presumed to have more non-tangible assets than tangible assets. Since collateral, is measured by the ratio of tangible assets to total assets, we are not surprise that the sensitivity of short-term debt to collateral is lower for WF firms than PD firms. This point is further re-enforced by the fact that monitoring cost is higher for foreign firms than PD firms since informational asymmetries is higher for WF firms. This result is consistent with hypothesis 2 set above. For JVs, the results show that their sensitivities of short-term debt to both financial variables are not different from PD firms. This means that their domestic component seems to play a major role in their short-term leverage behavior.

Most firm characteristics displayed in column1 that explain the short-term decisions of the entire sample also tend to play similar roles in this estimation. Considering lagged short-term debt, the results in column 3 shows that manufacturing firms adjust to their target debt levels at a certain rate, and this rate is about 55%. On average, a firm's cash flow and its size have no significant impact on short-term debt, but collateral value still maintains its negative sign and

significance. The negative sign on collateral supports both the POT and the TOT. Growth opportunities also have significant and positive impact on short-term debt. Looking at their specific impacts, on average, while all three types of firms increase their short-term debt by 30% when collateral declines by 1%, they increase their short-term debt by 4% when growth is expected to expand by 1%. The outcome of growth is in line with the POT. According to the POT, higher growth opportunities mean that firms will have a higher demand for funds, all other things being equal. This means that the demand for external financing will in turn rise. As we find a positive sign on growth opportunities, it falls exactly in line with the argument raised in Myers (1977). According to Myers (1977), this is expected to be especially true for the demand for short-term debt. In his argument, he states that any negative relationship between short-term debt and growth opportunities which is suggested by the trade-off theory can only be mitigated when firms use short-term debt (due to agency costs, investment that may generate higher future growth opportunities face problems in borrowing against such assets). This is because the negative relationship between leverage and long-term debt (because due to agency costs, investment that may generate higher future growth opportunities face problems in borrowing against such assets) which is suggested by the trade-off theory can only be mitigated when firms use short-term debt. In this estimation, both the Hansen Test and the AR (3) tests are valid at the 5% and 1% level of significance respectively, implying that our model is correctly specified.

We now compare our results from the static model to that of the dynamic model. From column 3, we can see that the coefficients have a lot in common with the coefficient in column 2: Almost all the variables that are significant in column 2 are also significant in column 3 and have the same signs. The only difference lies in the coefficients of cash flow and the individual ownership dummies. Cash flow tends to be statistically significant in the static estimation but no more significant when we look at the dynamic estimation. The significant result of cash flow in the static estimation could be due to the omission of the lagged-dependent variable in that model. That is, cash flow seems to be picking up the effects of the lagged

dependent variable in the static model. Our results are therefore robust to using a static version of our model.

6.6.3 GMM Estimation Results for Exporting and Non-Exporting Firm Years using Short- Term Debt Ratio

So far, the evidence just pointed out has demonstrated the importance of foreign ownership structures in the capital structure decisions of firms.

Table 6.7: GMM Estimates for Short-term Debt for Exporting and Non-Exporting Firm-Years

Dependent Variable: Short-Term Debt/Total Assets	Dynamic Results for Different Types of Firms	Static Results for Different Types of Firms
EF	-0.06* (0.03)	-0.16*** (0.04)
Lagged(Short-term debt/Total Assets)	0.80*** (0.03)	
Cash flow/Total Assets	-0.12 (0.09)	-0.65*** (0.12)
Cash flow/Total Assets*EF	-0.12 (0.09)	0.03 (0.13)
Collateral	-0.04 (0.10)	-0.67*** (0.07)
Collateral*EF	-0.15** (0.07)	-0.29*** (0.08)
Size	0.01** (0.01)	-0.04*** (0.01)
Growth	0.03 (0.04)	0.11*** (0.04)
Constant	0.03 (0.05)	1.03*** (0.06)
N	63758	63758
AR(2) z	5.22	-2.32
AR(3) z	1.63	-1.09
Hansen Test	chi2(43)=56.02	chi2(44)=619.41

Notes: Estimation was done using GMM forward orthogonal deviation method. EF represents exporting firms. Reported estimates are the coefficients of each of the variables. The standard errors are reported in parenthesis. *** means significant at 1%, ** significant at 5% and *, significant at 10%. The first and second order serial correlation tests are asymptotically distributed as N (0, 1) under the null of no serial correlation. The Hansen Test is a test of over identifying restrictions, distributed as a chi – square under the null of instrument validity. Time Dummies were included in the estimation as both regressors and instruments. We also used two or more lags of all variables in the regression as well as that of the variable.

Next in our analyses, we discuss the results for exporting and non-exporting firms. Our results can be found in table 6.7 above. Here again, export status seems to play a significant role in our estimation. Holding all other explanatory variables constant, both exporting and non-exporting firms have on average some short-term debt. However, like the results for firms with a higher degree of foreign ownership, exporting firms basically have less short-term debt. On average, they have 6% less short-term debt than non-exporting firms when all factors are controlled for. This is shown by the coefficient of the export dummy which is negative and significant at the 10% level of significance. Combining these results with the results obtained for firms with different ownership degrees, we can conclude that in general, more globally engaged firms have less short-term debt when all other factors are controlled for. With respect to their adjustment rates, the results show that firms adjust to their optimal short term debt targets, a rate equivalent to about 20%. We now pay specific attention to the sensitivity of short-term debt to the financial variables for both exporting and non-exporting firms. From table 6.7 column 1, we can see that short-term debts for both exporting firms and non-exporting firms are not sensitive to their respective cash flows. This can be seen from the insignificant coefficient of their interaction with cash flow.

Therefore, hypothesis 1a set above is rejected even at the 10% level of significance. For collateral however, the results appear different and are in line with the results of firms with different degrees of foreign ownership. Like the results for ownership, the short-term debt for exporting firms appear to be less sensitive to collateral compared to non-exporting firms. This latter result is in line with hypothesis 2a set above.

Turning to size, like the results for firms with different degrees of foreign ownership, its impact is positive and significant. On average, firms increase their short-term debts by 1% when size increases by 1%. The positive sign on size confirms the POT and implies that as firms get larger, they are presumed to have a lower bankruptcy rate which leads them to attracting a higher level of short-term debt. Growth opportunities in this estimation are not significant and therefore have no impact on short-term debt. Neither is the average impact of collateral and cash

flow respectively on short-term debt. This result is contrary to what we find for firms with different degrees of foreign ownership. Here again, the AR Test and the Hansen Test are both satisfied in these estimations, implying that our model is valid.

In sum, combining the results for exporting firms and firms with different degrees of foreign ownership, our results reveal certain similarities. Globally engaged firms tend to tow the same lines when it comes to the dummies, lagged short-term debt, size, and the interaction of collateral and the various dummies, likewise non-globally engaged firms.

6.6.4 Tobit Estimation Results for Firms with Different Degrees of Foreign Ownership Using Long-Term Debt Ratio

We now present and discuss the results obtained for long-term debt. Examining the factors that affect firms' long-term debt provides some interesting insight into our investigations.

As discussed in Section 6.5, we believe that the value of long-term debt is censored to the left and so we estimate a tobit regression. Since our model is dynamic, we do not only estimate a simple tobit model, but also an instrumental variable tobit model. Table 6.8 columns 1 to 3 report the marginal effects from three different tobit regressions.

In columns 1, 2, and 3, we use the dynamic and the static versions of the simple tobit model as well as the instrumental variable tobit model in the dynamic form respectively to analyse our results. As shown in these columns, the results for all three versions are almost similar. Both JV and WF firms appear to receive less long-term debt on average than PD firms. In particular, they receive 2% and 6% respectively less in the simple dynamic tobit regression, 3% and 7% respectively less in the static model and 1% and 4% respectively less in the instrumental variable tobit regression. We argue that, foreign firms because of the nature of their operations would not want to enter into long-term contracts on average, and this is especially so when one considers the Chinese economy. China, because of

its numerous state-managed policies, makes it difficult for firms, especially foreign firms to make some proper forecasting. This limits the operations of foreign firms.

Table 6.8: Marginal Effects for the Tobit Regression for Firms with Different Degrees of Foreign Ownership

Dependent variable:(Long-Term Debt/Assets)	Using a Dynamic Model (1)	Using a Static Model (2)	Dynamic Instrumental Variable Tobit Model (3)
JV	-0.02***	-0.03***	-0.01***
	(0.003)	(0.004)	(0.003)
WF	-0.06***	-0.07***	-0.04***
	(0.003)	(0.004)	(0.003)
(Cash Flow/Assets)*JV	-0.01	-0.01	-0.01
	(0.02)	(0.02)	(0.02)
(Cash Flow/Assets)*WF	0.08***	0.10***	0.07***
	(0..01)	(0.02)	(0.02)
Cash Flow/ Assets	-0.12***	-0.14***	-0.08***
	(0.01)	(0.01)	(0.01)
Collateral	0.10***	0.16***	0.03***
	(0.004)	(0.005)	(0.004)
Collateral*JV	-0.01	-0.02**	-0.01
	(0.01)	(0.01)	(0.01)
Collateral*WF	-0.02**	0.04***	-0.01*
	(0.01)	(0.01)	(0.01)
Size	0.02***	0.03***	0.01***
	(0.0004)	(0.001)	(0.0004)
Growth	0.004***	0.002***	0.01***
	(0.001)	(0.001)	(0.002)
Lagged(Long-Term Debt/Assets)	0.55***		0.95***
	(0.01)		(0.01)
Constant	-0.13***	-0.178***	0.09***
	(0.003)	(0.009)	(0.003)
sigma_u cons	0.06***	0.111***	
	(0.001)	(0.001)	
sigma_e cons	0.09***	0.085***	
	0.000003	0.000004	
Wald Test			Prob > chi2 = 0.0000
N	63315	61432	63315

Notes: Estimation was done using the Random Effect Tobit regression model. PD, JV and WF represent PD, joint ventures 1 and wholly foreign firms respectively. Reported estimates are the coefficients of each of the variables. The standard errors are reported in parenthesis. *** means significant at 1%, ** significant at 5% and *, significant at 10%. Time and Industry Dummies were included in the estimation as regressors.

Therefore, we are not surprised by the findings that PD firms to use more long term debt than the other firms. Moving on to the sensitivities of long-term debt to the respective financial variables (i.e. cash flow and collateral) for firms with different degrees of foreign ownership, while we find the long-term debt of

WF firms to be more sensitive to cash flow relative to PD firms, we find WF firms' long-term debt to be less sensitive to collateral compared to PD firms.

These results are thus consistent with Hypothesis 1 and 2 respectively above. We justify our results below. For long-term assets which may require more money, foreign firms would need to borrow more in addition to their retained earnings to support this financing. Given that they are relatively more profitable than PD firms, they remain in a better position to secure debt, not short-term but long-term for this cause. With Collateral, for the same reason given for short-term debt, WF firms are more endowed with intangible assets and given the measure of collateral (tangible assets/total assets) we are not surprised that the relationship is worst for WF firms. JVs are not any different from PD firms in both situations. Like the explanation given for short-term debt, we attribute the results to their domestic component that seems to be controlling their whole impact. Looking at the average estimates, the coefficient for cash flow is negative in all three specifications. This means that also with long-term debt, firms follow the POT when it comes to cash flow: firms would first want to use up all their cash flow before attempting any usage of long-term debt. In particular, on average firms reduce their long-term debt by 8%, 10% and 7% respectively when cash flow increases using the simple random effect tobit model, the static tobit model, and the instrumental variable random effect model respectively. The results are consistent with that found in Chen (2004). Unlike what was found with short-term debt, collateral has a positive impact on long-term debt on average. This is in line with the maturity-matching principle which states that long-term debts are used to finance fixed (tangible) assets and since collateral value is measured by tangible assets/total assets, we are not surprised by its positive relationship with long-term debt.

This result is consistent with both the POT and the TOT and also with Chen (2004) and Qian et al. (2007). Also consistent with Chen (2004), size is significant and positive and this is in line with the TOT. The larger the firm size, the lower the bankruptcy level and hence its default rate. Therefore, such a firm

has a higher tendency to receive high leverage and hence be endowed with high amount of long-term debt.

6.6.5 Tobit Estimation Results for Exporting and Non-Exporting Firms using Long-Term Debt

Table 6.9 below shows the marginal effect estimates of long-term debt for exporting and non-exporting firms. Most of the results here are similar to those we find for firms with different degrees of foreign ownership. From Table 6.9, like WF firms, on average, exporting firms also have less long-term debt than non-exporting firms. In fact, the actual estimates correspond to about a 2% decline in long-term debt respectively for each of the three types of estimations. With long-term debt also, we are safe to conclude that globally engaged firms behave in similar ways when it comes to financing decisions. Concentrating on the sensitivities of long-term debt to the financial variables for exporting firms and non-exporting firms, exporting firms' long-term debt appears to be more sensitive to cash flow than non-exporting firms. This is in line with Hypothesis 1a above. We are not surprised by this finding as exporting firms like WF firms will require more funds to be able to finance their long-term assets. Given that they are presumed to be more profitable than non-exporting firms, they will easily exhaust their internal finance when financing their assets and then be able to resort to long-term debt since they are in a better position to secure debt. Contrary to our predictions in the Hypothesis 2a, the sensitivity of long-term debt to collateral for exporting firms seems not to be different from non-exporting firms. Concentrating on the firm characteristics that affect leverage decisions, cash flow still maintains its negative sign, implying that, exporting firms will use up all their retained earnings before turning to long-term debt. This is in line with the POT. Specifically, on average, they reduce their long-term debt by 2% each for the simple dynamic tobit and the instrumental variable tobit models respectively and 3% for the static model when cash flow increases by 1%. Like the results obtained in firms for different degrees of foreign ownership, on average, collateral has a

positive impact on long-term debt. Since long-term debts are used to finance tangible assets due to the maturity matching principle, our result for collateral is not surprising. The positive sign supports both the POT and the TOT. Also in this estimation, we find size to be positively related to long-term debt. This is in line with the TOT. This result suggests that larger exporting and non-exporting firms are on average inclined to have larger amounts of long-term debt than smaller exporting firms. In relation to this estimation, long-term debt increases by 2%, 3% and 1% respectively on average when size increases by 1%.

Table 6.9: Marginal Effect Estimates for Long-Term Debt for Exporting and Non-Exporting Firms

Dependent variable:(Long-Term Debt/Assets)	Using a Dynamic Model (1)	Using a Static Model (2)	Dynamic Instrumental Variable Tobit Model (3)
EF	-0.02***	-0.02***	-0.02***
	(0.003)	(0.003)	(0.002)
(Cash Flow/Assets)*EF	0.02**	0.03**	0.02**
	(0.01)	(0.01)	(0.01)
Cash Flow/ Assets	-0.14***	-0.14***	-0.11***
	(0.01)	(0.01)	(0.01)
Collateral	0.09***	0.13***	0.03***
	(0.01)	(0.01)	(0.004)
Collateral*EF	-0.003	-0.01	0.01
	(0.006)	(0.01)	(0.01)
Size	0.02***	0.03***	0.01***
	(0.0005)	(0.001)	(0.0004)
Growth	-0.001	-0.01***	0.01***
	(0.001)	(0.001)	(0.001)
Lagged(Long-Term	0.51***		0.96***
	(0.005)		(0.01)
Constant	-0.16***	-0.20***	0.08***
	(0.01)	(0.01)	(0.003)
sigma_u			
cons	0.07***	0.111***	
	(0.001)	(0.001)	
sigma_e			
cons	0.09***	0.085***	
	0.000003	0.000004	
Wald Test			Prob > chi2 = 0.0000
N	63315	61432	44730

Notes: Estimation was done using the Random Effect Tobit regression model. EF represents exporting firms. Reported estimates are the coefficients of each of the variables. The standard errors are reported in parenthesis. *** means significant at 1%, ** significant at 5% and *, significant at 10%. Time and Industry Dummies were included in the estimation as regressors.

Growth opportunities on average have a negative impact on long-term debt for exporting and non-exporting firms. This is in accordance with the TOT. As explained by Myers (1977), firms investing in assets that may generate future higher growth opportunities may have problems in borrowing against such assets due to agency cost.

From the results presented above, we are safe to conclude that for long-term debt; globally engaged firms tend to behave in a similar way when it comes to leverage decisions, so do non-globally engaged firms.

6.7.5 GMM Estimation Results for Firms in the Coastal and Non-Coastal Regions using Short-Term Debt

As pointed out earlier, within the same country, the financial determinants of capital structure may behave differently when different regions are considered. In Table 6.10, we present the results on the determinants of short-term debt when different regions are considered. From Table 6.10 column 1, we find that on average, firms in better developed regions have less short-term debt. This supports greatly the statement made by Demirguc-Kunt and Maksimovic (1999). According to them, when the legal system and institutions of firms are less developed and costly to use, short-term debts are likely to be employed by firms.

As well known, the non-coastal region of China is considered less developed than the coastal region of China. Second, as Diamond (1991) and Rajan (1992) argue, short-term financing makes it relatively difficult for borrowers to take advantage of creditors. Liabilities with shorter maturities limit the period and the extent to which a firm can take advantage of its creditors without necessarily defaulting. Shorter maturities give the creditors the opportunity to re-examine the firm's decision more regularly, and if necessary to change the terms and conditions associated with the credit before they accumulate sufficient losses. Considering that firms in the non-coastal region are more prone to defaulting, these results are not surprising. Moreover, the fixed litigation cost which can be incurred in contract enforcement makes it more prudent for firms in less developed regions to have more short-term debt. For these reasons, our result that firms in

the coastal region have less short-term debt than those in the non-coastal region is justified.

Table 6.10: GMM Estimates for Short-term Debt for Firms from Different Regions

Dependent Variable: Short-Term Debt/Total Assets	Dynamic Model for Firms in the Coastal and Non-Coastal Regions (1)	Static Model for firms in the Coastal and Non-Coastal Region (2)
Coast	-0.39*** (0.07)	-0.10** (0.04)
Lagged(Short term debt/Total Asset)	0.79*** (0.03)	
Cash flow/Total Assets	-1.92*** (0.66)	-0.58*** (0.17)
Cash flow/Total Assets*Coast	2.22*** (0.76)	-0.10 (0.18)
Collateral	-0.38*** (0.10)	-0.44*** (0.06)
Collateral*Coast	0.31*** (0.11)	0.12* (0.07)
Size	0.01*** (0.01)	0.02*** (0.01)
Growth	0.01 (0.05)	0.19*** (0.03)
Constant	0.39*** (0.07)	0.63*** (0.05)
N	67055	67063
AR(2) z	4.72	-0.04
AR(3) z	1.07	-0.01
Hansen Test	chi2(34)=47.37	Chi2 (74)=1602.06

Notes: Estimation was done using GMM forward orthogonal deviation method. We use two to three lags of all the variables as instruments for our estimation. Reported estimates are the coefficients of each of the variables. The standard errors are reported in parenthesis. *** means significant at 1%, ** significant at 5% and *, significant at 10%. The first and second order serial correlation tests are asymptotically distributed as N (0,1) under the null of no serial correlation. The Hansen Test is a test of over identifying restrictions, distributed as a chi – square under the null of instrument validity. Time Dummies were included in the estimation as both regressors and instruments.

Concentrating on the sensitivity of short-term debt to the financial variables for both regions, we find that the short-term debt of firms in the coastal

region has a higher sensitivity to both cash flow and collateral relative to short-term debt's sensitivity to these same financial variables in the non-coastal region. This is consistent with our Hypothesis 3 set above. We provide the following justification for our results. For the sensitivity of short-term debt ratio to collateral we use information from Section 6.4 of this study to buttress our results. From Section 6.4, we found in the summary statistics that firms in the non-coastal region had an average value of real assets higher than that of firms in the coastal region (1980.31 and 1463.72 respectively).

A further breakdown of real assets into tangible and intangible assets also reveals firms in the non-coastal region to have a higher average of intangible assets than the average of firms in the coastal region (14195.55 and 8736.01). Given this information and the fact that our measure of collateral is defined by the ratio of tangible assets to total assets, we are not surprise by our findings that for firms in the non-coastal region, the sensitivity of short-term debt to collateral is lower than that of firms in the coastal region. For the sensitivity of short-term debt to cash flow, since firms in the coastal region are more developed, larger and have access to a large market size, they are able to have access to external debt more easily than their counterparts in the non-coastal region. This explains why firms in the coastal region have a higher sensitivity of short-term debt to cash flow. Size and Growth opportunities on average have great impacts at the 1% level of significance on short-term debt in this estimation also.

Their impacts on short term debt are roughly 1% and 10.5% respectively and the relationship is positive. The positive relationship between size and short-term debt, and growth opportunities and short-term debt are in line with the TOT. Also, on average, cash flow has a negative relationship with short-term debt and this is in line with the POT. Particularly, short-term debt declines by over 100% when cash flow increases by 1%. Concerning the average impact of collateral on short-term debt, short-term debt of firms on average declines when the value of collateral increases and the amount of reduction in short term debt is about 38%.

6.7.6 Tobit Estimation Results for the Coastal and Non-Coastal Regions Using Long-Term Debt

We now move on to discuss the long-term debt results for the two different regions.

Table 6.11: Marginal Effect Estimates for Firms in Different Regions

Dependent variable:(Long-Term Debt/Assets)	Using a Dynamic Instrumental Variable Model (1)	Using a Static Model (2)	Dynamic Simple Tobit Model (3)
Coast	-0.02*** (0.003)	-0.07*** (0.004)	-0.04*** (0.003)
(Cash Flow/Assets)*Coast	0.03** (0.01)	0.08** (0.02)	0.05** (0.02)
Cash Flow/ Assets	-0.11*** (0.01)	-0.18*** (0.02)	-0.15*** (0.01)
Collateral	0.02*** (0.01)	0.14*** (0.01)	0.08*** (0.01)
Collateral*Coast	0.003*** (0.01)	-0.01 (0.01)	0.002 (0.01)
Size	0.01*** (0.0004)	0.03*** (0.001)	0.02*** (0.001)
Growth	0.001*** (0.001)	-0.005*** (0.001)	-0.0001 (0.001)
Lagged(Long-Term	0.96*** (0.01)		0.51*** (0.003)
Constant	-0.07*** (0.003)	-0.18*** (0.01)	-0.15*** (0.004)
sigma_u Cons	0.07*** (0.001)	0.11*** (0.001)	
sigma_e Cons	0.09*** 0.000003	0.085*** 0.000004	
Wald Test			Prob > chi2 = 0.0000
N	44730	63736	44730

Notes: Estimation was done using Tobit analyses. Reported estimates are the coefficients of each of the variables. The standard errors are reported in parenthesis. *** means significant at 1%, ** significant at 5% and *, significant at 10%. Time Dummies and Industry Dummies were included in the estimation as both regressors and instruments.

Focusing on the different regions, the results in table 6.11 shows that firms in both the coastal and non-coastal regions have some long-term debt but that of the coastal region is about 1% less than how much firms in the non-coastal region can have when other factors are controlled for.

As explained by Li, Yue and Zhao (2009), the fact that firms in the coastal region use less of a particular type of finance proves a higher level of financial development: That is, there are alternative sources of finances which enable firms to use less of a particular finance type.

For the sensitivity of long-term debt to cash flow, we find similar results to what we find for the sensitivity of short-term debt ratio to cash flow. Specifically, we find that the sensitivity of long-term debt to cash flow is higher for firms in the coastal region than firms in the non-coastal region. The specific estimates are 3%, 8% and 5% higher for firms in the coastal region using the Instrumental Variable Tobit, Static Tobit and the Simple but dynamic Random Effect Tobit Models respectively. This is in line with Hypothesis 3 set above. We offer a similar explanation used for short-term debt for this. As the coastal region has a larger market size than the non-coastal region, we expect firms in the coastal region to have more cash flow than firms in the non-coastal region. This fact will make their long-term debt more sensitive to their cash flow. This falls in line with our hypothesis set above.

Contrary to our hypothesis above, we find that the sensitivity of long-term debt to collateral is not different for firms in both regions. Finally, concentrating on the individual firm characteristics, we find on average, size and growth opportunities are also important determinants of long-term debts. While the relationship between size and growth opportunities and long term are positive and negative respectively. Table 6.11 shows that on average a 1% decline in firm size increases firms' long term debt by about 2%. This falls in line with the TOT. Again, the *Hansen tests* and the *m3* tests both show that our model specification is valid.

6.7 Conclusion

In this study, we have analyzed the financing behavior of unlisted Chinese manufacturing firms. We have done this by considering the financing behavior of unlisted firms with different types of ownership groups as well as firms that export or do not export. Unlike many other studies, we have provided fresh evidence on firm-financing behavior by interacting the financial determinants of capital structure with either firms with different degrees of foreign ownership or exporting and non-exporting firms using unlisted firms. Generally, our results show that, ownership status matters for the choice of financing. While the sensitivity of short-term debt to cash flow and collateral is lower for Wholly Foreign firms than Purely Domestic firms, the sensitivity of long-term debt to cash flow appear to be higher for Wholly Foreign-Owned firms than Purely Domestic firms. This falls in line with what one would usually expect. For Joint Ventures, they appear not to be any different from Purely Domestic firms in their capital structure decisions. We attribute this result to their domestic component whose effect tends to dominate the impact of foreign ownership. Similarly, while the sensitivity of short-term debt to collateral appears to be lower for exporting firms than non-exporting firms, the sensitivity of long-term debt to cash flow is higher for exporting firms than non-exporting firms. Therefore, from our results, we are able to conclude that globally-engaged firms exhibit the same pattern in their financial behavior. These results suggest that under the current banking reforms in China, banks are beginning to lend to firms on the basis of economic and financial considerations. This shows how effective the banking reforms in China are becoming.

Second, we find that firms in the Chinese manufacturing sector adjust to some target debt level and their adjustment rate seems to be higher than that of many countries. This re-emphasises the greater asymmetric information that exists on the Chinese market.

Third, considering the impact of regional and institutional differences on firm financing behavior, our results have shown that institutional differences play a major role. Specifically, firms in better and developed regions seemed to have

less short-term and long-term debts on average than firms in less developed regions. We rationalise our results by explaining that firms in more developed regions have been able to discover other means of financing and therefore rely less on short-term and long-term debts. Considering the sensitivity of both long-term debt and short-term debt to cash flow and collateral respectively shows that firms in the coastal region have their long-term and short-term debts being more sensitive to these financial determinants than firms in the non-coastal region. Finally, like Chen (2004), we conclude that neither the Trade-Off Theory nor the Pecking Order Theory is sufficient enough to explain the capital structure of Chinese firms, although we find our results slightly skewing towards the Pecking Order Theory.

From these results, we recommend a strong continuation of the policies that support long-term debt lending to more efficient firms, that is, Wholly Foreign firms and exporting firms. Lending should be on financial consideration and not by political consideration. With regards to short-term lending, we also encourage its continual lending to Purely Domestic Firms, Joint Ventures and non-exporting firms that seem to have a relatively less amount of cash flow to cater for their short-term investment needs. We also recommend a continual implementation of the banking reforms to allow alternative forms of financing to exist, especially for firms in the non-coastal region where both short-term and long-term debt are relatively less compared to firms in the coastal region. Following this, we urge policy- makers to develop the Chinese stock market to help vary funds in the economy. With regards to Purely Domestic firms and Joint Ventures, the government should put in place policies that will make them more efficient and encourage them to have a clean balance sheet so that they can qualify for funds on the financial market.

Appendix 6

To investigate the possible correlation between the variables, we present a correlation matrix on *PD firms*, *Joint Ventures* and *Wholly-Foreign Firms* in Tables, 6.A1, 6.A2, 6.A3 and 6.A4 respectively. For *PD firms*, Table 6.A1 shows that all three measures of firms' indebtedness (short-term debt ratio, long-term debt ratio and total liabilities ratio) are significantly negatively correlated with profitability. This implies that as profitability increases, firms prefer to use less debt, because retained earnings represent a cheaper option. Based on this information, we are hinted that manufacturing firms in China follow the POT. While collateral is also significantly negatively correlated with short-term debt ratio and total liabilities ratio, it has a significantly positive correlation with long-term debt ratio. This makes sense as the asset-liability maturity matching principle requires that short-term assets are financed by short-term debts and long-term assets by long-term debt.

Table 6.A1: Correlation Matrices for All Variables for PD Firms

Variable	S.T.D Ratio	L.T.D Ratio	Profitability	Collateral	Growth Opportunities	Firm Size
S.T.D Ratio	1					
L.T.D Ratio	-0.30*	1				
Profitability	-0.2*	-0.12*	1			
Collateral	-0.25*	0.26*	0.08*	1		
Growth Opportunities	-0.02*	-0.06*	0.07*	-0.13*	1	
Firm Size	-0.12*	0.13*	-0.08*	0.05*	-0.02*	1

Notes: STD represents Short-Term Debt Ratio and LTD represents Long-Term Debt Ratio.
* represents significance at 5%.

Firm size measured in terms of sales is significantly negatively correlated with short-term debt ratio, total liabilities ratio and long-term debt ratio. While growth opportunities measured in terms of sales has an insignificant correlation with short-term debt ratio, it has a significantly negative correlation with long-term debt

ratio and total liabilities ratio. Among the explanatory variables, there exists some level of correlation, although not too high to cause multicollinearity problems. Collateral is significantly positively correlated with profitability. Likewise, growth opportunities are also positively correlated with profitability. These results make sense. Firms with a high value of collateral are able to access debt which helps the increase their production and thereby increase their profitability. Looking at it in the other way, more profitable firms are more likely to acquire lots of assets for use as collateral. With growth opportunities and profitability, a more profitable company has the ability to retain more profits and expand. Also a firm with high growth prospects has easy access to funds, and this goes on to boost its profitability.

Table 6.A2: Correlation Matrices for All Variables for Joint Venture Firms

Variable	S.T.D Ratio	L.T.D Ratio	Profitability	Collateral	Growth Opportunities	Firm Size
S.T.D Ratio	1					
L.T.D Ratio	-0.23*	1				
Profitability	-0.30*	-0.14*	1			
Collateral	-0.31*	0.29*	0.001	1		
Growth Opportunities	0.10*	-0.02*	0.06*	-0.14*	1	
Firm Size	-0.08*	0.20*	-0.02*	0.09*	-0.05*	1

Notes: STD represents Short-Term Debt Ratio and LTD represents Long-Term Debt Ratio.
* represents significance at 5%.

Table 6.A2 above gives us the correlation coefficients of all the variables for JVs. For *JVs*, short-term debt ratio and total liabilities ratio are significantly negatively correlated with profitability and collateral. Like PD firms, more profitable JV firms will utilize their retained earnings more because it represents a cheaper option. This leads to their using less short-term debt. Short-term debt ratio also displays significant negative correlation with firm size measured in terms of assets.

It however displays a positive and significant correlation with growth opportunities. This indeed meets our level of expectations as we would normally expect firms that have high growth opportunities to demand more short-term debt to meet their obligations quickly. In addition, total liabilities ratio is also significantly positively correlated with growth opportunities but negatively correlated with firm size. Long-term debt ratio on the other hand has a positive and significant correlation with collateral and firm size but a negative and significant correlation with profitability and growth opportunities measured. With respect to the level of correlation between the explanatory variables, collateral and profitability are not correlated for JVs. Like what was seen with PD firms,

With respect to *Wholly-Foreign Firms*, Table 6.A3 shows that short-term debt ratio, long-term debt ratio and total liabilities ratio are all negatively and significantly correlated with profitability. In addition, irrespective of how it is measured, firm size displays a significantly positive correlation with short-term debt, long-term debt ratio and total liabilities ratio. Further, collateral displays a negative and significant correlation with short-term debt ratio and total liabilities ratio while growth opportunities also correlates significantly and positively with both short-term debt ratio and total liabilities ratio.

Table 6.A3: Correlation Matrices for All Variables for Wholly-Foreign Firms

Variable	S.T.D Ratio	L.T.D Ratio	Profitability	Collateral	Growth Opportunities	Firm Size
S.T.D Ratio	1					
L.T.D Ratio	-0.21*	1				
Profitability	-0.27*	-0.05*	1			
Collateral	-0.32*	0.23*	0.01	1		
Growth Opportunities	0.12*	-0.01*	0.02*	-0.15*	1	
Firm Size	0.02*	0.18*	-0.05*	0.09*	0.07*	1

Notes: STD represents Short-Term Debt Ratio and LTD represents Long-Term Debt Ratio.
* represents level of significance at 5%.

By splitting the firms into those that export and those that do not export, exporting firms' short-term debt ratio has a negative and significant correlation with profitability, collateral and firm size measured in terms of assets but a positive and significant correlation with growth opportunities and firm size measured in terms of sales. Like their short-term debt ratio, their long-term debt ratio is significantly negatively correlated with profitability. However, its correlation with collateral and firm size is significant and positive. Total liabilities ratio exhibits a significantly negative correlation with profitability and collateral and a positive correlation with growth opportunities and firm size (Table 6.A4).

Table 6.A4: Correlation Matrices for All Variables for Exporting Firms

Variable	S.T.D Ratio	L.T.D Ratio	Profitability	Collateral	Growth Opportunities	Firm Size
S.T.D Ratio	1					
L.T.D Ratio	-0.21*	1				
Profitability	-0.27*	-0.12*	1			
Collateral	-0.29*	0.24*	0.03*	1		
Growth Opportunities	0.09*	-0.04*	0.04*	-0.14*	1	
Firm Size	-0.05*	0.19*	-0.05*	0.07*	-0.03*	1

Notes: STD represents Short-Term Debt Ratio and LTD represents Long-Term Debt Ratio.

Similar to that of exporting firms, Table 6.A5 shows that the short-term debt ratio of non-exporting firms is significantly and negatively correlated with profitability, collateral and firm size. It is nevertheless insignificantly correlated with growth opportunities and negatively correlated with firm size measured in terms of sales. The correlation between non-exporting firms' long-term debt ratio and profitability, growth opportunities and firm size using real sales is negative and significant, but its correlation with collateral and firm size measured in terms of assets is positive. Finally, total liabilities ratio displays a positive and significant correlation with profitability, collateral, growth opportunities and firm size measured in terms of assets but insignificantly correlated with firm size measured in terms of sales.

In summary, globally engaged firms (that is, JVs, Wholly-Foreign Firms and Exporting Firms) are similar in the way their short-term debt ratio correlates with all the explanatory variables. The correlation between their long-term debt ratio and the explanatory variables is also almost similar. Moreover, non-globally-engaged firms (PD Firms and Non-Exporting Firms) exhibit similar correlation characteristics between short term and long-term debt ratios and almost all the

explanatory variables. The only difference is with growth opportunities and firm size measured in terms of sales respectively. They are insignificantly correlated with short-term debt ratio for non-exporting firms but significantly negatively correlated with short-term debt ratio for PD Firms.

Table 6.A5: Correlation Matrices for All Variables for Non-Exporting Firms

Variable	Leverage	S.T.D Ratio	L.T.D Ratio	Profitability	Collateral	Growth Opportunities	Firm Size
S.T.D Ratio	0.84*	1					
L.T.D Ratio	0.27*	-0.28*	1				
Profitability	-0.35*	-0.27*	-0.13*	1			
Collateral	-0.12*	-0.26*	0.27*	0.04*	1		
Growth Opportunities	0.00	0.02*	-0.04*	0.06*	-0.14*	1	
Firm Size	-0.05*	-0.1*	0.10*	-0.03*	0.07*	0.05*	1

Notes: STD represents Short-Term Debt Ratio and LTD represents Long-Term Debt Ratio.

Next, we consider the correlation among the variables for the different regions of China. The coastal and the non-coastal regions show some differences in terms of their relationship with the three measures of indebtedness. As shown in Tables 6.A6 and 6.A7, while short-term debt ratio has a significant and negative correlation with profitability , firm size and collateral in both the coastal and the non-coastal regions, growth opportunities (measured in terms of both sales and assets) is positively correlated with short-term debt ratio in only the coastal region but in the non-coastal region, there is no consensus on the correlation of growth opportunities with short-term debt ratio: It is positively correlated with growth measured in terms of sales and negatively correlated with firm size measured in terms of assets. The relationship between long-term debt and the explanatory variables in both regions is also quite similar. It is negatively and significantly correlated with profitability and growth opportunities but positively correlated with collateral. The difference lies in its correlation with firm size. In the coast, it is positively correlated with firm size in general and positively correlated with firm

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size measured by real assets in the non-coastal region but negatively correlated with firm size measured in terms of real sales. For total liabilities ratio, while it has a negative correlation with all the explanatory variables in the non-coastal region, it has a positive relationship with growth opportunities and firm size in the coastal region and a negative relationship with collateral and profitability in the coastal region.

Table 6.A6: Correlation Matrices for All Variables for Coastal Region

Variable	S.T.D Ratio	L.T.D Ratio	Profitability	Collateral	Growth Opportunities	Firm Size
S.T.D Ratio	1					
L.T.D Ratio	-0.22*	1				
Profitability	-0.27*	-0.1*	1			
Collateral	-0.28*	0.24*	0.06*	1		
Growth Opportunities	0.08*	-0.03*	0.04*	-0.13*	1	
Firm Size	-0.09*	0.17*	-0.05*	0.05*	0.03*	1

Notes: STD represents Short-Term Debt Ratio and LTD represents Long-Term Debt Ratio.

Table 6.A7: Correlation Matrices for All Variables for Non-Coastal Region

Variable	S.T.D Ratio	L.T.D Ratio	Profitability	Collateral	Growth Opportunities	Firm Size
S.T.D Ratio	1					
L.T.D Ratio	-0.28*	1				
Profitability	-0.28*	-0.12*	1			
Collateral	-0.21*	0.26*	0.03*	1		
Growth opportunities	-0.01	-0.04*	0.10*	-0.12*	1	
Firm Size	-0.12*	0.08*	-0.05*	0.04*	0.03*	1

Notes: STD represents Short-Term Debt Ratio and LTD represents Long-Term Debt Ratio.

Definitions of Variables

Ownership Variables

PD: dummy variable equal to 1 if the share of the firm's total capital owned by foreign investors is 0, and 0 otherwise.

JV: dummy variable equal to 1 if the share of the firm's total capital owned by foreign investors is greater than 0 but less than 100%, and 0 otherwise.

WF: dummy variable equal to 1 if the share of the firm's total capital owned by foreign investors is 100%, and 0 otherwise.

Other Variables

Short-Term Debt Ratio: The sum of all current liabilities (debt incurred by the firms for less than one year) including trade credits.

Long-Term Debt Ratio: The sum of all non-current liabilities (debt incurred by firms which is more than one year).

Collateral: The ratio of tangible assets to total assets.

Cash flow: The Ratio Net Income plus depreciation/ Assets.

Export: A dummy variable equal to 1 if the firm exports a positive amount and 0 otherwise.

Coast: A dummy variable equal to 1 if the firm is in the coastal region and 0 otherwise.

Growth Opportunities: Change in the log of real assets

Chapter 7

7 Summary of Findings, Policy Implications, Limitations and Future Work

7.1 Summary of Findings

Models of heterogeneity have recently been widely accepted in the field of finance. However, previous studies on firm financing decision and financial constraints that have incorporated heterogeneity have focused on using some a priori criteria in their classification of firms. Very few of them have used foreign ownership as a basis for their classification. In the first part of this study, we have followed this side of literature and merged the literature on finance and foreign ownership. Following Harrison and McMillan (2003), we have specifically examined the relationship between foreign ownership, financial constraints and crowding out effect of firms in Ghana and have introduced an important dimension to this chapter, foreign firms that are not necessarily FDIs. With this variable, we aim at identifying whether being just foreign-owned is what makes a firm what it is or whether the firm has to be an FDI to be able to reap some benefits. Our results show that foreign-owned firms are less financially constrained than domestic firms. This is in line with what Harrison and McMillan (2003) find in their work on Ivory Coast. However, contrary to the findings of Harrison and McMillan (2003), we find that the share of foreign firms' borrowing has no impact on domestic firms. We rationalise this result by explaining that most local firms in Ghana are small and as a result will not even have the necessary collateral to borrow from the financial institutions if they have to borrow. As a result, little or no attempt is made on the part of the local firms to borrow let alone compete with the foreign firms on the financial market.

In the second part of the study, we carry out a similar study as in the first part but focus mainly on China. We choose China as our second country of focus to be able to see if there are things that Ghana could learn from them. Coming from a background with institutional characteristics that were so similar to Ghana,

China has now developed into a thriving economy. By modifying Harrison and McMillan (2003) and the first part of our study, we include Joint Ventures, making our classification three groups instead of two; purely domestic, joint ventures and wholly foreign owned firms. The whole point of separating joint ventures from both purely domestic firms and wholly foreign owned firms is to capture the financial constraints of firms with different degrees of foreign ownership and to thoroughly investigate the impact of foreign firms' borrowing on purely local firms. In addition to this innovation, we also use cash flow as an additional financial variable in the model specified by Harrison and McMillan (2003). This means that the ownership dummies are interacted with both financial variables and the share of foreign borrowing to be able to draw a firm conclusion on the financial constraints of firms and the crowding out of purely domestic private firms respectively. Before we carry out the latter part, we first divide purely domestic firms into both private and state-owned enterprises and test which of the two groups is more financially constrained. Using both cash flow and debt as measures of financial constraints for the entire manufacturing sector, we find Wholly-Foreign firms to be relatively less financially-constrained than Purely Domestic firms. We however, find no difference between Joint Ventures and Purely Domestic firms' financial constraints. We attribute the results of Joint Ventures to its domestic component. We also find purely domestic private firms to be financially constrained and purely domestic state-owned firms not to be financially constrained. As for our results on the impact of share of foreign borrowing on purely local firms, we find that foreign direct investment could serve as an alternative source of financing for purely domestic private firms. This result is contrary to what Harrison and McMillan (2003) find in Ivory Coast. This shows that institutional differences play a key role in all of this.

In the final section of this part, we divide the firms according to the regions in which they are located (coastal and non-coastal regions) and carry out a similar investigation. Estimates based on this suggest firms in the coastal region are less financially constrained than firms in the non-coastal region. We also find that, while Wholly Foreign firms are found to be relatively less financially constrained

than Purely Domestic Firms and Joint Ventures in the coastal region, there exists no difference among the degree of financial constraints faced by the different types of firms in the non-coastal region. We attribute the former result to the larger market size and the developed nature of the coastal region and the latter results to the special incentives offered to some firms in some regions.

In the third part of this study, we investigate the financing behaviour of firms with different degrees of foreign ownership, exporting and non-exporting firms and firms in the different regions of China. In doing this, we use a dynamic model to compare the relationship between both short-term debt ratio and long-term debt ratio with growth, size, collateral and cash flow. In addition to using these main determinants of the different measures of leverage ratio, we take a totally different turn from the existing literature and examine for the first time the sensitivities of the different leverage ratio measures to collateral and cash flow for firms with different degrees of foreign ownership, exporting and non-exporting firms and firms in different regions. Different types of firms may be heterogeneous in the way their leverage ratio measures are sensitive to all their determinants. We however restrict our focus in this study to the financial variables. As explained in the main document, restricting our focus to the sensitivities of the leverage ratio measures to the financial variables does not change the interpretation of the results when we interact all the determinants with the various dummies. Our results show that whilst the sensitivities of short-term debt to both cash flow and collateral are lower for wholly foreign firms than purely domestic firms, the sensitivity of long-term debt to cash flow is higher for wholly foreign firms than purely domestic firms. Joint Ventures' long-term and short-term debt sensitivities' to collateral and cash flow respectively are not different from that of Purely Domestic firms. With regards to the sensitivities of short-term debt and long-term debt to exporting and non-exporting firms, we find that while the sensitivity of short-term debt to collateral appears to be lower for exporting firms than non-exporting firms, the sensitivity of long-term debt to cash flow is higher for exporting firms than non-exporting firms. This shows that exporting firms behave in a similar way to wholly-foreign firms whilst non-exporting firms behave in a way similar to that of

purely domestic firms and joint ventures. From this, we are able to conclude that globally-engaged firms behave in a similar manner so do non-globally-engaged firms.

The next important deduction that we are able to make from our results is that firms in the Chinese manufacturing sector adjust to some target debt level and their adjustment rate seems to be higher than that of many countries. This re-emphasises the greater asymmetric information that exists on the Chinese market. Our results also therefore justify the use of a dynamic model rather than a static one.

As explained in Chapter 6, we do not only consider the sensitivities of long-term debt and short-term debt to cash flow and collateral for firms with different degrees of foreign ownership or exporting firms but we also look at these sensitivities in relation to firms located in different regions. Our results show that the sensitivities of both long-term debt and short-term debt to cash flow and collateral respectively are higher for firms in the coastal region than firms in the non-coastal region. With regards to the average impact of the location of a firm on both long-term and short-term debt ratio, our results show that institutional differences play a major role. We specifically find that firms in developed regions seemed to have less short-term and long-term debts on average than firms in less developed regions. We rationalise our results by explaining that firms in more developed regions have been able to discover other means of financing, like equity financing and therefore rely less on short-term and long-term debts.

7.2 Comparison of Chapters 3 and 4

As stated in the first chapter, no comparison of the test of financial constraints of foreign and domestic firms and of crowding out of domestic firms has been done on any country, let alone a comparison between Ghana and China. Broad comparisons between the two countries focusing on GDP growth and FDI growth and economic development in general put China ahead of Ghana. From the sections on the respective financial systems in Chapters 3 and 4, we can deduce

that although the general financial institutional characteristics of the two countries such as regulatory quality seemed similar at a point, Ghana seems very well ahead of China in terms of the liberalisation of financial system. Undoubtedly, a country's financial system is one of the most important institutions in an economy.

As mentioned in the previous sections we focus our study on manufacturing firms in China and Ghana. This allows us to compare the results of the test of financing constraints of firms and crowding out effect of firms in countries which were once at a similar state in terms of development but with one of them (China) now ahead of the other (Ghana). This constitutes part of the objectives we set out at the beginning of this study. It is worth-mentioning that our findings are based on data with similar measures but not exactly the same measures[69]. There are well known framing issues and problems involved in comparative research involving variables which are supposed to represent the same things but are measured in different ways and this comparison we are making should be interpreted with that caveat. That said, it is also worth-noting that our findings can be readily reconciled with a number of "objective" stylised fact that we know about foreign and domestic firms. Even though a systematic comparison of the results is lacking, the evidence that surfaces from this study on the financial constraints test of the respective countries shows that domestic firms in both countries are more financially constrained than foreign firms. This means that foreign firms, irrespective of where they are located carry some advantages: By their association with the international world, foreign firms are able to free themselves from some financial constraints. As for the crowding out effect test, whilst we find no impact of foreign presence on the financial constraints on Ghanaian domestic firms, we find that foreign firms actually relieve Chinese domestic firms from financial constraints. As well known, some firms irrespective of their location suffer from financial constraints mainly because of agency cost.

However, in China, the private domestic firms have an additional problem with receiving financial assistance from the local banks. Local banks in China which are predominantly state-owned banks lend primarily to the state-owned

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[69] For example, whilst we use output as one of the determinants of investments in the work on Ghana, we use sales in place of output in the work on China.

firms which until recently had dominated the Chinese economy. This means that some firms may not necessarily have agency cost problems but will still be prevented from gaining access to the external financial market. Given the large amount of FDI that come into China, one would expect them to help alleviate the financial constraints of the private domestic firms who are not able to receive financial assistance from the local banks. The presence of foreign firms in China therefore is able to solve in a way the problem of not actually having any access to the financial market. The situation is quite different in Ghana. Very few state-owned banks exist in the country and the economy is dominated mainly by private banks. This means that lending is not made on the basis of political consideration but rather using financial criteria. So a firm will continue to suffer from financial constraints even with the presence of foreign firms if the main problem which is agency cost is not addressed.

Also, the level of development in the existing manufacturing sector in China is by far more developed than that of Ghana. This makes the domestic Chinese firms able to absorb spillovers far more quickly than those in Ghana especially through learning-by-doing. For the Ghanaian manufacturing firms however, the gap between the foreign and the local firms are too wide (in terms of technical knowhow and infrastructural base) that the local firms find it difficult to converge to the level of foreign firms and take a longer time to absorb the FDI spillovers. In the next section, we compare Chapters 4 and 6.

7.3 Comparison of Chapters 4 and 6

As Chapters 4 and 6 use a common dataset, the ORIANA database, it is also relevant to draw out the similarities and the differences that we find in the results. In both chapters we limit our study to the manufacturing sector since the dataset comprises mainly firms from the manufacturing sector. Although we examine the relationship between finance and different degrees of foreign ownership, the specific issues we examine in both chapters can be distinguished: Whilst we focus on the relationship between financial constraints and firms with different degrees

of foreign ownership in Chapter 4, we examine the sensitivities of debt to both collateral and cash flow for firms with different degrees of foreign ownership in Chapter 6. The whole idea of Chapter 6 is to partly check whether the results of Chapter 4 will be robust. In Chapter 4, the result that domestic firms are more financially constrained than wholly foreign owned firms is supported by what we find in Chapter 6. In Chapter 6, wholly foreign-owned firms' short-term debts are found to be less sensitivity to cash flow than that of purely domestic firms. The conclusion we were able to draw from this results is that because purely foreign firms have a large pool of internal finance market, if international financial markets function properly foreign firms will rely on this which is a cheaper option than short-term debt. In a way, we can deduce from this result that purely foreign firms are less financially constrained than purely domestic firms because they have a larger base of internal finance. Our results for Joint Ventures are robust. In both Chapters we find that Joint Ventures behave like Purely Domestic Firms.

7.4 Policy Implications

This study has been primarily based on financial constraints of foreign and domestic firms, crowding out test and financing decisions of different types of firms. All these points are very important in guiding the governments of the respective countries when making policies for their countries. Recalling the results from this study, we find from both Chapters 3 and 4 that domestic firms in Ghana and China respectively are more financially constrained than foreign firms. Based on this result, we recommend the governments for both countries to institute certain policy incentives for their domestic firms. For instance, the governments of both countries can institute policies for subsidies and tax holidays for domestic firms to enable them produce more and gain more profit. This will enable them have a healthier balance sheet to be able to borrow more from the external market.

Secondly, there is the need for improvements in the financial development of both countries. This will mean that the bond market in both countries would have to be developed to enable firms to have a wider range of financial sources. Third, the legal system should be greatly improved so that creditors' right will be

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protected. This will enable creditors gain confidence in the system and lend to more firms. One main reason for agency cost is that banks find it very difficult to gather information on their lenders. In order to reduce this cost, private bureau organisations responsible for linking businesses to banks should be set up. In the case of Ghana, none exists at the moment. Based on our results for China, we support the continual abolition of the tax incentive policy for foreign firms which existed in China before 2008. This is because if the government wants to bridge the gap between the financial constraints of domestic firms and foreign firms.

Next, we recommend policies for the test of crowding out. As a reminder of our results, whilst we find no impact of foreign firms' presence on Ghanaian domestic firms' financial constraints, we find that foreign firms' presence in China relieve private domestic firms of their financial constraints. For China, we recommend a continual increase in the policies geared towards attracting foreign investors. Two main arguments can be made from this. First, bearing in mind that the tax incentive policy which was given to foreign firms before 2008 will further widen the gap between the financial constraints of foreign firms and that of domestic firms, the government should find another way of attracting them. As an alternative, we suggest that the government should focus on building up and improving the institutional structures within the Chinese economy. This will include defining the laws that govern foreign investment clearly and making them less cumbersome for them to easily adapt to it. Another way could be to develop the infrastructure of the country to make it easier for them to operate. One can also argue that a better policy will be maintaining the tax incentive policy for foreign firms whilst at the same time directing attention to the domestic firms and joint ventures. This will mean improving the conditions of domestic firms so that they can be credit-worthy. By this particular policy, we are able to satisfy both the attraction of foreign firms and then help domestic firms to also become financially healthy. We suggest that whichever policy will be implemented should be more intense in the coastal region than in the non-coastal region since we find in our results that PD and JV firms suffer the more in the coastal region, while all firms are equal in terms of financial constraints in the non-coastal region. We rationalise

our results by explaining that firms in more developed regions have been able to discover other means of financing and therefore rely less on short-term and long-term debts.

Finally, we recommend certain policies for our work on Chapter 6 of our study on the sensitivities of long-term debt and short-term debt to collateral and cash flow. It is evident from our results that banks in China are beginning to apply financial criteria in their lending. We therefore recommend a strong continuation of the policies that support lending to more efficient firms. Lending should be on financial consideration and not by political consideration. We also recommend a continual implementation of banking reforms so that firms may have a wide range of choices for financing, and this should apply especially in the non-coastal region. Following this, we urge policy- makers to develop the Chinese stock market to help vary funds in the economy. With regards to Purely Domestic firms and Joint Ventures, the government should put in place policies that will make them more efficient and encourage them to have a clean balance sheet so that they can qualify for funds on the financial market.

7.4   Limitations and Future Work

Our findings are suggestive, not definitive. One important issue has to do with the nature of the different datasets that we use for comparing Chapters 3 and 4. Although from the respective studies we can establish that both Chinese and Ghanaian domestic firms are more financially constrained than their foreign firms' counterparts and that foreign firms relieve domestic firms of their financial constraints in China but have no impact on the local firms in Ghana, we were unable to measure the some of the variables in the same way. For instance, whilst we use output as a determinant of lagged investment in the work on Ghana, we use sales as a determinant of lagged investment on the work on China. Although these variables serve the same purpose, they are measured differently, making a direct comparison between the two countries difficult to make. Secondly, our dataset on Ghana did not contain information on the amount of foreign capital that is invested

in each firm. Our measure for FDI in the Ghanaian dataset is discrete and not continuous. As a result, although we are able to classify firms into different degrees of foreign ownership for China, we are unable to do same for Ghana. This somehow provides another caveat to our study. Third, the dataset on Ghana contains very few observations. This makes analyses on it quite difficult especially when you have to use lags. Regarding the work on the financing behaviour of different types of firms that we do in Chapter 6, we believe that it would have been best for us to further divide joint ventures into minority foreign-owned and majority-foreign owned firms to be able to capture the actual financing behaviour of the different types of firms. In the case of our study for instance, although we are able to come out with some results that joint ventures behave in a similar way as purely domestic firms, we are unable to identify which type of joint ventures actually behave that way. It could so be that the majority-foreign owned joint ventures would behave in a way similar to that of wholly-foreign firms. Yet, we are unable to capture that due to data constraint. We tried splitting joint ventures further into these sub-groups, but realised we had too few observations to carry out our task. We therefore had to make do with just joint ventures as one broad category.

All these caveats to our study lead us to recommending extensions for future work. First, another study on the financial constraints of firms with different degrees of foreign ownership on the Ghanaian economy should be done. This could be an extension to our study and will help capture the financial constraints of firms with different degrees of financial constraints. If the study is able to have access to data that will enable a breakdown of joint ventures into minority-owned and majority-owned joint ventures, policy making can then be directed to specific firms. This also means that some extensions can also be done on our study on financial constraints and crowding out in China. As we are only able to divide firms into three, a more equally-distributed dataset could help further break our study down to be able to separate results of majority-owned foreign firms from minority-owned foreign firms. For our study on capital structure, using other

ownership characteristics would be interesting to develop, such as family and non-family ownership groups.

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