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BANK MARKET STRUCTURE AND INDUSTRIALIZATION: EVIDENCE FROM DEVELOPING COUNTRIES

By

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ABSTRACT

This thesis examines how bank market structure affects industry performance in developing countries. A high degree of bank concentration would be associated with tight constraints and high borrowing costs, while it has also been argued that, it would be easier for firms to access credit if the banking system is concentrated. Foreign banks are seen to promote financial development and spur economic growth; while critics suggest that a larger foreign bank presence in developing countries is associated with less credit to the private sector. Also, government ownership of banks is responsible for lower economic growth and slow financial development, while others argue that government banks promote long-run growth. The implications of bank market structure on the real economy are examined using cross-country, cross-industry panel data from developing countries, along with a variety of econometric techniques, and standard measures of industry performance. The research aims to ascertain whether bank market structure in developing countries influences financing for firms differently as a result of industry-specific characteristics. It also examines if institutional characteristics help in explaining industrial performance in the short-run. As a follow-up to one of the findings, the research examines if banks would prefer to fund innovative firms in a liberalized environment by exploring the impact of financial development on the export structure. The main empirical findings are as follows: first, it may not be possible to identify robust or consistent findings concerning the effects of good institutions; secondly, it might not necessarily be the case that financial development specifically benefits firms based on specific industry characteristics; and finally, the research finds that banking sector development reduces export sophistication and increases export concentration. This may suggest that banking sector development enforces specialization according to existing comparative advantage.

Keywords: Bank concentration, foreign bank entry, government ownership of banks, financial development, industrialization, institutional quality, export sophistication, export diversification, developing countries.

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DECLARATION

I declare that, except where explicit reference is made to the contribution of others, that this dissertation is the result of my own work and has not been submitted for any other degrees at the University of Glasgow or any other institutions.

Signature _____

Name _____

CHAPTER 1: BANKGROUND AND JUSTIFICATION FOR THE STUDY

1.1 INTRODUCTION

The literature on finance and growth in modern economic history has been ambiguous. The role financial development plays on economic growth has been extensively researched by economists, and it is startling that the views expressed are quite different. The diverse opinions on the finance- growth relationship brings about the question of the importance of financial development on economic growth. McKinnon- Shaw (1973) tries to underpin this question by formulating the financial liberalization hypothesis which helps to explain the effective role of financial institutions when interest rates are fully liberalized and the market is free from any sort of financial repression. Levine (1997) supports McKinnon-Shaw's hypothesis by developing the "*functional approach*" to further explain the importance of improving the functions of financial institutions for economic growth.

The study of the relationship between financial development and economic growth started with Bagehot (1873) where he stated that the financial system was hugely responsible for industrialization in England. Schumpeter (1912) also argued that a sound banking system is necessary for economic growth through the allocation of resources and technological improvement. Robinson (1952) criticized the supply-leading view of Bagehot (1873) and Schumpeter (1912) by arguing that economic growth induces financial development (demand-following) and not the other way round. Lewis (1955) suggested a bi-directional relationship between finance and growth. In 1966, Patrick buttresses Lewis' argument by explaining that both views occur during different stages of economic development. Levine (1997) supports a first-order relationship between financial development and growth through the efficient functioning of the financial system. Lucas (1988) criticized the use of finance in explaining economic growth.

Also, another discrete aspect of the literature tries to identify which financial structure is the most appropriate for economic development. One of the main goals of Goldsmith (1969) was to investigate the impact of financial structure on economic growth and development. He was able to give a fairly good comparison of financial structures in Germany, The United Kingdom, The United States of America and Japan. His study on these four countries gave logical penetrations into different financial structures and how they affected economic development. In the last decade or so, economists have argued that a market-based financial system is more efficient in performing the functions of finance in an economy and they see

the stock markets to be the active amongst these markets. Proponents of market-based financial systems were mainly from the US and the United Kingdom as the stock markets in these countries were active and were instrumental in efficiently allocating resources.[1]

As will be seen in recommended references[2], the difference between a bank-based and a market based financial systems propose that they stand as substitutes that carry out relatively similar functions executed in fairly dissimilar ways but with variable success rates. Research has it that limitation of information from outsiders by banks makes it less desirable when compared to markets where agents have more information and can take decisions based on the information even if there is diversity in views.

The literature on finance and growth has also produced several areas of research which have been controversial in its sense. The importance of concentration in the banking industry; as well as the ownership structure of banks: foreign, domestic and state; have emerged as important but debatable areas of research. In the first instance, concerning bank market concentration, there might be the question of why any relevant controversies exist in this area of research. In the real sense, one would expect that a highly concentrated banking industry is bad for economic growth.

Banks with market power would determine the rates they charge as well as the rates they pay on deposits. They are able to charge higher rents on loans to businesses and individuals; and pay depositors below the market rates. High rates on loans is capable of negatively affecting businesses, thereby forcing them to undertake highly risky projects which reduces the possibility of paying back loans and deteriorating the strength of the credit market; as well as leading to prospective market failures.[3]

[1] Allen and Gale (2000) for a criticism of this highly supported view.

[2] See for more on the market-based vs bank-based financial system: Gerschenkron (1962); Stiglitz (1985); Boyd and Prescott (1986); Atje and Jovanovic (1993); Bhide (1993); Demirguc-Kunt and Levine (1996); Boyd and Smith (1998); Harris (1997); Levine and Zervos (1998); Weinstein and Yafeh (1998); Demirguc-Kunt and Levine (1999); Mork and Nakkamura (1999); Levine (1999); Allen and Gale (2000); World Bank (2001); Arestis et al. (2001); Beck (2002);Beck and Levine (2002); Demirguc-Kunt and Maksimovic (2002); and Beck and Levine (2004).

[3] Another detrimental effect of very high interest rate is a fall in the pace of technological advancement. Businesses would be more concerned with making profits from already difficult situations rather than improving

Similarly, neo-liberal views suggest that state ownership of banks is bad for economic development. Until the late 1980s/early 1990s, a lot of developing countries applied financial repression policies unintentionally. This was not done to the benefits of the governments but rather to effectively control the financial system in a way where development of the economy was paramount (Fry, 1973; Nichols, 1974; and Giovanni and De Melo, 1993). Financial repression was mainly used to divert huge funds from the financial system to the public sector. In 1973, financial repression was heavily confronted by McKinnon (1973) and Shaw (1973).

In their financial economic models[4], financial liberalization as well as its development was responsible for facilitating economic growth. They also showed the detrimental effects of financial repression (interest rate ceilings, outrageously high reserve requirements, selective credit policies and biased taxes on the capital markets) slowed down the pace of economic growth (Fry, 1995). Government ownership of banks, which is seen as the most popular form of financial repression began to face hostility and was seen as bad for economic growth.

Foreign bank ownership on the other hand can initially be seen to mitigate the inefficiencies of the domestic banking sector by supplying the shortfall of credit to firms. In the past few decades, financial globalization as well as international trade has facilitated the extension of foreign branches by parent banks in many countries (Aliber, 1984). The extension of foreign branches and subsidiaries by large international banks has been as a result of increased financial liberalization which can be traced to the mid-1980s. The entry of foreign banks or the foreign ownership of banks as a result of financial liberalization is expected to improve the efficiency of the domestic banking sector as well as improve the allocation of financial resources[5]. However, it was later observed that the entry or ownership of foreign banks has detrimental effects on the domestic banking sector as well as the economy[6]. In some cases,

technology; which is detrimental for productivity growth and the real per capita income. This is the widely accepted outcome of concentrated banking industries.

[4] See Fry (1995) and Thirwall (2006) for a detailed description of these models
[5] See Levine, 1996; Goldberg and Saunders, 1981; and Walter and Gray, 1983, for the benefits of foreign banks to the domestic banking system.
[6] See Stiglitz (1993) for a summary of how competition from foreign banks can have detrimental effects on domestic banks, SMEs and the government

foreign banks are seen to have no benefits to developing countries with underdeveloped financial systems[7].

1.1 MOTIVATION FOR THE STUDY

The study is motivated by the need to provide an additional insight concerning the debate on bank market structure and growth. This is facilitated by investigating the effect of bank concentration, foreign bank ownership and state ownership of banks industrial performance in developing countries using different methodologies. First of all, this study uses a cross-country panel data set to explore the long-and short run effects of bank market structure on industrialization and explores the importance of institutional, regulatory and supervisory qualities in the process. Secondly, the study uses a cross-country, cross-industry panel data test to explore the effects. It does not do this only by examining the broad relationship between bank market structure and economic growth; it explores this relationship between bank market structures while considering different industrial characteristics that might be expected to benefit from financial development. Specifically, it takes advantage of industry-specific characteristics which are related to firms' dependence on external finance, firm size, factor intensity, technological intensity and economic importance. Industrialization (or industrial performance) is decomposed into industry growth and net firm entry. Finally, the study examines the importance of financial development on the export structures (where export structures are measured as export sophistication and export concentration). The next few sections provide some conceptual issues that led to the formulation of the associated research objectives.

The literature yields conflicting predictions about the effect of bank concentration on industrialization. On the one hand, there is the idea-typical of the so-called Structure-Conduct-Performance hypothesis-that concentration reflects the banks' oligopolistic position and, hence a high degree of concentration would be associated with tight credit access constraints and high borrowing costs. On the other hand, it has been argued that it would be easier for firms to access credit if the banking system is concentrated (Da Rin and Hellman, 2002; Petersen and Rajan, 1995; Cetorelli and Gambera, 2001) and that the occurrence of financial crises is less likely in more concentrated banking systems (Beck *et al*. 2006).

[7] See Stein (2010) for a detailed discussion on this.

Standard mainstream theory envisages that that the entry of foreign bank would promote financial development and spur economic growth (Beck *et al*. 2004). On the other hand, foreign bank entry is associated with less credit to the private sector (Detragiache *et al*. 2008).

Finally, state owned banks are seen to be responsible for lower economic growth and financial development (La Porta *et al*. 2002). On the other hand, state owned banks are seen to promote long-run economic growth (Andrianova *et al*. 2012).

The effect of either of this market structures on industrialization may be determined by the institutional characteristics of a country and the conditions of the financial system, particularly the regulatory environment and industry-specific characteristics in the manufacturing sector. Also, the results on technological intensities in the second empirical chapter persuaded us to examine the effects of financial development on export sophistication and concentration on a larger country sample.

The framework therefore provides an opportunity to evaluate how widely adopted financial reforms (i.e. reducing bank concentration levels, promoting foreign bank entry, and increasing the privatization of state owned banks) affect industrial performance in developing countries.

1.3. SIGNIFICANCE OF THE STUDY AND PROBLEM STATEMENT

Apart from contributing to the literature on bank market structure and industrialization, this study has relevant policy implications. First of all, if the effect of bank market structure on industrialization is explained by institutional characteristics, then developing countries are likely to benefit significantly from good institutions during the development process. In this first instance, this may be actualized through the formulation and proper implementation of policies that improve the operations of the financial system, resulting in industrialization. And also, by adopting policies that create an environment, where the financial system works efficiently-i.e. policies that improve the institutional environment.

Secondly, if bank market structure benefits industrialization based on different industrial characterizations that might be expected to benefit from financial development, it then means

that it is difficult suggest that industries with specific characterization (e.g. external finance dependence) will benefit the most from financial development.

Finally, if the effect of financial development on export sophistication and diversification is positive-i.e. increases the degree of export sophistication and diversification-in developing countries, then they are able to compete internationally because of improved exports structures which are normally characterized by low value-added and a concentrated group of products. These should be achieved by implementing policies that improve the efficiency of the financial system, thereby increasing not only export quantity, but export quality. Many developing countries have improved their export quantities significantly in recent times. Funding from the private sector and the state is partly responsible for this. However, these exports have been mostly concentrated in primary products, low technological products and oil. Even with increased export volumes, many developing countries remain relatively poor because they are unable to compete effectively at the international scene; and because their exports are concentrated in a few products, which may result in widespread detrimental effects in the presence of negative price shock.

1.3. **DATA SOURCES**

The study uses a cross-country panel on 31 developing countries over a 13-year period (1995-2007) in the first empirical chapter. Cross-country data on manufacturing value added growth is obtained from the World Bank *WDI* (World Development Indicators). In the second empirical chapter, cross-industry data for growth in industry value added and net firm entry in manufacturing industries for 26 countries are obtained from the *UNIDO* electronic database (Industry Statistics Data base 2013 at the 2-digit level of ISIC Code (Revision 3) (1995-2007). Data on bank concentration is obtained from the 'Financial Development and Structure Dataset' of the World Bank by Beck *et al*. (2013). Data on foreign ownership of banks was obtained from a selection of sources – Cull and Martinez Peria (2011), Claessens *et al*. (2008) and Cleessens and van Horne (2012). Government ownership of banks was obtained from a variety of sources: first of all we have used data from Barth *et al*. (2008) to cover for government ownership of banks for 1999, 2001 and 2005. Secondly, we have tried to compile data from different sources, particularly the BankScope database which provides information on bank ownership structure and financial statements.

Data on institutional quality, regulatory restrictions, supervision and monitoring, the quality of the legal environment are gotten from a selection of sources: 'Bank Regulation and Supervision' and 'Worldwide Governance Indicators', both of the World Bank and compiled by Barth *et al*., and Kaufmann *et al*. respectively; the Heritage Foundation, and the ICRG. Industry specific data on 'external financial dependence' was obtained from Rajan and Zingales (1998), 'small firm share was obtained from Beck *et al*. (2008), while data to calculate average firms size, labour intensity, technological intensity and measures of economic importance were also gotten from the same dataset as industry performance.

The third empirical chapter uses cross-country data from at least 63 developing countries between 1995 and 2010 (for export concentration) and 1985-2000 (for export sophistication). Data on export sophistication is obtained from Dani Rodrik's webisite, while data on export diversification (concentration) is obtained from the *UNCTADSTAT* electronic database. All other country-specific data were obtained from the World Bank World Bank *WDI.*

1.5. RESEARCH METHODOLOGY

The methodological and systematic foundation for this study is taken from the empirical literature that studies the relationship between bank markets and industrial performance. A broad assessment of the theoretical and empirical literature supports the evaluation of industrial performance in developing countries. The study mainly uses econometric techniques to derive results in this study. Econometric models were also specified to evaluate the specified objectives. The empirical methodology and techniques utilized in each empirical chapter is stated and the respective drawbacks highlighted. Policy implications of the results and areas that require further research are highlighted at the end of each empirical chapter as well as the concluding chapter.

1.6. STRUCTURE OF THE STUDY

The study is structured into 5 chapters. Chapter 1 introduces the foundation of the study. Empirical models are specified and presented in Chapters 2, 3 and 4. In Chapter 2, the study uses cross-country data to examine the role of institutions and the conditions of the financial system on the effect of bank market structure on industry performance (where industry performance is measured as industry growth in value added); Chapter 3 uses cross-country, cross-industry data to examine the impact of bank market structure on industrialization

(where industry performance is measured as the growth in industry value added and net firm entry) while considering industry-specific characteristics; and Chapter 4 examines the impact of financial development on export structure (where export structure is measured as export sophistication and export diversification). Chapter 2, 3 and 4 are discussed in detail and sometimes references are made between chapters. Each of these chapters discusses a robust literature survey, empirical methodology, techniques and results. Also, discussions of the empirical results are largely in line with the theoretical and empirical literature. Finally, Chapter 5 presents a summary of findings, concludes based on the empirical results, identify the study's contribution to literature, make policy recommendations based on the results and suggest areas for future research.

1.7. **CONCLUSION**

The impact of bank concentration, foreign bank ownership and state ownership of banks on industrialization in developing countries remains relatively inconclusive in the literature. In developing countries, international financial institutions (i.e. the World Bank and the IMF) continue to influence financial policies. Particularly, they persuade developing countries to implement policies that promote competition, reduce restrictions on foreign bank entry, and increase the pace of privatizing state banks. They suggest that these policies are likely to improve economic development and industrialization. When many of these policies resulted in financial and macroeconomic instability in developing countries, they argued that it was related to poor institutions and weak legal environments in developing countries. However, the industrial performance in many developing countries remains poor, even after adopting many of these policies. Firms in receipt of funding are largely categorized as those that more on external finance and are expected to perform better when the level of financial development is high. However, it is possible that other characterizations of firms may benefit from financial development. Also, it is assumed that exporting firms in developing countries are unable to compete effectively in the international markets because they are unable to receive funding to improve their production process. It is therefore important to examine the role of bank market structure on industrialization. This study examines the role of institutions and the importance of industry specific-specific characteristics on the impact of bank market structure on industrialization. Also, it examines the impact of financial development on the export structure of developing countries.

CHAPTER 2: BANK MARKET STRUCTURE AND INDUSRALIZATION IN DEVELOPING COUNTRIES – THE ROLE OF INSTITUTIONS

2.1. INTRODUCTION

Differences in the level of institutions have been seen to be one of the significant reasons why the levels of economic performance in countries vary. The inability of neoclassical growth theories to completely explain the determinants of economic growth have increased the volume of research that studies the role of institutions in economic development. North (1990, p. 3) defined institutions as 'the rules of the game in a society or, more formally, are the humanly devised constraints that shape human interactions. In consequence they structure incentives in human exchange, whether political, social, or economic. Institutional change shapes the way societies evolve through time and hence is the key to understanding historical change'. Accordingly, institutions are responsible for political, social and economic structure of any country. Formal institutions are notably Constitutions and laws which govern a country and informal institutions might include code of conduct (also known as social norms or values). Both forms of institutions are seen as important factors that affects how we relate with each other.

According to North, the definition of institutions could also be seen as idiosyncratic factors that affect political, economic and social structure of society after fundamental factors have been accounted for. It is difficult to discount the importance of institutions on economic performance based on North's definition. Institutions were also defined closely by Greif (2006, p. 30): 'An institution is a system of rules, beliefs, norms and organizations that together generate a regularity of social behaviour'. Right from the 18th century, particular interest has been on a set of institutions which include the rule of law, the protection of property rights and the ability to restrict the mitigating actions of influential capitalists (groups or the government). These institutions have the ability to create an environment where their agents are induced to invest and the thriving in investment subsequently leads to economic growth. However, these institutions could also create an economic environment where agents are discouraged to invest leading to slow growth. A number of recent empirical studies have established some evidence that the difference experienced in economic performance in different countries can be largely traced to differences in institutions (For example, Knack and Keefer, 1995; Hall and Jones, 1999; Acemoglu *et al*., 2001, 2002; Rodrik *et al*., 2004, Eicher and Leukert, 2009).

The importance of finance and financial markets to economic growth has led to increased research on the link between economic institutions and how they help financial institutions to work properly. This is important because of the conditions that financial contracts are based upon. The inability of institutions to impose financial contracts (e.g. loan contracts) increases the possibility that debtors will default on their loans. A strong legal framework sometimes is not adequate for a large financial system. The ability to enforce the rights and restraints of parties involved in a financial contract is also required. Without this, it is possible that financial contracts may be entangled in problems of moral hazards and adverse selections as a result of asymmetric information. Asymmetric information is a situation where the creditor has little or no information on the borrower's incentive and behaviour. Although, it is impossible for the creditor to have perfect knowledge on the borrower's incentive and behaviour, contracts that have been well-written in the presence of relevant institutional conditions are necessary for financial contracts to be properly enforced.

Asymmetric information and the manner in which information is shared between economic agents are relevant for how resources are allocated, particularly in financial markets. In economies where asymmetric information is present, the manner in which financial contracts have been designed as well as the institutional conditions is vital in determining investment and capital accumulation (Capasso, 2004). For example, a situation where institutional conditions are insufficient i.e. they may be poor and inadequately developed, may facilitate the likelihood of default. Also, adequate institutional conditions are necessary for financial institutions to efficiently perform their function of channelling financial resources to the most productive projects. The association between the quality of institutions and financial development is therefore seen as an important relationship.

The introduction of financial liberalization policies in developing countries produced mixed results. In the first instance, the empirical growth literature finds that private domestic credit and liquid liabilities exert a positive effect on per capita GDP growth. This indicates the growth enhancing effect of financial development (King and Levine, 1993; and Levine *et al*. 2000). In the second instance, the banking and currency crises literature finds that monetary aggregates, such as domestic credit, are among the best predictors for crisis. Since banking crises usually leads to recessions, an expansion of domestic credit would then be associated with growth slowdowns (Demirguc-Kunt and Degatriache, 1998, 2000, Kaminsky and Reinhart, 1999 and Gourinchas *et al*. 2001). A similar contradiction exists in the theoretical literature. According to the endogenous growth literature, financial deepening leads to a more efficient allocation of savings to productive investments (Greenwood and Jovanovic, 1990

and Bencivenga and Smith, 1991). On the other hand, the financial crisis literature points to the destabilizing effect of financial liberalization as it may lead to an excessively large expansion of credit. Excessive lending could occur as a result of the mixture of different channels, comprising inadequate monitoring capacity of regulatory agencies, failure of banks to identify good projects during boom periods, and the presence of an explicit or implicit insurance scheme against bank failures (Schneider and Tornell, 2004 and Aghion *et al*. 2004).

The negative effect of financial liberalization in many developing countries has been traced to weak institutional and regulatory capacities, particularly after the 1997/1998 global financial crises (Rodrik, 2001) and the recent 2008 global financial crisis. It was suggested that financial liberalization should be approached carefully, particularly in countries where the institutions necessary to enforce law and contract enforcement and effective prudential regulation and supervision are weak (Demirguc-Kunt and Degatriache, 1998, Kaminsky and Schmukler, 2008). In other words, countries with stronger institutional capacities and a strong legal environment are in a better position to benefit from financial liberalization policies. Hence, it can be argued that one way through which institutions affect economic growth and development is by creating larger and healthy financial markets. The motivation for this chapter is to find some robustness for this finding. In other words, the study explores whether good institutions improve how the financial structure affects industrialization in developing countries. Particularly, we explore if good institutions promote the effect of bank market concentration, foreign bank entry and state ownership of banks on industrialization in developing countries.[8]

Bank market structure is measured by bank concentration, foreign bank ownership and government banks ownership. The most relevant institutional variables for the financial variables we have used have also been employed. The study uses two empirical approaches. The first empirical approach is in two stages. First of all, an estimator is used to identify the long-run and short-run relationship between bank market structure and industrial development. Secondly, the relationships between the short-run coefficients and institutions are examined to explain the impact of institutions on the effect of bank market structure on industrial development. The second empirical approach employs the impact of bank market structure on industrial development in the presence of institutions (an interaction term

[8]Note: Financial liberalization policies are likely to promote bank market competitiveness, foreign bank entry and the privatization of state owned banks as opposed to bank market concentration, restriction of foreign bank entry and the presence of state owned banks.

between bank market structure and institutions is created). The study covers a sample of 31 developing countries over the period, 1995-2007.

2.2. CONCEPTUAL FRAMEWORK

2.2.1. Background to the Relationship between Institutions and Economic Growth

Institutions are seen to be important for economic growth, and differences in institutional quality across countries are used to explain why an economic gap exists between developed and developing countries.[9] One study which tried to link institutions with economic growth differences across countries was Hall and Jones (1999). According to Hall and Jones (1999), the output per worker in the United States was 35 times higher than the output per worker in Nigeria in 1988. In other words, in 1988, it took an average American 10 days to produce what it took an average Nigerian 1 year to produce. They find that the ability of some countries to be more productive than others in terms of output per worker in the long-run is linked to high rates of investment in physical and human capital and because inputs are used efficiently and at a high level of productivity. Their empirical analysis suggests that this achievement is linked to social infrastructure.

Their key findings include the following: growth theory predictions can be examined in a cross-country context by examining country level incomes. Large differences in output per worker in different countries are only partly explained by physical and human capital accumulation. Growth accounting finds large differences across countries that remain unexplained. Differences in the level of institutions and effectiveness of government policies across countries is responsible for the large differences in physical and human capital accumulation, productivity, and consequently large differences in income across countries; and the degree to which many countries have implemented different social structures is partly linked to their relationship with Western Europe. Here, Hall and Jones (1999) were able to show that institutions and government policies were responsible for the large differences in output per worker across countries.

[9] See North (1989) for a detailed discussion of this.

2.2.2. Bank Market Structure and the role of Institutions

2.2.2.1. Bank Concentration and Institutions

In recent years there has been an increase in research of the economic role of market competition on industrialization and the literature on this research has yielded conflicting predictions. In the first instance, the need for such a debate seems uncalled for. Logical reasoning would suggest that policies that do not support competition in markets would have social welfare losses. It is assumed that banks with market power would take advantage of their ability to extract rents by charging higher loan rates to businesses and pay low deposit rates to depositors. It is assumed that higher lending rates could cause entrepreneurs to undertake extremely risky projects, thereby having detrimental effects on the stability of credit markets and escalating the probability of systemic failures. It is also possible that higher lending rates would reduce investment in research and development, thereby reducing the pace of technological development and productivity growth. This would also lead to low capital accumulation and slow economic development. This is also referred to as the 'Structure-Conduct-Performance-Hypothesis' (Pagano, 1993; and Guzman, 2000). A few other examples provide empirical evidence for the negative effect of bank market power (Jayaratne and Strahan, 1996; Shaffer, 1998; Black and Strahan, 2002).

On the other hand, it has been argued that a concentrated banking sector improves the access of firms to finance. Petersen and Rajan (1995) use a stylized theoretical model to show that young firms with no historical records are likely to receive credit at better rates if they are in a credit market where banks have market power. The intuition as explained above is that a premium should be included to the rates of a pool of risky borrowers (young firms) as a result of possible default leading to higher lending rates than the ones use for established borrowers. It is also assumed that these rates will be significantly high and that credit will be partially rationed. However, according to Petersen and Rajan, banks with market power are likely to charge 'introductory' lower lending rates to attract the best young firms and establish a lending relationship with them, with the hope of extracting rents through charging higher rates in the future when they become established. This is only possible if the bank has market power.[10] Other examples that provide empirical evidence for the positive effect of bank

[10]However, in a study by Cetorelli and Gambera (2001), they empirically show that bank concentration has an economic dead weight loss on economic growth but promotes the growth of industries that rely more on external finance.

market power include: Shaffer (1998); Collender and Shaffer, 2000; Bonaccorci and Dell' Ariccia (2004).

However, Rajan (1992) previously pointed out that the positive association between bank concentration and credit availability through relationship lending may largely depend on the intensity of the so-called 'hold-up problem', i.e., a situation where firm may be unwilling to enter close relationships with banks if banks can use their discretion to hold up the firms and request a share of the profits in return for credit to finance future projects. Also, in contrast with Petersen and Rajan, Boot and Thakor (2000) argue that banks in a competitive environment are more likely to try to establish a lending relationship with borrowers, because it allows them to differentiate themselves from other lenders and give them the competitive edge. Relationship lending is seen as a means of acquiring soft information about firms in an environment characterized by asymmetric information.

Da Rin and Hellman (2002) examine the role of banks as catalysts for industrialization. They introduce financial intermediaries into the 'big push' model for this examination. In the model, they examine under what conditions profit-motivated banks would significantly invest in industrialization. The model predicts that the role of banks as catalysts for industrialization is associated with a situation where these banks have market power and are considerably large.[11]

The effect of bank concentration on economic development and industrialization is mixed as we have seen in the literature. It is possible that this relationship may be better explained while taking note of the institutional context and the conditions of the financial system. The ambiguity in the literature might be better explained by looking at the quality of institutions, bank supervision and particularly bank regulation.

Institutions

After examining the literature on the importance of strong legal system, good institutions and effective enforcement of laws and contracts for economic growth and industrialization, we find that markets are likely to function better in the presence of good institutions. This section examines the literature on the effects of bank concentration on economic growth and industrialization in the presence of institutions. Beck *et al.* (2004) uses a unique dataset of 74 countries for firms of small, medium and large size to examine how bank market structure affects the access of firms to bank finance. Primarily, they find that bank concentration

[11] According to Beck *et al.* (2006), it is also less likely that financial crises would occur in more concentrated banking sectors.

increases the financial constraints of firms (particularly small and medium sized firms) and this effect is stronger in low income countries. However, they also find that the institutional and regulatory characteristics as well as the ownership structure of a country influences how bank concentration associates with the access of firms to bank finance. They argue that countries with high institutional quality, an efficient credit registry and a strong presence of foreign banks reduce the negative effect of bank concentration on the financial constraints of firms and in some cases render the effect of bank concentration on the access of firms to bank finance insignificant. They also argue that the negative effect of bank concentration on the access of firms to bank finance is worsened in countries where there is a high restriction on bank activities, high government interference in the banking system, and a high presence of government-owned banks.

However, Ergungor (2004), in his comment on Beck *et al*. (2004) paper re-construes their results by suggesting that bank concentration has positive effects on growth and industrialization. He suggests that banks with more market power can initially develop expensive relationships with borrowers (charging lower lending rates) with the prospect extracting rents in the future (share in future surpluses), and further argues that banking regulations that restrict the ability of banks to engage in other commercial activities outside lending and receiving deposits would limit the opportunity of banks to engage in future business with their borrowers and, therefore, the profits that they could make through borrowers. He stresses that this is evident in the results of Beck *et al*. (2004). Furthermore, he argues that other results in Beck *et al.* (2004) support the fact that bank concentration alleviates firms' financial constraint. However, he suggest that this is more likely to occur when countries have good quality institutions, minimal government interference in the banking sector, a good credit registry, high presence of foreign banks and a low presence of government banks. In other words, while we see that Beck *et al.* (2004) and Ergungor (2004) agree that institutions are important for how bank concentration affects firms' access to finance, they disagree on the effect of bank concentration of firms' access to bank finance.

Fernandez *et al*. (2010) also examines the effect of bank concentration on economic growth in the presence of institutional quality but their results are quite opposite from what has been discussed so far. They use results from 84 countries over the 1980 – 2004 period to argue that high levels of bank concentration could have positive effects on economic growth in countries with weak institutions through resolving adverse selection and moral hazard problems. They believe that the problems associated with weak institutions might make long-term relationship between banks and borrowers a plausible solution in developing markets.

These long-term relationships will be encouraged in concentrated banking markets leading to a positive effect on economic growth. They also suggest that bank concentration would play the role of laws governing the strong protection of creditors and property as well as the role of good institutions by reducing informational asymmetries and agency costs between banks and firms. Finally, they suggest that good quality of institutions and effective laws governing the protection of creditors and property in developed countries make bank concentration less relevant.[12] From the examined studies in this section, the effect of bank concentration on firms' access of bank finance in the presence of institutions is ambiguous.

On the one hand, the negative effect of bank concentration on firms' access to bank finance is reduced in the presence of good institutions. On the other hand, bank concentration improves firms' access to bank finance in the presence of good institutions. Finally, a third strand argues that bank concentration improves firms' access to bank finance when institutions are weak, particularly in developing countries.

Bank Regulation

It has been argued that the type and nature of bank regulation may determine the impact of bank concentration. For example, Barth *et al*. (2004) and Demirguc-Kunt *et al*. (2004) examine the relationship between specific regulatory and supervisory practices and banking sector development. Both studies find that excessive bank restrictions and regulations on bank activities – such as bank entry, undertaking of non-traditional bank activities (e.g. securities, insurance and real estate) and the control of non-financial firms – are negatively associated with bank development and stability, as compared to when banks can diversify into other financial activities. In other words, excessive regulation and restriction of bank entry, bank activities and bank ownership of non – financial firms makes the banking system less competitive and less efficient.

Fernandez *et al*. (2010) also discusses the role of regulation with regards the relationship between bank concentration and economic growth. On one hand, they believe that strong restrictions on bank activities persuade banks to focus on lending and receiving deposits as this may form lending relationships between banks and firms. In other words, they believe that bank concentration facilitates lending relationships; to be exact; bank concentration promotes the exploitation of scale and scope, and may be more beneficial than harmful to economic growth. On the other hand, they suggest a drawback when bank restrictions are

[12]See Beck *et al*. (2011) and La Porta *et al*. (1998) for further discussion on the positive effect of bank concentration on financial constraints in developing countries.

strong by taking note of the 'hold-up' problem[13] that may arise as a result of reduced competition. Empirical results suggest that tighter restrictions on bank non-traditional activities and the control of non-financial firms dampen the negative effect of bank concentration on economic growth. On the impact of bank regulation and restriction on growth and development after bank concentration has been controlled for, they find, on the one hand, that excessive regulation and restriction on bank activities has a negative effect of bank development. On the other hand, they find that excessive regulation and restriction on bank activities reduces the negative effect of bank concentration on growth.

Bank Supervision

The literature on bank supervision emphasizes the importance of official supervision and private monitoring of banks on bank development and growth. While the new Basel Accord presumes that strict official supervision and private monitoring brings about more bank stability, the empirical aspect of the literature has found a somewhat different conclusion. For example, Barth *et al*. (2004) examine the relationship between official supervision (and private monitoring) on bank development and the cost of financial intermediation using a sample of 107 countries, and they find no convincing evidence that official supervision has a significant effect on bank development, the cost of financial intermediation and non-performing loans. However, on the other hand, their results show that private monitoring is strongly and positively linked with bank development and negatively associated with the cost of financial intermediation and non-performing loans.

Similarly, Barth *et al.* (2006) examine data on bank regulation and supervision in over 150 countries. Based on the data, they suggest that countries with political, legal and regulatory systems that encourage market-based or private monitoring of banks are likely to be more efficient with regards to social and developmental results than countries with systems that emphasize on official supervision. Beck *et al*. (2006) expatiate on this prediction by examining the effect of different bank supervisory policies on firms financing constraints in 37 countries. In line with Barth *et al*. (2004) and Barth *et al.* (2006), they find that the conventional mechanism through which banks are supervised – authorizing official supervisory agencies to monitor, restraint and influence banking decisions unswervingly – does not make banks more efficient in lending. Rather, they find that supervision policies that promote the private sector to monitor banks through enforcing accounting and information

[13] See Boot and Thakor (2000) for a discussion of this model.

disclosure is more likely to make banks more efficient in their lending processes, and that this is more likely to happen in countries with good quality institutions.[14]

According to Fernandez *et al*. (2010), the positive benefits of private monitoring on bank development might be detrimental for bank concentration in terms of its ability to resolve agency and adverse selection problems between banks and firms through developing lending relationships. On the other hand, they believe that if strict official supervision was the case rather than private monitoring, then bank concentration would be more beneficial in terms of its ability to resolve agency and adverse selection problems through developing lending relationships. In other words, bank concentration may be more beneficial to growth in the presence of official supervision. However, their results suggest that official supervision has no significant effect on how bank concentration affects economic growth but private monitoring seems to increase the negative effect of bank concentration on economic growth.

So far, we see that official supervision of banks has no significant effect bank development and growth, while private monitoring seems to be more effective. However, two strands exist in the literature on the effect of private monitoring of banks. On the one hand, private monitoring may promote financial development and growth. On the other hand, private monitoring may negatively affect financial development and growth.

The research question identified as a result of the following survey is as follows: how do the quality of institutions, regulatory restrictions and supervision in the banking sector influence the way bank concentration affects industrialization.

2.2.2.2. Foreign Bank Ownership and Institutions.

The idea in mainstream economics is that foreign bank entry has the capacity to promote financial development and spur economic growth in developing countries. A summary of how foreign bank entry may improve financial development and quicken the pace of economic growth includes its ability to easily gain access to international capital markets; improve bank regulation and supervision; introduce new instruments and techniques; increase competition and improve the efficiency of the domestic banking system, be relatively less involved in connected lending, improve financial stability, particularly in turbulent times, by being perceived as safer than private domestic banks.

[14] Similarly, Caprio *et al*. (2007) finds that official supervision has no significant effect on bank valuation.

Beck *et al*. (2004) empirically support this view by using a unique dataset of 74 developed and developing countries to examine the impact of bank competition on firms' access to credit. While they find that bank concentration increases financing constraints (particularly in small and medium firms), they also find that this relationship is influenced by the regulatory and institutional characteristics of a country, as well as the ownership structure of the banking system. By contrast, Detragiache *et al*. (2008), explore how the entry of foreign banks affects financial sector development in 60 low-income countries using a theoretical model and testing its predictions empirically. They find that while lending, financial intermediation and welfare may improve with the entry of foreign banks, this does not justify their presence. They suggest that under some circumstances, foreign banks might be involved in 'cream-skimming', which increases the cost of financial intermediations and reduces welfare. Also, the model strongly suggests that foreign banks are only likely to lend to more transparent firms, while other firms remain the same or are worse off. They suggest that the 'cream-skimming' model predicts that a stronger presence of foreign banks would only worsen the banking sector and that foreign banks would only lend to firms they consider 'safe'.

According to the model, four propositions are possible in the credit market: pooling equilibrium- all projects are funded and no monitoring costs are paid; separating equilibrium-banks monitor both hard and soft information and lend to borrowers with hard or soft information. They do not lend to hard borrowers; semi-pooling equilibrium-banks monitor hard information only. Borrowers with hard information borrow at a lower cost that borrowers with soft information and bad borrowers; and credit-constrained equilibrium-banks monitor hard information and only lend to borrowers with hard information. Soft information and bad borrowers do not receive any credit. In this model, it also assumed that foreign banks have a lower cost of monitoring hard information but a higher cost of monitoring soft information than domestic banks. The allocation of lending based on the following propositions is as follows: under pooling equilibrium, all projects are funded and no monitoring costs are paid. Therefore, the better lending technologies of foreign banks are irrelevant; on the other hand, the other equilibrium outcomes suggest that foreign banks lend only to borrowers with hard information while domestic banks lend to soft and bad borrowers.

The model was simulated under different scenarios to provide a better understanding of the effects of foreign banks. Simulations were done under six scenarios and predictions were made on the effect of foreign banks in relation to domestic banks: in the first scenario, all

borrowers are funded but hard borrowers are funded by foreign banks and this does not affect the volume of credit when compared to an equilibrium without foreign banks although there is a slight drop in total and net output; in the second scenario, it is assumed that the cost of monitoring soft information is lower. Therefore, in the presence of foreign banks, both hard and soft information borrowers are funded, while bad borrowers do not receive any credit and reduces the volume of credit as well as total and net output; in the third scenario, it is assumed that the returns form project are lower. Therefore, the presence of foreign banks only result in hard information borrowers being funded because projects returns are not adequate to cover the cost of monitoring soft information borrowers. In this case, there are significant falls in the volume of credit, total and net output; in the fourth and fifth scenarios, it is assumed that foreign bank entry brings about limited efficiency in monitoring and fewer bad and more soft information borrowers resulting in no change to change when only domestic banks are present and increase in slight increase in total and net output but no change in the volume of credit; finally, in the last scenario, it is assumed that projects by bad borrowers has an even greater risk of failure. In this scenario, bad borrowers are unlikely to receive funding resulting in a slight fall in the volume of credit, total and net output. In general, the model simulations show the likelihood that foreign bank entry could reduce total credit, total and net output.

This brings our attention briefly to the debate in the literature which suggests that foreign banks are unlikely to lend to small and medium firms. One view in this debate is that foreign banks would ‘cream-skim’ or ‘cherry-pick’ customers; these would most probably be well-known, large firms. Certainly, a number of studies find that foreign banks in low-income countries lend predominantly to multinational corporations, large domestic firms, or the government rather than small and medium firms (Brownbridge and Harvey, 1998; Satta, 2004; Clarke *et al.* 2005; Stein, 2010).

It has also been argued, however, that even in the above case, the entry of foreign banks would bring about indirect advantages: domestic banks in order to survive competition would be forced to find and specialise in other niches, such as lending to small and medium firms. Their access to credit would thus increase, rather than decrease as a result of foreign bank entry (World Bank, 2002). This argument, however, stands only to the extent that domestic banks are not driven out of the market, in this case, informationally-opaque firms may become more credit constrained. Another view suggests that foreign banks might lend more to small and medium enterprises than large domestic banks (Clarke *et al.*, 2005). In other words, bank ownership is not so relevant while the difference between large and small banks

is much more important. For example, in Levine (2003), he examines the impact of regulatory restrictions to foreign bank entry on bank interest rate margins across 47 countries. His results suggest that, after controlling for restrictions on domestic bank entry and foreign bank ownership of the domestic banking industry, restriction of foreign bank entry tends to boost bank interest margins. In other words, the cost of financial intermediation is determined by regulatory restrictions to entry, rather than by the national identity of bank owners.

In general, foreign banks have a considerable number of advantages, the most significant of which is likely to be their ability to access international liquidity through their parent banks. This reduces the cost of financial intermediation, increases bank efficiency and improves bank stability in developing countries. On the other hand, foreign banks might not be as 'development-enhancing' as they are assumed to be. They have a disadvantage with regards to lending because they have less knowledge of the host economy, and of local firms and customs. This puts them at a disadvantage relative to domestic banks. Also, the long geographic and communication distance makes it difficult for the managers in the parent bank to give much operation discretion to the local foreign banks. One way out of this is for foreign banks to rely on 'hard information' because they have no access to 'soft information'. This, however, makes them less useful to the economy since one of their key functions is to exploit 'soft information' (Mian, 2003). In other words, even when foreign banks enter by acquiring domestic banks, the knowledge of local markets and conditions may be lost as distant manager may need to impose formal and standardized procedures to monitor local loan officers. This is likely to disrupt existing relationships between the domestic bank and local firms.

Claessens *et al*. (2001) maintains the positive effect of foreign bank entry to the domestic banking market while using bank level data for 80 countries between 1988 and 1995. Two key findings are that, for most countries, a stronger presence of foreign banks is associated with increased competition through a reduction in the profitability and interest margins of domestically owned banks; and they also stress the downside of increased foreign bank presence by claiming that the lessening of restrictions on foreign bank entry can be risky for domestic banks. By this, they mean that increased competition and consequently lower profits of domestic banks as a result of foreign bank entry may reduce the valuation of domestic banks making them more susceptible. This may have a devastating effect on the financial system if the regulatory and supervisory framework is weak. In other words, the positive effect of foreign banks on the domestic financial system is reduced in the presents of poor regulatory and supervisory policies.

Foreign banks are seen to increase bank competition in host countries (Claessens *et al*. 2001) but this view remains a controversial one. The method of entry is what matters. Some banks enter through new, Greenfield investment, while others acquire ownership of domestic banks by entering through mergers and acquisitions. In particular, when foreign bank entry is through mergers and acquisition, foreign banks contribute to the degree of bank concentration.[15] Also, foreign bank entry could also increase bank concentration through the merging of domestic banks as a response to foreign competition. Martinez-Peria and Mody (2004) note that the potential benefit from foreign bank entry in terms of lower cost of operation throughout the banking system – which then translate into low financial intermediation costs – is offset where concentration levels increase according to data from four Latin American countries in the 1990s. In other words, while foreign bank entry is likely to increase bank competition in the domestic banking market, it is also possible that it could increase bank concentration.

As noted in Detragiache *et al*. (2008), a high presence of foreign banks in poor countries relatively result in shallower banking sectors and foreign banks have a tendency to 'cherry-pick' and provide services to mainly large firms and have correspondingly less risky portfolios than domestic banks.[16] Foreign bank entry has also been linked with a sharp increase in lending to households for consumption and mortgages across a range of middle-class income economies (IMF, 2006). This IMF report shows that financial institutions in many regions have been enjoying profitable business environments where most of their profits are as a result of the sharp increase in credit growth, particularly consumer credit. In some cases, consumer credit has exceeded corporate credit. However, the continuous increase in consumer credit has raised concerns with regards to a possible deterioration in loan quality in the future. Particularly, in some countries, rising consumer lending had led to high household indebtedness. High level of household debt is associated with high interest rate by banks, as well as a high interest rate risk exposure of banks that hold government bonds.[17] In other words, while foreign bank entry may increase lending in the domestic banking market,

[15] It has been argued that the entry of foreign banks through the acquisition of domestic banks is more likely to occur when foreign bank entry is encouraged by domestic authorities as a means of reducing the cost recapitalization of the domestic banking system in the wake of a financial crisis (Beck *et al*. 2006)

[16] However, it a comment to Detragiache, Tressel and Gupta (2008), Claessens (2006) argues that foreign banks may make domestic banks more prudent, leading to less lending in the short-run; and more transparent lending leading to higher loan-loss provisioning and reserves, but not because domestic banks do riskier lending.

[17] Some recent papers which study the growth of consumer credit compared to industrial and commercial credit and its possible detrimental effect to growth include Mohanty *et al*. (2004); Lapavitsas and Dos Santos (2008); and Dos Santos (2012).

it also has the capacity to increase the cost of financial intermediation and reduce the quality of loans, which are detrimental for economic growth.

In a study on Mexico, Haber and Musacchio (2005) also find that foreign bank entry has been associated with a decline in lending to house and business enterprises after they offer a detailed study on the impact of foreign banks in Mexico. One of the major findings in their study is that enforcing contracts in developing countries is more expensive when compared to developed countries. They find that in a country where it is difficult to assess risk before lending and enforce contracts after lending, foreign banks become more risk-averse. In Mexico, for example, foreign banks prefer to lend to government and hold their securities rather than lend to firms and households. They also find that it is easier to legally enforce consumer loans than commercial loans. Their data shows that commercial and housing loans fell drastically while consumer loans more than doubled during this period. This led to intensive screening exercises to identify 'safe borrowers' and offering lower interest rates. In other words, productive private sector lending fell as a result of foreign bank presence but this adverse effect was as a result of weak institutions.

As a result of the studies examined above, we try to answer the following research question: how do the quality of institutions, the regulatory restrictions and supervision in the banking sector influence how foreign bank entry affects industrialisation?

2.2.2.3. Government Bank Ownership and Institutions.

La Porta *et al.* (2002) investigate what they refer to as a neglected aspect of the financial systems around the world. In particular, they use data on government ownership of banks from over 90 countries to examine its effect on the promotion of consequent financial development and economic growth – through factor accumulation, savings and the growth of productivity. They find that government ownership of banks is associated with slower subsequent financial development and lower subsequent economic growth – mainly through lower productivity growth. They link this detrimental effect to the inability of state owned banks to efficiently allocate capital to its best use, resulting in lower productivity, without increasing capital accumulation. Also, since they found that government ownership of banks is larger in low income countries faced with underdeveloped financial systems, interventionists and inefficient governments, and poor protection of property rights, it is

assumed that the negative effect of state owned banks on productivity, growth and financial development is exacerbated by these conditions.[18]

The adverse consequences of the presence of state banks in the banking system are attributed to the fact that governments may use state banks to bolster their political support and, therefore, the allocation of credit would respond to opportunistic criteria rather than efficiency. There would tend to be less demand for quality information and accounting transparency and, moreover, official supervision and monitoring would be weak (as a result of inevitable conflict of interest which arises when one part of government is charged with monitoring another). In line with La Porta *et al*. (2002), World Bank (2001) argues the failure of government banks in many developing countries is attributed to incentives imposed on it by the political process, and suggests that the success of government banks in a few cases may be associated with a stronger institutional environment and dispersed political power. In other words, where government banks are subject to adequate check and balances and institutional development is more advanced, state ownership of banks may give rise to more positive results, since both official supervision and market monitoring of state banks would be better.

Studies on the relative performance of state and private banks provide evidence consistent with this view. For example, Micco *et al*. (2007) show that state banks underperform private banks in developing countries but not in developed ones. They find that state-owned banks in developing countries are less profitable than their private counterparts, and that these results are not statistically significant in developed countries. Also, Shen and Lin (2012) observe that the performance gap of state banks worsens in high corruption countries. They use a political interference hypothesis – which they define as the situation in which the executives of government banks are replaced within 12 months after major elections – to explain why government banks perform worse compared to private banks. First of all, they suggest that once government gets involved in political interference, government banks become operationally less efficient. Second, they find that the negative effect of political interference on government banks is more pronounced in developing countries than in developed countries. Finally, they show that the negative effect of government deteriorates when there is minimal or no political interference.

However, Rodrik (2012) warns against simplistic interpretations of negatively signed coefficients of state banks in growth regressions. He uses La Porta *et al*. (2002) as an

[18] Similarly, Barth *et al*. 2001 and Cetorelli and Gambera, 2001 establish the negative effect on state owned banks on financial development and credit availability respectively.

example to illustrate his point. La Porta *et al*. (2002) differentiate between two perspectives on the role of government banks. They identify the 'developmental' view which associates state ownership of banks with reducing market imperfection in the financial system, resource mobilization and economic development. They also identify the 'political' view which associates state owned banks with financing interest groups for political support by politicians. They test both perspectives by regressing GDP per capita and productivity growth on a measure of state owned banks as well as other standard regressors. The results suggest a robust negative relationship between state-owned banks and economic development and productivity growth.

Rodrik (2012) does not agree with the interpretation of these results. He argues that the country differences in government ownership of banks are not likely to be random as the theories that are being tested suggest. He shows that even if the existence of state banks were explained by a 'developmental' view – e.g., the need to correct market failures – rather than by the 'political' view, the estimated relationship between economic growth and state ownership of banks could turn out to be negative and, therefore, the estimated coefficient could not be used to justify the privatization of state banks. Many different types of market failures could be mitigated through state ownership of banks. For example, in a weak institutional environment characterised by deficiency in information and weak contract enforcement, private banks may be unable to allocate capital to highly productive investment. As another example, state banks could release firms' credit constraint in highly concentrated banking systems with private ownership.

Finally, Andrianova *et al*. (2008) find that the presence of state banks can certainly be seen as a response to institutional deficiency. At extremely low levels of institutional quality, government could use state banks to revive financial and economic development. An improvement in institutional quality is likely to increase depositors' confidence in private banks. They predict that the privatization of state banks is unnecessary and could be detrimental. Based on their model, state banks will disappear when they are no longer required: If they no longer enjoy government support, they will unable to compete with private banks in the presence of good institutions because they are less inefficient. Andrianova *et al.* (2012) stresses state-owned banks to be more beneficial in countries with weak regulation. Even if regulation is strict, they suggest that state banks are still beneficial for economic growth. However, as regulations reach one standard deviation above the mean, the impact of state-owned banks become insignificant. In other words, there are

circumstances where state banks might be beneficial for economic growth – when depositors prefer state banks to private banks, particularly at low institutional levels.

As a result of the studies reviewed, we explore how good institutions and supervision in the banking sector influences the effect of state owned banks on industrialization

2.2.3. Methodological Approach

The objective of this chapter is borne out of the several strands of literature discussed above. The objective is to test the assumptions that better institutional quality, fewer restrictions on non-traditional bank activities, less powerful official supervision and more private monitoring would improve the outcome of financial liberalization policies in developing countries. The results might be able to provide policy implications with regards to financial reforms in developing countries.

The methodology employed in this chapter uses two techniques to examine these assumptions. First of all, a methodology employed by Loayza and Ranciere (2006) is used. They use an econometric technique, Pooled Mean Group (PMG) estimator (Pesaran *et al*., 1999). They use the ability of this estimator to provide short and long-run results in explaining the contradictory effects of financial intermediation on economic activity. They estimate cross-country short-run effects of financial intermediation on economic growth and examine the association of the estimated short-run coefficients with country-specific measures of financial fragility (banking crises and volatility). The empirical methodology will be explained in details in the next section.

The second technique I employ, the fixed effects estimator (FE), which is particularly suited to panel data, allows for heterogeneity across panels and time but confines the heterogeneity to the intercept terms of the relationship. The intuition behind both techniques is as follows: first of all, it is evident in the literature that bank concentration, foreign bank entry and state ownership of bank may have contrasting effects on industrialization. The PMG estimator highlights these contrasting effects and we attempt to provide an empirical explanation for these effects. Also, we examine the possibility that the short-run effect of bank market structure on industrialization can be linked to the institutional environment and the regulatory and supervisory conditions in the banking sector. The short-run relationship is measured by the short-run effect of bank market structure on industrialization. We measure the quality of institutional environment by using various institutional variables; the regulatory conditions by regulatory restrictions to entry and participation in non-commercial activities; and the

supervisory conditions by official bank supervision and private motoring. The baseline regressions of both techniques are regressed without including the institutional and bank regulatory variables; secondly, the FE estimator takes advantage of the characteristics of panel data. We create interaction terms between bank market structure variables and institutional variables that have time variation, and introduce them into the specification one at a time. Using interaction terms is important to reduce the omitted bias is present in cross-country regressions.[19]

2.3. EMPIRICAL FRAMEWORK

2.3.1. Model Specification

2.3.1.1. PMG Estimation

The empirical model infers that industrialization (growth in manufacturing value added) is a function of bank market structure and other variables. The second stage examines the relationship between the short-run effects and cross-sectional institutional variables. To examine the long-run effect of bank market structure on industrialization, it is common to we estimate the following specification.[20]

$$MVAGR_{it} = \alpha + \beta_1 BCON_{it} + \beta_2 FBANK_{it} + \beta_3 GBANK_{it} + \beta_4 CV_{it} + \varepsilon_{it}, \qquad (2.1)$$

Where $MGAGR_{i,t}$ is the growth of manufacturing value added in period *t* for country *i*, $BCON_{i,t}$ is the level of bank concentration, $FBANK_{i,t}$ is the level of foreign bank entry, $GBANK_{i,t}$ is the level of state ownership of banks, $CV_{i,t}$ is a set of conditioning variables, and $\varepsilon_{i,t}$ is the error term. The three bank market structure variables are treated within the same framework, resulting in fewer problems with omitted variable bias. Normally, financial characteristics are treated in isolation with little or no analysis of them within the same framework. For example, the impact of a highly concentrated banking sector on the real economy may be influenced by the level of foreign bank entry and state ownership of banks.

[19] Rajan and Zingales (1998) argue that that their paper has an advantage over others because the introduction of interaction terms improves how country and industry characteristics are corrected as well as reduce omitted variable bias or model specification. Since the publication of Rajan and Zingles (1998), the estimation of models with interaction terms has become more popular in applied economics.

[20] It is uncommon to find papers where bank concentration, foreign bank entry and state ownership of banks have been entered into a specification simultaneously.

This chapter models the bank market structure-industrialization relationship as fundamentally dynamic; clearly differentiating between the short and long-run effects. Differentiating in this manner may be important for the sustainability of reforms (i.e. if the short-run effects are negative, reforms may not be sustainable even if they would be beneficial in the long-run). Another possible reason is to identify whether institutional reforms should be preconditions for other reforms (for example, if the short-run effect is negative when institutions are weak, there may be an argument in favour of prior institutional reforms).

It is possible to test this relationship using an econometric technique that ought to reveal appropriate long-run parameters in addition to the relationship between bank market structure and industrialization in the short-run. This can be achieved with the specification of an autoregressive distributed lag (ARDL) model for each country, pooling them together in a panel, and then testing the cross-equation restriction of a common long-run relationship and between bank market structure and industrialization using the Pooled Mean Group estimator developed by Pesaran *et al*. (1999). So, rather than averaging the data for each country to separate trend effects, both long and short-run effects are estimated using a panel of merging time-series and cross-sectional effects.[21] Averaging data removes information that may be important to estimate model that allows for country heterogeneity, as well as concealing the dynamic relationship that might exist between bank market structure and industrialization, mainly, if bank market structure has contrasting effects on industrialization at different period occurrences.

The most important advantage panel data analysis has when used on growth equations is that country-specific effects can be controlled for, for example, when using General Methods of Moments (GMM) estimators (Caselli *et al*. 1996). However, the advantage of the PMG estimator over the GMM or DFE (Dynamic Fixed Effect) estimators is that the GMM and DFE estimators generally restricts the slope coefficients to be homogeneous, while only the intercepts are heterogeneous across countries. On the other hand, PMG estimators allow short- run adjustments and convergence speeds to differ across countries, and restrict long-run coefficients to be homogeneous (Pesaran *et al*. 1999).

[21] Recent studies that have applied the PMG estimator include Bassanini and Scarpetta (2002); Byrne and Davis (2005); Catao and Solomou (2005); Catao and Torrones (2005); Loayza and Ranciere (2006), Frank (2009); Lin (2009); and Kim *et al*. (2010).

Consequently, the long-run growth equation on the effect of bank market structure on industrialization is inserted into an ARDL (p, q)[22] model to allow for rich dynamics in the way that industrialization adjusts to bank market structure and conditioning variables. The ARDL model is written as:

$$\Delta(MVAGR_i)_t = \sum_{j=1}^{p-1} \gamma_j^i \Delta(MVAGR_i)_{t-j} + \sum_{j=0}^{q-1} \delta_j^i \Delta(CV_i)_{t-j} + \varphi^i[(MVAGR_i)_{t-1} - \{\beta_0^i + \beta_1^i (CV_i)_{t-1}\}] + \varepsilon_{it}, \quad (2.2)$$

where, *MVAGR* is growth in manufacturing value added, *CV* signifies the determinants of manufacturing value added (bank market structure variables as well as the conditioning variables), γ and δ are short run coefficients related to manufacturing value added growth and its conditioning variables, β are the long run coefficients, φ is the speed of adjustment to the long-run relationship, j is the number of time lags, and ε is the error term. Also, $\sum_{j=1}^{p-1} \gamma_j^i \Delta(MVAGR_i)_{t-j}$ and $\sum_{j=0}^{q-1} \delta_j^i \Delta(CV_i)_{t-j}$ are the short-run relationships between manufacturing value added and its past values as well as the conditioning variables. The term in the square bracket defines the long-run or equilibrium relationship between $MVAGR_{it}$ and CV_{it}. It can be re-written as:

$$(MVAGR_i)_t = \beta_0^i + \beta_1^i (CV_i)_t + \varepsilon_{it}, \text{ where } \varepsilon_{it} \sim I(0) \quad (2.3)$$

The consistency and efficiency of coefficients obtained from the PMG estimators depends on some specification conditions. First of all, residuals from the regressions are not to be serially correlated, as well as treating the conditioning variables exogenously. We attend to this by including lags to the variables in the ARDL model (Pesaran and Shin, 1999). In this study, we include one lag to the dependent variable. Secondly, country-specific effects as well as cross-country common factors have to be accounted for. In line with Loayza and Ranciere (2006), we allow for country-specific intercepts and demean the data in trying to remove cross-country common factors. Thirdly, for a long-run relationship to exist, we would require the error-correction term to be negative but not less than -2.[23] In this study, the error-correction term for the PMG estimator falls within the dynamically stable range. Finally, the long-run parameters have to be same across countries and the suitability of the PMG

[22] Where p represents zero lags of the conditioning variables and q represents one lag of the growth in manufacturing value added.

[23] For a long-run relationship to exist (dynamic stability), the coefficient of the error-correction term should be negative but not less than -2 (i.e. within the unit circle).

estimator can be tested by a standard Huasman-type test (i.e. we test the null hypothesis of homogeneity based on the comparison between the PMG and the MG estimators).[24]

It is imperative that before proceeding with cointegration techniques, we confirm that the variables are integrated with the same order. We first apply both first generation and second generation unit root tests (by Im *et al*. 2003 and Pesaran, 2003 respectively). These tests are less restrictive, more powerful than tests developed by Levin and Lin (1993), Levin *et al*. (2002) and Breitung (2000), and allows for heterogeneity in the autoregressive coefficient. Both tests are explained in the appendix. Once we have confirmed that the variables are stationary, we apply Westland's cointegration test methodology (Westerlund, 2007). Westerlund (2007) developed four new panel cointegration tests that rely on structural dynamics rather than residuals, and so do not have common-factor restrictions. The tests are normally distributed and generally encompass unit-specific short-run dynamics, unit-specific trend and slope parameters, as well as cross-sectional dependence. Of the four tests, two are formulated to test the alternative hypothesis for cointegration in the whole panel, while the other two tests are formulated to test the alternative that at least one unit is cointegrated.[25]

Appendix 2.4 reports the results of both the first generation and second generation unit root tests. For the series of all variables in the model, the null hypothesis of a unit root is rejected.[26] With this outcome, it is therefore possible to apply a test for panel cointegration between the variables in the model. Appendix 2.5 reports the outcome of the Westerlund test for cointegration in the panel. The results reject the hypothesis that the series are not cointegrated, suggesting cointegration between the series of the dependent variable and the independent variables. The model can therefore be estimated using a panel cointegrating estimator (PMG in this study) because of a cointegrating link between industrialization and bank market structure (as well as other conditioning variables).

For the second stage of this estimation technique, we examine the association between the quality of institutions, regulatory restrictions and supervision in the banking sector and the short-run effect of bank market structure on industrialization. We examine this association using the simple and rank correlation coefficients. While both correlation coefficients are

[24] See appendix 2.3 for Hausman test.
[25] See Westerlund (2007) and Persyn and Westerlund (2008) for a description of these tests.

[26]We believe that the null hypotheses of a unit root are rejected for all variables because the variables have previously been demeaned. Before demeaning the data, the growth of manufacturing value added and GDP growth were I(0) while the other conditioning variables were I(1).

used to assess the strength and direction of linear relationship between two pairs of variables, the simple correlation coefficient is more suitable when both variables are normally distributed and the rank correlation coefficient, when outliers are present in the data. We have applied both correlation coefficients to utilize their advantages. Since the PMG estimator allows us to obtain the short-run effects of bank market structure on industrialization for each country, we can try to link these effects to the institutional and regulatory environment of the countries in our sample.

2.3.1.2. FE Estimation

In this study, applying the FE model allows the unobserved country specific factors to affect industrialization. One advantage of FE models over pure time series or cross-sectional models is that these models do not provide consistent and unbiased parameter estimates when unobserved country specific factors are correlated with the dependent and independent variables. By contrast, FE models are able to deal with unobserved factors affecting the dependent variable when they are time invariant but vary across cross-sectional units, as well as when, they change both over time and across cross-sectional units. FE models are able to eliminate time invariant unobserved effects through first-differencing or demeaning of the data. Ordinary Least Square (OLS) estimation is then applied to the transformed data in order to reduce the effect of time-varying omitted variables (Wooldridge, 2006).

Consider the following model:

$$y_{it} = \beta_0 + \beta_1 x_{it1} + \beta_2 x_{it2} + ... + \beta_k x_{itk} + a_i + \varepsilon_{it} \tag{2.4}$$

The correlation between the fixed effects a_i and the explanatory variables would cause the estimated coefficients to be biased. Therefore, it is necessary to eliminate a_i from the estimation. In this case, we apply the de-meaning method. First of all, it is necessary to compute the time series sample average for each individual, which results, in the following:

$$\bar{y}_i = \beta_0 + \beta_1 \bar{x}_{i1} + \beta_2 \bar{x}_{i2} + \beta_k \bar{x}_{ik} + a_i + \bar{\varepsilon}_i \tag{2.5}$$

Since a_i is constant overtime, a_i in (2.5) does not have the over-bar. Additionally, (2.5) is subtracted from (2.4) to get the following:

$$(y_{it} - \bar{y}_i) = \beta_i (x_{it1} - \bar{x}_{i1}) + \beta_2 (x_{it2} - \bar{x}_{i2}) + ... + \beta_k (x_{itk} - \bar{x}_{ik}) + (\varepsilon_{it} - \bar{\varepsilon}_i) \tag{2.6}$$

Note that the transformation eliminates the fixed effects a_i. This transformation is known as the 'within transformation'. Note also that the transformation eliminates the constant as well. Equation (2.6) can be simplified by using a different notation:

$$\ddot{y}_{it} = \beta_1 \ddot{x}_{it1} + \beta_2 \ddot{x}_{it2} + ... \beta_k \ddot{x}_{itk} + \ddot{\varepsilon}_{it} \tag{2.7}$$

where $\ddot{y}_{it} = y_{it} - \bar{y}$, denotes the time-demeaned data on *y*. The same notation is used for the *x* variables and *ε*. Finally, estimating the demeaned equation using OLS is known as the Fixed Effects estimator. Note that the model does not have an intercept. Stata reports the average value of $\hat{a}_i$.[27] In this study, the '*robust*' option has been used when running the FE models to control heteroskedasticity. [28]Also, in this study, Hausman test results indicate the FE estimator is preferable to the Random Effect (RE) estimator

The Fixed effects model to be estimated in this study is therefore as follows:

$$MVAGR_{it} = \beta_1 BCON_{it} + \beta_2 FBANK_{it} + \beta_3 GBANK_{it} + \beta_4 CV_{it} + \varepsilon_{it} \tag{2.8}$$

To estimate how the effect of bank market structure on industrialization is influenced by different institutional, regulatory environment, we incorporate an interaction term between each of the bank market structure variables and a relevant institutional variable (e.g. $BCON_{it} \times INST_{it}$, where $INST_{it}$ is an institutional variable). Note that the bank market variable, the institutional variable and their interaction term are incorporated simultaneously into the model. The interaction term is what interest us the most as we will be comparing it to the relationship between the short-run coefficients of bank market structure variables and institutional, regulatory and supervisory variables. The interaction terms captures the effect of bank market structure on industrialization in the presence of intuitions. We are mostly interested in the interaction term because it helps us to analyze how the influence of bank market structure on industrialization varies across countries depending on institutions. We compare the interaction terms with the correlation coefficients between the short-run coefficients and institutions by considering their signs and significance. The large number of country variables, and the necessity to use an interaction term with the bank market structure variables all support the incorporation of the interaction terms separately or one at a time rather than at the same time. Barth *et al*. (2004) and Fernandez *et al*. (2010) have applied a

[27] where $\hat{a}_i = y_i - \hat{\beta}_1 \bar{x}_{i1} - ... - \hat{\beta}_k x_{ik}$

[28] This applies when using Stata.

similar sequential technique. For example, when considering bank concentration, the model will take the following form:

$$MVAGR_{it} = \beta_1 BCON_{it} + \beta_2 (BCON_{it} \times INST_{it}) + \beta_3 FBANK_{it} + \beta_4 GBANK_{it} + \beta_5 CV_{it} + \varepsilon_{it} \quad (2.9)$$

where $BCON_{it} \times INST_{it}$ is the interaction term and $INST_{it}$ is amongst the conditioning variables CV_{it}.

As has been stated above, one of the key advantages of fixed effects estimation is its ability to control for all stable characteristics of individuals in the study, thus, to a large extent, removing possible sources of bias. On the other hand, a popular limitation with FE models is the fact that they are unable to estimate time-invariant variables (Baltagi, 2001; Wooldridge, 2002; and Hsiao, 2003) because they use only the within variance for the estimation and neglect the between variance. Another drawback to the FE models is the fact that they may provide inefficient estimates when estimating the effect of variables with very little within variance.

2.3.2. Variable Descriptions

The sample has been restricted to 31 countries over a period of 1995-2007 due to the availability of bank data. First of all, data on foreign bank ownership is mainly available from 1995 and restricts the period sample to 1995-2007. Secondly, while data on foreign bank ownership is available for more than 31 developing countries, data on government ownership of banks for many countries is available for only 2001, 2003 and 2008. This restricted us to rely on previous studies and *Bankscope* to collect data on government ownership of banks. Due to time constraints and access to the *Bankscope* database, data collection for state owned banks from *Bankscope* and other relevant sources was restricted to 31 countries for the time period under consideration. In this section, we describe how the variables are measured. However, in the Appendix 2.6, we give some useful information on why we chose some of the variables.

1. Manufacturing Value Added Growth

The annual growth in manufacturing value added *MVAGR* is a basic indicator to measure a country's country level of industrialization (Source: World Bank *WDI*). The growth in manufacturing value added is measured as the change in log of real value added of the manufacturing sector on a yearly basis between 1995 and 2007.

2. Bank Concentration

Bank Concentration is formally known as the '*k-firm*' Concentration Ratio and is defined as the sum of the market shares of the *K* largest firms in the market (Scherer, 1980; Clarke, 1985; Carlton and Pearloff, 1994). In other words, a one-industry firm will have a concentration ratio of 100% since all the value added in an industry is by a single firm. An industry with *'n'* firms has a total value-added of $x_i (i = 1....n)$ in a descending order. Industry value added is defined as , and therefore the market share of the *i*th firm is $S_i = \frac{x_i}{x}$. The ratio is hence defined as:

$$BCON = \sum_{i=1}^{K} \frac{x_i}{x} = \sum_{i=1}^{K} S_i \quad , \qquad (2.10)$$

Where *BCON* is the bank concentration ratio, *K* is the weight attached to the bank share of a particular bank, and $\frac{x_i}{x} = S_i$, where $\frac{x_i}{x}$ is the share of bank *i* assets to total banking industry assets. In this ratio, equivalent importance is given to the *x* largest banks but it overlooks the remaining banks in the banking industry. In this study, the 3-bank concentration ratio is used to represent bank concentration ratio (i.e. '*k*' = 3) (Source: Beck *et al*. 2013).

3. Foreign Ownership of Banks

Foreign bank ownership *FBANK* is mainly measured as the share of banking assets owned by foreigners to the total assets of a banking market (Sources: Claessens *et al*. 2008); Cull and Martinez Peria, 2011; and Cleessens and van Horne, 2012-but we checked to ensure that there was consistency between the different sources).

4. Government Ownership of Banks

Similarly, state ownership of banks *GBANK* is mainly measured as the share of banking assets owned or controlled by the state to total banking assets. In this study, we have made use of data from Barth *et al*. (2001, 2003, and 2008), *Bankscope*, and other sources which include previous studies and relevant websites. Data from *Bankscope* was calculated in a manner similar to Cornett *et al*. (2009).[29]

[29] First of all, we calculate the proportion of government ownership bank in each bank by first multiplying the share of each shareholder in a bank by the share the government owns in that shareholder, and then add the resulting products over the shareholders of the bank.

5. Bank Development

Bank development *BNKDEV* is measured as private credit by deposit money banks to GDP (Source: Beck *et al*. 2009).

6. GDP Growth

GDP growth *GDPGR* is measured as the growth in real GDP (Source: World Bank *WDI*). Theoretically, economic growth is identified as one of the determinants of industrialization. However, the endogeneity of economic growth makes it possible that industrialization affects economic growth. We try to mitigate the problem of endogeneity by ensuring that GDP growth is lagged.

7. Trade

International trade or trade openness *TRADE* is measured by the ratio of the sum of export and import to GDP. Data is in constant 2000 US$ (Source: World Bank *WDI*).

8. Exports and Imports

Exports *EXPGDP* and imports *IMPGDP* have been measured as a ratio of total exports to GDP. Data are in constant 2000 US$ (Source: World Bank *WDI*).

9. Human Capital

Human capital *HUMCAP* is measured as a ratio of health expenditure (private plus public) to GDP. Data are in constant 2000 US$ (Source: World Bank *WDI*).

10. Institutional and Regulatory Variables

- *Entry into Banking Requirement Index (BNKENTRY):* This index measures the conditions that are required for entry. It identifies weather different types of legal documents are required to obtain a banking license (Barth *et al*., 2004). Data is gotten from the World Bank 'Bank Regulation and Supervision' database compiled by Barth *et al*. This index requires 8 'yes' or 'no' questions to be answered where 'yes' is equal to 1 and 'no, is equal to 0. The answers are summed up and the index is generated. Higher values indicate greater entry restriction.

  For bank concentration, a significant positive correlation with *BNKENTRY* would indicate that increasing bank entry restrictions would improve the effect of bank concentration on industrialization, while a negative significant sign would indicate that reducing bank entry restrictions would negatively influence the effect of bank concentration on industrialization (Fernandez *et al*, 2010). On the other hand, Barth

et al. (2004) and Demirguc-Kunt *et al*. (2004) argue that increasing bank entry restrictions would only make the banking system less efficient.

With regards to foreign bank entry, strict entry restrictions are associated with bank fragility (Barth *et al*. 2004). In other words, strict bank entry restrictions should worsen the effect of foreign banks on industrialization in developing countries. However Claessens *et al*. (2001) suggest that relaxing barriers to foreign bank entry can have a negative effect on the domestic economy, in particular, by increasing competition and reducing profitability of domestic banks; foreign bank entry may reduce the charter values of domestic banks, thereby making them more at risk. This may be detrimental for the banking system particularly when domestic regulation and supervision is weak. In other words, competition between domestic and foreign banks is deleterious for industrialization in developing countries.

Barth *et al*. (2004) suggests that bank regulations and supervisory practices are closely associated with the degree of government ownership of banks, suggesting that state ownership of banks is positively associated with tighter restrictions on bank entry. However, the expected conclusion of this relationship might depend on the impact of state ownership of banks on economic growth. For example, in La Porta *et al*. (2002), state ownership of banks is responsible for lower economic growth. In this case, we would expect state ownership of banks to be positively associated with strict bank entry restrictions. On the other hand, Andrianova *et al*. (2012) suggest that government ownership of banks has been associated with faster long-run growth. In this case, we would expect state ownership of banks to be negatively related to strict bank entry restrictions.

The first case is likely to be valid when a country is just coming out of a banking crisis[30]. After a banking crisis, the country is more open to both domestic and foreign banks to help recapitalize the domestic banking system after stability has been restored, thereby suggesting a negative relationship between government ownership of banks and strict entry restrictions.[31] Based on these assumptions, it is possible that

[30] This in no way restricts the positive effect on industrialization after banking crises; state banks can have positive effects regardless of previous banking crises. For example, Korea's industrialization has unarguably been supported by state funding.

[31] A positive relationship between government ownership of banks and strict bank entry restrictions is also possible when government ownership of banks has a positive effect on economic growth. This argument has been explained in Stiglitz *et al*. (1993) under the sub-topic, 'Competition from Foreign Banks'.

the effect of bank entry restrictions on how state banks affect industrialization may depend on the aggregate impact of state banks on the domestic economy.

- *Regulatory Restrictions on Activities and Ownership (RESTRICT):* This index measures the extent to which banks are allowed to participate in fee-based rather than the more traditional interest-based activities, as well as the ability of banks to own and control non-financial firms (Barth *et al*., 2004). The fee-based activities include securities activities, insurance activities, and real estate activities. Four questions are asked in relations to the fee-based and ownership activities where the following options are available: Unrestricted, Permitted, Restricted and Prohibited and they represent 1, 2, 3 and 4 respectively. The respective answers are summed up to get the index, with higher value indicating more restriction. Data is gotten from the World Bank 'Bank Regulation and Supervision' database compiled by Barth *et al*. (2004). Similar to bank entry restrictions, the intuition is the same for bank restrictions on activities and ownership if we get significant positive or negative signs for bank concentration.
- *Regulatory Restrictions on Ownership (RESTOWN):* This index measures restrictions on the ability of banks to own and control non-financial firms (Barth, *et al*., 2004). Four questions are asked in relations to the fee-based and ownership activities with where the following options are available: Unrestricted, Permitted, Restricted and Prohibited, where they represent 1, 2, 3 and 4 respectively. The higher the values, the more the restrictions over banks owning non-financial firms. Data is gotten from the World Bank 'Bank Regulation and Supervision' database compiled by Barth *et al*. (2004). Similar to bank entry restrictions and restrictions on activities and ownership, the intuition is the same for bank restrictions on ownership, if we get significant positive or negative signs for bank concentration.
- *Economic Freedom Index (ECONFREE):* The index *ECONFREE* is an index that comprehensively measure economic freedom and is also available for an extensive number of countries. The index examines economic freedom from 10 perspectives. Economic freedom has external features – such as investment and trade liberalization – as well as internal features – such as the ability of entities to use labour and finance freely without any government restrictions. This index is an average of 10 individual freedoms –business freedom, trade freedom, fiscal freedom, government spending, monetary freedom, investment freedom, financial freedom, property rights, labour freedom and freedom from corruption - that individually has

a scale of 0 to 100, higher values indication higher freedom (Miller and Kim, 2011). Data has been made available by Heritage Foundation.

- *Private Monitoring Index*: This index *MONITOR*, measures private sector monitoring of the banking system. It is measured using four indicators - certified audit required, percent of 10 biggest banks rated by international credit agencies, no explicit deposit insurance scheme, and banking accounting -where 'yes' represents 1and 0 otherwise (except for the second indicator which represents 1 if it is 100 percent and 0 otherwise). Higher values indicate more private supervision (Barth *et al*., 2004). Data is gotten from the World Bank 'Bank Regulation and Supervision' database compiled by Barth *et al*., (2004). The new Basel Accord presupposes that both stringent official supervision and private monitoring promotes stability in banks. However, Barth *et al*. (2004) find that policies that promote effective monitoring by the private sector seem to be better for bank development and stability than policies that promote official supervision. Barth *et al*. (2006) and Beck *et al*. (2006b) are two other studies that support the effectiveness of privately monitoring banks. On the other hand, Fernandez *et al*. (2010) finds that increasing effective monitoring by the private sector worsens the effect of bank concentration on industrialization.
- *Accounting and Information Disclosure Requirement Index*: The Index *ACCOUNT*, measures the extent to which banks are required to make accounting and information disclosure public. It is constructed from 3 'yes' and 'no' questions related to bank income statements, interest rates, non-performing loans, and providing consolidated financial statements. Higher values indicate more informative bank accounts (Barth *et al*. 2004).

  With regards to bank concentration, the story is that information disclosure reduced information asymmetries (in the presence of which bank concentration may have a positive effect) and, therefore, the positive effect of market power starts to dominate the negative effect (in terms of amelioration of information asymmetries) of bank concentration. This position reflects the assumption that the market is best. But if there are market failures (e.g. Da Rin and Hellmann, 2002), where banks need adequate profits to fund industrialization, then disclosure could increase the positive effect of bank concentration since it increases the quality lending decisions. However, Fernandez *et al*. (2010) argues that improving disclosure would cause bank concentration to negatively affect industrialization in developing countries.

For foreign banks, it has been suggested that, although they are seen to be more efficient and profitable, they have less knowledge of the market than domestic banks (Mian, 2003). Therefore, they are likely to have a more positive impact on industrialization if disclosure of accounting and information is high. Also, Berger *et al*. (2008) suggest that foreign banks in India only develop lending relationships with transparent firms because they are able to use their advantages into processing hard information of more transparent firms.

Regarding state ownership of banks, the World Bank (2001) and Micco *et al*. (2007) points that because the government may use state banks to bolster their political support, and therefore, cause the allocation of credit to respond to opportunistic criteria rather than efficiency. Better quality of information and accounting disclosure and the demand for it can improve state bank lending behavior and make their allocation of credit to be more efficient. In other words, improving accounting and information disclosure is likely to improve the effect of state banks on industrialization.

- *Property Rights Index:* This Index *PROPRITE* is a component of the index of economic freedom by the Heritage Foundation. It emphasizes the ability of entities to accrue private property, protected by defined laws that are effectively enforced by the government. It measures the extent to which a country's laws protect private property rights and the degree of enforcement by the government. It also explore the possibility that private property rights will be expropriated and evaluates the autonomy of the courts, the existence of corruption within the courts, and the capacity of individual and business entities to enforce contracts (Heritage Foundation,2013).
- *Governance:* This index *GOV* is broadly defined as the traditions and institutions by which authority in a country is implemented. It includes the procedure that chooses and replaces governments; the ability of government development and application of sound policies; the respect of citizens; and the governance of the institutions that administrate economic and social relations amongst them (Kaufmann *et al*. 2002). Data on perceptions of governance are based on six point perspectives: voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law, the control of corruption. Each of these indices has a scale of -2.5 to 2.5, with higher value indicating better governance. The governance

index is an average of these six indicators. Data is made available by the World Bank on the 'Worldwide Governance Indicators' complied by Kaufmann *et al*.

- *Law and Order Index*: We have also used the law and order index LAWORDER to measure institutional and legal systems quality. The law and order index is published by ICRG. They define the index to measure the legal system of a country as well as the rule of law. It has a scale of 0-6 but was changed to a 0-10 scale by La Porta *et al*. (1998), with higher values indicating the existence of high integrity in the legal system and the acceptance of citizens of legal mechanisms to settle disputes (Burki and Perry, 1998). Data is made available on Rafael La Porta's website.

  For foreign banks, the literature suggests increased entry into developing countries when the rule of law is respected and properly enforced. For example, in Andrainova et *al*. (2008), a country's banking sector would not attract significant foreign entry if the rule of law is weak and corruption is widespread. Also, Focarelli and Pozzolo (2005), points that the presence of stronger law-and-order tradition in a country increases the probability that it would host foreign banks. Therefore, it is expected that foreign banks should improve industrialization in countries with a strong law-and-order.

  Regarding state banks, poor quality of institutions might not be to only impediment that weakens its effects in developing countries. Andrews (2005) suggest that a weak law-and-order tradition can cause serious short-comings on how state banks affect the economy. In other words, in countries where the rule of law is respected and effectively enforced, state banks are seen to perform better.
- *Official Supervisory Index:* This index *OFFICIAL* measures the extent to which official supervisory authorities have the authority to take specific actions to prevent and correct problems. It is obtained by adding a value of one for each affirmative answer to 14 questions intended to gauge the power of supervisors to take specific actions to prevent and correct problem (Barth *et al*., 2004). Data is gotten from the World Bank 'Bank Regulation and Supervision' database compiled by Barth *et al*.
- *Banking Freedom Index:* The banking freedom index *BNKFREE* represents the financial freedom index-a component of the index of economic freedom from the Heritage Foundation-and it measures banking efficiency as well as the independence from government control and intervention in the financial system-and we use it to measure government interference in the banking system. This index is constructed

based on 5 extensive areas: the extent of government regulation and services of financial services; the degree of state intervention in banks and other financial forms through direct or indirect ownership; the extent of financial and capital market development; government influence on the allocation of credit; and openness to foreign competition (Heritage Foundation, 2013). It has a scale of 0-100, with higher values indicating less government interference. The standard results in the literature would suggest that, with high government interference, the effects of bank concentration are worse (Cetorelli and Gambera, 2001). Also results from Barth *et al*. (2004) and Demirguc-Kunt *et al*. (2004) equally suggest that government intervention through excessive regulatory restrictions will make the banking system less efficient and supports the standard results in the literature. However, according to Fernandez *et al*. (2010), excessive government intervention in the banking system has the potential to reduce the negative effects of bank concentration on industrialization.[32]

- *Rule of Law Index:* The rule of law index *RL* is another index we use to measure the quality of institutional and legal systems. It is a component of the Governance index by Kaufmann *et al*. The rule of law index comprises indicators that measure how well economic entities respect the rules of society. These indicators include perceptions of the prevalence of crime, the effectiveness and integrity of the courts, and the effective enforcement of contracts. This index measures how well a society has been able to create an environment which is based on just and conventional rules that govern economic and social interactions as well as the protection of property rights (Kaufmann *et al*. 2002). It has a scale of -2.5 to 2.5, where higher values indicate better respect for the law by both the private sector and the government.
- *Degree of Corruption:* We use this index *CORRUPT* to measure the level of corruption in countries, and this index is based on the perceptions of foreign inventors and published by the International Country Risk Guide (ICRG). The ICRG corruption index signifies that at higher levels of corruption, senior government officials would probably insist on special payments and unlawful payments are commonly anticipated at lower levels of government, mainly in the form of bribes associated with foreign trade licenses, exchange controls, tax assessment, police protection or loans. It has a scale of 0-6, but has been changed to a scale of 1-10 by La Porta *et al*. (1998) with higher values indicating lower corruption levels. Data is made available on Rafael La Porta's website. In the literature, where corruption is

[32] See "Bank Regulation" in Section 2.2.2.1

high, domestic banks may not be trustworthy and make lending decisions marred by corruption. Foreign banks may be less vulnerable to this. We have previously mentioned that countries encumbered by widespread corruption will not attract significant entry of foreign banks, and even if foreign bank entry is significant, widespread corruption would prevent any meaningful benefits that would have been accrued to the country. In countries where governance is bad, foreign-ownership efficiency is negatively related to corruption (Lensink *et al*. 2008). In other words, foreign banks don't perform efficiently. Therefore, we would expect foreign banks to be more effective in developing countries with low levels of corruption.

- *Control of Corruption:* We also use this index *CC* to measure the control of corruption in countries. The index is a component of the Governance index by Kaufmann *et al.* Its definition is closely related to that of the ICRG-it measures the extent to which government and public officials use their official powers for personal gain, and this includes both trivial and grand of corruptions, in addition to unofficial control of the economy by elites and private interest-and has a scale of -2.5 to 2.5, where higher values indicate better control of corruption.
- *Good Governance Index:* The index *GOODGOV* measures the quality of the institutional environment and it equals the sum of 3 indexes: risk of expropriation by the government; degree of corruption; and law and order (La Porta *et al*. 1999). The risk of expropriation by government measures the extent to which private property is confiscated and nationalized by the government. Higher values indicate less risk of expropriation, less official corruption and greater law and order tradition. According to Lindgren *et al*. (1996), the conditions for good governance include a strong and comprehensive legal and institutional environment, as well as a trustworthy judiciary, and adequate laws that govern bankruptcy, contracts and private property. Another necessary condition includes transparency, particularly through appropriate, reliable, and precise information and disclosure standards. As a result of these, good governance will improve the dependability, depth, and coverage of information and disclosure. The entry of foreign banks into the domestic banking system will improve the general governance of banking and translate it into dividends for the domestic economy. That is why Garber (1997) warns that in countries where the level of governance is weak, the entry of foreign banks puts competitive pressure on the charter values of weak domestic banks, distorting incentives and leading to excessive risk-taking in an environment of unhealthy competition. Therefore, the

results that good governance promotes the performance of foreign banks with reference to industrialization in developing countries should be expected.

- *Regulatory Quality:* The index *RQ* measures the quality of supervision and the regulatory system. It is a component of the Governance index of Kaufman *et al*. and it measures perceptions of the capacity of the government to develop and implement robust policies and regulation that allow and encourage private sector development (Kaufmann *et al*., 2002). It has a scale of -2.5 to 2.5 with higher values indicating batter regulatory capacity.
- *Political Stability:* This index *PV* measures the stability of the political environment is also a component of the Governance index by Kaufmann *et al*. The index measures perceptions of the probability that the government will be undermined or removed from power by undemocratic or aggressive means, as well as politically-motivated violence and terrorism (Kaufmann *et al*., 2002). The index has a scale of -2.5 to 2.5, with higher values indicating the implausibility of government disability and politically motivated violence.
- *Government Effectiveness:* The index *GE* is a component of the Governance index by Kaufmann *et al*. and it measures perception of public service quality, civil service quality and its extent of independence from political powers, the quality of policy development and implementation, and the credibility of government to such policies. Higher values indicate better quality of public service, better quality of the civil service and a more efficient process in policy formulation and implementation by the government.

2.3.3. Data Specification

Summary statistics for key variables employed in the study are presented in Table (2.1), while the correlations between variables are presented as a correlation matrix in Table (2.2). In Table (2.2), two significant relationships that might interest us are that industrialization has a negative significant relationship with foreign bank entry, while it has a positive significant relationship with state owned banks. This relationship is not in line with the literature that strongly supports the idea that industrialization is strongly and positively associated with foreign bank entry and negatively related with the government ownership of banks. We also present some scatter plots on the relationship on the relationship between bank market structure variables and growth in manufacturing value added over subsamples with the aim of

showing stability of coefficients during the period[33] and we find some stability of the coefficients from this plots.

Table 2.1: Summary Statistics for Key Variables (Annually and Cross-Sectional) 1995-2007

VARIABLE	*OBS.*	*MEAN*	*STD. DEV.*	*MIN.*	*MAX.*
MVAGR	403	0.04827807	0.06044787	-0.300925	0.4028098
BCON	403	0.6162002	0.1862631	0.242511	1.0
FBANK	403	0.2533769	0.2624569	0	0.96
GBANK	403	0.3143587	0.2573553	0	1.0
BNKDEV	403	0.4110384	0.3084299	0.0308122	1.65962
GDPGR	403	0.04519056	0.03550849	-0.131267	0.167288
TRADE	403	0.6531303	0.3758918	0.149328	2.20407
EXPGDP	403	0.3159386	0.1962027	0.6566741	1.213114
IMPGDP	403	0.339358	0.186361	0.8366105	1.005971
HUMCAP	403	0.05420096	0.02003512	0.0176545	0.1560317
BNKENTRY	30	7.333333	1.028334	4	8
RESTRICT	30	11.46667	2.344963	5	16
RESTOWN	30	2.9	0.8448628	1	4
ECONFREE	403	0.5992754	0.07782524	0.345	0.780
MONITOR	30	6.766667	1.006302	5	9
ACCOUNT	30	4.466667	1.224276	0	6
PROPRITE	403	0.4945409	0.1787741	0.10	0.90
GOV	403	-0.1930565	0.550681	-1.19442	1.147717
LAWORDER	30	2.795352	0.8500174	1.25	4.214286
OFFICIAL	30	10.36667	2.141275	5	14
BNKFREE	397	0.4942065	0.1559969	0.10	0.70
RL	403	-0.1918568	0.6179955	-1.474449	1.370544
CORRUPT	30	5.087112	1.487118	2.142857	8.910256
CC	403	-0.2201353	0.5976025	-1.158098	1.570757
GOODGOV	30	13.77167	2.723236	8.690477	18.88095
RQ	403	-0.0708987	0.6207322	-1.727435	1.644733
PV	403	-0.4708186	0.7742069	-2.734312	1.042907
GE	403	-0.0276024	0.5463215	-1.282234	1.277851
YLEVEL	403	7.344928	1.109739	4.74352	9.62626
FINDEV	390	-0.0612451	1.871435	-2.415995	6.136674
STMKTACT	333	0.4940002	0.7484898	0.0003134	4.947826

[33] In appendix 2.7 We split the time period into 3 subsample (period 1, 1995-1998; period 2, 1999-2002; and period 3, 2003-2007).

Table 2.2: Pairwise Correlation Matrix for Bank Market Structure and Institutional Variables (1995-2007 and Cross-Section)

	MVAGR	*BCON*	*FBANK*	*GBANK*	*BNKENTRY*	*RESTRICT*	*RESTOWN*	*ECONFREE*	*MONITOR*	*ACCOUNT*	*PROPRITE*	*GOV*	*LAWORDER*
MVAGR	1.00												
BCON	0.07	1.00											
FBANK	-0.31*	0.02	1.00										
GBANK	0.47***	-0.10	-0.38**	1.00									
BNKENTRY	-0.08	0.01	-0.06	-0.18	1.00								
RESTRICT	0.10	-0.04	-0.21	0.24	-0.17	1.00							
RESTOWN	0.10	-0.16	-0.35**	0.38**	-0.20	0.79***	1.00						
ECONFREE	-0.32*	-0.34*	0.15*	-0.48***	-0.19	-0.03	0.06	1.00					
MONITOR	-0.30	0.13	0.27	-0.33*	0.11	0.03	-0.19	0.20	1.00				
ACCOUNT	0.09	-0.30	0.01	-0.35*	0.26	-0.13	-0.09	0.44**	0.18	1.00			
PROPRITE	-0.25	-0.37**	0.03	-0.36**	-0.22	-0.18	-0.06	0.85***	0.15	0.34*	1.00		
GOV	-0.16	-0.23	0.03	-0.24	-0.26	-0.16	0.02	0.81***	0.17	0.27	0.84***	1.00	
LAWORDER	0.15	-0.23	-0.10	0.09	-0.15	0.02	0.03	0.30	0.06	0.13	0.36**	0.48***	1.00

Note: This table reports the correlation matrix of key variables used in the regression, where * indicates significance at the 10% level, ** indicates significance at the 5% level, and *** indicates significance at the 1% level.

Table 2.2 Continued.

	MVAGR	*BCON*	*FBANK*	*GBANK*	*OFFICIAL*	*BNKFREE*	*RL*	*CORRUPT*	*CC*	*GOODGOV*	*RQ*	*PV*	*GE*
MVAGR	1.00												
BCON	0.07	1.00											
FBANK	-0.31*	0.02	1.00										
GBANK	0.47***	-0.10	-0.38***	1.00									
OFFICIAL	-0.34*	-0.41**	0.11	-0.31	1.00								
BNKFREE	-0.42**	-0.16	0.35**	-0.53***	0.23	1.00							
RL	0.05	-0.18	-0.14	-0.09	-0.12	0.28	1.00						
CORRUPT	0.05	0.13	-0.08	-0.04	-0.25	0.06	0.42**	1.00					
CC	-0.12	-0.15	-0.03	-0.16	-0.11	0.38**	0.90***	0.49***	1.00				
GOODGOV	0.10	-0.19	-0.11	-0.03	-0.06	0.06	0.59***	0.85***	0.60***	1.00			
RQ	-0.17	-0.31*	0.07	-0.36*	0.01	0.61***	0.79***	0.39**	0.84***	0.58***	1.00		
PV	-0.14	-0.01	0.18	-0.11	-0.03	0.27	0.76***	0.59***	0.78***	0.67***	0.60***	1.00	
GE	0.05	-0.33*	-0.16	-0.22	0.01	0.30	0.88***	0.46***	0.88***	0.66***	0.87***	0.67***	1.00

Note: This table reports the correlation matrix of key variables used in the regression, where * indicates significance level at 10%, **

2.4. EMPIRICAL RESULTS

2.4.1. Result Diagnostics

After applying both econometric techniques discussed above on the data, the following regression results are presented and discussed: first of all, the relationship between bank market structure and industrialization are presented in Tables 2.3 and 2.4 (PMG [34]and FE respectively). Also, the relationship between the short-run coefficients of *BCON*, *FBANK* and *GBANK* on industrialization, and measures of institutional quality are presented in Tables 2.5, 2.7 and 2.9 respectively, using parametric and non-parametric correlations coefficients. These tests illustrate how the effect of bank market structure on industrialization varies in the presence of institutions and regulatory restrictions.

Further results are presented in the form of interacting bank market structure variables with measures of institutional quality (with time variation) and these results are presented in Tables 2.6, 2.8 and 2.10.[35] In the PMG regression (as well as the MG and DFE), we control for country and time effects. The Joint Hausman test between PMG and MG estimation is also presented. For the FE estimation, all models include period dummies that are not reported. To control for the heteroskedasticity in the FE estimation, the *t*-ratios are computed using Heteroskedasticity consistent standard errors. So as not to get carried away exploring the importance of all institutional variables with bank market structures, we have identified in the literature, what we regard as the most relevant institutional variables for each bank market structures.

2.4.2. The Effect of Bank Market Structure on Industrialization

2.4.2.1. PMG Baseline Model

In Table 2.4, we report the results for regressions based on the specification in (2.2). The lagged dependent variable is expected to have a positive sign because it is possible that past industry performance may influence future industry decisions. Therefore, the past values of growth in manufacturing value added would be expected to positively influence the future of industrialization. We would expect the level of bank development, real GDP growth, and human capital to have a positive influence on industrialization, at least in the long-run.

[34] The MG and DFE estimates are also presented for completeness but are not discussed because we are interested in the PMG estimates.
[35] Tables 2.6, 2.8 and 2.10 present results with interaction terms for bank concentration, foreign bank entry and state ownership of banks respectively.

However, it is not obvious that the ratio of exports plus imports to GDP should be positive. While it is expected to be positive, it could be negative, particularly when a country exports little and imports a lot.

However, our main focus is the long-and short-results of bank concentration, foreign bank entry and state ownership of banks in industrialization. Our long-run results suggest that bank concentration has a positive and significant effect on industrialization, while foreign bank entry and state ownership of banks, both have negative and significant effects on industrialization. In the short-run, our results suggest that bank concentration has a negative effect on industrialization, while foreign bank entry and state ownership of banks positively influence industrialization.

2.4.2.2. FE Baseline Model

The baseline of the fixed effects estimates of equation (2.8) are reported in Table 2.4[36]. Both baselines are relatively similar except for the fact that the ratio of exports plus imports to GDP has been replaced with the growth rate exports and imports and human capital has been replaced with the rate of inflation. The results suggest that bank concentration is positive and significantly related to industrialization while foreign bank entry and state ownership of banks have a negative sign (although the negative sign is insignificant for state ownership of banks). The other control variables have the expected signs. The results of our variables of interest (bank concentration, foreign bank entry and state ownership of banks) are similar to what we have in the PMG long-run regression, and it is encouraging that it was possible to replicate them in the FE regression. The results are significant with the exception of government ownership of bank which is insignificant but at 15% and bank development which is largely insignificant.

2.4.2.3. Discussion of Baseline Results.

The results in Table 2.3 suggest that bank concentration positively influences industrialization in the long-run, while this effect is negative in the short-run. On the other hand, the results also suggest that foreign bank entry and state ownership of banks have a negative effect on industrialization in the long-run, while this effect is positive in the short-run. The results in Table 2.4 (FE estimation) suggest that bank concentration positively

[36] The RE results are also presented in Table 2.4 for completeness and also for the reason that the Hausman test will be presented. However, the RE results are only presented in the FE baseline model, they are not presented when the interactions are used.

influences industrialization while foreign bank entry and state ownership of bank have a negative effect. Our aim in this section is to try to discuss the short and long run results of bank concentration, foreign bank entry and government ownership of banks in isolation, after then we will try to reconcile the long-and short-run results.

The positive effect of bank concentration on industrialization in the long-run are largely associated with the theoretical predictions of Peterson and Rajan (1995). In their study, they hypothesize that that young/new firms without historical records or firms that find it difficult to get funds from the capital market are more likely to be financed by banks with market power. This occurs through the facilitation of funds towards investment projects, resulting in the fast growth of firms; with the intention of sharing in future profits through the extraction of monopoly rents when the firms become successful.

Another theoretical study that supports this view is Da Rin and Hellman (2002). They argue that banks act as a catalyst for industrialization but they also emphasize that these banks have to be profit-driven, significantly large and with market power in the banking market. Also, according to Marquez (2002), the positive effect of bank concentration could also be as a result of the ability of banks with market power to evaluate the credibility of borrowers, thus, reducing risks and inefficiencies in the credit market. Mitchener and Wheelock (2013) suggest that increasing bank concentration would result in higher growth in manufacturing output. However, in line with our short-run result, Cetorelli and Gambera (2001) argue that bank concentration at the country level imposes a dead weight loss on industry growth. In other words, they suggest that bank concentration negatively affects the economy through the credit market by reducing the total amount of loanable funds available to firms.

To reconcile the long-and short-run effect of bank concentration on industrialization, we consider Panetta and Focarelli (2003). Their study examines the long-run price effects of mergers. They argue that the effects of market power as a result of mergers and acquisitions harmed consumers only in the short-run. In other words, many of the studies with this result restricted their examination to the short-run. After their examination, they find evidence that the significance of long-and short-run effects of mergers and acquisition are distinct. In line with previous research, they find that in the short-run, effects of mergers increases concentration, as well as market power, which results in the change of deposit rates that are not beneficial to consumers. However, in the long-run, they find that deposit rates of banks

Table 2.3: Long- and Short-Run Effect of Bank Market Structure on Industrialization

	Pooled Mean Group	*Mean Group*	*Dynamic Fixed Effects*
Variables	*MVAGR*	*MVAGR*	*MVAGR*
Long-Run Coefficients			
BCON	0.042***	-0.020	0.089***
	(0.0051)	(0.1977)	(0.0287)
FBANK	-0.051***	0.216	0.008
	(0.0021)	(0.2828)	(0.0222)
GBANK	-0.048***	0.530*	-0.047
	(0.0150)	(0.3348)	(0.0373)
BNKDEV	0.112***	1.295*	-0.037
	(0.0193)	(0.8012)	(0.0419)
GDPGR (-1)	0.124***	0.540	1.051***
	(0.0108)	(1.8107)	(0.0974)
TRADE	0.127***	1.295***	-0.002
	(0.0156)	(0.5712)	(0.0486)
HUMCAP	0.916***	2.977	0.174
	(0.0993)	(2.8972)	(0.4329)
Joint Hausman Test (χ^2): 0.26 (0.3834)			
Error-Correction Coefficients			
Φ_i	-1.547***	-1.036***	-1.087***
	(0.3984)	(0.2299)	(0.0579)
Short-Run Coefficients			
Δ *MVAGR (-1)*	0.581**	0.050	0.041
	(0.2908)	(0.1963)	(0.0465)
Δ *BCON*	-0.277	0.135	0.033
	(0.0.3138)	(0.1304)	(0.0439)
Δ *FBANK*	1.116	0.399	-0.015
	(1.0735)	(0.2887)	(0.0295)
Δ *GBANK*	0.516	-0.334	-0.042
	(0.7696)	(0.3056)	(0.0599)
Δ *BNKDEV*	3.301	0.502	0.092
	(3.3143)	(0.4321)	(0.1386)
Δ *GDPGR (-1)*	0.611	-0.167	0.168***
	(0.6219)	(0.5683)	(0.0705)
Δ *TRADE*	0.181	-0.504	0.174
	(0.5260)	(0.5070)	(0.1353)
Δ *HUMCAP*	2.359	-0.164	0.962*
	(2.621)	(0.4058)	(0.5902)
CONS.	3.667	-2.229	-6.834***
	(3.1148)	(4.1798)	(2.705)
No of Obs.	341	341	341

with increased market power starts to increase. Finally, they argue that the net effect of an increase in bank concentration on consumers is positive: the long-run efficiency gains through an increase in the deposit rate are greater that than the negative short-run effects of market power.

The long-run results suggest that foreign bank entry has a negative effect has a negative effect on industrialization and are similar to the theoretical arguments put forward by Detragiache *et al*. (2008), where they argue that while lending, financial intermediation, and welfare may improve with the entry of foreign banks, this does not justify their presence

Table 2.4: The Effect of Bank Market Structure on Industrialization

	Fixed Effects	*Random Effects*
Variables	*MVAGR*	*MVAGR*
BCON	0.120***	0.0531***
	(0.0326)	(0.0193)
FBANK	-0.0657**	-0.0251
	(0.0281)	(0.0165)
GBANK	-0.0712*	0.0138
	(0.0438)	(0.0158)
BNKDEV	0.0216	0.0006
	(0.0494)	(0.0142)
GDPGR (-1)	0.420***	0.467***
	(0.1369)	(0.1253)
EXPGDPGR	0.107***	0.104***
	(0.0341)	(0.0339)
IMPGDGR	-0.0514**	-0.0491**
	(0.0242)	(0.0239)
INF	-0.159***	-0.144***
	(0.0441)	(0.0389)
CONS.	3.109	2.184
	(3.727)	(2.296)
No of Obs.	372	372
R^2 *within*	0.228	0.207
R^2 *between*	0.004	0.363
F-Test/Wald Test	5.00	99.21

Notes: Estimators: Fixed effects and Random Effects, all include period dummies which are not presented. The standard errors are reported in parentheses, where * indicates significance at the 10% level, ** indicates significance at the 5% level, and *** indicates significance at the 1% level. The Hausman test statistic and *p*-value: 13.41 (0.000), suggest using fixed effects.

They suggest that under some circumstances, foreign banks might be involved in 'cream-skimming', which increases the cost of financial intermediations and reduces welfare. The results are also consistent with Berger *et al* (2001) who argue that informationally opaque small firms in Argentina received less credit from large banks and foreign banks; Satta (2004), who on average finds that that foreign banks in Tanzania between 1991 and 2001 lent less to small firms than domestic banks; and Clarke *et al*. (2005), who finds that foreign banks devoted less of their lending to small businesses in Argentina, Chile, Colombia and Peru during the mid-1990s than domestic private banks.

However, in line with our short-run results, Beck *et al*. (2004) and Clarke *et al*. (2006) argue that foreign bank entry has a positive effect on the domestic economy. Beck *et al*. (2004) initially argues that bank concentration increases financing obstacles, with stronger effects for small and medium firms but also finds that a high foreign bank presence dampens this effect; also, Clarke *et al*. (2006) point that all enterprises, including small and medium ones, report lower financial obstacles in countries having higher level of foreign bank presence. Another argument by Havrylchyk (2012) suggests that foreign bank entry has an average positive

relationship with lower entry rates of firms and smaller size of entrants in informationally opaque industries but this effect may be affected by the mode of entry. In other words, foreign bank presence has a negative effect on firm entry and firms in informationally opaque industries when they enter through the acquisition of domestic banks, while this effect is positive when foreign banks enter through Greenfield investments, suggesting the multiple effects of foreign banks.

We try to reconcile the long-and short-run effects of foreign bank entry on industrialization in developing countries using Clarke *et al*. (1999). In their study, they examine how foreign bank entry affected domestic banks in Argentina in the mid-1990s. Foreign banks concentrated their lending in manufacturing and mortgages, areas where they had comparative advantage. Domestic banks that concentrated in these areas were not initially affected, at least in the short-run, because they enjoyed informational advantages and were not immediately chased out of this niche. However, in the long-run, they were eventually chased out of the market as a result of the superiority of foreign banks. Although Clarke *et al*. (1999) argues that such banks should have gone into other areas that foreign banks stayed away from, we argue that in this case, informationally-opaque firms, particularly in manufacturing, may become more credit constrained, thereby worsening their production activities. We see here that, while foreign bank entry may have a positive effect in the short-run, its ability to completely drive out domestic banks from areas where it has interest may result in a negative effect in the long-run.

The long-run results suggest that state ownership of banks has a negative and significant effect on the growth of manufacturing value added. In accordance with Stiglitz *et al*. (1993), we argue that financial markets are very different from other types of market, resulting in a more detrimental effect as a result of market failures. Also, we argue that the presence of market failures in financial markets is a justification for government intervention, not only to make the market work more efficiently, but to improve the performance of the economy. Finally, we argue that the justification of government intervention in financial markets is not only restricted to market failures, but also the presence of complex financial operations which requires government regulators. To support Stiglitz *et al*. (1993), Andrianova *et al*. (2008) argue that state bank would naturally wither when they are no longer required. Finally, according to Rodrik (2012), the positive effect of state owned banks on growth might not be shown in the coefficient of standard growth regressions because of the presence of market

failures. In other words, it is possible that true effect of state owned banks on manufacturing value added has being masked by market failures in our model.

However, the negative long-run results are similar to those of La Porta *et al*. (2002), Barth *et al*. (2001), Beck and Levine (2002), Komer and Schanabel (2002). They all argue that state owned banks are detrimental for economic growth through slow financial development and lower economic growth. The short-run results suggest a positive effect of state owned banks on industrialization. In line with these results, our study is similar to Sapienza (2004); Yeyati *et al*. (2007) and Andrianova *et al*. (2012). Sapienza (2004) argues that state banks positively influence firm growth by lending to them; Yeyati *et al*. (2007) argues that it improves efficiency in the financial system and reduces credit procyclicality; and Andrianova *et al*. (2012) argues that state ownership of banks is associated with long-run growth.

To reconcile the long-and short-run effect of state ownership of banks on industrialization, we use an argument similar to Andrianova *et al*. (2008), where they argue that state owned banks would naturally wither when they are no longer required. In line with our study, we argue that the presence of state owned banks positively influences industrialization in developing countries when industries are underdeveloped. In other words, firms in underdeveloped industries are likely to benefit from low-cost funding from state owned banks in the short-run. However, when industries become developed, firms are in a better position to secure funding from the private banking market. The continuous presence of state banks in such markets may be detrimental to the growth of firms in that industry because lending to firm may become less efficient and politically motivated. In other words, we argue that when industries become developed, the presence of state banks may have a negative effect on industrialization.

2.4.2.4. Discussion of Correlation Coefficients and FE Interactions.

Bank Concentration

Correlation coefficients are presented in Table 2.5, while the panel estimations are presented in in Table 2.6.

- *Economic Freedom (ECONFREE)*

The Spearman correlation coefficient suggests a positive and significant relationship between the effect of bank concentration on industrialization and economic freedom. Also, in column 1, the result suggests that while bank concentration by itself has a negative significant effect on industrialization, its interaction with economic freedom is positive and significant.

Table 2.5: Correlation between Short-Run PMG Coefficients and Measures of Institutional Quality (Bank Concentration)

	PEARSON	*SPEARMAN*
VARIABLES	*BCON*	*BCON*
BANKENTRY	0.0245	-0.3000
RESTRICT	-0.1081	0.1002
RESTOWN	0.0159	0.1814
ECONFREE	0.2645	0.3902**
MONITOR	-0.0010	0.1404
PROPRITE	0.1854	0.3130**
ACCOUNT	0.2128	0.1401
GOV	0.2177	0.3382**
LAWORDER	0.0219	0.1809
OFFICIAL	0.2875	0.1388
BNKFREE	0.2493	0.2179
RL	0.2108	0.3213**

Table 2.6: Bank Concentration and it's interaction with measures of Institutional Quality

	1	*2*	*3*	*4*	*5*
Variables	*MVAGR*	*MVAGR*	*MVAGR*	*MVAGR*	*MVAGR*
BCON	-0.258	-0.0180	0.161***	0.158***	0.0239
	(0.174)	(0.0773)	(0.0353)	(0.0355)	(0.0881)
BCON × ECONFREE	0.00638**				
	(0.00294)				
BCON × PROPRITE		0.00285**			
		(0.00146)			
BCON × GOV			0.146***		
			(0.0491)		
BCON × RL				0.131***	
				(0.0439)	
BCON × BNKFREE					0.00186
					(0.00167)
FBANK	-0.0603**	-0.0551**	-0.0684***	-0.0673***	-0.0555**
	(0.0282)	(0.0287)	(0.0279)	(0.0279)	(0.0289)
GBANK	-0.0808*	-0.0727*	-0.0681*	-0.0611	-0.0752*
	(0.0441)	(0.0437)	(0.0434)	(0.0436)	(0.0446)
BNKDEV	0.0147	-0.0446	0.0253	0.0243	0.0273
	(0.0498)	(0.0504)	(0.0493)	(0.0495)	(0.0499)
GDPGR (-1)	0.407***	0.419***	0.408***	0.428***	0.389***
	(0.136)	(0.137)	(0.136)	(0.136)	(0.138)
EXPGDPGR	0.116***	0.109***	0.111***	0.108***	0.105***
	(0.0343)	(0.0341)	(0.0340)	(0.0338)	(0.0345)
IMPGDPGR	-0.0514***	-0.0501**	-0.0533**	-0.0532**	-0.0449*
	(0.0242)	(0.0241)	(0.0239)	(0.0239)	(0.0246)
INF	-0.166***	-0.159***	-0.157***	-0.155***	-0.171***
	(0.0442)	(0.0440)	(0.0440)	(0.0437)	(0.0250)
ECONFREE	-0.366*				
	(0.209)				
PROPRITE		-0.210**			
		(0.0961)			
GOV			-9.738***		
			(3.828)		
RL				-7.555**	
				(3.351)	
BNKFREE					-0.159
					(0.103)
CONS.	24.70**	14.08**	0.750	0.870	11.44
	(13.327)	(6.232)	(3.796)	(3.782)	(6.467)
No of Obs.	372	372	372	372	369
R^2 *within*	0.240	0.239	0.249	0.249	0.235
R^2 *between*	0.002	0.006	0.000	0.000	0.007
F-Test	4.80	4.80	5.06	5.05	4.64

Note: The standard errors are reported in parenthesis and ,*,**,*** indicate significance at the 10%, 5%, and 1% level respectively. Period dummies are included but not reported. Columns 1, 2,3,4,5 indicate interactions between bank concentration and economic freedom, property rights governance, rule of law and banking freedom respectively.

However, economic freedom by itself is negative and significant. In the literature, a number of economic freedom indicators have a positive and significant effect on growth. However,

this does not necessarily mean that improving economic freedom results in more growth. A single measure of economic freedom might not represent the multifaceted nature of the economic environment, while an aggregate measure makes it difficult to draw policy conclusions. Based on a paper by Carlsson and Lundstrom (2002), different categories of economic freedom have different effects on growth. For example, the effects of monetary policy and price stability have an insignificant effect on growth; economic structure and the use of markets have a weak effect of growth; while the size of government and the freedom to trade with foreigners have a negative effect on growth. In other words, the use on an index of economic freedom may be misleading.

To estimate the economic relevance of the interaction on industrialization, we calculate the elasticities in the form of $\partial \log y / \partial \log x$, the percentage change in *y* from a 1% change in *x*. The effect on industrialization based on the coefficient of the interaction between bank concentration and economic freedom is a positive 4.53[37] percentage points. In other words, the marginal effect of bank concentration on industrialization is positive as the level of economic freedom is increased i.e. the marginal effect of bank concentration on industrialization increases by 4.53 percentage points when economic freedom increases by 1 percent.

Economic freedom is a measure of institutional quality and the results suggest that increasing the quality of institutions when measured as economic freedom would reduce the negative effect of bank concentration on industrialization. Good institutions are likely to check the activities of oligopolistic banks, thereby reducing their negative effects. Demirguc-Kunt and Maksimovic (2004) and Ergungor (2004) support these results because they argue that the positive effect of bank concentration is only possible in the presence of good institutions. However, Fernandez *et al*. (2010) finds the interaction between bank concentration and economic freedom to be negative and significant suggesting that improving the quality of institutions would only worsen the effect of bank concentration on industrialization.

- *Property Rights (PROPRITE)*

The Spearman correlation coefficient suggests a positive and significant relationship between the effect of bank concentration on industrialization and the protection of property rights. Also, in column 2, bank concentration by itself is negative and insignificant, while the

[37] The standard error is (1.92207). The *mfx* command in Stata used to generate the elasticities of the interaction term also provides its standard errors.

interaction term is positive and significant. The protection of property rights by itself is negative and significant. While, both results suggest that stronger and effective protection of property rights would reduce the negative effects of bank concentration on industrialization, the negative significant coefficient of property rights by itself is not consistent with the other results, and therefore difficult to explain.

Based on this result, one would think that stronger property rights would impede industrialization. However, there are explanations that might support this result. For example, Bose *et al*., (2012) argues that the relationship between property rights and growth is not straightforward. They show that while the protection of property may be beneficial to the growth prospects of countries, this is unlikely to happen in countries with weak banking systems because the monitoring of borrowers become difficult and the positive impact of increasing property right protection can become detrimental and reduce growth. They use a simple rationale to suggest that while strong property rights are beneficial for growth; low-quality loan applicants pursue other sources funds by presenting themselves as high-quality applicants. Banks respond to this by increasing their screening technologies because the average quality of a bank's pool of borrowers has declined. As a result of this, loan rates would be higher and the quantity of credit would be smaller in the market. In other words, for countries to benefit from strong property rights, the level of banking development has to be higher.

The effect on industrialization based on the coefficient of the interaction between bank concentration and property rights is a positive 1.37 percentage points.[38] In other words, the marginal effect of bank concentration on industrialization is positive as the level of property rights protection is increased i.e. the marginal effect of bank concentration on industrialization increases by 1.37 percentage points when property right protection increases by 1 percent. It is essential that lenders are able to recover collateral in case of borrower failure. Beck *et al*. (2004) suggests that bank concentration can only have positive effects with good property rights, while Fernandez *et al*. (2010) argues that bank concentration has positive effects in the absence of strong property rights.

- *Governance (GOV)*

The Spearman correlation coefficient suggests a positive and significant relationship between the effects of bank concentration on industrialization. Also, in column, bank concentration by

[38] The standard error is (0.79492).

itself as well as its interaction with governance is positive and significant, while governance by itself is negative and significant.[39] Khan (2008) argues that the implementation of good governance reforms is unlikely to promote growth in developing countries because they suffer from structural and fiscal constraints that impede the capabilities of good governance. When he compares high-growth and low-growth developing countries, he finds to significant difference in their level of good governance. In other words, growth in high-growth developing countries was not triggered by good governance. The observations by Khan suggest that developing countries that concentrate on good governance reforms to trigger economic growth are unlikely to experience significant success. Also, he suggest that rather than concentrating on improving good governance reforms, developing countries should concentrate on alternative governance capabilities that would enable the tackle market failures. It is therefore possible to suggest that improving governance in developing countries could result in less growth because the reforms do not address market failures and poverty reduction.

The effect on industrialization based on the coefficient of the interaction between bank concentration and governance is a positive 0.37 percentage points.[40] In other words, the marginal effect of bank concentration on industrialization is positive as the quality of governance increases i.e. the marginal effect of bank concentration on industrialization increases by 0.37 percentage points when the quality of governance increases by 1 percent.

Governance is another measure of institutional. Similar to economic freedom, good institutions softens the negative impact of bank concentration in industrialization. Again, these results are in line with Beck *et al*. (2004) and Ergungor (2004). However, as a robustness test to economic freedom, Fernandez *et al*. (2010) find that improving the quality of governance could worsen the negative effect of bank concentration on industrialization.

- *Official Supervisory Power (OFFICIAL)*

The correlation coefficients suggest an insignificant relationship between the effect of bank concentration on industrialization and official supervisory power. In other words, official supervisory power has no influence on how bank concentration affects industrialization. In line with our findings, it has been argued in the literature that strict official supervision is unimportant, particularly with respect to private monitoring. For example, Caprio *et al*.

[39] In other words, the correlation coefficient suggest that good governance reduces the negative effect of bank concentration on industrialization, while the interaction term suggest that good governance improves the positive effect of bank concentration.
[40] The standard error is (0. 12109).

(2007) suggest that official supervision has no significant effect on bank valuation. Fernandez *et al*. (2010) also find that official supervisory powers have no significant effect on the manner in which bank concentration affects economic growth.

While there seems to be no strong evidence in the literature that strict official supervision ensures bank stability and development, the definition of what supervisory power includes suggest that it should promote bank development and stability. One reason why strict official supervision may not promote bank development and valuation is corrupt bank supervisors, particularly in developing countries (Barth *et al*. 2013). It has also been suggested that if monitoring skills are scarce and there are economies of scope in monitoring, then concentrated banking markets are likely to promote monitoring (Beck *et al*. 2007).

- *Rule of Law*

The Spearman correlation coefficient suggests a positive and significant relationship between the effect of bank concentration on industrialization and the rule of law. Also, in column 4, the effect of bank concentration by itself as well as its interaction with the rule of law index is positive and significant, while rule of law by itself is negative and significant. While it is difficult to explain the negative and significant coefficient of rule of law, the result proves inconsistency in our results. The relationship between rule of law and economic growth depends on the institutions that are required to enforce them, i.e. government and the courts. In other words, weak enforcement of the rule of law by the government may impede economic growth. Another element of rule of law is corruption. Corruption is mainly seen to originate from politicians and bureaucrats, but typically, private agents are the beneficiaries because they are involved in exchanges where corruption is involved. On an empirical note, it has been found that the correlation of indicators of rule of law for developed countries is higher than for developing countries suggesting some caution in making policy recommendations from a large country sample. Also, aggregate indictors of rule of law make better predictions than distinct components of rule of law (Haggard and Tiede, 2011). In other words, some implications with reference to the importance of the rule of law, particularly in developing countries, may be weak.

The effect on industrialization based on the coefficient of the interaction between bank concentration and the rule of law is a positive 0.35 percentage points.[41] In other words, the marginal effect of bank concentration on industrialization is positive as the administration and respect of the rule of law improves i.e. the marginal effect of bank concentration on industrialization increases by 0.35 percentage points when the quality of rule of law increases by 1 percent. These results suggest that the negative effect of bank concentration on industrialization is reduced in the presence of an environment where the rule of law is respected and effectively enforced.[42] However, the negative and significant effect of rule of law indicates the results are obviously not robust.

Foreign Bank Entry

Correlation coefficients are presented in Table 2.7, while the panel estimations are presented in Table 2.8.

- *Private Monitoring (MONITOR)*

The correlation coefficients suggest a positive and significant relationship between the effect of foreign bank entry on industrialization and private monitoring. The result suggests that effective private monitoring may improve the positive short-run effect of foreign bank entry on industrialization, as well as encourage foreign bank entry (Dopico and Wilcox, 2001) because it guarantees bank development and stability. However, for private monitoring of banks to be effective, it is required that accounting systems and information disclosure mechanisms are developed, as this provides investors with adequate information to make investment decisions

- *Property Rights (PROPRITE)*

The correlation coefficients suggest a positive significant relationship between the impact of foreign bank entry on industrialization and the protection of property rights. However, in column 1, the interaction term is insignificant. Based on correlation coefficients, effective protection of property right may improve the positive impact of foreign bank entry on industrialization. According to Demiurguc-Kunt *et al*. (2004), countries that restrict the entry of foreign banks are normally associated with weak protection of property rights. In other words, weak protection of property rights could mitigate the positive effects of foreign banks in developing countries. Also, a study on Mexico by Haber and Musacchio (2005) argue that

[41] The standard error is (0. .10507).
[42] However, the interaction term suggest that the positive effect of bank concentration on industrialization is improved in the presence of effectively enforced rule of law.

Table 2.7: Correlation between Short-Run PMG Coefficients and Measures of Institutional Quality (Foreign Bank Entry)

	PEARSON	*SPEARMAN*
VARIABLES	*FBANK*	*FBANK*
BANKENTRY	-0.1224	-0.1368
MONITOR	0.3257*	0.4308***
PROPRITE	0.4990***	0.4198**
ACCOUNT	0.1846	-0.0966
GOV	0.3926**	0.4266**
LAWORDER	0.2350	0.1075
OFFICIAL	0.1253	-0.1684
RL	0.3085*	0.4000**
CORRUPT	0.1860	0.1630
CC	3124*	0.3424*
GOODGOV	0.2837	0.2631
RQ	0.4730***	0.4325***

Table 2.8: Foreign Bank Ownership and it's interaction with measures of Institutional Quality

	1	*2*	*3*	*4*	*5*
Variables	*MVAGR*	*MVAGR*	*MVAGR*	*MVAGR*	*MVAGR*
BCON	0.119***	0.125***	0.122***	0.119***	0.116***
	(0.0327)	(0.0332)	(0.0334)	(0.0326)	(0.0329)
FBANK	-0.0659	-0.0532*	-0.0478	-0.0543*	-0.0702***
	(0.0592)	(0.0290)	(0.0306)	(0.0289)	(0.0282)
FBANK×PROPRITE	0.00013				
	(0.0011)				
FBANK×GOV		0.0850*			
		(0.0460)			
FBANK×RL			0.0601		
			(0.0402)		
FBANK×CC				0.0667*	
				(0.0358)	
FBANK×RQ					0.0804*
					(0.0459)
GBANK	-0.0733*	-0.0874**	-0.0784*	-0.0899**	0.0933**
	(0.0439)	(0.0448)	(0.0442)	(0.0447)	(0.0454)
BNKDEV	-0.0309	-0.0434	-0.0389	-0.0355	-0.0248
	(0.0157)	(0.0507)	(0.0515)	(0.0497)	(0.0493)
GDPGR (-1)	0.412***	0.396***	0.399***	0.389***	0.407***
	(0.138)	(0.137)	(0.138)	(0.137)	(0.138)
EXPGDPGR	0.106***	0.111***	0.108***	0.108***	0.112***
	(0.0343)	(0.0343)	(0.0341)	(0.0341)	(0.0343)
IMPGDPGR	-0.0503**	-0.0554**	-0.0539**	-0.0576**	-0.0542**
	(0.0242)	(0.0242)	(0.0243)	(0.0242)	(0.0242)
INF	-0.157***	-0.161***	-0.157***	-0.150***	-0.155***
	(0.0443)	(0.0444)	(0.0441)	(0.0446)	(0.0442)
PROPRITE	-0.0440**				
	(0.0513)				
GOV		-3.938			
		(2.956)			
RL			-1.615		
			(2.445)		
CC				0.128	
				(2.078)	
RQ					-3.153*
					(2.013)
CONS.	5.473	3.773	3.813	4.678	4.104
	(4.756)	(3.799)	(3.767)	(3.799)	(3.769)
No of Obs.	372	372	372	372	372
R2 within	0.231	0.237	0.233	0.240	0.237
R2 between	0.005	0.000	0.009	0.023	0.000
F-Test	4.56	4.73	4.64	4.80	4.72

Note: The standard errors are reported in parenthesis and *,**,*** indicate significance at the 10%, 5%, and 1% level respectively. Period dummies are included but not reported. Columns 1, 2,3,4,5 indicate interactions between foreign bank entry and property rights, governance, rule of law, control of corruption, and regulatory quality respectively.

the impact of foreign bank lending to the private sector depends on the enforcement of property rights, for improved financial intermediation. Therefore, we would expect that the enforcement of good property rights would improve foreign bank performance with regards to industrialization in developing countries. However, based on the insignificant interaction term in the panel estimation, there is no consistency in our results.

- *Governance (GOV)*

The correlation coefficients suggest a positive and significant relationship between the impact of foreign bank entry on industrialization and governance. Also, in column 2, foreign bank entry by itself remains negative but insignificant while its interaction with governance is positive and significant. By itself, governance has a negative and insignificant effect on industrialization. Based on the correlation coefficient, good governance may improve the short-run positive impact of foreign bank entry, while the interaction term suggests that it may soften the negative impact of foreign bank entry on industrialization. The effect on industrialization based on the coefficient of the interaction between foreign bank entry and governance is a positive 0.08 percentage points.[43] In other words, the marginal effect of foreign bank entry on industrialization improves as the quality of governance increases i.e. the marginal effect of foreign bank entry on industrialization increases by 0.08 percentage points when the quality of governance increases by 1 percent. In other words, these results suggest that foreign banks would perform better in the presence of good quality of institutions. Levine (1996), Andrainova *et al*. (2008), and Lensink *et al.* (2008) all suggest that a country would only reap the benefits of foreign banks entry with the institutional environment is strong. As is also evident in the literature, foreign banks could also press for further improvements in institutional quality in developing countries. Previously, it has been argued that the negative or insignificant effect of foreign bank entry in developing countries may be related to weak institutional capacity. These results seem to be consistent with the literature.

- *Official Supervisory Power (OFFICIAL)*

The correlation coefficients suggest an insignificant relationship between the effect of foreign bank entry on industrialization and official bank supervision. In other words, official bank supervision has no effect on how foreign bank entry impacts industrialization. The neo-liberal view argues that official supervision should have an insignificant or even negative significant impact on bank development, valuation and stability. It has also been suggested that, while it

[43] The standard error is (0. 03965).

might positively affect bank development and stability, this effect is less when compared to private monitoring by the market. However, Levine (1996) suggests that the possibility of benefitting from the entry of foreign banks is crucially dependent on the existence of an adequate supervisory and regulatory system which ensures safety, soundness and transparency of the financial system. For weak financial systems, official supervision might prevent foreign banks from taking undue advantage of the loopholes in the financial system. After all, Clarke *et al*. (2005) suggest that a scenario is possible when foreign banks can take full advantage of regulatory and judicial lacunae. Therefore, our results are supported by one aspect of the literature where official supervision is seen to have little or no effect on how foreign banks entry affect the economy of developing countries.

- *Rule of Law (RL)*

The correlation coefficients suggest a positive and significant relationship between the effect of foreign bank entry on industrialization and the rule of law. However, in column 3, the interaction term is insignificant. It has been argued that foreign banks in developing countries cannot be effective under an environment where the rule of law is weak, prompting the importance of an effective rule of law regime. However, the fact that our interaction term is insignificant suggests an inconsistency with the correlation coefficient. Based on the correlation coefficient, respected and well-enforced rule of law improves the short-run positive impact of foreign bank entry on industrialization.

- *Control of Corruption (CC)*

The correlation coefficients suggest a positive and significant relationship between the impact of foreign bank entry on industrialization and the control of corruption. Also, in column 4, the interaction term is positive and significant. Based on the results, the correlation coefficient suggests that an effective control of corruption may improve the short-run positive effect of foreign banks, while the interaction terms suggests that it may soften the negative impact of foreign banks on industrialization. The effect on industrialization based on the coefficient of the interaction between foreign bank entry and the control of corruption is a positive 0.07 percentage points.[44] In other words, the marginal effect of foreign bank entry on industrialization increases as the control of corruption improves i.e. the marginal effect of foreign bank entry on industrialization increases by 0.07 percentage points when the control of corruption increases by 1 percent. Foreign banks will perform when the level of corruption is low. Reducing corruption is one way of promoting financial development. Eliminating corruption is also vital for strengthening property rights and the legal system. When bribes

[44]The standard error is (0. 03933).

are demanded by public officials, they reduce the incentive for entrepreneurs to make investments. The ability to buy off judges weakens enforcement of legal contracts that enable the financial system to operate smoothly and promote foreign bank entry. Also, the level of corruption may fall as a result of foreign bank entry (de Haas and van Lelyveld, 2006). This is one case where our results are consistent.

- *Regulatory Quality (RQ)*

The correlation coefficients suggest a positive and significant relationship between the effect of foreign bank entry on industrialization and regulatory quality. Also, in column 5 of, the effect of bank concentration by itself remains negative and significant while its interaction term is positive and significant. The effect of regulatory quality by itself is negative and significant. In developing countries, industrialization will benefit from foreign bank entry when government is adequately able to develop and implement robust policies. The correlation coefficient suggests that strengthening the quality of regulation improves the short-run positive impact of foreign bank entry on industrialization, while the interaction term suggests that it softens the negative effect of foreign bank entry on industrialization. However, the negative significant coefficient of the regulatory variable questions the consistency of the results. The effect on industrialization based on the coefficient of the interaction between foreign bank entry and regulatory quality is a positive 0.02 percentage points.[45] In other words, the marginal effect of foreign bank entry on industrialization increases as regulatory quality improves i.e. the marginal effect of foreign bank entry on industrialization increases by 0.02 percentage points when regulatory quality increases by 1 percent. It is therefore expected that with good quality of regulations, foreign banks would perform better in developing countries. However, the negative and significant effect of regulatory quality by itself on industrialization is not consistent with our other results.

State Ownership of Banks

Correlation coefficients are presented in Table 2.9, while the panel estimations are presented in Table 2.10.

- *Economic Freedom (ECONFREE)*

The Spearman correlation coefficient suggests a positive and significant relationship between the short-run effect of state ownership of banks on industrialization and the degree of economic freedom. In column 1, the interaction term is insignificant. The correlation coefficient suggests that when the fundamental right of individuals in developing countries to

[45] The standard error is (0. 0105).

control their labour and property increases, this may improve the short-run positive effect of state ownership of banks on industrialization. The World Bank is a proponent of economic freedom and suggests that state ownership of banks may give positive results under this condition. It is therefore expected that good institutional quality will improve the effect of state banks on industrialization. However, the interaction term in our panel estimations suggest an inconsistency in the results.

- *Private Monitoring (MONITOR)*

The Spearman correlation coefficient suggests a positive relationship between the impact of state banks on industrialization and private monitoring. This result suggests that effective private monitoring of banks may improve the positive short-run impact of state banks on industrialization. It has been suggested in the literature that private monitoring is more effective in promoting bank development and stability than official supervision. However, while the World Bank agrees that private monitoring is relevant, it does not undermine the importance of official supervision and even argues that state banks may produce more positive results in the presence of official supervision. In other words, weak official supervision could jeopardize or even make worse the effect of state banks on economic growth in the presence of effective private monitoring. Barth *et al*. (2004) suggest that state ownership of banks is negatively associated with private monitoring. While we do not criticize this conclusion, we suggest that this is likely to occur when state banks negatively affect economic growth. When the effect of state banks is positive, improving private monitoring would only ensure that state banks further improve their operations by requiring them to disclose reliable and comprehensive information in a timely manner, resulting in even less corruption in lending. Therefore, our results suggest that, the positive impact of government banks on industrialization is improved in the presence of increased private monitoring.

Table 2.9: Corr. between Short-Run PMG Coefficients and Inst. Quality (State Banks)

	PEARSON	*SPEARMAN*
VARIABLES	*GBANK*	*GBANK*
BANKENTRY	0.0750	-0.0451
ECONFREE	0.2854	0.4532***
MONITOR	0.1797	0.3743***
PROPRITE	0.2635	0.3560***
ACCOUNT	0.1937	0.2160
GOV	0.3901***	0.4727***
LAWORDER	0.2392	0.0404
OFFICIAL	0.2105	-0.0158
RL	0.4239***	0.5256***
CORRUPT	0.3128*	0.2153
CC	0.3638**	0.4695***
GOODGOV	0.3656**	0.1532
PV	0.3449**	0.3783**
GE	0.5275***	0.4192**

Table 2.10: Government Ownership of Bank and it's interaction with measures of Institutional Quality

	1	*2*	*3*	*4*	*5*	*6*	*7*
Variables	*MVAGR*	*MVAGR*	*MVAGR*	*MVAGR*	*MVAGR*	*MVAGR*	*MVAGR*
BCON	0.123***	0.119***	0.124***	0.120***	0.117***	0.132***	0.118***
	(0.0331)	(0.0328)	(0.0333)	(0.0334)	(0.0323)	(0.0326)	(0.0327)
FBANK	-0.0667**	-0.0589**	-0.0738***	-0.0671***	-0.0696***	-0.0847***	-0.626***
	(0.0283)	(0.0289)	(0.0279)	(0.0285)	(0.0285)	(0.0289)	(0.0286)
GBANK	-0.168	-0.100	-0.0497*	-0.0664	-0.0669	-0.0406	-0.0571
	(0.242)	(0.102)	(0.0462)	(0.0457)	(0.0451)	(0.0447)	(0.0456)
GBANK×ECONFREE	0.0016						
	(0.0041)						
GBANK×PROPRITE		0.001					
		(0.002)					
GBANK×GOV			0.0907				
			(0.0641)				
GBANK×RL				0.0207			
				(0.0553)			
GBANK×CC					0.0257		
					(0.0506)		
GBANK×PV						0.0692*	
						(0.0409)	
GBANK×GE							0.0601
							(0.0579)
BNKDEV	-0.0174	-0.0294	-0.0257	-0.0196	-0.0234	-0.0545	-0.0216
	(0.0502)	(0.0500)	(0.0498)	(0.0502)	(0.0494)	(0.0502)	(0.0499)
GDPGR (-1)	0.421***	0.409***	0.413***	0.421***	0.399***	0.414***	0.413***
	(0.137)	(0.138)	(0.137)	(0.139)	(0.139)	(0.137)	(0.137)
EXPGDPGR	0.109***	0.106***	0.110***	0.108***	0.105***	0.113***	0.109***
	(0.0344)	(0.0342)	(0.0343)	(0.0343)	(0.0449)	(0.0339)	(0.0341)
IMPGDPGR	-0.0527**	-0.0509**	-0.0516**	-0.0514**	-0.0526**	-0.0498**	-0.0515**
	(0.0244)	(0.0243)	(0.0242)	(0.0243)	(0.0242)	(0.0239)	(0.0241)
INF	-0.160***	-0.157***	-0.160***	-0.158***	-0.148***	-0.170***	-0.152***
	(0.0445)	(0.0443)	(0.0444)	(0.0443)	(0.0449)	(0.0440)	(0.0445)
ECONFREE	-0.0229						
	(0.209)						
PROPRITE		-0.0549					
		(0.0243)					
GOV			-4.128				
			(3.259)				
RL				-0.429			
				(2.788)			
CC					1.259		
					(2.506)		
PV						-4.289***	
						(1.521)	
GE							0.588
							(2.976)
CONS.	4.131	5.911	2.582	2.959	4.011	2.959	2.891
	(11.129)	(4.907)	(3.775)	(3.788)	(3.806)	(3.746)	(3.783)
No of Obs.	372	372	372	372	372	372	372
R^2 *within*	0.229	0.231	0.233	0.220	0.232	0.247	0.234
R^2 *between*	0.002	0.003	0.002	0.005	0.001	0.000	0.008
F-Test	4.52	4.57	4.64	4.51	4.61	5.01	4.66

Note: The standard errors are reported in parenthesis and *,**,*** indicate significance at the 10%, 5%, and 1% level respectively. Period dummies are included but not reported. Columns 1, 2,3,4,5 indicate interactions between government ownership of banks and economic freedom, property rights governance, rule of law, control of corruption, political stability and government effectiveness respectively.

- *Property Rights (PROPERTY RIGHTS)*

The Spearman correlation suggests a positive significant relationship between the effect of state owned banks on industrialization and the protection of property rights. In column 2, the interaction term is insignificant. La Porta *et al*. (2002) suggest that the negative effects of state banks on productivity, growth and financial development are made worse where the protection of property rights are weak. Although, they do not suggest that government banks

in anyway have any positive effect on the economy, their propositions suggest that stronger protection of property rights can in some way improve the effect of state banks on economic growth. This provides support for our result by suggesting that better enforced property rights may improve the short-run positive effect of state banks on industrialization. However, the insignificant interaction term in the panel estimation suggest that the results are inconsistent.

- *Governance (GOV)*

The correlation coefficients suggest a positive and significant relationship between the effect of state banks on industrialization and the quality of governance. In column 3, the interaction term is insignificant. This result suggest that an improvement in the ability of governments to develop and apply sound policies, as well as improving the administration of relationships with private citizens is likely to improve the short-run positive effect of state banks on industrialization. The World Bank (2001) is one reference in the literature that has supported this view. However, the insignificant interaction term in the panel estimation suggests inconsistency in the results.

- *Official Supervisory Power (OFFICIAL)*

The correlation coefficients suggest an insignificant relationship between the effect of state banks on industrialization and official supervisory power. Barth *et al*. (2004) specifically suggest that the degree of state ownership of banks is positively associated with supervisory practices.[46] Also, Caprio *et al*. (2007) and Fernandez *et al*. (2010) emphasize the insignificant effect of official supervisory power on bank valuation and bank concentration. However, it has been argued that, where state banks have a negative effect on economic growth, official supervision is expected to be weaker. And to make reference to the World Bank again, they suggest that improving official supervision may facilitate positive results through state banks. The intuition from this results and the literature is that official supervision may only be beneficial for industrialization when effect of state banks is negative. However, when the effect of state banks on industrialization is positive, official supervision might only be required to maintain market discipline. The correlation coefficient may simply be suggesting that official supervision has no further influence on the mechanism through which state banks affect industrialization when the effect is positive. While not evident in our result, official supervisory powers may have a negative effect on this relationship if supervisors are corrupt.

[46] This positive relationship is assumed to further worsen the negative relationship of government ownership of banks with bank sector development, efficiency and stability.

- *Rule of Law (RL)*

The correlation coefficient suggests a positive and significant relationship between the effect of state banks on industrialization and the rule of law. In column 4, interaction term is insignificant. According to La Porta *et al*. (2002), one factor responsible for the negative effect of government ownership of banks is when the respect rule of society by economic agents is low. Put differently, when the rule of law is respected and effectively enforced, government banks become more important for growth. In line with this intuition, the correlation coefficient suggests that improving the rule of law index may improve the short-run positive effect of state owned banks on industrialization. However, the insignificant term in our panel estimation suggest inconsistency in the results.

- *Degree of Corruption (CORRUPT)*

The Pearson correlation coefficient suggests a positive and significant relationship between the effect of state banks on industrialization and the degree of corruption. In the literature, it has been argued that in countries with high levels of corruption, the performance of government owned banks is typically worse than that of private banks (Sapienza, 2004; Dinc, 2005; Micco *et al*. 2007; and Shen and Lin, 2012). It is therefore possible that the poor performance of government banks in both developing countries may be as a result to high levels of corruption. Our results seem to indicate that higher corruption levels may improve the short-run positive effect of government banks industrialization. This result is dubious. Normally, we would expect lower levels of corruption to improve the performance of government banks. However, it could be supported with the argument that corrupt behavior can positively influence an economy, by replacing bad governance. In other words, attacking corruption in countries with poor governance, could damage the informal economy (Houston, 2007).

- *Control of Corruption (CC)*

The correlation coefficients suggest a positive and significant relationship between the effect of state banks on industrialization and the control of corruption. In column 5, the interaction term is insignificant. These results are not suggesting that government banks are unaffected by corruption but in countries where politicians are answerable to the voters, corrupt government bank officials can't get away with a lot because the cost of corruption is political costly in these countries. So, the correlation coefficient would suggest that stronger control of corruption may improve the short-run positive effect of state banks on industrialization. The insignificance of the interaction term in our panel estimation makes the results inconsistent.

- *Good Governance (GOODGOV)*

The Pearson correlation coefficient suggests a positive and significant relationship between the effect of state banks on industrialization and an index of good governance. Inadequate governance has contributed to discredit the role of state banks in supporting the development of the domestic financial system. It has been argued that good corporate governance is equally important for state owned banks as it is for private banks. Most of the poor performance by state owned banks is associated with a lack of clear mandate, and a governance system that allows the presence of weak board of directors and management, which are subject to political intervention (Rudolph, 2009). Caprio *et al*. (2004), La Port *et al*. (2002) and Dinc (2005) provide evidence that show that state owned banks around the world that are characterized by poor managerial skills that are subject to government intervention in lending decisions. Therefore, the result suggests that good governance may improve the positive effect of state banks on industrialization.

- *Political Stability (PV)*

The correlation coefficients suggest a positive and significant relationship between the effect of state banks on industrialization and the level of political stability. In column 6, the interaction term is positive and significant, while political stability by itself is negative and significant. La Porta *et al*. (2002) provides some weak evidence that government ownership of banks is associated with political instability. They suggest that government ownership of banks may cause instability through political lending, or it may occur as a result of nationalizations. However, they don't examine the effect of political instability on government ownership of banks. If any category of bank is to withstand the negative effects of political instability, it would be government owned banks. Private Banks may be unwilling to lend during period of uncertainties, leaving government owned banks to be overburdened with rising amount of loans. So, while state owned banks may be able to withstand some of the effects of political instability, it may become less efficient in lending. Therefore, our result suggests that political stability improves the effect of state banks on industrialization. However, the significant negative effect of the political stability index makes our results inconsistent.

- *Government Effectiveness*

The correlation coefficients show a positive and significant relationship between the effect of state banks on industrialization and an index of government effectiveness. In column 7, the interaction term is insignificant. Government effectiveness is an indicator that has also been used to measure good governance. The relationship between state bank lending and good

governance might have two positions. According to Bertay *et al*. (2012), state bank lending is seen to be less procyclical than private bank lending, particularly in countries where the level of governance is good. Also, state bank lending is even seen to be countercyclical in high income countries. However, these results are based on lending data during a financial crisis. The second position is that government bank lending is improved in the presence of good governance. In other words, irrespective of what the level of governance is, the effect of state banks on industrialization is not affected. Our results, therefore, suggest that the government effectiveness improves the positive effect of government banks on industrialization. However, the insignificant interaction term in the panel estimation are inconsistent makes our result inconsistent.

2.5. CONCLUSION

Using a sample of 31 developing countries between 1995 and 2007, this chapter examines the role of bank market structure on industrialization. It also examines how the effect of bank market structure on industrialization varies across countries as a result of institutions, bank regulation and supervision. The long-run results indicate that bank concentration promotes industrialization, while foreign bank entry and state owned banks slow down the pace of industrialization in developing countries. However, the process through which bank market structure affects industrialization can be influenced by the nature of the legal environment and the quality of institutions.

Our results on the effect of bank market structure on industrialization contradict what is perceived in the literature. For example, banks with market power can finance industrialization as opposed to policies that promote competition in the banking market because their ability to adequate profits enables them to lend to lend to small firms and long-term capital projects. Our results on foreign ownership of banks are equally not in line with what the literature suggests. Foreign bank entry reduces overall volume of credit available for lending in the market as opposed to promoting financial development and economic growth. Small and informationally opaque firms are the most likely to suffer as a result of foreign bank entry because foreign banks in developing countries its lending is "cream-skimmed" benefitting mainly large and transparent firms. The entry of foreign banks may slow down the rate on industrialization because small and informationally-opaque firms become more credit constrained.[47]Our result for state ownership of banks is negative and seems to be consistent

[47] Small and informationally-opaque firms make up the bulk of manufacturing firms in developing countries, so if foreign bank entry makes them credit-constrained, industrialization would be negatively affected.

with the literature. However, since state ownership of banks may be an outcome of weak institutional quality or market failures, the interpretation that state ownership of banks is bad for economic growth might be misleading. The presence of state banks is to improve or soften an already bad situation. Even if we assume that state banks have a positive effect on industrialization, this effect might not be enough to completely offset the negative effect of market failures or low institutional quality, resulting in a negative coefficient.

The policy implications for our findings so far are as follows: first of all, competitively-driven large banks with market power and so high concentration promotes industrialization; second, foreign banks should be a concern for policy makers in developing countries because of their lending approach, which makes a large number of manufacturing firms credit-constrained, resulting in a negative effect on industrialization; finally, rather than implement policies that promote the privatization of state banks, policy makers should be more concerned with creating an environment where market failures are minimal and developing capacities to improve institutional quality.

We draw your attention to the fact the each bank market structure has an opposite effect on industrialization in the long-and short-run. We try to reconcile long-and short-run results for each bank market structure in section 2.4.2.3. A recap of the short-run results suggests that bank concentration has a negative impact on industrialization, while foreign bank entry and state ownership of banks positively influence industrialization. The negative short-run effect of bank concentration can be linked to its oligopolistic nature where it negatively affects the economy through the credit market by reducing the total amount of loanable funds available to firms. On the other hand, the positive short-run effect of foreign banks entry is linked to the fact that it has the capacity to promote financial development and spur economic growth in developing countries. The argument in favour of the positive short-run effects of state ownership of banks on the economy is that state banks can certainly be seen as a response to institutional deficiency. At extremely low levels of institutional quality, government could use state banks to revive financial and economic development.

We go further by examining the short-run relationships between bank market structure on industrialization and institutions, bank regulation and supervision. For robustness, we also explore this relationship in a panel data setting using interaction terms. For example in Table 2.5, the correlation coefficients suggest that good institutions soften the negative effects of bank concentration on industrialization. However, these results are weakly robust and not consistent because only about 30 percent of the relationships are significant. The interaction

terms in the panel estimation suggest that good institutions improve the positive effect of bank concentration on industrialization. However, in four of the estimations in Table 2.6, effect of good institutions by itself on industrialization is negative and significant. It is difficult to reconcile the positive interaction terms and the negative institutional effects in the panel estimation. In other words, the results suffer from weak robustness and inconsistency.

In Table 2.7, the correlation coefficients suggest that good institutions improve the positive effects of foreign banks on industrialization. The level of consistency and robustness is better than that of bank concentration but only about 50 percent of the relationships are significant. The interaction terms in the panel estimations of Table 2.8 equally suggests that good institutions improve the positive influence of foreign banks on industrialization. However, only three of these estimations have significant interaction terms and the problem of negative significant institutional variables exist.[48] Similar to results in bank concentration, we are unable to reconcile these results, and are therefore classify them as weakly robust and inconsistent.

Finally, in Table 2.9, the correlation coefficients suggest that good institutions improve the positive effect of state banks on industrialization. Compared to the other two banking market structures we have considered, the results show stronger consistency, although over 40 percent of the relationships are insignificant. However, in Table 2.10, of the seven estimations, only one has a significant interaction term[49] but it equally suffers from a negative significant institutional indicator. While the correlation coefficients seem to be fairly consistent, the panel estimations suffer from lack of robustness. Results are equally difficult to reconcile.

In general, while these results suggest good institutions improve the positive effect of bank market structure on industrialization (or reduce the negative effects), it also suggest that good institutions have a negative effect on industrialization. How is it possible for good institutions to improve how bank market structure affects industrialization when, considered on their own, they have either a negative effect or no effect at all? The inconsistencies and lack of robustness of good institutions is the most important aspect of our study. The chapter finds that the evidence in support of so-called 'good institutions' to economic development is not robust. While this finding is not novel, similar contributions are still relatively rear. Moreover, the particular investigation of this chapter – which relates institutional quality to

[48] Only one of the estimations seems to be consistent, control of corruption in column 4 because the institutional indicator is insignificant.
[49] Political stability in column 6.

bank market structure and industrialization, is novel. In other words, the combination of the approach and the ensuing econometric results constitute a useful addition to the literature.

There is some evidence in the literature to suggest that institutions matter for growth and development, but according to Aron (2000), the process of integrating institutions and institutional change into economic theory is still relatively new. Therefore, channels through which institutions affect development is still not well or fully understood (Jutting, 2003). In other words, according to Helpman (2004), more research on the channels through which institutions affect development and the relationship between institutions is required. However, large cross-country studies that are evident in the literature might not be the most appropriate way to examine mechanisms and processes that lead to development (Bardhan, 2005).

In the recent literature, some cracks have begun to appear on the importance of good institutions for development. For example, Khan (2008) does not find any significant difference in the scores of good governance when he compares high-and low-growth developing countries. Also, Angeles (2011) argues that property rights may not be as important for development as many studies claim it to be. Finally, Bhaumik and Dimova (2013) criticize the classification of institutions into 'good or bad' by suggesting that a 'bad' institution like the protection of employee rights which is seen to have a negative impact on macro variables may well improve production efficiency when firm-level data is used. On the other hand, they show that a 'good' institution like a better business environment which may be good for macro variables, may actually hurt the production efficiency of firms.

The inconsistencies in our results suggest that the 'good institutional' approach to policy reform is wrong: good institutions are certainly beneficial but they should not be policy priorities.

This study is not without drawbacks. A key drawback is that time series are not available for some of the most important institutional variables that have been widely used in the literature, particularly variables on regulation and supervision in the banking system. Also, a possible drawback of the analysis is that it is cross-country. The 'good-institution' approach to economic development is largely based on cross-country studies and the associated problems are that institutional quality is not well-defined and measured and the heterogeneity across country-samples is not seriously considered when estimating empirically. Also, since there is an argument that studies on institutions should not be cross country because there are no

optimal institutions and the same function can be performed by different institutions. The literature has argued that the problems associated with financial liberalization policies in many developing countries can be linked to weak institutions and poor bank regulation and supervision. Further research on how good institutions affect financial liberalization policies which shape up the banking market would improve this study by providing deeper insight. For example, through more times-series studies on institutions and economic development.

APPENDIX

Appendix 2.1: List of Countries and Bank Market Structure

country	*BCON*	*FANK*	*GBANK*
Argentina	37.84994	34.46154	33.09231
Bolivia	56.22365	29.61539	21.5
Brazil	44.11658	18.38461	48.34615
Cameroon	74.27174	77.53846	41.16154
Chile	49.58051	26	12.89231
China	74.15365	0.976923	88.01539
Colombia	39.68378	18.15385	17.64692
Costa-Rica	65.82275	21	67.95308
Ecuador	68.07567	7.076923	17.58077
Egypt	57.0677	8.692307	64.83231
Ethiopia	87.66412	0.246154	72.30385
India	34.62122	3.703077	81.58462
Indonesia	51.77898	14.53846	41.59077
Iran	87.4584	0.0000	100.00
Jordan	87.13157	4.086538	14.83077
Kenya	57.36552	38.23077	1.138077
Korea Republic	40.36131	10.90769	30.10923
Malawi	90.70892	23.84615	30.07846
Malaysia	43.22022	16.30769	1.542308
Mauritius	80.23518	42.69231	1.542308
Mexico	62.28733	48.76923	0.813231
Morocco	62.44783	16.69231	29.06615
Pakistan	56.12247	14.53846	43.84615
Peru	67.79322	77.15385	6.818461
Philippines	70.95197	6.846154	12.80385
Senegal	70.88318	71.38461	0.813231
South Africa	85.20609	5	1.138077
Tanzania	58.73573	75.53846	26.77461
Thailand	48.18151	6.076923	25.87231
Tunisia	46.55404	15.07692	52.43462
Uruguay	53.66583	47.84615	44.79923

Appendix 2.2: Summary Table for Institutional Variables

INSTITUTIONAL INDICATORS	***BCON***	***FBANK***	***GBANK***
*Entry into banking requirements index**	✓	✓	✓
*Regulatory restrictions on activities and ownership**	✓		
*Regulatory restrictions on ownership**	✓		
Economic freedom index	✓		✓
*Private monitoring index**	✓	✓	✓
*Accounting and information disclosure **	✓	✓	✓
Property rights index	✓	✓	✓
Quality of institutions index	✓	✓	✓
*Law and order index**	✓	✓	✓
*Official supervisory power**	✓	✓	✓
Banking freedom index	✓		
Rule of law index	✓	✓	✓
*Degree of corruption index**		✓	✓
Control of corruption index		✓	✓
*Good governance index**		✓	✓
Regulatory quality index		✓	
Political stability index			✓
Effectiveness of government index			✓

* indicates institutional indicators without time variation or are available an average over a selected time period.

Appendix 2.3: Hausmann Test of no difference between Mean Group and Pooled Mean Group Estimates:

Variables	*(b)* *Mean Group*	*(B)* *Pooled Mean Group*	*(b-B)* *Difference*	*sqrt(diag(V_b-V_B)* *S.E.*
BCON	-0.020	0.042	0.062	0.193
FBANK	0.216	-0.051	0.267	0.281
GBANK	0.530	-0.048	0.578	0.320
BNKDEV	1.295	0.112	1.183	0.782
GDPGR	0.540	0.124	0.416	1.800
TRADE	1.295	0.127	1.168	0.556
HUMCAP	2.977	0.916	2.061	2.798

b = consistent under Ho and Ha; obtained from xtpmg
B = inconsistent under Ha, efficient under Ho; obtained from xtpmg
Test: Ho: difference in coefficients no systematic
chi2(1) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 0.26
Prob>chi2= 0.3834
(V_b-V_B is not positive definite)

Appendix 2.4: Panel unit root for all variables in the regression, 1995-2007.

	Im *et al*. (2003)		Pesaran (2003)	
Variables	*Statistics*	*P-values*	*Statistics*	*P-values*
MVAGR	-2.883	0.000	-1.818	0.009
BCON	-3.009	0.000	-1.899	0.018
FBANK	-3.448	0.000	-2.327	0.000
GBANK	-2.797	0.000	-1.799	0.034
BNKDEV	-2.364	0.000	-2.167	0.011
GDPGR	-3.341	0.000	-2.034	0.055
TRADE	-2.778	0.000	-2.474	0.000
HUMCAP	-3.363	0.000	-2.258	0.000

Notes: We used the 'xtunitroot ips' command in stata for the first generation unit root test and the 'pescadf' command in stata for the second generation unit root test.

Appendix 2.5: Panel cointegration test results, 1995-2007 (Persyn and Westerlund, 2008).

BCON			***FBANK***			***GBANK***		
Test	*Value*	*P-value*	*Test*	*Value*	*P-value*	*Test*	*Value*	*P-value*
G_t	-16.279	0.000	G_t	-15.636	0.000	G_t	-8.121	0.000
G_a	-19.318	0.000	G_a	-9.532	0.008	G_a	-11.031	0.000
P_t	-23.463	0.000	P_t	-28.606	0.000	P_t	-17.189	0.000
P_a	-21.913	0.000	P_a	-12.525	0.000	P_a	-9.185	0.000
BNKDEV			***GDPGR***			***TRADE***		
Test	*Value*	*P-value*	*Test*	*Value*	*P-value*	*Test*	*Value*	*P-value*
G_t	-47.863	0.000	G_t	-38.926	0.000	G_t	-6.380	0.000
G_a	-11.076	0.000	G_a	-11.539	0.000	G_a	-11.191	0.000
P_t	-17.385	0.000	P_t	-25.062	0.000	P_t	-15.757	0.000
P_a	-8.566	0.000	P_a	-10.553	0.000	P_a	-10.461	0.000
HUMCAP								
Test	*Value*	*P-value*						
G_t	-6.995	0.000						
G_a	-13.202	0.000						
P_t	-20.734	0.000						
P_a	-14.962	0.000						

Notes: We use the 'xtwest' command from stata to show the outcomes of the cointegration tests between industrialization and the independent variables. The Westerlund (2007) tests are implemented with *MVAGR* as the dependent variable. The test regression is fitted with a constant, the first to second lag, and 0 to the third lead. The Kernel bandwidth is set according to the rule $4(T/100)^{2/9}$.The P-values are for one-sided test based on the normal distribution. The G_t and test statistics test the null hypothesis of no cointegration for all cross-sectional units against the alternative that there is cointegration for at least one cross-sectional unit. Rejection of the null should therefore be taken as evidence of cointegration in at least one cross-sectional unit. The P_t and P_a test statistics pool information over all the cross-sectional units to test the null of no cointegration for all cross-sectional units against the alternative of cointegration for all cross-sectional units. Rejection of the null should therefore be taken as evidence of cointegration for the panel as a whole.

Appendix 2.6: Variable Description

GDP GROWTH

The GDP growth *GDPGR* is measured as the growth in real GDP. GDP growth proxies for economic performance as well as market demand growth. Early studies on economic development suggest that economic growth is associated with a structural transformation of the economy from agricultural and primary production to manufacturing (Clark, 1983; Kuznets, 1966). Syrquin and Chenery (1989) also associate industrialization with a distinct pace of economic growth. It has been established during periods of significant economic growth, the size of the domestic market increases, subsequently

leading to an increase in the demand for goods and services, firms would earn more profit and create an influx into the industry and generally have spillover effect on the manufacturing sector. Sustained economic growth also ensures that the manufacturing sector growth is sustained. Other factors of economic growth that could benefit industrialization include macroeconomic stability and the provision of adequate infrastructural facilities.

TRADE

International trade or trade openness *TRADE* is measured as the ratio of the sum of export and import to GDP. The theoretical literature suggests that under the right environment, trade openness can have a positive effect on industrialization through technology spillovers, and R&D (Rivera-Batiz and Romer, 1991a, b; and Romer, 1990), and Coe *et al*., (1997) have provided empirical evidence for this. Further empirical evidence on the positive relationship between trade openness and industrialization include Dodzin and Vamvakidis (1999); Dollar (1992); Sachs and Warner (1995); Edwards (1998), and Frankel and Romer (1999). It has also been argued that trade openness reallocates productivity from agriculture to manufacturing in developing countries (Dodzin and Vamvakidis, 2004). However, there have been studies which criticize the positive relation between trade openness and industrialization. For example, Edwards (1993) and Rodriguez and Rodrik (1999) have criticized empirical studies which find a positive relationship between trade openness and industrialization. Their criticisms are based on the grounds of estimation techniques, endogeneity and measurement errors, vague measures of trade openness, and poor proxies for trade restrictions. Another strand of the literature suggest that trade openness may have a negative effect on industrialization (Greenaway *et al*. 1997; and Shafaeddin, 2005). The negative effect of trade openness or trade liberalization on industrialization has often been associated with political instability, contractionary macroeconomic policy after reforms and protecting domestic sectors from unnecessary adjustments (Harrison, 1996; Wacziarg and Welch, 2008). In other words, the effect of trade openness on industrialization is ambiguous and could have a positive, negative or no effect on industrialization.

EXPORTS and IMPORTS

The impact of exports *EXPGDP* and imports *IMPGDP* on economic growth and development is an aspect of the international trade literature. Previously, we have shown that an increase in international trade or trade openness spurs economic growth and development. In the first instance, we would expect both variables to positively affect economic growth in developing countries. The intuition goes along this line: developing countries would initially export primary products (including fuel) to generate export revenues which are beneficial for economic growth. The export revenues are therefore used to import intermediate and advanced technological goods which are used to improve the standard of domestic manufacturing with the prospect of competitively exporting manufactured products. In other words, exports and imports might have positive effect on economic growth.

However, it is also possible that the exports for developing countries (be it in primary or manufactured form) might negatively affect economic growth if it faces price competition that would damage its balance of trade payments. Also, importing goods into sectors that are not efficient to exploit the benefit of improved technology might also be detrimental for economic growth. Another aspect of the literature suggests that increased exports are more beneficial to growth and productivity than increased imports. For example, Harrison (1996) states that a majority of micro studies have shown that increased exports is positively associated with productivity growth while, this relationship tends to be negative in the case of imports. Also, Santos-Paulino and Thirtwall (2004) find that trade openness facilitates the growth of exports, but stimulated the growth of imports by more, resulting in a worsening of balance of trade payments and leading to a fall in growth of output and living standard.

On the contrary, While Thangavelu and Rajaguru (2004) find that trade has important implications for productivity and output growth in an economy, they find that it is imports that are more positively influential in the association between trade and output growth in a selection of rapidly growing Asian economies. Their results suggest that imports and exports have qualitatively different effects on labour productivity. First of all, the long-run results indicate that exports do not cause labour productivity growth in Hong-Kong, Indonesia, Japan, Taiwan, and Thailand; thus indicating that there is no export-led productivity in these countries. On the other hand, they find that imports significantly causes labour productivity growth in India, Indonesia, Malaysia, Philippines, Singapore and Taiwan; indicating import-led productivity growth. In other words, they suggest imports to be more important for productivity and output growth.

It has also been established that while exports positively affect economic growth, this effect is most accounted for by manufactured exports, rather than the exports of primary products (i.e. including fuel and non-factor services) (Fosu, 1996). However, Soderbom and Teal (2003) find no evidence that manufactured exports are associated with economic growth in Africa, although they find an association between exports and income levels. They further argue that factors that have limited the success of African manufacturing firms in exporting are their levels of efficiency and small size. In other words, the impact of exports and imports on industrialization would depend on country specific factors.

HUMAN CAPITAL

Human capital *HUMCAP* has been established as important determinant of growth and productivity. When measured as educational level, it is seen to improve the productivity of firms both in the manufacturing sector and the non-manufacturing sectors (Black and Lynch, 1996). However, it has been found that human capital has an insignificant negative effect on economic growth when using a Cobb-Douglas production function; but it has a significant positive effect on total factor productivity growth through the rate of domestically produced technological innovation and the speed of adoption of technology from abroad (Benhabib and Spiegel, 1994).

Human capital has been measured mainly by educational stock and flow variables that have been made available by Barro and Lee. Also, expenditure on education as well as health has been used as measures of human capital that indirectly affects economic growth positively. Baldacci *et al*. (2008) measure human capital as education and health expenditure. They find that both measures have a direct positive and significant effect on education and health capital, and an indirect impact of growth. They also find that that increasing education expenditure by 1 percentage point of GDP is associated with 3 more years of schooling and on average increases GDP per capita by 1.4 percentage points in 15 years. Likewise, increasing health expenditure by 1 percentage point of GDP is associated with an increase of 0.6 percent in the under-5 year child survival rate and an increase of 0.5 percent point in annual per capita GDP growth. Rivera and Currais (1999) also confirm the indirect positive effect of health expenditure on economic growth. In other words, we would expect the level of human capital to be positively associated with industrialization.

Appendix 2.7: Scatter Plots showing the relationship between Manufacturing Value Added Growth and Bank Market Structures over different time periods

Figure 1

Figure 1A

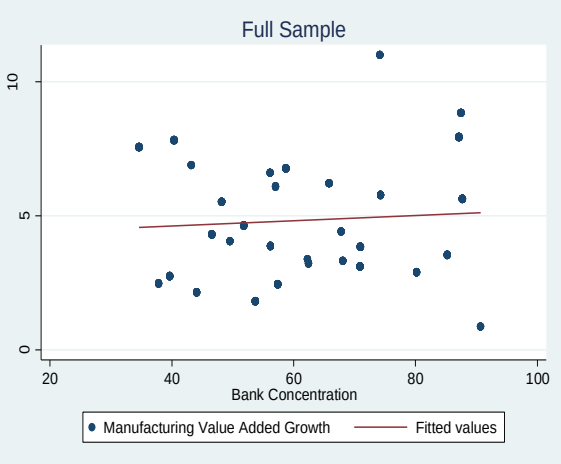


Figure 1B

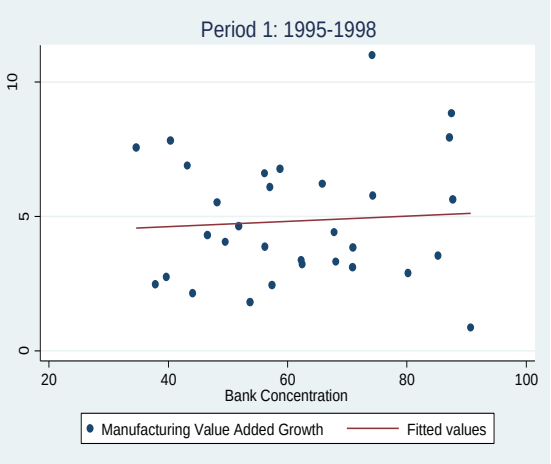


Figure 1C

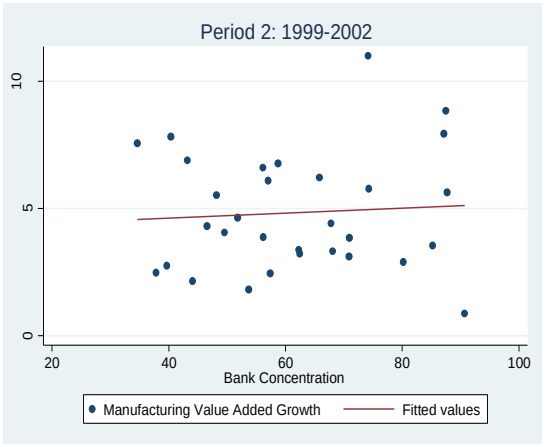


Figure 1D

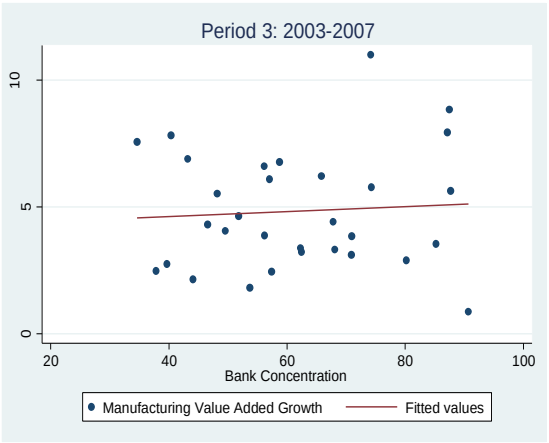


Figure 2

Figure 2A

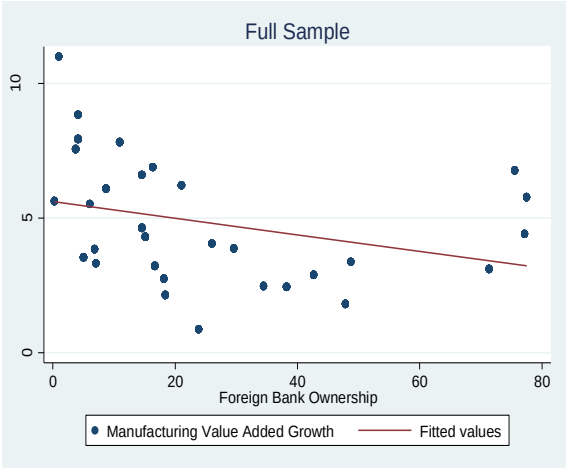


Figure 2B

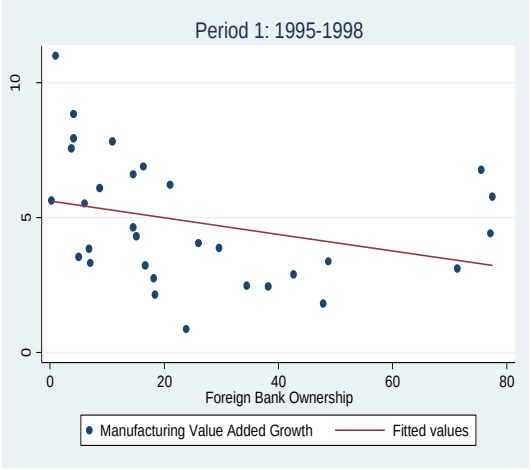


Figure 2C

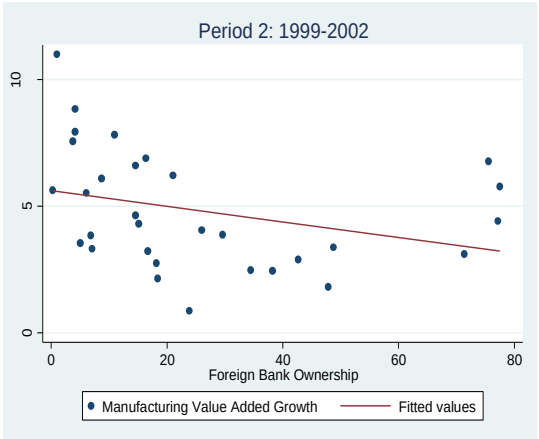


Figure 2D

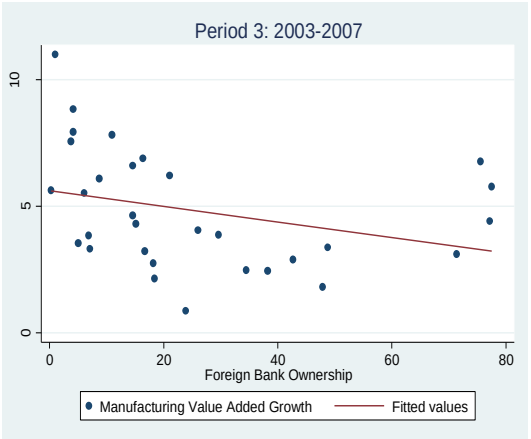


Figure 3

Figure 3A

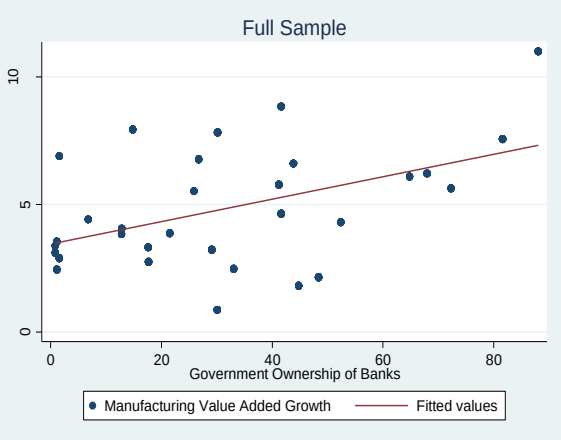


Figure 3B

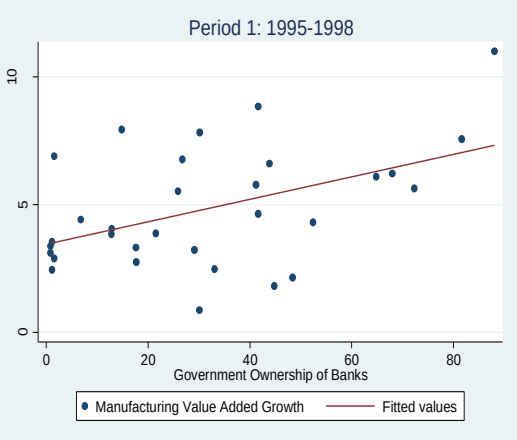


Figure 3C

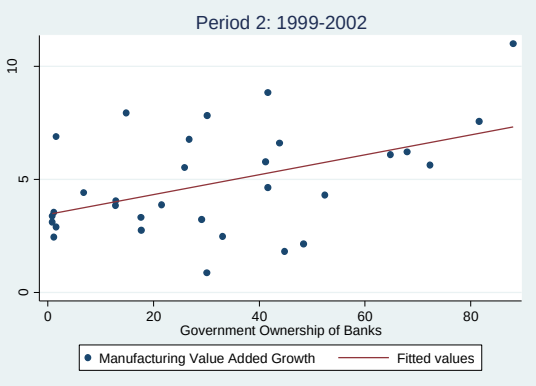
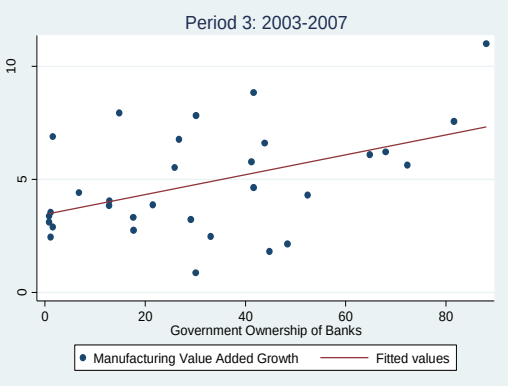


Figure 3D



In Figure 1, Figure 1A shows a positive, albeit weak relationship between bank concentration and manufacturing value added growth. This relationship doesn't change when we split the sample into three subsamples (1995-1998, 1999-2002, 2003-2007) as shown in Figures 1B, IC and ID. We experience the same pattern in Figures 2 and 3, where under different subsamples; the relationship between foreign bank ownership/government ownership of banks is negative/positive. It is therefore fair to suggest that the relationships are stable over different subsamples of the time period.

CHAPTER 3: BANK MARKET STRUCTURE AND INDUSTRALIZATION IN DEVELOPING COUNTRIES: EVIDENCE FROM INDUSTRY-SPECIFIC DATA

3.1. INTRODUCTION

Important contributions to the literature try to explain which financial structure is more appropriate for economic development. Rival financial structures in the literature have been taken to be bank-based and market-based financial systems.[50] The relationship between financial structure and economic development can be traced to Goldsmith (1969). In that study, he attempted to examine how financial structure changes as the economy grows and to how it contributed to rapid economy development. While his was work was one of the early ones to establish a relationship between economic growth and financial development, it has been criticised on the grounds that the number of countries was too limited[51] and that did not robustly control for other factors that might affected economic growth. In this chapter, rather than consider the broad bank-based or market-based views, we examine some mechanisms (bank concentration, foreign bank entry, and state ownership of banks) through which banks can finance industrialization. We clearly try to examine the role of bank market structures in industrialization while taking note of industry-country specific characteristics.

The main objective in this chapter is to examine how banking and ownership structures affect industry growth and the creation of new establishments in the manufacturing sector. A cross industry-country panel is utilized to examine this. While it is essential to examine characteristics of the banking sector that influence the growth and structure of the manufacturing sector, it is equally essential to examine the characteristics of the manufacturing sector that are directly influenced by finance from the banking sector, that in the long run, leads to increased economic growth.

[50] A number of these studies include: Goldsmith (1962), He tried to examine how financial structure changes as the economy grows, the overall impact of financial development on growth, and weather financial structure (bank-and market-based financial systems) influenced the pace of growth; Levine and Zervos (1998), they examine if well-functioning stock-markets and banks promote long-long growth; Allen and Gale (199), they compare the effectiveness of financial markets and financial intermediaries in financing new industries and technologies in the presence of diversity of opinions; Demirguc-Kunt and Levive (2001), they examine how well financial systems (bank-based and market-based) function for long-run economic growth but they take note of the quality of institutions; Demirguc-Kunt and Maksimovic (2002), they examine the effect of bank-based and market-based financial systems on firm growth; Levine (2002), he compares the effectiveness of bank-based and market based financial systems; and Luintel *et al*. (2008), they examine the impact of bank-based and market based financial system on growth but by using time series and dynamic heterogeneous panel models.

[51] The United States, the United Kingdom, Germany and Japan.

In a pivotal study by Rajan and Zingales (1998), financial-dependent industries are assumed to growth faster in countries where the level of financial development is higher. In this study, the dependence of external finance across industries is assumed to be determined by technological reasons, and that technological differences across industries are similar across countries. For example, external financial dependence for the medical, precision and optical instrument industry in the United States is assumed to similar to that in Kenya. What we try to do in this chapter is to investigate whether there are other characterizations, besides external finance dependence (if indeed such a characterization is valid) that should be common to sectors that benefit from financial development.

The rationale for testing for other industry-specific characteristics which might be expected to benefit from financial development is based on the assumption the the industry characterization of external finance dependence might not be valid. The index has been criticized on some grounds: firstly, a more appropriate microeconomic database should have been used to construct the index; secondly, differences in the index across industries are not mainly attributed to technological/structural factors; thirdly, technological/structural differences of the index across industries cannot be the same across countries when country-specific institutional structures and policy reforms, which may determine external finance dependence in some industries have not been considered; and lastly, capital expenditure data, a key component of the index, may undermine the actual level of firms' external finance dependence, in particular, developing countries.[52] These tests examine the generalizations about which sectors benefit from financial development or, to put it differently, are the effect of financial development more country-specific or industry specific?

3.2. THEORETICAL AND CONCEPTUAL FRAMEWORK.

3.2.1. Banking Market Structure and Economic Development

In the last decade or so, the literature on finance and growth has produced several areas of research which have been controversial. For example, as also highlighted in Chapter 2, the importance of concentration in the banking industry or the relevance of the ownership structure of banks-whether foreign, domestic or government ownership- for the relationship between finance and growth have emerged as important but debatable areas of research.

[52] These points have been raised by Von Furstenberg and Von Kalckreuth (2006) and Kabango and Paloni (2011) and the points will be discussed in section 3.2.2.

3.2.1.1. Bank Concentration and Industrial Characteristics

On the empirical relationship between bank concentration and industrialization, Cetorelli and Gambera (2001) find that bank concentration has a positive effect on industrialization. They explore the empirical importance of bank market structure on growth using a dataset similar to that of Rajan and Zingales (1998). First of all, they find that bank concentration has a 'first-order' negative effect on growth. However, results at the industry level prove that bank concentration affects manufacturing industries differently. They find that industries that depend more on external finance are positively affected by bank concentration. Also, Da Rin and Hellmann (2002) provide theoretical evidence for this. They introduce banks into the 'big-push' model to examine if banks that are profit-motivated would engage in financing industrial investments. The model develops a link between the role of banks and industrialization. They find that banks act as a catalyst for industrialization but they also emphasize that these banks have to be profit-driven, significantly large and with market power in the banking market.

On the other hand, studies suggest bank concentration to negatively influence industrialization include Beck *et al*. (2004) and Black and Strahan (2002). Beck *et al*. (2004) find that bank concentration increases financing obstacles, and this effect is worse for small and medium firms. Also, Black and Strahan (2002) suggest that policies which promote bank concentration might have a negative effect on new corporations, firm creation or firm entry.

External finance dependence[53] has been indicated as one of the key characteristics which determine the nature of the impact of bank concentration on industry growth. A significant number of papers provide evidence that industries that depend more on external finance are likely to growth faster in countries where the level of bank concentration is high. Cetorelli and Gambera (2001) are probably the first to provide empirical evidence for this. Specifically, they examine the effect of bank concentration on the growth of industries that depend more on external finance. With regards to industry- specific results, their study shows more financial dependent industries to benefit more from a concentrated banking market. Also, they find that industries under this category are expected to benefit from bank concentration in the form of increased average size but not growth in firm entry.

[53] See Rajan and Zingales (1998) for a detailed discussion on this theoretical industry-specific measure.

Other studies find a positive effect of bank concentration on financial dependent industries, see for example Cetorelli (2001), Cetorelli (2004) and Mitchener and Wheelock (2013). Cetorelli (2001) asks if bank concentration promotes the formation of industries composed of a few, large firms or, whether it facilitates the entry of new firms, thus upholding unconcentrated market structures across industries. His results specifically show that firms in sectors that depend more on external finance are of disproportionately larger in size if they are in countries with greater concentrated banking markets. Similarly, Cetorelli (2004) examines whether changes in bank competition have played a role on the market structure of non-financial industries in EU-member countries. His results suggest that where more mature firms require more external finance, they are disproportionately larger in size if they are in countries whose banking sector is more concentrated.

Mitchener and Wheelock (2013) examine the relationship between bank market structure and economic growth in a country with segmented markets (i.e. the United States) from 1899 through 1929. They find that bank market concentration generally exerted a positive influence on the growth of U.S manufacturing industries during this period. Also, they find that industries that were composed of smaller firms or firms with less access to capital markets relied more on banks for external finance and thus were more directly affected by concentration of banking markets. On the other hand, Claessens and Laeven (2005) find that greater competition in countries' banking system allows financial dependent industries to grow faster. In their study, they relate a structural measure of banking system competiveness (the methodology of Rosse and Panzar) to industrial growth. They find that external financially dependent sectors grow faster in more competitive banking systems. They also find no evidence that market structure -i.e. bank market concentration-help predict industrial sector growth.

In our review of bank concentration and external financial dependence, there is some evidence that bank concentration promotes the growth of industries that depend more on external finance (except in Classens and Laeven, 2005). There is also a substantial part of the literature which examines how bank concentration affects industrialization through firm entry, firm creation or entrepreneurship.

Studeis that find a positive effect of bank concentration on firm entry or entrepreneurship includes Bonaccorsi di Patti and Dell'Ariccia (2004) and Bergantino and Capozza (2012). Bonaccorsi di Patti and Dell'Ariccia (2004) investigate the effects of bank competition on the

creation of firms in the non-financial sector in Italy, while allowing for heterogeneous effects across borrowers characterized by different degrees of asymmetric information. First of all, they find that the relationship between bank market power and firms creation is bell-shaped. Secondly, they find that the bell-shaped relationship differs across industries characterized by different degree of opaqueness. Bank market power (or bank concentration) is more beneficial to firms in highly opaque industries, where the average effect is positive, and relatively less detrimental to the where the average effect is negative.

Similarly, Bergantino and Capozza (2012) investigate the impact of bank concentration on entrepreneurial initiative in the Central and Eastern European transition countries over the period 2000 to 2007. Their results suggest that bank concentration has a non-monotonic relationship with entrepreneurial initiative during this period. Bank concentration promoted entrepreneurship but, at very high levels of concentration, it could be harmful. The positive effect is actualized through two channels: a microeconomic channel-where banks develop a lending relation with start-up firms; and a macroeconomic channel - where banks with market power ensure stability in the banking sector.

On the other hand, a negative impact of bank concentration (or the positive impact of bank competition) on firm entry or entrepreneurship is detected in Cetorelli (2002); Black and Strahan (2002); and Cetorelli (2006). Cetorelli (2002) examines the role of bank competition on the life-cycle dynamics of non-financial industries and finds that more bank competition tends to promote job creation among industrial establishments at the entry stage and to permits them to proper shortly after they enter the market. At the same time, they find that more bank competition accelerates the exit of more mature establishments from the market. Similarly, Black and Strahan (2002) examine whether policy changes that promoted competition and consolidation helped or harmed entrepreneurs. Their results suggest that policies such as branching and interstate banking reform that promoted competition and consolidation in the banking sector helped entrepreneurship. They find that the rate of new incorporation in a state increased significantly following deregulation.

Finally, Cetorelli and Strahan (2006), while investigating how competition in the local banking market affects the market structure of non-financial sectors in the United States, find that more aggressive competition policies in the local U.S. banking markets that foster reduced concentration at the MSA (Metropolitan Statistical Area) - level and less restriction on bank entry at the state-level reduce the size of the typical establishment. They also find

greater competition to increase the share of establishments in the smallest size group and increase the total number of establishments. These studies are in line with theories that predict that greater bank concentration may represent a financial barrier to entry in the product markets.

The effect of bank concentration has also been related to firm opacity, factor intensity and asset type. For example, Ratti *et al*. (2008) is able to show the positive effect of bank concentration on non-financial firms. Primarily, they find that increasing concentration relaxes financial constraints on firm-level investment. Another finding in their study is that, while large firms are found to be less financially constrained than small firms, the effect of reducing financial constraints in both groups of firms through increased concentration is significantly not different. Finally, they find that, while the relaxation of financial constrains is greater in less opaque industries, this effect also accrues to firms in more opaque industries. In other words, bank concentration equally benefits small and large firms, as well as firms in less opaque and more opaque industries.

In terms of factor intensity, Lin *et al*. (2012) tries to empirically examine the ownership and the size-structure views on low banking efficiency in China. The ownership-structure view suggests that the large presence of government in the banking sector is responsible for its poor performance. On the other hand, the size structure view suggests that it is the unsuitable size structure that is responsible for low efficiency in the Chinese banking sector. Their results are consistent with the structure-size view. In particular, they find that more labour-intensive industries grow faster than more capital-intensive industries in provinces with more active banks compared to provinces with more dominant Big Four branches. We view this as greater bank competition fostering the growth of labour-intensive industries. Finally, with regards to asset type, Bergantino and Capozza (2012) shows that greater bank concentration is more suitable for financing physical-asset-intensive industries rather than high-technology, and R&D-based industries.

3.2.1.2. Foreign Bank Entry and Industrial Characteristics.

In Chapter 2, the literature survey suggests that foreign bank entry may have ambiguous effects for industrialization in developing countries. However, our findings suggest that foreign bank entry may slow down industrialization in developing countries, at least in the long-run. Other studies that emphasise the negative effect of foreign bank entry in developing

countries include Berger *et al*. (2001) and Mian (2006). On average, the net externalities as a result of foreign banks presence in developing countries are largely dependent on how competitive the local banks are in the long run. The inability of foreign banks to gain access to soft information on loan applicants induces them to only provide credit to firms with a credit history. This causes the pool of quality borrowers from domestic banks to be reduced. Moreover, banks will not be willing to take excessive risk by lending to applicants without a credit history. This reduces their zeal to lend and thereby reduces credit availability in the market.

On the other hand, Levine (1997) and Moreno and Villar (2005) argue that the presence of foreign banks may, together with economic stability, help the development of a healthy and sound financial system. Foreign bank entry may also have mixed effects on the domestic economy. For example, according to Havrylchyk (2012), foreign bank entry in Central and Eastern Europe is associated with lower entry rates of firms and smaller size of entrants in informationally opaque industries. However, he also shows that the effect of foreign banks on firm entry depends on the entry mode. The negative result above occurs when foreign banks enter through the acquisition of domestic banks. On the other hand, when foreign banks enter through Greenfield investments, they are positively associated with higher rates of start-ups in more opaque industries.

While foreign bank entry may or may not increase competition and credit availability in the domestic economy of developing countries, another question is how their entry affects industries. In other words, do all industries benefit equally from foreign bank entry, or are some industries more favoured? First of all, according to Beck *et al*. (2004) and Clarke *et al*. (2006), foreign bank entry may reduce financial constraints for all firms, including small and medium firms. Beck *et al*. (2004) finds that foreign bank presence dampens the effect of financing obstacles of firms of all sizes; while Clarke *et al*. (2006) point that all enterprises, including small and medium ones, report lower financial obstacles in countries having higher level of foreign bank presence.

On the other hand, foreign bank entry may only benefit industries that have certain characteristics. For example, according to Bruno and Hauswald (2013) and Taboda (2011), foreign bank entry may improve lending to industries with a high dependence on external finance and industries that are the most productive. According to the findings of Bruno and Hauswald (2013), industries that depend more on external finance perform significantly

better in the presence of foreign banks; while according to the findings of Taboda (2011), foreign bank ownership improves capital allocation efficiency by increasing lending to more productive industries. In other words, the most productive industries benefit from foreign bank entry.

However, it is also possible that foreign bank entry negatively affect industries with certain characteristics. For example, according to Berger *et al*. (2001), informationally opaque small firms in Argentina receive less credit from large banks and foreign banks; also, Satta (2004) specifically finds that, on average, foreign banks in Tanzania between 1991 and 2001 lent less to small firms (as a share of total lending) than domestic banks. Clarke *et al*. (2005) find that foreign banks devoted less of their lending to small businesses in Argentina, Chile, Colombia and Peru during the mid-1990s than domestic private banks, while Detragiache *et al*. (2008) finds that foreign bank presence is associated with less credit to the private sector. Finally, according to the findings of Giannetti and Ongena (2009), in Eastern Europe, foreign bank lending fosters growth in firm sales, assets and the use of financial departments, but they find this effect to be less for small firms.

On the whole, the literature is ambiguous on whether the impact of foreign bank entry on industry is uniform or differentiated across sectors. This is something that would be examined in the chapter.

3.2.1.3. Government Ownership of Banks and Industrial Characteristics.

The literature survey in the Chapter 2 mostly highlighted that state ownership of banks slows down growth and development, although there is some evidence that this effect might be positive. According to our findings, the effect of state banks on industrialization is negative in the long-run. However, because this effect is positive in the short-run, we interpret the results as ambiguous, since both interpretations are possible.

While state ownership of banks may be beneficial or detrimental for growth and development in developing countries, how would it affect industrialization through specific industries? In other words, would it affect industries uniformly or would the effect be industry-specific? First of all, while Cetorelli and Gambera (2001) find that government ownership of banks reduces the positive effect that bank concentration has for the promotion of growth of external finance dependent industries. Similarly, Galindo and Micco (2004) find no evidence

that state owned banks play a significant role in the development of industries that rely on external finance and/or that have less tangible assets to pledge as collateral. Beck and Levine (2002), on the other hand, find no evidence that state-owned banks promote industry growth or foster the formation of new establishments, particularly in labour-and capital-intensive industries.

Clarke *et al*. (2005) find no evidence that government owned banks surpassed private banks in lending to small firms in Latin America during the 1990s; Berger and Udell, (2006) show that a greater presence of foreign owned banks and a lesser presence of state owned banks is likely to be associated with significantly higher SME credit availability in developing countries; and Beck *et al*. (2008) find a weak relationship between development bank and government bank lending towards small firms.

Finally, Xiao and Zhao (2012) find that, in countries where the presence of state owned banks is high, bank development has a negative or an insignificant effect on firm innovation. On the other hand, Sapienza (2004) finds a positive effect of state bank lending to Italian firms; and Micco and Panizza (2006) find evidence that state owned banks may play a credit smoothing role. In other words, their lending is less responsive to macroeconomic shocks than lending of private banks.

In general, the effect of state owned banks industries that require more external finance or composed of small firms is ambiguous (negative or positive), or they might lend uniformly to all firms. These are aspects of the study which are empirically examined.

3.2.2. Methodological Approach

Previously, most empirical studies that identified a relationship between bank market structure and economic growth and development (mainly credit supply to firms) assume that the effects of bank market structure are heterogeneous across firms. In this chapter, we systematically analyse a greater variety of industry characteristics because external finance dependence, an industry characterization that has been largely used in the literature and has become essential for financial policy reforms, has been questioned on the grounds of construction and assumptions.

The theoretical measure of external financial dependence by Rajan and Zingales (1998) has been questioned in the literature by Von Furstenberg and Von Kalckreuth (2006) and Kabango and Paloni (2009). Von Furstenberg and Von Kalckreuth (2006) establish serious empirical uncertainty of the Rajan and Zingales measure of external financial dependence by trying to answer two research questions. First of all, they try to examine to what extent the microeconomic data used by Rajan and Zingales to describe the external financial dependence values of each sector is suitable to characterize the financing conditions in that entire sector for the United States. Secondly, they try to examine if the differences in the US external financial dependence values by sector are attributable to distinguishable factors that may possibly be considered as structural/technological?

They use aggregate data US industry-level data from the (US Department of Commerce) Bureau of Economic Analysis (BEA) to construct external financial dependence on a yearly basis for 21 industries between 1977 and 1997. Compared to their measure, they find that Rajan and Zingales measure poorly represents the macroeconomic nature of manufacturing sectors in the US, a country which the measure is based on. Also, they argue that the elimination of "cyclical" factors by Rajan and Zingales through aggregation is flawed. Rather, they adjusted their annual measure for each sector which results in better control and preservation of annual residuals that may comprise of relevant information that relates to non-cyclical characteristics.

Secondly, they criticize the attribution of structural or technological differences to only between-sector effects as suggested by Rajan and Zingales, rather than between-sector and within-sector effects. From their investigation, they find that between-sector effects explain only 70% of the total sum of squares of their measure, while the within-sector effects explain the remaining 30%. They also criticize the assumption of Rajan and Zingales that the difference in external financial dependence as a result of structural or technological reasons in the US is the same in other countries. They examine if differences in external financial dependence in manufacturing sectors in the US are as a result of structural or technological reasons based on the values of variables used in constructing their annual measure. When their variables are unweighted, they explain 59% of the between-group effect, while when they are weighted; the variables explain only 32% of the between-group effects, thereby emphasizing the importance of weighting. In other words, close to 70% of the between-sector difference remains unexplained. Finally, what explains sectoral differences is the growth rate

of the capital stock, which is not necessarily structural or technological. Also, variables like the share of intermediate inputs in gross output and the depreciation rate of the fixed stock of capital in a sector that could be regarded are structural or technological did not show any substantial signs of explaining sectoral differences. It is therefore difficult to assume that measure differs across industries as a result of technological factors.

In general, after using an alternative dataset, Von Furstenberg and Von Kalckreuth (2006) find that the measure by Rajan and Zingales does not sufficiently signify financial requirements in different industries in the manufacturing sector, that is including the United States, and secondly, they fail to find any evidence that the heterogeneity of external financial requirements across industries is based on technological or structural characteristics inherent to different industries according to the Rajan and Zingales measure.

Similarly, Kabango and Paloni (2009) are uncertain of the fact that this measure is assumed to be applicable for all countries. First of all, they argue that countries may have specific institutional features or policies which may determine how much the dependence of external financial dependence of certain industries would be. They give examples to suggest that structural or technological reasons may be just one factor that determines the sector differences in the dependence of external finance. First of all, they suggest that some industries may receive subsidies for strategic reasons, like the food industry, to promote trade and protect food security, or the fact that large firms who are major players in their industry may have better opportunities to finance, or even the fact that firms in joint partnership with foreign firms may have access to international channels of finance. They also argue that capital expenditure may underrate the actual level of firms' external financial dependence. They make reference to a work by Nissanke (2001) which examines financial development in some sub-Saharan Africa countries. In this study, Nissanke notes that political instability and an uncertain economic tendency greatly influences the manner, in which people save as well as how they invest, preferring safe investments which is characterized by self-insurance. Kabango and Paloni (2001) relate this to the fact that people in these countries borrow mainly for commerce and trading and not long-term capital investments.

In line with the two studies, we are of the opinion that the external financial dependence measure by Rajan and Zingales has significant limitations because it does not measure the true level of external financial dependence in industries; its level is not solely determined by structural or technological factors, and it cannot be applicable for all countries, particularly

developing countries. The insignificant interactions in our results may serve as further evidence of the limitations of this measure.

Our methodology examines how bank concentration, foreign bank ownership and government ownership of banks finance the expansion of and entry into industries that are heavily dependent on external finance, composed of small firms, labour-intensive, technologically-intensive, and of economic importance. We use a panel dataset of cross-country and cross-industry observations to examine the relationship between bank market structure and both industry growth and net firm entry.

In our panel data approach, we extend the Rajan and Zingales methodology to examine whether industries of different characterizations grow faster in countries where bank concentration, foreign entry and government ownership of banks are high. Industry performance is also represented by net firm entry or growth in the number of firms. New firms depend more on finance than mature firms. Therefore, growth in the number of firms in industries that are expected to benefit more from financial development would be sensitive to bank market structure. In our models, we create interaction terms between bank market structure and industry-specific characteristics. The interaction term interests us the most because it examines, for example when considering an interaction bank concentration and external finance dependence, whether industries that are more in need of external finance grow disproportionately slower or faster in countries where the level of concentration is high. Rajan and Zingales also point out that using an interaction between country and industry-specific characteristics in cross-country empirical studies is important because it enables one to make predictions about within-country difference between industries. Using interaction terms, therefore makes is possible to correct for industry and country-specific characteristics as well as control for problems of omitted variable bias and model specification. We employ the system GMM estimation technique to estimate the relationship bank market structure and industry performance.

3.3. EMPIRICAL FRAMEWORK

3.3.1. Model Specification

The empirical model estimates that industry growth and growth in the number of establishments are a function of the bank market structure, which affects them through

channels that have been discussed in the previous chapter. The chapter would help in determining whether cross-country variation in bank market structures can help in explaining cross-industry-country variation in industry growth and growth in the number of firms. Period dummies are also included to the model, to control for possible policy changes that have been employed over the period under consideration. The following regression is therefore estimated:

$$MVAGR_{ki,t} = \alpha + \delta_1 MVAGR_{ki,t-1} + \delta_2 BNKMKT_{it} + \delta_3 CV_{it} + \mu_{ki} + \lambda_t + \varepsilon_{ki,t}, \qquad (3.1)$$

where $MVAGR_{ki,t}$ is the annual growth rate of manufacturing industry value added in industry *k* and country *i*, between 1995 and 2007; $MVAGR_{ki,t-1}$ is the lagged value of the annual growth rate of manufacturing industry value added; $BNKMKT_{it}$ is the annual level bank concentration, foreign bank entry, and state ownership of banks in country i, between 1995 and 2007; CV_{it} is the annual level or growth rate of a set of conditioning variables between 1995 and 2007; μ_{ki} and λ_t are industry-country- and time-specific effects, respectively, where μ_{ki} may be correlated with the levels of the explanatory variables and is constant over time, and λ_t may capture global shocks.(they correct for industry-country- and time-specific effects that might determine industry growth/growth in the number of firms). This therefore isolates the effect that the interaction terms have on industry growth rates/growth in the number of firms relative to industry-country and time means patterns; and $\varepsilon_{ki,t}$ is the error term.

To estimate the effect of bank market structure on net firm entry, we specify the following model:

$$NFEGR_{ki,t} = \alpha + \delta_1 NFEGR_{ki,t-1} + \delta_2 BNKMKT_{it} + \delta_3 CV_{it} + \mu_{ki} + \lambda_t + \varepsilon_{ki,t}, \qquad (3.2)$$

where $NFEGR_{ki,t}$ is the annual growth of net firm entry in industry *k* and country i, between 1995 and 2007, while $NFEGR_{ki,t-1}$ is its lag.

In (3.1), the model examines an overall cross-country effect of bank market structure on industrial performance. To identify variability of this effect across industries based on industry-specific characteristics, we extend the model to include interaction terms between bank market structure variables and industry-specific characteristics. In other words, would certain industries perform better or worse as a result of bank concentration, foreign bank

entry and state ownership of banks? In general, does the heterogeneity across industries explain how bank market structures affect industry performance? We specify the following relationship using external finance dependence as industry-specific characteristics.

$$MVAGR_{ki,t} = \alpha + \delta_1 MVAGR_{ki,t-1} + \delta_2 BNKMKT_{it} + \delta_3 (BNKMKT_{it} \times ED_k) + \delta_4 CV_{it} + \mu_{ki} + \lambda_t + \varepsilon_{ki,t}, \quad (3.3)$$

where $(BNKMKT_{it} \times ED_k)$ is an interaction term between bank market structure i.e. bank concentration, foreign bank entry and state ownership of banks; and the measure of external finance dependence for industry *k*. On the other hand, in (3.2), to identify variability of the effect of bank market structure on net firm entry across industries, we extend the model to include interaction terms between bank market structure and industry-specific characteristics. We therefore specify the following model:

$$NFEGR_{ki,t} = \alpha + \delta_1 NFEGR_{ki,t-1} + \delta_2 BNKMKT_{it} + \delta_3 (BNKMKT_{it} \times ED_k) + \delta_4 CV_{it} + \mu_{ki} + \lambda_t + \varepsilon_{ki,t}, \quad (3.4)$$

The limited degrees of freedom supports the incorporation of the interaction terms separately or one at a time rather than at the same time

3.3.2. The Econometric Model

To estimate the equations above, we apply the Generalized Methods of Moments (GMM) estimator (Holtz-Eakin *et al*. 1998; Arellano and Bond, 1991; Arellano and Bover, 1995). First-differencing of the equations is recommended to eliminate the industry-country-specific effect (Arellano and Bond, 1991). Using the lagged values of the explanatory variables as instruments is recommended to reduce the problem of endogeneity. Supposing that the error terms $\varepsilon_{ki,t}$ are not serially correlated and that the regressors are not strictly exogenous, the following moment conditions can be applied:

$$E\left[\left(\varepsilon_{ki,t} - \varepsilon_{ki,t-1}\right) X_{ki,t-j}\right] = 0 \quad j = 2, \ldots, t\text{-}1;\ t = 3, \ldots, T \quad (3.5)$$

where X = [*BNKMKT CV*]. When the equations are first-differenced, we refer to the estimator as the difference estimator.

Nevertheless, a conceptual problem with the difference estimator is that it eliminates the cross-country relationship between manufacturing value added growth/net firm entry and

their determinants (Loayza *et al*. 2000 and Beck, 2002). Statistical problems associated with the difference estimator include: lagged levels are weak instruments when the explanatory and dependent variables are persistent over time; first-differencing tends to emphasize measurement error over signal; and differences are less correlated over time than levels which might produce biased estimates if the dynamic structure of estimated model differs from the true model (Alonso-Borrego and Arellano, 1996; Blundell and Bond, 1997; and Barro, 1997). To fix this theoretical and econometric shortcoming, a different estimator that combines the regressions in differences with regressions in levels in a system is recommended (Arellano and Bover, 1995).

The system estimator reduces the potential biases and imprecision associated with the difference estimator (Blundell and Bond, 1998). The lagged values of the explanatory variables remain instruments for the regression in differences while lagged differences are used as instruments for the regression in levels. The validity of these instruments is based on a further assumption: while it is possible that explanatory variables in levels may be correlated with the industry-country-specific effect in the equations, explanatory variables in differences are not correlated with the industry-country specific effect. The moment conditions for the regressions in levels are therefore:

$$E\left[\left(X_{ki,t-j} - X_{t-j-1}\right)\left(\varepsilon_{ki,t} - \mu_{ki}\right)\right] = 0 \quad j = 2, \ldots, t-1; t = 3, \ldots, T \qquad (3.6)$$

The system therefore consists of the combined regressions in differences and levels, with the moment conditions in (3.5) applied to the first part of the system, the regression in differences, and the moment conditions in (3.6) applied to the second part of the system, the regression in levels. In this study, we have not included any external instruments. We use those internally generated.

The lagged dependent variable has been included because the process may be dynamic. In other words, current values of manufacturing value added growth or net firm entry many have been influenced by past values (Roodman, 2009). The lagged dependent variable may also capture the influence of variables that have not been considered or are unobservable. The lagged-dependent variable for manufacturing growth is included to evaluate the impact of expected growth in manufacturing. Since it is the assumption that growth rates are highly correlated over time, it is realistic to suggest that manufacturing firms forecast future growth

using past growth (Dehejia and Lleras-Muney, 2007). On the other hand, lagged net entry is included to control for the pace at which firms enter and exit an industry as a result of the changing economic environment. The influx and outflow of firms in and out of industries (Geroski, 1995 and Cincera and Galgau, 2005) maybe triggered by a multiplier effect where future entry is as a result of past entry and future exit, a result of past exit (Johnson and Parker, 1994 and Hannan and Freeman (1989). For example, the perceptions of new entrants are positively linked to the experience of incumbents firms that operated in the industry previously.

The system GMM estimator is preferred to the two stage least squares (2SLS) or the difference estimators because it reduces the potential biases and imprecision associated with these estimators. Estimating (3.1) - (3.4) may result in several econometric problems that are handled better when using the system GMM estimator. First of all, since the bank market structure variables are assumed to be endogenous, causality may run from the bank market structure variables to industrialization and the other way round, resulting in a probable situation where the regressors are correlated with the error term. Using the 2SLS estimator may result in weak instruments, which are likely to bias the fixed-effect IV estimators in the way of the OLS estimators. The difference GMM estimator is a better estimator because it uses the lagged level of the explanatory variables, making the endogenous variables predetermined and therefore not correlated with the error term. However, in some cases, the instruments may be weak. The system GMM estimator reduces this bias.

Secondly, the presence of time-invariant country characteristics (fixed effects)[54], such as geography or demographics, may be correlated with the explanatory variables. The difference GMM estimator transforms the equation using first-differencing and the country-specific effects are removed, because it does not vary with time. However, this might also produce biased estimates, particularly when the dynamic structure of the model differs from the true one (Barro, 1997). Thirdly, the presence of the lagged dependent variable may give rise to autocorrelation. The difference GMM estimator caters for this because the first-differenced lagged dependent variable is also instrumented with past levels. However, the problem of bias estimates still exists. Finally, because our panel is unbalanced with a short time period, the system GMM estimator is suitable because it works well with unbalanced panels (no matter how many gaps), reduces data loss, and when the panel has a short time period.

[54] Industry-country specific effects in our case.

The consistency of the GMM estimator depends on the validity of the assumption that the error term does not exhibit serial correlation and on the validity of instruments. We apply two tests proposed by Arellano and Bond (1991) to test for these assumptions. The first is a Sargan test of over-identifying restrictions, which tests for the overall validity of the instruments by analyzing the sample analog of the moment conditions used in the estimation procedure. However, for robust GMM estimations, the Sargan test statistic is inconsistent. Therefore, the Hansen *J* test of over-identifying restrictions is utilized in the study. The second test examines the assumption of no serial correlation in the error term. It tests whether the differenced error terms are second-order serially correlated. Failure to reject the null hypothesis of both tests gives support to the model.

Finally, in the specifications, we have treated the bank market structures variables as endogenous, while we treat the other conditioning variables as exogenous. Issues might be raised over why GDP growth has been treated exogenously. Bernanke and Gurkaynak (2001) and argue that, because long-run growth is significantly correlated with behavioral variables like the savings rate, it should be treated endogenous variable rather than an exogenously. They state this argument because in their model, they see saving rates to depend on growth rates rather than the other way round. However, a study by the Food and Agricultural Organization of the United Nations (2006) suggest that GDP can be treated either exogenously or endogenously in regressions. For example, they suggest that GDP can be treated endogenously when analyzing the impacts of policy shocks (e.g. trade liberalization, technological changes, resource endowment changes and fiscal or financial policy changes). On the other hand, GDP can be treated as exogenous when analyzing the impact of overall economic growth on the performance of individual sectors and trade. In line with this argument, we treat GDP growth exogenously, because we analyse its impact on the performance of the manufacturing sector.

3.3.3. Variable Descriptions

The bank market structure and conditioning variables have been described in Chapter 2. Therefore, in this chapter, only the dependent variables and the industry-specific variables will be described. Also, the data is in 3 dimensions: cross-industry; cross-country and across yearly time periods.

1. Manufacturing Value Added Growth (at Industry Level)

The variable $MVAGR_{ki}$ was previously discussed in Chapter 2 but at country level. At industry level, it is measured as the log difference of value added in industries on a yearly basis between 1995 and 2007. Data is from the United Nations Industrial Development Organization (UNIDO).

2. Net Firm Entry (Growth in number of Establishments)

Many studies emphasize the ability of banks to influence industry performance through the promotion of the establishment of new firms. The establishment of new firms in industries can therefore be determined by how much banks protect established firms. When banks are able to obtain inside information about firms, this increases their ability to extract informational rents, resulting in an extraction of significant shares of firms' profits (Hellwig, 1991 and Rajan, 1992). Cross-country data on the number firms in an industry is not available so we make use of cross-country data on the number of establishments in an industry available from UNIDO. Net firm entry $NFEGR_{ki}$ can simply be described as the percentage change in the number of establishments in an industry. In line with Beck and Levine (2002), we have measured net firm entry as the log difference of the number of establishments on a yearly basis between 1995 and 2007:

$$NFEGR_{ki} = Log\left(\frac{n_{k,t}}{n_{k,t-1}}\right) \qquad (3.7)$$

where $n_{k,t}$ is the number of establishments in industry *k* at time *t*. Theoretically, it has been suggested that the entry of firms into an industry is dependent on the conditions on entry. In other words, greater obstacles to entry will discourage the entry of new establishments while reduced obstacles to entry will motivate the entry of new firms to an industry. The entry of firms is largely dependent on industry conditions and the overall economy. As we have identified from the literature, the effect of bank market structure on entry remains ambiguous. In the previous section, we provide some discussion on why previous entry and exit may influence future entry and exit.

3. External Financial Dependence

While we would have preferred actual data on external financing across countries, particularly for developing countries, it is not available. However, Rajan and Zingales (1998) suggest that even it were available, it would reflect the equilibrium between the demand for

external funds and its supply rather just the demand for external funds. For this reason, they use data on manufacturing industries in the United Stated to calculate a measure of external finance dependence across industries. They assume that the difference across industries are based on technological factors and support this assumption with the fact that the initial project scale, the gestation period, the cash harvest period, and the continuing investment vary significantly across industries[55] They also assume that the technological differences across industries are similar across countries, which results in using the United States to proxy for other countries.

The calculation itself is based on US companies over the 1980s and they use the Standard and Poor's (1994) *Compusat*. *Compusat* contains data on US firms publicly traded. In defining external financial dependence ED_k, Rajan and Zingales are interested in measuring the amount of desired investment that cannot be financed by internal cash flows generated by the same business. Therefore, they define a firm's external financial dependence as the "capital expenditures minus cash flow from operations divided by capital expenditures". They define cash flow from operations as "the sum of cash flow from operations plus decreases in inventory, decreases in receivables, and increases in payables". They therefore use the industry median to proxy better for the indicator. Finally, they use dependence of US firms to proxy for dependence of the world and give reasons to support their argument. The data was taken from their paper. Since data used to calculate this index for firms in the US if from the 1980s, it may be subject to criticism based on the fact that it may be outdated. This may not necessarily be a problem because we are more interested in ranking than the values of the index. For example, based on the index ranking by Rajan and Zingales, the tobacco industry requires the least external finance, while the pharmaceutical drugs industry required the most external finance. While the value of the index may be different if more recent data was used, we are of the opinion that this ranking will relatively stay the same.

4. Small Firm Share/Average Firm Size

Beck *et al*. (2008) point out that an industry's technological firm size depends on the industry's production process, including capital intensities and economies of scales. They construct measures of each industry's "natural" or technological share of small firms and use a benchmark country to get a proxy of each industry's natural or technological share of small

[55] Ilyina and Samaniego (2011) discuss how some factor intensities and factor attributes of the production technology (some technological reasons why industries might differ in their need for external finance) that might related to the need or the ability to raise external funds.

firms. They require a country with an economy with minimal market imperfections and policy distortions, so that they are mainly able to capture the impact of cross-industry differences in production processes, capital intensities, and scale of economies on industry firm size. Therefore, they use the United States to calculate the benchmark measure of an industry technological share of small firms. Small Firm Share SFS_k for industry k is consequently measured as the share of employment in firms with less than 20 employees in the United States, and data was acquired from the 1992 Census. Data are from Beck *et al*. (2008).

The average firm size AFS_{ki} has also been used to represent the size of firms in industries. While Beck *et al*. (2008) used a theoretical measure to represent industries that are technologically composed of small firms, we also apply a measure that actually proxies for firm size. It could be referred as an actual measure for average firm size, resulting in the process where we are able to actually measure industries that are composed of small firms. We measure the simple average of firm size AFS_k as the total number of employees in a sector divided by the total number of establishments in that industry:

$$AFS_k = \frac{N_{ind}^{emp}}{N_{ind}^{estab}}, \tag{3.8}$$

where N_{ind}^{emp} is the number of employees in an industry and N_{ind}^{estab} is the number of establishments in that industry

5. Labour Intensity

Another industrial characteristic we employ is labour intensity. Labour intensive industries refer to industries which require a considerable amount of human labour to manufacture industrial products. The degree of labour intensity is mostly measured by the labour-capital ratio, or the ratio between employment and the capital stock. This ratio shows the relative factor utilization in production, and the level to which it is labour intensive versus capital intensive. Theoretically, the labour-capital ratio is established by both technological characteristics of industries and the factor endowments of the economy. The labour-capital ratio captures the purely technological determinant of labour intensity (Lin *et al*. 2012).

Another measure of labour-intensity is the ratio between employment and value added; this shows the labour intensity of production. It has been argued that using value added instead of total output has an advantage because total output of an industry measures the total output of

an industry rather than the actual contribution of that sector in terms of what it directly produces. This ratio specifies how labour-absorbing, a production activity is for each unit of value added. However, in the recent literature, where data on wages and salaries of employees have become available, labour intensity is also measured as ratio of total employee wages and salaries to value added of an industry:

$$LI_k = \frac{COMP_k}{VADDED_k}, \tag{3.9}$$

where $COMP_k$ is the compensation to employees in the form of wages and salaries in industry *k* and $VADDED_k$ is the valued added from production in industry *k*. We employ this measure of labour intensity in our study and it has previously been used by Beck and Levine (2002)[56] and Ilyina and Samaniego (2011). Data are from UNIDO and the index was constructed by the author.

6. High Technological Intensive Industries

Economic globalization suggests that technology, a key component for promoting growth, enables firms to be more competitive both domestically and internationally. Technological intensive firms are more innovative, capture larger proportions of the market share, are more efficient in allocating resources for production and pay more to employees in terms of wages and salaries. Developing a complete classification of industries based on their technological intensity has proved to be difficult. The problems most associated with this include being able to identify the technological content of an industry, the fundamental concept; and ambiguity associated with choosing cut-off point between technological classes. Also, the unavailability of data has made R&D intensity the major factor in determining technological intensity. However, Hatzichronoglou (1997) was able to classify industries based on R&D intensities in 22 manufacturing industries for 10 OECD countries by using International Standard Industrial Classification ISIC Rev. 2. Although he uses a sectorial approach and a product approach, the sectorial approach covers the manufacturing sector alone, while the product approach is more appropriate for international trade.

[56] They used labour intensity for the United States.

We use a dummy variable to represent industries that are classified as high technology according to Hatzichronoglou (1997) to explore the impact of bank market structure on industrialization through 'high-tech industries' HTI_k .

7. Economic Importance.

We include a number of indicators that measure the economic significance of each industry to examine how bank market structure affects the most economically important industries. First of all, we create interaction terms between the banks market structure variables and the initial values of ratio of industry value added to manufacturing value added.[57] Comparable to the function of initial per-capita income in standard cross-country growth regressions, the interaction term captures an industry-specific convergence effect. A positive sign would indicate that industries that have grown significantly in the past would continue to grow at a high rate in the future, while industries that have had slow growth will grow at the same pace as a result of functions of bank market structure. On the other hand, a negative sign should indicate that industries that have grown considerably in the past are unlikely to continue to grow at a high rate in the future, resulting in other industries catching up.

We have also created an interaction term between bank market structure and the values of the lagged manufacturing value added. A positive sign for the interaction term would mean that important sectors are favored (where the importance of a sector is measured by the lagged manufacturing value added growth rate). For example, if banks lend to an industry, it continues to lend to that industry. While it is likely that incumbents in this industry are favored, it does not mean that new firms in this industry do not get funding. On the other hand, a negative sign would indicate that banks have lent in the past to an important sector, but this lending relation does not exist anymore. One reason could be that banks do not wish to be overexposed to one sector. The actions that lead to this could be as a result of the bank refusing to lend to the firm or the firms seek alternative credit options.

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[57] $IMVAR_k = \frac{MVA_k}{MVA_{sec}}$, where MVA_k is the initial value of total manufacturing value added in industry *k*, and MVA_{sec} is the initial value of total manufacturing value added in the manufacturing sector.

Finally, we create an interaction term between bank market structure and the industry share of employment.[58] A positive sign would indicate that bank market structure improves the growth of important industries-where the economic importance of an industry is measured by the industry share of employment. On the other hand, a negative sign would indicate that banks worsen the growth of important industries. These ratios have been calculated by the author.

3.3.4. Data Specification

The sample includes 26 countries, and for each of them, 23 industries are all selected from the manufacturing sector at the two-digit International Standard Industrial Classification (ISIC) Rev.3 level from UNIDO. The time period under consideration is 1995 to 2007. The dependent variables are the industry growth of manufacturing value added and net firm entry and the panel data set is unbalanced. The justification for country sample and time period have been provided in the previous chapter. However, because this panel includes cross-industry data and data is not consistently available at this level for all countries in our sample, thus, our country sample is reduced from 31 to 26 countries. Our justification for using this classification is that we have more consistent data at industry-level for our country sample and time period under consideration.

In Table 3.2, we show the correlation matrix between key variables that have been used in the study. A few important relationships that might be of interest to us include the significant positive relationship between manufacturing value added growth rate and net firm entry. In other words, it is possible that industries that experience growth in manufacturing value added also experience an increase in net firm entry. We also see that foreign bank entry has negative significant relationship with manufacturing value added growth, echoing our results in the previous chapter, but its relationship with net firm entry is significant and positive. However, bank concentration has a negative significant relationship with net firm entry. This might mean that while bank concentration might promote the growth of manufacturing industries, it also has the ability to impede the entry of new firms into the industry.

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[58] $ISE_k = \frac{N_{ind}^{emp}}{N_{\sec}^{emp}}$, where N_{ind}^{emp} is the number of employees in industry k, and $N_{\sec}^{emp}$ is the total number of employees in the manufacturing sector.

3.4. EMPIRICAL RESULTS.

3.4.1. Result Diagnostics

After using the econometric technique to estimate the data, the following regression results are presented and discussed: first, the effects of bank market structure on industrial performance (industry growth rate and net firm entry) are presented in Table 3.3 (the baseline estimations). Also, regression results that estimate the effect of bank market structure on industrial growth rate/net firm entry after exploiting heterogeneity across industries through interaction terms between bank market structures and industrial-specific characteristics are presented in Tables 3.4 to 3.11. Tables 3.4 to 3.11 compose of 8 columns; columns 1, 2 and 3 present results that use the growth rate of manufacturing value added for bank concentration, foreign bank entry and state ownership of bank respectively, while columns 5, 6 and 7 present results that use net firm entry for bank concentration, foreign bank entry and state ownership of banks respectively.

Table 3.1: Summary Statistics of Key Variables (1995-2007)

VARIABLES	*OBS.*	*Mean*	*Std. Dev.*	*Min.*	*Max.*
MVAGR	5591	6.468394	30.19778	-144.655	148.652
NFEGR	4747	2.694881	21.46748	-100	150
BCON	7429	0.626549	0.188317	0.242511	1
FBANK	7774	0.272894	0.271814	0	0.96
GBANK	7774	0.270768	0.239028	0	1
BNKDEV	7774	0.369643	0.270561	0.030812	1.55253
GDPGR	7774	4.282374	3.482037	-13.1267	16.7288
LABPOP	7774	0.009538	0.000656	0.008088	0.011842
EXPGDP	7774	0.321116	0.197361	0.065667	1.21311
INF	7774	9.068017	11.39171	-8.23784	96.0941
ED	7774	0.327391	0.350838	-0.45	1.06
SFS	7774	7.633913	5.818645	0.3	21.37
LI	5131	31.6624	20.37562	0.003525	190.1
AFS	4695	174.3532	464.7733	0.872432	8105.88
IES	5458	5.054021	7.502174	0.001029	83.637

In columns 4 and 8, we present regressions where we incorporate all the interaction terms simultaneously. While we include the interaction terms separately in the other regressions, this technique has some limitations. For example, the impact of a certain element of bank market structure on sectors with certain characteristics may depend on the simultaneous presence of a certain level of another element of bank market structure. Moreover, these industry characteristics are then considered in isolation, when they may be related. The

Table3.2: Pairwise Correlation Matrix for Bank Market Structure and Other Key Variables (1995 – 2007)

	MVAGR	*NFEGR*	*BCON*	*FBANK*	*GBANK*	*BNKDEV*	*GDPGR*	*LABPOP*	*EXPGDP*	*INF*	*LI*	*AFZ*	*IES*
MVAGR	1.00												
NFEGR	0.073***	1.00											
BCON	0.011	-0.086***	1.00										
FBANK	-0.046***	0.084***	-0.003	1.00									
GBANK	-0.014	-0.005	-0.045***	-0.259***	1.00								
BNKDEV	0.042***	0.122***	-0.220***	-0.306***	-0.281***	1.00							
GDPGR	0.076***	0.048***	0.085***	-0.071***	0.052***	-0.016	1.00						
LABPOP	0.005	-0.026*	0.031***	0.013	0.086***	-0.273***	-0.044***	1.00					
EXPGDP	0.027**	0.020	0.196***	0.110***	-0.294***	0.233***	0.032***	-0.008	1.00				
INF	-0.017	-0.109***	-0.042***	-0.117***	0.083***	-0.096***	-0.042***	-0.124***	0.058***	1.00			
LI	-0.087***	0.007	0.042***	0.110***	-0.065***	0.071***	-0.093***	0.117***	0.022	-0.049***	1.00		
AFZ	-0.004	0.001	0.141***	0.109***	-0.01	-0.106***	0.027*	0.104***	-0.03**	-0.054***	0.035**	1.00	
IES	-0.013	-0.019	0.026*	0.025*	0.004	-0.023*	0.016	0.006	0.026*	0.018	-0.002	0.112***	1.00

Note: This table reports the correlation matrix of key variables used in the regression, where * indicates significance at the 10% level, ** indicates significance at the 5% level, and *** indicates significance at the 1% leve

relevant regression tests have been included at the end of the tables. As in Chapter 2, we present some scatter plots on using the variable averages to show the relationship on the relationship between bank market structure and growth in manufacturing value added/net firm entry over subsamples with the aim of showing stability of coefficients during the period[59] and we find some stability of the coefficients from these plots.

3.4.2. Baseline Model: Cross-Country Effect.

In Table 3.3 we report the results for regressions based on the specifications in (3.1) and (3.2). The main results to focus on are that bank concentration has a positive and insignificant effect, while foreign bank entry and state ownership of banks have negative and significant effects on the growth in manufacturing value added of industries. On the other hand, bank concentration and foreign bank entry have negative and significant effects, while state ownership of banks has a positive and significant effect on net firm entry. The result based on manufacturing value added growth are similar to the PMG long-run and FE results in Chapter 2 , so, we try to explain the results based on net firm entry. In column 2 of Table 3.3, the bank concentration coefficient reveals a negative relationship with net firm entry. This result supports the view that banks with market power reduce the supply of loans to potential entrepreneurs looking to start new businesses. The result does not support the view which suggests that banks with market power help new firms by developing lending relationships. The foreign bank ownership coefficient also suggests a negative relationship with net firm entry. We interpret the results as great reluctance by foreign banks to engage in relationship lending with potential entrants. This is likely to happen because new entrants are unlikely to have hard information and loan officers of these banks find it difficult to communicate soft information with bank's headquarters abroad. Thus, because they have little discretion to provide loans based on soft information, they will have to rely on hard information.

The result does not appear to support the view that foreign bank presence benefits all firms. The coefficient of state owned banks reveals a positive relationship with net firm entry. This result might be linked to the ability of government to influence how banks allocate credit. The government relies on directed credit through it banks. The rationales for direct credit in developing countries are underdeveloped tax systems, its success in East Asia, its

[59] In appendix 3.2, we split the time period into 3 subsample (period 1, 1995-1998; period 2, 1999-2002; and period 3, 2003-2007).

effectiveness, and possible economies of scope and the targets are mostly firms in the manufacturing sector (technology) and exporting firms (Stiglitz *et al.* 1993). Such credits are likely to go to new entrants as reflected in our results. However, the coefficient on manufacturing growth shows a negative relationship.

We try to reconcile these results by suggesting that, while state ownership of banks might negatively affect the growth of manufacturing added (maybe as a result of politicizing lending decisions, softening budget constraints, and diverting funds towards politically motivated projects rather than economically viable ones); its direct credit schemes may be effective for some firms, particularly new ones.

Table 3.3: Baseline Models for Industry Growth and Net Firm Entry

	1	*2*
Variables	*MVAGR*	*NFEGR*
$MVAGR_{t-1}$	0.0478**	
	(0.024)	
$NFEGR_{t-1}$		-0.239*
		(0.133)
BCON	0.00232	-0.103***
	(0.023)	(0.027)
FBANK	-0.0970***	-0.179***
	(0.026)	(0.035)
GBANK	-0.0351*	0.165***
	(0.021)	(0.029)
BNKDEV	0.0286*	0.0391**
	(0.017)	(0.020)
GDPGR	0.337**	0.368**
	(0.150)	(0.185)
LABPOP	11.60	
	(7.144)	
HUMCAP		0.835***
		(0.212)
EXPGDP	0.0382*	0.0581**
	(0.021)	(0.028)
INF	-0.00552**	-0.165**
	(0.002)	(0.073)
CONS.	-3.400	1.157
	(7.636)	(3.187)
No of Obs.	4516	3756
AR(1) test	-13.37	-2.05
	(0.000)	(0.041)
AR(2) test	-0.42	-1.10
	(0.677)	(0.272)
Hansen test	3.71	0.38
	(0.156)	(0.827)

The robust standard errors are in parentheses, where * indicates significance at the 10% level, ** indicates significance at the 5% level and *** at 1% level. *AR(1)* and *AR(2)* are p-values and t-statistics of the test of first and second order autocorrelations and Hansen is the p-value and t-statistic of the Hansen test of overidentifying-restrictions.

3.4.3. Interaction Models: Industry-Specific Effects.

3.4.3.1. External Financial Dependence

In Table 3.4, we report the results of regressions based on the specifications in (3.3) and (3.4), where we include the interaction terms between external financial dependence and bank market structure. Also, we include external financial dependence by itself as a regressor. Interaction terms are only significant in columns 4 and 8 (where the interaction terms have been included simultaneously). In column 4, the coefficient of the interaction term between foreign ownership of banks and external finance dependence is negatively related to manufacturing growth. Based on significant interaction term in column 4, the elasticity is -0.15.[60] The marginal effect of foreign bank ownership on manufacturing growth falls by a negative 0.15 percentage points when external finance dependence increases by 1percent. At high levels of foreign bank presence, industries that depend more on external finance do benefit. Put differently, industries that depend more on external finance, grow slower when the presence of foreign banks is high. This result does not support the view which suggests that industries which depend more on external finance grow faster in the presence of foreign banks. To calculate the total impact of the interaction term on industrialization, we compute the elasticities in the same form as Chapter 2. In column 8, the coefficient of the interaction term between bank concentration and external finance dependence suggest a positive relationship with net firm entry. The elasticities of the interaction terms with bank concentration, foreign ownership of banks and state ownership of banks on net firm entry are 1.32, -1.60 and 2.15 respectively.[61] The elasticities indicate that the marginal effect of bank concentration and state ownership of banks on net firm entry increase by 1.32 and 2.15 percentage points, while the effect of foreign ownership of banks is a negative 1.60 percentage points when external finance dependence increases by 1 percent. Based on the results, those industries that are more financially dependent tend to experience fast growth of new entrants when the level of bank concentration is high. This result does not support the argument that bank concentration induces concentration in industries that depend more on external finance.

[60] Standard error is 0.08738.
[61] Standard errors: 0.84353, 0.69757, and 0.78628.

Table 3.4: External Financial Dependence

	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
Variables	*MVAGR*	*MVAGR*	*MVAGR*	*MVAGR*	*NFEGR*	*NFEGR*	*NFEGR*	*NFEGR*
$MVAGR_{t-1}$	0.0480**	0.0476**	0.0480**	.0476**				
	(0.024)	(0.024)	(0.024)	(0.024)				
$NFEGR_{t-1}$					-0.240*	-0.244*	-0.236*	-0.245*
					(0.134)	(0.131)	(0.133)	(0.131)
BCON	-0.00222	0.00211	0.00193	0.0012	-0.119***	-0.102***	-0.0976***	-0.115***
	(0.032)	(0.023)	(0.023)	(0.032)	(0.0350)	(0.0268)	(0.0261)	(0.0341)
BCON ×ED	0.0146			0.00097	0.0594			0.097*
	(0.073)			(0.074)	(0.071)			(0.067)
FBANK	-0.0970***	-0.0985***	-0.0823***	-0.0698**	-0.179***	-0.145***	-0.193***	-0.136***
	(0.026)	(0.026)	(0.030)	(0.032)	(0.0353)	(0.0477)	(0.0394)	(0.0473)
GBANK	-0.0352*	-0.00978	-0.0356*	-0.0016	0.165***	0.166***	0.166***	0.175***
	(0.021)	(0.026)	(0.021)	(0.027)	(0.0292)	(0.0289)	(0.0292)	(0.0292)
BNKDEV	0.0286*	0.0280*	0.0286*	0.0276*	0.0386*	0.0389**	0.0394**	0.0432**
	(0.017)	(0.017)	(0.017)	(0.017)	(0.0199)	(0.0198)	(0.0200)	(0.0199)
GDPGR	0.337**	0.338**	0.336**	0.333**	0.373**	0.373**	0.378**	0.411**
	(0.150)	(0.150)	(0.150)	(0.150)	(0.186)	(0.185)	(0.186)	(0.184)
LABPOP	11.69	11.54	11.60	11.431				
	(7.124)	(7.159)	(7.143)	(7.111)				
HUMCAP					0.843***	0.849***	0.848***	0.898***
					(0.212)	(0.211)	(0.212)	(0.206)
EXPGDP	0.0384*	0.0380*	0.0385*	0.0381*	0.0584**	0.0595**	0.0519*	0.0371
	(0.021)	(0.021)	(0.021)	(0.21)	(0.0280)	(0.0280)	(0.0275)	(0.0265)
INF	-0.00553***	-0.00550***	-0.00551**	-0.00548***	-0.167**	-0.166**	-0.163**	-0.156**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.0735)	(0.0733)	(0.0742)	(0.0757)
ED	-1.170	2.053	1.214	5.754	-2.641	3.763*	-1.779	-0.0903**
	(4.757)	(2.156)	(2.581)	(6.365)	(4.073)	(2.224)	(2.240)	(0.0455)
FBANK ×ED		-0.0873		-0.119*		-0.128		-0.378***
		(0.066)		(0.071)		(0.109)		(0.133)
GBANK ×ED			-0.0498	-0.0985			0.0912	0.367***
			(0.075)	(0.081)			(0.0755)	(0.0829)
CONS.	-3.134	-3.858	-3.730	-4.738	1.812	-0.0300	0.687	0.0705
	(7.728)	(7.626)	(7.536)	(7.709)	(3.447)	(3.313)	(3.256)	(3.569)
No of Obs.	4516	4516	4516	4516	3756	3756	3756	3756
AR(1) test	-13.37 (0.000)	-13.37 (0.000)	-13.37 (0.000)	-13.37 (0.000)	-2.03 (0.042)	-2.05 (0.041)	-2.06 (0.039)	-2.04 (0.041)
AR(2) test	-0.41 (0.678)	-0.42 (0.674)	-0.41 (0.680)	-0.42 (0.673)	-1.10 (0.272)	-1.16 (0.246)	-1.07 (0.285)	-1.16 (0.245)
Hansen test	3.71 (0.457)	3.58 (0.167)	3.69 (0.158)	3.51 (0.173)	0.38 (0.805)	0.35 (0.839)	0.41 (0.816)	0.39 (0.823)

The robust standard errors are in parentheses, where * indicates significance at the 10% level, ** indicates significance at the 5% level and *** at 1% level. *AR(1)* and *AR(2)* are p-values and t-statistics of the test of first and second order autocorrelations and Hansen is the p-value and t-statistic of the Hansen test of overidentifying - restrictions.

Similarly, the interaction between state ownership of banks and external finance dependence supports the view that the growth of new entrants is faster in industries that depend more on external finance when the presence of state owned banks is higher. On the other hand, since the coefficient of the interaction between foreign ownership of banks and external finance dependence is negative, we find that in those industries that are more dependent on external finance, there is a slower growth of new entrants, when foreign bank presence is high, suggesting that foreign banks may lead to concentration in industries that depend more on external finance. In Table 3.3, interaction terms are only significant in specifications where we have included them simultaneously. This might occur because it is possible, in a sense, that the elements of banks market structure are proxying each other.

3.4.3.2. Small Firm Share

In Table 3.5, we report the results of regressions based on the specifications where we include the interaction terms between small firm share and bank market structure variables. In columns 2 and 4, the interaction between foreign bank ownership and small firm share is positively related to manufacturing growth. The results indicate that industries composed of small firms grow faster in countries where foreign bank presence is high because they face lower financing obstacles.

Table 3.5: Small Firm Share

	1	2	3	4	5	6	7	8
Variables	*MVAGR*	*MVAGR*	*MVAGR*	*MVAGR*	*NFEGR*	*NFEGR*	*NFEGR*	*NFEGR*
$MVAGR_{ti1}$	0.0478**	0.0469**	0.0476**	0.0469**				
	(0.024)	(0.024)	(0.024)	(0.025)				
$NFEGR_{t-1}$					-0.243*	-0.239*	-0.237*	-0.243*
					(0.133)	(0.133)	(0.133)	(0.133)
BCON	0.00227	0.00182	0.00162	-0.0170	-0.0177	-0.104***	-0.104***	-0.0165
	(0.039)	(0.023)	(0.023)	(0.039)	(0.0420)	(0.0271)	(0.0270)	(0.0421)
BCON ×SFS	-0.0000474			0.00246	-0.0113**			-0.0114**
	(0.004)			(0.004)	(0.00505)			(0.00503)
FBANK	-0.0970***	-0.177***	-0.0970***	-0.179***	-0.180***	-0.148***	-0.179***	-0.159***
	(0.026)	(0.040)	(0.026)	(0.0423)	(0.0353)	(0.0556)	(0.0351)	(0.0529)
GBANK	-0.0354*	-0.0356*	-0.0108	-0.0337	0.165***	0.164***	0.133***	0.134***
	(0.021)	(0.021)	(0.035)	(0.036)	(0.0288)	(0.0287)	(0.0434)	(0.0398)
BNKDEV	0.0282*	0.0275*	0.0281*	0.0275*	0.0385*	0.0384*	0.0386*	0.0388**
	(0.017)	(0.017)	(0.017)	(0.17)	(0.0197)	(0.0196)	(0.0198)	(0.0197)
GDPGR	0.336**	0.336**	0.338**	0.337**	0.373**	0.368**	0.366**	0.374**
	(0.150)	(0.150)	(0.150)	(0.149)	(0.185)	(0.184)	(0.184)	(0.184)
LABPOP	11.52	11.33	11.49	11.31				
	(7.146)	(7.207)	(7.149)	(7.194)				
HUMCAP					0.835***	0.835***	0.834***	0.836***
					(0.210)	(0.214)	(0.211)	(0.211)
EXPGDP	0.0382*	0.0383*	0.0387*	0.0384*	0.0585**	0.0584**	0.0582**	0.0581**
	(0.021)	(0.020)	(0.021)	(0.019)	(0.0279)	(0.0281)	(0.0280)	(0.0278)
INF	-0.00551**	-0.00546**	-0.00548**	-0.00545***	-0.165**	-0.167**	-0.167**	-0.166**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.0728)	(0.0735)	(0.0735)	(0.0728)
SFS	0.143	-0.178	0.226**	-0.337	0.811**	0.199	-0.0134	0.766
	(0.255)	(0.132)	(0.112)	(0.334)	(0.343)	(0.154)	(0.170)	(0.360)
FBANK ×SFS		0.0105***		0.0109***		-0.00407		-0.00255
		(0.004)		(0.004)		(0.00663)		(0.00631)
GBANK ×SFS			-0.00318	-0.0027			0.00410	0.00399
			(0.003)	(0.003)			(0.00499)	(0.00428)
CONS.	-4.348	-1.688	-4.960	-0.449	-4.987	-0.271	1.330	-4.662
	(7.772)	(7.969)	(7.725)	(8.103)	(4.042)	(3.409)	(3.436)	(3.997)
No of Obs.	4516	4516	4516	4516	3756	3756	3756	3756
AR(2) test	-13.36 (0.000)	-13.35 (0.000)	-13.37 (0.000)	-13.35 (0.000)	-2.03 (0.043)	-2.05 (0.040)	-2.06 (0.040)	-2.02 (0.043)
AR(2) test	-0.42 (0.678)	-0.44 (0.662)	-0.42 (0.675)	-0.43 (0.664)	-1.13 (0.260)	-1.10 (0.270)	-1.08 (0.280)	-1.14 (0.256)
Hansen test	3.73 (0.155)	3.48 (0.176)	3.63 (0.163)	3.46 (0.177)	0.36 (0.837)	0.38 (0.826)	0.40 (0.820)	0.36 (0.837)

The robust standard errors are in parentheses, where * indicates significance at the 10% level, ** indicates significance at the 5% level and *** at 1% level. *AR(1)* and *AR(2)* are p-values and t-statistics of the test of first and second order autocorrelations and Hansen is the p-value and t-statistic of the Hansen test of overidentifying - restrictions

The elasticities of both interaction terms on manufacturing growth are a positive 0.39 and 0.40 percentage points.[62] The elasticities indicate that the marginal effect of foreign bank ownership on manufacturing growth increases by 0.39 and 0.40 percentage points when

[62] The standard errors are 0.14311 and 0.15862.

industry small firm share increases by 1 percent. In columns 5 and 8, the coefficient of the interaction between bank concentration and small firm share is negatively related to net firm entry. The elasticities of the interaction terms in columns 5 and 8 on net firm entry are negative 3.56 and 3.61 percentage points[63]. The elasticities indicate that the marginal effect of bank concentration on net firm entry falls by 3.56 and 3.61 percentage points when industry small firm share increases by 1 percent. Banks with market power might be unwilling to develop lending relationships with new entrants to into industries composed of small firms to reduce the likelihood that incumbents (firms which they support financially) will face further competition. By doing this, bank concentration is likely to lead to concentration in industries composed of small firms, and thus industry monopoly profits.

3.4.3.3. Average Firm Size

In Table 3.6, we report the results of regressions where we include the interaction terms between average firm size and bank market structure variables. In columns 1 and 4, the coefficients of the interaction between average firm size and bank concentration are positively related to manufacturing growth. Based on the coefficients in both columns, the elasticities indicate that the marginal effect of bank concentration on manufacturing growth increases by 0.30 and 0.31 percentage points when industry average firm size increases by 1 percent. The results indicate that banks with market power are more likely to develop lending relationships with large domestic firms; resulting in continued financial support towards. For that reason, industries composed of large firms are expected to growth faster when the level of bank concentration is high. In columns 5 and 7, the coefficient of the interaction between bank concentration/state ownership of banks and average firm size is positively related with net firm entry, while the interaction term with foreign bank ownership in column 6 is negatively related to net firm entry. In column 8, the coefficients for bank concentration and foreign bank ownership interactions are consistent with the results in columns 5 and 6.

[63] The standard errors are 1.78929 and 1.8003.

Table 3.6: Average Firm Size

	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
Variables	*MVAGR*	*MVAGR*	*MVAGR*	*MVAGR*	*NFEGR*	*NFEGR*	*NFEGR*	*NFEGR*
$MVAGR_{t-1}$	0.0511*	0.0512*	0.0519*	0.0512*				
	(0.028)	(0.028)	(0.028)	(0.028)				
$NFEGR_{t-1}$					-0.331**	-0.349**	-0.317**	-0.349**
					(0.152)	(0.153)	(0.153)	(0.153)
BCON	-0.0132	0.00881	0.00865	-0.127	-0.0967***	-0.0424	-0.0504*	-0.0637**
	(0.035)	(0.036)	(0.036)	(0.036)	(0.0305)	(0.0275)	(0.0274)	(0.0309)
BCON×AFS	0.000227**			0.000232*	0.000574***			0.000191**
	(0.0001)			(0.0001)	(0.000125)			(0.000119)
FBANK	-0.0600	-0.0545	-0.0622	-0.0574	-0.182***	-0.103***	-0.188***	-0.113***
	(0.039)	(0.041)	(0.039)	(0.0419)	(0.0316)	(0.0323)	(0.0342)	(0.0333)
GBANK	-0.0559*	-0.0539*	-0.0493*	-0.0489*	0.0871***	0.103***	0.0613*	0.0859***
	(0.029)	(0.029)	(0.029)	(0.029)	(0.0300)	(0.0294)	(0.0333)	(0.0303)
BNKDEV	-0.0128	-0.0103	-0.00874	-0.0125	0.0361	0.0435**	0.0320	0.0395*
	(0.024)	(0.024)	(0.023)	(0024)	(0.0223)	(0.0214)	(0.0219)	(0.0215)
GDPGR	-0.265	-0.262	-0.263	-0.267	0.540**	0.545**	0.503**	0.561***
	(0.193)	(0.193)	(0.193)	(0.193)	(0.213)	(0.215)	(0.210)	(0.215)
LABPOP	-1.036	-0.330	-0.455	-0.607				
	(8.007)	(8.033)	(7.965)	(8.137)				
HUMCAP					0.512**	0.754***	0.830***	0.736***
					(0.231)	(0.215)	(0.244)	(0.216)
EXPGDP	0.00270	0.00139	0.00195	0.00189	-0.0117	-0.0194	0.00428	-0.0151
	(0.028)	(0.028)	(0.028)	(0.028)	(0.0303)	(0.0296)	(0.0314)	(0.0300)
INF	0.0000667	-0.000341	-0.000443	0.0000315	-0.117	-0.149**	-0.123*	-0.148**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.0725)	(0.0717)	(0.0723)	(0.0722)
AFS	-0.0212**	-0.000823	-0.000476	-0.0198*	-0.0566***	-0.0000201	-0.0151**	0.0202**
	(0.011)	(0.001)	(0.001)	(0.012)	(0.0121)	(0.000940)	(0.00590)	(0.00905)
FBANK×AFS		-0.0000554		-0.0000153		-0.000259***		-0.000322***
		(0.0001)		(0.0001)		(0.0000558)		(0.0000643)
GBANK×AFS			-0.0000267	-0.00005			0.000281**	0.000401
			(0.000)	(0.000)			(0.000132)	(0.000341)
CONS.	17.60*	14.80	14.82	16.92	8.135**	-0.541	2.927	2.109
	(9.392)	(9.482)	(9.395)	(9.705)	(3.431)	(2.977)	(3.384)	(3.261)
No of Obs.	3212	3212	3212	3212	3588	3588	3588	3588
AR(1) test	-10.70	-10.69	-10.73	-10.69	-1.32	-1.21	-1.38	-1.22
	(0.000)	(0.000)	(0.000)	(0.000)	(0.186)	(0.227)	(0.169)	(0.223)
AR(2) test	-0.79	-0.83	-0.82	-0.78	-1.50	-1.58	-1.45	-1.58
	(0.429)	(0.404)	(0.410)	(0.433)	(0.135)	(0.113)	(0.148)	(0.114)
Hansen test	0.20	0.24	0.19	0.19	1.87	2.04	2.23	2.03
	(0.906)	(0.889)	(0.908)	(0.869)	(0.393)	(0.360)	(0.329)	(0.362)

The robust standard errors are in parentheses, where * indicates significance at the 10% level, ** indicates significance at the 5% level and *** at 1% level. *AR(1)* and *AR(2)* are p-values and t-statistics of the test of first and second order autocorrelations and Hansen is the p-value and t-statistic of the Hansen test of overidentifying – restrictions.

The interaction term in columns 1 and 4 indicates that Banks with market power develop a lending relationship with firms when they are young and continue to lend to them when they become incumbents (or large firms). The marginal effect of bank concentration on manufacturing growth based on the coefficients in columns 1 and 4 are a positive 0.30 and 0.31 percentage points when industry average firms size increases by 1 percent.[64] This results into faster growth of industries composed of large firms when the level of bank concentration is high. In columns 5 and 8, the interaction terms with bank concentration are positively related to net firm entry. The marginal effect of bank concentration on net firm entry based on these coefficients are positive 6.99 and 2.35 percentage points when average firm size increases by 1 percent.[65] These results indicate that more bank concentration promotes faster growth in the entry of large firms into industries composed of large firms. These results are in

[64] Standard error (0.15437 and 0.17129).
[65] Standard errors (4.05435 and 1.61576)

line with the results in the previous section where bank concentration represents a barrier to entry into industries composed of small firms.

In column 7, the interaction term is positively related to net firm entry, suggesting state owned banks promote the entry of large firms in to industries composed of large firms. The marginal effect of state ownership of banks on net firm entry increases by 1.22[66] percentage points when industry average firm size increase by 1 percent. A possible indication of the result is that state owned bank promotes 'national champions'. By national champions, we mean the most successful domestic firms (which are likely to be large firms) in terms of performance, local content application, employment rate of domestic nationals and its contribution to the development process. State owned banks would probably promote the start-up of firms that fall under this category. Hence, while they might shift towards large firms under exceptional terms, overall entry is made easier in the presence of state owned banks. In columns 6 and 8, the interaction term is negatively related to net firm entry, suggesting that growth of entry into industries composed of large firms slows down when foreign bank presence is high. The marginal effect of foreign bank ownership on net firm entry based on the coefficients falls by -1.40 and -1.11[67] percentage points when average firm size increases by 1 percent. This result might indicate that is that foreign banks are not likely to lend to large domestic entrants because they could compete with their existing clients (large domestic firms or multinationals). If entrants are funded at all, they are more likely to be small than large.

3.4.3.4. Labour Intensity

In Table 3.7, we report the results of regressions where we include the interaction terms between labour-intensity and bank market structure. In columns 1 and 4, the interaction terms suggest that bank concentration promotes the growth of industries composed of labour-intensive firms. The marginal effect of bank concentration on manufacturing growth increases by 1.05 and 0.85 percentage points when industry labour-intensiveness increases by 1 percent percentage point[68]. The results indicate that banks with market power are more likely to finance large firms which are labour intensive (i.e. have a large workforce). In developing countries, banks would rather finance firms that use low technology than firms

[66] Standard error (0.95411).
[67] Standard errors (0.76104 and 0.65275).
[68] Standard errors (0.40709 and 0.43804).

that use high technology in their production process because of the risk that might be associated with application of technology that is advanced and new. We make reference to technology because low technological intensity is positively associated with labour intensive industries. In other words, banks in developing countries are unlikely to finance firms that use technology where they are not competitive.

Table 3.7: Labour Intensity

	1	2	3	4	5	6	7	8
Variables	*MVAGR*	*MVAGR*	*MVAGR*	*MVAGR*	*NFEGR*	*NFEGR*	*NFEGR*	*NFEGR*
$MVAGR_{t-1}$	0.0664**	0.0646**	0.0657**	0.0653***				
	(0.027)	(0.027)	(0.027)	(0.027)				
$NFEGR_{t-1}$					-0.202	-0.202	-0.195	-0.193
					(0.150)	(0.149)	(0.148)	(0.147)
BCON	-0.0775*	0.0278	0.0275	-0.0572	-0.0686	-0.0767***	-0.0918***	-0.0898*
	(0.045)	(0.025)	(0.026)	(0.0456)	(0.0502)	(0.0264)	(0.0268)	(0.0492)
BCON ×LI	0.00346***			0.00283**	-0.000308			-0.000222
	(0.001)			(0.001)	(0.00173)			(0.00161)
FBANK	-0.0619**	0.0372	-0.0707***	0.0302	-0.171***	-0.170**	-0.168***	0.128**
	(0.027)	(0.058)	(0.026)	(0.0591)	(0.0367)	(0.0669)	(0.0367)	(0.0667)
GBANK	-0.0469*	-0.0492**	-0.0761**	-0.0331	0.123***	0.124***	0.210***	0.221***
	(0.024)	(0.023)	(0.037)	(0.041)	(0.0291)	(0.0292)	(0.0471)	(0.0465)
BNKDEV	-0.000559	-0.00115	0.00170	-0.00261	0.0421**	0.0426**	0.0379*	0.0351*
	(0.020)	(0.020)	(0.020)	(0.020)	(0.0210)	(0.0207)	(0.0200)	(0.0196)
GDPGR	0.277*	0.290*	0.287*	0.280*	0.455**	0.458**	0.433**	0.440**
	(0.159)	(0.161)	(0.161)	(0.159)	(0.218)	(0.218)	(0.216)	(0.215)
LABPOP	5.146	4.991	9.880	1.551				
	(7.939)	(8.010)	(7.724)	(8.154)				
HUMCAP					0.857***	0.855***	0.965***	0.947***
					(0.221)	(0.222)	(0.227)	(0.227)
EXPGDP	0.0329	0.0254	0.0325	0.0258	0.0256	0.0256	0.0441	0.0440
	(0.021)	(0.021)	(0.022)	(0.0216)	(0.0292)	(0.0291)	(0.0289)	(0.0287)
INF	-0.00600***	-0.00629***	-0.00568***	-0.00649***	-0.142**	-0.144**	-0.123*	-0.129*
	(0.002)	(0.002)	(0.002)	(0.00225)	(0.0705)	(0.0694)	(0.0680)	(0.0691)
LI	-0.335***	-0.00324	-0.118***	-0.200	-0.0266	-0.0465	0.0434	0.0927
	(0.091)	(0.045)	(0.040)	(0.133)	(0.127)	(0.0530)	(0.0509)	(0.129)
FBANK ×LI		-0.00332**		-0.00289*		-0.0000593		-0.00131
		(0.001)		(0.001)		(0.00207)		(0.00207)
GBANK ×LI			0.000456	0.000175			-0.00265**	-0.00303**
			(0.001)	(0.001)			(0.00106)	(0.00169)
CONS.	11.82	2.420	1.255	11.24	-0.889	-0.397	-3.877	-5.229
	(9.148)	(8.307)	(8.438)	(9.410)	(4.423)	(3.274)	(3.456)	(4.654)
No of Obs.	3738	3738	3738	3738	3447	3447	3447	3447
AR(1)	-11.51 (0.000)	-11.59 (0.000)	-11.55 (0.000)	-11.55 (0.000)	-1.94 (0.052)	-1.95 (0.051)	-1.98 (0.047	-2.01 (0.044)
AR(2)	-0.47 (0.641)	-0.38 (0.707)	-0.41 (0.685)	-0.43 (0.668)	-0.52 (0.601)	-0.53 (0.597)	-0.48 (0.629)	-0.46 (0.643)
Hansen test	0.51 (0.774)	0.48 (0.787)	0.51 (0.775)	0.49 (0.784)	1.30 (0.523)	1.30 (0.522)	1.30 (0.521)	1.24 (0.539)

The robust standard errors are in parentheses, where * indicates significance at the 10% level, ** indicates significance at the 5% level and *** at 1% level. *AR(1)* and *AR(2)* are p-values and t-statistics of the test of first and second order autocorrelations and Hansen is the p-value and t-statistic of the Hansen test of overidentifying – restrictions.

In Columns 2 and 4, the interaction terms are negatively related to manufacturing growth suggesting that the growth of industries composed of labour-intensive industries is slowed down by the presence of foreign banks. The marginal effect of foreign bank ownership on manufacturing growth based on the coefficients falls by 0.53 and 0.46[69] percentage points when labour-intensiveness in industries increase by 1 percent. Previously, foreign banks in

[69] Standard errors (0.23579 and 0.25502).

developing countries financed firms involved in the extractive and labour-intensive manufacturing activities. However, presently, they are more involved in the service-based sectors. The negative effect of foreign banks on the growth of industries composed of labour intensive industries might be linked to their lending portfolios, which is largely directed towards multinationals and large domestic firms. Moreover, their entry could put competitive pressure on domestic banks by reducing their profit margins and charter values, resulting in a fall of credit towards labour intensive firms. These results are supported by Chen (2009). He suggested that foreign bank customers are mainly capital-and technology-intensive companies rather than labour-intensive businesses.

In columns 7 and 8, the interactions terms are negatively related to net form entry suggesting that the growth of labour-intensive industries is slowed down by the presence of state owned banks. The marginal effect of state owned ownership of banks on net firm entry falls by 1.39 and 1.59[70] percentage points when labour-intensiveness of industries increases by 1 percent. These results could be linked to our results in column 7 of Table 3.6, where state owned banks are seen to positively promote start-ups of large firms in the manufacturing sector. One explanation for this could be that state owned banks generally promote firms that are relatively capital intensive (Lin *et al*. 2012). In other words, if they promote the entry of large firms, which could most likely be 'national champions', it may well be that these large firms are more capital-intensive. Also, this says that state banks may be more willing to fund capital intensive-firms than labour-intensive firms.

3.4.3.5. High Technology-Intensity

In Table 3.8, we report the results of regressions where we include the interaction terms between high technology intensity dummy and bank market structure variables. There are no significant interaction terms in any of the specifications. In the next few sections, we examine the effect of bank market structure on industry performance by employ a variety measures that represent economic importance of industries in an economy.

[70] Standard errors (0.63418 and 0.65071).

Table 3.8: High Technology Intensity

	1	2	3	4	5	6	7	8
Variables	*MVAGR*	*MVAGR*	*MVAGR*	*MVAGR*	*NFEGR*	*NFEGR*	*NFEGR*	*NFEGR*
$MVAGR_{t-1}$	0.0479**	0.0477**	0.0478**	0.0478**				
	(0.0236)	(0.0236)	(0.0236)	(0.0236)				
$NFEGR_{t-1}$					-0.242*	-0.239*	-0.239*	-0.239*
					(0.133)	(0.134)	(0.133)	(0.134)
BCON	0.00296	0.00241	0.00232	-0.00424	-0.108***	-0.103***	-0.103***	-0.123***
	(0.0237)	(0.0233)	(0.0233)	(0.0242)	(0.0273)	(0.0268)	(0.0269)	(0.0277)
BCON×HTI	-0.00278			0.0299	0.0218			0.0848
	(0.0158)			(0.0272)	(0.0178)			(0.0265)
FBANK	-0.0968***	-0.0901***	-0.0969***	-0.0829***	-0.180***	-0.178***	-0.179***	-0.160***
	(0.0260)	(0.0274)	(0.0260)	(0.0280)	(0.0354)	(0.0391)	(0.0353)	(0.0397)
GBANK	-0.0351*	-0.0350*	-0.0334	-0.0316	0.165***	0.165***	0.166***	0.187***
	(0.0207)	(0.0207)	(0.0212)	(0.0216)	(0.0291)	(0.0290)	(0.0300)	(0.0325)
BNKDEV	0.0287*	0.0288*	0.0286*	0.0287*	0.0392**	0.0391**	0.0390**	0.0392**
	(0.0168)	(0.0168)	(0.0168)	(0.0168)	(0.0200)	(0.0199)	(0.0199)	(0.0202)
GDPGR	0.337**	0.339**	0.338**	0.339**	0.371**	0.368**	0.369**	0.368**
	(0.150)	(0.150)	(0.150)	(0.150)	(0.185)	(0.185)	(0.185)	(0.185)
LABPOP	11.61	11.56	11.57	11.67*				
	(7.129)	(7.163)	(7.132)	(7.089)				
HUMCAP					0.833***	0.835***	0.836***	0.839***
					(0.210)	(0.212)	(0.212)	(0.209)
EXPGDP	0.0383*	0.0389*	0.0382*	0.0388*	0.0570**	0.0582**	0.0582**	0.0572**
	(0.0210)	(0.0211)	(0.0210)	(0.0210)	(0.0280)	(0.0281)	(0.0281)	(0.0279)
INF	-0.00551**	-0.00550**	-0.00550**	-0.00551**	-0.165**	-0.165**	-0.165**	-0.163**
	(0.00214)	(0.00214)	(0.00214)	(0.00214)	(0.0727)	(0.0734)	(0.0732)	(0.0724)
FBANK×HTI		-0.0269		-0.0592		-0.00428		0.00773
		(0.0249)		(0.0434)		(0.0518)		(0.0664)
GBANK×HTI			-0.00727	-0.0156			-0.00534	-0.00879
			(0.0334)	(0.0416)			(0.0314)	(0.0478)
CONS.	-3.430	-3.433	-3.374	-3.527	1.197	1.159	1.151	1.559
	(7.630)	(7.652)	(7.630)	(7.586)	(3.183)	(3.194)	(3.192)	(3.192)
No of Obs.	4516	4516	4516	4516	3756	3756	3756	3756
AR(1) test	-13.37 (0.000)	-13.37 (0.000)	-13.37 (0.000)	-13.37 (0.000)	-2.03 (0.043)	-2.03 (0.042)	-2.04 (0.041)	-2.03 (0.042)
AR(2) test	-0.41 (0.678)	-0.42 (0.675)	-0.42 (0.677)	-0.42 (0.675)	-1.12 (0.264)	-1.09 (0.275)	-1.10 (0.273)	-1.08 (0.279)
Hansen test	3.70 (0.157)	3.66 (0.161)	3.71 (0.157)	3.71 (0.157)	0.37 (0.833)	0.38 (0.825)	0.38 (0.826)	0.39 (0.824)

The robust standard errors are in parentheses, where * indicates significance at the 10% level, ** indicates significance at the 5% level and *** at 1% level. *AR(1)* and *AR(2)* are p-values and t-statistics of the test of first and second order autocorrelations and Hansen is the p-value and t-statistic of the Hansen test of overidentifying – restrictions.

3.4.3.6. Lagged Industry Value Added Ratio

In Table 3.9, we report the results of regressions where we include the interaction terms between the lagged industry value added ratio and bank market structure variables. In columns 1 and 4, the interaction terms are positively related to manufacturing growth, suggesting that bank concentration promotes the growth of firms in industries that are important to the economy (where the economic importance of industries is measured by the lagged industry value added ratio). The marginal effect of bank concentration on the growth of manufacturing value added increases by 0.07 and 0.11[71] percentage points when industries' economic importance increases by 1 percent.

[71] Standard errors (0.03169 and 0.05471)

Table 3.9: Lagged Industry Value added Ratio

	1	2	3	4	5	6	7	8
Variables	*MVAGR*	*MVAGR*	*MVAGR*	*MVAGR*	*NFEGR*	*NFEGR*	*NFEGR*	*NFEGR*
$MVAGR_{t-1}$	0.0409*	0.0406*	0.0406*	0.0410*				
	(0.0244)	(0.0244)	(0.0244)	(0.0244)				
$NFEGR_{t-1}$					-0.308**	-0.309**	-0.309**	-0.309**
					(0.143)	(0.144)	(0.143)	(0.143)
BCON	0.00495	0.0132	0.0120	0.0155	-0.0877***	-0.0816***	-0.0857***	-0.0792**
	(0.0243)	(0.0235)	(0.0235)	(0.0252)	(0.0287)	(0.0281)	(0.0281)	(0.0295)
BCON ×MVAR	0.00138**			0.00220**	0.000691			-0.00107
	(0.000575)			(0.00105)	(0.000502)			(0.000447)
FBANK	-0.0988***	-0.105***	-0.0996***	-0.0891***	-0.201***	-0.206***	-0.201***	-0.204***
	(0.0260)	(0.0279)	(0.0260)	(0.0299)	(0.0367)	(0.0385)	(0.0368)	(0.0392)
GBANK	-0.0396*	-0.0400*	-0.0492**	-0.0379	0.129***	0.128***	0.119***	0.112***
	(0.0208)	(0.0210)	(0.0228)	(0.0251)	(0.0302)	(0.0302)	(0.0311)	(0.0332)
BNKDEV	0.0146	0.0155	0.0156	0.0149	0.0410**	0.0418**	0.0410**	0.0415**
	(0.0164)	(0.0164)	(0.0164)	(0.0164)	(0.0207)	(0.0208)	(0.0207)	(0.0207)
GDPGR	0.392**	0.394**	0.392**	0.393***	0.308	0.308	0.307	0.307
	(0.164)	(0.164)	(0.164)	(0.164)	(0.201)	(0.202)	(0.201)	(0.201)
LABPOP	11.46	12.30*	11.64	11.21				
	(7.114)	(7.164)	(7.138)	(7.142)				
HUMCAP					0.780***	0.779***	0.786***	0.791***
					(0.228)	(0.228)	(0.228)	(0.228)
EXPGDP	0.0388*	0.0384*	0.0393*	0.0389*	0.0299	0.0286	0.0322	0.0307
	(0.0207)	(0.0206)	(0.0206)	(0.0206)	(0.0287)	(0.0286)	(0.0287)	(0.0285)
INF	-0.00732***	-0.00734***	-0.00730***	-0.00729***	-0.158**	-0.157**	-0.160**	-0.159**
	(0.00227)	(0.00227)	(0.00227)	(0.00226)	(0.0760)	(0.0762)	(0.0759)	(0.0761)
$FBANK \times MVAR_{t-1}$		0.000733		-0.00196		0.000689		0.000534
		(0.000943)		(0.00139)		(0.000685)		(0.000395)
$GBANK \times MVAR_{t-1}$			0.00217*	-0.000345			0.00236*	0.00375*
			(0.00130)	(0.00186)			(0.00123)	(0.00228)
CONS.	-2.907	-3.769	-3.183	-2.656	4.120	3.962	4.017	3.831
	(7.608)	(7.645)	(7.620)	(7.628)	(3.137)	(3.114)	(3.134)	(3.138)
No of Obs.	4184	4184	4184	4184	3612	3612	3612	3612
AR(1) test	-12.34 (0.000)	-12.34 (0.000)	-12.34 (0.000)	-12.34 (0.000)	-1.49 (0.137)	-1.48 (0.138)	-1.49 (0.137)	-1.48 (0.139)
AR(2) test	-0.64 (0.522)	-0.66 (0.507)	-0.66 (0.511)	-0.63 (0.530)	-1.36 (0.174)	-1.36 (0.174)	-1.36 (0.173)	-1.37 (0.171)
Hansen test	2.84 (0.497)	2.85 (0.488)	2.80 (0.491)	2.83 (0.494)	1.07 (0.585)	1.10 (0.578)	1.06 (0.589)	1.07 (0.584)

The robust standard errors are in parentheses, where * indicates significance at the 10% level, ** indicates significance at the 5% level and *** at 1% level. *AR(1)* and *AR(2)* are p-values and t-statistics of the test of first and second order autocorrelations and Hansen is the p-value and t-statistic of the Hansen test of overidentifying – restriction.

Our result in column 1 suggests that important industries are favored. For example, if banks with market power lend to firms in the food and beverage industry, they continue lending to firms in this industry. This might mean that incumbents are favored, but strictly speaking, the results do not rule out the fact new firms in the food and beverage industry get funding. Put differently, the evidence is that, with concentrated banking systems, information capital is vital: if they lend to an industry, they acquire knowledge in the industry and continue to lend to it.

In columns 3, 7 and 8, the interaction terms are positively related to manufacturing growth and net firm entry, suggesting that state owned banks promote the growth of as well as the entry into industries of economic importance. The marginal effect of state ownership of banks on manufacturing growth increases by 0.05 percentage points; while its effect on net firm entry increases by 0.18 and 0.8 percentage points when economic importance of industries increase by 1 percent. The results indicate that firms in important industries are favored by

state banks and may also mean that incumbents as well as entrants into the manufacturing industry get funding from state banks. Some of the incumbents may fall under the category of 'national champions', which are likely to be funded by state banks.

3.4.3.7. Initial Industry Value Added Ratio

In Table 3.10, we report the results of regression where we include the interaction terms between the initial industry value added ratio and bank market structure variables. In columns 6 and 8, the interaction terms are positive, signifying that foreign banks slow down the growth of entry into industries of economic importance (when economic importance is measures as the initial industry value added ratio) when the presence of foreign banks is high.

Table 3.10: Initial Industry Value Added Ratio

	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
Variables	*MVAGR*	*MVAGR*	*MVAGR*	*MVAGR*	*NFEGR*	*NFEGR*	*NFEGR*	*NFEGR*
$MVAGR_{t-1}$	0.0237	0.0237	0.0237	0.0238				
	(0.0240)	(0.0240)	(0.0240)	(0.0239)				
$NFEGR_{t-1}$					-0.268*	-0.269*	-0.268*	-0.269*
					(0.157)	(0.157)	(0.157)	(0.157)
BCON	-0.0154	-0.00540	-0.00570	-0.0149	-0.105***	-0.103***	-0.106***	-0.116***
	(0.0316)	(0.0260)	(0.0260)	(0.0323)	(0.0316)	(0.0274)	(0.0276)	(0.0341)
BCON×IMVAR	0.00192			0.00187	-0.000195			-0.00254
	(0.00214)			(0.0220)	(0.00186)			(0.00277)
FBANK	-0.106***	-0.101***	-0.106***	-0.101***	-0.194***	-0.205***	-0.195***	-0.205***
	(0.0262)	(0.0296)	(0.0262)	(0.0308)	(0.0378)	(0.0395)	(0.0376)	(0.0395)
GBANK	-0.0327	-0.0324	-0.0319	-0.0286	0.176***	0.175***	0.183***	0.178***
	(0.0223)	(0.0223)	(0.0264)	(0.0271)	(0.0304)	(0.0303)	(0.0335)	(0.0395)
BNKDEV	0.0238	0.0236	0.0236	0.0235	0.0430**	0.0458**	0.0425**	0.0457**
	(0.0165)	(0.0165)	(0.0165)	(0.0165)	(0.0214)	(0.0219)	(0.0214)	(0.0220)
GDPGR	0.363**	0.363**	0.362**	0.363***	0.480**	0.473**	0.478**	0.472**
	(0.155)	(0.155)	(0.155)	(0.155)	(0.208)	(0.207)	(0.208)	(0.207)
LABPOP	9.736	9.748	9.721	9.758				
	(7.099)	(7.100)	(7.092)	(7.106)				
HUMCAP					0.827***	0.825***	0.822***	0.825***
					(0.227)	(0.226)	(0.228)	(0.228)
EXPGDP	0.0414**	0.0418**	0.0419**	0.0413**	0.0602**	0.0572**	0.0593**	0.0551**
	(0.0207)	(0.0207)	(0.0207)	(0.0207)	(0.0294)	(0.0292)	(0.0293)	(0.0292)
INF	-0.00525**	-0.00522**	-0.00523**	-0.00524**	-0.188**	-0.188**	-0.189**	-0.188***
	(0.00205)	(0.00205)	(0.00205)	(0.00207)	(0.0784)	(0.0787)	(0.0785)	(0.0785)
IMVAR	-0.0809	0.0702	0.0401	-0.0263	0.0479	-0.0701	0.0740	-0.0223
	(0.123)	(0.0661)	(0.0445)	(0.157)	(0.106)	(0.0538)	(0.0487)	(0.184)
FBANK ×IMVAR		-0.000867		-0.000782		0.00171**		0.0021**
		(0.00129)		(0.00142)		(0.000781)		(0.000826)
GBANK ×IMVAR			-0.000156	-0.000836			-0.00157	-0.000239
			(0.00136)	(0.00158)			(0.00173)	(0.00186)
CONS.	-0.202	-1.016	-0.817	-0.487	1.375	1.691	1.362	2.560
	(7.718)	(7.718)	(7.660)	(7.823)	(3.250)	(3.097)	(3.119)	(3.332)
No of Obs.	4100	4100	4100	4100	3428	3428	3428	3428
AR(1) test	-12.65	-12.65	-12.65	-12.65	-1.54	-1.53	-1.54	-1.53
	(0.000)	(0.000)	(0.000)	(0.000)	(0.124)	(0.126)	(0.154)	(0.126)
AR(2) test	-0.42	-0.42	-0.42	-0.42	-1.14	-1.14	-1.13	-1.14
	(0.677)	(0.672)	(0.672)	(0.677)	(0.256)	(0.254)	(0.258)	(0.253)
Hansen test	2.06	2.06	2.06	2.06	4.08	4.10	4.08	4.12
	(0.357)	(0.357)	(0.358)	(0.357)	(0.130)	(0.129)	(0.130)	(0.127)

The robust standard errors are in parentheses, where * indicates significance at the 10% level, ** indicates significance at the 5% level and *** at 1% level. *AR(1)* and *AR(2)* are p-values and t-statistics of the test of first and second order autocorrelations and Hansen is the p-value and t-statistic of the Hansen test of overidentifying - restrictions

The marginal effect of foreign bank ownership on net firm entry increases by 0.22 and 0.27[72] percentage points when industry economic importance increases by 1 percent. This means that foreign banks concentrate their lending towards firms in industries that have previously experienced high growth, resulting in a 'divergence effect'. In high-growth industries, more entry increases competition and consequently, development, while low-growth industries continue to remain concentrated without adequate funding from foreign banks or any motivation to improve.

3.4.3.8. Industry Employment Share

In Table 3.11, we report the results of regressions where we include the interaction terms between industry employment share and bank market structure variables. Industry employment share could in some way serve as robustness to labour-intensity because both measures emphasize the importance of the labour force in industrial performance. In columns 2 and 4, the interaction term is negative, suggesting that the growth of industries of economic importance (when economic importance is measures as industry employment share) slows down when the presence of foreign banks is high. The marginal effect of foreign bank ownership on manufacturing growth based on the coefficients fall by 0.09 and 0.11 percentage points when industry economic importance increases by one percent. We highlight similar results in columns 2 and 4 of Table 3.7: foreign bank ownership may harm the growth of industries composed of labour-intensive firms. Similarly, they may harm the growth of economically important industries when economic importance is measured as industry employment share.

3.5. Conclusion

Using a sample of 26 developing countries between 1995 and 2007, this chapter examines the role of bank market structure (where bank market structure is measured as bank concentration, foreign bank entry and state ownership of banks) on industrialization (where industrialization is measured as the growth of manufacturing value added and net firm entry), with the primary aim of investigating whether there are other characterizations besides external finance dependence (if such a characterization is indeed valid) that should be common to industries that benefit from financial development. We carry out this

[72] Standard error (0.13225 and 0.16154).

investigation by incorporating interaction terms between bank market structure and industry-specific characteristics to the specifications.

Table 3.11: Industry Employment Share

	1	2	3	4	5	6	7	8
Variables	*MVAGR*	*MVAGR*	*MVAGR*	*MVAGR*	*NFEGR*	*NFEGR*	*NFEGR*	*NFEGR*
$MVAGR_{t-1}$	0.0625**	0.0622**	0.0624**	0.0623**				
	(0.0255)	(0.0255)	(0.0255)	(0.0255)				
$NFEGR_{t-1}$					-0.291*	-0.292*	-0.292*	-0.293*
					(0.159)	(0.159)	(0.159)	(0.159)
BCON	0.00672	0.00934	0.00899	0.00858	-0.0693**	-0.0753***	-0.0754***	0.0680**
	(0.0293)	(0.0242)	(0.0242)	(0.0294)	(0.0333)	(0.0284)	(0.0284)	(0.0335)
BCON×IES	0.000460			0.000161	-0.00115			-0.00145
	(0.00183)			(0.00197)	(0.00246)			(0.00257)
FBANK	-0.0806***	-0.0619**	-0.0806***	-0.0601**	-0.218***	-0.222***	-0.217***	-0.225***
	(0.0259)	(0.0289)	(0.0259)	(0.0301)	(0.0379)	(0.0410)	(0.0379)	(0.0407)
GBANK	-0.0476**	-0.0473**	-0.0527*	-0.0432	0.109***	0.109***	0.101***	0.0981***
	(0.0230)	(0.0228)	(0.0274)	(0.0283)	(0.0295)	(0.0296)	(0.0339)	(0.0332)
BNKDEV	-0.0100	-0.0104	-0.0101	-0.0104	0.0366*	0.0366*	0.0367*	0.0364*
	(0.0203)	(0.0203)	(0.0203)	(0.0203)	(0.0218)	(0.0217)	(0.0218)	(0.0217)
GDPGR	0.337**	0.337**	0.336**	0.338**	0.427**	0.429**	0.428**	0.428**
	(0.162)	(0.162)	(0.162)	(0.162)	(0.211)	(0.212)	(0.211)	(0.211)
LABPOP	6.938	6.879	6.951	6.877				
	(7.244)	(7.237)	(7.236)	(7.243)				
HUMCAP					0.697***	0.701***	0.699***	0.697***
					(0.219)	(0.219)	(0.219)	(0.219)
EXPGDP	0.0455**	0.0465**	0.0457**	0.0465**	0.0126	0.0125	0.0122	0.0127
	(0.0206)	(0.0206)	(0.0205)	(0.0205)	(0.0319)	(0.0320)	(0.0320)	(0.0319)
INF	-0.00579***	-0.00586***	-0.00581***	-0.00585***	-0.136*	-0.136*	-0.136*	-0.135*
	(0.00212)	(0.00211)	(0.00212)	(0.00212)	(0.0727)	(0.0726)	(0.0726)	(0.0727)
IES	-0.0501	0.134	-0.0456	0.160	0.128	0.0237	0.0154	0.0579
	(0.134)	(0.0860)	(0.0615)	(0.187)	(0.183)	(0.0810)	(0.0829)	(0.195)
FBANK×IES		-0.00373**		-0.00409**		0.000746		0.00136
		(0.00163)		(0.00189)		(0.00272)		(0.00266)
GBANK×IES			0.00102	0.000823			0.00129	0.00197
			(0.00176)	(0.00208)			(0.00235)	(0.00208)
CONS.	1.855	1.004	1.827	0.873	2.681	3.197	3.274	3.087
	(8.246)	(8.138)	(8.095)	(8.339)	(3.312)	(3.143)	(3.177)	(3.333)
No of Obs.	3886	3886	3886	3886	3588	3588	3588	3588
AR(1) test	-11.89 (0.000)	-11.89 (0.000)	-11.89 (0.000)	-11.89 (0.000)	-1.44 (0.149)	-1.44 (0.150)	-1.44 (0.151)	-1.44 (0.151)
AR(2) test	-0.93 (0.354)	-0.93 (0.354)	-0.93 (0.354)	-0.93 (0.354)	-1.27 (0.206)	-1.27 (0.205)	-1.27 (0.203)	-1.27 (0.202)
Hansen test	0.51 (0.774)	0.49 (0.781)	0.51 (0.775)	0.50 (0.780)	2.25 (0.324)	2.28 (0.320)	2.28 (0.320)	2.28 (0.320)

The robust standard errors are in parentheses, where * indicates significance at the 10% level, ** indicates significance at the 5% level and *** at 1% level. *AR(1)* and *AR(2)* are p-values and t-statistics of the test of first and second order autocorrelations and Hansen is the p-value and t-statistic of the Hansen test of overidentifying - restrictions.

The initial findings of this chapter are based on the results from the baseline regression, where net firm entry has been used as the dependent variable, are that bank market structure affects the growth of entry into manufacturing industries. The negative effect of bank concentration on net firm entry emphasizes the oligopolistic nature of banks with market power while the negative effect of foreign bank entry highlights its ability to squeeze credit available to incumbents as well as new entrants in the manufacturing sector. On the other hand, the growth of entry into manufacturing industries is faster in the presence of state banks because of its welfare-enhancing effect by lending to new entrants, financially constrained firms and during periods of uncertainly and instability.

On the relationship between bank market structure and industrial performance, a significant amount of literature suggests that industries that depend more on external finance benefit more in countries where the level of financial development is higher. For that reason, we would expect bank concentration and foreign bank entry, and to a lesser extent state owned banks to promote the growth of industries that depend more on external finance, as well as entry into these industries. We find no evidence of this. Bank lending to firms in the manufacturing sector appear not to be influenced by their external financial dependence (except when we include the interaction terms simultaneously into the specifications which might indicate that elements of bank market structure are proxying for each other).

Because we are unsure of the construction and assumptions of external finance dependence, our investigation of other characterizations that could be common to industries that benefit from financial development suggest that are affected by bank market structure. On the whole, the results suggest that industries composed of large firms, labour-intensive firms, and firms of economic importance (when economic importance is measured as lagged manufacturing value added growth) growth faster in countries where the level of financial development is high. The growth of entry into industries composed of large firms is also quicker when the level of bank concentration is high. However, bank concentration slows down the growth of entry into industries composed of small firms. On the other hand, while industries composed of small firms grow faster in countries where foreign banks presence is high, the growth of industries composed of labour-intensive firms and firms of economic importance (when economic importance is measures as industry share), as well as the growth of entry into industries composed of large firms and firms of economic importance (when economic importance is measured as initial manufacturing value added growth), slows down in countries where the presence of foreign is high. Finally, we find that the growth of and entry into industries composed of large firms and firms of economic importance (when economic importance is measured as lagged manufacturing value added growth) faster in countries where the presence of state banks is high. The growth of industries composed of labour-intensive firms slows down when state ownership of banks is high.

We have not previous stated in this section or discussed in the previous, the high-technological intensity characterization because the interaction terms were insignificant in all the specifications in Table 3.8. According to Rajan and Zingales (1998), external finance dependence differs across industries for technological or structural reasons. Also, when we

consider the ranking of this index across industries, we find that to a great extent, more innovative or technologically-intense industries require more external finance in the manufacturing sector. According to Da Rin and Hellmann (2002), banks with market power and are profit driven promote industrialization. Also, Berger and Udell (2006) argue that foreign banks have better lending technologies and are better suited to lend to high-tech firms in manufacturing industries. We find no evidence of this in our results. This may provide further evidence that the measure of external financial dependence by Rajan and Zingales is fundamentally flawed (while they assume that these firms are the dynamic and innovative ones).

From a policy perspective, while innovative or technologically-intense industries may require adequate external finance, it is not necessarily the case that they benefit explicitly when the level of financial development is higher. Rather, while the effect of financial development on such industries may be positive, this effect on their development may be implicit. In other words, it is not enough for governments of developing countries to simply assume that increasing the level of financial development will directly lead to industrialization. Some form of state intervention on how credit is allocated is required to trigger industrialization.

In general, while different industry characterisations that are expected to benefit from financial development are influenced by bank market structure, they are not necessarily industries that depend more on external finance. The significant effects of bank market structure on industrial performance through a variety of industry characterizations are the most important aspect of our study. Also, the systematic approach we use by including all there bank market structure variables is a valuable contribution to the literature. Finally, not all the interaction terms we employ have been examined in the literature. Some of the results cast doubts over Rajan and Zingales measure of external financial dependence as well as the ability of banks in developing countries to fund firms that use innovative technology by questioning the ability of a general policy like financial development, through bank market structure to promote industrialization. In other words, the systematic approach and the econometric results comprise valuable contribution to the literature.

The study is not without drawbacks, some of which relate to data availability. Another drawback can be related to the insignificance of some of the interaction terms and they may be due to measurement errors. For example, one would have expected the interaction between state ownership of banks and small firm share/labour-intensity/high-tech intensity to be

significant and positive. These would have suggested the improvement of industrial performance as a result of the welfare-enhancing effect of state banks.

Finally, it will also been interesting to see if these findings will hold for a larger number of developing countries, provided adequate is data available. Also, a good idea to improve on this chapter would be to directly investigate the link financial development/bank market structure and measures of innovation and technological development.

Appendix 3.1: Manufacturing Industry Specific Characteristics

Manufacturing Sector – Industries	*ED*	*SFS*	*AFS*	*LI*
Food and beverages	0.14	3.93	146.58	23.78
Tobacco products	-0.45	0.3	782.93	23.56
Textiles	0.4	2.81	223.79	36.06
Wearing apparel, fur	0.03	8.18	172.27	41.15
Leather, leather products and footwear	-0.14	10.45	162.50	36.68
Wood products (excl. furniture)	0.28	21.37	118.30	31.41
Paper and paper products	0.18	3.03	115.8	26.46
Printing and publishing	0.2	16.32	63.01	35.77
Coke, refined petroleum products, nuclear fuel	0.25	5.8	464.79	16.14
Chemicals and chemical products	0.33	9.26	99.52	23.58
Rubber and plastics products	0.23	4.62	125.18	31.14
Non-metallic mineral products	0.06	14.17	111.59	25.11
Basic metals	0.24	9.98	135.50	24.78
Fabricated metal products	0.09	4.76	76.26	32.36
Machinery and equipment n.e.c.	0.45	13.68	94.93	38.79
Office, accounting and computing machinery	1.06	2.85	346.20	27.14
Electrical machinery and apparatus	0.77	3.44	124.31	35.66
Radio, television and communication equipment	1.04	3.09	262.84	30.48
Medical, precision and optical instruments	0.96	4.01	108.03	36.83
Motor vehicles, trailers, semi-trailers	0.39	2.28	119.48	32.24
Other transport equipment	0.31	2.21	119.07	38.49
Furniture; manufacturing n.e.c.	0.24	9.09	135.91	37.23
Recycling	0.47	19.95	45.16	31.22

Note: Data for *ED* (external financial dependence) was obtained from Rajan and Zingales (1998), data on *SFS* (small firm share was obtained from Beck *et al*. (2008), while *AFS* (average firm size) & *LI* (labour intensity) were calculated by the author, where data was gotten from the *UNIDO* industry database.

Appendix 3.2: Scatter Plots showing the relationship between Manufacturing Value Added Growth/Net Firm Entry and Bank Market Structures over different time periods

Figure 1

Figure 1A

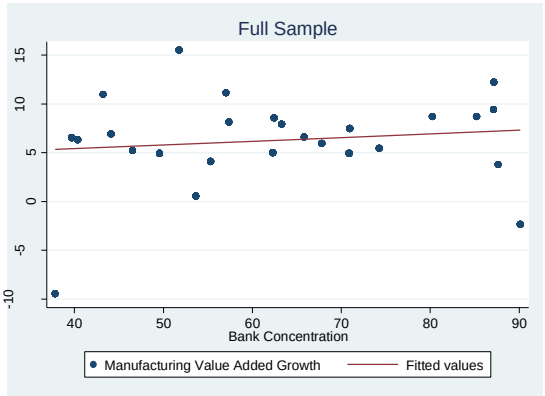


Figure 1B

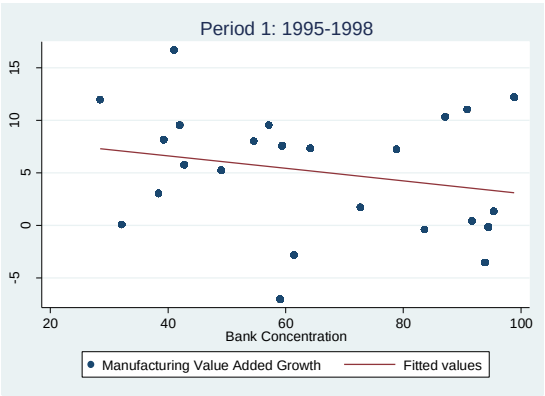


Figure 1C

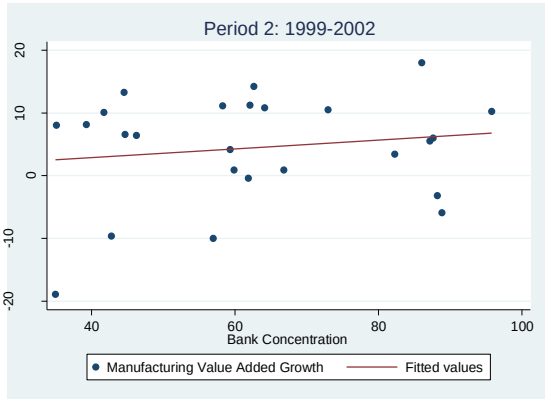


Figure 1D

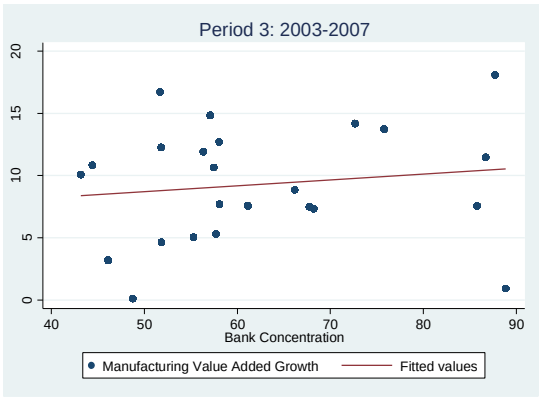


Figure 2

Figure 2A

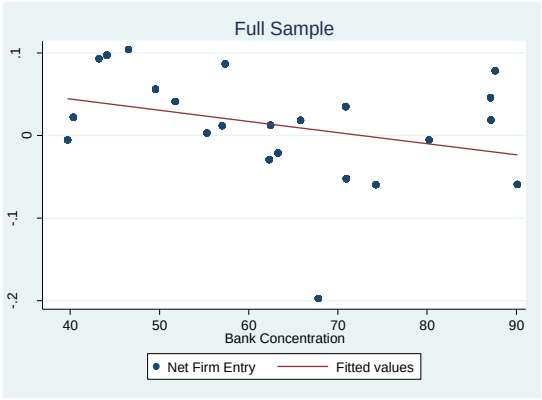


Figure 2B

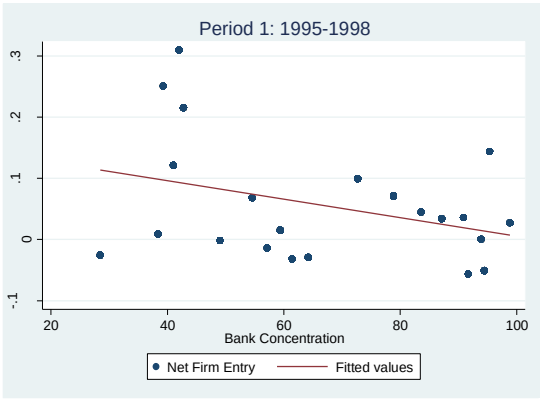


Figure 2C

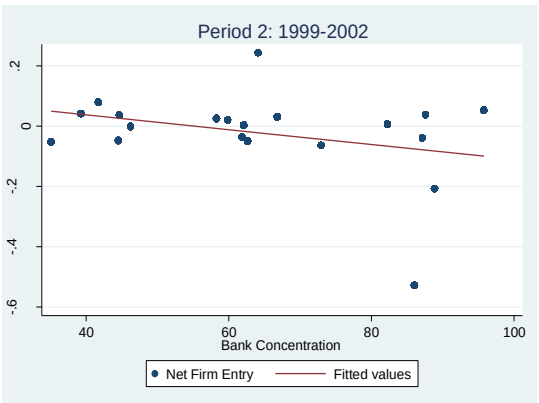
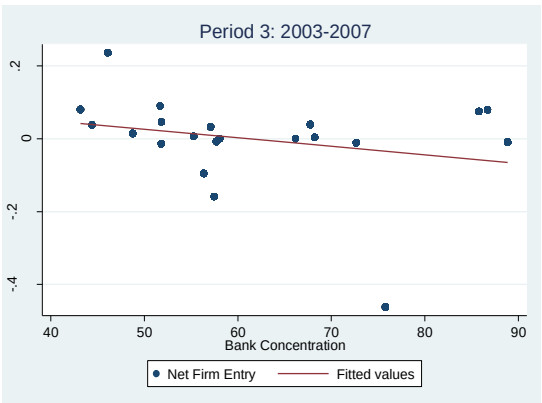


Figure 2D



Plot A of figure 1 shows a positive relationship between average of manufacturing value added growth and bank concentration across countries over the sample period. This relationship is consistent in plots C and D but not B, the relationship in plot B is negative. On the other hand, plot A of figure 2 shows a negative relationship between the average of net firm entry and bank concentration. This relationship is consistent over the other time periods.

Figure 3

Figure 3A

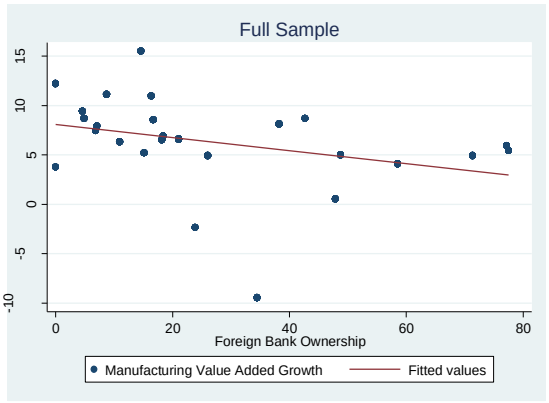


Figure 3B

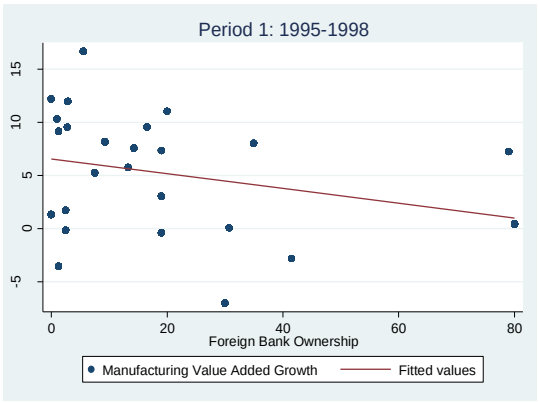


Figure 3C

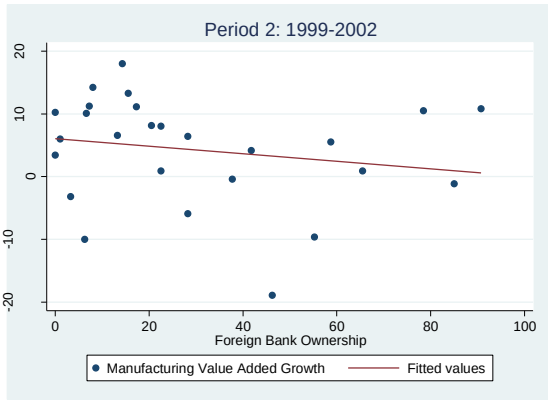


Figure 3D

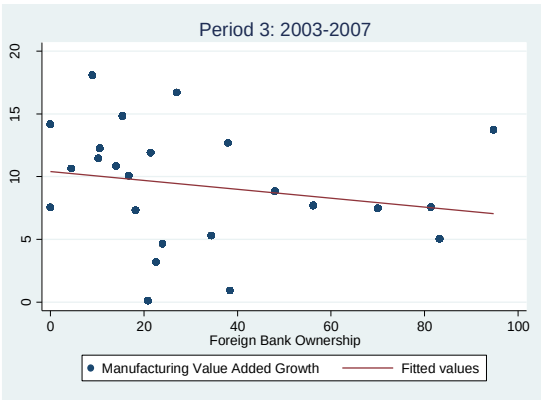


Figure 4

Figure 4A

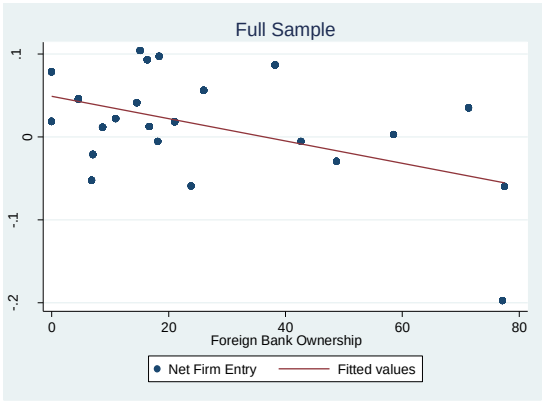


Figure 4B

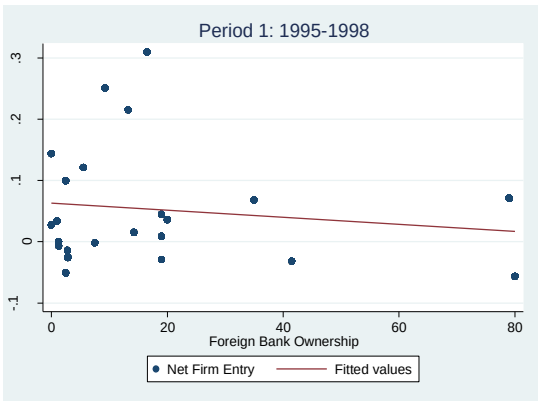


Figure 4C

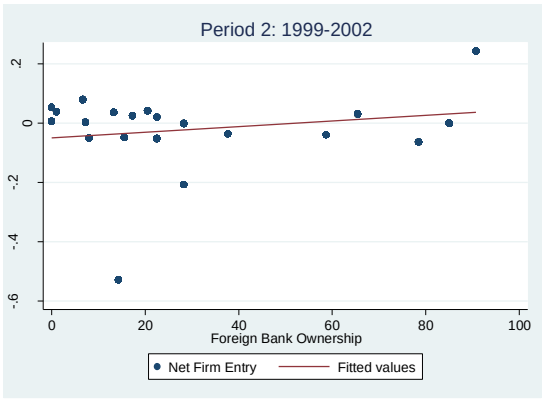
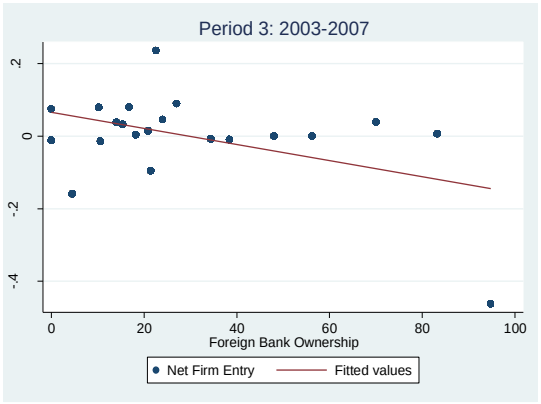


Figure 4D



Plot A of figure 3 shows a negative relationship between the average of manufacturing value added and foreign bank ownership. This relationship is consistent over the different times period specified in plots B, C and D. On the other hand, plot A of figure 4 shows a negative relationship between the average values of net firm entry and foreign bank ownership. This relationship is consistent over different time periods (except in plot C, where the relationship is positive).

Figure 5

Figure 5A

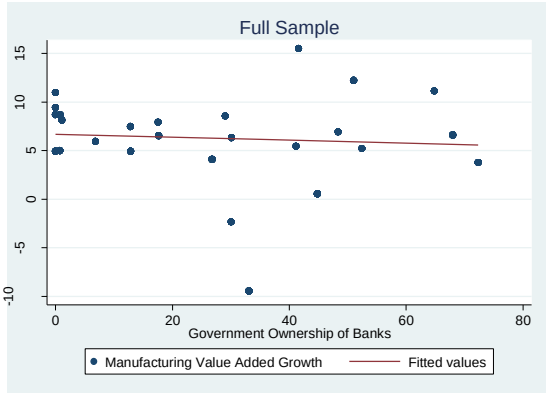


Figure 5B

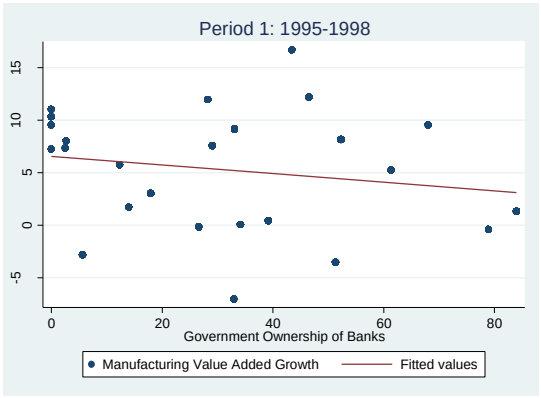


Figure 5C

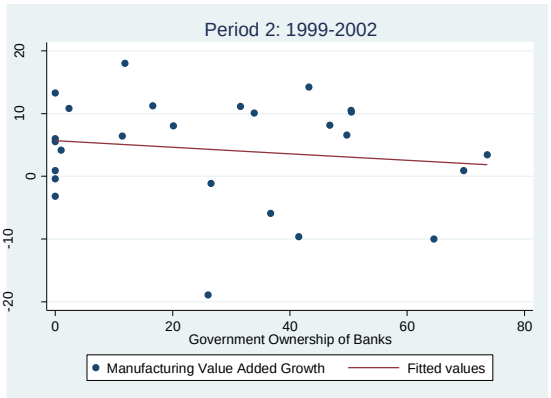


Figure 5D

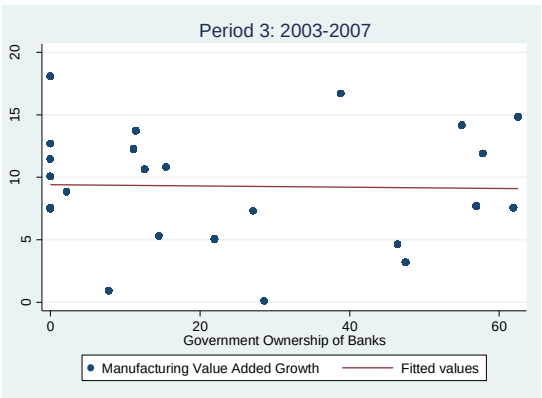


Figure 6

Figure 6A

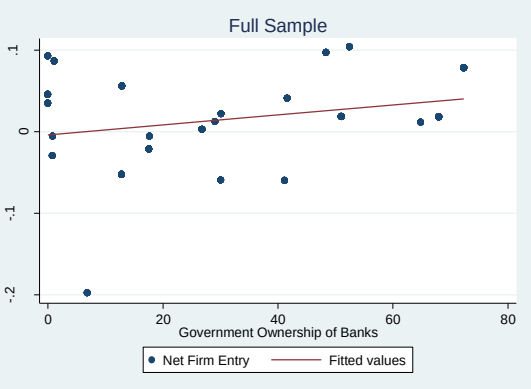


Figure 6B

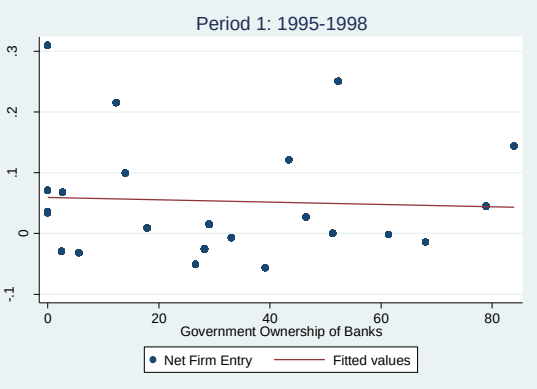


Figure 6C

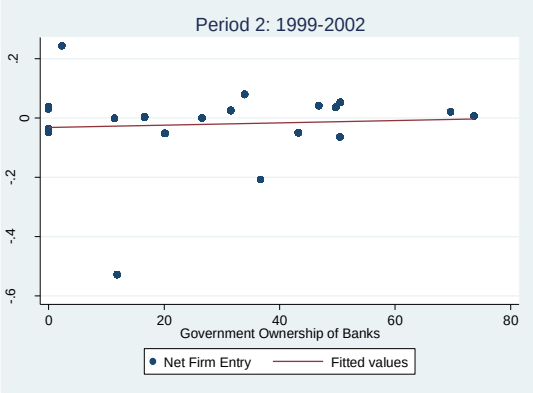
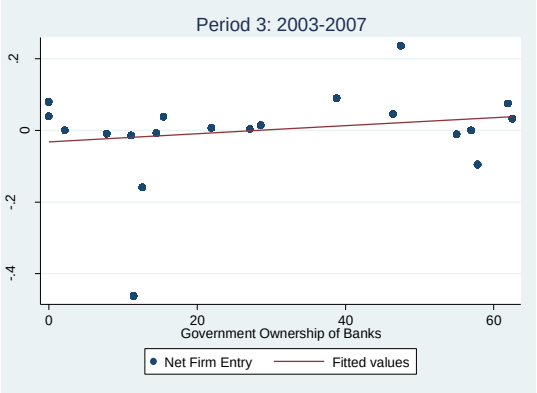


Figure 6D



Plot A of figure 5 shows a negative relationship between the average of manufacturing value added and government ownership of banks, and this relationship is consistent when the sample is divided into three periods (i.e. in B, C, and D). However, in plot A of figure 6, the relationship between the average value of net firm country and government ownership of banks across countries is positive. This relationship is maintained in periods 2 and 3, but not 1. The relationship in period one is negative. In general, we find the relationships to be relatively stable over subsamples of the time period.

CHAPTER 4: THE EFFECT OF FINANCIAL DEVELOPMENT ON EXPORT SOPHISTICATION AND EXPORT DIVERSIFICATION IN DEVELOPING COUNTRIES

4.1. INTRODUCTION

There is an exhaustive literature establishing the link between finance and growth[73] and an additional literature which links trade with growth[74]. In this chapter, we suggest that there might be a close relationship between these two aspects of the literature. In other words, it is possible that financial development may affect growth through trade. International trade theories suggest that factor endowments, economies of scale and technological levels are factors responsible for comparative advantage and consequently responsible for determining trade quantities and patterns between countries. A strand of the literature additionally proposes that the level of financial development in countries may be responsible for determining trade quantities and patterns between countries. Kletzer and Bardhan (1987) are seen to be the ones who introduced this theoretical concept. They use an amplified Heckscher-Ohlin trade model, incorporating a financial sector and illustrate that its development encourages countries to specialize in sectors that rely heavily on external finance. Even though some recent empirical studies seem to support this hypothesis, it is fair to say that there is still no consensus, not only because the literature is not expansive, but also on the grounds of the issue of direction of causality or indeed if a relationship financial development and trade specialization really exists.

Traditional models of international trade suggest that trade expansion leads to improved future economic performance by countries through the principle of comparative advantage. It has however been documented that from a long-term outlook, the impact of exported products (and services) are heterogeneous on economic performance[75]. It has also been documented in the literature that potential economic growth as a result of specialization in exports in more pronounced in some products than others. Previously, prospective economic

[73] See King and Levine (1994).
[74] See Frankel and Romer (1999).
[75] In other words, it has been documented that because exported goods and services have different characteristics, their impact on economic performance will vary. Some will have a more pronounced effect on economic growth than others.

growth was seen to be positively influenced by the volume of trade[76], but in the last twenty years or so, the quality and content of what you exported was seen to significantly determine how competitive you were in the international market, and primarily future economic growth. Recent trade theory also highlights the importance of sophisticated exports for economic growth and suggests that countries which are at the top of the scale in terms of sophisticated exports are likely to have better economic performance (Funke and Ruhwedel, 2001; Amiti and Freund, 2008 and Hausmann, *et al*., 2007).

While the sophistication of exports is important, the diversification of exported products is equally important, particularly for developing countries. They experience external shocks because of their over-reliance on commodity exports. To tackle the problems of external shocks, policies that increase export revenues, sustain export earnings, and upgrade the trade structure have to be implemented. Free trade, based on comparative advantage, specialization, and international division of labour was the view before the First World War. This view was based on traditional trade theories developed by Smith (1776) and Ricardo (1817). However, Prebisch (1950) and Singer (1950) criticized this view after the Second World War by suggesting that increased specialization in developing countries meant exporting raw materials and agricultural products for consumer and investment goods manufactured in developed countries. Therefore, for developing countries to increase export revenues, sustain export earnings and upgrade their export structure, it was essential to diversify products that were exported. This led many of them to gradually implement policies that facilitated outward orientation and reduced trade barriers from the 1980s. However, the results of expanding and diversifying exports have been mixed from a developing country point of view, so, this remains a key concern for governments in many developing countries.

Our motivation for this chapter is that, compared to the literature linking financial development and international trade, the literature linking financial development and export structures (particularly export diversification) has not been exhaustively explored. This relationship is relevant for developing countries as many of them have undertaken structural reforms (including financial reforms) in the last 30 years with the sole aim of improving economic growth. One channel through which economic growth can be sustained is being competitive in international trade (i.e. increasing export sophistication and product

[76] Countries (particularly developing countries) sought to increase the volume of exports because they saw it as an active channel through which economic growth could be achieved.

diversification). Therefore, we consider the link between financial development and structure of exports rather than aggregate trade or exports in developing countries.

4.2. CONCEPTUAL FRAMEWORK

4.2.1. Background to the Effects of Financial Development on International Trade.

Baldwin (1989) developed one of the early theoretical models where financial institutions were seen to be a source of comparative advantage. In his model, he shows that in countries equipped with better financial institutions, the ability to diversify risk is greater, and therefore firms are able to produce risky goods at lower risks and marginal costs. Also, Kletzer and Bardhan (1987) develop a model where a country's comparative advantage depends on the development of financial institutions. However, while Baldwin emphasizes the ability of financial institutions to diversify risk, Kletzer and Bardhan concentrate on the ability of financial institutions to provide external finance to activities that require it the most. They use two models to show that comparative advantage of a country explicitly depends on financial institutions. One model shows that international lending to countries with poor reputation requires higher interest rates and firms are unable to specialize in sophisticated manufactured products, while the second model shows that in countries with weak financial institutions, firms do not face higher interest rates but tighter credit rationing. It is also important to note that in both models the level of technology is assumed to be the same across countries.

The above studies find that better financial institutions will improve the growth of activities that require more external finance. We find these suggestions to be vague without a more precise definition of what characteristics are similar in industries that largely depend on external finance.[77] The idea by Rajan and Zingales (1998) that highly external dependent industries would experience faster growth rates in countries with better financial institutions might not be saying much. According to them, industries that depend more on external finance are more technologically-intense. However, it is possible that better financial institutions may promote the growth of industries with other characteristics. For example, Kowalski (2011) finds that better financial institutions may improve the growth of capital intensive industries; Becker *et al*. (2013) finds that better financial institutions may promote

[77] In the previous chapter, we were able to show that there are no common characteristics among industries that depend more on external finance as defined by Rajan and Zingales (1998) and our findings are supported by Von Furstenberg and Von Kalckreuth (2006) and Kabango and Paloni (2011).

the growth of industries with high up-front costs; and Manova (2008) finds that better financial institutions promote the growth of industries with limited tangible assets.

Apart from the theoretical studies of Baldwin (1989) and Kletzer and Bardhan (1987), Beck (2002, 2003) and Svaleryd and Vlachos (2005), provide empirical support for the importance of financial institutions in shaping up a country's comparative advantage. As an extension to Kletzer and Bardhan's model, Beck (2002) specifies technology to be different across countries but supports the theoretical predictions of Baldwin (1989) and Kletzer and Bardhan (1987). His model emphasizes how important financial institutions are at financing large-scale and high-return projects. He provides further evidence through empirical examination to show that countries with better financial institutions are expected to have higher exports as well as trade balance of manufactured goods.

On the other hand, Beck (2003) uses data at a more disaggregated level i.e. industry level data, to show that in countries with better financial institutions, the cost of financial intermediation is lower, resulting in higher exports and trade balances in industries that depend more on external finance. In other words, Beck provides empirical support for the theory using a methodology introduced by Rajan and Zingales (1998). On a similar note, Svaleryd and Vlachos (2005) use OECD countries to show that the effects of the financial system on patterns of specialization are more significant when compared to human and physical capital endowments. These studies show a robust positive relationship between financial development and exports in sectors that depend heavily on external finance i.e. comparative advantage and specialization in international trade occur as a result of financial development.

Functions of the financial system as described by Levine (1997) allow the economy of a country to specialize and take advantage of economies of scale. These functions include the ability of financial institutions to mobilize savings and facilitate trading, hedge, diversify and pool risk, allocate resources efficiently, and monitor managers and exert corporate control. In a theoretical model of finance and trade by Beck (2002), he predicts that economies with a better financial system are net exporters of goods with increasing returns to scale. In the model, he presents an open economy with two production technologies (one with constant returns to scale-for food production-the other with increasing returns to scale for manufactures). Producers who use both technologies will supplement their existing capital with debt financing from savers. Market uncertainties and friction as a result of moral hazards

and asymmetric information will create a situation where financial intermediaries have to intervene. However, it proves expensive for financial intermediaries to channels savings to producers. Financial development is now modelled to reduce the cost of financial intermediation and therefore increase the volume of external finance in the economy. Given that financial development creates incentives for the producer to produce more goods with increasing returns to scale, industrial specialization, and consequently the structure of trade flows, is determined by the level of financial development.

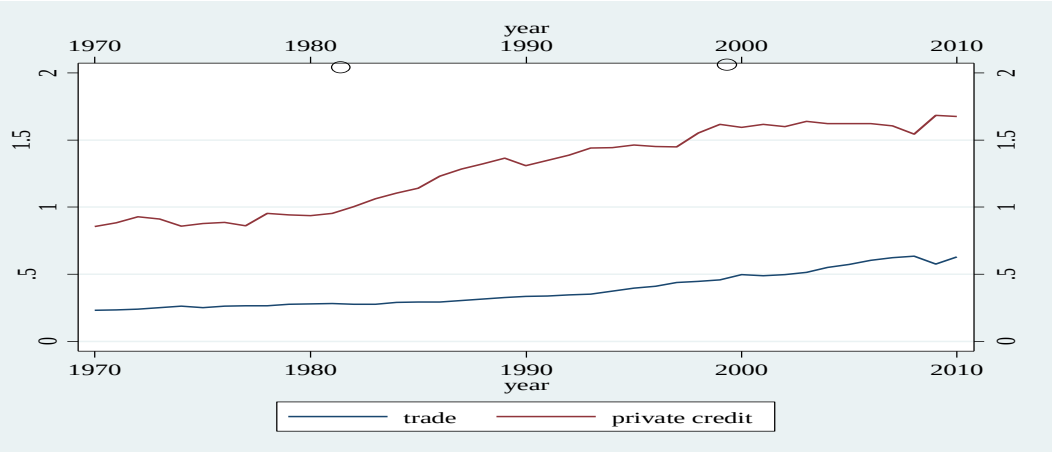
Figure 4.1 shows a positive but weak relationship between the average data for trade (ratio of exports plus imports over GDP) and financial development (credit provided by commercial banks to the private sector over GDP) in the last 40[78]. However, it also possible that financial development levels increase as a result of international trade due to the demand for increased financial services.

While the positive relationship between financial development and trade has only been recently established in the last decade, a contrary view does exist in the literature. In this strand of the literature, financial development occurs as a result of the demand and supply of external finance. It is assumed that the demand for financial services from well-developed financial sectors is likely to be more evident in countries where industries are structured to rely mainly on external finance. For that reason, the quality and pattern of trade may be responsible for influencing the quality of financial institutions in countries. how countries demand for financial service.

In other words, countries structured with industries heavily reliant on external finance will require more financial services, and consequently higher levels of financial intermediary development. Do and Levchenko (2007) develop this hypothesis, while Huang and Temple (2005), Klein and Olivei (2008) and Baltagi *et al.* (2009) provide empirical support for it. Generally, these studies postulate that countries that export goods from industries that rely heavily on outside finance are likely to have highly developed financial systems when compared with countries who primarily exports goods from industries that are not heavily reliant on external finance.

[78] In figure 1, we can see that both variables are increasing (although the growth in world trade is slower than that of financial development).

Figure 4.1: Average Trade and Financial Development (World, 1970-2010)



Source: World Development Indicators (WDI) for Trade and Beck and Al-Hussainy (2010) for Private Credit.

At firm-level, the importance of financial institutions is measured by how much they are able to reduce problems of information asymmetries and contract enforcement, as well as how firms with promising projects can effectively meet their external financial needs. When financial institutions are good, exporting firms find it easier to meet their external financial needs; this makes it easier for them to effectively compete in the international market even after making the initial costs that cannot be recovered. Also, the presence of good financial institutions increases funds available for lending in the credit market and reduces any form of volatility that may be associated with exporting firms (Manova, 2008).

There is some evidence in the literature to suggest that the performance of exporting firms in the international market suffers when they are faced with financial constraints. For example, Chaney (2005) builds a model of international trade with financial constraints and predicts that, if firms must pay sunk costs to enter international markets and if they are liquidity constrained to finance these costs, only those firms that have sufficient liquidity are able to export; Manova (2008) develops a model which predicts that financial market imperfections severely restrict international trade flows because exporting firms require outside finance; Greenaway *et al*. (2007) use over 9000 UK firms (1993-2003) to investigate the link between firms' financial health and their export market participation decision. They find that exporting firms reveal better financial health than non-exporting firms. In other words, firms that face credit or liquidity constraints are unlikely to export. Muuls (2008) uses a theoretical model to predict that firms are more likely to export if they enjoy higher productivity levels and lower credit constraints. Bellone *et al. (*2010) analyse the link between financial

constraints and firms' exporting behaviour, and the main finding is that firms enjoying better financial health are likely to become exporters. These studies suggest that better financial institutions help in reducing the problem of financial constraints that might be faced by exporting firms.

Some scepticism exists on the positive relationship between financial development and trade in the literature. Some studies find a negative or insignificant relationship between financial development and international trade. For example, Kim *et al*. (2010) investigate the dynamic relationship between trade openness and financial development and finds that the positive relationship between financial development and trade openness is only existent in the long-run, while a negative relationship exist in the short-run; Demir and Dahi (2011) shows some evidence of the effect of financial development on trade between developing countries; and trade between developed and developing countries by emphasizing the positive significant relationship between financial development and trade between two developing countries and an insignificant relationship of financial development and trade between a developing and a developed country.

While there is some theoretical and empirical evidence that financial development promotes production in technologically advancement, we believe these results are vague because the measure which the empirical results are based on-sectors that are more external finance dependent (Rajan and Zingales, 1998)-are not clearly defined and have been criticized on these grounds (Von Furstenberg and Von Kalckreauth, 2006 and Kabango and Paloni, 2011). Our findings in the previous chapter casts further doubts over characteristics of sectors described as more external finance dependent. While technologically innovative sectors may share the characteristics identified in this literature, it is the case that these sectors are not singled out explicitly and that, therefore, the positive effect financial development might have on the development of such sectors remains implicit. This may simply be suggesting that the impact of financial development on industries that depend largely on external finance is not clearly understood, and also signifies that assumptions on the effect of financial development in industry specialization might be based on questionable foundations.

Theoretically, it might also be difficult to suggest that better financial institutions in developing countries would ensure that exports are more sophisticated. The fundamentals of such arguments are based on an abstract and unrealistic modeling of technological

advancement in developing countries because market failures may prevent this from happening. Market failures require some form of government welfare-enhancing interventions but have been criticized on the grounds of political economy considerations[79] by the mainstream literature. According to Neoclassical theory, the role of the state in financial markets is to ensure it operates freely and remains competitive (Khan, 2008).

Some critics have argued that restricting the role of the state to creating a favorable environment for both financial markets and the rest of the economy may be responsible for hindering technological advancement in developing countries. Their arguments are based on two fundamentals of technological progress i.e. the centrality of learning and the tacit character of knowledge/technology. In developing countries, technological progress occurs through innovation rather than invention. By innovation, we mean the ability of developing countries to disseminate and familiarize themselves with the machines/technologies, organizational and commercial processes imported from developed countries and applying them to the local economy. In other words, technological progress in developing countries occurs through learning[80] rather than through invention or R&D which makes countries more technologically advanced (UNCTAD, 2007).

Although, technological progress may occur through the transfer of technology, it is not exactly straightforward. In other words, the fact that developing countries have access to foreign technology does not mean that they immediately accrue the benefits. For foreign technology to be clearly understood, its assimilation and absorption requires an understanding of its tacit element, which mostly occurs through learning that depends on training and experience (Hausmann and Rodrik, 2003). Hence, understanding the tacit elements of technology is associated with high costs and risks, and an effective application of the process would also hinge on technological efforts, i.e. investment in technological change. The difficulty is that firms may not be able to get funds to finance these investments. Outside financiers find it exceedingly difficult to differentiate between high-and-low value investment opportunities because of significant information asymmetries which results in inadequate (or lack of) history of managers' entrepreneurial abilities and the uncertainties about the profitability of innovative projects.

[79] i.e. government failure and its rent-seeking behaviour.
[80] Learning in this case could occur through seeking technological alternatives, choosing a technology and learning how to use it efficiently.

There are no easy solutions to this problem, because the innovating firm would have little or no incentive to make public insider information on the project's potential because it faces the risk of competing firms copying its strategies or innovations. As a result of these circumstances, banks may be reluctant to fund such innovative projects, particularly since the loan contract is unlikely to give them any opportunity to make claim to any part of the productivity gains if the firm's project prospers. Another scenario that may occur is that banks may only be willing to fund firms' projects if they invest in projects that have lower-risk or use known technologies (Lall, 2004). Additionally, banks may only be willing to fund projects based on short-termism. In other words, they tend to favour short-term projects with front-loaded returns and discouraging entrepreneurial learning. Banks may be willing to lend to innovative entrepreneurs with no history of their abilities and collateral, who engage in innovative projects, but charge high risk premiums, particularly in a liberalized financial environment. Banks may feel safer increasing their lending portfolio towards the more profitable and less risky government and household sectors (Carpenter and Peterson, 2002). Therefore, it is possible that financial development may not have the positive effect that it has been hypothesized to have on markets failures that prevent innovative projects from being funded and could worsen the situation.

Technologies differ in their tacit elements and, while learning in general faces market failures, the solutions may be dependent on the activity. Generalized interventions (liberalization of finance and trade and investment in education) will ensure countries exploit existing comparative advantage: in developing countries, low-technology and value added sectors are more likely to experience growth because they are internationally competitive. Since developing countries are associated with low levels on investment in technological change and productivity-enhancing industries, their production is concentrated in technology with lower learning potentials. Under these circumstances, substantial growth in manufactured exports is not impossible but, for it to be sustainable, incessant technological upgrading and deepening is required, and this requires selective (Lall, 2004). For this reason, therefore, it is possible that financial development may result in reduction in the degree of sophistication of the export basket in developing countries.

It has been argued that the ability of developing countries to diversify their export baskets is a significant step towards fast-paced economic development. It is generally recognized that an economy's susceptibility to exogenous shocks is largely dependent on its degree of trade

openness (Briguglio, 2009; Rodrik, 2010; and World Bank, 2010). Because trade openness is commonly measured as the ratio of exports plus imports to GDP, an economy becomes vulnerable through its exports or imports. Import-dependent countries are vulnerable to the availability and cost of the imports (Briguglio, 2009), while export earnings and economic growth of export-dependent countries become volatile due to economic shocks. Countries that depend on exports are largely exposed to external shocks because foreign exchange earnings finance imports and directly contribute to investment and growth (Foxley, 2009). Although, economic shocks occur through foreign exchange earnings, the degree of the impact depends on the degree of export diversification.

The link between financial development and export diversification in the literature is scarce, but Manova (2008) finds that if financial development reduces liquidity constraints and increases the number of exporting firms, then it is expected that financial development may increase the degree of export diversification of a country's export basket. On the other hand, the effect of financial development may be the opposite if banks decide to finance activities where the country already has comparative advantage. Empirical studies that have clearly examined the effect of financial development on export diversification are scarce. First of all, Agosin *et al*. (2012) find the effect of financial development on export diversification to be insignificant in all of their regressions. Bebczuk and Berrettoni (2006) on the other hand, find that financial development either reduces diversification or it has no effect.[81] Finally, in a study of the five members of the Southern African Customs Union, Seabe and Mogotsi (2012) present some weak evidence that financial development helps diversification, as its estimated coefficient is only significant at 10 percent.

4.2.2. Export Structure: A Theoretical Framework

4.2.2.1. Export Sophistication.

Traditional models of international trade suggest that trade expansion leads to improved future economic performance by countries through the principle of comparative advantage. It has also been documented in the literature that potential economic growth as a result of specialization in export products in more pronounced in some products than others. Previously, prospective economic growth was seen to be positively influenced by the volume

[81] The latter result is obtained in their preferred specification.

of trade[82], but in the last twenty years or so, the quality and content of what you exported was seen to significantly determine how competitive you were in the international market, and primarily, future economic growth. Recent trade theory also highlights the importance of sophisticated exports to economic growth and suggests that countries which are at the top of the scale in terms of sophisticated exports are likely to have better economic performance (Funke and Ruhwedel, 2001; Hausmann, *et al*. 2007 and Amiti and Freund, 2008).

According to Lall *et al*. (2006), "export sophistication" is a way of classifying traded products which does not require industry data. It infers product characteristics from the characteristics of the exporter rather than the parent industry data on factor content." (p. 5). In other words, according to the authors, countries with higher average income levels export more sophisticated products. While highly sophisticated exports require a high level of technology, Lall *et al*. suggest that the level of sophistication also requires other factors that affect location. In their paper, they include technology (R&D, production capacities and innovation), marketing, logistics and proximity (transport costs), fragmentability (divisible production processes), information and familiarity, natural resources, infrastructure, and value chain organization.[83] Apart from the economic factors that affect sophistication, policy factors like "trade restrictions, subsides, trading blocs and trading preference can affect the location of export production, and so sophistication". (p. 6). The authors stress that while export sophistication is largely determined by the level of technology; other factors mentioned are important determinants of the degree of export sophistication.

This chapter uses an empirical proxy for the productivity level of projects/goods as described by Hausmann *et al*. (2007) to represent export sophistication, *EXPY*. Other measures have previously been used[84] in the literature but the important aspect of this measure is that it links productivity levels with a country's exports.[85] To calculate *EXPY*, commodities are classified in accordance with their exporting countries.[86] The authors use the commodity-specific calculations of sophistication to construct the degree of sophistication for each country. They use trade data from the United Nations Commodity Trade Statistics Database (COMTRADE) and it covers over 5000 products at the Harmonized System 6-digit level for the years 1992-

[82] Countries (particularly developing countries) sought to increase the volume of exports because they saw it as an active channel through which economic growth could be achieved.
[83] See Lall *et al*. (2006) for more on these factors.
[84] Michaely (1984), Lall *et al*. (2006), Fan *et al*. (2006), and Xu (2007).
[85] See Hausmann *et al*. (2007) for a complete discussion of the model.
[86] Commodities exported by rich countries are ranked higher than commodities exported by poor countries.

2003. They also trade data from the World Trade Flow dataset (Feenstra *et al*. 2005). It covers 700 products and is based on the 4-digit standard international trade classification (SITC rev. 2) from the years 1962-2000. In this study, we utilize *EXPY* constructed from the trade flow dataset because it has a relatively longer time span and covers more countries in the initial period when compared to *EXPY* constructed from the COMTRADE data.

In the first instance, *PRODY* is constructed[87]. *PRODY* is the weighted average of the per capita GDPs of countries exporting a given product, and therefore represents the income level associated with that product. Accordingly, let countries be indexed by *j* and goods be indexed by *l.* The total exports of country *j* is equivalent to

$$X_j = \sum_l x_{jl} \tag{4.1}$$

where X_j (the total exports of country *j* or the country's overall export basket) is equivalent to $\sum_l x_{jl}$ (the summation of the export of all commodities *l* in country *j*).

Let the per-capita GDP of a country *j* be represented by Y_j. Then the productivity level associated with product *k*, $PRODY_k$, equals

$$PRODY_k = \sum_j \frac{(x_{jk} / X_j)}{\sum_j (x_{jk} / X_j)} Y_{j.} \tag{4.2}$$

The numerator of the weight, x_{jk} / X_j, is the value-share of the commodity in the country's overall export basket. The denominator of the weight, $\sum_j (x_{jk} / X_j)$, aggregates the value-shares across all countries exporting the good. Therefore, the index represents a weighted average of per capita GDPs, where the weights correspond to the revealed comparative advantage of each country in good *k.*

Next, the *PRODYs* are used to calculate the productivity level associated with country *j's* export basket of goods, $EXPY_j$. Specifically, $EXPY_j$ is the average income and productivity level associated with all commodities exported by a country. It is calculated as the weighted average of all relevant *PRODY's*, where the weights represent the share of the relevant

[87] PRODY is the commodity-specific calculation.

product in the country's export basket. The productivity level associated with country *j*'s export basket, $EXPY_j$, is therefore defined by

$$EXPY_j = \sum_l \left(\frac{x_{jl}}{X_l} \right) PRODY_l \qquad (4.3)$$

This is a weighted average of *PRODY* for that country, where the weights are simply the value shares of the products in the country's total exports.

Lall *et al*. (2006) and Hausmann *et al*. (2007) find that the positive relationship between the levels of sophistication and GDP per capita is relatively high. In other words, an economy experiences growth when the level of sophistication in the products she produces and exports is increased. Hausmann *et al*. suggest that high growth countries like China and India have sophistication levels comparable to developed countries even when their GDP per capita is somewhat low. The reason for this they suggest is that, unlike many of their developing counterparts, their exports are relatively more sophisticated.

In figure 4.2[88], the degree of sophistication is in logs. Overall, figure 4.2 shows a continuous rise in the level of sophistication over the time during the period under consideration. Anand *et al*. (2012) may help in explaining the way export sophistication has evolved overtime.[89] First of all, they note that while the ratio of exports to GDP increased for all developing country groups, sub-Sahara Africa experienced the lowest increase. Also, when they decompose export products into resource/primary based and manufactures, they find that the share of manufactures increased significantly in high-and middle-income countries, while it decreased in low-income countries but marginally increased in sub-Sahara Africa. In other words, the export baskets of low-income countries and sub-Sahara Africa remain largely composed of primary/resource based products.

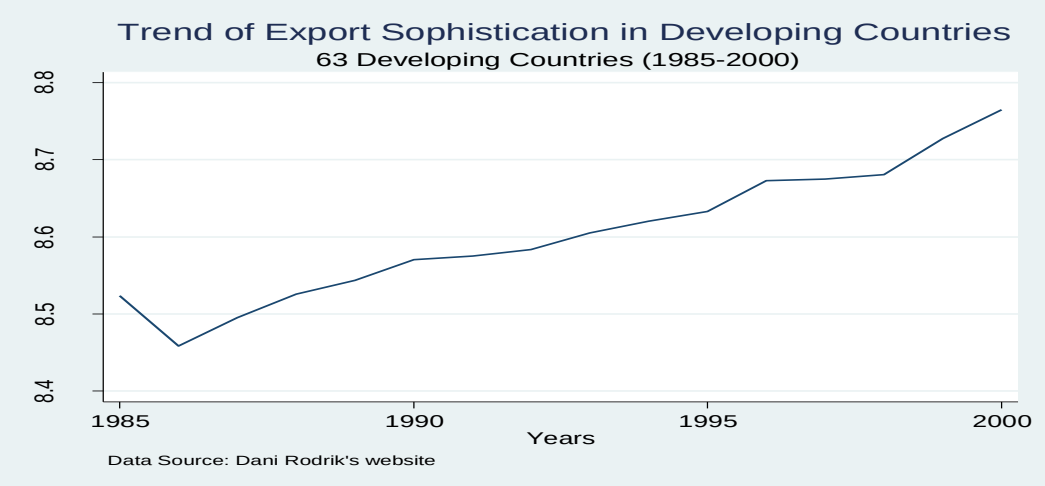
When they decompose the exports of resources into primary products and higher-value added resource-based products, they find that the share of primary products declined in high-income and fast growing economies, while it remained constant is sub-Sahara Africa and increased in low-income countries. After they decompose manufactured exports are decomposed into low-

[88] In the appendix, we present graphs which show how export sophistication has evolved for each country over the sample period.
[89] Their sample period runs from 1990 to 2010.

tech, medium-tech and high-tech, the share of high-tech increased in high, medium and low-income countries but it declined in sub-Sahara Africa. The share of medium-tech manufactures have increased in all regions with low-income countries and sub-Sahara Africa having the smallest share. Finally, while the sophistication levels of exported goods and services have increased, they are relatively low in low-income countries and sub-Sahara Africa. The reason for this can be traced to exports of low-income countries (particularly sub-Sahara Africa), and its export basket which is dominated by primary/resource based product that are low-value, low-tech manufactures and only has a small number of medium-and high-tech manufactures. In other words, growth in the degree of export sophistication in figure 4.2 may have been triggered by high and medium-income countries (Lall, 2000).

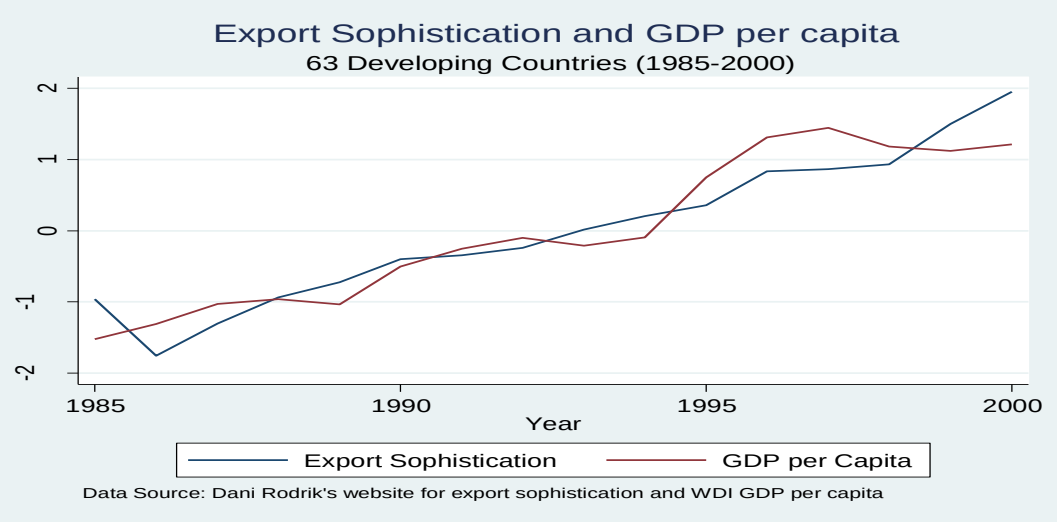
Figure 4.3[90] shows a positive relationship between the degree of sophistication and GDP per capita after both variables have been standardized to give them similar scales. The relationship is explained by the fact that an element of *EXPY*, a commodity's *PRODY*, is determined by per capita GDPs of countries that are large exporters of that commodity (Lall *et al*. 2006 and Hausmann *et al*. 2007).

FIGURE 4.2



[90]. In appendix 4.3, we present scatter plots between export sophistication and GDP per capita for every year between 1985 and 2000 to check if this relationship is consistent on a yearly basis.

FIGURE 4.3



Determinants of Export Sophistication

The theory of comparative advantage states that the nature and understanding of trade between countries is largely dependent on how the cost of production of the exporting country varies from the production costs of its trading partners. The difference in production costs between trading partners can be directly linked to the level of productivity in the countries' sectors and industries (Ricardo, 1817) or the endowment and comparative accessibility of production factors between countries (Kletzer and Bardhan, 1987). While both models are simple in nature, they have been used as a theoretical foundation in explaining the complex nature of trade between countries.

Ricardo's model of international trade assumes comparative advantage to be determined by a relationship between trade and differences in labour supply by means of varied levels of technology. In other words, Ricardo identifies technological differences in labour as the factor of production to determine comparative advantage. On the other hand, the Heckscher-Ohlin model of international trade assumes that the production structure of a country is determined by its resources. In other words, a country with relatively abundant capital will export mostly capital-intensive goods, while a country that is endowed with labour is likely to export mostly labour-intensive goods.

Hence, trade theory principally assumes that the exports of a country should reveal its factor endowments. This theory also suggests that the production structure of a country and its

export is largely dependent on its comparative advantage. The Heckscher-Ohlin model creates a foundation by which the quality of exports from a country is measured. It links countries' comparative advantage to the types of production they can profitably engage in and export. It is however assumed that a country's exports should include products where it has comparative advantage; therefore comparative advantage largely determines its export sophistication.

Factor endowments of a country are classified as natural resources, labour, physical capital, knowledge capital and institutional quality. Land, crude oil and minerals are typical examples of natural resources. Countries with abundant natural resources are associated with low human and physical capital accumulation according to the so-called 'resource curse' hypothesis. In the literature, there is empirical evidence to support the hypothesis that countries with abundant natural resources are likely to experience slow-paced economic growth and slow technological development in the long-run (Auty, 1998; Sachs and Warner, 1995, 1997, 2001; and Leamer *et al*. 1999).[91] Similarly, Hausmann *et al.* (2007) finds a negative relationship between a country's land area and its degree of export sophistication.

Other factors that affect the production process are knowledge capital (Romer, 1990). Two fundamental factors that contribute to the creation of knowledge creation are human capital and Research and Development (Ascari and Di Cosmo, 2004). An increase in human capital (when human capital is measured by educational attainment) makes the export structure of a country converge towards the export structure of the group of OECD countries.[92] The quality of institutions is likely to be an important factor that indirectly affects the degree of export sophistication. It 'oils' the effect of factors of production on the export sophistication of countries. For example, important trade policies can 'make' or 'break' the volume of exports as well as it quality (Lo and Chan, 1998; and Schott (2008).

4.2.2.2. Export Diversification

External shocks are a major challenge facing developing countries because they are largely reliant on commodity exports. Policies that can increase export revenues, sustain export earnings, and upgrade the trade structure in developing countries are seen as a key solution to this challenge. Before the First World War, Smith (1776) and Ricardo (1817) developed

[91] However, Lederman and Maloney (2003) criticise the robustness of Sachs and Warner by stating that measurement of resource abundance and estimation techniques used might have determined their conclusion.
[92] See Schott (2008) for a detailed discussion on this.

traditional theories with the view that free trade was based on comparative advantage, specialization and international division of labour. However, this view has been criticized on the grounds that increasing specialization in developing countries meant the continuous exportation of raw materials and agricultural products in exchange for the consumer and investment goods manufactured in developed countries (Prebisch, 1950 and Singer, 1950).The Presbisch-Singer hypothesis suggest that when countries specialize their exports in a few products, it exposes them to increased instability in export revenues and worsens when the products are subject to worsening terms of trade. The hypothesis emphasizes that the trade theories of Smith and Ricardo restricted developing countries to the production of primary products which had negative effects for developing countries irrespective of the time horizon.

Therefore, for developing countries to increase export revenues, sustain export earnings and upgrade their export structure, it was essential to diversify the products that were exported. In the 1980s, many developing countries were led to gradually implement policies that facilitated outward orientation with the sole aim of maximizing the benefits of exporting. However, the results of expanding and diversifying exports have been mixed from a developing country's point of view. From a developing country point of view, export diversification is seen to be an upgrade from traditional to more modern exports.

Trade theory suggests that exports diversification can occur via different dimensions. According to Samen (2010), export diversification mainly occurs through horizontal and vertical dimensions. Horizontal export diversification occurs within the same sector or industry and requires changes in the country's export basket by accumulating new products on the existing ones within the same sector or industry with the intention of reducing the negative effects of external shocks and political instability. On the other hand, vertical export diversification in the production of manufactured products requires an entire shift from the production sector. For example, it is a shift from the primary to the secondary sector or from the secondary to the tertiary sector. It requires improving the quality or value of existing exports by upgrading the production process through technological progress, as well as improving marketing and logistics. Vertical export diversification particularly has the potential to create a larger market for raw materials and improve growth since goods that are processed are likely to have grater price stability than when they are in a raw state.

While aggregate exports are seen to be relevant for economic growth and development, developing countries have struggled to expand and diversify their export baskets. Collier and Hoeffler (2004) identify economic and political risks as possible dangers accompanied with an export basket that is concentrated in a few primary commodities. Economic risk associated with foreign exchange earnings volatility can negatively affect economic growth in the short-run through increased unemployment, reduced investment, trade volumes and foreign exchange cash flows, increased inflation, and capital flight. The economic risks are aggravated in the long-run due to worsening terms of trade conditions. Political risk on the other hand is associated with a deteriorating level of governance and the likelihood of severe instability in politically-tense countries. The over-reliance on primary commodities by countries is related to poor governance, which leads to poor economic performance.

In the literature, export diversification has been measured in different ways and the different measures are based on the different definitions. In the literature, the most widely used measure of export diversification is the Concentration Ratio[93] i.e. across products. Using the Concentration Ratio is advantageous because it is easy to compute, available for a large number of countries and comparisons across countries can be easily examined

In this study, we utilize the Herfindhal-Hirschman index from UNCTADstat. An aggregate measure of export diversification *EXPCON* is used in this study because this is what is prevalent in the literature that explores the relationship between export diversification and economic growth. The export diversification index is calculated by taking the sum of squares of all exported products in a country. It has been normalized to obtain value ranking from 0 to 1 (maximum concentration or when only one product is exported). Export diversification according to the Herfindahl-Hirschman index is based on the following formula:

$$H_j = \frac{\sqrt{\sum_{i=1}^{n}\left(\frac{x_i}{X}\right)^2} - \sqrt{1/n}}{1-\sqrt{1/n}} \qquad (4.4)$$

where H_j = country index

x_i = value of exports of product *i*

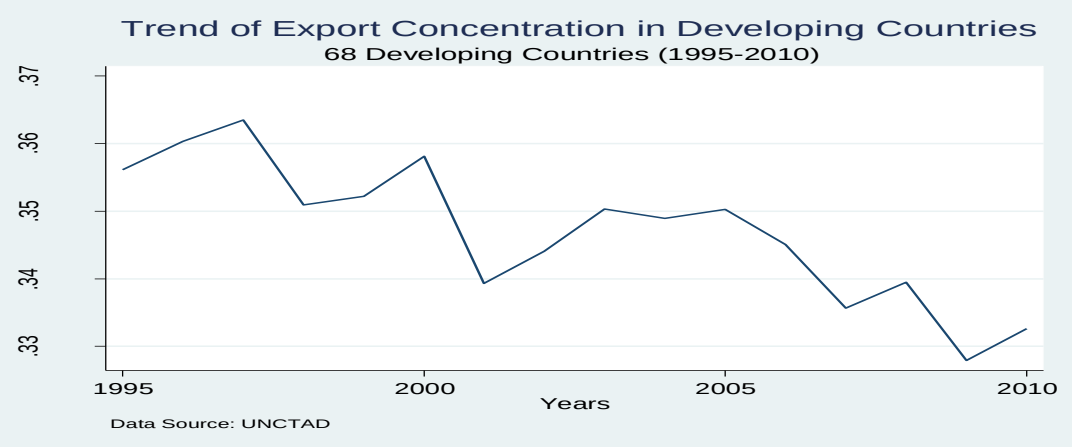
[93] See Agosin (2009), Lederman and Maloney (2003) and Hesse (2008).

$$X = \sum_{i=1}^{n} x_i \text{ and,}$$

n = number of products (SITC rev. 3 at 3-digit group level).

In general, Table 4.4[94] shows that export concentration has fallen in developing although there are periods where it increased. For example, during the 1997/1998 Asian financial crisis, export concentration appears to have risen. Also, the *Y2K.com* bubble scare may have been partly responsible for the rise in 2000, although it started to decrease in 2001. The rise in export concentration was also pronounced after the 2008 crisis. Figure 4.5[95] shows a negative relationship between export concentration and GDP per capita (both variables have been standardized to be similar in scale) - which is expected because it has been highlighted that export diversification is beneficial for economic growth and development. The area to the left of Figure can be associated with the period of structural adjustment programmes in many developing countries (late 1980s to mid-1990s), particularly financial liberalization policies. A lot of these countries experienced financial and economic instability after the implementation of these policies.

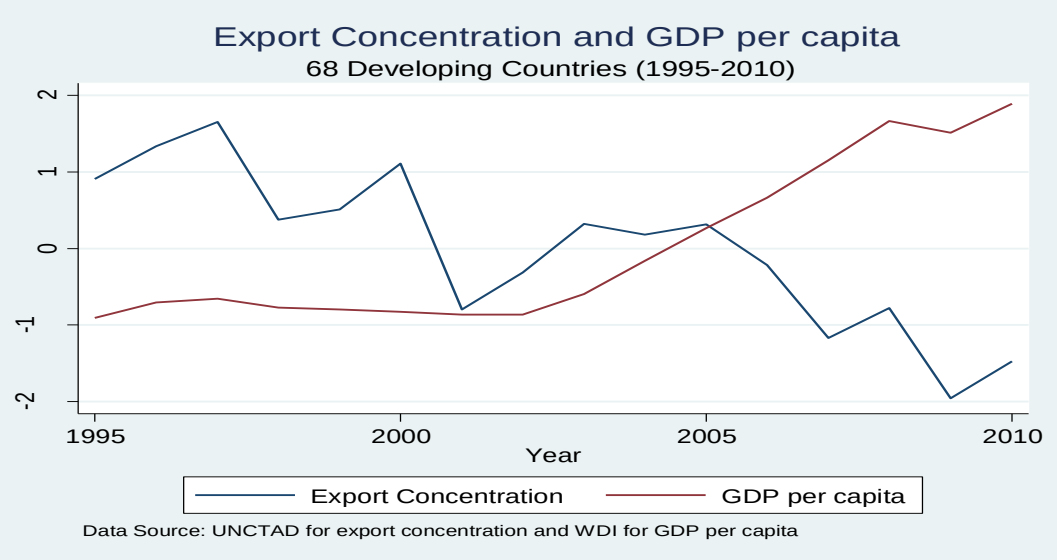
FIGURE 4.4



[94] In the appendix, we present graphs which show how export concentration has evolved for each country over the sample period.

[95] In the appendix, we present scatter plots between export concentration and GDP per capita for every year between 1995 and 2010 to check if this relationship is consistent on a yearly basis.

FIGURE 4.5



Determinants of Export Diversification

The factors that determine international trade have been previously discussed in the theoretical trade literature. However, as we previous mentioned, there are no theoretical model of reference for the determinants of export diversification. We have to rely on international trade models as well as some empirical studies that examine the determinants of export diversification. According to the Ricardian model of international trade, the level of productivity can be seen as a potential determinant of export diversification. Melitz (2003) suggest that the level of productivity varies across firms, and therefore only firms with the highest level of productivity are able to export. However, studies like Klinger and Lederman (2006) and Cadot *et al*. (2010) find a non-linear (or U-shaped) relationship between the level of productivity and the degree of export diversification.

Accordingly, Agosin *et al.* (2012) use the Melitz (2003) model of trade with firm heterogeneity to determine factors that might affect export diversification. The factors are classified under three categories: economic reforms, structural factors and macroeconomic variables. Economic factors include trade openness and financial development. Agosin *et al*. measure trade openness as the ratio of trade (exports plus imports) to GDP and financial development as the ratio of credit to the private sector from commercial banks to GDP. In his model, Melitz (2003) hypothesizes that trade liberalization can increase the level of export

diversification by raising the number of exporting firms in industries and sectors where there are enhanced export opportunities.

Melitz (2003) does not directly explore the relationship between financial development (financial liberalization) and export diversification. Nevertheless, according to an extension of his model, the effect of financial factors show that liquidity constraint may impede entry into international markets (Chaney, 2005 and Manova, 2008). Financial development is thus seen to reduce liquidity constraints and increase the number of exporting firms, resulting in an increase in the degree of export diversification. Manova (2008) uses a multi-sector model to show that sectors which rely more on external finance will perform better when the level of financial development is high. Put differently, financial development would facilitate export diversification if sectors that rely heavily on external finance produce highly differentiated goods.

The second classification (structural factors) includes factor endowments and economic distance. According to Melitz (2003), human capital will positively affect export diversification if its accumulation makes it possible for a country to upgrade their production process through specialization from primary to manufactured products. Economic distance on the other hand could proxy for trade costs. As Melitz (2003) has shown, high variable and fixed trade cost reduce export volumes (including the number of exporting firms and differentiated products). So it is expected that the relationship between economic distance (trade costs) and export diversification will be negative.

The third classification, macroeconomic factors, is understood to reduce the profitability of production. This could occur directly through exchange rate over-valuation, or indirectly through uncertainty due, for example, to exchange rate volatility. Terms of trade changes could also have an effect on export diversification. Exchange rate over-valuation and volatility are expected to negatively affect export diversification. The effect of exchange rate over-valuation has a similar effect as economic distance (trade cost) bearing in mind that stronger exchange rates make export more expensive thereby reducing the profits and number of exporting firms. The negative effect on exchange rate volatility on export diversification is linked to the literature on hysteresis[96]. This simply means uncertainty creates a situation

[96] Hysteresis is a situation where short-run effects are consistent. It could also mean that long-run equilibria are determined by short-run ones.

where production might be adversely affected due to firms' persistence in production and trade decisions in the presence of trade costs. Melitz (2003) argues that a weaker exchange rate is likely to increase the number of exporting firms but, where sunk costs are vital, firms are unlikely to export because they are unsure if any profits will be made as a result of the sunk costs. This shows that exchange volatility increases volatility and could possibly have a negative impact on export diversification.

A positive trend in terms of trade can increase export concentration according to a simple factor-endowment model. In Agosin *et al.* (2012), if the world price for a commodity that is the main export of a country increases, factor resources are reallocated towards this sector, reducing the access of other sectors to resources due for new production processes (classical Dutch Disease phenomenon).[97] Conversely, Melitz (2003) sees a positive trend in terms of trade to increase the profits of exporting firms that benefit from this process and could facilitate export diversification. The effect of terms of trade is therefore an empirical matter. However, Agosin *et al.* (2012) investigate this matter further by examining the effect of terms of trade improvements on export diversification in the presence of human capital endowments. An interaction term between human capital and the terms of trade improvement is included in the model since high levels of human capital are seen to be associated with the production of highly differentiated products. The results suggest that terms of trade improvement will negatively affect export diversification but only in countries with low human capital levels. The results on the other hand suggest that terms of trade improvements will facilitate export diversification in countries with high human capital levels and an already diversified production base.

Another determinant of export diversification is the size of the economy which is mostly proxied by the population. The intuition is that larger economies are expected to be more diversified because they have larger domestic markets and highly specialized production processes. Market access is another factor that they believe will affect export diversification. In their study, market access is measured using the country's membership to preferential trade agreement. It is understood that due to this membership, exports should improve in terms of volumes and differentiation. They also see the quality of institutions and FDI as potential determinants of export diversification.

[97] For example, Krugman (1980) and Schott (2008) identify a negative relationship between export diversification and endowment in natural resources.

4.2.3. Methodological Approach

Lall *et al*. (2000) and Hausmann *et al*. (2007) do not consider financial factors are important determinants of export sophistication. Samen (2010) and UNDP (2011) suggest that financial factors, though trade credits and the reduction of transaction costs can improve export diversification but they show no empirics to support this, while Agosin *et al*. (2012) does not find any evidence that financial development helps countries diversify their exports. Finally, Cadot *et al.* (2010) makes no mention of financial factors as possible determinants of export diversification.

The main objective is to examine the effect of financial sector development on export structures in developing countries. Export sophistication and diversification are independently modelled to examine this relationship. This chapter investigates the link between financial development and export sophistication and diversification for one key reason: if it is established that financial development increases export sophistication and reduces concentration, it emphasizes the significance of financial sector development not just for economic growth and development but for export structure and therefore increases the importance of financial sector policy reforms with regards to trade policies.

To examine the effect of financial development on export structures, we first examine the effect of bank development on export sophistication. The benchmark bank development variable we use is the ratio of private credit to GDP because it by far the most frequently used measure of financial development in the literature. To identify different functional aspects of financial sector development, we use four other bank development indicators are used: the ratio of deposit money bank assets to GDP, liquid liabilities to GDP, the ratio of deposit money bank assets to central bank assets and deposit money bank assets, and the standardized sum of all four indicators. Since countries with high per capita GDPs and productivity levels are assumed to export more sophisticated products, we assume that a significant number of these products will be high-technologically intensive. For this reason, we extend the model by replacing export sophistication with high-skill manufactured exports as a ratio of total exports. High-skill manufactured exports are from the *UNCTADstat* database and data sample is similar to export concentration. Secondly, we examine the effect of bank development on export sophistication. Similar to export sophistication, the ratio of private credit to GDP is the benchmark bank development variable and the other four are used for robustness. For robustness analysis, we include an export diversification index from UNCTAD. The index

measures whether the structure of exports by product of a given country differ from the structure of product of the world. The index ranges from 0 to 1 reveals the extent of the difference between the structure of a country and the world average. A higher value would indicate larger difference from the world average, and therefore more concentration. This index is sometimes referred to as a 'similarity index' of trade.

The methodology proceeds by broadly investigating the impact of financial development on export sophistication and diversification where financial development includes general characteristics of the financial system and includes relevant control variables to the respective models of export sophistication and diversification. The country sample and time period are restricted to relevant data availability. The time period is relevant to this study because it overlaps a period where most countries in the sample have already initiated some form of financial liberalization

4.3. EMPIRICAL FRAMEWORK

4.3.1. Model Specification

The empirical model estimates that export sophistication is function of the level of financial development, through the functions of the financial system that were stated in Levine (1997). The chapter would help in determining whether cross-country variation in financial development can help in explaining cross-country variation in export structures, as well as exploiting time-series variation on the data. Additionally, panel data estimation makes it possible to control for biases due to country-specific effects. Time dummies are also included in the model to control for possible policy changes that have been undertaken over the period under consideration but are not presented because of economic of space. The following regression is therefore estimated:

$$EXPY_{it} = \alpha + \delta_1 EXPY_{i,t-1} + \delta_2 BNK_{it} + \delta_3 CV_{it} + \mu_i + \lambda_t + \varepsilon_{it}, \quad (4.5)$$

where $EXPY_{it}$ measures the degree of export sophistication in country i at time t, $EXPY_{i,t-1}$ is the lagged dependent variable, BNK_{it} is some measure of bank development, CV_{it} is set of conditioning variables in country i at time t, μ_i and λ_t are country-and time-specific effects, and ε_{it} is the error term. We estimate the impact of financial development on export concentration using the following model:

$$EXPCON_{it} = \alpha + \delta_1 EXPCON_{i,t-1} + \delta_2 BNK_{it} + \delta_3 CV_{it} + \mu_i + \lambda_t + \varepsilon_{it}, \qquad (4.6)$$

where $EXPCON_{it}$ measures the degree of export concentration in country *i* at time at time *t*, while $EXPCON_{i,t-1}$.The existence of the so-called dynamic panel bias involves some econometric problems in estimating (4.5) which can be solved using a system-GMM estimator proposed by Blundell and Bond (1998). The system-GMM estimator was used in the previous chapter and how it solves the associated econometric problems with dynamic panels, as well as its advantages over other panel estimators have already been discussed in Chapter 3.

4.3.2. Variable Descriptions

1. Financial Development

The importance of financial development is largely established in the literature and has already being previously discussed in this study. The next issue with financial development is the existence of an adequate direct measure of it. According to Cihak *et al*. (2012), for financial development to be properly measured, one would need to have direct measures of how well the financial system processes information prior to probable investment projects and capital allocation; monitors investment projects and ensures corporate governance after financing; manages risk; mobilizes and pools savings; and eases the exchange of goods and services. However, it has not been possible to obtain precise measures for these functions. While proxy measures for different characteristics[98] of the financial systems have been made available, this study will employ proxy measures of financial depth for financial institutions for reasons related to data availability and the fact that banks are more active in many developing countries.

Financial depth refers to the extent of services provides by the financial system (particularly banks). Financial depth proxies used in the study include the ratio of private sector credit to GDP[99] (*BNKDEV*), ratio of deposit money bank assets to GDP (*BNKSIZE*), ratio of M2 to GDP (*BNKLIQ)*, ratio of deposit money bank assets to central bank assets plus deposit money bank assets (*BNKCBN*) and financial intermediation development [100](*FININTDEV*).

[98] Financial depth, financial access, financial efficiency, and financial stability.
[99] This proxy is the one that is most widely used in the empirical literature.
[100] This is a summation of the standardized values of all four financial indicators previously mentioned.

BNKDEV measures to large extent financial intermediary services provided for the private sector. *BNKSIZE* measures the importance of financial services in relation to the size of the economy. *BNKLIQ* broadly measures financial intermediation since it includes the central bank, commercial banks and non-bank financial intermediaries. BNKCBN measures the relative importance of deposit money banks relative to central banks. Finally, *FININTDEV* is a broad measure of the other four indicators.

2. Trade

Agosin *et al.* (2012) established that international trade was a determinant of export diversification. In this study, we measure trade openness *TRADE* as the ratio of the sum of exports and imports to GDP. We treat trade openness as exogeneous to export sophistication because when exporters are more productive than non-exporters, this would help sophistication (for example, through learning by exporting as well as other effects. Similarly, its effect on export concentration is exogeneous because it increases the variety of exports.

3. GDP per capita

Income level of a country is a significant determinant of the level of export sophistication and diversification. We measure this by using the log of GDP per capita *GDPPC*. We treat GDPPC as exogenous in these models not only because higher *EXPY* and less *EXPCON* can increase *GDPPC*, but because both variables change as a result of policy shocks.

4. Human Capital

In Hausmann *et al*. (2007), the model hypothesizes human capital and the size of the labour force to be two key determinants of production specialization. Melitz (2003) emphasizes the importance of human capital in export diversification. In this study, human capital is measured by using the average years of schooling in the population over 15 years, from Barro and Lee (2010).[101] We treat human capital as an endogenous determinant of export sophistication. According to Hausmann *et al*. (2007), it might be difficult to define a causality from human capital to export sophistication, rather they suggest that export sophistication is more likely to cause human capital accumulation.

[101] Average years of schooling by Barro and Lee are only in 5-year intervals, rather than yearly. To use this indicator in our estimation, we used a linear interpolation to estimate the 'missing observations'.

5. Land-Labour Ratio

Although not discussed in their study, Hausmann *et al*. (2007) have included the log of land area as a determinant of export sophistication and it tends to have a negative effect on export sophistication. In this study we have included the land-labour ratio *LANDLAB* to control for countries that are rich in natural resources. The land-labour ratio is simply the ratio of total land area to the size of the labour force. We therefore, would expect *LANDLAB* to have a negative impact on export sophistication as we would expect it to impede export diversification. LANDLAB is relatively an exogenous variable for both *EXPY* and *EXPCON*, because we believe causality runs from *LANDLAB* to *EXPY* and *EXPCON*.

6. Terms of Trade Growth

Countries with positive terms of trade of trade growth rate are expected to have larger trade balances (Beck, 2002). According to Agosin *et al.* (2012), a simple factor-endowment model shows that an improvement in terms of trade can increase export concentration (or reduce export diversification). However, in the Melitz (2003) model, terms of trade improvements are modelled to increase export profitability which in turn increase export diversification, leaving the sign of the effect of terms of trade on export diversification to be purely an empirical matter. However, as we would see in our study, terms of trade growth *TOTGR* improves export sophistication and increases export concentration. *TOTGR* is the rate of change in the level of terms of trade. We treat *TOTGR* in both models as exogenous because in terms of international trade, many developing countries are price takers in the world market for their exports and imports and consequently they face the outcome of adverse movements in the terms of trade, stemming from exogenous price shocks in its imports and exports. Increasing *EXPY* or reducing *EXPCON* is unlikely to affect export or import prices, and therefore *TOTGR*.

7. Foreign Direct Investment

FDI inflows are seen to improve export sophistication and reduce export concentration. This is possible through two channels: one direct, the other indirect. Through the direct channel, domestic firms that are in a joint venture with foreign firms export more sophisticated products (See Rodrik, 2006; Xu and Lu, 2007 and Harding and Javorcik, 2009). Indirectly, FDI can affect the economy through spillovers and this is evidenced in domestic firm productivity and innovation. In their model, Koko and Globerman (2000) identify the factors that determine the extent and scale of *FDI* spillovers to domestic firms in the host countries.

They find that a competitive market in the host country and its absorptive capacity are important for positive spillovers[102]. In other words, it is possible that *FDI* could affect export sophistication and diversification positively but this will depend on how competitive the host market is and on its absorptive capacity. However, in our study, we would expect *FDI* to positively affect export sophistication and diversification. We measure *FDI* as the net inflows of foreign direct investment. We treat FDI as an exogenous determinant *EXPY* and *EXPCON*. However, it is possible that higher *EXPY* and less *EXPCON* could also attract *FDI*, leading to a problem of endogeneity. We believe that rather than high *EXPY* and low *EXPCON*, it is factors that lead to high *EXPY* and low *EXPCON* that attract *FDI* e.g. favourable investment climate, resource availability and quality of institutions (Weldemicael, 2012).

4.3.3. Data Specification

For the specification which uses export sophistication, the data covers an annual period of 1985-2000 for 63 developing countries. While data for export sophistication is available from 1962, the consistent availability of bank development data begins from 1985. On the other hand, the country sample was determined by data availability for both export sophistication and bank development. From the country sample, we have also dropped former members of the defunct Union of Soviet Socialist Republics and small island nations. The specification on export concentration uses data from 1995 to 2010 for 68 developing countries. The time period was primarily determined by data availability for export concentration, while the country sample was determined in the same manner as export sophistication.

The summary statistics for the key variables employed in this study are presented in Tables 3.1 and 3.2 based on yearly observations. Table 3.1 presents summary statistics of export sophistication and key variables between 1985 and 2000. The export sophistication index has been converted into logs with an average of 8.6 but with a large difference between the minimum value of 7.37 (e.g. in Chad Republic) and the maximum value of 9.56 (e.g. Korea Republic). The export sophistication index is expected to be higher in countries that are richer as seen in the paper by Hausmann *et al*. (2007). Export diversification on the other hand, has an average of 34.7 percent with a low of 6.2 percent (e.g. in South Africa) and a maximum of 96.1 percent (e.g. in Nigeria). In appendix 4.6, we present scatter plots to portray stability of

[102] These factors have been established by Girma (2005), Markusen and Venebales (1998), and Cheung and Lin (2004).

the relationship between financial development and export structures over different time subsamples of the time period.

Table 4.1: Summary Statistics of Key Variables Annually (1985-2000)

VARIABLE	OBS.	MEAN	STD.DEV.	MIN	MAX
EXPY	1007	8.60351	0.45846	7.3732	9.5599
BNKDEV	927	0.28206	0.27000	0.011	1.7645
BNKSIZE	932	0.34545	0.29137	0.0219	1.8759
BNKLIQ	898	0.39267	0.28613	0.0463	2.1737
BNKCBN	962	0.7253	0.2032	0.0905	1
FININTDEV	875	-0.2108309	3.061826	-6.043654	13.48106
HUMCAP	928	5.42669	2.26489	0.777	11.055
TRADE	1008	0.67017	0.38740	0.1345	3.2643
TRADEOPEN	1003	9.58e-10	0.35925	-0.7202	2.2286
TOTGR	1008	0.12927	16.22986	-52.357	182.2143
GDPPC	971	6.800674	1.14453	4.7526	10.2157
LANDLAB	1008	0.087522	0.12268	0.0003	0.7493
FDI	979	18.40204	2.88214	-20.1012	24.849

Table 4.2: Summary Statistics of Key Variables Annually (1995-2010)

VARIABLE	OBS.	MEAN	STD.DEV.	MIN.	MAX.
EXPCON	1088	0.3471864	0.201606	0.061831	0.9607
BNKDEV	1045	0.389988	1.958288	0.019615	0.609
BNKSIZE	1045	0.504918	2.907805	0.024319	0.9132
BNKLIQ	1032	0.578064	3.333245	0.069142	1.0335
BNKCBN	1032	0.7951572	0.183	.1241956	0.9999
FININTDEV	996	-.0100296	3.105871	-4.391611	46.04941
HUMCAP	1008	6.36505	2.351744	0.9248	11.8479
TRADE	1008	0.771728	0.603299	0.137859	4.3305
TRADEOPEN	1086	0.011657	6.555648	-43.6547	65.8651
TOTGR	1056	0.129667	3.701493	-32.4864	68.2540
GDPPC	1088	7.213545	1.274857	4.723108	10.687
LANDLAB	1088	0.182861	0.3773741	0.000002	2.5510
FDI	969	19.98664	2.474918	2.374347	25.94406

Tables 4.3 and 4.4 show the correlation matrix between the key variables used in the regression for export sophistication and concentration during both time periods. The significant relationships between some of these variables are evident. First of all, in Table 4.3, the significant and positive relationship between financial development (*BNKDEV*, *BNKSIZE*, *BNKLIQ*, *BNKCBN* and *FININTDEV*) and export sophistication is evident. In other words, financial development and export sophistication are positively related. This relationship has not been thoroughly examined in the literature but in the first instance, it is what you would expect. Other variables have the expected signs in terms of relationship with export sophistication except the terms of trade growth. The level of human capital, trade openness, GDP per capita and foreign direct investment all correlate positively with export sophistication and are significant. The land-labour ratio is negatively correlated as we would expect and is significant. Terms of trade growth is negative and not significant but like has been stated previously, the sign is an empirical matter. Another correlation to take note of is the relationship between human capital and terms of trade growth: positive and significant. In

other words, high level of human capital is present with positive terms of trade growth. Trade openness is also positively correlated with terms of trade growth.

In Table 4.4, the correlation between financial development and export concentration is negative and significant; suggesting that export diversification is accompanied by financial development. Other variables such as trade openness, GDP per capita, and foreign direct investment are negatively correlated with export concentration and significant. Human capital and the land-labour ratio have a positive and significant relationship with export concentration, while terms of trade growth has an insignificant relationship.

4.4. EMPIRICAL RESULTS

4.4.1. Result Diagnostics

After estimating the model, the following regression results are presented and discussed: first, the impact of financial development on export sophistication is presented in Table 4.5, while the impact of financial development on export concentration is presented in Table 4.6. Each table has five columns: in each column, banking development represents a different measure, i.e. column 1 uses private credit to GDP, column 2 uses total banking assets to GDP, column 3 uses liquid liabilities to GDP, column 4 uses bank assets to central bank plus bank assets, and column, financial intermediation development. We have included period dummies in all regressions although we do not present them in the regressions, and the relevant regression tests have been included at the end of the tables. The robustness analyses are presented in Tables 4.7 and 4.8.

4.4.2. Export Sophistication

Table 4.5 shows regressions results for the export sophistication index. All of the control variables are significant with most of them have the have the expected signs, and largely robust across the different specifications. Trade openness seems to favour export sophistication except in column 4. The results also suggest that per capita GDP is positively related to export sophistication (i.e. per capita GDP is a good predictor of the quality of export specialization). The results on human capital suggest that countries associated with higher skill- or human capital accumulation can export more sophisticated goods (except in column 3). The coefficients for land-labour ratio are negative and significant in all the specifications, supporting the ‘resource hypothesis’ hypothesis that abundance in natural resources hinders a country’s efforts in skills accumulation and industry upgrading.

The coefficients of the growth in terms of trades are consistently negative in the first 3 columns. Positive terms of trade shocks may hinder export sophistication when a price increase of major exports reallocates factors away from other sectors, making it more expensive to produce and export sophisticated goods. However, in column 5, export sophistication could benefit from positive terms of trade shocks through an increase in export profitability. FDI tends to promote export sophistication through joint-ventures between domestic and foreign firms, and through positively spillover effects on productivity and innovativeness of domestic firms. The lagged dependent variable is significant and positive across all specifications, suggesting a strong persistent behavior of export sophistication. In other words, the current degree of sophistication in exported products depends on previous learning from exporting. For example, exporting firms that aggressively run efficient and low-cost operations are more likely to produce more sophisticated products than firms that are operated less efficiently and more conservatively.

Our interest lies in the coefficients of financial development. Results suggest that financial development has a negative and significant effect on export sophistication at 1, 5 and 10 percent (except for the bank liquidity ratio in column 3 which is negative but insignificant). To some extent, we argue that these results are robust across the different specifications. The results also show that it is not implausible to suggest that the degree of financial development is a robust determinant of export sophistication. Based on the elasticities, a 1% increase in financial development significantly decreases export sophistication by between 0.23 and 1.42 percentage points. In contrast to a significant number of studies in the literature, financial development may lead to less quality in export specialization because investors are unlikely to take the risk of financing in untried projects but would rather finance activities where the economy uses known technology or where they have comparative advantage. These results are supported by the empirical study of Jaud *et al*. (2012) where they suggest the allocative and disciplining role of finance. In their paper, they argue that banks do not promote exports in a broad unbiased manner. Rather, banks encourage exporting firms to optimally produce and export in activities where the country has comparative advantage. In this manner, financial sector development reduces the ability of innovative firms to produce and export more sophisticated goods.

Table 4.3: Pairwise Correlation Matrix of the Key Variables Annually (1985-2000)

	EXPY	*BNKDEV*	*BNKSIZE*	*BNKLIQ*	*BNKCBN*	*FININTDEV*	*HUMCAP*	*TRADE*	*TRADEOPEN*	*TOTGR*	*GDPPC*	*LANDLAB*	*FDI*
EXPY	1.00												
BNKDEV	0.34***	1.00											
BNKSIZE	0.36***	0.97***	1.00										
BNKLIQ	0.33***	0.86***	0.91***	1.00									
BNKCBN	0.20***	0.53***	0.51***	0.40***	1.00								
FININTDEV	0.31***	0.94***	0.95***	0.87***	0.72***	1.00							
HUMCAP	0.60***	0.42***	0.40***	0.36***	0.34***	0.33***	1.00						
TRADE	0.18***	0.41***	0.40***	0.43***	0.10***	0.25***	0.24***	1.00					
TRADEOPEN	0.09***	0.31***	0.31***	0.35***	0.02	0.17***	0.05	0.93***	1.00				
TOTGR	-0.00	-0.03	-0.02	-0.01	-0.03	-0.04	0.02	0.01	0.02	1.00			
GDPPC	0.52***	0.51***	0.51***	0.43***	0.41***	0.49***	0.74***	0.20***	-0.12***	0.00	1.00		
LANDLAB	-0.26***	-0.21***	-0.23***	-0.28***	-0.10***	-0.23***	-0.15***	-0.09***	-0.16***	-0.05*	-0.01	1.00	
FDI	0.48***	0.49***	0.50***	0.39***	0.25***	0.46***	0.50***	0.15***	0.11***	0.02	0.50***	-0.13***	1.00

Note: The robust standard errors are in parentheses where * indicates significance at the 10% level, ** indicates significance at the 5% level and *** indicates significance at the 1% level

Table 4.4: Pairwise Correlation Matrix of the Key Variables Annually (1995-2010)

	EXPCON	*BNKDEV*	*BNKSIZE*	*BNKLIQ*	*BNKCBN*	*FININTDEV*	*HUMCAP*	*TRADE*	*TRADEOPEN*	*TOTGR*	*GDPPC*	*LANDLAB*	*FDI*
EXPCON	1.00												
BNKDEV	-0.14***	1.00											
BNKSIZE	-0.15***	0.86***	1.00										
BNKLIQ	-0.17***	0.86***	0.97***	1.00									
BNKCBN	-0.33***	0.02	0.05	0.05	1.00								
FININTDEV	-0.04	0.88***	0.93***	0.93***	0.36***	1.00							
HUMCAP	0.12***	0.65***	0.72***	0.73***	-0.12***	0.64***	1.00						
TRADE	-0.05*	0.03	0.12	0.03	-0.01	0.24***	0.17***	1.00					
TRADEOPEN	-0.07**	0.02	-0.11***	-0.22***	0.03	-0.10***	0.20***	0.09***	1.00				
TOTGR	0.03	0.13***	0.24***	0.19***	0.03	0.04	0.14***	-0.02	0.19***	1.00			
GDPPC	-0.29***	-0.01	-0.03	-0.05	0.14***	0.11***	-0.15***	0.13***	0.02	0.03	1.00		
LANDLAB	0.05*	-0.10***	-0.14***	0.15***	-0.16***	0.08***	0.15***	-0.03	0.01	0.05	-0.13***	1.00	
FDI	-0.15***	-0.24***	0.29***	0.30***	0.17***	0.32***	0.22***	0.03	0.03	0.03	0.12***	0.55***	1.00

Note: The robust standard errors are in parentheses where * indicates significance at the 10% level, ** indicates significance at the 5% level and *** indicates significance at the 1% level.

Table 4.5: The Effect of Financial Development on Export Sophistication.

Variables	*1*	*2*	*3*	*4*	*5*
	EXPY	*EXPY*	*EXPY*	*EXPY*	*EXPY*
$EXPY_{t-1}$	0.809***	0.825***	0.825***	0.806***	0.762***
	(0.0760)	(0.0736)	(0.0770)	(0.109)	(0.0897)
BNKDEV	-0.0597*				
	(0.0356)				
TRADE	0.151**	0.139**	0.136*	0.211	0.309*
	(0.0777)	(0.0742)	(0.0762)	(0.161)	(0.0829)
GDPPC	0.0004**	0.0004*	0.0004**	0.0011**	0.0013**
	(0.000223)	(0.000245)	(0.000267)	(0.000571)	(0.000557)
HUMCAP	0.157*	0.150*	0.137	0.173*	0.252*
	(0.103)	(0.105)	(0.109)	(0.170)	(0.179)
LANDLAB	-0.0512***	-0.0432***	-0.0423***	0.0860**	-0.124***
	(0.0192)	(0.0154)	(0.0157)	(0.0479)	(0.0507)
TOTGR	-0.0562***	-0.0541**	-0.0429**	0.0460	0.0695*
	(0.0206)	(0.0202)	(0.0229)	(0.0406)	(0.0555)
FDI	0.0157*	0.0141*	0.0142*	0.0234*	0.0297**
	(0.0084)	(0.0082)	(0.0084)	(0.0154)	(0.0146)
BNKSIZE		-0.0617**			
		(0.0291)			
BNKLIQ			-0.0344		
			(0.0316)		
BNKCBN				-0.525*	
				(0.323)	
FININTDEV					-0.143***
					(0.0581)
CONS	1.673***	1.550***	1.498***	1.932**	1.814***
	(0.607)	(0.582)	(0.604)	(1.063)	(0.739)
No. of Obs.	842	841	840	822	806
AR(1) test	-3.29 (0.001)	-3.32 (0.001)	-3.31 (0.001)	-3.35 (0.001)	-3.29 (0.001)
AR(2) test	-0.29 (0.774)	-0.27 (0.786)	-0.27 (0.786)	-0.17 (0.862)	0.11 (0.912)
Hansen test	3.43 (0.489)	3.26 (0.515)	3.08 (0.544)	4.31 (0.366)	3.45 (0.485)

Note: Each column in this table reports statistics from system GMM two-step regressions, where the dependent variable is the log of export sophistication. The robust standard errors are in parentheses where * indicates significance at the 10% level, ** indicates significance at the 5% level and *** indicates significance at the 1% level. *AR(1)* and *AR(2*) are p-values and t-statistics of the test of first and second order autocorrelations and Hansen is the p-value and t-statistics of the Hansen test of overidentifying restrictions.

4.4.3. Export Concentration.

Table 4.6 shows the regression results for export concentration. All control variables are significant and most of them have the expected signs. Trade openness is seen to reduce export concentration and this result is consistent across all specification. In line with previous theoretical literature, trade openness is associated with product differentiation and heterogeneous firms. These findings are in contrast to Agosin *et al*. (2012) who find that trade openness is associated with export concentration. The negative and significant coefficients of per capita GDP suggest that it reduces export concentration. This evidence suggests that there is a uniform positive relationship between the level of development and export diversification. These results are in line with theoretical contributions which suggest that increased export concentration is associated with lower levels of development, as a result of scarcity of capital and indivisibility of investment project (Acemoglu and Zilibotti, 1997).

There is a possibility of non-linear effects; however, I did not find any. The turning point of such relationship is at high level of income which is too high for the countries included in the sample. The land-labour ratio, a measure of countries' natural resources increases the degree of export concentration. Developing countries with abundant natural resources are unlikely to invest in human capital, capital accumulation and technological advancement; rather, they would be more interested in exporting these resources, particularly in their raw forms. This is unlikely to diversify the production base of the economy; therefore, it leads to an increase in the degree of concentration.

The coefficients suggest that terms of trade improvements increase the degree of export concentration. Similar to the discussion we have provided for positive terms of trade shocks in export sophistication, increase in export prices can negatively affect export diversification. The negative and significant coefficients of *FDI* suggest that FDI inflows lead to higher productivity in developing countries, as well as positive externalities which help domestic firms become more competitive resulting in a higher degree of export diversification. Finally, the lagged dependent variable is positive and significant is all specifications suggesting persistence overtime of export concentration: the inability of exporting firms to diversify their export base predicts the degree of future export concentration.

For our variable of interest, our results suggest that financial development worsens export concentration. The results are significant at 5 and 10 percent (except for *BNKCBN*, which is insignificant). While there are currently no theoretical models where financial factors are seen possible predictors of the degree of concentration, our results suggest financial development not only predicts export concentration, but it promotes it. Based on the elasticities, a 1% increase in financial development significantly increases export concentration by between 0.21 and 0.87 percentage points. Empirical studies that have not considered financial factors as possible determinants of export diversification include Cadot *et al*. (2010) and Parteka and Tamberi (2013). In Agosin *et al*. (2012), we find some interesting facts about the relationship between export concentration and financial reforms between 1962 and 2000. Their graph shows that the degree of export concentration falls after different episodes of financial reforms. However, they also point out that export concentration was already falling before the episodes of financial reforms, casting doubt on the effect of financial reforms on export diversification. Empirically, they find no evidence that financial development is a significant predictor of export diversification.

In a similar argument to the relationship we find between export sophistication and financial development, we find more evidence that supports our results and we trace this effect to the fact that banks are more likely to finance exporting activities in which the country has competitive advantage relative to activities that are unknown and untried because of the costs and risk involved. Financial development is expected to increase export concentration in developing countries through the following channel: when the main exported products of a country are performing well, it is possible that the financial system would reallocate financial resources towards these industries and away from other industries where the potentials and opportunities are not as high. This improves the specialization of the main exports while other exports worsen in performance or even disappear from the market. An increase in specialization of the main exports increases concentration in the export structure as has been seen in many developing countries.

Table 4.6: The Effect of Financial Development on Export Concentration.

Variables	*1*	*2*	*3*	*4*	*5*
	EXPCON	*EXPCON*	*EXPCON*	*EXPCON*	*EXPCON*
$EXPCON_{t-1}$	0.718***	0.563***	0.618***	0.695***	0.566***
	(0.0912)	(0.107)	(0.122)	(0.206)	(0.202)
BNKDEV	0.0082*				
	(0.0049)				
TRADE	-0.0413*	-0.0505*	-0.0489*	-0.0612*	-0.0721*
	(0.0267)	(0.0291)	(0.0292)	(0.0381)	(0.0409)
GDPPC	-0.0118*	-0.0236**	-0.0185**	-0.0121	-0.0242*
	(0.0076)	(0.0097)	(0.0093)	(0.0128)	(0.0149)
LANDLAB	0.0042*	0.0065*	0.0058*	0.0059	0.0084*
	(0.0041)	(0.0043)	(0.0045)	(0.0053)	(0.0067)
TOTGR	0.0636***	0.0949***	0.0797***	0.0741*	0.0957**
	(0.0247)	(0.0204)	(0.0279)	(0.0459)	(0.0429)
FDI	-0.0149**	-0.0271***	-0.0217***	-0.165	-0.0276*
	(0.0067)	(0.0098)	(0.0058)	(0.0121)	(0.0149)
BNKSIZE		0.0073**			
		(0.0035)			
BNKLIQ			0.0035**		
			(0.0018)		
BNKCBN				-0.0146	
				(0.0658)	
FININTDEV					0.0087**
					(0.0044)
CONS.	0.120	0.301	0.231	0.120	0.307
	(0.118)	(0.177)	(0.148)	(0.160)	(0.240)
No. of Obs.	949	947	946	931	905
AR(1) test	-3.89 (0.000)	-3.54 (0.000)	-3.97 (0.000)	-3.56 (0.000)	-3.31 (0.001)
AR(2) test	1.27 (0.206)	1.27 (0.206)	1.25 (0.210)	0.95 (0.343)	1.12 (0.264)
Hansen test	7.30 (0.121)	6.93 (0.145)	6.95 (0.139)	6.48 0.134	6.46 (0.151)

Note: Each column in this table reports statistics from system GMM two-step regressions, where the dependent variable is the log of export sophistication. The robust standard errors are in parentheses where * indicates significance at the 10% level, ** indicates significance at the 5% level and *** indicates significance at the 1% level. *AR(1)* and *AR(2*) are p-values and t-statistics of the test of first and second order autocorrelations and Hansen is the p-value and t-statistics of the Hansen test of overidentifying restrictions.

4.4.4: Robustness

While our results are firmly robust across different measures of financial development, we go a step further to check whether the results will hold when we replace the dependent variables: ratio of high-skill manufactures to total exports *HIGHEXP* for export sophistication and the similarity index *EXPDIV* for export concentration. If the assumptions based on our previous results are correct, then we should expect financial development to have a negative effect on *HIGHEXP* and a positive effect on *EXPDIV*. In both models, we have excluded the growth in terms of trade improvements because it was insignificant in all specifications. In Table 4.7, we present regression results for the high-skill manufactures ratio. The coefficients for the control variables have the expected signs are significant across all specifications (except for columns 4 and 5 where trade openness, human capital and FDI inflows have the expected signs but are insignificant). The lagged dependent variable is positive and significant in all the specifications and continues to show persistence. In all but one of the specifications, we get coefficients which suggest that financial development may hinder the ability of developing countries to export high-value or sophisticated products.

Table 4.7: The Effect of Financial Development on High-Skill Manufacture Exports

Variables	*1*	*2*	*3*	*4*	*5*
	HIGHEXP	*HIGHEXP*	*HIGHEXP*	*HIGHEXP*	*HIGHEXP*
$HIGHEXP_{t-1}$	0.572***	0.589***	0.602***	0.669***	0.693***
	(0.164)	(0.157)	(0.154)	(0.085)	(0.085)
BNKDEV	-0.0215***				
	(0.0092)				
TRADE	0.0328**	0.0304**	0.0283**	0.0311	0.0282
	(0.0153)	(0.0153)	(0.0142)	(0.0263)	(0.0191)
GDPPC	0.0006*	0.0006*	0.0006**	0.0002**	0.0001**
	(0.00032)	(0.00032)	(0.00035)	(0.0067)	(0.0006)
HUMCAP	0.0534*	0.0531*	0.0463*	0.0427	0.0322
	(0.0302)	(0.0307)	(0.0266)	(0.0309)	(0.0290)
LANDLAB	-0.0074*	-0.0064*	-0.0059*	-0.0111**	-0.0110**
	(0.0044)	(0.0043)	(0.0043)	(0.0056)	(0.0507)
FDI	0.0026**	0.0027**	0.0026*	0.0025	0.0297
	(0.0014)	(0.0014)	(0.0014)	(0.0019)	(0.0017)
BNKSIZE		-0.0171*			
		(0.0096)			
BNKLIQ			-0.0112**		
			(0.0056)		
BNKCBN				-0.0570*	
				(0.0335)	
FININTDEV					-0.075
					(0.0050)
CONS	-0.021	-0.020	-0.023	0.016	-0.029
	(0.0217)	(0.0213)	(0.0220)	(0.0375)	(0.0279)
No. of Obs.	908	909	905	896	869
AR(1) test	-2.55 (0.011)	-2.61 (0.009)	-2.66 (0.008)	-2.91 (0.004)	-2.93 (0.003)
AR(2) test	-0.18 (0.857)	-0.19 (0.851)	-0.22 (0.823)	-0.30 (0.761)	-0.26 (0.795)
Hansen test	6.75 (0.150)	6.96 (0.138)	6.56 (0.164)	3.06 (0.548)	4.92 (0.295)

In Table 4.8, we present regression results for export diversification. All the control variables are significant and have the expected signs (except for the land-labour ratio in columns 2 and 5 which has the expected sign but is insignificant). The lagged dependent variable is positive and significant in all the specifications suggesting persistence. Finally, in all but one of the columns, the coefficients for our bank development variables are positive and significant, indicating that financial development hinders the ability of countries diversify their export structures similar to the world average.

Table 4.7: The Effect of Financial Development on Export Diversification (Similarity Index)

Variables	*1*	*2*	*3*	*4*	*5*
	EXPDIV	*EXPDIV*	*EXPDIV*	*EXPDIV*	*EXPDIV*
$EXPDIV_{t-1}$	0.241*	0.292*	0.297*	0.461**	0.433***
	(0.153)	(0.187)	(0.171)	(0.208)	(0.156)
BNKDEV	0.0030*				
	(0.0019)				
TRADE	-0.0028***	-0.0019*	-0.0014***	-0.0017*	-0.0016***
	(0.0011)	(0.012)	(0.0038)	(0.0099)	(0.0065)
GDPPC	-0.0426***	-0.0413***	-0.0419***	-0.0269**	-0.0354***
	(0.0123)	(0.0149)	(0.0138)	(0.0119)	(0.0129)
LANDLAB	0.0637*	0.0493	0.0294*	0.0376*	0.0078
	(0.0229)	(0.0371)	(0.0176)	(0.0206)	(0.0153)
FDI	-0.0221**	-0.0241***	-0.0252***	-0.0157**	-0.0202***
	(0.0068)	(0.0098)	(0.0094)	(0.0081)	(0.0075)
BNKSIZE		0.0029*			
		(0.0014)			
BNKLIQ			0.0044***		
			(0.0017)		
BNKCBN				-0.0239	
				(0.0646)	
FININTDEV					0.0134***
					(0.0054)
CONS.	1.239***	1.227***	1.246***	0.839***	1.022**
	(0.269)	(0.357)	(0.349)	(0.340)	(0.302)
No. of Obs.	949	947	946	931	905
AR(1) test	-3.74	-3.22	-3.35	-3.43	-4.19
	(0.000)	(0.001)	(0.001)	(0.001)	(0.000)
AR(2) test	1.33	1.30	1.32	0.97	1.05
	(0.183)	(0.192)	(0.210)	(0.332)	(0.295)
Hansen test	3.55	3.99	6.95	3.82	5.07
	(0.737)	(0.262)	(0.188)	(0.282)	(0.535)

4.5. CONCLUSION

This chapter analyzed the effects of financial development on the export structure of developing countries. The empirical results from a 16 year panel (1985-2000 and 1995-2010) with between 63 and 68 developing countries provide some evidence that is largely not in support of previous research on the relationship between financial development and specialization in international trade. Specifically, we find that financial development hinders the sophistication of exports in developing countries and these results hold when we use a battery of bank sector development indicators and high-skill manufactures exports. Also, we

find that financial development negatively predicts export concentration and these results hold when we a different measure of export concentration. In other words, financial development may be unable to reduce the funding difficulties experienced by innovative firms caused by market failures in developing countries, and may even worsen it. For exporting firms to increase the degree of sophistication and to diversify their exports, they require new technology but banks are unlikely to finance these investments because of the costs and risk involved, leading to less sophisticated and more concentrated exports, making developing countries poorer.

Our results contribute to the literature in two ways. First of all, it finds that financial development reduces the degree of export sophistication in developing countries. This finding is unique because it is an original contribution to the literature. Secondly, the study contributes to the literature by finding that financial development increases export concentration in developing countries. As we previously stated, there are no theories that link financial factors with export diversification and some recent studies have not considered financial factors as important determinants of export diversification. Our contribution is unique because it links financial development to export diversification and it identifies a significant negative effect.

From a policy perspective, conventional wisdom tells us that financial sector development should promote the export sophistication and diversification because firms suffer less from financial constraints. However, financial development might harm export sophistication and diversification in developing because of persistent market failures. For financial development to positively affect the degree of export sophistication and diversification in developing countries, government intervention might be required in financial markets through the provision of finance to exporters, particularly during market failures. This not only helps firms to produce more value-added products, it helps them to develop and export new products. However, this step alone might not be enough to make the exports of domestic firms more competitive. More government intervention might be required through divisive selective measures in the form of fiscal and direct credit incentives and selective subsidies. Also, Government can intervene through maintaining market discipline. For example, banks might need to be persuaded to provide loans to exporters at rates fixed by the government.

Our results suggest that financial development without government intervention in developing countries may be bad for export sophistication and diversification due to market failures. Therefore, it would be interesting to directly test the effect of government intervention on this relationship. Also, compared to data on bank development, data on capital market is limited[103]. However, it would be interesting to see if the relationship will hold if capital market development indicators are used.

This study has one key drawback. There are no widely accepted theoretical models that explain export diversification. Therefore, it may take some time to identify the key determinants of export diversification. Presently, there are still studies that try to examine the determinants of export diversification. So, hopefully in the near future, determinants based on widely accepted theoretical models will become available.

[103] Although this might reduce the period and country sample because many developing countries do not have active capital markets.

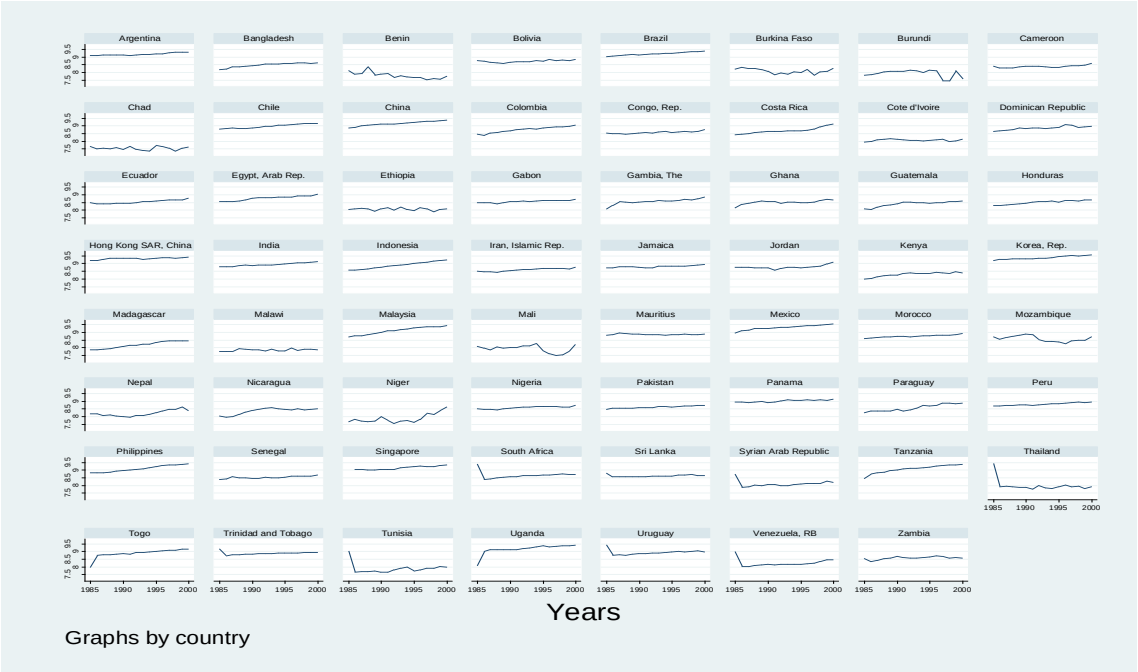
Appendix 4.1: Export Sophistication and Concentration at Country-Level

Country	*Export Sophistication*	*Export Concentration*
Algeria	-	53.95
Argentina	9770.28	14.03
Bangladesh	4887.43	37.17
Benin	2523.56	49.45
Bolivia	6180.90	30.14
Botswana	-	57.11
Brazil	10098.11	9.51
Burkina-Faso	3303.93	59.52
Burundi	2869.42	56.90
Cameroon	4437.38	39.89
Central African Republic	-	46.71
Chad	1894.85	78.21
Chile	7971.44	31.70
China	9555.77	9.11
Colombia	6448.73	24.48
Congo	5337.65	74.19
Costa Rica	6118.17	27.51
Cote d'Ivoire	3213.81	35.25
Dominican Rep	7093.15	21.66
Ecuador	5145.62	43.98
Egypt	6588.16	26.36
Ethiopia	3199.75	44.99
Gabon	5278.91	73.84
Gambia	5311.39	40.48
Ghana	5013.24	39.02
Guatemala	4529.56	17.75
Honduras	4976.47	26.44
Hong Kong	11269	13.31
India	7665.60	13.96
Indonesia	7434.40	13.64
Iran	5445.47	75.67
Jamaica	6725.95	54.03
Jordan	6526.97	18.10
Kenya	4049.28	22.03
Korea, Republic	11953	15.26
Madagascar	3714.40	23.22
Malawi	2591.85	59.00
Malaysia	9418.51	19.08
Mali	2880.60	61.42
Mauritania	-	50.64
Mauritius	7116.87	31.72
Mexico	11336.99	13.65
Morocco	6368.45	16.74
Mozambique	5467.46	42.89
Nepal	3777.94	22.42
Nicaragua	4372.27	20.86
Niger	2800.33	36.62
Nigeria	5403.24	87.15

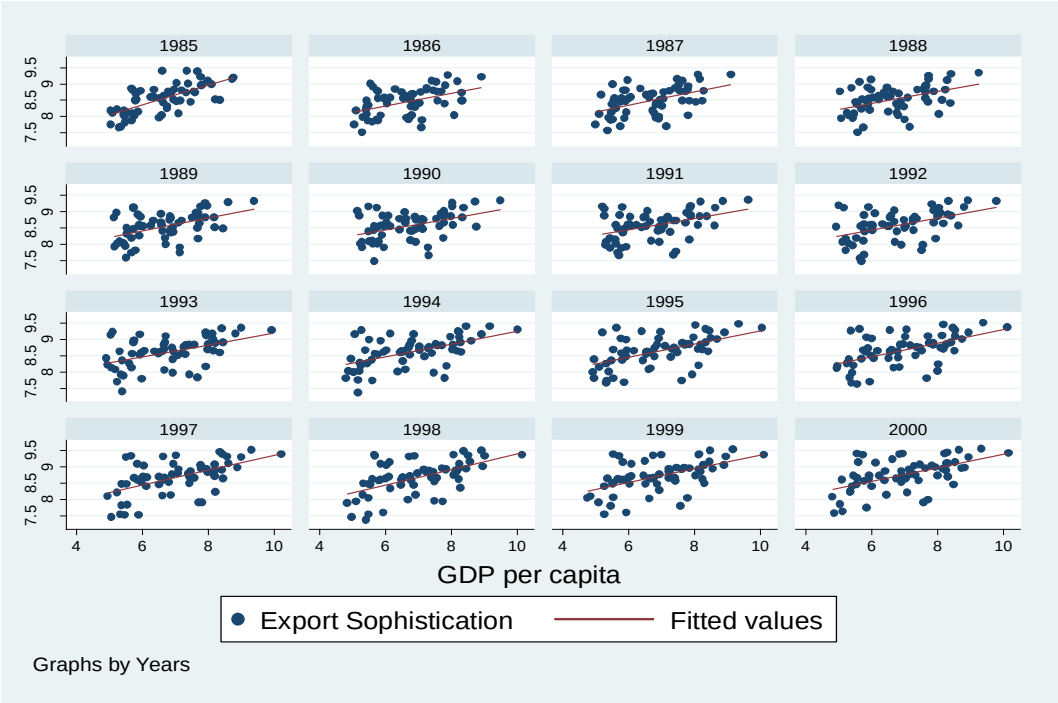
Pakistan	5546.32	21.94
Panama	8300.73	20.68
Paraguay	5418.15	36.85
Peru	6766.78	24.15
Philippines	9123.63	36.84
Senegal	5087.71	23.72
Singapore	9445.63	24.74
South Africa	5938.65	11.96
Sri Lanka	5585.27	22.29
Syria	3383.30	46.20
Tanzania	8949.19	21.95
Thailand	3288.53	9.38
Togo	7515.40	27.47
Trinidad and Tobago	7263.69	34.08
Tunisia	2859.26	19.29
Uganda	9873.56	38.46
Uruguay	7707.89	18.08
Venezuela	3961.27	61.01
Zambia	5349.47	56.32
Zimbabwe	-	24.71

Note: Data on export sophistication was obtained from Rodrik's website, while data on export concentration was obtained from the *UNCTAD* trade database.

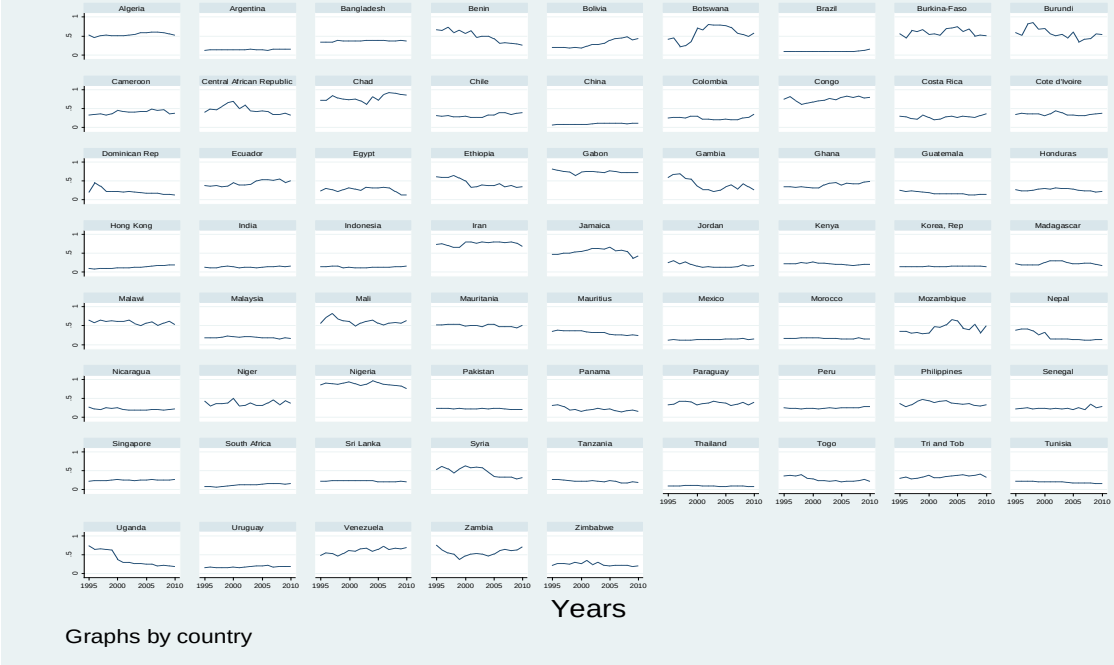
Appendix 4.2: Trend in Export Sophistication for each Developing Country, 1985-2000.



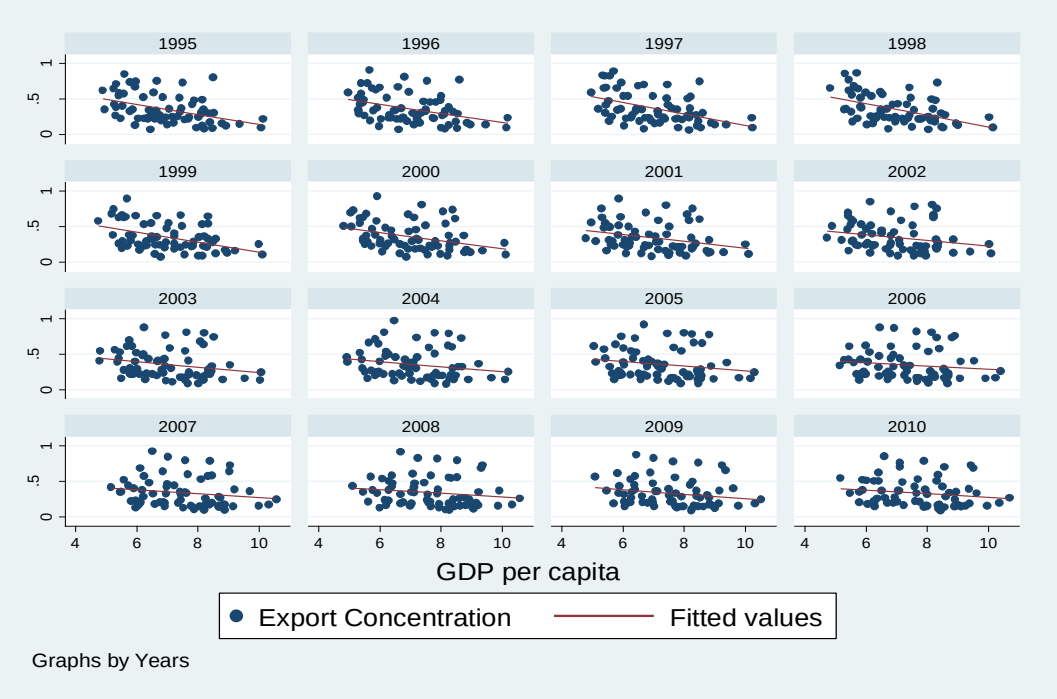
Appendix 4.3: Relationship between Export Sophistication and GDP per capita, 1985-2000.



Appendix 4.4: Trend in Export Concentration for each Developing Country, 1995-2010



Appendix 4.5: Relationship between Export Concentration and GDP per capita, 1995-2010.



Appendix 4.6: Appendix 3.2: Scatter Plots showing the relationship between Export Sophistication/ Concentration over different time periods.

Figure 1

Figure 1A

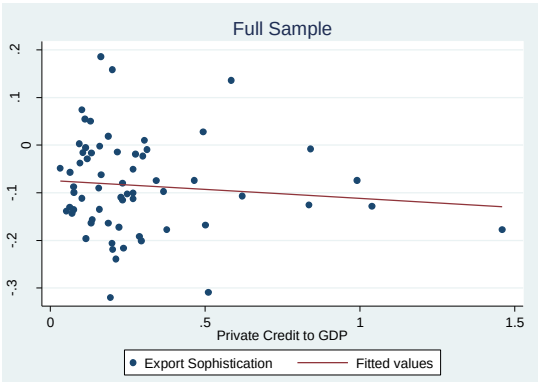


Figure 1B

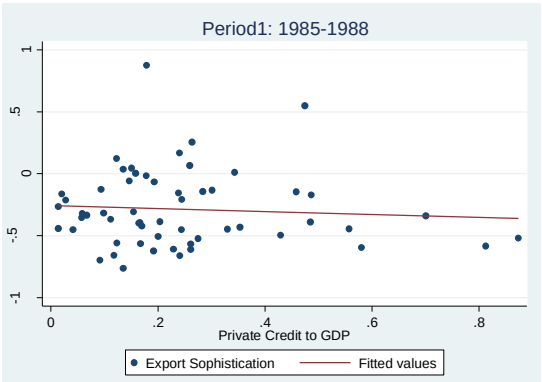


Figure 1C

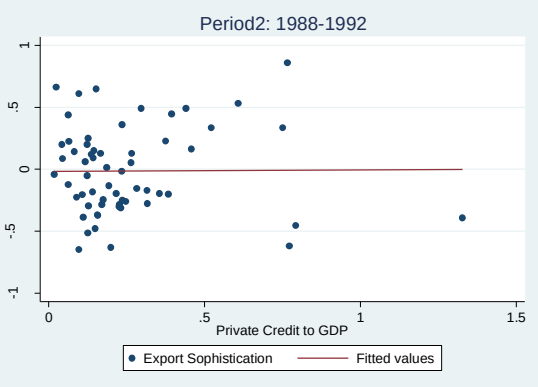


Figure 1D

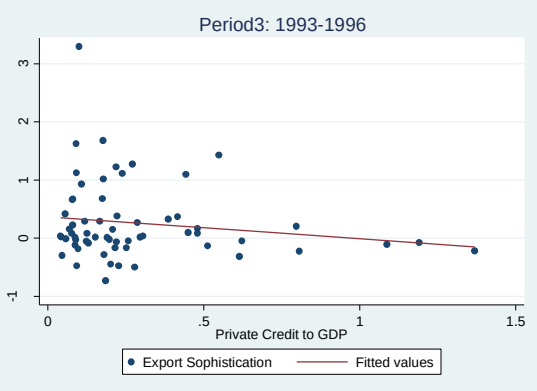
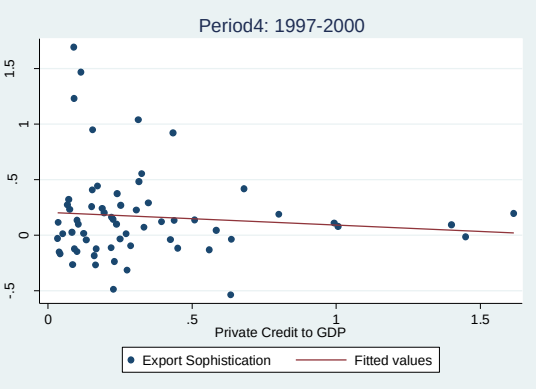


Figure 1E



In figure 1A, we show a negative relationship between the average growth in export sophistication and the ratio of private credit to GDP. This relation seems to be consistent under different time periods of the sample except in period 2 (1988-1992), where the relationship seems to be weakly positive.

Figure 2

Figure 2A

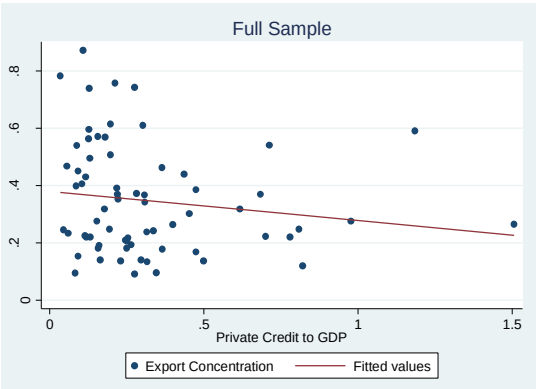


Figure 2B

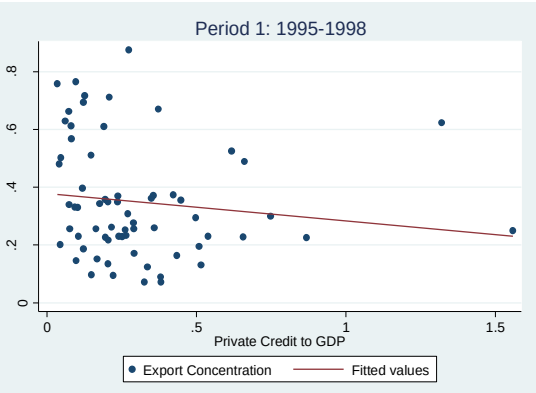


Figure 2C

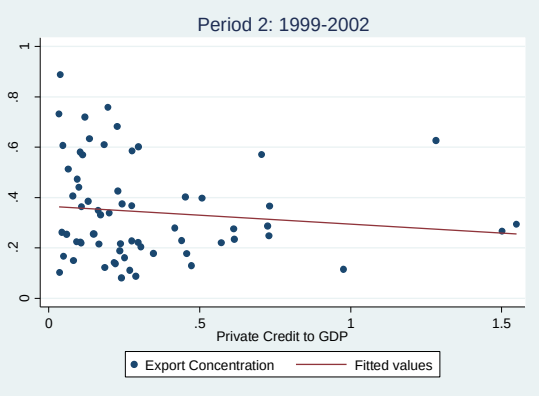


Figure 2D

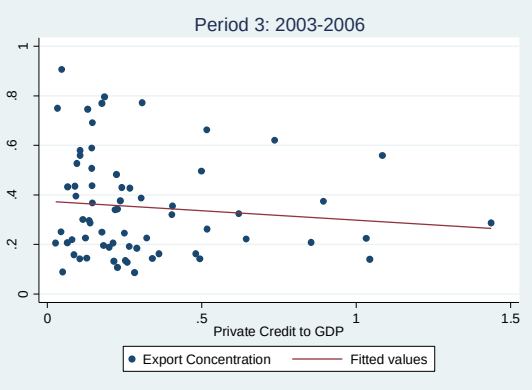


Figure 2E

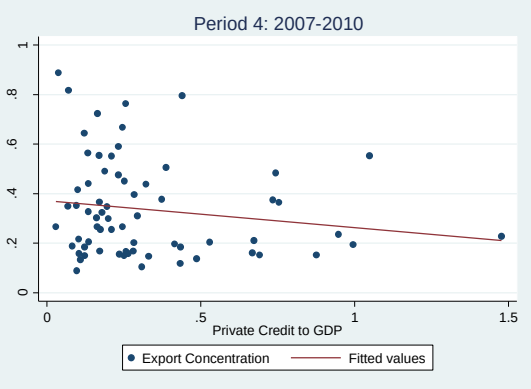


Figure 2A shows a negative relationship between export concentration and the ratio of private credit to GDP, and this relationship is when we split the sample into different time period, suggesting stability of the coefficients.

CHAPTER 5: CONCLUSION AND POLICY RECOMMENDATIONS

5.1. SUMMARY OF STUDY FINDINGS.

The structure of the banking system has been identified as one channel thorough the financial system can affect economic development and industrialization. This study defines bank market structure as bank sector concentration, foreign ownership of banks, and state ownership of banks. Bank concentration is argued to affect economic development and industrialization in two ways: on the one hand, there is the idea that concentration reflects the banks' oligopolistic position and, hence, a high degree of concentration would be associated with tight credit access constraints and high borrowing costs. On the other hand, it has been argued that it would be easier for firms to access credit if the banking system is concentrated. For foreign banks, standard mainstream thought envisages that the entry of foreign banks would promote financial development and spur economic growth. By contrast, it has been argued that a larger foreign bank presence in developing countries is associated with less credit to the productive private sector. Also, a large aspect of the literature argues that government ownership of banks is responsible for lower economic growth and found to retard financial development; Rodrik (2005) thinks that the negative effect is as a result of market failures, while others believe that government ownership of banks promote long-run economic growth. Finally, it has been argued that a developed financial system should help in improving the production process in countries, thereby improving the value added of domestically produced goods which are exported, making countries more competitive. The importance of these theoretical predictions and empirical evidence has been examined in developing countries, focusing on industries in the manufacturing sector and export structures.

The theoretical and empirical literature on the issues discussed above remains ambiguous, but they remain largely skewed towards mainstream thoughts. For example, a competitive banking system rather than a concentrated is more suited to promoting economic development and industrialization; less regulatory restrictions on foreign bank entry are seen to promote financial development and economic growth; state-owned banks are seen to be responsible for lower economic growth and to retard financial development, and financial development is seen as an important factor for improving the value of exports. However,

some of the evidence we find are not in line with the widely accepted views, particularly for developing countries. First of all, our results show that bank market concentration is seen to promote the growth of manufacturing industries, although it does not encourage entry. Foreign bank entry is neither seen to promote the growth of nor entry into these industries. Finally, government ownership of banks negatively affects industry growth but it promotes entry.

Our view of these results is as follows: banks with market power are likely to lend more to large firms than small and medium firms, so firms that benefit from such lending would grow in size, but such lending might not encourage overall entry; Foreign banks on the other hand, would rather lend to their multinational clients, large domestic firms and the government, resulting in a negative effect on overall industry growth and entry; government banks are more active during market failures, so, their positive effect on industry growth may be is ambiguous; however, they promote overall entry.

We also examine the role of institutional quality as well as the regulatory and supervisory environment on the effect of bank market structure on industry growth. The results suggest that while good institutions may benefit industrialization through the effect of bank market structures, the importance of good institutions for industrialization may not be robust. For example, not all the institutional variables proved to have a significant influence on the effect of bank market structure on industrialization in the cross-sectional estimation. Also, while some of the interaction terms in the panel data estimation suggest the positive effect of good institutions on the effect of bank market structure on industrialization, the effect of the institutional variable by itself on industrialization was negative. In some cases, the interaction terms were insignificant. These inconsistencies suggest inconsistencies in the 'good institution' approach to growth.

On the impact of bank market structure on industries that depend more on external finance, we find no evidence that bank concentration, foreign bank entry and state owned banks affect the growth of industries or the entry into industries that depend more on external finance. In line with Von Furstenberg and Von Kalckreuth (2006) and Kabango and Paloni (2009), we are of the opinion that the measure does not reflect the true level of external financial

dependence by manufacturing industries and that a measure based on listed firms in the United States is not easily applicable in other countries, particularly developing countries.

Also, we find some evidence that other industry-specific characteristics that are expected to benefit from financial development are affected by bank market structure. For example, in the literature, there is strong empirical evidence that small firms would benefit from financial development through a concentrated banking system and foreign bank entry. However, based on the measures of firm size we use, we find that foreign bank entry promotes the growth of industries composed of small firms (although this measure is only a theoretical measure) and that foreign banks negatively affect entry of large firms into manufacturing industries. We don't find overwhelming evidence that bank concentration and foreign bank entry promote the performance of small firms.

Another example is when we use high-technological intensity as an industry characteristic. Our results suggest that none of the bank market structures we have employed significantly affects industrialization in developing countries. When we consider Da Rin and Hellmann (2002), we would expect an increase in the level of banks concentration to have some sort of positive effect on industrialization, or Berger and Udell, (2006), who argue that foreign banks with better lending technologies are better suited to lend to high-tech firms in manufacturing industries. However, we find no evidence of this. For both examples, it may well be that the generalizations about who benefits from financial development might not hold, or to put it differently, the effect of financial development may to a large extent be country-specific, rather than industry-or sector specific. It may well be that financial development benefits sectors in which the country has comparative advantage.

With regards to the results based on high-technology intensity, our understanding is that it may provide some evidence that the measure of external financial dependence by Rajan and Zingales is fundamentally flawed (while they assume that these firms are the dynamic and innovative ones). These particular results require more examination and led us to directly explore the importance of financial development for technological advancement or innovation through export sophistication and diversification. Technological innovation is highly risky, and in banking markets where foreign banks are present, it is unlikely that banks would be willing to fund firms using new technology, particularly in developing countries.

The literature largely suggests that financial development is positively linked to international trade. Specifically, Beck (2002) finds that countries with a higher quality of financial development have higher shares of manufactured exports in GDP and in total merchandise exports and have a higher trade balance in manufactured goods. While Beck's conclusions are not related to the export structure, he specifically talks about the quality of exports (manufactured exports). It can generally be assumed that financial development improves the quality of exports and makes them more diversified. Results in this study, however, conflict these assumptions. Specifically, financial development is seen to negatively impact the sophistication of and increase the concentration of exports in developing countries. In other words, developing countries continue to export low value-added products that are not diversified. As this particular research objective is based on results which suggest that banks with market power, foreign banks and government banks are unlikely to fund industries composed of firms that are high-technologically intensive, it could mean that in a liberalized environment, banks will prefer to fund firms using known technology rather than innovative ones because of the costs and risks associated technological advancement.

5.2. CONTRIBUTION TO THE LITERATURE

The study makes the following contributions to the literature:

1. First, it contributes to the literature by suggesting that it is not possible to discover robust or consistent findings concerning the effects of good institutions in developing countries;
2. Second, its cast doubts over the Rajan and Zingales measure of 'External Finance Dependence' and questions the consistent use of it in the literature. Also, it systematically finds that's financial development, through bank market structure may equally be important for industries with other characteristics (i.e. apart from depending more on external finance);
3. Third, it questions the willingness of banks to fund innovative firms in developing countries because of the costs and risks involved in technological advancement and suggest that it might result in detrimental effects i.e. reducing the degree of export sophistication and increasing the level of export concentration.

Other secondary contributions include:

1. It contributes to the literature on industrial organization by examining how bank market structure affects industrial performance while considering industry-specific characteristics in relation to developing countries.
2. It applies an empirical technique that relates bank market structure, industry performance and institutions in developing countries. The Pooled Mean Group estimator has previously been used to link financial liberalization with growth, however, we don't know of any studies that have used it to link bank market structure, industry performance and institutions;
3. All financial characteristics are treated within the same framework, resulting in less problems of omitted variables bias. Normally, financial characteristics are treated in isolation with little or no analysis of them within the same framework; and
4. Data on government ownership of bank is longitudinal. Not many studies on government ownership of banks use longitudinal data because it is not available. Also, even less studies use it for cross-country studies. Like a few others, we have used Bankscope to obtain most of the data. The utilization of this data provides an in-depth analysis.

5.3. POLICY RECOMMENDATIONS

A number of policy issues have been identified in this study, and they may not only be relevant to only the developing countries in our sample, but all developing countries, where policies that promote competition, internationalization of banking, and privatization of state-owned banks are been implemented.

We therefore, discuss the following policy issues:

1. In the first instance, from a policy perspective, the study finds that good institutions might not be enough for developing countries to achieving and sustain the required level of growth, particularly when they are persuaded to integrate with the international economy. For example, Carlin (2010) uses East Germany to argue that the success of a capitalist economy is not primarily determined by high quality institutions, rather, it also requires to the ability of an economy to identify its area of comparative advantage in the international labour market. Also, Khan (2008) argues that while the difference in growth rate between converging and diverging developing

countries is significant, their market-enhancing governance are not significantly different. In other words, there are other dimensions of governance capabilities that explain the difference in growth rate between these two groups of countries. According to Khan, for developing countries to enjoy sustained growth and productivity, they have to improve specific governance capabilities. First of all, the capacity to improve weak property rights is required; second, the capacity to technologically catch-up with developed countries; and the capacity to overcome structural political corruption. In other words, while good institutions are good for development, developing countries require governance capabilities to overcome some of the impediments to developing good quality institutions.

2. Also, the study finds that financial institutions in developing countries are unlikely fund industries that produce high technology and high-value added products because of the risks and cost involved or they may be more motivated to fund short-term projects with front-loaded returns or more profitable and less risky projects. A generalized policy like financial development may primarily benefit activities where the country is competitive or has comparative advantage (i.e. low technology and low-value added products). The ability of financial institutions to finance activities in a discriminatory manner may require some form of government intervention to ensure innovative firms succeed. In other words, the growth-enhancing effects of government might not be enough; it requires the welfare-improving effect of government intervention. Without selective policies, it is improbable that technological upgrading and deepening will occur in developing countries where market failures are presents and the financial system is liberalized. According to Stiglitz *et al*. (1993), government interventions in financial markets are motivated by market failures. The use the case of the fast growing Asian economies to stress the role of government in creating financial institutions, regulating them, and using selective policies to direct credit in ways that ensure economic stability, healthy financial institutions and growth prospects. So, for developing countries to benefit from financial development in the area of technological advancements and export structure, government intervention may be required. While government failures and rent-seeking behavior have been rightly used to criticize government intervention (outside regulation and supervision), without the kind of intrusive government interventions we suggest, technological development will be impeded in developing countries.

5.4. FURTHER RESEARCH AND CONCLUSION

In general, the finance-growth literature suggest that the structure of the banking system, through bank sector concentration, foreign bank ownership and state ownership of banks, and financial development, through bank development, affect industry performance in developing countries. This in turn may be determined by industry specific factors. However, ongoing research in this literature is required as some areas remain unexploited. For example, the relationship between how institutions and institutional change effect economic development is too simplistic. It requires further research to examine all possible links and channels through with institutions affect economic development. Also, the availability of more robust industry-specific characteristics would be beneficial to the literature. For example, if actual data on external finance dependence on industries that has time variation and is country-specific becomes available, it might be possible to determine the characteristics of these industries. It would also be interesting to examine the impact of stock market development on industrial performance in developing countries using industry data and industry-specific characteristics. The stock markets in many developing countries are not very active, and are sometimes seen to negatively affect growth in developing countries. In other words, these will not only give new insights on the relationship between bank market structure and industrial performance, it may also be a relevant tool for developing policies that promote industrial performance in developing countries. A robust theoretical model that predicts the determinants of export diversification is also required in the literature to improve the outcome of empirical studies and to improve general knowledge on the concept. Finally, more research is required on the impact of state owned banks on economic development. Particularly, the effect of state owned banks on technological advancement, export sophistication and diversification in developing countries. It would be better if data on state owned banks were longitudinal.

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