ESSAYS ON THE ROLE OF FINANCE IN ECONOMIC PERFORMANCE

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A thesis submitted for the degree of Doctor of Philosophy

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November 2012

Abstract

Essay 1 investigates the question of whether perceived financial constraints, perceived corruption and perceived quality of legal institutions affect firm size. We use a unique firm-level data for 27 Eurasian countries. Our results show that while perceived financial constraints and perceived corruption are negatively associated with firm size, perceived quality of legal institutions is positively associated with firm size. Consistent with the findings in Beck, Demirguc-Kunt and Maksimovic (2006), we find that perceived financial constraints are the only factor having a significant effect on firm size, while perceived corruption and perceived quality of legal institutions do not have statistically significant effects.

Essay 2 investigates the effect of government ownership of banks on employment growth by using a cross-industry, cross-country (difference-in-difference) approach. Our results show that government ownership of banks lowers employment growth relatively more in industries with higher job creation opportunities. We also find that the negative effect of government ownership of banks is lower in countries with high financial development and institutional quality

Essay 3 examines whether financially integrated countries export relatively more in industries that are heavily dependent on external finance. Given that the components of international capital flows differ markedly in terms of volatility and their effects, this essay considers three different components of financial integration. These components are: international portfolio equity investments, foreign direct investments, and external debt. Our results show that the effect of international

portfolio equity investments on sectoral composition of export flows is much stronger and more robust among three different components of financial integration. International portfolio equity investments increase export disproportionately more in industries that are heavily dependent on external finance. We also find that this positive effect on export disappears when the quality of institutions is low.

Acknowledgments

This thesis is dedicated to my uncle Nurullah, my father Halil Ibrahim, my mother Hayriye and my brother Ismail Burak. I would like to express my sincere gratitude to my family members for their encouragement, for believing in me, and for being proud of my achievements.

I would like to offer special thanks to my supervisor, George Symeonidis, for giving me invaluable advice and guidance. I would like to express my gratitude and thanks to Gordon Kemp, Horst Feldmann, Patrick Nolen, João M. C. Santos, Marco Francesconi and Holger Breinlich for their helpful suggestions.

This dissertation has benefited from the comments and suggestions of Thorsten Beck (Tilburg University), Kalina Manova (Stanford University), Roberto Samaniego (George Washington University), Elias Papaioannou (Dartmouth College), Antonio Ciccone (Universitat Pompeu Fabra), Alessandra Bonfiglioli (Institut d'Analisi Economica, CSIC), Rebecca Neumann (University of Wisconsin) and Guglielmo Barone (Banca d'Italia). I would like to thank all of them for their help. I also thank the participants of seminars at University of Essex RSS, Eurasia Business and Economics Society Antalya Metting and University of Marmara. A very special thanks to administrative staff at University of Essex Department of Economics for support they have given since 2008.

I would like to express my deep appreciation to my friends, Onder Avni Hanedar, Mehmet Gokhan Goktan, Alihan Limoncuoglu, Recep Ilhan, Eyup Eksik and Bilal Incecik who provided so much support throughout my PhD process.

Ziya Altan Elmas's invaluable support would not be forgotten. I would like to express my deepest gratitude to him.

And, last but not least, I thank my fiancé, Esra Kılıc, for her support, encouragement and quite patience. I would never have been able to finish this dissertation without her.

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Chapter 1

Introduction

It was banks and the bond market that financed the Battle of Waterloo and the American Civil War (Ferguson, 2008; Haber, 2008). On the other hand, it was also banks and the bond market that provided the material basis of the Italian Renaissance (Ferguson, 2008). Modern financial institutions and instruments are blamed for creating the Global Financial Crisis, which is considered to be the worst financial crisis since the Great Depression (Reinhart and Rogoff, 2009; Rajan, 2010; Stiglitz, 2010, Johnson, 2009; Johnson and Kwak, 2010; Krugman, 2012). On the other hand, the evolution of financial markets has been important in the rise of civilisation and technological change (Ferguson, 2008; Leaven, Levine and Michalopoulos, 2012). It is the financial sector that causes death, unemployment and pain but it is the same phenomenon that fosters the economic prosperity of a country.

Economists have tried to understand how finance shapes our world for at least two centuries. Starting with Bagehot (1876), Schumpeter (1949) and Robinson (1952), the role of finance in economic performance has attracted a considerable amount of attention[1]. Robinson (1952: 86) argues that "*where enterprise leads finance follows*". On the other hand, Bagehot (1876) and Schumpeter (1949) argue that financial deepening plays a key role in economic growth and development. How might financial markets provide economic prosperity? They promote economic prosperity by pooling savings, producing information, allocating capital, monitoring

[1] In the 18th century, Adam Smith and Alexander Hamilton also highlighted the importance of finance for industrialisation and economic development. This topic has been debated more intensely since the late 19th century. See Levine (2005) and Beck (2012) to get more information about the history of this topic.

the use of that capital and facilitating transactions and risk management (Levine, 2005).

Following the seminal works by Bagehot (1876) and Schumpeter (1949), empirical papers have paid high attention to this field. Goldsmith (1969) is the first empirical study in this area. He shows that there is a positive correlation between financial development and GDP per capita. Using more sophisticated econometric techniques and a range of new financial indicators, the empirical literature on finance and economic performance has made considerable progress for the last two decades. Using macro-level data, a large body of empirical research has shown that finance influences economic performance (King and Levine, 1993a, 1993b; Levine and Zervos, 1998; Beck, Levine and Loayza, 2000; Aghion, Howitt and Mayer-Foulkes, 2005; Leaven, Levine and Michalopoulos, 2012).

The macro-level evidence has helped us to understand the role of finance in economic performance. However, further insights can be gained if one focuses on the micro-level evidence because it might show microeconomic channels linking finance to macroeconomic outcomes. Using micro-level data might also mitigate econometric challenges that recent macro-level studies face. Therefore, the purpose of this thesis is to provide micro-level evidence on the role of finance in economic performance.

In the first essay of this thesis we examine the relative importance of the perceptions of financial constraints, corruption and the quality of legal institutions on firm size. Thanks to the enterprise surveys, the last decade has witnessed an explosion of firm-level evidence on the effects of financial constraints and other business environment obstacles on firm performance. The main purpose of these surveys is to indentify obstacles to firm performance. The firms are asked to report obstacles and challenges they face related to the business environment. Macro-level studies assume

that the business environment is the same across regions within a country. This assumption is problematic because the business environment that firms face might not be the same within a country (Dollar, Hallward-Driemeir and Mengistae, 2005; Acemoglu and Dell, 2010). Therefore, self-reported business environment obstacles have been paid enormous attention in recent years.

Authors generally analyse the effect of financial constraints on firm performance by comparing it with the effects of other business environment indicators. In one of the earliest attempts in this field, Johnson, McMillan and Woodruff (2002) use firm-level data from four post-Communist transition countries to examine the importance of access to finance and property rights protection on investment. Their micro-level evidence shows that, while property rights protection has a significant and positive effect on investment, access to finance has no significant effect on investment. On the other hand, using a large sample of Chinese firms, Cull and Xu (2005) show that both access to finance and the quality of legal institutions affect reinvestment in China. In recent years, there have been lots of published papers that examine the effect of financial constraints, or the effect of other dimensions of the business environment, on firm performance (e.g. export, innovation, growth, informality etc.).

The first essay contributes to this micro literature by investigating the relative importance of the perceptions of financial constraints, corruption and the quality of legal institutions on firm size. This work is mainly built on Beck, Demirguc-Kunt and Maksimovic (2006). They examine whether financial development and the quality of institutions affect firm size. They use country-level data to measure financial development and the quality of institutions. As discussed above, using aggregate-level data for the business environment has its own weakness. Therefore, this essay

differs from Beck, Demirguc-Kunt and Maksimovic (2006) in that it examines the relationship between the business environment and firm size by using cross-country firm-level data, which provides cross-firm variation in perspective on the perceived business environment. We implement some strategies to mitigate potential endogeneity problems. Our results show that while perceived financial constraints and the perceived level of corruption are negatively associated with firm size, the perceived quality of legal institutions is positively associated with firm size. However, our findings show that perceived financial constraints are the only factor having a statistically significant effect on firm size, while perceived corruption and perceived quality of legal institutions do not have statistically significant effects. Consequently, this essay provides additional evidence on the importance of access to finance on firm performance.

In the second essay we investigate the effect of government ownership of banks on employment growth. Recent theoretical papers show the importance of financial markets for employment (Acemoglu, 2001; Wagner and Weil, 2004; Pagano and Pica, 2012). These results suggest that countries should also strengthen their financial markets in order to increase employment growth. An efficient banking system is crucial for the strength of financial markets. Government interventions in the banking system have been strong throughout history. Government ownership of banks is pervasive around the world, especially in developing countries. In the wake of the Global Financial Crisis, governments in many developed countries acquired majority stakes in the largest banks. This recent revival has renewed the debate regarding the effectiveness of government-owned banks. At the same time, unemployment has been soaring since the Global Financial Crisis. Even though the previous literature provides the bulk of empirical evidence regarding the effectiveness of government-

owned banks, it has paid little attention to the effect of government-owned banks on employment growth. To the best of our knowledge, this is the first paper that investigates the effect of government ownership of banks on employment growth by a cross-industry, cross-country approach.

There are mainly two broad views related to the effectiveness of the government ownership of banks. According to the "development view", government-owned banks are important in financing socially desirable but financially unprofitable investments and in solving market imperfections (see Gerschenkron, 1962; Stiglitz, 1993). On the other hand, the "political view" claims that government-owned banks are used to maximise politicians' personal objectives (see Shleifer and Vishny, 1994; Shleifer, 1998; Mishkin, 2006). While the "development view" might lead one to think that governments would use government-owned banks to reduce income inequality and social tensions by increasing employment growth, the "political view" might lead one to think that politicians would use government-owned banks to gain more political support by increasing employment growth. In this scenario, the "development view" and the "political view" work in the same direction, even if this effect occurs through different channels. Therefore, government ownership of banks might increase employment growth in industries with higher job creation opportunities. One's view might be changed by analysing this relationship in terms of the effectiveness of government-owned banks in allocating their resources. Given that well-functioning financial institutions allocate resources to the best uses, they might facilitate the reallocation of labour from declining to expanding industries. The existing literature shows that government ownership of banks is associated with corruption, clientelism and low quality of financial intermediation (Ayyagari, Kunt-Demirguc and Maksimovic, 2012; Beck, 2012; Levine, 2012). Therefore,

government-owned banks might not be good at expanding access to credit and allocating their credits. This is another dimension highlighted by the "political view". In this scenario, the "development view" and the "political view" work in the opposite direction. Therefore, government ownership of banks might lower employment growth in industries with higher job creation opportunities. The overall effect of government ownership of banks on employment growth is ambiguous. Ultimately, it is an empirical question whether industries with higher job creation opportunities have slower or higher employment growth in countries with higher government ownership of banks.

This paper uses a cross-industry, cross-country (difference-in-difference) approach pioneered by Rajan and Zingales (1998) and extended by Fisman and Love (2007) and Ciccone and Papaioannou (2007, 2008 and 2011). The main motivation of this approach is that the effects of the financial markets are stronger in some industries than in others. Our results show that government ownership of banks reduces employment growth relatively more in industries with higher job creation opportunities. We also find that the negative effect of government ownership of banks is smaller in countries with high financial development and high institutional quality.

The main conclusion of this essay questions the role of government as an owner of banks. However, it should not be interpreted as the policy implication of our results that if the government are removed fully from the financial sector the economy will function better. On the contrary, the recent financial crisis shows us that we need a better institutional and regulatory environment in order to make the financial sector more transparent and competitive.

In the third essay we focus on another controversial financial issue, namely financial integration. Using Rajan and Zingales's (1998) cross-industry, cross-country

(difference-in-difference) approach, this essay examines financially integrated countries export relatively more in industries that are dependent on external finance. Exporting is a costly activity and, therefore, more external finance is needed to cover additional sunk, fixed and variable costs of exporting (Manova, 2010). Therefore, countries have to provide new ways of generating external funding opportunities for their firms and industries in order to export more and, consequently, have a greater voice on the world economy. In addition to the benefits of domestic financial development, financial integration could be an important way of providing external funding opportunities.

Our framework is close to Manova (2008), who examines the effect of financial integration on exports. As in Manova (2008), we focus on the impact of financial integration on exports. Compared with Manova (2008), however, this paper has two main differences. First, we use *de facto* measures for financial integration because *de jure* measures suffer from a variety of shortcomings. Secondly, given that the components of international capital flows differ markedly in terms of volatility and their effects, this essay considers three different components of financial integration (international portfolio equity investments, foreign direct investments and external debt). To the best of our knowledge, this essay is the first attempt to decompose the effects of different components of financial integration on export. Our results show that the effect of international portfolio equity investments is much stronger and more robust among three different components of financial integration. International portfolio equity investments increase export relatively more in financially dependent industries. Our results also show that the positive effect of international portfolio investments is limited to countries with a high institutional quality. This positive effect turns negative for countries with low institutional quality.

The Global Financial Crisis has raised concerns about the role of finance in economic performance and the social productivity of the financial sector. Unfortunately, this dissertation doesn't cover the effects of the Global Financial Crisis on firms and industries due to the lack of cross-country micro (firm and industry) level datasets that cover the crisis period for a large set of countries. The current crisis might have important consequences for our topic. Therefore, there are some crucial research questions that we leave them to future work to analyze.

First of all, it could be interesting to examine how the current crisis, which makes borrowing constraints more binding, affects firm performance. The Global financial crisis has caused a massive reduction in the availability of external finance since mid-2007. Therefore, small- and medium-sized firms and entrepreneurs with promising ideas could not find credits to start-up their own businesses, to innovate, to export, to create new employment opportunities, and to reach their optimal firm size level. In the future, we should focus more on the effects of frozen credit markets on firm performance during the recent financial crisis. It is also important to note that while poor access to finance might have negative effects on firm performance; this does not mean that excessive financial development and massive credit opportunities are always good for firm performance. The Global Financial Crisis has shown that some countries might have financial markets which are too large compared to the size of the real economy (Arcand, Berkes and Panizza, 2012). The presence of a large and complex financial sector might result in excessive credit growth and indebtedness, and thus negatively affects firm performance. Therefore, examining whether there is a threshold above which access to external finance has no positive effect on firm performance is an important task for future studies.

Secondly, as mentioned above, many governments have acquired majority stakes in the largest banks since the Global Financial Crisis. As the World Bank's latest Global Financial Development Report (2013) concludes, government-owned banks can stabilize financial markets in times of crisis, but this effort will come at a cost. Government-owned banks can also lead to credit misallocation and deterioration of the quality of financial intermediation. Therefore, future studies should analyse both costs and benefits of government-owned banks during the Global Financial Crisis. For future work, it will be worth analysing the effects of recent bank nationalization policies on bank performance and the real economy.

Lastly, the recent crisis has affected not only international trade flows, but also international capital flows. Financially integrated countries might become more associated with capital flow reversals and more sensitive to global financial conditions. Both sudden slowdowns in capital inflows and contagion might reduce external finance opportunities and also harm export performance of financially integrated countries. Therefore, positive effects of financial integration on exports might evaporate during financial crises. At the end, examining exact mechanisms of how the Global Financial Crisis affects the relationship between international capital flows and international trade flows constitutes a fruitful area for further research.

To conclude, this thesis focuses on the role of finance in economic performance. Using micro-level datasets, this thesis contributes to three related strands of literature: the finance and firm performance literature, the literature on the effects of government ownership of banks and the financial integration and export literature. Finance has been an important part of economic activity throughout history. It is true that the financial sector has caused a lot of pain. Recent scandals in Western financial institutions are important messages that show more work is needed

to make the financial sector function properly. However, not only the previous results, but also our results suggest that the positive role of the financial sector in economic performance should not be dismissed out of hand. Therefore, as Beck (2012) argues, it is unconscientious to throw the baby out with the very dirty bathwater. What is necessary is to provide an appropriate institutional and regulatory environment for a sound and effective financial system.

Chapter 2

Financial Constraints, Quality of Institutions and Firm Size: What Do Perceptions Tell Us?[2]

2.1 Introduction

Large firms are important for any modern economy because they are able to grow by constantly refining existing products and developing new ones (Baumol, Lithan and Schramm, 2007). In their seminal paper, Rajan and Zingales (1998) find that two thirds of industry growth in the 1980s comes from growth in the size of existing establishments, with only one third from the creation of new firms. Moreover, Guner, Ventura and Xu (2008) show that government policies which impose restrictions on the size of large firms lead to considerable negative effects on output and productivity. Given the significance of large firms, it is important to understand the factors that cause the large disparity of firm size across and within countries.

Access to finance and the quality of institutions shape firms' business environment and have therefore commonly seen as important factors in determining a country's economic performance[3]. Access to finance has notable effects on economic

[2] A shortest version of this essay is forthcoming in ***Eurasian Economic Review***.
[3] In this article, the quality of institutions refers not only to the legal environment, but also to the level of corruption.

performance (see Levine, 2005, for a survey)[4]. A well-functioning financial system enhances economic prosperity by mobilising savings to best effect, as well as easing information, enforcement, and transaction costs, and providing mechanisms for hedging and trading idiosyncratic risks (Levine, 2005). On the other hand, recent macroeconomic literature has highlighted the role of the quality of institutions in promoting economic prosperity (see Acemoglu, Johnson and Robinson, 2005, for a survey)[5]. An entrepreneur has relatively weak incentive to accumulate capital and innovate without adequate control over his or her return from these investments (North, 1990; Rodrik, 2000; Acemoglu and Robinson, 2012). Protection of property rights ensures that firms can reap benefits from their investments. Moreover, better contract enforcement increases relationship-specific irreversible investments and leads to the adaptation of more advanced technologies (Williamson, 1985; Acemoglu, Antes and Helpman, 2007). On the other hand, the "law and finance" view emphasises that legal systems affect both the laws governing financial transactions and the enforcement of these laws (La Porta *et al.*, 1997; 1998). This indicates that countries with less effective property rights protection and contract enforcement have relatively poor access to finance. Hence, there may be indirect channels through which the quality of legal institutions affects economic performance. Besides, existing literature argues that corruption reduces investment, distorts allocation of resources and entrepreneurial talent and impedes efficient industrial policies (Baumol, 1990; Mauro, 1995; Ades and Di Tella 1997). While macroeconomic literature has helped us to understand the role of financial development and the quality of

[4] See Goldsmith (1969), King and Levine (1993a, 1993b), Levine and Zervos (1998), Beck, Levine and Loayza (2000) and Aghion, Howitt and Mayer-Foulkes (2005) on the importance of finance for growth and development.

[5] See Knack and Keefer (1995), Mauro (1995), Hall and Jones (1999), Acemoglu, Johnson and Robinson (2001), Rodrik, Subramanian and Trebbi (2004) and Acemoglu and Johnson (2005) on the importance of institutions for growth and development.

institutions in economic performance, micro channels through which these factors affect the economic destiny of countries are also important topics on which to focus.

Using firm level data sets, recent papers show that better access to finance increases export (Bellone *et al.*, 2010; Minetti and Zhu, 2011), firm growth (Demirguc-Kunt and Maksimovic, 1998; Beck, Demirguc-Kunt and Maksimovic, 2005) and innovation (Gorodnichenko and Schnitzer, 2011; Ayyagari, Demirguc-Kunt and Maksimovic, 2011).There is also a growing body of micro level studies on the effects of contract enforcement and property rights protection on firm performance. Using firm level data from Poland, Romania, Russia, Slovakia, and Ukraine, Johnson, McMillan and Woodruff (2002) find that while property rights protection has a significant and positive effect on investment, access to finance has no significant effect on investment. Using a large sample of Chinese firms, Cull and Xu (2005) show both access to finance and quality of legal institutions affect reinvestment in China. Nunn (2007) and Ma, Qu and Zhang (2010) find that countries with better contract enforcement export relatively more in industries for which relationship-specific investments are important. Micro level evidence finds that corruption impedes firm growth (Fisman and Svensson, 2007) and increases informal economy (Johnson *et al.*, 2000).

As a contribution to this micro literature, the aim of this paper is to investigate the relative importance of the perceptions of financial constraints, corruption and quality of legal institutions on firm size. This paper is related to newly emerging literature on the effect of business environment on firm size. While Kumar *et al.* (2002), Herrera and Lora (2005) and Beck, Demirguc-Kunt and Maksimovic (2006) use country-level data on the business environment, Laeven and Woodruff (2007) use region-level data on the quality of the legal institutions for Mexico. Previous papers

using country-level data on the business environment assume that the investment climate is the same across regions within a country. This assumption is problematic because the business environment that firms face might not be uniform within a country (Dollar, Hallward-Driemeir and Mengistae, 2005; Acemoglu and Dell, 2010). While the business environment appears to be formed at a national level, the *de facto* business environment differs across regions of the same country. Recent studies show that business environment differs across regions, and thus the tightness of credit constraints, protection of property rights, enforcement of contracts and the burden of corruption are not the same within a country (Fisman and Svensson, 2007; Hallward-Driemier, Wallsten and Xu, 2010; Li, Mengistae and Xu, 2011; Minetti and Zhu, 2011). Therefore, this paper uses perceptions of business environment. To the best of our knowledge, this is the first empirical paper to examine the relationship between the business environment and firm size by using a unique cross-country firm-level data, which provides cross-firm variation in the perceived severity of business environment constraints. We find that perceived financial constraints are the only factor having a negative and significant effect on firm size, while perceived corruption and perceived quality of legal institutions do not have statistically significant effects.

As in most of the papers that use cross-country firm-level data, a key concern or caveat is that the effects of perceived business environment might reflect some unobservable characteristics or suffer from reverse causality. While our results show that better perceptions of the business environment are associated with larger firm size, we cannot claim that all possibilities of potential endogeneity are ruled out. We follow some strategies in order to mitigate the potential endogeneity problem. First, we control for industry and country fixed effects to capture industry and country-level

unobservable characteristics. Commander and Svejnar (2011) emphasize that country fixed effects might matter more for firm performance than differences in perceived business environment across firms within countries. Since we include industry and country dummies to pick up industry and country level unobservable factors, the omitted variable bias caused by industry and country fixed effects is less of a concern. Secondly, we use information about the perceived business environment from other firms in the same industry, region and country. The advantage of using the responses of other firms that are subject to the same environment is that perceived business environment is not affected by a firm's own performance. This method helps us to alleviate the reverse causality problem. Third, we include all variables of the perceived business environment simultaneously. Regressions on single perceived business environment indicator are very likely to produce biased estimates due to omitted variables (Dethier, Hirn and Straub, 2011; Commander and Svejnar 2011). In recent survey papers, Dethier Hirn and Straub (2011) and Xu (2011) argue that perceived business environment indicators might mainly represent some regional omitted factors. To the best of our knowledge, previous papers that examine the effects of perceived business environment on firm performance by using cross-country firm-level data have not controlled for region fixed effects. We account for region-fixed effects by including region dummies into our empirical analysis. Therefore, the endogeneity problem caused by unobserved regional characteristics is also less of concern.

The paper is organised as follows. The next section of the paper discusses the literature review. Section 2.3 describes our data. Section 2.4 explains the econometric specification. In section 2.5, we present a descriptive analysis and the baseline results. Section 2.6 discusses some further econometric issues and gives some further

econometric results. Section 2.7 provides some conclusions.

2.2 Related Literature

Recent economic research has revealed a relationship between business environment and firm size. In one of the earliest empirical papers on this topic, Kumar, Rajan and Zingales (2002) use the Enterprise in Europe dataset in order to examine the effect of legal system on firm size in fifteen European countries. They use average firm size for an industry in each country, rather than using a firm-level measure of firm size. They also use Business International Corporation's index for judicial efficiency, which is an assessment of the efficiency and integrity of the legal environment as it affects business. Kumar, Rajan and Zingales (2002) find that countries with more efficient legal institutions have larger firms. Following the theoretical model proposed by Rajan and Zingales (2001), Kumar, Rajan and Zingales's (2002) industry-level data allow them to test whether the relative size of firms in industries with intangible assets should increase when the efficiency of the judicial system improves. In their theoretical model, Rajan and Zingales (2001) show that well-functioning legal institutions increase management's ability to use critical resources, such as brand names, intellectual property and innovative processes other than physical assets, to generate economic surplus, which in turn leads to the establishment of larger firms. This theory is based on the "critical resource" theory of firm. Kumar, Rajan and Zingales (2002) find that the positive effect of efficient legal institutions is stronger in industries that rely on intangible assets such as reputation, client relationships and intellectual property, because a sophisticated legal system is

necessary to protect these assets. This indicates that their findings are consistent with Rajan and Zingales (2001).

Rather than using industry-level data, Herrera and Lora (2005) use firm-level data (WorldScope) to study the relationship between business environment and firm size in a cross-section of developing and developed countries. In addition to the quality of institutions, their analysis also covers financial development. Financial development indicators are the ratio of total credit to the private sector to GDP, and stock market capitalization, the value of outstanding shares as share of GDP. The indexes for the rule of law and corruption are from World Bank Governance Indicators. They find empirically that while financial development has a positive effect on firm size, the rule of law and corruption have no direct effects on firm size.

Using data on industrial firms in 44 countries, Beck, Demirguc-Kunt and Maksimovic (2006) also examine the influence of financial and legal institutions on firm size. Financial development indicators are the ratio of total credit to the private sector to GDP, and stock market capitalization. They use various indicators (judicial efficiency, contract enforcement, property rights protection, legal formalism and control of corruption) from various sources to measure institutional development. They find that financial development and better contract enforcement and property rights protection are positively related to firm size. Their results show that while the effect of financial development is robust, the effects of contract enforcement and property rights protection are less robust to different sensitivity tests. They do not find any significant evidence that firms are larger in countries with lower levels of corruption. It is important to note that they enter each variable for business environment one at a time rather than simultaneously.

In a more recent work, Laeven and Woodruff (2007) develop a theoretical framework in which quality of legal institutions affects the level of idiosyncratic risk faced by an entrepreneur who invests an increasing share of his assets in a single firm. They show that legal institutions affect firm size by reducing idiosyncratic risk. The quality of legal institutions has a smaller effect on partnerships and corporations than on sole proprietorships where owners are not able to limit and diversify their risk. They test these propositions by using two-digit industry-level data for each Mexican state, and state-level data for judicial efficiency. Their empirical results show that judicial efficiency increases average firm size and that this effect is stronger in industries dominated by sole proprietorships.

This paper is also related to the literature that focuses on the effects of business environment on firm dynamics. In a highly influential paper, Cabral and Mata (2003) propose a model of firm growth and firm size distribution. Financial constraints restrict the scale of operations of, and cause under-investment in, small firms. Therefore, firm size distribution is skewed in the presence of financial constraints. Overcoming financial constraints allows these small firms to grow rapidly and reach their optimal size. This, in turn, gives rise to a more symmetric size distribution. Similar to Cabral and Mata's (2003) findings, some empirical papers investigate the effect of financial constraints on firm growth (Demirguc-Kunt and Maksimovic, 1998 for developed and developing countries; Carpenter and Petersen, 2002 for the US; Oliveira and Furtunato, 2006 for Portugal; Bottazzi, Secci and Tamagni, 2010 for Italy). In a striking paper, Beck, Demirguc-Kunt and Maksimovic (2005) investigate the effect of financial, legal, and corruption obstacles on firm growth rates. They find that all three obstacles reduce firm growth rates. Moreover, they show that the smallest firms are consistently the most adversely affected by financial, legal, and

corruption obstacles. Using firm-level data of European countries, Desai, Gompers and Lerner (2003) find that inclusive institutions are important in encouraging both the emergence and growth of new enterprises. Aidis, Estrin and Mickiewicz (2010) also find that strong protection of property rights and better access to finance affect entrepreneurial entry positively.

2.3 Data

To examine the effects of perceived business environment on firm size, this paper uses data from the Business Environment and Enterprise Performance Survey (BEEPS) 2005. This data is from a joint initiative of the European Bank for Reconstruction and Development (EBRD) and the World Bank. This data set includes 27 Eurasian countries: Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Macedonia, Poland, Romania, Russia, Serbia and Montenegro, Slovak Republic, and Slovenia, Tajikistan, Turkey, Ukraine and Uzbekistan. The BEEPS consists of a representative sample that is selected randomly from countries' registered firms. Firms in these surveys differ according to firm size, industries, and geographic regions within countries. The BEEPS covers a broad range of information about employment, sales and supplies, business environment, business-government relations, innovation and etc.

The BEEPS gives us information about firm size. We use the log of total full-time employment ($firmsize_1$) as a measure of firm size.[6] Following Kumar *et al.* (2002), Herrera and Lora (2005), Beck, Demirguc-Kunt and Maksimovic (2006) and

[6]We add the log of the number of full-time employment into our regression model. Some papers also use total sales as a measure of firm size. We also add the log of total sales into our regression in order to check the robustness of our results.

Laeven and Woodruff (2007), firm size is measured in the natural log form to normalize the distribution, and thus to make our estimates less sensitive to extreme observations[7]. The BEEPS collects detailed information on many aspects of the business environment in which firms operate. First, we use firms` perceptions of access to finance (perceived financial constraints). Managers are asked to rank, on a scale of 0-4, "How problematic is access to finance for the operation and growth of your business?" Higher values indicate more severe constraint.[8] Secondly, the BEEPS asks firms to report the perceived level of corruption. Reinikka and Svensson (2006) highlight some strategies for collecting information on corruption levels across firms. Since there is a high distrust of government in most developing countries, independent associations administered these surveys.[9] The question on corruption is asked in an indirect manner to avoid unreliable responses,[10] using the following question: "We've heard that establishments are sometimes required to make gifts or informal payments to public officials to get things done with regard to customs, taxes, licenses, regulations, services. On average, over a year, what percent of annual sales value would such expenses cost a typical establishment in your area of activity?" Lastly, the BEEPS asks the following question about the quality of legal institutions: "To what degree do you agree with this statement? *I am confident that legal institutions will uphold my contract and property rights in business disputes*." Firms choose one of six answers ranging from "strongly disagree (1)" to "strongly agree

[7] See Wooldridge (2009, p.191).
[8] Same or similar variables have been also used by different papers in order to examine the effect of perceived financial constraints on firm performance (see Beck, Demirguc-Kunt and Maksimovic, 2005; Gorodnichenko and Schnitzer 2011 and Commander and Svejnar, 2011).
[9] In our case, they are the European Bank for Reconstruction and Development and the World Bank.
[10] Since individuals involved in illegal activities might try to conceal what they do, indirect questioning has also been used in other fields such as psychology and criminology. For further information, see Ayyagari, Demirguc-Kunt and Maksimovic (2010).

(6)". A higher value implies more effective legal institutions. We use this question as an indicator of the perceived quality of legal institutions.[11]

It is important to note that perceptions are not necessarily directly related to the actual property rights offered, contracts enforced, bribes paid and financial constraints faced. However, recent studies show that these perceptions capture meaningful variations across and within countries. Hallward-Driemeier and Aterido (2009) use measures of the business environment on external indicators drawn from the World Bank Development Indicators, the World Bank Governance Indicators and the Doing Business Survey. They find that external indicators for the business environment are highly correlated with firms' perceptions of the business environment. Using several objective financial market indicators, Bouton and Tiongson (2010) find a significant relationship between subjective and objective indicators of financial markets (real lending rate; interest rate spreads; domestic credit to private sector; number of ATMs per 100,000 people; average deposit size/GDP per capita; and number of deposits per 1000 people. In a field study of a road building project in rural Indonesia, Olken (2009) examines the relationship between perceived level of corruption and a more objective measure of corruption (missing expenditures in the road project). His empirical results show that villagers' perceptions of corruption are positively correlated with missing expenditures in the road project. Therefore, it is meaningful to examine the relationship between business environment and firm size by using data on cross-firm variation in the perceived business environment.

To control for firm characteristics, we use firm age, market size, two different dummy variables for ownership, a dummy variable for export, a dummy variable for

[11]In addition to firm-level analysis, this kind of perception-based measure of contract enforcement and property rights protection has also been used to examine the effects on agricultural investments. For example, Dercon and Krishnan (2010) show that perceived land rights matter for agricultural investment in Ethiopia.

loan status of firm and two variables for domestic and foreign competition. Age is the log of the number of years since the firm began operations in the country. Market size is a set of dummies for the size of population where the firm is operating or headquartered. State is a dummy variable which equals 1 if the firm is state-owned and 0 otherwise. Proprietorship is a dummy variable which equals 1 if the legal status of the firm is sole proprietorship and 0 otherwise. Export is a dummy variable which equals 1 if the firm is an exporter and 0 otherwise. Loan is a dummy variable which equals 1 if the firm received a loan three years ago and 0 otherwise. We use firms' responses regarding the importance of foreign and domestic competition on developing new products or services and reducing the production cost of existing products or services. Compdom is a self-reported measure of pressure from domestic competition which ranges from 1 (not important) to 4 (very important). Compfor is a self-reported measure of pressure from foreign competition which ranges from 1 to 4. Appendix Table 2.1 gives a detailed description of the variables.

2.4 Empirical Methodology

Using data from the BEEPS, we estimate the following main econometric models:

$$y_{isrc} = \beta x'_{isrc} + \gamma finance_{isrc} + \delta corruption_{isrc} + \varphi legal_{isrc} + \theta_s + \mu_c + \varepsilon_{isrc} \quad (2.1)$$

where y_{isrc} is the log of total full time employment; i, s, r and c index firms, industries, regions, and countries, respectively. x'_{isrc} is a vector of control variables; $finance_{isrc}$ denotes perceived financial constraints; $corruption_{isrc}$ denotes perceived level of corruption; $legal_{isrc}$ denotes perceived quality of legal institutions; θ_s denotes industry

fixed effects; μ_c denotes country fixed effects and ε_{isrc} is the error term. Inclusion of industry and country dummies is important to control for industry and country fixed effects. Controlling for country fixed effects allows us to absorb the differences in factors such as economic development, and macroeconomic and political stability. On the other hand, industry fixed effects account for differences in factors that can generate heterogeneity across industries. Therefore, including industry and country fixed effects are important to check whether these factors eliminate the effects of perceived business environment.

Based on previous literature, we have three main hypotheses. First, poor access to finance limit firms to grow and reach their optimal size (Cabral and Mata, 2003; Beck, Demirguc-Kunt and Maksimovic, 2006). Therefore, we expect that financial constraints would have negative effect on firm size. That is $\gamma<0$. Second, corruption diverts resources from productive and formal activities to unproductive and informal ones (Baumol, 1990; Johnson *et al*., 2000). In a highly corrupt environment, keeping firm size small might help to escape from corrupt bureaucrats. Therefore, we expect that corruption would reduce firm size. That is $\delta<0$. Lastly, well-functioning legal system protects property rights and enforces contracts. Firm owners will likely be willing to expand their capacity, and thus increase their firm size under well-functioning legal system (North, 1990, Rajan and Zingales, 2001). Therefore, we would expect that better quality of legal institutions increases firm size. That is $\varphi>0$.

2.5 Descriptive Analysis and Baseline Results

In this section, we present a descriptive analysis and our baseline econometric results. Appendix Table 2.2 reports descriptive statistics. On average, firms employ 101

workers. The average firm age in the sample is 17 years. While 37 percent of firms are single establishment firms, 8 percent of them are state-owned firms. On the other hand, 23 percent of firms are exporters.

Appendix Figure 2.1 shows perceived financial constraints averaged over all firms in each country. As seen in this figure, firms complain more about poor access to finance in Armenia, Czech Republic, Serbia & Montenegro and Poland. Appendix Figure 2.2 shows country average score of perceived corruption. This figure indicates that firms pay more bribes in Albania, Azerbaijan and Kyrgyzstan. Appendix Figure 2.3 shows country average score of perceived quality of legal institutions. In Bulgaria, Macedonia, Moldova and Russia, firms are less confident that the legal system will uphold my contract and property rights.

We also show how our perceived business environment indicators are correlated with country level business environment measures that have been used in the previous literature. Financial development is measured as domestic credit to private sector (in percent of GDP). It is from European Bank for Reconstruction and Development Structural Change Indicators. We use control of corruption and rule of law indicators from the Worldwide Governance Indicators. This is a World Bank dataset and constructed by Kaufmann, Kraay and Mastruzzi (2009). These are perception based indicators. According to the official definition, control for corruption captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests (Kaufmann, Kraay and Mastruzzi, 2009, p.6). According to the official definition, rule of law captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the

courts, as well as the likelihood of crime and violence (Kaufmann, Kraay and Mastruzzi, 2009, p.6).These indexes lie between -2.5 and 2.5. Higher values imply better control of corruption and rule of law.

As Appendix Figure 2.4 shows, financial development is negatively correlated with perceived financial constraints (country level average). This evidence suggests that our measure of perceived financial constraints is supported by objective (hard) measure of financial development. Appendix Figure 2.5 shows that control of corruption is negatively correlated with our perceived corruption indicator (country level average). Appendix Figure 2.6 shows that there is no statistically significant correlation between the rule of law and perceived quality of legal institutions (country level average). It is important to note that readers should take caution in interpreting Appendix Figure 2.4 and Appendix 2.5 because control of corruption and rule of law are also perception based indicators. Previous empirical papers use these indicators because it is difficult to find objective based data on control of corruption and rule of law. Therefore, World Bank and other international organizations should put more effort on collecting objective based data on control of corruption and rule of law. World Bank and other institutions should also focus more on collecting objective indicators of business environment constraints at the sub-national level, because recent empirical papers show that the business environment that firms face might not be the same within a country.

To provide some tests of means comparison across groups, we divide the sample into those firms with size below the mean (101 workers) and those above the mean. Table 2.1 shows these tests of means. The test of means shows that small firms face more severe obstacles in obtaining external finance, accessing legal systems and dealing with corruption.

Table 2.1 Test of Means

	Small Firms	**Large Firms**	
	Mean	**Mean**	**Test of means (t-statistics)**
Finance$_1$	2.292	2.054	7.730***
Legal$_1$	3.468	3.797	-8.679***
Corruption$_1$	1.116	0.656	6.642***

Note: Author's own calculations.

Table 2.2 gives benchmark estimates for the determinants of firm size. The first column shows that age is an important determinant of firm size. A firm's age has a positive effect on firm size. Its effect is statistically significant at the 1% significance level. The coefficient of market size is positive and statistically significant, indicating that increased market size is associated with larger firm size. There is also a significant and positive relationship between state ownership and firm size. This result implies that state-owned firms are larger than privately-owned firms, which is not surprising because our data set covers mainly post-communist countries. From our results, it is evident that sole proprietorship is negatively related to firm size. The export dummy is positively associated with firm size. The estimated coefficient of the export dummy is statistically significant at the 1% significance level. Our results indicate that exporters are larger than non-exporters, and that, while greater pressure from domestic competition has a negative effect on firm size, greater pressure from foreign competition is positively related to firm size.

Table 2.2 Benchmark Results-Firm Level Perceptions

Dependent Variable: $firmsize_1$ (log of Total Full Employment)					
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
Market Size	0.0555**	0.0571**	0.0592**	0.0578**	0.0640**
	(0.0234)	(0.0240)	(0.0257)	(0.0227)	(0.0251)
Age	0.5010***	0.4951***	0.5094***	0.5010***	0.5081***
	(0.0507)	(0.0523)	(0.0491)	(0.0520)	(0.0505)
State	0.9947***	1.0144***	0.9451***	0.9607***	0.9329***
	(0.1072)	(0.1083)	(0.0996)	(0.1001)	(0.1370)
Proprietorship	-0.8021***	-0.7939***	-0.7881***	-0.7925***	-0.7679***
	(0.1073)	(0.1097)	(0.1169)	(0.1066)	(0.1072)
Export	0.7943***	0.7783***	0.8528***	0.7906***	0.8512***
	(0.0752)	(0.0791)	(0.0636)	(0.0834)	(0.0700)
Loan	0.4968***	0.5033***	0.4709***	0.4897***	0.4677***
	(0.0487)	(0.0487)	(0.0499)	(0.0493)	(0.0486)
Compdom	-0.0494**	-0.0417	-0.0507*	-0.0490*	-0.0445
	(0.0243)	(0.0245)	(0.0243)	(0.0250)	(0.0268)
Compfor	0.1105***	0.1205***	0.1021***	0.1113***	0.1109***
	(0.0231)	(0.0251)	(0.0199)	(0.0241)	(0.0229)
$Finance_1$		-0.1084***			-0.0934***
		(0.0157)			(0.0167)
$Corruption_1$			-0.0302***		-0.0246***
			(0.0065)		(0.0066)
$Legal_1$				0.0828***	0.0751***
				(0.0116)	(0.0150)
Industry FE	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
No. of Obs.	9246	8849	8104	8787	7387
R^2	0.407	0.415	0.414	0.410	0.424

Note: Regressions are estimated by OLS. In each specification, the number of countries is 27 and the number of industry is 8. Standard errors are clustered at country level. ***, [**] and (*) denote statistically significant at 1, [5] and (10) percent levels, respectively.

The following columns show the effects of our variables relevant to firm size. The second column shows that perceived financial constraints are negatively associated with firm size. The estimated coefficient of perceived financial constraints is statistically significant at the 1% significance level. Column (3) of Table 2.2 shows that the perceived level of corruption has a negative effect on firm size. The effect of perceived corruption on firm size is statistically significant at the 1% significance level. Column (4) of Table 2.2 shows that there is a highly significant and positive relationship between perceived quality of legal institutions and firm size. Firms that are subject to more effective legal institutions are larger than other firms. When the relevant variables are included simultaneously, the effects of perceived financial constraints, perceived corruption and perceived quality of legal institutions are still valid. These effects are significant at the 1% significance level.

2.6 Further Econometric Issues

2.6.1 Endogeneity

Our baseline results show that while perceived financial constraints and perceived level of corruption have negative and statistically significant effects on firm size, there is a significant and positive relationship between the perceived quality of legal institutions and firm size. However, these results do not necessarily correspond to the causal effects of the perceived business environment on firm size. Therefore, readers shouldn't focus more on these initial results. In the following two tables, we provide our results after taking into account potential endogeneity problem. In Table 2.3, we use industry-region-country averages of perceptions (including firms' own perceptions) instead of just using firm's own perceptions. In Table 2.4, we use

industry-region-country averages of other firms' perceptions firms' own perceptions. As two recent survey articles (Dethier, Hirn and Straub, 2011; Xu, 2011) underlines, Table 2.4 gives us most reliable results because firms' own perceptions have no impact on the industry-region-country average of other firms' perceptions.

It is better to start discussing why endogeneity problem matters. Some studies don't take into account endogeneity problem and they just use firms' own perceptions (e.g. Johnson, McMillan and Woodruff, 2002; Cull and Xu, 2005; Kalemli-Ozcan and Sorensen, 2012). But, there are some issues that will cause an endogeneity problem. First, controlling all the variables related to firm size is almost impossible. It is possible that a firm's own perceived business environment is correlated with some of these omitted factors which affect firm size. If this is the case, omitted factors will bias our results. In each specification, we control for industry and country fixed effects. In the following section, we also control for region fixed effects. Therefore, omitted variable bias is less of a concern in this approach.

Second, using perceived measures for business environment might lead to endogeneity problem because these measures are intrinsically endogenous. Beck, Demirguc-Kunt and Maksimovic (2005) emphasize some reasons why unaudited self-reporting is unlikely to be a significant source of problems. They highlight that the main purpose of these kinds of surveys is to evaluate business environment, not firm performance. Therefore, the questions about firm performance are few and they are asked only at the end of the interview. This sequencing reduces the respondents' need to justify their own performance when answering the questions about business environment. Even if this is the case, we should consider the endogeneity problem because small firms are likely to experience a worse business environment (Schiffer and Weder, 2001).

Third, there is a special reason for perceived level of corruption that will cause an endogeneity problem. There are some papers that focus on how firm size affects the decision of paying bribes or lobbying the government. Harstad and Svensson (2011) develop a growth model where firms can either bribe bureaucrats or lobby the government. They define lobbying as an activity that aims to change existing rules or policies, while they view corruption as an attempt to get around existing rules or policies. In this framework, corruption and lobbying are substitutes. They highlight that a firm's bargaining power in relation to corrupt bureaucrats decreases with the level of investment, which is less of a problem for firms that lobby the government. One of their main findings is that firms prefer bribing to lobbying early in the development process, but they are more likely to lobby government at later stages, when firms have invested more. In an empirical paper, Campos and Giovannoni (2007) empirically investigate how lobbying and corruption are affected by firm characteristics and institutional backgrounds of countries. Their results show that the decision to join a lobby group is positively correlated with firm size and economic development. Their results also indicate that lobbying is a substitute for corruption. These two papers imply that firm size might also affect perceived level of corruption.

Lastly, there might be measurement error problem. Given the difficulties in collecting firm-level data across many different countries, there might be concerns about measurement error in perceptions of business environment. As Hallward-Driemeier and Aterido (2009) underline, some people are more optimistic than others, and thereby complain less about the business environment. Therefore, differences in responses might simply reflect the degree of optimism rather than differences in the underlying business environment.

While reverse causality or omitted variables might tend to bias our estimates upward, potential measurement error in indicators for perceived business environment might result in downward bias. Previous literature has used some techniques to deal with the endogeneity problems. Industry-region averages of perceived business environment are generally used as instrumental variables (IV) for perceived business environment. Fisman and Svensson (2007) were the first to use this strategy. They assume that a firm's perception of corruption levels can be divided into two terms, one based on factors idiosyncratic to the firm, and the other industry-region specific. They also assume that the industry-region component of the perceived corruption is determined by underlying technologies and the rent-extraction talents of officials. In this case, the industry-region average of corruption is exogenous to the firm, therefore it can be used as an IV for firms' perceptions of corruption. This strategy is also used for other business environment indicators. Lin, Lin and Song (2010) use this strategy for perceived quality of legal institutions and Kinda (2010) uses it for perceived financial constraints. However, using an instrumental variables approach is not feasible when different dimensions of the business environment are analysed at the same time mostly due to weak instrument problem (Hallward-Driemeier, Wallsten and Xu, 2006). Thus, papers analysing the effects of different business environment constraints use averages of the perceived business environment variables for other firms as independent variables rather than using perceptions reported by a firm itself (Dollar, Hallward-Driemeier and Mengistae 2005; Hallward-Driemeier, Wallsten and Xu, 2006; Commander and Svejnar, 2011; Aterido, Hallward-Driemeier and Pages,2011). As Dethier, Hirn and Straub (2011) and Xu (2011) highlight, the advantage of using the responses of other firms that are subject to the same environment is that perceived business environment is not affected by a firm's own

performance. Using region-industry-country averages as independent variables rather than instrumental variables provides us with more observations; since some firms do not answer questions on business environment obstacles, using the responses of other firms increases the number of observations. As in recent papers, we use region-industry-country averages as independent variables. Our main conclusion is also same when we use them as instrumental variables. Results are shown in Appendix Table 3, 4, 5 and 6[12]. But, these results should need to be interpreted with caution because weak instrument problem occurs in some specifications.[13]

Table 2.3 shows the results when use industry-region-country averages of the perceived business environment indicators (including firms' own perceptions) as independent variables[14]. As seen in column (1), we find a strong negative effect of perceived financial constraints on firm size. The estimated coefficient of perceived financial constraints is again significant at 1% significance level. Column (2) shows that perceived level of corruption is again negatively associated with firm size. However, it is not statistically significant anymore. When we just include the industry-region-country average of the perceived quality of legal institutions as a variable of interest, our results show that the effect of the perceived quality of legal institutions is now statistically significant at 5% significance level. When our averages of perceptions are included simultaneously, the statistically significant effect

[12] The effect of perceived financial constraints is negative and statistically significant in all but one specification. We don't find robust relationship between two measures of perceived quality of institutions and firm size.

[13] First stage F-test results and Shea R^2 indicate that there are weak instrument problems in some specifications. This problem is more severe when we control region fixed effects. Region fixed effects capture most of the variation of the perceived business environment indicators, and reduce explanatory power of the industry-region-country averages of the perceived business environment indicators as instrumental variables. This situation creates weak instrument problem for all our perceived business environment indicators, and thus using instrumental variables technique becomes infeasible. Therefore, we couldn't report IV results for the specifications with region fixed effects.

[14] $Finance_2$ denotes industry-region-country average of perceived financial constraints (including firms' own perceptions); $corruption_2$ denotes industry-region-country average of perceived corruption (including firms' own perceptions) and $legal_2$ denotes industry-region-country average of perceived quality of legal institutions (including firms' own perceptions).

of perceived financial constraints and quality of legal institutions are still valid. However, the estimated coefficient of perceived quality of legal institutions is now significant at 10% level. Consequently, we find statistically significant effects of perceived financial constraints and the quality of legal institutions on firm size when we use the industry-region-country averages of perceived business environment (including firms' own perceptions) as independent variables.

Table 2.3 Controlling for Endogeneity 1 (Average Values of the Perceptions Including Firms' Own Perceptions)

Dependent Variable: $firmsize_1$ (log of Total Full Time Employment)				
	(1)	**(2)**	**(3)**	**(4)**
Market Size	0.0517**	0.0555**	0.0538**	0.0550**
	(0.0235)	(0.0245)	(0.0236)	(0.0243)
Age	0.5021***	0.5082***	0.5041***	0.5070***
	(0.0511)	(0.0497)	(0.0510)	(0.0497)
State	0.9833***	0.9775***	0.9838***	0.9682***
	(0.1085)	(0.1063)	(0.1077)	(0.1043)
Proprietorship	-0.8036***	-0.7953***	-0.8034***	-0.7937***
	(0.1044)	(0.1044)	(0.1035)	(0.1036)
Export	0.8051***	0.8083***	0.8090***	0.8021***
	(0.0748)	(0.0769)	(0.0764)	(0.0761)
Loan	0.4998***	0.4974***	0.4969***	0.5000***
	(0.0504)	(0.0503)	(0.0501)	(0.0498)
Compdom	-0.0402	-0.0485*	-0.0468*	-0.0425*
	(0.0240)	(0.0242)	(0.0239)	(0.0247)
Compfor	0.1098***	0.1076***	0.1069***	0.1082***
	(0.0234)	(0.0241)	(0.0235)	(0.0231)
$Finance_2$	-0.1825***			-0.1781***
	(0.0471)			(0.0231)
$Corruption_2$		-0.0340		-0.0268
		(0.0225)		(0.0219)
$Legal_2$			0.0858***	0.0680*
			(0.0364)	(0.0364)
Industry FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
No. of Obs.	8967	8926	8969	8922
R^2	0.410	0.407	0.409	0.410

Note: Regressions are estimated by OLS. In each specification, the number of countries is 27 and the number of industry is 8. Standard errors are clustered at country level. ***, [**] and (*) denote statistically significant at 1, [5] and (10) percent levels, respectively.

There may still be some concerns about reverse causality because our averages of the perceived business environment indicators include firms' own perceptions. As Dethier, Hirn and Straub (2011) and Xu (2011) indicate, using the industry-region-country average of other firms' perceptions can help to alleviate endogeneity due to reverse causality. In contrast to industry-region-country averages of perceptions (including firms' own perceptions), firms' own perceptions have no impact on the industry-region-country average of other firms' perceptions. Therefore, these new averages for a firm are the average levels of the perceived business environment indicators of other firms in that firm's industry and region categories for each country. Table 2.4 shows the results when we use industry-region-country averages of other firms' perceptions[15]. In this specification, only the effect of perceived financial constraints is statistically significant. The coefficient of perceived financial constraints is now smaller in absolute value. Based on the techniques used in the previous papers, this table give us most reliable results. Among our three main business environment indicators, we see that only perceived financial constraints matter for firm size. Hence, our results are consistent with Beck, Demirguc-Kunt and Maksimovic (2006).

[15]$Finance_3$, $corruption_3$, and $legal_3$ denote industry-region-country averages of other firms' perceived business environment.

Table 2.4 Controlling for Endogeneity 2 (Average Values of Other Firms' Perceptions)

Dependent Variable: $firmsize_1$ (log of Total Full Time Employment)				
	(1)	**(2)**	**(3)**	**(4)**
Market Size	0.0534**	0.0527**	0.0540**	0.0536**
	(0.0237)	(0.0243)	(0.0239)	(0.0244)
Age	0.5019***	0.5085***	0.5032***	0.5063***
	(0.0511)	(0.0498)	(0.0509)	(0.0497)
State	0.9859***	0.9748***	0.9889***	0.9703***
	(0.1090)	(0.1069)	(0.1097)	(0.1077)
Proprietorship	-0.8054***	-0.7971***	-0.8030***	-0.7974***
	(0.1044)	(0.1047)	(0.1048)	(0.1048)
Export	0.8065***	0.8054***	0.8097***	0.8014***
	(0.0751)	(0.0775)	(0.0764)	(0.0769)
Loan	0.4971***	0.4984***	0.5006***	0.5027***
	(0.0506)	(0.0506)	(0.0509)	(0.0510)
Compdom	-0.0426*	-0.0485*	-0.0470*	-0.0450*
	(0.0239)	(0.0241)	(0.0237)	(0.0244)
Compfor	0.1073***	0.1087***	0.1076***	0.1077***
	(0.0238)	(0.0241)	(0.0238)	(0.0236)
$Finance_3$	-0.1066**			-0.1154***
	(0.0388)			(0.0390)
$Corruption_3$		-0.0007		-0.0041
		(0.0171)		(0.0174)
$Legal_3$			0.0353	0.0305
			(0.0277)	(0.0267)
Industry FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
No. of Obs.	8945	8893	8949	8858
R^2	0.408	0.406	0.408	0.407

Note: Regressions are estimated by OLS. In each specification, the number of countries is 27 and the number of industry is 8. Standard errors are clustered at country level. ***, [**] and (*) denote statistically significant at 1, [5] and (10) percent levels, respectively.

2.6.2 Further Sensitivity Tests

So far we have examined how perceived business environment affects firm size by using firms' full-time employees as a measure of firm size. We also check the robustness of our results by using firms' total sales as a measure of firm size.[16] This variable is also used as a measure of firm size in the empirical literature. As previously mentioned, nearly 2000 observations are lost when we use total sales as a measure of firm size. Moreover, there are no observations for the total sales of Azerbaijani firms. Hence, we have around 6500 observations. Table 2.5 gives us empirical findings when we use the log of total sales ($firmsize_2$) as a dependent variable and an industry-region-country average of perceptions (including firms' own perceptions) as independent variables. Table 2.5 shows that only the effect of perceived financial constraints is statistically significant.

Table 2.6 shows the results when we use the log of total sales as a dependent variable and industry-region-country averages of other firms' perceptions as independent variables. The coefficient of perceived financial constraints is now smaller in absolute value. Its significance is also lower in this specification. When we add all four variables for perceived business environment simultaneously, the effect of perceived financial constraints is statistically significant at 5%.

[16]We use the log of total sales as a dependent variable.

Table 2.5 Sensitivity Test 1

Dependent Variable: $firmsize_2$ (log of Total Sales)				
	(1)	**(2)**	**(3)**	**(4)**
Market Size	0.0685**	0.0713**	0.0711**	0.0711**
	(0.0319)	(0.0325)	(0.0322)	(0.0322)
Age	0.5059***	0.5075***	0.5090***	0.5051***
	(0.0548)	(0.0556)	(0.0549)	(0.0553)
State	0.8648***	0.8665***	0.8640***	0.8604***
	(0.1265)	(0.1280)	(0.1263)	(0.1258)
Proprietorship	-0.9328***	-0.9345***	-0.9358***	-0.9305***
	(0.1418)	(0.1413)	(0.1407)	(0.1408)
Export	0.9099***	0.9166***	0.9184***	0.9061***
	(0.0745)	(0.0767)	(0.0752)	(0.0762)
Loan	0.6558***	0.6503***	0.6493***	0.6538***
	(0.0498)	(0.0496)	(0.0495)	(0.0492)
Compdom	-0.0525*	-0.0598*	-0.0597*	-0.0524
	(0.0306)	(0.0304)	(0.0306)	(0.0307)
Compfor	0.1584***	0.1559***	0.1549***	0.1573***
	(0.0250)	(0.0259)	(0.0257)	(0.0253)
$Finance_2$	-0.2167***			-0.2124***
	(0.0630)			(0.0637)
$Corruption_2$		-0.0209		-0.0119
		(0.0265)		(0.0260)
$Legal_2$			0.0818	0.0701
			(0.0504)	(0.0527)
Industry FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
No. of Obs.	6504	6491	6504	6488
R^2	0.449	0.446	0.447	0.449

Note: Regressions are estimated by OLS. In each specification, the number of countries is 26 and the number of industry is 8. Standard errors are clustered at country level. ***, [**] and (*) denote statistically significant at 1, [5] and (10) percent levels, respectively.

Table 2.6 Sensitivity Test 2

Dependent Variable: $firmsize_2$ (log of Total Sales)				
	(1)	**(2)**	**(3)**	**(4)**
Market Size	0.0705**	0.0688**	0.0706**	0.0695**
	(0.0332)	(0.0324)	(0.0325)	(0.0326)
Age	0.5054***	0.5060***	0.5076***	0.5012***
	(0.0549)	(0.0555)	(0.0549)	(0.0553)
State	0.8638***	0.8653***	0.8760***	0.8625***
	(0.1272)	(0.1267)	(0.1277)	(0.1271)
Proprietorship	-0.9375***	-0.9385***	-0.9351***	-0.9380***
	(0.1416)	(0.1412)	(0.1418)	(0.1411)
Export	0.9111***	0.9121***	0.9202***	0.9045***
	(0.0746)	(0.0773)	(0.0753)	(0.0770)
Loan	0.6511***	0.6517***	0.6526***	0.6542***
	(0.0497)	(0.0503)	(0.0503)	(0.0507)
Compdom	-0.0560*	-0.0594*	-0.0596*	-0.0547*
	(0.0306)	(0.0303)	(0.0303)	(0.0304)
Compfor	0.1561***	0.1564***	0.1555***	0.1560***
	(0.0252)	(0.0258)	(0.0257)	(0.0252)
$Finance_3$	-0.1080*			-0.1250**
	(0.0543)			(0.0555)
$Corruption_3$		0.0138		0.0200
		(0.0230)		(0.0240)
$Legal_3$			0.0344	0.0389
			(0.0337)	(0.0357)
Industry FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
No. of Obs.	6487	6466	6489	6349
R^2	0.446	0.446	0.446	0.445

Note: Regressions are estimated by OLS. In each specification, the number of countries is 27 and the number of industry is 8. Standard errors are clustered at country level. ***, [**] and (*) denote statistically significant at 1, [5] and (10) percent levels, respectively.

Even though using industry-region-country averages of other firms' perceptions can help to alleviate endogeneity due to reverse causality, it is important to note that the issue of the absence of region-level variables remains a problem. Some of the perceived business environment indicators might represent mainly omitted regional factors (Dethier, Hirn and Straub, 2011; Xu 2011). Previous papers that use firm-level data for a single country generally account for region fixed effects by using region dummies (e.g. Lin, Lin and Song, 2010) or adding a large number of variables related to regional characteristics (e.g. Cull and Xu, 2005; Amin, 2009). On the other hand, previous papers that use cross-country firm-level data to examine the effect of perceived business environment do not account for region fixed effects. This paper provides the first attempt to control for region fixed effects. In addition to accounting for industry and country fixed effects, we argue that accounting for region fixed effects is also crucial to examining the effect of perceived business environment. In our empirical analysis, we include the region dummies to control unobserved fixed effects at region level.

Table 2.7 shows the results after simultaneously including our perceived business environment and accounting for all firm characteristics and industry, region and country fixed effects. In the first two columns, the dependent variable is the log of total full-time employment. In the remaining two columns, the dependent variable is the log of total sales. Industry-region-country averages of perceived business environment (including firms' own perceptions) are used for the specifications in columns (1) and (3). On the other hand, industry-region-country averages of other firms' perceptions are used as independent variables for the specifications in columns (2) and (4).

Table 2.7 shows that the results for perceived financial constraints hold even after controlling for industry, region and country fixed effects when we use the log of total employment as a measure of firm size. Results in column (3) of Table 2.7 show that when we use the log of total sales as a dependent variable and industry-region-country averages of the perceived business environment indicators (including firms' own perception) as independent variables, perceived financial constraints have a significant effect on firm size. On the other hand, the last column shows that when we use the log of total sales as a dependent variable and industry-region-country averages of other firms' perceptions as independent variables, the estimated coefficient of perceived financial constraints is not statistically significant. Again, it is important to note that the results for total sales should be interpreted carefully because we lose nearly 2000 observation in this specification. It is also important to note that the results in Table 2.7 are not the most reliable results because our aim is to investigate whether regional level differences in perceived business environment matter for firm size and region fixed effects capture most of the variation of the perceived business environment indicators. Readers should interpret this table as a robustness check, which shows the effect perceived financial constraints is negative and mostly statistically significant even after controlling for region fixed effects.

Table 2.7 Sensitivity Test 3

Dependent Variable:	$firmsize_1$ (log of Total FT Employment)		$firmsize_2$ (log of Total Sales)	
	(1)	**(2)**	**(3)**	**(4)**
$Finance_2$	-0.1784**		-0.2169**	
	(0.0650)		(0.0829)	
$Corruption_2$	-0.0255		-0.0165	
	(0.0207)		(0.0262)	
$Legal_2$	0.0411		0.0177	
	(0.0442)		(0.0642)	
$Finance_3$		-0.0949*		-0.0936
		(0.0521)		(0.0739)
$Corruption_3$		0.0087		0.0219
		(0.0155)		(0.0207)
$Legal_3$		-0.0130		-0.0134
		(0.0277)		(0.0398)
All Controls	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
County FE	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes
No. of Obs.	8922	8858	6488	6439
R^2	0.431	0.429	0.475	0.472

Note: Regressions are estimated by OLS. In the first two columns, the number of countries is 27. In the last two columns, the number of countries is 26. In each specification, the number of industry is 8. Standard errors are clustered at country level. ***, [**] and (*) denote statistically significant at 1, [5] and (10) percent levels, respectively.

2.7 Conclusion

A business-friendly environment is crucial for firms. Access to finance, the level of corruption and the legal environment are important factors that shape the business environment. We address the question of whether the perceived business environment

affects firm size by using a unique firm-level dataset. To the best of our knowledge, this paper is the first empirical paper to examine the relationship between the business environment and firm size by using cross-firm variation in the perceived business environment. Our results show that only perceived financial constraints have a negative and significant effect on firm size, while perceived corruption and perceived quality of legal institutions do not have statistically significant effects.

As we have repeatedly indicated, because of the nature of our data set, our results cannot conclusively imply that there is a casual effect of the perceived business environment on firm size. Caution should therefore be taken in interpreting the results. In summary, our results show that while the effect of perceived financial constraints is robust in all except one specification, the effects of perceived level of corruption and perceived quality of legal institutions are not. Therefore, our results are consistent with the findings of Beck, Demirguc-Kunt and Maksimovic (2006).

The evidence of the comparatively robust relationship between perceived financial constraints and firm size points an important policy issue. Policymakers should acknowledge the importance of external finance for firms. It appears that, though frustrating, firms are able to circumvent these specific institutional obstacles. But, easing access to finance is crucial for countries wishing to reap the benefits of having larger firms. If governments want encourage small firms to grow and reach a larger size, policies reducing financial constraints will play key roles in achieving this aim. Based on the results shown in this essay, we also make some suggestions related to the data collection. The World Bank and other institutions should focus more on collecting objective indicators of business environment constraints at the sub-national level. Objective indicators are less vulnerable to measurement error and reverse causality. Using objective indicators also help researchers to analyze the

heterogeneous effects of business environment constraints across regions across within a country and to make more precise policy recommendations.

This essay doesn't take into account the possible impact that the Global Financial Crisis might have on the relationship between access to finance and firm size. In a future work, it will be interesting to examine whether financially constrained firms reduce their size of the operations more relative to financially unconstrained firm during the financial crisis.

2.8 Appendix

Appendix Table 2.1 Definition of Variables

Variable	Definition	BEEPS Question
$Firmsize_1$	Log of Total Employment	How many full-time employees Does your firm have?
$Firmsize_2$	Log of Total Sales	Could you tell me the estimate of your firm's total sales?
Market Size	Market Size	Where are this establishment and your headquarters located in this country? (Categories are recorded as: 4 = capital city and other city of over 1 million population …1 = town or location less than 50.000 population.
Age	Firm's age	Year of survey minus the year when firm was established?
State	State-Owned Firms	Dummy variable = 1 if a firm responds "State-owned" to "What is your legal status of this company?"
Proprietorship	Sole Proprietorship Firms	Dummy variable = 1 if a firm responds "Proprietorship" to "What is your legal status of this company?"
Export	Export Status of the Firm	Dummy variable = 1 if a firm responds "Yes" to "Does your firm currently sell its products and services directly to consumers outside the country?"
Loan	Loan Status of the Firm	Dummy variable = 1 if a firm responds "Yes" to "Did you receive a loan in 2002 from any of the following resources?" (private individuals, commercial banks, state and NGO)
Compdom	Pressure from Domestic Competition	Average value of the following two questions: "How would you rate the importance of pressure from domestic competition on key decisions about your business with respect to (1) developing new products or services and markets?; (2) reducing the costs of existing products or services?" (1 = not at all important… 4 = very important)
Compfor	Pressure from Foreign Competition	Average value of the following two questions: "How would you rate the importance of pressure from foreign competition on key decisions about your business with respect to (1) developing new products or services and markets?; (2) reducing the costs of existing products or services?" (1 = not at all important… 4 = very important)
$Finance_1$	Perceived Financial Constraints	How contrasting access to finance is for the operation and growth of your business? (0 = no obstacle, 4 = severe obstacle)
$Corruption_1$	Perceived Corruption	On average, what percent of total annual sales do firm's like you pay in unofficial payments/gifts to public officials?
$Legal_1$	Perceived Quality of Legal Institutions	To what degree do you agree with this statement? "I am confident that legal system will upload my contract and property rights in business disputes" (1 = strongly disagree… 6 = strongly agree)

Appendix Table 2.2 Descriptive Statistics

Variable	**Observation**	**Mean**	**Standard Deviation**
$Firmsize_1$	9654	101.6588	368.977
$Firmsize_2$	6984	3344.486	17199.69
Age	9655	17.2137	59.8304
State	9655	0.0878	0.283
Proprietorship	9655	0.372	0.4833
Export	9601	0.2353	0.4242
Market Size	9655	2.6746	1.2
Loan	9655	0.3674	0.4821
Compdom	9553	2.8442	0.9666
Compfor	9305	2.0519	1.0981
$Finance_1$	9201	2.2501	1.1347
$Corruption_1$	8462	1.0343	2.4454
$Legal_1$	9144	3.5271	1.3936
$Finance_2$	9360	2.2491	0.5225
$Corruption_2$	9317	1.0346	1.0368
$Legal_2$	9358	3.5278	0.5927
$Finance_3$	9337	2.2498	0.5607
$Corruption_3$	9281	1.0338	1.1383
$Legal_3$	9337	3.5287	0.6448

Appendix Table 2.3 IV Estimation1 (Using Average Values of the Perceptions Including Firms' Own Perceptions as Instruments)

Dependent Variable: $firmsize_1$ (log of Total Full Employment)				
	(1)	**(2)**	**(3)**	**(4)**
Market Size	0.0525**	0.0560**	0.0550**	0.0578**
	(0.0237)	(0.0262)	(0.0224)	(0.0250)
Age	0.4961***	0.5117***	0.5035***	0.5075***
	(0.0522)	(0.0492)	(0.0510)	(0.0516)
State	1.0186***	0.9405***	0.9510***	0.9446***
	(0.1046)	(0.1008)	(0.0949)	(0.0891)
Proprietorship	-0.7834***	-0.7880***	-0.7909***	-0.7490***
	(0.1048)	(0.1044)	(0.1002)	(0.1094)
Export	0.7826***	0.8684***	0.8057***	0.8531***
	(0.0791)	(0.0630)	(0.0830)	(0.0711)
Loan	0.5147***	0.4718***	0.4899***	0.4818***
	(0.0503)	(0.0502)	(0.0499)	(0.0484)
Compdom	-0.0258	-0.0479*	-0.0453*	-0.0260
	(0.0259)	(0.0257)	(0.0236)	(0.0281)
Compfor	0.1233***	0.0987***	0.1095***	0.1127***
	(0.0250)	(0.0195)	(0.0224)	(0.0231)
Finance	-0.1922***			-0.2083***
	(0.0443)			(0.0448)
Corruption		-0.0359		-0.0242
		(0.0256)		(0.0235)
Legal			0.0962**	0.0785*
			(0.0408)	(0.0410)
Industry FE	YES	YES	YES	YES
Country FE	YES	YES	YES	YES
No. of Obs.	8585	7860	8531	7179
F-test (p-value) for finance	0.00***			0.00***
F-test (p-value) for corruption		0.00***		0.00***
F-test (p-value) for property			0.00***	0.00***
Shea R^2 for finance	0.131			0.132
Shea R^2 for corruption		0.119		0.133
Shea R^2 for property			0.126	0.122
R^2	0.412	0.415	0.410	0.419

Note: Regressions are estimated by 2SLS. In each specification, the number of countries is 27 and the number of industry is 8. Standard errors are clustered at country level. ***, [**] and (*) denote statistically significant at 1, [5] and (10) percent levels, respectively.

Appendix Table 2.4 IV Estimation 2 (Using Average Values of Other Firms' Perceptions as Instruments)

Dependent Variable: $firmsize_1$ (log of Total Full Employment)				
	(1)	**(2)**	**(3)**	**(4)**
Market Size	0.0492**	0.0405	0.0577**	0.0488
	(0.0231)	(0.0706)	(0.0229)	(0.0489)
Age	0.4850***	0.5352***	0.5042***	0.5033***
	(0.0547)	(0.1307)	(0.0515)	(0.1211)
State	1.0402***	0.9932***	0.9023***	0.9225***
	(0.1002)	(0.2672)	(0.1094)	(0.1630)
Proprietorship	-0.7404***	-0.8211***	-0.7736***	-0.6817***
	(0.1114)	(0.1593)	(0.1022)	(0.1479)
Export	0.7464***	0.8883***	0.8011***	0.8220***
	(0.0836)	(0.1189)	(0.0853)	(0.1214)
Loan	0.5543***	0.4647***	0.4907***	0.5328***
	(0.0632)	(0.0559)	(0.0498)	(0.0780)
Compdom	-0.0290	-0.0600	-0.0391	0.0404
	(0.0409)	(0.0602)	(0.0261)	(0.0991)
Compfor	0.1407***	0.0835	0.1061***	0.1194**
	(0.0282)	(0.0695)	(0.0246)	(0.0557)
Finance	-0.5675***			-0.6458*
	(0.2042)			(0.3569)
Corruption		0.1691		0.0625
		(0.8917)		(0.6343)
Legal			0.2439	0.3210
			(0.1720)	(0.2286)
Industry FE	YES	YES	YES	YES
Country FE	YES	YES	YES	YES
No. of Obs.	8563	7827	8512	7123
F-test (p-value) for finance	0.00***			0.00***
F-test (p-value) for corruption		0.66		0.78
F-test (p-value) for property			0.01**	0.02**
Shea R^2 for finance	0.006			0.001
Shea R^2 for corruption		0.000		0.000
Shea R^2 for property			0.004	0.003
R^2	0.327	0.333	0.394	0.239

Note: Regressions are estimated by 2SLS. In each specification, the number of countries is 27 and the number of industry is 8. Standard errors are clustered at country level. ***, [**] and (*) denote statistically significant at 1, [5] and (10) percent levels, respectively.

Appendix Table 2.5 IV Estimation 3 (Using Average Values of the Perceptions Including Firms' Own Perceptions as Instruments)

Dependent Variable: $firmsize_2$ (log of Total Sales)				
	(1)	**(2)**	**(3)**	**(4)**
Market Size	0.0739**	0.0816***	0.0682**	0.0836***
	(0.0324)	(0.0312)	(0.0313)	(0.0309)
Age	0.5016***	0.5000***	0.5029***	0.4935***
	(0.0553)	(0.0553)	(0.0532)	(0.0556)
State	0.9277***	0.8642***	0.8103***	0.8712***
	(0.1236)	(0.1316)	(0.1192)	(0.1212)
Proprietorship	-0.9012***	-0.9224***	-0.9339***	-0.8818***
	(0.1456)	(0.1473)	(0.1359)	(0.1503)
Export	0.8886***	0.9606***	0.9179***	0.9443***
	(0.0743)	(0.0665)	(0.0762)	(0.0683)
Loan	0.6738***	0.6302***	0.6333***	0.6346***
	(0.0499)	(0.0498)	(0.0484)	(0.0469)
Compdom	-0.0300	-0.0652*	-0.0542*	-0.0287
	(0.0340)	(0.0345)	(0.0305)	(0.0386)
Compfor	0.1697***	0.1518***	0.1598***	0.1671***
	(0.0259)	(0.0264)	(0.0254)	(0.0281)
Finance	-0.2382***			-0.2525***
	(0.0646)			(0.0687)
Corruption		-0.0210		-0.0034
		(0.0306)		(0.0285)
Legal			0.0953*	0.0903
			(0.0548)	(0.0617)
Industry FE	YES	YES	YES	YES
Country FE	YES	YES	YES	YES
No. of Obs.	6239	5792	6228	5331
F-test (p-value) for finance	0.00***			0.00***
F-test (p-value) for corruption		0.00***		0.00***
F-test (p-value) for property			0.00***	0.00***
Shea R^2 for finance	0.128			0.132
Shea R^2 for corruption		0.134		0.130
Shea R^2 for property			0.123	0.139
R^2	0.448	0.451	0.446	0.449

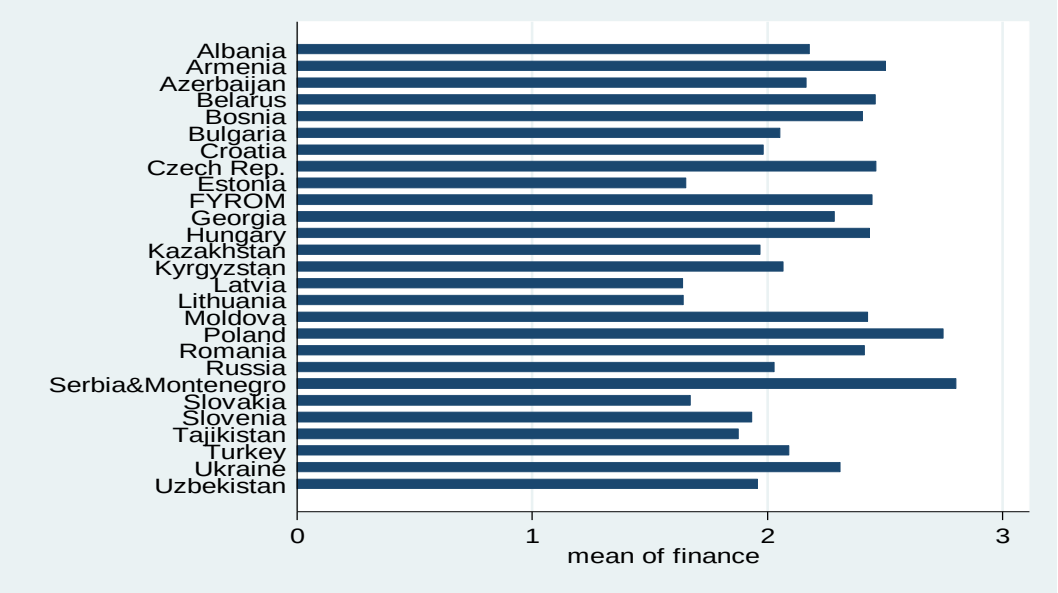
Note: Regressions are estimated by 2SLS. In each specification, the number of countries is 26 and the number of industry is 8. Standard errors are clustered at country level. ***, [**] and (*) denote statistically significant at 1, [5] and (10) percent levels, respectively.

Appendix Table 2.6 IV Estimation 4 (Using Average Values of Other Firms' Perceptions as Instruments)

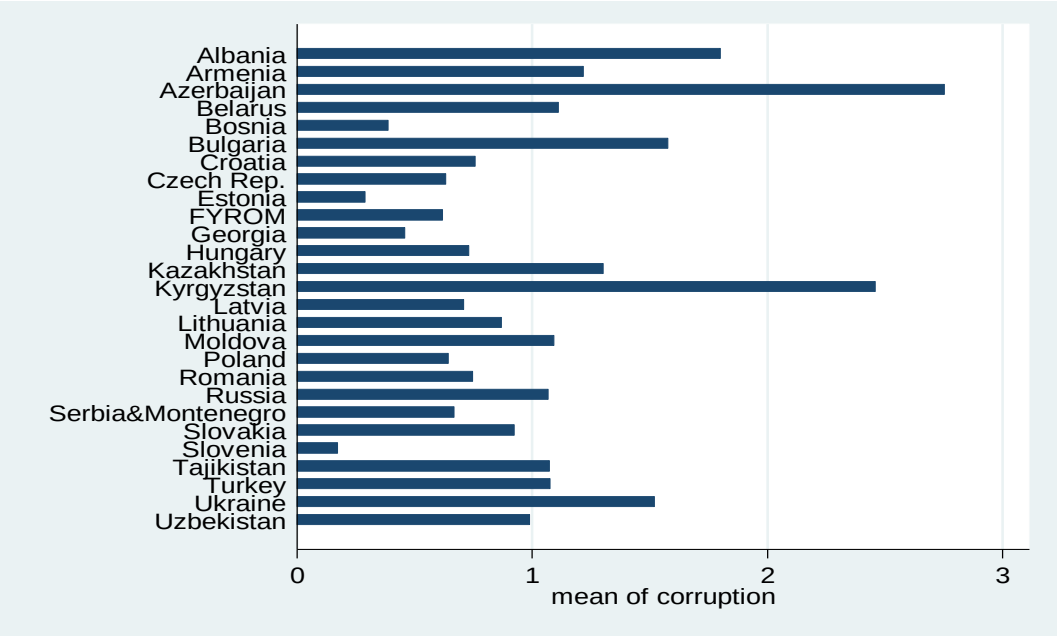
Dependent Variable: $firmsize_2$ (log of Total Sales)				
	(1)	**(2)**	**(3)**	**(4)**
Market Size	0.0732**	0.0520	0.0710**	0.0684
	(0.0317)	(0.0529)	(0.0317)	(0.0519)
Age	0.4833***	0.5440***	0.5031***	0.4988***
	(0.0589)	(0.1045)	(0.0544)	(0.1086)
State	0.9968***	0.9847***	0.7578***	0.9239***
	(0.1276)	(0.2091)	(0.1522)	(0.1564)
Proprietorship	-0.8376***	-0.9998***	-0.9092***	-0.8189***
	(0.1652)	(0.1628)	(0.1404)	(0.2387)
Export	0.8382***	0.9901***	0.9192***	0.9199***
	(0.0877)	(0.1061)	(0.0748)	(0.1364)
Loan	0.7226***	0.6145***	0.6238***	0.6671***
	(0.0752)	(0.0594)	(0.0504)	(0.1189)
Compdom	0.0385	-0.1069	-0.0422	0.0349
	(0.0649)	(0.0790)	(0.0390)	(0.1996)
Compfor	0.1953***	0.1155**	0.1583***	0.1681**
	(0.0368)	(0.0546)	(0.0263)	(0.0701)
Finance	-0.6924**			-0.7284
	(0.3538)			(0.7805)
Corruption		0.3853		0.2198
		(0.6235)		(0.5200)
Legal			0.2845	0.3916
			(0.2736)	(0.4923)
Industry FE	YES	YES	YES	YES
Country FE	YES	YES	YES	YES
No. of Obs.	6222	5767	6213	5289
F-test (p-value) for finance	0.00***			0.00***
F-test (p-value) for corruption		0.28		0.15
F-test (p-value) for property			0.05**	0.10
Shea R^2 for finance	0.006			0.001
Shea R^2 for corruption		0.000		0.000
Shea R^2 for property			0.004	0.003
R^2	0.351	0.216	0.426	0.210

Note: Regressions are estimated by 2SLS. In each specification, the number of countries is 26 and the number of industry is 8. Standard errors are clustered at country level. ***, [**] and (*) denote statistically significant at 1, [5] and (10) percent levels, respectively.

Appendix Figure 2.1 Country Average of Perceived Financial Constraints

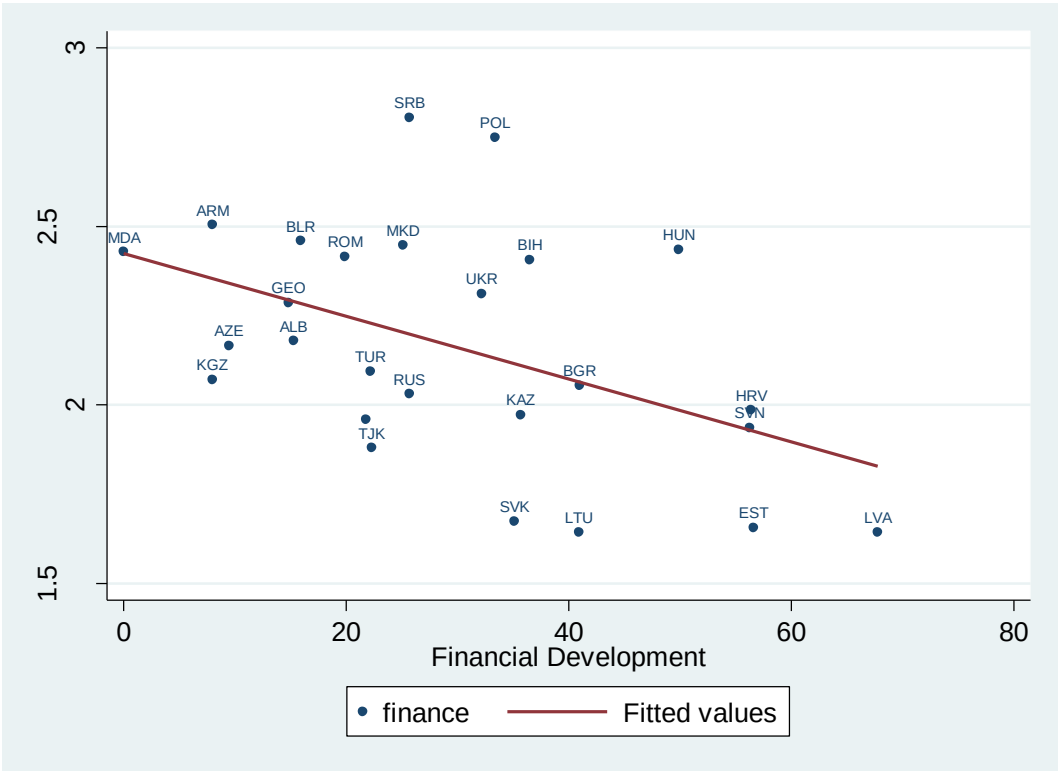


Appendix Figure 2.2 Country Average of Perceived Level of Corruption

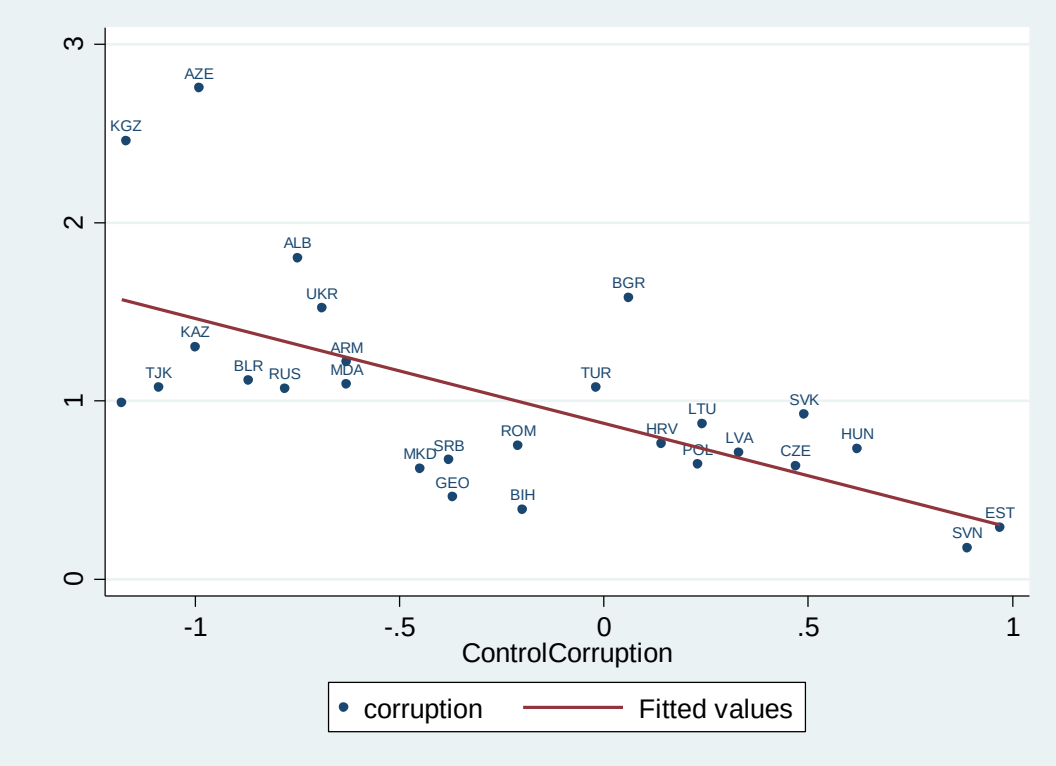


Appendix Figure 2.3 Country Average of Perceived Quality of Legal Institutions

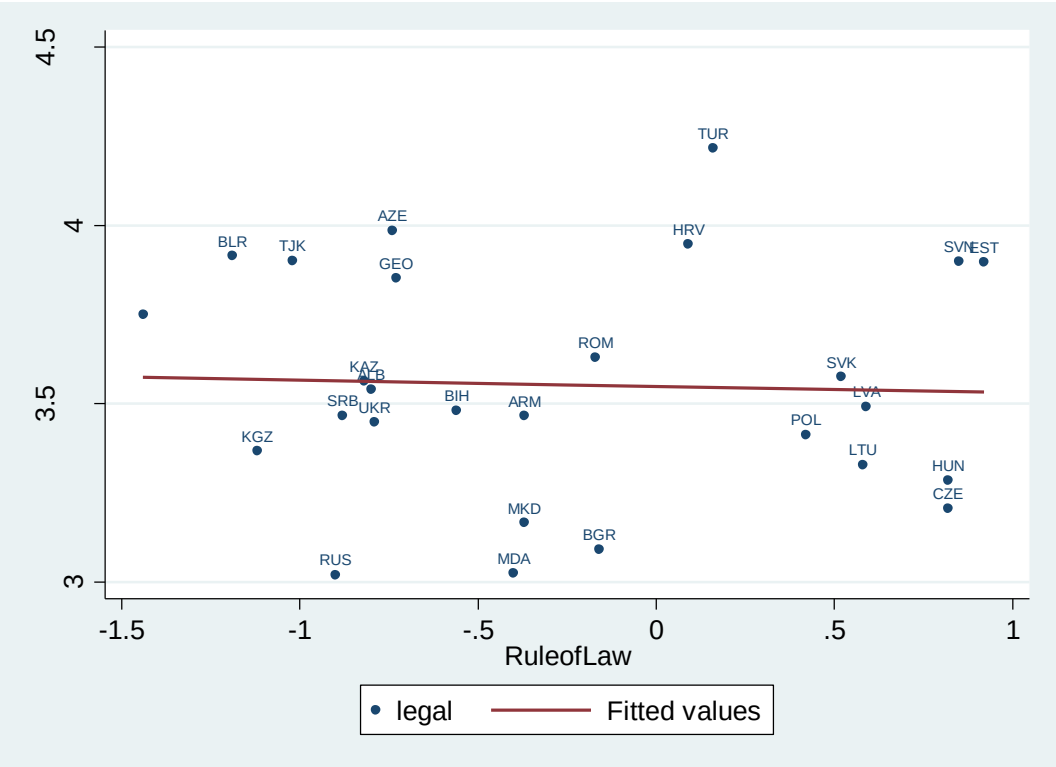
Appendix Figure 2.4 Financial Development and Perceived Financial Constraints



Appendix Figure 2.5 Corruption and Perceived Corruption



Appendix Figure 2.6 Rule of Law and Perceived Quality of Legal Institutions



Chapter 3

Government Ownership of Banks, Job Creation Opportunities and Employment Growth[17]

3.1 Introduction

Any difference in the way in which credit markets respond to new opportunities is an important contributor to the difference in employment performance between countries (Acemoglu, 2001). Therefore, in addition to implementing policy reforms related to labour markets, countries should solve credit market imperfections in order to increase employment growth and to reduce unemployment. An efficient banking system is crucial to reduce credit market imperfections. It enhances economic prosperity by mobilising resources, managing risks and facilitating economic transactions (Levine, 2005). Governments have always been a part of the banking system. Government ownership of banks is pervasive around the world, especially in developing countries. In response to the Global Financial Crisis, governments in many developed countries acquired majority stakes in the largest banks. This recent revival has renewed the debate regarding the effectiveness of government-owned banks. Even though the previous literature provides the bulk of empirical evidence regarding the effectiveness of government-owned banks, it has paid little attention to the effect of government-owned banks on employment growth. This paper will try to

[17] A shortest version of this essay was published in ***Economics Letters***. "Government ownership of banks, job creation opportunities and employment growth," Economics Letters, 117(2), pp.509-512.

address this issue.

There are two broad views on the effectiveness of the government ownership of banks. According to the "development view", government-owned banks are important in financing socially desirable but financially unprofitable investments and in solving market imperfections. Gerschenkron (1962) argues that government-owned banks could play an important role in the industrialisation of countries where scarcity of capital and public distrust hinder financial development. Another argument for this view is that market failures are likely to be more pervasive in financial markets. Stiglitz (1993) points out that government participation is crucial to addressing market imperfections, such as moral hazard and adverse selection[18]. On the other hand, the "political view" claims that politicians provide employment, subsidies and other benefits for themselves, their families and their supporters through government-owned banks (Shleifer and Vishny, 1994; Shleifer, 1998; Mishkin, 2006). According to this view, government-owned banks do not allocate their resources to the most productive uses, but rather to maximise politicians' personal objectives.

In light of these arguments, previous empirical studies provide some evidence regarding the effect of government ownership of banks on growth. For example, La Porta *et al.* (2002) show that increased government ownership of banks has a negative effect on financial development, growth of per capita income and productivity[19].

[18] In contrast, in one of his earlier papers, Stiglitz (1989, p.202) argues that: "*While the market failures with which I have been concerned do provide a rationale for a variety of types of government intervention, governments face information and incentive problems no less than does the private market. It may be foolhardy for the government to go where the private market fears to tread: credit rationing in private capital markets doesn`t necessarily suggests a role for government providing credit*." On the other hand, Mishkin (2006) states that governments have fewer incentives to solve adverse selection and moral hazard because government-owned banks are not driven by the profit motive.

[19] In a more recent paper, Körner and Schnabel (2011) find that the negative effect of government ownership of banks diminishes as the financial markets and the quality of institutions develop. On the other hand, Andrianova, Demetriades and Shortland (2011) replicate the results shown in La Porta *et al*. (2002) and show that the effect of public ownership becomes insignificant after controlling the quality of institutions. For that reason, they argue that results shown in La Porta *et al.* (2002) suffer

Ciccone and Papaioannou (2011) find that industries with better investment opportunities have relatively lower value-added growth in countries with higher government ownership of banks. Using a survey data on 28,000 firms from 46 countries, Xiao and Zhao (2012) find that firms are less likely to innovate in countries with higher government ownership of banks. In contrast to these papers, this essay focuses on labour market consequences of government ownership of banks. As a contribution to the literature, this paper tests whether or not government ownership of banks increases employment growth relatively more in industries with higher job creation opportunities. In other words, this paper investigates whether government ownership of banks facilitates the reallocation of employment from declining to expanding industries.

It is important to note that the empirical evidence for a negative relationship between government ownership of banks and growth need not translate directly into a link between government ownership of banks and employment growth. Even if government-owned banks reduce industry and economic growth, they can be used as a policy tool to increase employment growth. The arguments of the "development view" might lead one to think that governments would use government-owned banks to reduce inequality and social tensions by increasing employment growth. On the other hand, the arguments of the "political view" might lead one to think that politicians would use government owned-banks to gain more political support by increasing employment growth[20]. In this scenario, the "development view" and the

from omitted variable bias. For recent years, their results find that government ownership of banks is positively associated with economic growth.

[20]Some empirical papers show that government-owned banks expand their credits in election years or election regions and that this expansion is not permanent. Using data on developing countries, Dinc (2005) shows that government-owned banks sharply increase lending in election years. In a study for India, Cole (2009a) finds that politicians and officials use government-owned banks to maintain political power rather than to expand access to credit. His results show that government-owned banks lend more in regions where there is an election. On the other hand, using annual bank-level data representing all banks in Turkey during 1963–2007, Baum, Caglayan and Talavera (2010) find no

"political view" work in the same direction, even if this effect occurs through different channels. Hence, government ownership of banks might increase employment growth more in industries with higher job creation opportunities.

On the other hand, one's view might be changed by analysing this relationship in terms of the effectiveness of government-owned banks in allocating their resources. As Bagehot (1876), Schumpeter (1949) and Goldsmith (1969) indicate, well-functioning financial institutions improve economic performance to the extent that they allocate funds to the best uses. It has often been argued that well-functioning financial institutions accelerate economic development by identifying successful entrepreneurs and funding more promising firms and industries (Greenwood and Jovanovic, 1990; King and Levine, 1993b). Given that an efficient banking system allocates resources to promising industries, it might facilitate the reallocation of labour from declining to expanding industries. In this context, an obvious question arises: how good are government-owned banks at expanding access to credit and allocating their credits?

Previous empirical literature shows that government-owned banks favour large and politically connected firms. Sapienza (2004) finds that government-owned banks lend to large rather than small firms in Italy. Similar evidence emerges from Khwaja and Mian's (2005) examination of lending in Pakistan. Khwaja and Mian (2005) find that government-owned banks lend disproportionately more to large and politically connected firms in Pakistan. Previous literature also finds that government ownership of banks increases interest rate spread and corruption in lending. La Porta *et al.* (2002) show that government ownership of banks is positively correlated with interest

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evidence that government-owned banks increase their lending in comparison to either domestic or foreign-owned private-sector banks before, during or after elections. However, they find that government-owned banks are less efficient than both domestic and foreign-owned private banks in Turkey.

rate spread between lending and borrowing. Houston, Lin and Ma (2011) provide empirical evidence that not only government ownership of media, but also government ownership of banks are positively associated with corruption in lending. These results suggest that government-owned banks are not good at expanding access to credit and allocating their credits, thereby limiting the economic opportunities for most promising firms and industries[21]. In this scenario, the "development view" and the "political view" work in the opposite direction. Hence, government ownership of banks might lower employment growth more in industries with higher job creation opportunities.

The overall effect of government ownership of banks on employment growth is ambiguous. At the end of the day it is an empirical question whether government ownership of banks increases or reduces employment growth more in industries with higher job creation opportunities. The central aim of this essay is to shed light on this empirical question, which appears to be the first attempt to investigate the effect of government ownership of banks on employment growth by using a cross-industry, cross-country (difference-in-difference) approach. This essay uses the empirical methodology pioneered by Rajan and Zingales (1998) and extended by Fisman and Love (2007), and Ciccone and Papaioannou (2007, 2008, and 2011). The main motivation of the cross industry and cross country approach is that the effects of the business environment - especially financial markets - are stronger in some industries

[21] In this paragraph we focus on the empirical studies that give insights about how well government-owned banks allocate their funds. Differently from these papers, there are some other papers which investigate whether government-owned banks are more efficient than other types of banks. But, the results are highly mixed. Altunbas, Evans and Molyneux (2001) find that government-owned banks have slight cost and profit advantages over the private-owned banks in Germany. Micco, Panizza and Yanez (2007) show that while government-owned banks located in developing countries are more efficient than domestic and foreign owned private banks, there is no association between ownership and performance for banks located in developed countries. Studies on China find that four large government-owned are less efficient than other types of banks (Lin and Zhang, 2009; Berger, Hasan and Zhu, 2009). On the other hand, Bonin, Hasan and Wachtel (2005) find no evidence that government-owned banks are more efficient than domestic private banks in 11 transition countries.

than in others. In contrast to the standard cross-country regression models, this approach helps to deal with potential econometric issues such as omitted variable bias, reverse causality and model specification. In this paper, the focus is on the employment growth effect of government ownership of banks between industries that have potential job creation opportunities and industries that do not.

To preview our main results, we find that industries with higher job creation opportunities, as proxied by US industry employment growth, experience relatively greater contradiction of employment growth in countries with higher government ownership of banks. Ciccone and Papaioannou (2007, 2008, and 2011) show that using US industrial growth as a proxy for potential growth or investment opportunities introduces measurement error into the regressions and thus leads to biased results. This will be the case because US employment shifts reflect not only global, but also US industry shifts. Therefore, we follow Ciccone and Papaioannou (2007, 2008, and 2011) by instrumenting the US industry employment growth with an alternative proxy for industry job creation opportunities that doesn't reflect the idiosyncrasies of a particular country. This approach yields even stronger evidence that government-owned banks hamper the reallocation of employment from declining to expanding industries. This effect is robust to control for the effects of different dimensions of the business environment.

The rest of this chapter is organized as follows. The next section discusses the previous literature. In section 3.3, we describe our empirical methodology. In section 3.4, we describe our data. In section 3.5, we present our results. Section 3.6 concludes.

3.2 Related Literature

This paper is related to three strands of literature. First of all, this paper is related to theoretical papers analysing how financial markets affect employment. In an early study, Acemoglu (2001) proposes a model in which credit market imperfections cause higher unemployment. He considers two economies one of which has better credit markets than the other. He analyses the response of these two economies to a common shock. In response to the arrival of a new set of technologies, an economy with better credit markets channels money to the correct entrepreneurs who take advantage of the new technologies. The emergence of new innovating firms creates new jobs and compensates for the losses of jobs in firms that are adversely affected by the technological shock. According to Acemoglu (2001), credit market imperfections hinder the emergence of new innovating firms and lead to a rise in unemployment. Wasmer and Weil (2004) develop a model of job creation and job destruction in an environment where new entrepreneurs must find credit before they start up their firms and enter the labour market to search for workers. Under credit market imperfections, firms and banks cannot match easily on the credit market. According to their model, credit market imperfections increase searching costs for banks and reduce market liquidity. These imperfections reduce firm entry, thus depressing labour demand, which in turn raising the unemployment rates.

In a more recent theoretical paper, Pagano and Pica (2012) focus on how financial development affects employment. At first they posit an economy with one industry. Financial development enables this industry to better exploit its investment opportunities, and thus to increase labour demand and wages. According to the model, financial development has a crucial effect on the labour market, by expanding

either employment or labour productivity. This effect depends on the elasticity of labour supply. The extent to which a rise in the equilibrium wage leads to an increase in the labour supply depends on the elasticity of labour supply. By raising the equilibrium wage, financial development will induce firms to substitute capital for labour, and thus increase labour productivity. On the other hand, financial development will increase employment, if labour supply is wage elastic. The flatter the labour supply curve, the larger the effect on employment; the steeper the curve, the greater the impact on wages and labour productivity. Secondly, Pagano and Pica (2012) posit an economy that consists of two industries. There is one strong industry with greater profitability and productivity. There is a weak industry with lower profitability and productivity. Their model shows that financial development benefits the stronger industry more than the weak one. As financial development increases, financial institutions provide more funds to firms in the stronger industry. Therefore, the stronger industry bids more aggressively for workers, and thus outbids the weaker one in the labour market. Well-developed financial institutions allow the strong industry to expand their labour capacity and redirect labour from the weak industry to the strong one[22].

Secondly, this paper is related to the literature that examines the effect of government ownership of banks on employment by using country level or cross-country level data. In a country level study, Cole (2009b) examines the effect of bank nationalisation on economic outcomes in India. The Indian government nationalised all banks with a deposit base above two billion rupees in 1980. The main goals of the

[22] In their empirical part, Pagano and Pica (2012) find that financial development increases employment growth relatively more in industries that rely heavily on external finance. This positive effect of financial development holds only in non-OECD countries. In the time of banking crises, financially more dependent industries experience a sharper contraction in employment growth in countries with developed financial systems. On the other hand, they find no relationship between financial development and labour productivity or the growth of real wages.

nationalisation programme were to increase agricultural credit and to promote employment in small-scale industries. His results show that there is no statistically significant effect of bank nationalisation on agricultural investments. However, Cole (2009b) finds that a 10% increase in the share of banks owned by government leads to an approximately 0.2%-0.6% decline in industrial and trade employment. On the other hand, it increases agricultural employment by 0.3%. His results suggest that government ownership of banks slows employment growth in areas that are important to economic development. In another country-based study, Carvalho (2010) investigates the relationship between government-owned banks and employment growth of manufacturing firms in Brazil. His results show that firms eligible for lending from government-owned banks expand employment in states with allied incumbent governors before a re-election race. His results also show that credit expansion of government-owned banks occurs simultaneously with employment expansion. Carvalho (2010) interpret these results to show that politicians use government-owned banks for their own objectives. According to his results, firms expand overall employment before the re-election races of allied incumbent governors but this expansion does not persist over time. His results also indicate that firms` local employment expansion is not associated with persistent expansion in their overall employment. This might indicate that firms are substituting employment between states. These papers show that even if politicians use government-owned banks to promote employment and thus increase their political powers, credits from government-owned banks might not create permanent employment growth.

There are also some country-based studies investigating the effect of banking deregulation on employment. Bertrand, Schoar and Thesmar (2007) examine the effects of the French banking industry deregulation process in the mid-1980s on real

economic activity. This deregulation process reduced government interventions in banks' lending, virtually abolished subsidized bank loans, privatized government-owned banks, and allowed French banks to compete more freely in the credit market. They find that industries that are more dependent on bank financing experience relatively more employment growth after the deregulation. On the other hand, Boustanifar (2012) studies how US branch banking deregulations affect employment. State-level restrictions were removed in the 1970s and 1980s in the US. These reforms allowed bank entry across state borders and ended local banking monopolies. In the US between 1970 and 1994, 38 states removed regulatory restrictions on branching. He finds that employment in financially dependent industries grows 0.83 percent more in a deregulated state.

Using cross-country regressions, there are some papers that investigate the employment effects of government interventions in financial markets. Feldmann (2006) analyses the effects of credit market restrictions on employment and unemployment by using rating based cross-country data on credit market restrictions. He uses the ratings for credit market restrictions from Economic Freedom of the World-2005 (Gwartney and Lawson, 2005). These ratings are designed to identify governmental restrictions on credit extended to the private sector, on the private ownership of banks, on the competition from foreign banks, and on the free determination of interest rates. His results show that while governmental restriction on private ownership of banks has no statistically significant effect on overall levels of employment and unemployment, it is significantly associated with more unemployment among women and a lower level of employment among young people. Using data on 53 countries, Feldman (2012) studies the effects of banking regulations on unemployment. He uses indicators constructed by Abiad, Detragiache

and Tressel (2008) to measure the strictness of banking regulations. These indicators measure five types of banking regulation: interest rate controls, credit controls, banking competition restrictions, state ownership of banks, and banking supervision. All of these variables are scaled to vary between zero and one, with higher values indicating stricter regulation. His results show that financial regulations increase unemployment, particularly among young people. Banking competition restrictions, state ownership of banks and interest rate controls have statistically significant effects on unemployment. On the other hand, credit controls and banking supervision have no significant effect.

Lastly, this paper is related to empirical papers that analyze the effect of government ownership of banks by using a cross-industry and cross-country approach. While Cetorelli and Gambera (2001) show empirically that higher government ownership of banks lowers value-added growth in industries that require more external finance, Beck and Levine (2002) do not find any significant relationship between government ownership of banks and industry growth. In a more recent paper, Ciccone and Papaioannou (2011) find that industries with better investment opportunities have relatively higher value-added growth in countries with lower government ownership of banks. Rather than focusing on the value-added growth, our paper investigates the effects of government ownership of banks on employment growth.

3.3 Empirical Methodology

As indicated before, this paper's empirical methodology is based on Rajan and Zingales (1998), Fisman and Love (2007) and Ciccone and Papaioannou (2007, 2008

and 2011). Rajan and Zingales (1998) follow the theoretical idea that financial markets help firms to overcome problems of moral hazard and adverse selection, thus financial development should disproportionately help industries that need more external finance. They identify an industry's need for external finance (the difference between investments and cash generated from operations) by using data on US firms. This approach uses US industry data as a proxy for industry structure, because rich and high quality industry level data are available for the US and financial markets in the US are relatively frictionless compared to other countries. Rajan and Zingales (1998) find that the interaction term between countries' financial development and external financial dependence is positive and highly significant. This suggests that industries highly dependent on external finance grow more in countries with developed financial markets. Their influential paper is important in understanding the main empirical methodology of this paper. However, this paper does not test whether government ownership of banks increases employment growth in industries that need more external finance, rather it tests whether government ownership of banks raises or lowers employment growth more in industries with higher job creation opportunities. In order to do that, a proxy is needed for these job creation opportunities. Following Fisman and Love (2007) and Ciccone and Papaioannou (2007, 2008 and 2011), this paper assumes the existence of global industry-specific shocks to job creation opportunities. Fisman and Love (2007) use US industry sales growth rate as a proxy for global growth opportunities and Ciccone and Papaioannou (2011) use US industry capital growth as a proxy for global investment opportunities. Ciccone and Papaioannou (2007 and 2008) also use US employment growth as a proxy for potential job creation opportunities. The focus of this paper is on job creation opportunities and therefore US industry employment growth is used as a

proxy for job creation opportunities. In sum, the following benchmark regression is run:

$$EG_{ic} = \alpha \ln E_{ic} + \delta_i + \gamma_c + \beta(GOB_c * EGUS_i) + \varepsilon_{ic} \quad (3.1)$$

where the dependent variable is the annualized growth rate of employment in industry i in country c during 1980-1989; $\ln E_{ic}$ is the initial log of employment in industry i in country c; δ_i and γ_c are industry and country dummies respectively; GOB_c denotes the share of government ownership of banks in country c in 1970; $EGUS_i$ denotes US industry employment growth (proxy for potential job creation opportunities) in industry i and residual growth is denoted by ε_{ic}[23]. In sum, the average growth of employment of industry i and country c are regressed over (1) initial employment level of industry i in country c; (2) industry and country dummies; and (3) the interaction between government ownership of banks in country c and industry i's potential employment growth opportunities. As usual, initial employment level is added in order to control for a convergence effect: industries with a higher initial employment level will grow more slowly. Industry and country fixed effects are controlled by including industry and country dummies. As Rajan and Zingales (1998) underline, the inclusion of country and industry dummy variables implies that we do not need to specify any industry- nor country specific variables that might affect employment growth. Only additional explanatory variables that vary both with industry and country need to be included. The US (the benchmark country) is excluded from the regressions. If government-owned banks distort responses to potential job creation opportunities, it is predicted that $\beta < 0$. Otherwise, β is higher

[23] Following the previous papers that use Rajan and Zingales's (1998) methodology, we use robust (heteroskedasticity-adjusted) standard errors. But, our findings are robust to use clustered standard errors.

than zero.

This approach has some advantages. First of all, compared to cross-country studies, endogeneity problem is less of a concern. The problem of endogeneity due to omitted variable bias is unlikely to be a serious problem since we control country and industry fixed effects. Moreover, the interaction term between industry-specific characteristics (job creation opportunities) and country specific characteristics (government ownership of banks) is likely to be exogenous to the dependent variable (employment growth). While the proxy for job creation opportunities belongs to industries in the US, the dependent variable (employment growth) involves countries other than the US. It is much less likely that employment growth outside the US might affect job creation opportunities in the US. But, there could be endogeneity problem as regards government ownership of banks. While the variable for government ownership of banks is measured at country level, employment growth is measured at industry level. There are few reasons to think why the labour market performance of a specific industry should affect government ownership of banks. Nevertheless, sceptics will claim that poor economic performance might create financial problems for private banks, and thus result in government takeovers of banks. Compared to cross-country studies, the problem of endogeneity due to reverse causality is quite less likely in this approach. Nevertheless, a lagged value (1970) of share of the government ownership of banks has been used in order to mitigate the potential reverse causality problem.

Ciccone and Papaioannou (2007, 2008 and 2011) show that using US growth as a proxy for global growth or investment opportunities introduces measurement error into the regressions and therefore leads to biased results. The main reason is that, in addition to reflecting global employment shifts, a US industry employment shift also

reflects US idiosyncrasies. This introduces measurement error into the empirical analysis. In order to avoid this, we follow a strategy implemented by Ciccone and Papaioannou (2007, 2008 and 2011)[24]. We instrument the US based proxy for industry job creation opportunities with a second proxy that does not reflect US trends or trends specific to countries. We use an estimate of industry employment growth in a (hypothetical) country facing world-average demand and technology shifts. Estimated global job creation opportunities are obtained in two steps. In the first step, we regress industry-country employment growth for all countries except the US on initial employment levels, country dummies, industry dummies, and industry dummies interacted with country-level government ownership of banks. In the second step, we obtain estimated global job creation opportunities by predicting industry employment growth for a country without government ownership of banks (in practice, the US level of government ownership of banks)[25]. Therefore, we first estimate equation (3.2) with OLS using data for all countries except the US.

$$EG_{ic} = \theta \ln E_{ic} + \mu_i + \eta_c + \phi_i GOB_c + \varepsilon_{ic} \quad (3.2)$$

Our prediction for global cross-industry job creation opportunities becomes as $PEG = \hat{\theta} \ln E_i + \hat{\mu}_i + \hat{\eta}_i + \hat{\phi}_i GOB_i$, where $\hat{\theta} \ln E_i$ controls for the initial employment level; $\hat{\mu}_i$ is the estimated industry effect; $\hat{\eta}_c$ the estimated country effect; and $\hat{\phi}_i$ the estimated marginal effect of government ownership of banks on employment growth in industry i. Then, we obtain the estimate of global job creation opportunities by predicting industry employment growth rates for U.S. value of GOB_c. Thus, estimated

[24]This strategy is more recently used by Barone and Cingano (2011).
[25]The predicted global measure does not capture the idiosyncrasies of any particular country, since we are accounting for the government ownership of banks in the first step.

global employment growth opportunities for industries are $GEG = \hat{\theta} \ln E_{US} + \hat{\mu}_i + \hat{\eta}_i + \hat{\phi}_i GOB_{US}$. Finally, we estimate the effect of government ownership of banks on employment growth by using a two-stage least squares approach, using $GOB_c * GEG_i$ as an instrument for $GOB_c * EGUS_i$. In the following sections, we report both OLS and IV estimation results.

While we instrument US-based proxy for industry job creation opportunities in order to take into account measurement error bias, we don't use same technique for other US based industry structure proxies. It is important to note that there are mainly two reasons of this. First of all, as can be seen in the previous literature, other US based industry structure proxies (e.g. external financial dependence, contract intensity, human capital intensity, etc.) are not as noisy as US based proxies for industry job creation opportunities (see Rajan and Zingales, 1998; Fisman and Love, 2007; Nunn, 2007; Ciccone and Papaioannou, 2007, 2008, and 2011). Therefore, under the assumption that technological differences within the same industry across countries are likely to be small for these other US based industry structure proxies, US based industry indicators are used as proxies for different industry structures in this literature. Secondly, we are able to construct an alternative proxy for job creation opportunities because data is available to do it. Unfortunately, there is no available cross-country industry level datasets that can be used to construct alternative (global) proxies for other industry structure proxies. It is not possible claim that US based industry structure proxies are the perfect proxies. But, Rajan and Zingales's (1998) approach helps us to mitigate some of the econometric problems encountered in cross-country regressions and enables us to test a specific mechanism in which financial markets matters for economic performance. Finding better proxies is a

challenge for this literature, and thereby constructing better proxies constitutes a fruitful area for further research.

3.4 Data

We use industry-specific and country-specific data from a variety of sources. The data on employment growth for each industry in each country is taken from the Industrial Statistics of the United Nations Industrial Development Organization (UNIDO). The UNIDO INDSTAT3 database reports employment data for 28 manufacturing industries at the level of 3-digit International Standard Industrial Classifications (ISIC). Previous literature focuses mainly on value-added growth and employment growth over the period 1980-1989, because the UNIDO database has a wider coverage in the 1980s than the 1990s. The sample of UNIDO reduces too much because of missing observations for several countries and industries. Therefore, as in the previous papers, we focus on employment growth over the period 1980-1989[26]. Following the previous literature, we drop countries with data for less than ten industries and also require at least five years of data in the 1980s. We exclude the US because it is our benchmark country. In this essay, we use employment growth as our dependent variable instead of using employment level. It has been argued that government-owned banks might sometimes increase credit flows and employment in order to gain political support during the election terms, but this effect is not persistent in the medium and long run (Dinc, 2005; Cole, 2009a and 2009b; Carvalho, 2010). Therefore, analysing level effect might be misleading. This essays aims to analyse the effects of government-owned banks on labour market in the medium and

[26]We also use employment growth over 1980-1999 as a sensitivity test.

long term. Hence, following Cole (2009b) and Carvalho (2010), we use employment growth as our dependent variable. At the same time, we don't have data on government ownership of banks in each year. If future datasets provide data on both government-ownership banks and employment on annual basis over multiple time periods, it will be interesting to use panel data estimation techniques to check how the effect of government-owned banks changes over the years.

Data on government ownership of banks is taken from La Porta *et al.* (2002). This variable shows the share of the assets of the top ten banks in a given country owned by the government of that country in 1970[27]. The percentage of the assets in a given bank owned by the government is calculated by multiplying the share of each shareholder in that bank by the share the government owns in those shareholders, and then summing the resulting shares. In contrast to data used for the business environment by some papers, our data for government ownership of banks does not suffer from a non-overlapping time period. Appendix Figure 1a, 1b and 1c portray government ownership of banks among countries. In our sample, Australia, Canada, Cyprus, Denmark, Ireland, Japan, Netherlands, South Africa, Trinidad and Tobago, United Kingdom and Zimbabwe are the countries that have low level of government ownership of banks. On the other hand, in our sample, Bangladesh, Bulgaria, China, Egypt, Greece, Hungary, Iceland, India and Poland are the countries that have high level of government ownership of banks.

We also use some other country-level controls for the business environment. Financial development is measured as the share of private credit to GDP. This is taken from the World Bank Development Indicators. As a measure for the regulation of entry, we use data from Djankov *et al.* (2002). Regulation of entry is the amount of

[27]La Porta *et al.* (2002) have data for 1970 and 1995. We also use the share of ten banks owned by the government in 1985 and 1995 in order to check the robustness of our results. Data for 1985 are taken from La Porta *et al.* (2000), which is a working paper version of La Porta *et al.* (2002).

time required by an entrepreneur to complete the legal procedures for starting a new business[28]. Our measure of labour regulation is an index constructed by Botero *et al.* (2004). This index is constructed by examining detailed provisions in the labour laws regarding the existence of alternative employment contracts, the cost of increasing hours, the cost of firing, and the formality of dismissal procedures[29]. Our measure for human capital is the share of the population who have completed secondary education, from Barro and Lee (2001). The measure for the rule of law comes from the International Country Risk Guide database[30]. It is scaled from 0 to 6. Higher values indicate better quality of institutions. Market capitalisation is the stock market capitalisation divided by GDP (Rajan and Zingales, 1998, 2003a). In order to control for governments` weight on the economy, we also use government consumption over GDP. This data is taken from the World Bank Development Indicators. Real per capita GDP is taken from the Penn World Tables.

The industry level proxies used in this paper are for 3-digit ISIC manufacturing industries. Our proxy for industry job creation opportunities is annual 3-digit industry employment growth in the US during the 1980s. The original data is taken from the NBER Manufacturing Industry Database. It was previously used by Ciccone and Papaioannou (2007 and 2008). Industry dependence on external financing is defined as the industry-level median of the ratio of capital expenditure minus cash flow to capital expenditure for US firms during 80s. Data originally come from COMPUSTAT. This proxy was previously used by Laeven, Klingebiel and Kroszner (2007). The proxies for industry job reallocation and entry rates come from Micco

[28] Natural logarithm of this variable is used in the regressions.

[29] Our measures for the regulations suffer from the nonoverlapping time period. Claessens and Laeven (2003), Klapper et al. (2006), and Ciccone and Papaioannou (2007) face similar nonoverlapping problem for data on institutional quality and regulations. They use these measures based on the argument that the burden of regulation and the quality of institutions have been stable over the long time period

[30] This variable is taken from Ciccone and Papaioannou (2009).

and Pages (2007). Job reallocation is defined as sum of job creation and job destruction at 3-digit ISIC industries for the US. Original source is from Davis and Haltiwanger (1999). Entry rate is defined as the number of new firms divided by average number of firms at 3-digit ISIC industries for the US. Original source is from Dunne et al. (1988).

Our proxy for industry human capital intensity is average years of employee schooling for all industries in US. The main data source is the 1980 Integrated Public Use Microdata Serious. This proxy was previously used by Ciccone and Papaioannou (2009). Our proxy for industry contract intensity is formulated by Nunn (2007) to measure the importance of relationship-specific investments across industries by using 1997 US input-output table. It is computed as the weighted average of relation specificity of all intermediate inputs used. Our proxy for labour intensity is defined as total wages and salaries divided by valued added in US Original data source is UNIDO. This proxy was also previously used by Ilyina and Samaniego (2011). Proxy measure of each industry's natural or technological share of small firms is the industry's share of employment by firms with less than 100 employees, and is calculated using data from the U.S. Census. This data was previously used by Beck et al. (2008). Appendix Table 3.1 describes our variables. Appendix Table 3.2 reports descriptive statistics of our variables.

3.5 Results

3.5.1 Government Ownership of Banks, Industry Structure and Employment Growth

As seen in Table 3.1, we start our analysis by showing the heterogeneous effect of

government ownership of banks on employment growth. The result in column (1) shows that the coefficient of interaction term between government ownership of banks and job creation opportunities (GOB*EGUS) is negative and statistically significant at 1%. This implies that employment in industries with higher job creation opportunities grows more slowly in countries with higher government ownership of banks. This suggests that government-owned banks fail to allocate their funds from declining to expanding industries. The coefficient of GOB*EGUS (-0.6325) implies that the difference in employment growth rates between an industry with EGUS around the 75th percentile and an industry around the 25th percentile is about 0.94% lower if they operate in Chile (where the share of government ownership of banks is 91%, around the 75th percentile of GOB), than if they operate in Australia (where the share of government ownership of banks is 23%, around the 25th percentile of GOB).

As a next step, we add an interaction term between government ownership of banks and industries' dependence on external finance (GOB*EXTFIN), because industries also differ in their technological demand for external finance. Column (2) shows that GOB*EXTFIN is negative and significant at 10%, indicating that countries with larger government ownership of banks see slower employment growth more in industries that need more external finance. Based on the "political view", it might be argued that government-owned banks are more likely to channel credit to labour intensive industries and to industries that have a higher proportion of smaller firms. Therefore, in order to take this argument into account, we add an interaction term between government ownership of banks and industry labour intensity (GOB*LAB) and an interaction term between government ownership of banks and the share of small firms (GOB*SMALL). Column (3) shows that GOB*LAB is positive, but the effect is not statistically significant. Column (4) shows that the effect

of GOB*SMALL is positive and statistically significant[31]. In the last column, we add other three interaction terms and our main interaction term simultaneously in order to see how strong is the effect of GOB*EGUS. Column (5) shows that the effect of GOB*EGUS is always negative and statistically significant. This implies strong evidence that government ownership of banks reduces employment growth more in industries with higher job creation opportunities. Additionally, our results show that government ownership of banks reduces employment growth more in industries with higher dependence on external finance. However, the effects of GOB*LAB and GOB*SMALL are not always statistically significant[32].

[31]We do not have the share of small firms in the US for ISIC 351 Manufacture of Industrial Chemicals. Therefore, we lose 59 observations when we add GOV*SMALL into the regression. We could also use the share of small firms in ISIC 3511 Manufacture of Industrial Chemicals except Fertilizers as a proxy for the share of small firms in ISIC 351 Manufacture of Industrial Chemicals. Our results are almost same when we do so.

[32] Appendix Table 3.3 shows the results when we include the interaction terms one by one.

Table 3.1 GOB, Industry Structure and Employment Growth

Dependent Variable: EG_{8089} (Annual Growth Rate of Employment for the Period 1980-1989)

	(1)	(2)	(3)	(4)	(5)
LnE	-0.0163***	-0.0163***	-0.0163***	-0.0160***	-0.0160***
	(0.0032)	(0.0032)	(0.0032)	(0.0033)	(0.0033)
GOB*EGUS	-0.6325***	-0.4243**	-0.6319***	-0.7030***	-0.4691**
	(0.1499)	(0.1696)	(0.1501)	(0.1612)	(0.1902)
GOB*EXTFIN		-0.0229*			-0.0236*
		(0.0118)			(0.0118)
GOB*LAB			0.0520		0.0338
			(0.0345)		(0.0401)
GOB*SMALL				0.0507*	0.0363
				(0.0272)	(0.0301)
Industry FE	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
No of country	59	59	59	59	59
No of obs.	1543	1543	1543	1484	1484
R^2	0.440	0.441	0.441	0.442	0.444

Notes: Regressions are estimated by OLS. In columns 1,2 and 4, the number of industries is 28. In columns 3 and 5, the number of industries is 27. Robust standard errors are reported in parentheses. ***, [**] and (*) denote statistically significant at 1, [5] and (10) percent levels, respectively.

As we discussed before, if US industry employment growth not only reflects global growth opportunities, but also US idiosyncrasies, using it as a proxy for potential job creation opportunities will introduce measurement error bias. If measurement error reflects only US idiosyncrasies, it will lead us to understate the effects of government-owned banks on employment growth. However, if US industry employment growth is a better proxy for technology and demand shifts in countries with lower government ownership of banks than countries with higher government ownership, measurement error could lead us to overstate the effects of government-

owned banks on employment growth. In order to avoid these biases, we follow a strategy implemented by Ciccone and Papaioannou (2007, 2008 and 2011). We instrument the US-based proxy for industry job creation opportunities with a second proxy that does not reflect US trends or trends specific to countries with a certain level of government ownership of banks.

The estimated global employment growth opportunities are obtained in two steps. In the first step, we regress industry-country employment growth for all countries except the US on initial employment levels, country dummies, industry dummies, and industry dummies interacted with country-level government ownership of banks. Hence, we estimate equation (3.2). In the second step, we obtain global job creation opportunities (GEG) by predicting industry employment growth for a (hypothetical) country without government ownership of banks (in practice, the US level of government ownership of banks). We then use an instrumental variable approach where the interaction between government ownership of banks and US-based job creation opportunities (GOBc*EGUSi) is instrumented with an interaction term between government ownership of banks and estimated global job creation opportunities (GOBc*GEGi).

We re-estimate the results in Table 3.1 using an instrumental variables approach. Column (1) of Table 3.2 shows that the coefficient of government ownership interaction is negative and larger than the estimate in column (1) of Table 3.1. GOB*EGUS is statistically significant at the 1% level. This IV estimate of GOB*EGUS (-1.4160) implies that the difference in employment growth rates between an industry with EGUS around the 75th percentile and an industry around the 25th percentile is about 2.1% lower if they operate in Chile (where the share of government ownership of banks is 91%, the 75th percentile of GOB), than if they

operate in Australia (where the share of government ownership of banks is 23%, the 25th percentile of GOB). Our new results show that using an instrumental variables approach gives even stronger evidence that industries with higher job creation opportunities experience relatively lower employment growth in countries with larger government ownership of banks. Our first-stage F-statistics are above the rule of thumb proposed by Staiger and Stock (1997), and thus p-values of the first stage F-statistics are 0. This suggest that we reject the hypothesis our instrument is weak at the 1% significance level. The relevance of instrument is also confirmed by a high Shea R^2. We present the first-stage results of Table 3.2 in Appendix Table 3.4. The results in columns (2), (3) and (4) give similar results after controlling for GOB*EXT, GOB*LAB and GOB*SMALL. In our previous table, the coefficient of GOB*EXT is negative. In column (2) and (4), the coefficient of GOB*EXT turns to positive. This implies that the effect of GOB*EXT is not reliable. The last column of Table 3.2 indicate that the effect of GOB*EGUS persists despite the inclusion of these other interactions. When we look at Tables 3.1 and 3.2 and Appendix Table 3.3, we see that only the effect of interaction term between government ownership of banks and industry employment growth (GOB*EGUS) is robust. The effects of GOB*EXT, GOB*LAB and GOB*SMALL are not robust.

Table 3.2 GOB, Industry Structure and Employment Growth- IV Estimation

Dependent Variable: EG_{8089} (Annual Growth Rate of Employment for the Period 1980-1989)

	(1)	**(2)**	**(3)**	**(4)**	**(5)**
LnE	-0.0170***	-0.0174***	-0.0169***	-0.0164***	-0.0165***
	(0.0032)	(0.0032)	(0.0032)	(0.0032)	(0.0032)
GOB*EGUS	-1.4160***	-2.2800***	-1.3770***	-1.3453***	-2.0108**
	(0.2315)	(0.4664)	(0.2319)	(0.2242)	(0.4436)
GOB*EXTFIN		0.0539**			0.0405*
		(0.0220)			(0.0215)
GOB*LAB			0.0516		-0.0418
			(0.0339)		(0.0452)
GOB*SMALL				0.0783**	0.1092***
				(0.0269)	(0.0301)
Industry FE	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
No of country	59	59	59	59	59
No of obs.	1543	1543	1543	1484	1484
R^2	0.427	0.396	0.429	0.434	0.415
F-test (p-value)	0.00***	0.00***	0.00***	0.00***	0.00***
Shea R^2	0.445	0.169	0.451	0.499	0.198

Notes: Regressions are estimated by 2SLS. In each specification, the number of industries is 28. Robust standard errors are reported in parentheses. ***, [**] and (*) denote statistically significant at 1, [5] and (10) percent levels, respectively.

3.5.2 GOB, Business Environment and Other Interaction Terms

3.5.2.1 GOB, Other Dimensions of the Business Environment and Job Creation Opportunities

Table 3.1 and 3.2 and Appendix Table 3 show that when add other three interaction terms (GOB*EXTFIN, GOB*SMALL and GOB*LAB) and our main interaction

term (GOB*EGUS) simultaneously only the effect of GOB*EGUS is consistent and robust. Thereafter, we investigate the strength of the effect of GOB*EGUS when we control other relevant interaction terms (interaction terms between job creation opportunities and other business environment indicators and interaction terms between other industry structure proxies and business environment indicators) that has been used in the previous literature[33]. It is important to note that readers should focus more on Table 3.3 and 3.4 because these tables control all other relevant interaction terms that has been used in the previous literature. Therefore, they give us most reliable results. It is also important to note that this essay is more generous in controlling other relevant interaction terms than the previous papers. Previous papers generally include two or three relevant interaction terms, and they generally don't include them simultaneously. In sum, they are not as generous as this essay.

Beside government ownership of banks, a number of other factors interacted with job creation opportunities may influence employment growth. Therefore, the results shown in the first two tables might be driven by other aspects of the business environment interacted with industry job creation opportunities. We address this issue by adding some other interaction terms between variables related to different dimensions of the business environment and industry job creation opportunities into our empirical analysis. It has been generally accepted that financial development is crucial for any modern economy[34]. Government ownership of banks and financial

[33] We also follow an instrumental variables strategy for financial development, human capital entry regulations, labour market regulations and rule of law. Therefore, interactions between country-level characteristics (financial development, human capital entry regulations, labour market regulations, and rule of law) and US industry employment growth are instrumented with interactions between estimated global industry employment growth and the respective country-level characteristic. We just report the p-value of F-stat and Shea's R^2 for government ownership of banks interaction to save some space. The first-stage F-statistics for other variables are also above the critical value of 10 and they have a high Shea's R^2.

[34] See King and Levine (1993a, 1993b) and Levine and Zervos (1998) for cross-country evidence; Rajan and Zingales (1998) for cross-industry, cross-country evidence and Demirguc-Kunt et al. (1998) for firm level evidence.

development are related topics, because government ownership of banks is negatively associated with financial development. Given that financial development is correlated with government ownership of banks, its omission from the regression might bias the results. Government ownership of banks might affect employment growth in industries that have potential job creation opportunities because inter-industry reallocation is slower in countries with low financial development. In column (1) of Table 3.3, we examine whether government ownership of banks continues to have an effect on employment growth in industries with higher employment growth opportunities when we include an interaction term between financial development and industry job creation opportunities (FINDEV*EGUS). The coefficient of FINDEV*EGUS is positive, and statistically significant. But, as seen in the last column, when we include all interaction terms together, the coefficient of FINDEV*EGUS turns statistically insignificant. On the other hand, government ownership interaction continues to be negative and highly significant.

Countries with higher levels of human capital might also respond better to expansionary global demands and technology shifts. In this case, employment reallocation within firms and industries will be higher in countries with higher levels of human capital. To control this, we use an interaction term between human capital and job creation opportunities (HUMAN*EGUS). Column (2) shows that countries with higher levels of human capital experience higher employment growth more in industries that have higher employment growth opportunities. The effect of HUMAN*EGUS is statistically significant at 1%. The coefficient of HUMAN*EGUS (5.2985) implies that difference in employment growth rates between an industry with EGUS around the 75th percentile and an industry around the 25th percentile is about 6.2% higher if they operate in Japan (the share of the population who have completed

second level education is %16, the 75th percentile of HUMAN), rather than in Uruguay (the share of the population who have completed second level education is 5%, the 25th percentile of HUMAN). Column (2) also shows that the result for the government ownership of banks interaction remains negative and statistically significant.

Table 3.3 GOB, Alternative Business Environment and Job Creation Opportunities

Dependent Variable: EG_{8089} (Annual Growth Rate of Employment for the Period 1980-1989)

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
LnE	-0.0183*** (0.0036)	-0.0186*** (0.0034)	-0.0105*** (0.0019)	-0.0096*** (0.0020)	-0.0195*** (0.0034)	-0.0135*** (0.0025)
GOB*EGUS	-1.0137*** (0.2282)	-1.2130*** (0.2211)	-1.1259*** (0.2490)	-0.9326*** (0.2433)	-0.9638*** (0.2076)	-0.8362*** (0.3438)
FINDEV*EGUS	2.3164*** (0.6693)					1.0215 (0.7764)
HUMAN*EGUS		5.2985*** (1.0562)				5.4319*** (2.0030)
ENTRY*EGUS			-0.0749 (0.0679)			0.8109*** (0.2481)
LABOUR*EGUS				-3.3810*** (1.0461)		-6.2398*** (1.7558)
RULE*EGUS					0.3630*** (0.0679)	0.4532*** (0.1209)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
No of country	54	56	52	52	59	46
No of obs.	1409	1475	1385	1385	1543	1234
R^2	0.396	0.412	0.417	0.322	0.438	0.125
F-test (p-value)	0.00***	0.00***	0.00***	0.00***	0.00***	0.00***
Shea R^2	0.423	0.434	0.376	0.384	0.397	0.310

Notes: Regressions are estimated by 2SLS. In each specification, the number of industries is 28. Robust standard errors are reported in parentheses. ***, [**] and (*) denote statistically significant at 1, [5] and (10) percent levels, respectively.

As we mentioned before, Andrianova, Demetriades and Shortland (2011) argue

that the results shown in La Porta *et al.* (2002) suffer from omitted variable bias because they don't control for more fundamental determinants of growth such as the institutional environment. They show that the results in La Porta *et al.* (2002) are not robust to conditioning on more fundamental determinants of growth. Therefore, we add other interaction terms which include variables related to the burden of regulations and the quality of institutions into our analysis. We start by controlling for an interaction term between entry regulations and job creation opportunities. Ciccone and Papaioannou (2008) find that entry regulations slow down employment growth more in industries that have higher job creation opportunities. Thus, we include an interaction term between regulations of entry and industry employment growth opportunities (ENTRY*EGUS). Column (3) of Table 3.3 shows a negative coefficient for ENTRY*EGUS, as predicted, but the effect of ENTRY*EGUS is not statistically significant. The coefficient of main interest is still negative and statistically significant. Since employment growth might also be affected by strict labour market regulations, Ciccone and Papaioannou (2008) also include an interaction term between labour market regulation and job creation opportunities. Column (4) shows that the coefficient of LABOUR*EGUS is negative and statistically significant. The coefficient of LABOR*EGUS (-3.3810) implies that difference in employment growth rates between an industry with EGUS around the 75th percentile and an industry around the 25th percentile is about 2.3% lower if they operate in Panama (the index for labor regulation is 0.6246; the 75th percentile of LABOR), rather than in Pakistan (the index for labor regulation is 0.3433; the 25th percentile of LABOR).

In addition to the burden of regulations, an interaction term between quality of institution and job creation opportunities might also matter. The quality of institutions

is important, because better institutions increase the incentives to invest in physical and human capital, and help to allocate resources to their most efficient uses (Acemoglu Johnson and Robinson, 2005). Thus, we also add an interaction term between rule of law and employment growth opportunities in order to control for the quality of institutions. Column (5) shows that the coefficient of RULE*EGUS is positive and statistically significant at the 1% level, suggesting that industries with higher job creation opportunities experience higher employment growth more in countries with better quality of institutions. GOB*EGUS is still an economically and statistically important determinant of employment growth even after we control for rule of law interacted with job creation opportunities. Column (6) controls jointly for all the factors examined in the previous columns. GOB*EGUS remains negative and highly statistically significant. Our results also show that industries with higher job creation opportunities experience relatively higher employment growth in countries with high human capital, better rule of law and low labour regulations. In sum, Table 3.3 augment the analysis with controls for different dimensions of the business environment, demonstrating that the results of GOB*EGUS remain robust under these additional controls[35].

3.5.2.2 GOB, Business Environment and Industry Structure

In here, we include some business environment variables interacting with different aspects of industry structure that are likely to be influential. As mentioned above, Pagano and Pica (2012) show that financial development increases employment growth more in industries that are highly dependent on external finance. Therefore,

[35] OLS results of Table 3.3 are shown in Appendix Table 3.5.

we also include an interaction term between financial development and industry external finance dependence (FINDEV*EXTFIN). Column (1) of Table 3.4 shows that while FINDEV*EXTFIN appears positively, the effect of GOB*EGUS remains the same. Ciccone and Papaioannou (2009) find that countries with a higher level of human capital experience relatively higher employment growth in human capital intensive industries. In column (2), we augment our specification by including an interaction term between human capital and the human capital intensity of US industries (HUMAN*HINT). Our result for HUMAN*HINT is consistent with Ciccone and Papaioannou (2009). The interaction term between government ownership of banks and US industry employment growth is still negative and statistically significant at the 1% level.

Klapper, Laeven and Rajan (2006) find that entry regulations hamper the creation of new firms relatively more in industries that have naturally high entry (proxied by the US industry entry rate). Hence, it is possible that an interaction term between entry regulations and US industry entry rate (ENTRY*ENT) might also matter for employment growth. Column (3) of Table 3.4 shows that this interaction has no statistically significant effect on employment growth. But, as we expect, the effect is negative statistically significant when we include all other relevant interaction terms simultaneously. The results in column (3) still show a highly significant negative effect of GOB*EGUS on employment growth.

Table 3.4 GOB, Business Environment and Other Relevant Interactions

Dependent Variable: EG_{8089} (Annual Employment Growth for the Period 1980-1989)

	(1)	(2)	(3)	(4)	(5)	(6)
LnE	-0.0176*** (0.0035)	-0.0172*** (0.0033)	-0.0102*** (0.0019)	-0.0105*** (0.0018)	-0.0164*** (0.0031)	-0.0100*** (0.0020)
GOB*EGUS	-1.4075*** (0.2355)	-1.4078*** (0.2252)	-1.2777*** (0.1936)	-1.2798*** (0.1852)	-1.4159*** (0.2310)	-1.2648*** (0.2019)
FINDEV*EXT	0.0419*** (0.0142)					0.0257** (0.0111)
HUMAN*SKILL		0.0604*** (0.0149)				0.0364*** (0.0116)
ENTRY*ENT			0.0118 (0.0121)			-0.0079** (0.0040)
LABOUR*JOB				-0.4214*** (0.1269)		-0.3678*** (0.1235)
RULE*CONT					-0.0063* (0.0037)	-0.0074** (0.0040)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
No of country	54	56	52	52	59	46
No of obs.	1409	1475	1385	1385	1543	1234
R^2	0.447	0.436	0.417	0.420	0.428	0.439
F-test (p-value)	0.00***	0.00***	0.00***	0.00***	0.00***	0.00***
Shea R^2	0.425	0.441	0.436	0.444	0.446	0.414

Notes: Regressions are estimated by 2SLS. In each specification, the number of industries is 28. Robust standard errors are reported in parentheses. ***, [**] and (*) denote statistically significant at 1, [5] and (10) percent levels, respectively.

In another empirical study, Micco and Pages (2007) find that stringent labour market regulations reduce job flows more in industries that require a higher level of job reallocation, as proxied by US industry job reallocations. To control for this issue, we include an interaction term between labour market regulation and US industry job reallocations (LABOUR*JOB). Column (4) shows that employment growth in industries with higher job reallocation is relatively slower in countries with stringent labour market regulations. The effect of LABOUR*JOB is statistically significant at

the 1% level. We have a similar result for GOB*EGUS after including LABOUR*JOB. Nunn (2007) shows that countries with better contract enforcement (proxied by rule of law) export relatively more in industries for which relationship-specific investments are important. He uses a measure of industry contract intensity for the US as a proxy for relationship-specific investments. We add an interaction term between rule of law and US industry contract intensity (RULE*CONT) in order to control for its possible effect on employment growth, expecting that RULE*CONT will be positive. However, the results in column (5) show that the sign of RULE*CONT is negative. On the other hand, the nature and significance level of the coefficient on government ownership interaction remains the same. Reassuringly, Column (6) indicates that the effect of government ownership of banks interaction persists despite the inclusion of these other interactions[36].

3.5.3 Sensitivity Tests

In this section we apply some sensitivity tests[37]. First of all, it can be argued that government ownership of banks might simply capture other dimensions of financial development. Feldmann (2011) find that well developed stock markets reduce unemployment. Therefore, we also control for stock market capitalisation over GDP, which is another important aspect of financial development. Column (1) of Table 3.5 confirms the effect of GOB*EGUS on employment growth, regardless of whether we control for private credit over GDP or stock market capitalisation over GDP. Another concern is that government ownership of banks might simply be a proxy for the size of the government. Feldmann (2010) show that a large government size increase

[36] OLS results of Table 3.4 are shown in Appendix Table 3.6.
[37] The same instrumental variables approach is also used for market capitalisation, government consumption divided by GDP, and real GDP per capita.

unemployment. In order to capture this, we add an interaction term between government consumption over GDP and job creation opportunities (GOVCONS*EGUS). Column (2) shows that the coefficient of EGUS is positive but not statistically significant. The effect of GOB*EGUS remains the same for this specification. Lastly, it can be argued that government ownership of banks might be significant simply because it captures the effect of economic development. The specification in column (3) of Table 3.5 takes into account this issue by including an interaction term between the log of GDP per capita and job creation opportunities (GDP*EGUS). The estimated coefficient of GDP*EGUS is positive and statistically significant at the 1% level. Column (3) also confirms that the coefficient of GOB*EGUS is negative and highly significant even after the level of economic development is accounted for.

Table 3.5 Sensitivity Tests 1

Dependent Variable: EG_{8089} (Annual Growth Rate of Employment for the Period 1980-1989)

	(1)	**(2)**	**(3)**
LnE	-0.0160***	-0.0167***	-0.0196***
	(0.0051)	(0.0033)	(0.0034)
GOB*EGUS	-1.2675**	-1.4568***	-0.5574***
	(0.5028)	(0.2516)	(0.2159)
MARCAP*EGUS	0.9791		
	(0.6830)		
GOVCON*EGUS		0.4191	0.9138***
		(0.8418)	(0.1704)
GDP*EGUS			
Industry FE	Yes	Yes	Yes
Country FE	Yes	Yes	Yes
No of country	38	55	59
No of obs.	1046	1434	1543
R^2	0.419	0.438	0.374
F-test (p-value)	0.00***	0.00***	0.00***
Shea R^2	0.283	0.406	0.426

Notes: Regressions are estimated by 2SLS. In each specification, the number of industries is 28. Robust standard errors are reported in parentheses. ***, [**] and (*) denote statistically significant at 1, [5] and (10) percent levels, respectively.

In our previous results, we use the time period for employment growth over the 1980s, because the UNIDO database has wider coverage in the 1980s than the 1990s. We can also extend this time period to 1980-1999. Column (1) of Table 3.6 show that GOB*EGUS is negative and statistically significant when employment growth during 1980-1999 is regressed over it[38]. It is important to note that the share of government

[38]It is important to note that EGUS now indicate the interaction term between government ownership

ownership of banks has changed over time because of the privatisation of the banking sector during the 1980s and 1990s. Appendix Figure 3.1, 3.2 and 3.3 show that there are changes in the level of government ownership of banks among some countries. As Körner and Schnabel (2011) argue, government ownership data for 1970 might not be appropriate to capture the conditions for employment growth over more recent years if government ownership of banks has changed sharply after the privatisation waves. In order to control for this argument, we also use government ownership data for 1985 and 1995. Firstly, we create an interaction term between government ownership of banks in 1985 and US industry employment growth during the 1980s (GOB_{85}*EGUS). Then, employment growth over the 1980s is regressed over GOB_{85}*EGUS[39]. Column (2) shows that the effect of GOB_{85}*EGUS is also negative and statistically significant. Then, we regress employment growth during 1980-1999 on GOB_{85}*EGUS[40]. Column (3) confirms our previous results. Finally, we create an interaction term between government ownership of banks in 1995 and US industry employment growth during the period 1980-1999 (GOB_{85}*EGUS)[41]. Column (4) shows that the result for the interaction term between government ownership of banks and job creation opportunities remains the same when employment growth during 1980-1999 is regressed over GOB_{95} *EGUS.

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of banks in 1970 and US industry employment growth (job creation opportunities) during 1980-1999. The estimated employment growth opportunities are obtained by using the same steps as before, but for the 1980-1999 period. Then, it is used as an IV.

[39] The predicted employment growth opportunities (GEG) are obtained by using the same steps as before, but for the government ownership of banks in 1985. Then, GOB_{85}*GEG is used as an IV for GOB_{85}*USEG.

[40] The predicted employment growth opportunities (GEG) are obtained by using the same steps as before, but for the 1980-1999 period and government ownership of banks in 1985. Then, GOB_{85}*GEG is used as an IV for GOB_{85}*USEG.

[41] The predicted employment growth opportunities (GEG) are obtained by using the same steps as before, but for the 1980-1999 period and government ownership of banks in 1995. Then, GOB_{95}*GEG is used as an IV for GOB_{95}*USEG.

Table 3.6 Sensitivity Test 2

	(1)	**(2)**	**(3)**	**(4)**
Dependent Variable	EG_{8099}	EG_{8099}	EG_{8099}	EG_{8099}
LnE	-0.0149*** (0.0016)	-0.0170*** (0.0032)	-0.0145*** (0.0016)	-0.0144*** (0.0016)
GOB*EGUS	-1.4509*** (0.1709)			
GOB_{85}*EGUS		-1.4460*** (0.2595)	-0.8635*** (0.1469)	
GOB_{95}*EGUS				-1.1220*** (0.1790)
Industry FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
No of country	46	59	46	46
No of obs.	1054	1543	1054	1054
R^2	0.568	0.422	0.583	0.583
F-test (p-value)	0.00***	0.00***	0.00***	0.00***
Shea R^2	0.463	0.345	0.522	0.492

Notes: Regressions are estimated by 2SLS. Dependent variable is the annual employment growth for the period for 1980-1999 in columns 1, 3 and 4. Dependent variable is the annual employment growth for the period for 1980-1989 in columns 2. In each specification, the number of industries is 28. Robust standard errors are reported in parentheses. ***, [**] and (*) denote statistically significant at 1, [5] and (10) percent levels, respectively.

3.5.4 Country Heterogeneity

In the previous sections, we showed that the effect of government ownership of banks on employment growth is not homogenous, but heterogeneous across industries. It is also important to ask whether this effect is uniform across countries. In this section, we allow not only for heterogeneity across industries but also for heterogeneity across

countries. La Porta *et al.* (2002) run some additional regressions by dividing the sample into relatively rich and poor countries, relatively financially developed and financially underdeveloped countries, and relatively institutionally developed and institutionally underdeveloped countries. Their results show that government ownership of banks has an even stronger negative effect on economic growth in countries with low initial income, low financial development and low institutional quality. In a more recent paper, Körner and Schnabel (2011) find that government ownership of banks is harmful for economic growth only if a country has low financial development and low institutional quality. They argue that government ownership of banks might not be expected to be harmful in countries with high financial development, because well-developed financial systems are usually marked by better risk management techniques, prudential financial regulation and supervision, and higher competition. On the other hand, they also argue that the negative impact of government ownership of banks might be expected to be less pronounced in countries with high institutional quality, because politicians may not be able to abuse government-owned banks for their own interests in these countries.

In the first two columns of Table 3.7, we divide the sample into those countries with private credit as a proportion of GDP below the median and those above the median. We find that government ownership of banks is less harmful for employment growth in industries with higher job creation growth opportunities when the financial market is more developed. In the last two columns of Table 3.7, we divide the sample into those countries with a rule of law index below the median and those above the median. Our results show that the negative effect of GOB*EGUS is lower in countries with high institutional quality compared to countries with low institutional quality.

Table 3.7 Country Heterogeneity

Dependent Variable: EG_{8089} (Annual Employment Growth for the Period 1980-1989)

	(1)	(2)	(3)	(4)
	Financially Developed	**Financially Underdeveloped**	**High Quality Of Institutions**	**Low Quality Of Institutions**
LnE	-0.0121***	-0.0208***	-0.0101***	-0.0244***
	(0.0036)	(0.0052)	(0.0020)	(0.0052)
GOB*EGUS	-1.1841***	-1.6969***	-1.0187***	-1.4931***
	(0.2583)	(0.4053)	(0.1887)	(0.4525)
Industry FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
No of country	28	26	36	23
No of obs.	753	656	965	578
R^2	0.401	0.483	0.424	0.417
F-test (p-value)	0.00***	0.00***	0.00***	0.00***
Shea R^2	0.422	0.443	0.438	0.452

Notes: Regressions are estimated by 2SLS. In each specification, the number of industries is 28. Robust standard errors are reported in parentheses. ***, [**] and (*) denote statistically significant at 1, [5] and (10) percent levels, respectively.

3.6 Conclusion

The banking system is supposed to allocate capital, relax credit constraints, manage risks and facilitate economic transactions. Dysfunctional banking systems fail to allocate capital to uses that will yield the best economic and social returns. Given the role of government-owned banks in the banking system, it is vital to evaluate the effectiveness of these banks in allocating their resources to the industries. In this paper, we investigate the effect of government ownership of banks on employment growth by using a cross-industry and cross-country approach. This essay tests mainly

whether government ownership of banks increases or decreases employment growth in industries with higher job creation opportunities. This paper provides empirical evidence that government ownership of banks lowers employment growth relatively more in industries with higher job creation opportunities. Following Ciccone and Papaioannou (2007, 2008, and 2011), our empirical methodology also takes into account that using US industry employment growth as a proxy for global employment growth opportunities introduces measurement error into the regressions and therefore leads to biased results. Our empirical results also show that the negative effect of government ownership of banks is smaller in countries with high financial development and high institutional quality.

The policy implication of our results should not be interpreted as a sign that government-owned banks are entirely harmful for employment growth. We also find some evidence that labour-intensive industries and small firm industries experience higher employment growth in countries with higher government ownership of banks. We show that the effect of government ownership of banks is heterogeneous. However, our results and those of Cole (2009b) indicate that government ownership of banks slows down employment growth in industries that are crucial for low unemployment and high employment. Therefore, governments should reconsider their roles in employment growth as financial intermediaries. As World Bank (2012) underlines, past experience shows that government-owned banks could misallocate their resources and deteriorate the quality of financial intermediation. On the other hand, as discussed widely in the previous literature, governments should primarily provide a better institutional and regulatory environment in order to create more developed and competitive financial markets (see La Porta *et al.*, 1997; Rajan and Zingales, 2003b; Acemoglu and Johnson, 2005; Mishkin, 2006; and Andrianova,

Demetriades and Shortland, 2008; World Bank, 2012). The Global Financial Crisis and recent scandals in Western financial institutions are important messages that highlight the importance of transparency. Protection of property rights, better contract enforcement, prudential regulations and the creation of trustworthy public credit-rating agencies will be key policy topics for governments to create more transparent and competitive financial markets.

It is crucial to state that this essay doesn't take into account the effect of recent bank nationalization policies. Not only developing countries, but also developed countries have turned to government-owned banks to deal with the economic meltdown caused by the Global Financial Crisis. Hence, analysing the effects government-owned banks during the current crisis constitutes a fruitful area for further research.

3.7 Appendix

Appendix Table 3.1 Definition and Source of the Variables

Variable	Definition	Source
GOB	Government Ownership of Banks	La Porta *et al.*(2002)
FINDEV	Financial Development	World Bank Development Indicators
ENTRY	Entry Regulation	Djankov *et al.* (2002)
LABOUR	Labour Market Regulation	Botero *et al.* (2004)
HUMAN	Human Capital	Barro and Lee (2001)
RULE	Rule of Law	Original source is International Country Risk Guide. This variable is taken from Ciccone and Papaioannou (2009).
MARCAP	The stock market capitalisation divided by GDP	Rajan and Zingales, 1998, 2003a
GOVCON	Government consumption over GDP	World Bank Development Indicators
GDP	Real per capita GDP	Penn World Tables
EGUS	Industry's Job Creation Opportunities	The original data is taken from the NBER Manufacturing Industry Database. It was previously used by Ciccone and Papaioannou (2007 and 2008)
GEG	Instrumental variable for global job creation opportunities	Check the text to see how to construct this variable.
FINEXT	Industry's External Financial Dependence	Data originally come from COMPUSTAT. This proxy was previously used by Laeven, Klingebiel and Kroszner (2007)
JOB	Industry's Job reallocation	Original source is from Davis and Haltiwanger (1999). It is from Micco and Pages (2007).
ENT	Industry's Entry Rate	Original source is from Dunne et al. (1988). It is from Micco and Pages (2007).
SKILL	Industry's Human Capital Intensity	The main data source is the 1980 Integrated Public Use Microdata Serious. This proxy was previously used by Ciccone and

		Papaioannou (2009).
CONT	Industry's Contract Intensity	Nunn (2007)
LAB	Industry's Labour Intensity	Original data source is UNIDO. This proxy was also previously used by Ilyina and Samaniego (2011).
SMALL	Industry's Share of Small Firms	It is calculated using data from the U.S. Census. This data was previously used by Beck et al. (2008).

Appendix Table 3.2 Descriptive Statistics

	Observations	Mean	Standard Deviation
EG_{8089}	1543	0.0072	0.0557
EG_{8099}	1054	0.0033	0.0431
LnE	1543	9.3239	1.9998
GOB	59	0.5614	0.3417
GOB_{85}	59	0.5168	0.3348
GOB_{95}	59	0.3928	0.2941
GDP	59	6084.94	4423.39
FINDEV	54	0.4419	0.2542
HUMAN	56	0.1167	0.0896
RULE	59	3.5915	1.7284
LABOUR	52	0.4717	0.1718
ENTRY	52	3.5202	0.9831
MARCAP	39	0.2210	0.3292
GOVCON	55	0.1648	0.0625
EGUS	28	0.0000	0.0244
GEG	28	0.0464	0.0204
EXTFIN	28	0.2685	0.3586
SKILL	28	11.6355	0.8389
JOB	28	0.1832	0.0408
ENT	28	0.3803	0.0869
CONT	28	0.4871	0.2058
LAB	28	0.3827	0.1029
SMALL	27	0.2179	0.1316

Appendix Table 3.3 GOB and Employment Growth

Dependent Variable: EG_{8089} (Annual Growth Rate of Employment for the Period 1980-1989)

	(1)	(2)	(3)	(4)
LnE	-0.0163***	-0.0160***	-0.0157***	-0.0156***
	(0.0032)	(0.0032)	(0.0032)	(0.0033)
GOB*EGUS	-0.6325***			
	(0.1499)			
GOB*EXTFIN		-0.0460***		
		(0.0130)		
GOB*LAB			0.0524	
			(0.0346)	
GOB*SMALL				0.0204
				(0.0253)
Industry FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
No of country	59	59	59	59
No of obs.	1543	1543	1543	1484
$\mathbf{R^2}$	0.440	0.439	0.432	0.432

Notes: Regressions are estimated by OLS. In the first three columns, the number of industries is 28. In the last column, the number of industries is 27. Robust standard errors are reported in parentheses. ***, [**] and (*) denote statistically significant at 1, [5] and (10) percent levels, respectively.

Appendix Table 3.4 First Stage Results

	(1)	(2)	(3)	(4)	(5)
GOB*GEG	0.7807***	0.5503***	0.7915***	0.8255***	0.6204***
	(0.0369)	(0.0492)	(0.0379)	(0.0364)	(0.0475)
$\mathbf{R^2}$	0.855	0.862	0.854	0.874	0.808

Note: This table shows first stage results of Table 3.2. We just show the coefficients and robust standard errors of IVs. The results of exogenous variables are not reported. All columns include country and industry dummies. ***, [**] and (*) denote statistically significant at 1, [5] and (10) percent levels, respectively.

Appendix Table 3.5 GOB, Alternative Business Environment and Job Creation Opportunities (OLS Results)

Dependent Variable: EG_{8089} (Annual Growth Rate of Employment for the Period 1980-1989)

	(1)	(2)	(3)	(4)	(5)	(6)
LnE	-0.0164***	-0.0169***	-0.0096***	-0.0096***	-0.0170***	-0.0096***
	(0.0035)	(0.0034)	(0.0019)	(0.0019)	(0.0033)	(0.0020)
GOB*EGUS	-0.6275***	-0.5931***	-0.5425***	-0.6563***	-0.5085***	-0.6890***
	(0.1520)	(0.1447)	(0.1893)	(0.1486)	(0.1391)	(0.2142)
FINDEV*EGUS	0.2798					-0.2473
	(0.1813)					(0.1632)
HUMAN*EGUS		1.7537***				0.8361
		(0.5320)				(0.5578)
ENTRY*EGUS			-0.0514			0.0474
			(0.0518)			(0.0834)
LABOUR*EGUS				0.2924		0.1915
				(0.2459)		(0.27332)
RULE*EGUS					0.0994***	0.0762*
					(0.0316)	(0.0463)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
No of country	54	56	52	52	59	46
No of obs.	1409	1475	1385	1385	1543	1234
R^2	0.454	0.446	0.428	0.428	0.445	0.426

Notes: Regressions are estimated by OLS. In each specification, the number of industries is 28. Robust standard errors are reported in parentheses. ***, [**] and (*) denote statistically significant at 1, [5] and (10) percent levels, respectively.

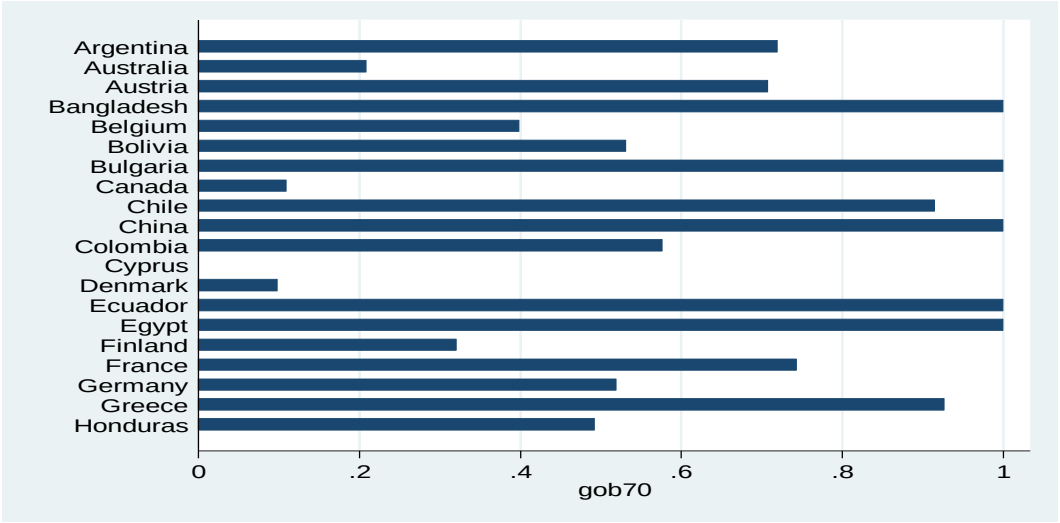
Appendix Table 3.6 GOB, Business Environment and other Relevant Interactions (OLS Results)

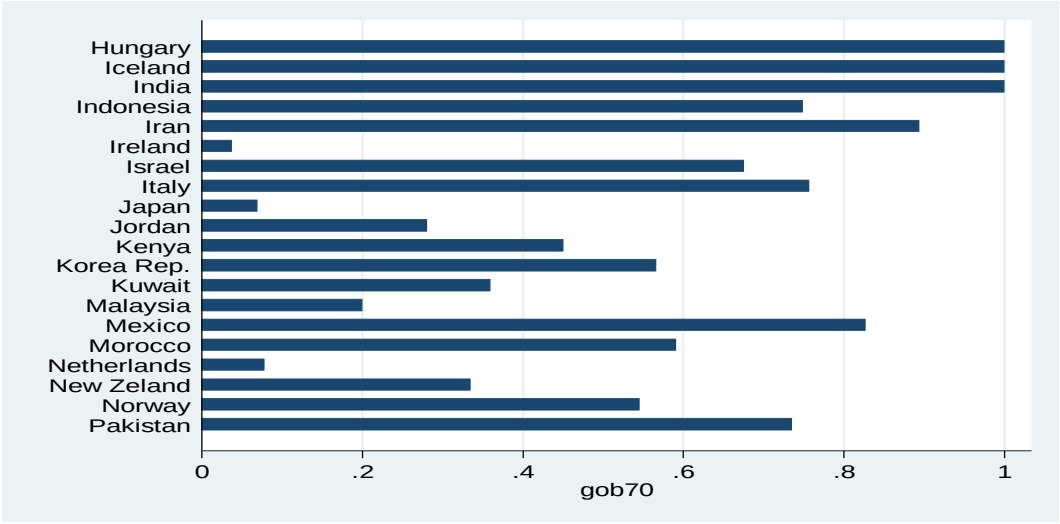
Dependent Variable: EG_{8089} (Annual Employment Growth for the Period 1980-1989)

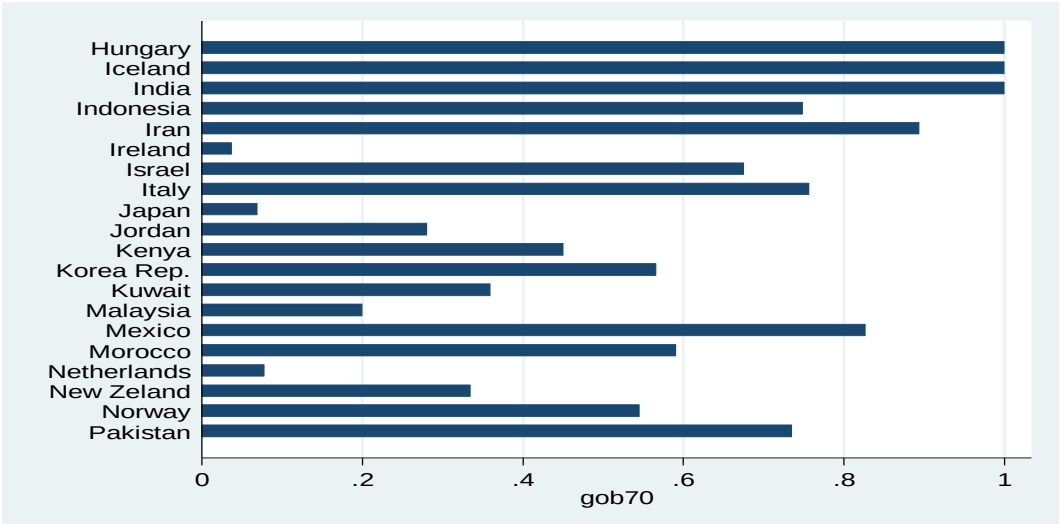
	(1)	(2)	(3)	(4)	(5)	(6)
LnE	-0.0173***	-0.0167***	-0.0097***	-0.0096***	-0.0159***	-0.0098***
	(0.0036)	(0.0034)	(0.0019)	(0.0035)	(0.0032)	(0.0020)
GOB*EGUS	-0.5816***	-0.6399***	-0.5982***	-0.6276***	-0.6431***	-0.5297***
	(0.1516)	(0.1417)	(0.1501)	(0.1423)	(0.1507)	(0.1615)
FINDEV*EXT	0.0558***					0.0369***
	(0.0146)					(0.0108)
HUMAN*SKILL		0.0668***				0.0372***
		(0.0157)				(0.0120)
ENTRY*ENT			0.0088			-0.0279**
			(0.0122)			(0.0126)
LABOUR*JOB				-0.4224***		-0.3464***
				(0.1293)		(0.1257)
RULE*CONT					-0.0054	-0.0094**
					(0.0038)	(0.0041)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
No of country	54	56	52	52	59	46
No of obs.	1409	1453	1385	1385	1543	1234
R^2	0.461	0.449	0.428	0.431	0.441	0.439

Notes: Regressions are estimated by OLS. In each specification, the number of industries is 28. Robust standard errors are reported in parentheses. ***, [**] and (*) denote statistically significant at 1, [5] and (10) percent levels, respectively.

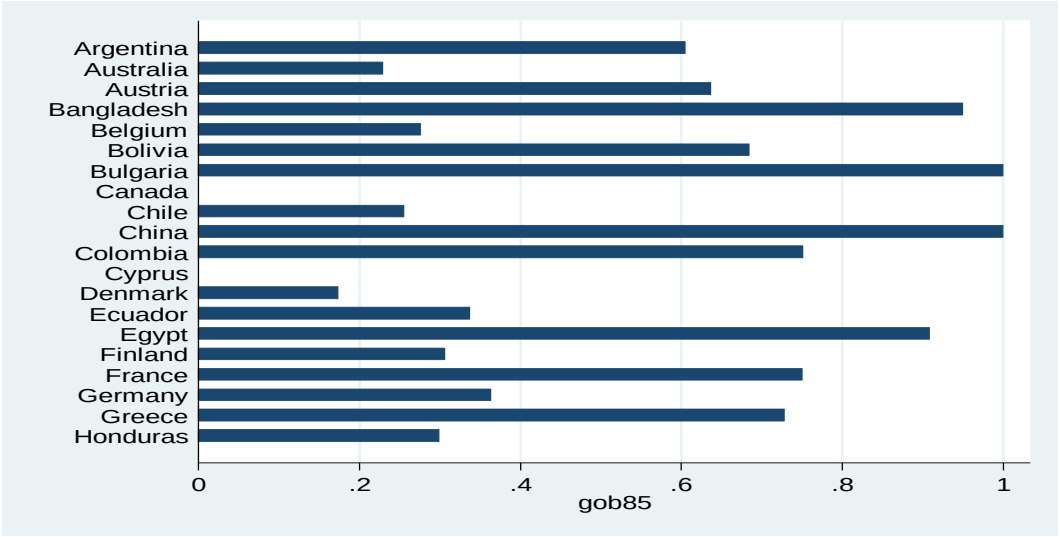
Appendix Figure 3.1 Government Ownership of Banks 1970

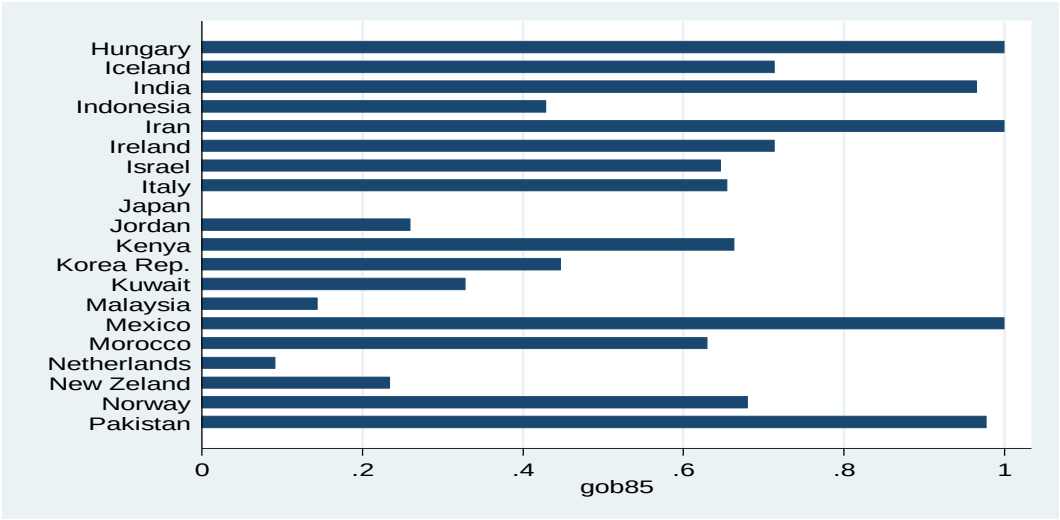


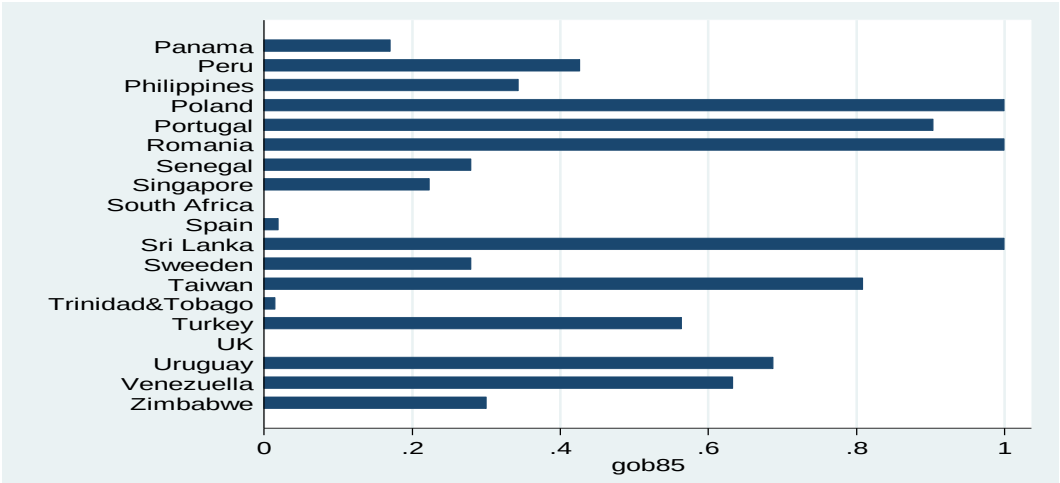




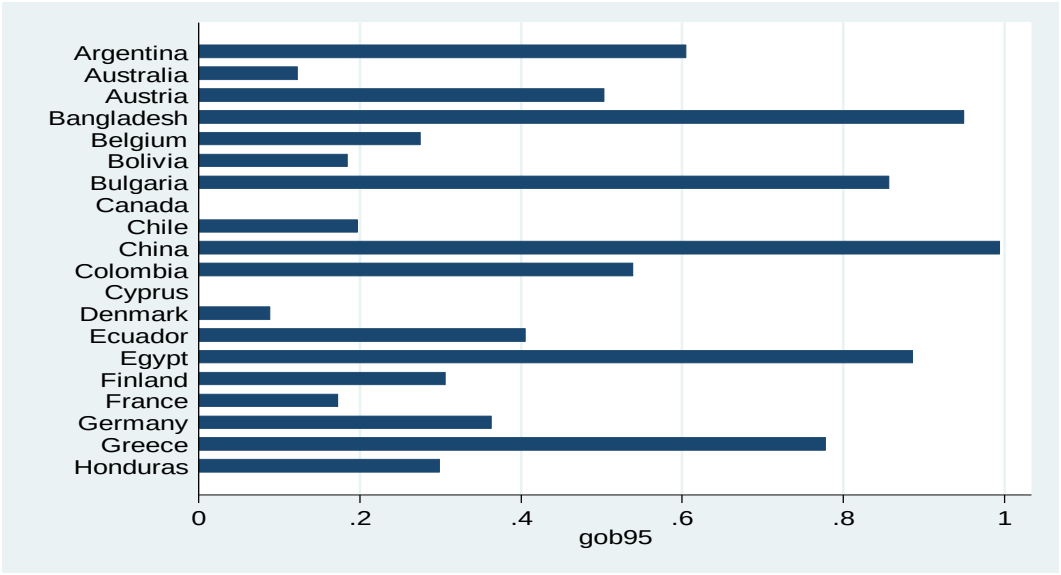
Appendix Figure 3.2 Government Ownership of Banks 1985

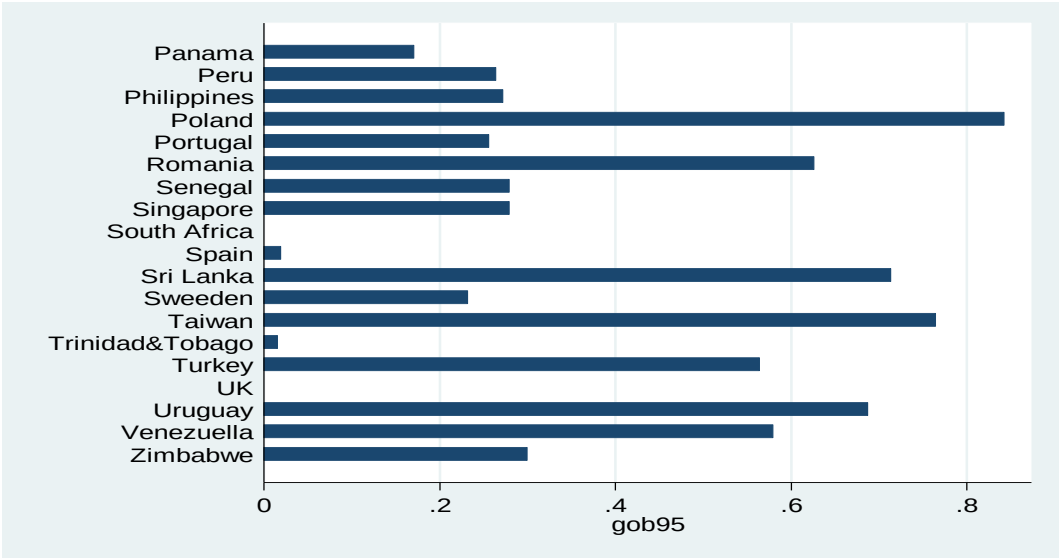


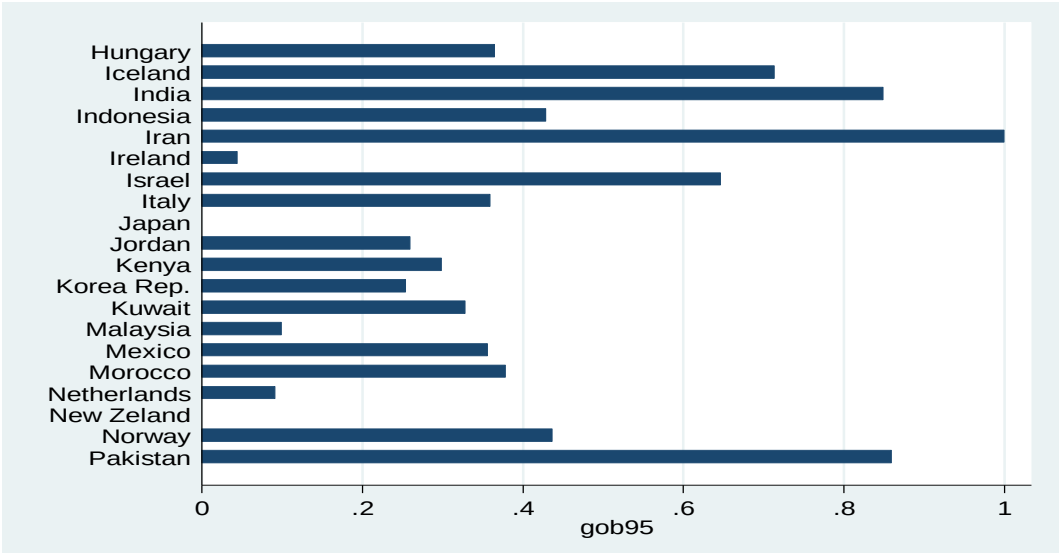




Appendix Figure 3.3 Government Ownership of Banks 1995







Chapter 4

FINANCIAL INTEGRATION, FINANCIAL DEPENDENCE, AND EXPORT[42]

4.1 Introduction

Standard international trade theories predict that cross-country differences in factor endowments and technology determine a country's comparative advantage. However, these theories assume that financial markets are perfect, when in the real world there are frictions in financial markets. The presence of financial frictions implies that financial constraints might affect a country's export performance. Why might financial constraints matter to exports? Exporting is a costly activity and, therefore, more external finance is needed to cover the additional sunk, fixed and variable costs of exporting (Manova, 2010). Sunk and fixed trade costs include learning about the profitability of export opportunities, learning about the profitability of potential export markets, making market-specific investments in capacity, product customization and regulatory compliance, and building and maintaining distribution networks. Some of the additional variable costs are shipping, freight insurance, and applicable trade duties[43].

In line with this argument, theoretical and empirical papers show that external finance opportunities affect the comparative advantage and, therefore, export performance (Kletzer and Bardhan, 1987; Beck, 2002; Beck, 2003; Svaleryd and

[42] This essay is invited for publication in a special issue of ***Emerging Markets Finance and Trade***.
[43] See Manova (2010) for more details about the cost of exporting.

Vlachos, 2005; Hur et al., 2006; Manova, 2008, 2012; Manova, Wei and Zhang, 2011). While a large body of empirical evidence has established the importance of domestic financial development to the sectoral composition of exports, evidence on the effect of financial integration on exports has been limited. Therefore, our focus is on financial integration, rather than domestic financial development.

Why is it important to analyse the impact of financial integration? It is important due to policy considerations and theoretical disputes. Most developed countries relaxed their capital controls on foreign capital flows before 1980. After 1980, many developing countries were recommended to follow the developed countries and open their financial markets to foreign investors. The recent financial integration episode has generated a great deal of debate among economists[44]. Some economists argue that financial integration is essential for prosperity and stability (Fischer, 1998; Summer, 2000; Mishkin, 2006). By contrast, some economists claim that financial integration is associated with greater instability, and therefore it exacerbates economic fluctuations (Stiglitz, 2002; Bhagwati, 2004; Rodrik, 2011). On the other hand, others argue that financial integration might be beneficial under developed financial markets, well established economic institutions and sound macroeconomic policies (Obstfeld and Taylor, 2004; Wolf, 2004).

Financial integration has promised benefits. It has been argued that financial integration augments domestic savings, improves allocation of capital, reduces the cost of external capital and generates technological and managerial know-how. However, unfortunately, the effect of financial integration is quite mixed and controversial (see Kose *et al.*, 2009, 2010; Prasad, Rajan and Subramanian, 2007; Rodrik and Subramanian, 2008; Prasad and Rajan, 2008). Based on this controversial

[44] It is important to note that financial integration is not a new phenomenon. The world has been witnessing different phases of financial integration since the sixteenth century. See Kindleberger (1993), Ferguson (2002) and Obstfeld and Taylor (2004) for a summary of this history.

conclusion, Prasad and Rajan (2008) and Kose *et al*. (2009, 2010) argue that financial integration would not be beneficial directly, but indirectly through financial market development, institutional development, and macroeconomic discipline. These indirect effects are called "collateral benefits".

Financial integration also has some potential costs. International market imperfections, such as momentum trading, herding, panics, and the speculative nature of capital flows can lead to financial volatility, crises and contagion (Prasad *et al.*, 2003; Schumkler, 2008). On the other hand, large foreign capital inflows might also cause exchange rate appreciation, which could lead to a decline in exports (Johnson *et al.*, 2007; Prasad *et al.*, 2007; Rodrik, 2008; Rajan and Subramanian, 2011). Since the results are mixed and controversial in this field, one of the main motivations of this paper is to provide new evidence.

This article contributes to the small literature on the effect of financial integration on the sectoral composition of export flows. Our framework is close to that of Manova (2008). Using a *de jure* measure of financial integration, the official year of equity market liberalisation, Manova (2008) examines the effect of financial integration on exports. As Manova (2008) do, we focus on the impact of financial liberalization on exports. Nevertheless, this paper has two main differences from that of Manova (2008).

First, this paper uses *de facto* measures of financial integration rather than *de jure* measures. While *de jure* measures of financial integration are associated with capital account liberalization policies, *de facto* measures are associated with actual capital flows[45]. Most of the recent papers emphasise that *de jure* measures suffer from

[45] Some of the most commonly used *de jure* measures are: (1) A dummy variable measure of capital account openness, which is created by the information from IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER); (2) Chinn's (1997) capital account openness measure It is also created by using the information from IMF's AREAER; (3) The Chinn-Ito index

a variety of shortcomings (Prasad *et al.*, 2003; Obstfeld, 2008; Kose *et al.*, 2009 and 2010). *De jure* measures do not accurately capture the degree of financial integration because they are based on various restrictions that may not fully stop capital flows. These measures also do not capture the degree of enforcement of capital controls, which can change over time even if the legal restrictions themselves remain unchanged. For example, using *de jure* measures, one might consider many Latin American countries as well as China to be financially disintegrated, when in reality, the volume of capital flows has been relatively large in these countries. Therefore, it would be preferable to use *de facto* measures since they provide a better picture of the extent of a country's integration into global financial markets.

Secondly, this paper considers three different components of financial integration rather than using only one dimension of it. It is important to note that the components of international capital flows differ markedly in terms of volatility and their effects. These three components are: international portfolio equity investments, foreign direct investments (FDI), and external debt. International portfolio equity investments and external debt are substantially more volatile than foreign direct investments (Prasad *et al*., 2003). International portfolio equity investments have the potential to deepen domestic financial markets and improve corporate governance among domestic firms (Levine, 2001; Obstfeld, 2008; Kose, Prasad and Terrones 2009; Bekaert, Harvey and Lundblad, 2010). Even though external debt flows provide some external financial opportunities, they might not be as effective as equity investments. External debt flows might lead to inefficient capital allocation under poorly supervised banking systems and generate moral hazard problems in the case

(*KAOP*) is based on the binary dummy variables that codify the tabulation of restrictions on cross-border financial transactions reported in the IMF's *AREAER;* (4) A dummy variable measure of equity market liberalisation, which is created by using the official year of equity market liberalisation. One of the most widely used *de facto* measures is total external assets and liabilities constructed by Lane and Milesi-Ferretti (2007)

that debt is guaranteed by the government and/or international financial institutions (Kose, Prasad and Terrones, 2009). On the other hand, foreign direct investments (FDI) can generate technology spillovers and provide better management practices (Borensztein *et al.*, 1998; Javorcik, 2004). Therefore, comparing the effects of these three different components of financial integration is crucial.

In sum, for theoretical disputes and policy considerations, it is important to examine whether financially integrated countries export relatively more in industries that are more in need of external finance. This paper uses a cross-industry, cross-country approach (difference-in-difference approach) pioneered by Rajan and Zingales (1998). This approach has two main advantages. First, endogeneity is less problematic in this approach. The problem of endogeneity due to omitted variable bias is unlikely to be a serious problem since we control country and industry fixed effects. Compared to cross-country studies, the problem of endogeneity due to reverse causality is also less likely because there are fewer reasons to think why the export performance of a specific industry should affect financial integration of a country. Nevertheless, we take some steps to address the potential endogeneity problem. Secondly, this approach enables us to test a specific mechanism in which financial integration matters for export activity.

Our results show that the effect of international portfolio equity investments on the sectoral composition of export flows is much stronger and more robust among three different components of financial integration. International portfolio equity investments increase exports relatively more in industries that are heavily dependent on external sources of finance. We also find that this positive effect on exports disappears when the quality of institutions is low. The last result shows that well-functioning institutions are needed to gain from financial liberalization.

The rest of this paper is organized as follows. The next section discusses the previous literature. In section 4.3, we describe our empirical methodology. In section 4.4, we describe our data. In section 4.5, we present our results. In section 4.6, we perform some sensitivity tests. Section 4.7 concludes.

4.2 Literature Review

First of all, this essay is related to literature on finance and export. Theoretical and empirical papers show that financial development affects the comparative advantage, and hence export performance of a country. On the theoretical side, Kletzer and Bardhan (1987), Beck (2002) and Manova (2012) argue that financial development is a source of comparative advantage in the presence of financial frictions. Kletzer and Bardhan (1987) propose a model that shows how credit market imperfections affect the comparative advantage between countries even when their technology and endowments are identical. They presume that more sophisticated goods require more working capital, marketing costs and trade finance. Therefore, they require more external finance to cover these costs. They model two kinds of credit market imperfections: (a) a moral hazard problem in the international credit market under sovereign risk; (b) differences between countries in the contract enforcement of their domestic institutions under incomplete information. Poor reputation and contract enforcement lead to one country facing a higher interest rate or rationed credit compared to another country with a better reputation and rate of contract enforcement. Therefore, the country with lower interest rate or less credit rationing exports goods that require more external finance and imports goods with no need for external finance.

Building on Kletzer and Bardhan (1987), Beck (2002) presents a theoretical model that consists of an open economy with two production technologies, one with constant returns to scale and the other with increasing returns to scale. His model focuses on the role of finance channelling funds from savers to entrepreneurs. Financial intermediaries face search costs when channelling funds. Financial development reduces search costs, and thus increases the level of external financial opportunities in the economy. The producers of goods with increasing returns to scale benefit more from a higher level of financial development more than producers of goods with constant returns to scale, since more external finance allows them to exploit scale economies. Therefore, a more developed financial market not only increases the relative production share of goods with increasing returns to scale, but also the export share of them. In sum, economies with better developed financial systems have a comparative advantage in goods with increasing returns to scale. On the other hand, Manova (2012) adds financial constraints in a heterogeneous-firm model of trade in the spirit of Melitz (2003). She assumes that firms need to find external financial opportunities to finance part of the additional costs associated with exporting activities. According to the model, credit constraints affect firms in different countries and industries unevenly. First, credit constraints differ between countries due to the level of financial development. Firms enjoy better access to external finance in countries with well-developed financial markets. Due to technological reasons, firms in certain industries require more external finance. Industries also differ in their endowments of tangible assets which can serve as collateral. Industries that require more external finance and have fewer tangible assets are called financially vulnerable industries. Manova (2012) finds that financial development increases both the extensive (number of firms exporting) and the

intensive (firm-level exports) margin of trade. She also shows that the effect of financial development is more pronounced in financially vulnerable industries.

On the empirical side, Beck (2003) and Svaleryd and Vlachos (2005) show that economies with higher levels of financial development tend to specialize in industries that are more dependent on external financing. On the other hand, Hur, Raj and Riyanto (2006) find that countries with well-developed financial markets have relatively higher export shares and trade balances in industries with more intangible assets. In parallel with these papers, Manova (2008) exploits shocks to the availability of external finance and examines the effect of equity market liberalization on export. Her results show that equity market liberalization increases exports relatively more in industries intensively using external financing and intangible assets. Using a data set of Chinese firms, Manova, Wei and Zhang (2011) find that foreign-owned affiliates and joint ventures have better export performance than private domestic firms, and that the advantage is higher in industries that require more external finance or have fewer assets capable of acting as collateral. She underlines that these results are consistent with the argument that foreign owned firms overcome their credit constraints by compensating for domestic financial market imperfections and accessing better funding opportunities.

Second, our paper is related to recent literature on the effects of financial liberalization. While most of the papers use cross-country data in this literature, there are also some papers that employ a cross-industry, cross-country approach. Using cross-country data, there are early papers that make important contributions to this literature (for example, Quinn, 1997 and Rodrik, 1998). Here we emphasise more recent contributions. Using cross-country data, Edison *et al.* (2002) provide a comprehensive analysis of the relationship between financial integration and

economic growth, by using both *de jure* measures and *de facto* measures. Their results show that there is no statistically significant effect of financial integration on economic growth. Using the official date of equity market liberalization as a proxy for financial integration, Bekaert *et al.* (2005) provide empirical evidence that equity market liberalisation increases economic growth even after controlling for other macro-reforms, financial development, banking crises and the quality of institutions. In another cross-country study, Bekaert *et al.* (2010) show that financial integration increases capital stock growth and total factor productivity (TFP), but it has more impact on TFP. The authors attribute this effect to the role that financial integration plays in the stock market, banking sector development, and institutional quality improvement. They also show that the positive effects of equity market liberalisation are higher in countries with well-developed financial markets and high quality institutions. Kose, Prasad and Terrones (2009) examine the effect of financial integration on TFP growth by using not only *de jure* measures, but also *de facto* measures. They find that FDI and portfolio equity liabilities increase TFP growth, while external debt has a negative effect on TFP growth. Their results also show that the negative effect of external debt on TFP growth is attenuated in economies with higher levels of financial development and better institutions.

There are also some important studies, which contribute to this literature by using industry level data. In one of the earlier attempts, Vlachos and Waldenström (2005) find that financial integration doesn't have positive effects on the growth financially dependent industries. On the other hand, they find that financial integration increases the growth rates of both output and firm creation among externally dependent industries in countries that have a relatively high level of financial development. In contrast to the previous papers, Prasad, Rajan and Subramanian (2007) find that

industries that are dependent on external finance grow relatively faster in countries that receive more foreign capital. But for countries with low financial development, the effect of foreign capital inflows is opposite. Gupta and Yuan (2009) investigate the impact of equity market liberalization on industry growth in developing countries. They find that industries that are more externally dependent on finance and face better growth opportunities grow relatively faster after equity market liberalization. Their results also indicate that the effect of equity market liberalization is stronger if those industries are located in countries that allocate capital more efficiently. Eichengreen, Gulapelli and Ranizza (2011) study the effect of financial integration on industry growth after controlling for financial crises. They show that industries highly depend on external financing experience higher growth in countries with liberalized financial markets. But, the positive effects of financial integration don't hold during financial crises. Their results also show that the positive effects of financial liberalization are limited to countries that are more financially developed and have higher quality of institutions.

These four papers focus mainly on the growth effect of financial integration. As indicated before, financial integration might increase volatility. Levchenko, Ranciere and Thoenig (2009) consider this issue and examine the relationship between financial integration and volatility at the industry level in a large sample of countries. They find that financial integration increases not only output growth, but also volatility of output. But, those effects are not long-lasting. Different than the previous papers, Maskus, Neumann and Seidel (2012) examine the impact of financial integration on R&D intensities in OECD countries. Among multiple forms of financial integration (portfolio equity, FDI and debt), only FDI has significant effect.

They find that the stock of FDI liabilities and assets relative to GDP increases R&D intensity more in industries intensively using external financing and intangible assets.

4.3 Data

This paper uses industry level export data from Nicita and Olarrega (2007). Since most of the country level data is widely available after mid 1990s, we wish to use the most recent data available for industry level export data as well. For this reason, our dependent variable is average of total exports for industries of 3-digit International Standard Industrial Classifications (ISIC) classification over 1996-2004. We average total exports in order to smooth the effects of any year to year fluctuations in the level of total exports across industries.

This paper uses three different variables that describe financial integration. Portfolio equity investment measures ownership of shares of companies and mutual funds below the 10% threshold. Foreign direct investment includes controlling stakes in acquired foreign firms at least 10% of an entity's equity, as well as greenfield investments. External debt includes portfolio debt securities, plus bank loans and deposits and other debt instruments. The financial integration variables are from Lane and Milesi-Ferretti (2007). As in the previous literature, we use the stock of assets and liabilities. Using stock of assets and liabilities is preferable to using capital flows because the flows tend to be more volatile and suffer more from measurement error (Lane and Milesi-Feretti, 2001, 2007; Vlachos and Waldenström, 2005; Kose *et al.* 2009)[46]. Even if stocks of assets and liabilities do not have sharp fluctuations across

[46] It might be argued that stocks of international portfolio equity investments, FDI and debt (as a share of GDP) might likely to proxy for the development level of countries. We control this argument by including an interaction term between external financial dependence and GDP per capita in our results. .

short period, we use averages over 1996-2004 to smooth the effects of any potential fluctuations[47]. PORT is the stock of portfolio equity assets and liabilities as a share of GDP. FDI is the foreign direct investment asset and liabilities as a share of GDP. DEBT is the stock of foreign debt assets and liabilities as a share of GDP. We use the sum of international assets and liabilities relative to GDP for each indicators of financial integration, which is similar to using the sum of exports and imports relative to GDP as an indicator of trade openness. We include both assets and liabilities since theoretical concepts of financial integration include both the ability of foreigners to invest in a country and the ability of residents to invest abroad. This strategy is followed by Edison *et al.* (2002) and Maskus, Neumann and Seidel (2012). As a robustness check, we also use stock of liabilities[48]. This strategy is followed by Vlachos and Waldenström (2005) and Kose, Prasad and Terrones (2009).

Financial development (FD) is measured as the share of private credit by deposit money banks and other financial institutions to GDP. This variable is from the Financial Development and Structure Database (FDSD), which is constructed by Beck and Demirguc-Kunt (2009). It would be interesting to take into account trade finance. But, to the best of our knowledge, there is no available cross-country dataset that provides direct measurements of trade finance. Therefore, this literature uses domestic financial development in order to study the effects of domestic financial opportunities on export flows. We also use the Chinn-Ito index (KAOP) as a *de jure* measure of financial integration. KAOP is constructed by Chinn and Ito (2006). KAOP is an index measuring a country's degree of financial integration by using the

[47] The results are same when we use initial values (year 1996) of financial integration variables instead of average values.

[48] Results are shown in the Appendix. PLIB is the stock of portfolio equity liabilities as a share of GDP. FLIB is the foreign direct investment liabilities as a share of GDP. DLIB is the stock of foreign debt liabilities as a share of GDP.

binary dummy variables that codify the tabulation of restrictions on cross-border financial transactions reported in the IMF's AREAER. This index ranges from -1.84 to 2.48. Higher values imply higher financial integration. The measure for rule of law (RULE) is from Worldwide Governance Indicators. This variable captures perceptions of the extent to which agents have confidence in the quality of contract enforcement, property rights, the police, and the courts. Our measure of labour regulation (LR) is an index constructed by Botero *et al.* (2004). This index is constructed by examining detailed provisions in the labour laws regarding the existence of alternative employment contracts, the cost of increasing hours, the cost of firing, and the formality of dismissal procedures. As a measure for the regulation of entry, we use data from Djankov *et al.* (2002). Regulation of entry (ER) is the amount of time required by an entrepreneur to complete the legal procedures for starting a new business. Market capitalization (MARCAP) is the stock market capitalization divided by GDP. This is also from Beck and Demirguc-Kunt (2009). Real per capita GDP (GDP) is taken from the Penn World Tables. Measures of factor endowments are from Caselli (2005). Physical capital per worker is used as a proxy for capital endowments. Physical capital per capita (C) is calculated according to the perpetual inventory method. Human capital per worker (H) is constructed from the average years of schooling in a country with Mincerian non-linear returns to education.

The industry level proxies used in this paper are measured for 3-digit ISIC manufacturing industries in US. They come from various sources. Industry dependence on external financing (FINDEP) is defined as the industry-level median of the ratio of capital expenditure minus cash flow to capital expenditure for US firms during 90s. Some of the industries that highly dependent on external finance are: 322

Wearing Apparel, except footwear; 352 Other Chemicals; 354 Misc. petroleum and coal products; 382 Machinery, except electrical; 383 Machinery, electric; 385 Professional and Scientific Equipment. Tangibility of assets (TANG) is measured as the ratio of tangible assets to total assets. FINDEP and TANG are from Ilyina and Samaniego (2011).

Our proxy for industry contract intensity (CONT) is formulated by Nunn (2007) to measure the importance of relationship-specific investments across industries by using 1997 US input-output table. It is computed as the weighted average of relation specificity of all intermediate inputs used. Our proxy for industry technological volatility (VOL) is the standard deviation over the absolute value of mean annual growth rate in value added. This proxy is from Braun (2003). Entry rate (ENTRY) is defined as the number of new firms divided by average number of firms at 3-digit ISIC industries for the US. This data is from Dunne *et al.* (1988) and Micco and Pages (2007).

Physical capital intensity (CAPINT) corresponds to the median of the ratio of gross fixed capital formation to value added in the US in each industry. The index for human capital intensity (HUMINT) is the median of the industry's mean wage over that of the whole U.S. manufacturing sector. The original dataset for CAPINT and HUMINT are UNIDO's dataset. CAPINT and HUMINT are from Braun (2003). Appendix Table 4.1 describes our variables and Appendix Table 4.2 provides summary statistics of our variables.

4.4 Empirical Methodology

Our empirical methodology is based on cross-industry, cross-country (difference-in-difference) approach pioneered by Rajan and Zingales (1998). They follow the theoretical idea that financial markets help firms to overcome problems of moral hazard and adverse selection, thus financial development should disproportionately help firms that need more external finance. Rajan and Zingales (1998) hypothesize that there are underlying technological reasons why industries differ in their use of external financing opportunities, and that these persist across countries. As Rajan and Zingales (1998) and Ilyina and Samaniego (2011) underline, initial project scale, the requirement for continuing investment, the gestation period and the cash harvest period differ between industries. Some industries need more working capital to buy their production technologies every period before the production process (Beck, 2003). Industries with higher initial project scale, longer gestation and harvest period and higher requirement for continuing investment depend more on external finance than other industries. While some industries can fund all necessary investments with their internal cash flows, some industries need to get external funds in order to cover their expenses of investments. Therefore, for example, chemical, petroleum and machinery industries are naturally depend more on external financing.

In an economy where financial markets work relatively frictionless, the supply of external financing will be elastic. Therefore, differences in the actual use of external funds will reflect not the supply of external financing opportunities, but differences in demand for this type of opportunities. They use US micro-level data to derive the typical external financial dependence of a given industry. There are mainly two reasons that explain why this approach uses US as a benchmark for industry

structure. First of all, rich and high quality industry level data is available for US. Secondly, financial markets in US are relatively frictionless compared to other countries. In this approach, level of financial dependence of each industry's is not important for identifying the coefficients. But, it is the ranking of financial dependence of each industry's that matters. In chapter 3, we instrument US-based proxy for industry job creation opportunities in order to take into account measurement error bias. But, we don't use same technique for other US based industry structure proxies. As mentioned above, there are mainly two reasons of this. First of all, as can be seen in the previous literature, other US based industry structure proxies (e.g. external financial dependence, contract intensity, human capital intensity, and etc.) are not as noisy as US based proxies for industry job creation opportunities and investment opportunities (see Rajan and Zingales, 1998; Fisman and Love, 2007; Nunn, 2007; Ciccone and Papaioannou, 2007, 2008, and 2011; Cunat and Melitz, 2012). Secondly, there is no available cross-country industry level datasets that can be used to construct alternative (global) proxies for other industry structures. Under the assumption that technological differences within the same industry across countries are likely to be small, US industry characteristics is used as a proxy for industry structure in this literature. To examine whether financially integrated countries export relatively more in financially dependent industries, the following equation is estimated:

$$\ln Export_{ic} = \gamma_c + \alpha_i + \beta(FI_c * FINDEP_i) + \varepsilon_{ci} \quad (4.1)$$

where $\ln Export_{cit}$ is the log value of country c's exports in industry averaged over 1996-2004; α_i and γ_c are industry and country dummies respectively; FI_c denotes the level of financial integration in country c; $FINDEP_i$ denotes industry i's need for

outside financing, which is measured using the U.S data and error term is denoted by ε_{ic}[49]. Following Nunn (2007), Manova (2008) and Cunat and Melitz (2012), export flows are measured in the natural log form to normalize the distribution, and thus to make our estimates less sensitive to extreme observations[50]. As discussed above, FI_c includes three different terms: $PORT_c$, FDI_c, and $DEBT_c$. The inclusion of country and industry dummy variables implies that we do not need to specify any industry- nor country specific variables that might affect industry growth. Only additional explanatory variables that vary both with industry and country need to be included. The US (the benchmark country) is excluded from the regressions. If β is positive and significant, this suggests financial integration increases export relatively more on industries that are technologically more dependent on external finance.

As indicated before, the main advantage of this approach is that the problem of endogeneity due to omitted variable bias is unlikely to be a serious problem since the model controls for country and industry fixed effects. The interaction term between industry-specific characteristics (financial dependence) and country specific characteristics (financial integration) is likely to be exogenous to the dependent variable (export). While the proxy for dependence on external finance belongs to industries in the US, the dependent variable (export) involves countries other than the US. It is less likely that export performance outside the US might affect external financial dependence in the US. While the variables for financial integration are measured at country level, export is measured at industry level. Therefore, compared with cross-country regressions, reverse causality is less likely to occur. Nevertheless, some strategies have been used in order to mitigate the potential reverse causality

[49] Following the previous papers that use Rajan and Zingales's (1998) methodology, we use robust (heteroskedasticity-adjusted) standard errors. But, our findings are robust to use clustered standard errors.
[50] See Wooldridge (2009, p.191).

problem.

4.5 Results

4.5.1Different Dimensions of Financial Integration

In Table 4.1, we interact three measures of financial integration (PORT, FDI, and DEBT) with external financial dependence (FINDEP). As seen in column (1), the estimated coefficient of PORT*FINDEP is positive and statistically significant at 1%. Column (2) shows that the coefficient on the interaction between FDI and external dependence (FDI*FINDEP) is positive, but it is not statistically significant. On the other hand, column (3) shows that DEBT*FINDEP is positive and statistically significant at 1%. Results in column (4) show that when we take into account all three dimensions of financial integration simultaneously, only the coefficient on the interaction term between the stock of portfolio equity investments and external financial dependence is statistically significant. This result suggests that international portfolio equity investments increase exports more in industries that are dependent on external finance.

To understand the impact of international portfolio equity investment, we compare miscellaneous petroleum and coal products, which is an industry at the 75th percentile of financial dependence (0.256), with pottery, china and earthenware, which has low financial dependence (-0.09) and is at the 25th percentile of dependence. Then we consider Malaysia, which has high international portfolio equity investments (0.208) at the 75th percentile of the sample, and Moldova, which is at the 25th percentile of PORT with a value of 0.007. The coefficient of PORT*FINEXT (0.3831), as seen in column (1), implies that that miscellaneous

petroleum and coal products' exports increase by 1.8 percent more than pottery's exports in Malaysia in comparison to Moldova[51].

Table 4.1 Financial Integration and Export

Dependent Variable: lnexport (log of exports averaged over 1996-2004)				
	(1)	**(2)**	**(3)**	**(4)**
PORT*FINDEP	0.3831***			0.4825***
	(0.0761)			(0.1364)
FDI*FINDEP		0.1281		-0.1261
		(0.0892)		(0.0797)
DEBT*FINDEP			0.0878***	-0.0076
			(0.0261)	(0.0446)
Country FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
No of countries	96	96	96	96
No of obs.	2680	2680	2680	2680
R^2	0.831	0.830	0.830	0.831

Notes: Regressions are estimated by OLS. In each specification, the number of industries is 28. Robust standard errors are reported in parentheses. ***, [**] and (*) denote statistically significant at 1, [5] and (10) percent levels, respectively.

International portfolio equity investments deepen domestic financial markets and therefore provide more direct channels for new financial opportunities. Even if external debt might provide new funding opportunities, they are more volatile and

[51] As indicated above, we also use stock of liabilities as a measure of financial integration. We provide results in the Appendix Table 3, 4, 5, 6 and 7. These results indicate same conclusion. Among three different financial integration measures (international portfolio equity liabilities, foreign direct investment liabilities and foreign debt liabilities) only the effect of portfolio equity investment liabilities is statistically significant. International portfolio equity investment liabilities increase export disproportionately more in industries that are heavily dependent on external finance. To understand the impact of international portfolio equity liabilities, we compare miscellaneous petroleum and coal products, which is an industry at the 75th percentile of financial dependence (0.256), with pottery, china and earthenware, which has low financial dependence (-0.09) and is at the 25th percentile of dependence. Then we consider Japan, which has high international portfolio equity investment liabilities (0.111) at the 75th percentile of the sample, and Qatar, which is at the 25th percentile of PLIB with a value of 0.007. The coefficient of PLIB*FINEXT (0.3831), as seen in column (1) of Appendix Table 4.3, implies that that miscellaneous petroleum and coal products' exports increase by 2 percent more than pottery's exports in Japan in comparison to Qatar.

less efficient at allocating capital to the best uses. While Harrison, McMillian and Love (2004) find that FDI reduces domestic firms' financing constraints, their main potential benefits work through generating technology spillovers and providing better management practices (Borensztein *et al.,* 1998; Javorcik, 2004). Based on these arguments and our results, the stock of international portfolio equity investments seems to matter more to the export performance of financially dependent industries.

As discussed before, industries with an inherent financial dependence tend to export more in countries with deep financial systems. Therefore, it is important to control for domestic financial development. We do this by including an interaction term on domestic financial development and external financial dependence (FD*FINDEP). Table 4.2 shows that the coefficient of FD*FINDEP is always positive and highly significant. This result confirms previous studies by showing that domestic financial development affects comparative advantage. Among our three main interaction terms, only the coefficient of PORT*FINDEP is statistically significant after controlling for domestic financial development. Therefore, the results in Table 2 reinforce our first results. The stock of international portfolio equity investments increase exports by reducing the costs of external finance to industries. Therefore, we drop the FDI and debt variables from here onwards because our initial results show that international portfolio equity investments matter for export performance. In the next section, we investigate the strength of the effect of international portfolio equity investments.

Table 4.2 Financial Integration, Financial Development and Export

Dependent Variable: lnexport (log of exports averaged over 1996-2004)			
	(1)	**(2)**	**(3)**
PORT*FINDEP	0.2608***		
	(0.0725)		
FDI*FINDEP		-0.0573	
		(0.031)	
DEBT*FINDEP			0.0352
			(0.0320)
FD*FINDEP	0.2467**	0.4326***	0.3399***
	(0.1003)	(0.1106)	(0.0988)
Country FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
No of countries	92	92	92
No of obs.	2568	2568	2568
R^2	0.829	0.828	0.828

Notes: Regressions are estimated by OLS. In each specification, the number of industries is 28. Robust standard errors are reported in parentheses. ***, [**] and (*) denote statistically significant at 1, [5] and (10) percent levels, respectively.

4.5.2 International Portfolio Equity Investments and the Sources of Comparative Advantage

In Table 4.3, we include different interaction terms that reflect the traditional and new sources of comparative advantage. Readers should focus more on Table 4.3 because it controls all other relevant interaction terms that has been used in the previous literature as the traditional and new sources of comparative advantage. Therefore, they give us most reliable results. It is also important to note that this essay is more generous than the previous papers in controlling the traditional and new sources of comparative advantage. Previous papers generally include two or three relevant

interaction terms, and most of them don't include them simultaneously. In sum, their results are not as generous as results shown in this essay.

First, we include different interactions between countries' endowments and their interactions with the factor intensity of each factor to control for the traditional sources of comparative advantages. These interaction terms are C*CAPINT and H*HUMINT. Table 4.3 also shows that the effect of C*CAPINT is positive, but it is not statistically significant. On the other hand, countries with a high level of human capital experience better export performance in human capital intensive industries. The coefficient of PORT*FINDEP is always positive and statistically significant at 1% even after controlling for the traditional sources of comparative advantage.

Previous studies indicate the impact of institutional quality on international trade (Levchenko, 2004; Nunn, 2007). In an influential paper, Nunn (2007) finds that countries with good contract enforcement export more in industries for which relationship-specific investments are more important. To control this effect, we add an interaction term between the rule of law and industry contract intensity (RULE*CONT). Column (3) of Table 4.3 shows that the coefficient of this interaction term is positive and statistically significant, suggesting that countries with good contract enforcement export relatively more in contract-intensive industries export. In addition to contracting institutions, regulations might affect export performance. For example, entry regulations reduce competition, hinder the creative destruction process, and thus result in low productivity and comparative disadvantage. Pang, Wu and Xu (2010) show that entry regulations discourage exports more severely in industries with low natural entry barriers (higher entry rate). Therefore, we also use an interaction term between entry regulations and industry entry rate (ER*ENT). As seen in column (5), entry regulations reduce exports more in

industries that should naturally have high entry. In addition to entry regulations, labour market regulations might matter, but through a different channel. Differences in labour market regulations might affect how firms and industries can adjust to idiosyncratic demand and productivity shocks. Based on this argument, Cunat and Melitz (2012) formalize a model where these regulatory differences interact with industry specific differences in volatility to generate industry level differences in relative productivity, and hence a new source of comparative advantage. Their empirical evidence shows that countries with more flexible labour markets export more in industries where adjustment to these idiosyncratic shocks is important. We also add an interaction term between an index for labour market regulations and industry level volatility measure (LR*VOL). As in Cunat and Melitz (2012), the coefficient of LR*VOL is negative. However, it is not statistically significant. In the last column, we control all relevant interaction terms that represent the traditional and new sources of comparative advantage (PORT*FINDEP, FD*FINDEP, C*CAPINT, H*HUMINT, RULE*CONT, ER*ENTRY and LR*VOL). The last column of Table 4.3 shows that the coefficients of C*CAPINT, FD*FINDEP and LR*VOL is not statistically significant. Reassuringly, Table 4.3 indicates that the significance of our main interaction term (PORT*FINDEP) persists even after controlling the traditional and new sources of comparative advantage.

Table 4.3 International Portfolio Equity Investments and the Traditional and New Sources of Comparative Advantage

Dependent Variable: lnexport (log of exports averaged over 1996-2004)						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
PORT*FINDEP	0.3586***	0.3377***	0.3232***	0.3661***	0.3822***	0.2491***
	(0.0815)	(0.0798)	(0.0617)	(0.0715)	(0.0715)	(0.0828)
FD*FINDEP						0.1047
						(0.1107)
C*CAPINT	0.4516					-0.3505
	(0.5601)					(0.7476)
H*HUMINT		1.1414***				1.2028***
		(0.1969)				(0.2458)
RULE*CONT			0.8865***			0.8562***
			(0.1470)			(0.2000)
ER*ENTY				-0.7247**		-0.7160**
				(0.3200)		(0.3212)
LR*VOL					-0.0673	0.0556
					(0.1526)	(0.1596)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
No of countries	72	70	96	68	71	52
No of obs.	2010	1954	2680	1903	1987	1455
$\mathbf{R^2}$	0.833	0.839	0.834	0.853	0.853	0.853

Notes: Regressions are estimated by OLS. In each specification, the number of industries is 28. Robust standard errors are reported in parentheses. ***, [**] and (*) denote statistically significant at 1, [5] and (10) percent levels, respectively.

4.5.3 Sensitivity Tests

In Table 4.4, we provide some sensitivity tests. Manova (2008) also shows that equity market liberalization results in a reallocation of exports towards industries with greater reliance on external finance and intangible assets. For now, we do not take into account industries that use more intangible assets. Under financial frictions, tangible assets are required as collateral to access credit. Therefore, industries with

more tangible assets export relatively more in countries with limited financial opportunities. To control this argument, we add an interaction term between international portfolio equity investments and tangibility of industry (PORT*TANG). As seen in Column (1), the estimated coefficient of this interaction term is negative, suggesting that international portfolio equity investments increase exports more in industries with more intangible assets. After adding PORT*TANG, our main interaction term is still positive and statistically significant at 1%. In sum, our results show that the effect of international portfolio equity investments are more pronounced in financially vulnerable industries.

It might also be argued that a higher need for continuing investment makes capital intensive industries more financially dependent (Ilyina and Samaniego, 2011). As a second argument, capital intensive industries might find relatively more funds in less developed financial systems because they can provide more fixed assets which can be used as collateral. In order to take into account these arguments, we include an interaction term between international portfolio investment and physical capital intensity (PORT*CAP). Results in column (2) shows that PORT*CAP is negative. This favours the second argument, but the effect is not statistically significant.

As discussed above, *de jure* measures of financial integration are frequently used in the literature because they are related to capital account liberalization policies. We follow Kose, Prasad and Terrones (2009) and distinguish between *de jure* financial integration, the absence of restrictions on capital account transactions, and *de facto* financial integration. To see how both measures of financial integration affect exports, we also include an interaction term between a *de jure* measure of financial integration and financial dependence (KAOP*FINDEP). As seen from the results in column (3), we find that both PORT*FINDEP and KAOP*FINDEP are

positive and statistically significant, indicating that the effect of international portfolio equity investments holds, even after controlling for capital account liberalization policies.

In our benchmark results, we use the share of private credit by deposit money banks and other financial institutions to GDP as a proxy for financial development. It might be argued that the stock of international portfolio equity investments simply capture other dimensions of financial development. Therefore, we also control for stock market capitalisation over GDP, which is another important aspect of financial development. Column (4) shows that the coefficient of STOCK*FINDEP estimate is small and not statistically significant, and the estimate of PORT*FINDEP remains unaltered. One might also argue that the effect of international portfolio equity investments is significant, simply because it captures the effect of economic development. Column (5) shows that portfolio equity investments still increase the export performance of financially dependent industries, even after the country's level of economic development is accounted for.

As indicated previously, Rajan and Zingales's (1998) approach helps to alleviate endogeneity problems that might occur due to omitted variable bias and/or reverse causality. Omitted variable bias is unlikely to be a serious problem since the model controls for country and industry fixed effects. The reverse causality is also less of a concern in this approach since there is no reason why the export performance of a specific industry should affect the financial integration level in the country as a whole. Therefore, recent papers on the effects of financial integration (e.g. Prasad, Rajan and Zingales, 2007; Manova, 2008, 2012; Manova, Wei and Zhang, 2011; Levchenko, Ranciere and Thoenig, 2009; Eichengreen, Gulapelli and Ranizza, 2011, Maskus, Neumann and Seidel, 2012) use this strategy without using an IV estimation

method. Even if our export data is at industry level, some sceptics might claim that the export performance of a country might affect the degree of financial integration. Rajan and Zingales (2003a, 2003b) argue that trade openness might stimulate financial development. There are also empirical papers that provide support to this argument (for example, Do and Levchenko, 2007; Braun and Raddatz, 2008). Therefore, it can be also argued that trade openness reduces obstacles to financial integration, and creates incentives for it. Besides, it is important to take into account measurement error. Even if we use *de facto* measures of financial integration, it is important to note that measurement error is substantial for variables that measure financial integration. As highlighted by Lane and Milesi-Ferretti (2007), there are two main causes of potential measurement error. The first reason is the incomplete reporting of the balance of payments by some countries. The second is the difficulty of tracking increasingly complex international financial transactions. Although our approach helps us to get around the omitted variable bias and reverse causality problem, we use an instrumental variable estimation strategy in order to address the concerns of sceptics and potential measurement error problems.

We use the instrumental variable (IV) estimation technique. Edison *et al.*, (2002) and Alfaro and Charlton (2006) use each country's legal origin as an instrument for financial integration. La Porta *et al.*, (1997, 1998, and 2008) suggest that legal traditions affect both the laws governing financial transactions and the enforcement of these laws. Therefore, measures of legal origin have been used as exogenous determinants of financial integration. There are five main distinct legal systems: English common law, French civil law, German civil law, Socialist civil law and Scandinavian civil law. Most countries adopted one of these legal systems through colonialism, conquest, or outright borrowing. These systems differ in terms

of protection of property rights, shareholders and creditors. A country's legal origin shapes the way it protects property rights, shareholders and creditors, and therefore will affect the financial system of that country. In sum, we follow Edison *et al.*, (2002) and Alfaro and Charlton (2006) and use legal origin variables as instruments for portfolio equity investments. Following the geography (endowment) view, Edison *et al.,* (2002) also use the absolute value of latitudinal distance from the equator as an additional instrument for financial integration. Countries with a poor geographic environment tend to encounter increased inequality between the elite and the rest of the population, which in turn engenders institutions that are closed to competition and free markets. On the other hand, countries with a better geographic environment tend to create institutions that protect property rights and are open to competitive and free markets. In sum, legal traditions and geography influence the economic and political institutions that shape the financial systems of countries, and they are used as instrumental variables for financial integration[52].

Column (6) shows our result when we use legal origins as instrumental variables for international portfolio equity investments. Column (7) shows our results when we use legal origins and the absolute value of latitudinal distance from the equator as instrumental variables. Our first stage F-statistics are above the critical value of 10 and thus the p-value of the first stage F-statistics is zero, suggesting that we reject the hypothesis that our instruments are weak at the 1% significance level. The relevance of instruments is also confirmed by a high Shea R^2. Sargan test results for the over-identifying restrictions indicate that the instruments meet the exclusion restrictions. As seen in the last two columns, our 2SLS results also provide evidence that portfolio equity investments increase exports relatively more in industries that

[52] See Beck, Demirguc-Kunt and Levine (2003) for more details about the role of law and geography on financial opportunities.

require more external finance. Our results show that IV estimates are larger than OLS estimates. Financial measures are generally noisy, and therefore OLS estimates are downward biased in the presence of measurement error problems. Hence, IV estimates are usually higher than OLS estimates for different measures in the finance literature[53].

[53] Some examples can be seen from Rajan and Zingales (1998), Beck *et al.* (2001), Beck, Demirguc-Kunt and Levine (2006), Svaleryd and Vlachos (2005), Vlachos and Waldenström (2005).

Table 4.4 Sensitivity Tests

Dependent Variable: lnexport (log of exports averaged over 1996-2004)							
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
PORT*FINDEP	0.3478*** (0.0763)	0.3830*** (0.0798)	0.3166*** (0.0864)	0.3045*** (0.0751)	0.2818*** (0.0695)	1.0110*** (0.2675)	0.8396*** (0.2114)
PORT*TANG	-0.7684* (0.3988)						
PORT*CAP		-0.4683 (1.5634)					
KAOP*FINDEP			0.0536* (0.0278)				
STOCK*FINDEP				0.0865 (0.0945)			
GDP*FINDEP					0.0919*** (0.0358)		
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No of countries	96	96	94	86	96	96	96
No of obs.	2680	2680	2624	2404	2680	2680	2680
R^2	0.831	0.831	0.833	0.826	0.832	0.827	0.829
1st Stage F-stat (p-value)	-	-	-	-	-	0.00***	0.00***
Shea R^2	-	-	-	-	-	0.140	0.268
Sargan test (p-value)	-	-	-	-	-	0.730	0.667

Notes: Regressions are estimated by OLS in the first five columns. Regressions are estimated by 2SLS in the last two columns. In each specification, the number of industries is 28. Robust standard errors are reported in parentheses. ***, [**] and (*) denote statistically significant at 1, [5] and (10) percent levels, respectively.

4.5.4 Country Heterogeneity

The previous results show that the effect of financial integration on exports is not homogenous. First, we show that this effect is heterogeneous across industries. Secondly, among three different financial integration measures, only the effect of international portfolio equity investments is statistically significant. It is also

important to ask whether this effect is uniform across countries. In this section, we allow not only for heterogeneity across industries but also for heterogeneity across countries. Bekaert *et al.,* (2005, 2010) and Kose, Prasad and Terrones (2009) find that financial integration is more beneficial in countries that are more financially developed or have a higher quality of institutions. On the other hand, Prasad, Rajan and Subramanian (2007) show that only countries with developed financial markets can benefit from financial integration. On the other hand, financial integration is harmful for financially underdeveloped countries. Eichengreen, Gullapalli and Panizza (2011) find that the positive effects of financial integration are limited to countries with developed financial markets and inclusive economic institutions.

Financial development might be important because international capital flows cannot be channelled to the best uses under a poor-functioning financial system. Financial integration has also caused costly crises, mostly in countries with underdeveloped financial systems. Given that well-developed financial systems are usually marked by better risk management techniques, prudential financial regulation, better supervision, and higher competition, financial development can prevent the potential risks caused by financial integration, and therefore provide a more well-founded environment for international capital flows. The quality of the legal system, the level of corruption and the degree of corporate and government transparency can also affect the allocation of resources. Given that more funds are circulated under a higher degree of financial integration, the quality of institutions might matter more in this environment.

In order to check whether there are threshold effects, (the positive effects of international portfolio equity investments may kick in only once a country's institutional quality and domestic financial development are above a certain level), we

follow the strategy used by Prasad, Rajan and Subramanian (2007) and Eichengreen, Gullapalli and Panizza (2011). We include a separate triple interaction between our international portfolio equity investments, an industry's dependence on finance and a dummy variable (FUD) that takes value one if the country is below the median level of financial development. To test the second threshold effect, we include a separate triple interaction between international portfolio equity investments, an industry's dependence on finance and a dummy variable (IUD) that takes value one if the country is below the median level of institutional quality.

As seen in column (1) of Table 4.5, international portfolio equity investments have a positive and statistically significant impact in the financially developed countries, but the coefficient for the financially developed countries is negative but not statistically significant. Column (2) shows that the effect of international portfolio equity investments is positive for countries with a high institutional quality. On the other hand, the effect of international portfolio equity investments is reversed for countries with a low institutional quality. This suggests that countries with a low quality of institutions cannot benefit from international portfolio equity investments.

Table 4.5 Country Heterogeneity

Dependent Variable: lnexport (log of exports averaged over 1996-2004)		
	(1)	**(2)**
PORT*FINDEP	0.3688***	0.3795***
	(0.0764)	(0.0764)
PORT*FINDEP*FUD	-1.2980	
	(1.0930)	
PORT*FINDEP*IUD		-0.9024**
		(0.4232)
Country FE	Yes	Yes
Industry FE	Yes	Yes
No of countries	92	96
No of obs.	2568	2680
R^2	0.829	0.831

Notes: Regressions are estimated by OLS. In each specification, the number of industries is 28. Robust standard errors are reported in parentheses. ***, [**] and (*) denote statistically significant at 1, [5] and (10) percent levels, respectively.

4.6 Conclusion

Countries should provide new ways of external funding opportunities to their firms and industries in order to export more and have therefore greater voice on world economy. Financial integration has been seen as an important way of providing external funding opportunities since 1980s. Although it has promised benefits, recent empirical works draw a mixed and controversial picture on the effects of financial integration. After considering external financial needs of exporters and promised benefits of financial integration, this paper analyzes financial integration on sectoral composition of export flows.

Given that the components of international capital flows differ markedly in terms of volatility and their effects, this paper considers three different components of financial integration. These three components are: international portfolio equity investments, foreign direct investments, and external debt. This paper also considers that even if financial integration can bring benefits, these benefits might not be same across industries. Given that some of the most important promised benefits of financial integration are to reduce the cost of external capital and to improve allocation of capital, financial integration might increase exports relatively more in industries that need more external finance.

Our results show that the effect of international portfolio equity investments is much stronger and more robust among three different components of financial integration. International portfolio equity investments increase export more in industries that are heavily dependent on external sources of finance. We also find that this positive effect on export disappears and turns negative when the quality of institutions is low. Our results have important policy implications for countries. First of all, removing restrictions on international portfolio equity investments can ease domestic credit constraints, and thus increase external financial opportunities for exporters. Secondly, this essay also shows that it is the countries with better institutions that stand to benefit from international portfolio equity investments. This result is a reminder of the importance of carefully sequencing policies of financial integration with institutional development.

Readers should note that our results should interpreted with care as they don't take into account the possible effects of the recent financial crisis on the relationship between financial integration and export flows. Financial integration might have adverse effects on external finance conditions during financial crises. Given the

importance of external finance opportunities for exporters, providing evidence on channels through which financial integration might affect export flows during the Global Financial Crisis will be a crucial task for future research.

4.7 Appendix

Appendix Table 4.1 Definition and Sources of the Variables

Variable	Definition	Source
PORT	International Portfolio Equity Investment (Assets + Liabilities over GDP)	Lane and Milesi-Ferretti (2007)
FDI	Foreign Direct Investment (Assets + Liabilities over GDP)	Lane and Milesi-Ferretti (2007)
DEBT	Foreign Debt (Assets + Liabilities over GDP)	Lane and Milesi-Ferretti (2007)
FD	Financial Development	Beck and Demirguc-Kunt (2009)
KAOP	*De jure* Measure of Financial Integration	Chinn and Ito (2006)
RULE	Rule of Law	World Bank Governance Indicators
LR	Labour Regulations	Botero *et al.* (2004)
ER	Entry Regulations	Djankov *et al.* (2002)
MARCAP	Stock Market Capitalization over GDP	Beck and Demirguc-Kunt (2009)
GDP	Per capita GDP	Penn World Tables
C	Physical Capital per capita	Caselli (2005)
H	Human Capital per worker	Caselli (2005)
FINDEP	Industry's External Financial Dependence	Data originally come from COMPUSTAT. Ilyina and Samaniego (2011)
TANG	Industry's Tangibility of Assets	Data originally come from COMPUSTAT. Ilyina and Samaniego (2011)
ENT	Industry's Entry Rate	Original source is from Dunne et al. (1988). It is from Micco and Pages (2007).
CONT	Industry's Contract Intensity	Nunn (2007)
VOL	Industry's Technological Volatility	Braun (2003)
CAPINT	Industry's Physical Capital Intensity	Braun (2003)
HUMINT	Industry's Human Capital Intensity	Braun (2003)
PLIB	International Portfolio Equity Investment (Liabilities over GDP)	Lane and Milesi-Ferretti (2007)
FLIB	Foreign Direct Investment (Liabilities over GDP)	Lane and Milesi-Ferretti (2007)
DLIB	Foreign Debt (Liabilities over GDP)	Lane and Milesi-Ferretti (2007)

Appendix Table 4.2 Descriptive Statistics

	Observations	Mean	Standard Deviation
lnexport	2680	10.8679	3.3176
PORT	96	0.2001	0.4687
FDI	96	0.4181	0.5108
DEBT	96	1.2796	1.3721
FD	92	0.5278	0.4351
STOCK	86	0.4453	0.5215
KOPEN	94	0.6504	1.4730
RULE	96	0.2676	0.9372
ER	68	2.8822	1.2394
LR	71	0.4877	0.1389
GDP	96	8.8156	1.2049
C	72	10.0776	1.5197
H	70	2.1884	0.5790
FINDEP	28	0.1598	0.7351
PLIB	96	0.1128	0.2852
FLIB	96	0.2830	0.2980
DLIB	96	0.7472	0.5502
CONT	28	0.4871	0.2058
ENT	28	0.3803	0.0869
VOL	28	1.5979	1.0629
TANG	28	0.2920	0.1344
KINT	28	0.0694	0.0375
HINT	28	0.9995	0.2771

Appendix Table 4.3 Financial Integration and Export

Dependent Variable: log of exports averaged over 1996-2004				
	(1)	**(2)**	**(3)**	**(4)**
PLIB*FINDEP	0.5814***			0.6598***
	(0.1301)			(0.2032)
FLIB*FINDEP		0.1374		-0.1114
		(0.1307)		(0.1312)
DLIB*FINDEP			0.1760***	-0.0219
			(0.0634)	(0.1151)
Country FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
No of countries	96	96	96	96
No of obs.	2680	2680	2680	2680
R^2	0.831	0.830	0.830	0.831

Notes: Regressions are estimated by OLS. In each specification, the number of industries is 28. Robust standard errors are reported in parentheses. ***, [**] and (*) denote statistically significant at 1, [5] and (10) percent levels, respectively.

Appendix Table 4.4 Financial Integration, Financial Development and Export

Dependent Variable: log of exports averaged over 1996-2004			
	(1)	**(2)**	**(3)**
PLIB*FINDEP	0.3876***		
	(0.1137)		
FLIB*FINDEP		-0.1070	
		(0.1521)	
DLIB*FINDEP			0.0423
			(0.0811)
FD*FINDEP	0.2810***	0.4285***	0.3707***
	(0.0979)	(0.0998)	(0.0965)
Country FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
No of countries	92	92	92
No of obs.	2568	2568	2680
R^2	0.829	0.828	0.828

Notes: Regressions are estimated by OLS. In each specification, the number of industries is 28. Robust standard errors are reported in parentheses. ***, [**] and (*) denote statistically significant at 1, [5] and (10) percent levels, respectively.

Appendix Table 4.5 International Portfolio Equity Investments and the Traditional and New Sources of Comparative Advantage

Dependent Variable: log of exports averaged over 1996-2004						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
PLIB*FINDEP	0.5433***	0.5129***	0.4922***	0.5828***	0.6015***	0.3933***
	(0.1335)	(0.1307)	(0.1044)	(0.1227)	(0.1291)	(0.1293)
FD*FINDEP						0.1342
						(0.1061)
C*CAPINT	0.4493					-0.3497
	(0.5605)					(0.7475)
H*HUMINT		1.1496***				1.2025***
		(0.1906)				(0.2458)
RULE*CONT			0.8983***			0.8560***
			(0.1474)			(0.2000)
ER*ENTY				-0.7584***		-0.7163**
				(0.3212)		(0.3211)
LR*VOL					-0.0610	0.0593
					(0.1525)	(0.1596)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
No of countries	72	70	96	68	71	52
No of obs.	2010	1954	2680	1903	1987	1455
R^2	0.832	0.838	0.834	0.853	0.853	0.853

Notes: Regressions are estimated by OLS. In each specification, the number of industries is 28. Robust standard errors are reported in parentheses. ***, [**] and (*) denote statistically significant at 1, [5] and (10) percent levels, respectively.

Appendix Table 4.6 Sensitivity Tests

Dependent Variable: log of exports averaged over 1996-2004							
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
PLIB*FINDEP	0.5263***	0.5810***	0.4712***	0.4256***	0.4230***	1.8811***	1.4095***
	(0.1297)	(0.1297)	(0.1208)	(0.1117)	(0.1147)	(0.5515)	(0.3941)
PLIB*TANG	-1.1997*						
	(0.6362)						
PLIB*CAP		-1.3044					
		(2.5621)					
KAOP*FINDEP			0.0613**				
			(0.0244)				
STOCK*FINDEP				0.1317			
				(0.0913)			
GDP*FINDEP					0.1021***		
					(0.0355)		
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No of countries	96	96	96	86	96	96	96
No of obs.	2680	2680	2680	2404	2680	2680	2680
R^2	0.831	0.831	0.832	0.826	0.832	0.825	0.828
1st Stage F-test(p-value)	-	-	-	-	-	0.00***	0.00***
Shea R^2	-	-	-	-	-	0.109	0.246
Sargan Test (p-value)	-	-	-	-	-	0.785	0.5339

Notes: Regressions are estimated by OLS in the first five columns. Regressions are estimated by 2SLS in the last two columns. In each specification, the number of industries is 28. Robust standard errors are reported in parentheses. ***, [**] and (*) denote statistically significant at 1, [5] and (10) percent levels, respectively.

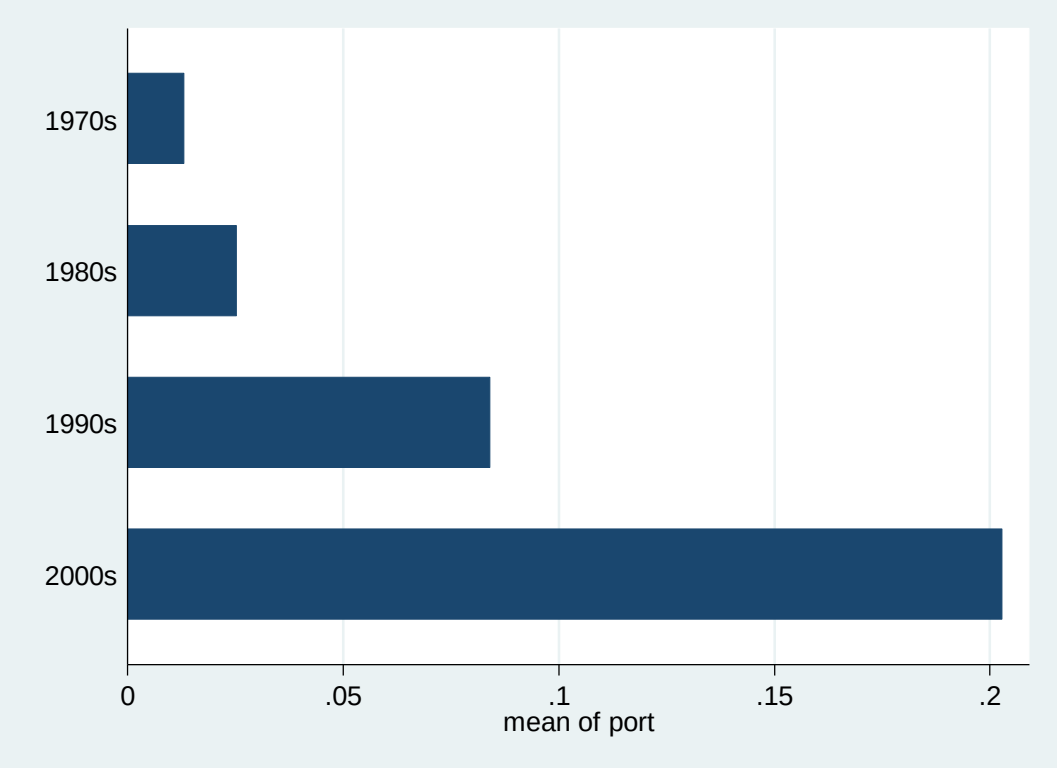
Appendix Table 4.7 Country Heterogeneity

Dependent Variable: log of exports averaged over 1996-2004

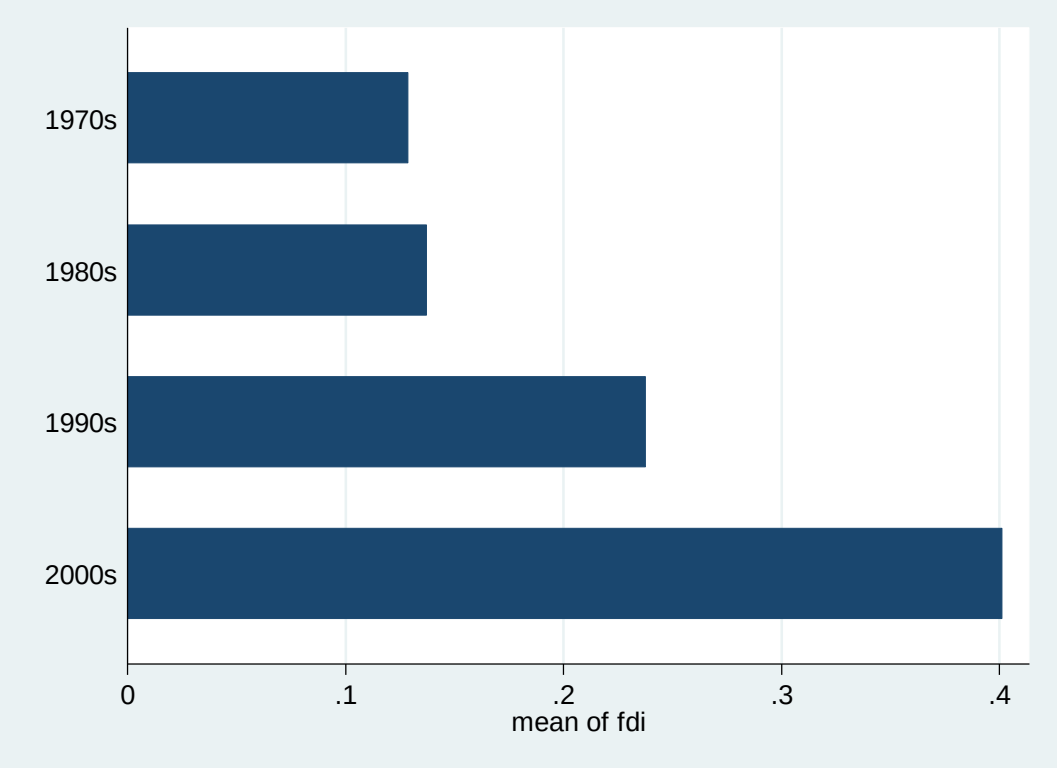
	(1)	**(2)**
PLIB*FINDEP	0.5608***	0.5706***
	(0.1300)	(0.1304)
PLIB*FINDEP*FUD	-2.0028	
	(1.2550)	
PLIB*FINDEP*IUD		-2.1259**
		(0.8697)
Country FE	Yes	Yes
Industry FE	Yes	Yes
No of countries	92	96
No of obs.	2568	2680
R^2	0.828	0.831

Notes: Regressions are estimated by OLS. In each specification, the number of industries is 28. Robust standard errors are reported in parentheses. ***, [**] and (*) denote statistically significant at 1, [5] and (10) percent levels, respectively.

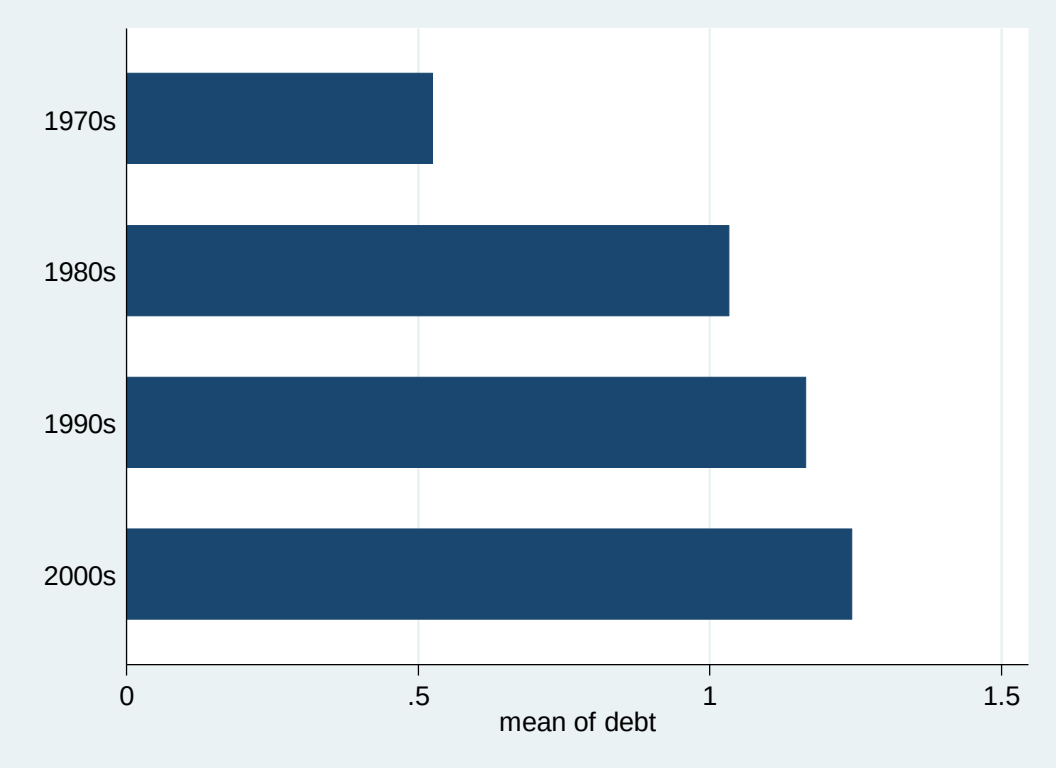
Appendix Figure 4.1 International Portfolio Equity Investments



Appendix Figure 4.2 Foreign Direct Investments



Appendix Figure 4.3 Foreign Debt



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