November 2016

WORKING PAPER SERIES

2016-ACF-02

Does Economic Structure Determine Financial Structure?

Franklin Allen
Imperial College London

Laura Bartiloro
Banca d'Italia

Xian Gu
Central University of Finance and Economics

Oskar Kowalewksi
IESEG School of Management (LEM-CNRS - UMR 9221)

IESEG School of Management
Lille Catholic University
3, rue de la Digue
F-59000 Lille
www.ieseg.fr

Does Economic Structure Determine Financial Structure?*

Franklin Allen, Imperial College London†

Laura Bartiloro, Banca d'Italia

Xian Gu, Central University of Finance and Economics

Oskar Kowalewski, IÉSEG School of Management (LEM-CNRS 9221)

Abstract

In this paper, we examine the relationship between the structure of the real economy and a country's financial system. We consider whether the development of the real economic structure can predict the direction of evolution of a country's financial structure. Using data for 100 countries, we find a significant positive relationship between real economic structure and financial structure. We find that changes in the economic structure of a country influence the evolution of its financial system. This suggests that financial institutions and capital markets change in response to the structure of industries.

Keywords: financial system, economic structure

Classification codes: G20; O14; O16

*We thank Philipp Hartmann, Elias Papaioannou, Luigi Zingales, and Felix Rioja for helpful comments. We benefited from the comments of the seminar participants at the CEPR/Banca d'Italia Conference, the 2007 American Finance Association Meeting, the WIEM Meeting, the Warsaw School of Economics Seminar, and the Wharton Seminar.

†Corresponding author: Brevan Howard Centre, Imperial College Business School, e-mail: f.allen@imperial.ac.uk

1. Introduction

The structures of financial systems vary among industrial and developing countries. In some countries, financial systems are predominantly bank-based, while in others they are dominated by capital markets. Only fragmented theories exist in the literature that explain the prevailing differences in country financial structures, which are defined as the mix of financial markets, institutions, instruments, and contracts that prescribe how financial activities are organised at a particular date.

The existing studies explain the prevailing differences in financial structures using legal origin and protection, politics, history, and culture as factors. This paper considers the link between the real economic structure and the financial system of a country. Such a relationship is influenced by the funding sources for corporate investment that differ depending on firm and project characteristics (Allen, 1993; Boot and Thakor, 1999; Allen and Gale, 1999). Consistent with this theory, banks are more appropriate for the financing of traditional asset-intensive industries, whereas capital markets favour innovative and high risk projects. One implication of this theory is that the real economic structure of a country, whether it is asset intensive or service oriented, could determine its financial structure. For instance, financial systems in countries such as Germany and Japan would remain bank-based as long their economies are dominated by manufacturing industries. Contrastingly, the financial system in the United States will continue to be market-oriented as long as service and highly innovative companies constitute a large share of the economy. Consequently, the financial systems of the United States, Germany, or Japan will remain at polar extremes because of their economic structures even though the countries are at a similar stage of development.

Robinson (1952) argued that financial intermediaries and markets emerge when required by

industries. Consequently, intermediaries and markets appear in response to economic structure. The idea that the form of financing, and thus the country's financial structure, depends on the type of activity that firms engage in has not yet been directly addressed in the literature. To provide evidence of the hypothesis that structure and changes in the real economy determine the direction of evolution of a country's financial system we first must distinguish the different financial structures across countries. However, although recent attention has shifted to a more systematic classification of financial systems, the literature provides only very broad measures and definitions for classification. Consistent with the literature this study classify a country's financial system as either bank-based (the German or Japanese model) or market-based (the Anglo-Saxon model). In the bank-based financial system, financial intermediaries play an important role by mobilising savings, allocating credit, and facilitating the hedging, pooling, and pricing of risks. In the market-based financial system, capital markets are the main channels of finance in the economy (Allen and Gale, 2000).

Our theory builds on Rajan and Zingales (2003a) who noted that bank-based systems tend to have a comparative advantage in financing fixed-asset-intensive firms rather than high technology research and development-based firms. Rajan and Zingales (2003a) argued that fixed-asset-intensive firms are typically more traditional and well understood, and the borrower has the collateral to entice fresh lenders if the existing ones prove overly demanding. As per Rajan and Zingales (2003a), loans are well collateralised by physical assets, and therefore are liquid; hence, the concentration of information in the system will not be a barrier to the financing of these assets. Conversely, the authors argue that market-based systems will have a comparative advantage in financing knowledge industries with intangible assets.

Consequently, we suggest that countries with a majority of physical-asset-intensive firms,

depending on external finance, will be more likely to possess a bank-oriented financial system. However, capital markets should develop more effectively in countries with firms that are based on knowledge and intangible assets. We test this hypothesis by identifying fixed-asset-intensive firms within the economic sector defined as industry by the standard classification system for economic activity. Conversely, in this study the services sector acts as a proxy for knowledge and intangible assets firms. The relative importance of the two types of firms in an economy will be represented by the relative volume of activity of the two different economic sectors. The standard system of classification for economic activity includes a third sector, agriculture. We classify agriculture as a physical-asset-intensive industry because land and agricultural machinery may be used as collateral and, therefore, we assume that firms in the agricultural sector will prefer bank financing over capital markets.

We test the outlined hypothesis using a panel data set for 100 countries and employing both the panel OLS and a two-step generalised-method-of-moments (GMM) system. Additionally, we test the robustness of the results by splitting the sample period in different ways and using different additional control variables. The results find that there is a positive and significant relationship between a country's economy and financial system structure. In economies where the service sector carries more weight economically than industry and agriculture, the country tends to have a market-based financial system. Contrastingly, a bank-based financial system is more likely to emerge in economies with many fixed-asset-intensive firms. Thus, the results confirm the hypothesis that the relative importance of financial intermediaries and markets is determined by industry needs.

The findings of this study are interesting from a regulatory perspective and lend insight into the development of financial structures worldwide. The main policy implications from this study

are that financial structures should be evaluated in terms of whether they meet the requirements of the real economy and industries. The implication is that the financial structure cannot be changed as long as the economic structure does not change. The results provide insight into the reasons for limited capital markets growth in developing countries despite official stimulation efforts from governments and multilateral organisations (Schmukler et al., 2007). According to our study of many developing countries, as long as economies remain relatively agriculture- and industry-oriented, any government effort to create or further develop a capital market is likely to fail. Additionally, any regulations that attempt to force a change in the financial system may result in a discrepancy in the economic and financial structure. Therefore, such efforts or regulations may introduce financial constraints that can further stall economic growth because financial structure influences output levels and economic growth (Luintel et al., 2008).

This paper is organised as follows. Section 2 develops the main hypothesis, Section 3 presents the data and the descriptive statistics. Section 4 introduces the econometric methodology, and section 5 presents the main results and findings of an additional sensitivity test. Section 6 describes the robustness analysis. Finally, Section 7 provides concluding remarks.

2. The real economy and finance nexus

A number of explanations for financial structure exist in the literature; however, none are able to provide a comprehensive account of the observations. The first explanation is based on legal origin and investors protection. Levine (1997) built on the work of La Porta, Lopes-de-Silanes, Shleifer, and Vishny (1997, 1998; henceforth LLSV) stating that legal systems originate from a limited number of legal traditions: English common law or French, German, and Scandinavian civil law. In his study on financial development and economic growth, the author employed measures of creditors' rights and demonstrated that they may explain the emergence of

bank-based financial systems. Modigliani and Perotti (2000) argued that legal institutions determine the degree of financial development and the financial structure of a country. They argued that market-based systems flourish in environments with strong institutions. According to the authors, strong institutions should be associated with large, well established financial systems in addition to market-based systems. Ergungor (2004) also attempted to explain differences in financial structure by examining legal origin across countries. His study presents evidence that countries with civil law financial systems are more likely to be bank-oriented than common law countries. In the author's opinion, this evolution is a result of effective rule of law in common law countries, which improves shareholder and creditor rights protection. A perspective has emerged in the literature that legal origin can be used to explain the structure of a financial system.

However, Rajan and Zingales (2003a) argued that countries with a common law system did not rely on markets to a greater extent than civil law systems at the beginning of the last century. They reported that in 1913, the ratio of France's stock market capitalisation to GDP was twice as high as that of the United States, which is a country that has an environment that favours capital market development according to the legal origin perspective. It is therefore problematic to argue that legal origin is the main determinant of financial structure. The view of this paper is that both the structure of the financial system and the laws will adapt to the needs and demands of the economy. One example of this is branching regulation in the United States banking sector. Rajan and Zingales (2004) noted that as technology improved the ability of banks to lend and borrow from customers at a distance, competition increased in the United States even when banks had no in-state branches. Politicians who could not prevent this competition because they lacked jurisdiction, withdrew the regulations that limited branching. Another example is the removal of

the Glass-Steagall Act, which had restricted banking activities in the United States since 1933. In this case, the introduction of the Financial Modernisation Act in 1999 followed the creation of the first financial holding company in the United States and removed past restrictions. Therefore, we argue that economic demand may enhance the evolution of the financial structures and of the legal system.

The existing empirical results shows also that legal investor protection may support financial development. LLSV (1997) showed that countries with poorer investor protection have less developed capital markets. Demirgüç-Kunt and Levine (2004) found that countries with stronger protection for shareholder rights tend to have a more market-based financial system. Djankov et al. (2007) investigated cross-country determinants of private credit and found that legal creditor rights are statistically significant and quantitatively important in determining private credit development, while there is no evidence showing that creditor rights are converging among legal origins. Moreover, Djankov et al. (2007) confirmed that shareholder protection is positively related to stock market development.

The second explanation for the financial structure is based on political factors. Biais and Perotti (2002) modelled government incentives to structure privatisation policy so that financial shareholders are diffused, which may be designed to ensure re-election. Additionally, Perotti and Volpin (2004) argued that established firms have an incentive to limit entry by retarding financial development, which may well impact the financial structure. Perotti and von Thadden (2006) use a theoretic model to demonstrate the distribution of income and wealth in democratic societies and its influence on the financial structure of an economy.

Moreover, according to Rajan and Zingales (2003a, 2004) structures of the financial system are unstable and evolve over time. In the authors' opinion, the structure of the financial system

may experience substantial reversals when a political majority decides to alter the legal framework. The authors argued that a financial system will develop toward the optimal structure but will be hindered by politics, which are often influenced by powerful, incumbent groups. Thus, financial development and changes in structure can take place only when the country's political structure changes, or when incumbents want the development to take place. Additionally, the authors maintained that when a government possesses a will for change, civil law countries have a greater ability to translate government policy into practice because change emanates directly from the laws rather than evolving through judicial decisions as is the case in common law countries. While politics is clearly significant, the occurrence of great reversals suggests that the relationship is complex. There is also an intricate interaction between events and politics that is difficult to decipher. Similarly, Cull and Xu (2013) argued that financial development is driven by political economy. In their opinion financial development may reflect the interests of the elite, rather than providing broad-based access to financial services.

More recently, Song and Thakor (2012) developed a theory of how a financial system is influenced by political intervention that is designed to expand credit availability. Their results show that the relationship between political intervention and financial system development is nonmonotonic. In the early stage of financial development, the size of market is relatively small and politicians intervene by controlling some banks and providing capital subsidies. In the intermediate stage when the size of both banking sector and market is larger, there is no political intervention. However, in the advanced stage when the financial sector is most developed, political intervention returns in the form of direct-lending regulation.

A third explanation is that historical factors may influence the existing shape and development of the financial system. Monnet and Quintin (2005) argued that the legal differences

in countries with bank-based and market-based financial systems are fading as a result of government efforts to deregulate and liberate financial systems in the last few decades. However, institutional convergence has not implied financial convergence across countries. Monnet and Quintin (2005) suggest that financial systems will continue to differ for a substantial period even if their basic characteristics become identical. The argument is based on the assumption that the historical fundamentals of financial systems are relevant and any change in structure is costly. Thus, the authors claim that the past structure of a financial system explains and determines the existing structure. The work of Monnet and Quintin (2005) provides some explanation as to why financial structures persist in countries following changes in the institutional framework; however, the work does not provide a clear explanation of why determinants change over time. Torre et al. (2013) argued that financial development paths are found to be strongly dependent on initial level of per capita income. Further, the regular dynamics that financial development followed can be largely explained by the underlying frictions that hinder financial contracting. The structure of financial system and its evolution over time reflect efforts to find the path of least resistance around these frictions.

Another perspective is presented by Kwok and Tadesse (2006) who argued that national culture may be an important determinant of a country's financial structure and presented evidence that countries characterised by higher uncertainty avoidance (risk averse) are more likely to have a bank-based system. As a result, culture, and history to an extent, determine a country’s financial structure.

This variety of approaches suggest that there is no consensus with respect to the determinants of financial system structure. We suggest that specialisation patterns in a financial system are influenced by the composition of the economy, which in turn is determined by a

country's endowments. In our view, the financial structure may adapt to the needs of the economy as has been reported by economic historians such as Gerschenkron (1962), Tilly (1967), and Chandler (1977).

Allen (1993) and Allen and Gale (1999, 2000) use the theoretical framework to argue that markets are superior at funding new innovations with uncertain outcomes, whereas banks are superior at providing additional funding for existing, more mature enterprises. In Allen and Gale's (1999) model, individual investors agree to disagree on the feasibility of new projects with uncertain returns. In a financial system where each investor makes an individual decision with respect to an investment, more innovative but risky projects are funded compared to a financial system where the investment decision is delegated to a bank manager. Consequently, the authors' framework would indicate that markets are more likely to finance innovative industry.

However, the existing empirical work is less conclusive concerning the impact of the financial structure on economic or industry growth. Beck et al. (2000) and Beck and Levine (2002) using cross-section data have attempted to establish whether the differences in country financial structures affect the growth of different industries. The results of these studies have shown that the overall level of financial development and legal system efficiency exert a significant and economically large effect on economic growth; however, there is no cross-country empirical support for similar effects on financial structure. However, Demirgüç-Kunt and Levine (2004) conceded that the result of economic performance being impervious to financial structure does not necessarily imply that institutional structure is of no consequence to industry and economic growth. Instead, it may simply indicate that either there is no optimal institutional structure that fits every situation at all times, or the indicators used in the literature may not satisfactorily capture the roles of banks and markets. The assumption of Demirgüç-Kunt and

Levine (2004) was later confirmed by Tadesse (2002), who investigated the effects of a country's financial architecture on performance in the real sector of the economy. His results suggest that in underdeveloped financial systems, industries from bank-based economies grow more rapidly than industries from market-based systems, whereas industries in market-based systems grow more rapidly across countries with well-developed financial systems. He noted that a lack of fit between the country's financial architecture and its legal institutions can restrain economic performance. This is also consistent with Demirgüç-Kunt et al.(2012), who demonstrated that the roles of banks and markets evolve with the development of real economy. Their results show that the association between an increase in economic output and an increase in bank development becomes smaller while the association between an increase in output and an increase in market development becomes larger. From another perspective, Beck et al. (2013) explored the relationship between the size of different financial institutions and their impact on firms' access to financial services. They showed that dominance of banks in most developing and emerging countries is associated with lower use of financial services. On the other hand, larger banks may actually ease financing constraints of small firms in low-income countries.

Carlin and Mayer (2003) investigated the relationship between institutional and financial structures with industry characteristics in a cross-sectional setting. The authors found that the differences in financial structure had impacted the real economy by affecting the growth and investment decisions of various industries. The industries that were heavily dependent on equity financing were found to grow more rapidly in countries with a market-based financial system. Additionally, they found that the financial structure has an impact on industrial growth and on R&D investment. Those findings were confirmed later by Binh et al. (2006) who reported that industries with high R&D intensity, high operational risk, and high capital intensity grow faster

in countries with more pronounced market-based financial structures. Rioja and Valev (2006) did not confirm that the financial structure affects economic growth; however, they found that a bank-based financial system is associated with stronger capital accumulation.

Based on the previous research, Lin, Sun and Jang (2009) argued that the demand of financial service is affected by the economic development and industrial structure. They proposed that a financial structure is optimal for a country at some stage of economic development only when the financial structure matches the industrial structure, which is determined by the factor structure in the economy. When the country's economy develops, the optimal financial structure evolves correspondingly. This argument is also consistent with Cull and Xu (2013), who demonstrated that financial structure should be matched to the country's industrial structure that is determined by the endowments and level of economic development.

Finally, Luintel et al. (2008) have shown that the complete absence of cross-country support for a financial structure reported by certain panel or cross-section studies may be a result of inadequate accounting for cross-country heterogeneity. Taking into account the problems of existing studies and the use of time series and a dynamic heterogeneous panel method, the authors document that the financial structure and financial development affect output levels and economic growth. To better grasp the multi-dimensional nature of financial systems, Cihak et al. (2012) examined four measures of financial systems of 205 countries around the world, namely financial depth, access to finance, the efficiency of financial system and the stability of financial system, demonstrating that financial sectors differ widely in shapes and performances.

This study differs from the existing literature on financial structure and economic growth. We focus only on the relationship between financial structure and economic structure. However, in providing evidence that the economic structure determines financial structure, we provide

support for the existing research, which has documented that financial structure is relevant to industry and economic growth.

3. Data and descriptive statistics

Our dataset consists of a panel of observations for 100 industrial and developing countries over the sample period 1972 to 2011. We use the revised financial structure database of Beck et al. (2001, 2010, 2012, 2013) to construct the financial structure indicators and update the missing information with the data from Demirgüç-Kunt and Levine (2004). The data for economic structure are from the World Bank WDI database, and we use data from Easterly (2001) for the set of control variables, which are described in detail later in the paper.

We average data over no overlapping, five-year periods, to provide eight observations per country when available. The first period is from 1972 to 1976, the second period is from 1977 to 1981, and so on. The last period is from 2007 to 2011. Table A.2 in the Appendix presents relevant facts concerning the financial, economic, and institutional structure of the countries in our sample.

We also control for systemic banking crises because they may influence the structure of the financial system (Allen et al., 2012). We follow the definition of a systemic banking crisis by Laeven and Valencia (2008), which documented that a systemic banking crisis represents a crisis when a country's corporate and financial sector experiencing a substantial number of defaults. However, because the minor alterations in economic fundamentals are always successive, it is not easy to provide an exact definition and differentiation of a banking crisis. This paper uses the initial date of systemic banking crises provided by Laeven and Valencia (2012); therefore, 147 banking crises around the world during 1972 to 2011 are considered in the analysis.

3.1. The variable definitions

Our hypothesis is that countries with a predominance of tangible-asset-intensive industries are more likely to exhibit a bank-based financial system. However, economies with a strong service sector are more likely to exhibit a market-based financial system. To test the hypothesis, we require appropriate indicators for the financial structure and the structure of the real economy.

We follow Beck and Levine (2002) and Levine (2002) to construct the measures for the financial system structure. The main indicator for financial structure (*Structure)* is the first principal component of two variables that measure the comparative *Size* and *Activity* of markets and banks. The first variable *Size* equals the log of the ratio of market capitalisation to private credit. Market capitalisation is defined as the value of listed shares divided by GDP and is a measure of the size of stock markets relative to the economy. Private credit represents the value of credits by financial intermediaries to the private sector divided by GDP. It is a broader measure of financial intermediation because it includes all other financial institutions, such as deposit money banks, but excludes credit issued by the monetary authority. The second measure *Activity* equals the log of the ratio of value traded to private credit. Value traded equals the value of stock transactions as a share of national output. It is frequently used as an indicator of stock market liquidity. It is an important measure because stock market size and activity are entirely different issues. Stock markets could be sizable because of a substantial number of listings but may be illiquid or shallow because of a lack of active trading.

For robustness we use an alternative aggregation of the financial structure variable called *Aggregate*. The variable is a principal component of the three variables: *Size, Activity,* and *Efficiency*. The last variable measures the relative efficiency of a country's stock markets compared to that of its banks. The efficiency of stock markets is measured by the total value traded ratio, whereas in banking it is measured using overhead costs. In the regression, each of

the underlying variables in addition to the two aggregate measures are constructed to reflect that higher values indicate more market-based financial systems.

The main regressor, the one that we are checking for correlation with financial structure, is an indicator of the significance of the industrial sector in the real economy. Our main claim is that the predominance of the industrial sector, represented in this study by tangible-asset-intensive firms, will induce a financial system to be bank-based, as opposed to a service-oriented economic structure that will lead to a market-based financial system. We use, therefore, a ratio that has an indicator of the industrial sector as the numerator and a variable for the service sector as the denominator. Higher values of this indicator suggest that the industrial sector (fixed-asset-intensive firms) plays a more significant role in a given economy than the service sector (firms based on knowledge and intangible assets). To divide the real economy into the two different industries, we use gross value added for the three main economic sectors: *Agriculture*, *Industry*, and *Service*. *Agriculture* is defined as the value of gross value added generated by agriculture, hunting, forestry, and fishing as a percentage of GDP. *Industry* is defined as the value of gross value added generated from mining, manufacturing, construction, electricity, water, and gas. *Service* is defined as the gross value added generated from the wholesale and retail trade, hotels and restaurants, transport, government, financial, professional, and personal services such as education, health care, and real estate services. Because land, agriculture, and machines may be used as collateral, we classify *Agriculture* together with *Industry* as an asset-intensive sector, whereas we use the *Service* sector as a proxy for firms based on knowledge and intangible assets.

We measure the real *Economic Structure (ES)* by combining the three variables in two different ways. The first variable ES_1 equals *Agriculture* and *Industry* to total gross value added.

It is a measure of the importance of the asset-intensive sectors in the economy. For the second measure, we decided not to employ *Agriculture* because sector development in certain developed countries may depend on state subsidies and transfers rather than on funds raised through the financial system. Hence, this sector may to a lesser extent influence the shape of a country's financial structure. Therefore, we construct our second measure ES_2 by dividing *Industry* by *Service* only. This variable reflects the importance of the asset-intensive industry with respect to knowledge and intangible asset sectors.

The changes in gross value added, and therefore the proxies, can provide unclear information concerning a country's economic structure. In the majority of countries, the share of industry value added has been declining in recent decades. However, an increasing share of service gross value added does not necessarily mean that economies are becoming more service-oriented. In recent years, many changes in economic structures have been a result of service activity outsourcing. These service activities were previously carried out internally by industrial enterprises, for example, the marketing activities of an industrial sector firm. In this case, the salaries of the employees form part of the gross value added recorded for the industrial sector. If the industrial firm outsources the marketing activities and subsequently purchases them from a specialist producer, the salaries of the employees will now be part of the gross value added of the service sector. Consequently, there will appear to have been a decline in the share of industry and a rise in the share of the services sector although there may have been no changes in the quantity of services actually produced. We assume that such factors affect all of the countries in the sample and should not significantly alter the results of this study.

The literature provides some evidence that other factors may determine the structure of a country's financial system. We therefore augment the main regression with various policy

variables to assess the sensitivity of our results to additional determinants of the financial structure, which have been put forward in the literature. Those determinants are legal origin, legal protection, political, historical, and cultural factors.

We follow LLSV (1998, 1999) and identify the legal origin of each country's company or commercial law as French, German, Scandinavian, British, or Socialist. Because all the former socialist countries in our sample have reverted to their prior legal system, we follow Harper and McNulty (2008) and replace the Socialist legal origin with Russian legal origin. The dummy variable *L_Russia* equals one if the former socialist country company/commercial law has Russian legal origin and zero otherwise. The dummy includes many former socialist countries; however, it should be emphasised that not all of them had Russian legal origin. The majority of the countries moved either to German or French legal origin, which they adhered to prior to communism. The dummy for French civil law (*L_French*), German civil law (*L_German*), and British common law (*L_British*) legal origin are constructed in an identical manner as the Russian legal origin dummy, whereas the Scandinavian legal origin (*L_Scandinavian*) is captured in the regressions by the constant. Based on the existing evidence, we expect to observe a negative correlation between the dummy for the French, German, and Russian civil law legal origin and the financial structure indicators. Conversely, we expect a positive relationship between our financial structure measures and the dummy for the British common law legal origin.

The political view holds that civil and common law differ in their emphasis on the rights of private property compared to the rights of the State. To account for the possibility that the legal system influences the structure of the financial system through the political channel, we include a common law dummy, which is an alternative legal variable. The dummy *Common Law* takes the value one for common law countries and zero otherwise.

LLSV (1998) argued that stock markets tend to be underdeveloped in civil law countries compared to common law countries. Rajan and Zingales (1998) argued that banks are predominant in countries with an ineffective legal system and where contract enforcement is lacking because the banks are able to enforce contracts through market power. Demirgüç-Kunt and Levine (1999) showed that countries with more legal protection to minority shareholders tend to have a market-oriented financial system. Additionally, Claessens and Laeven's (2003) empirical results show that weaker legal frameworks diminish the availability of external resources and show an assets substitution effect, which is the investment in more fixed assets relative to intangible assets compared to firms operating in a strong legal environment because of weaker (intellectual) property rights. Because common law provides more protection to minority shareholders, we expect a positive relationship between the common law dummy and the financial structure variables.

We follow Djankov et al. (2007) and Spamann (2010) to identify creditor protection and shareholder protection at country level, respectively. Creditor rights are an ex-post mechanism that protects creditors upon default. Djankov et al. (2007) constructed creditor rights index based on LLSV(1997) and expanded their sample from 49 to 133 countries. The creditor rights (*CR*) index, which ranges from zero (weak) to four (strong), measures the power of secured lenders in bankruptcy from four aspects which include creditors' consent for reorganization, no automatic stay to seize collateral, secured creditors paid first and management out. While, we control for shareholder protection using use the anti-director rights (ADR) index. The original ADR index of LLSV (1998) aggregates six dimensions of shareholder protection rules. Of the six components, three are concerned with shareholder voting, including voting by mail, voting without blocking shares and calling an extraordinary meeting; the others are concerned with minority protection,

including proportional board representation, preemptive rights and judicial remedies. Pagano and Volpin (2005), however, criticized the ADR index for its ad hoc nature and mistakes in coding. In response, Djankov et al. (2008) provided a revised ADR index, which was better theoretically grounded and more reliably weighted for 72 countries. Spamann (2010) further improved the index involving leading local lawyers and provided a corrected ADR index for forty-six countries, which is used in this study.

Monnet and Quintin (2005) used a theoretical model to demonstrate that financial structure differences can persist between two economies even when their fundamental characteristics have converged. This implies that changes in a financial structure are costly and are an explanation as to why financial systems still differ across countries. The main implication from the model is that the history of a financial structure is required for an understanding of its current structure.

We therefore must take into account the past fundamentals of a financial structure. We control for the past structure by employing variables representing the historical size (*H-size*), activity (*H-activity*), and structure (*H-structure*) of the financial system, which have been calculated using the data from the year 1972 to 1976. However, we are not able to calculate the historical financial structure for all the countries because of missing data and limited time series. Moreover, we do not have historical variables for efficiency or aggregate variables because the data on overhead costs required for the calculations was available only from the year 1980.

Finally, we introduce a culture variable into the model as a potential explanation of diversity in the financial structures. Consistent with Kwok and Tadesse (2006), we employ an uncertainty avoidance index (*UAI*), which assesses people's reaction to uncertainty. It is a composite score of three empirical indicators: stress, employment stability, and rule orientation. The index was based on Hofstede's surveys from 1967 to 1971 and data is available for 40

countries. Kwok and Tadesse (2006) have shown that countries with a high UAI, higher levels of uncertainty avoidance, are more likely to be associated with a bank-based financial system. All the definitions and sources of the main variables are listed in Table A.1 in the Appendix.

3.2. The descriptive statistics

Table 1 presents the descriptive statistics and the contemporaneous correlations for all the variables used in the regression analysis. The variables are averaged for 100 countries over the period 1972 to 2011. The results indicate a large variation in financial and economic structures across the sample countries.

The variable *Structure* exhibits high cross-sectional variability ranging from -4.37 to 2.02 with a mean value of -0.09. The variable *Aggregate* also shows a large variation with values ranging from -3.75 to 2.32 with a mean value of -0.06. The variable *Structure* identifies Armenia, Guatemala, and Uruguay as having the most bank-based financial systems in our sample. Conversely, Hong Kong, Singapore, and Kuwait are classified as countries with the most market-based financial systems in the sample. When the variable financial aggregate is used, the United States and Turkey, instead of Singapore and Kuwait, are classified as the most market-based financial systems in our sample, whereas Bolivia, Guatemala, and Uruguay are classified as the most bank-based financial systems. The variables ES_1 and ES_2 present considerable cross-country variations also. The first real economic indicator classifies Nigeria, Papua New Guinea, and Ghana as tangible-asset-intensive economies, whereas Hong Kong, Panama, Luxembourg, and Barbados are classified as intangible-asset-intensive economies. In the case of Panama and Barbados, the results are driven by the importance of single sectors in their economy. In the case of Panama, the economy is primarily based on tourism, trade, and transit sectors, whereas for Barbados the result is mainly a result of the development of the tourism

sector. The service sectors are well-developed in both countries and account for approximately three-quarters of GDP. When we exclude the agriculture sector and compute the second measure for economic structure, the countries Oman, Kuwait, and Nigeria are classified as the countries with the most tangible-asset-intensive economies in our sample. Conversely, Barbados, Panama, and Hong Kong are again classified as intangible asset-based economies. As a result of the exclusion of the agriculture sector, we are able to observe certain changes in the classification of economies as asset intensive, whereas the classification of intangible-asset-intensive economies remains almost unchanged. On average, economies tend to be based on the service sector rather than on the agriculture and industry sectors. Among industrialised countries, the size of the agriculture and industrial sector with respect to that of the service sector ranges from 30% in the United States to 66% in Japan.

The statistics in Table 1 show that each of the financial structure indicators is negatively correlated with the two indicators of the real economic structure; however, each of the financial structure indicators is more significant with our main economic structure indicator, which confirms our assumption with respect to the existing relationship between financial and economic structures. Additionally, as shown in other studies, there is a positive correlation between financial structure and British law, whereas the relationship between financial structure and the French and Russian Law implies the opposite. The results are consistent with the existing studies that demonstrate a positive relationship between common law and capital market development. Moreover, consistent with literatures, shareholder protection shows a positive and significant relationship with the relative growth of capital markets to banking sector. Creditor protection, however, shows no statistical significant association with countries financial structure. The results also show that the historical financial structure is significant in addition to the country's

national culture.

[TABLE 1]

4. Methodology

We use different regression models in the study to assess the impact of economic structure on the financial structure. First, we use a panel OLS model to test if economic structure determines financial structure with the following basic model:

$$y_{i,t} = \alpha ES_{i,t} + \beta X_{i,t} + c + \varepsilon_{i,t}$$

where, $y_{i,t}$ represents one of the five measures for *Financial Structure*, *ES* is one of the two economic structure indicators, *X* is a set of additional explanatory variables including variables for legal origin and national culture, $\varepsilon_{i,t}$ is the error term, and *i* and *t* denote country and time period, respectively.

Panel OLS with heteroskedasticity-consistent standard errors allows us to correct for errors that are both heteroscedastic and contemporaneously correlated within countries, whereas it does not control for endogeneity, which may cause simultaneity bias. To address this problem, we use the two-step generalised method of moments (GMM), a dynamic panel procedure developed by Arellano and Bond (1991), Arellano and Bover (1995), and implemented by Blundell and Bond (1998) as a second step to test the relationship between financial and economic structures. The regression equations have the following form:

$$y_{i,t} = \alpha' ES_{i,t-1} + \beta' X^{2}_{i,t} + \mu_i + \lambda_t + \varepsilon_{i,t}$$

where $y_{i,t}$ represents one of the five measures for *Financial Structure*, *ES* is one of the two economic structure indicators, and *X* is a set of contemporaneous explanatory variables. In the regression, μ captures unobserved country-specific effects, λ is a time-specific effect, ε is a time-varying error term, and *i* and *t* represent the country. We also use time dummies to account

for period-specific effects although these are omitted from the equations.

The consistency of the system GMM estimator depends on the validity of the instruments and the validity of the assumption that the error terms do not exhibit serial correlation. We use the specification tests suggested by Arellano and Bond (1991), Arellano and Bover (1995), Blundell and Bond (1997), and recently by Roodman (2009) to test our specifications. The first is the Hansen J specifications test, which tests the validity of the instruments. The second test examines the hypothesis that the error term $\varepsilon_{i,t}$ is not serially correlated. We test whether the differenced error term is second-order serially correlated because, by construction, the differenced error term is likely to be first-order serially correlated even if the original error term is not. A failure to reject the null hypotheses of both specification tests provides support to our model.

5. Empirical Results

In this section, we present the main results, whereas in the regression with the dependent variable we use the three proxies that illustrate different aspects of the structure of the financial system in addition to the two main indicators for the financial structure. We regress each of the dependent variables separately on the two economic structure indicators.

Table 2 shows that the variables for economic structure are negatively and significantly associated with financial structure when we employ both the OLS and GMM estimation method. The negative sign implies that an increase in the size of the service sector with respect to the industry and agriculture sector would lead to an increase in the significance of the stock market in the financial system. Moreover, an interpretation of the coefficients implies that a change in the economic structure will have a greater impact on the activity and efficiency of the financial sector and, to a lesser extent, on its size. In our opinion, this implies that a change in the economic

structure leads to a shift in the structure of the financial system and to its development.

When the second variable for economic structure is employed, the results are weaker statistically. The coefficient for economic structure remains negative and is significant at least at the 5% level in almost all of the specifications. Only when the dependent variable is the aggregate measure for financial structure is the coefficient for economic structure insignificant. One of the explanations for the weaker results could be that in using the second variable we exclude agriculture, which is an important sector of the economy in certain countries and may have a significant impact on a country's financial structure.

[TABLE 2]

The study findings confirm that the structure of an economy exerts a positive influence on the direction of the evolution of the financial system. Countries with asset-intensive industries tend to have a bank-based financial system. Conversely, market-based financial systems are more likely to evolve in countries where the service sector represents a large part of the economy. Hence, a shift in the economy from industry toward service may cause a change in the financial structure. Moreover, the coefficients on economic structure in the regressions imply a substantial impact on all aspects of the financial structure. If a country's economic structure moves toward intangible asset-intensive industries, it would potentially increase first the liquidity and efficiency of the capital market and then its size. However, all these interpretations must be accepted with caution. In practice, we expect that development of the service sector would increase the need to finance through capital markets, which would result in the market's expansion. However, change in financial structure is a long-term process that may not immediately follow a shift in the economic structure.

5.1. Sensitivity analysis and discussion

We test the sensitivity of our results and control for other variables that may also influence a country's financial structure and that are suggested in the literature. We group these controls into four categories according to the different perspectives on the financial structure determinants outlined in Section 2.

The addition of control variables does not change the main results. The coefficients of the economic structure remain negative and highly significant in the majority of the specifications. Previously the results were weaker when we used the second measure for economic structure, which excludes agriculture, or the aggregate measure for financial structure.

Table 3 presents the results when we augment the main estimation and employ dummy variables for British, German, French, or Russian legal origin. The coefficient for economic structure is negative and statistically significant when we employ the OLS regression. The results change slightly when we use the two-step system GMM. The coefficients for the French, German, and Russian legal origin enter negatively into the regression. However, the coefficients for those legal origins show a weaker relation to the financial structure indicators. The coefficients for French and Russian legal origin dummies are negative and significant only when the dependent variable is financial system efficiency and aggregate. The British legal origin enters with mixed signs, whereas a positive and significant sign is seen when we employ financial system size as the dependent variable. Generally, we find weak evidence only of the impact of the legal origins on financial structure. Moreover, we assume that Russian legal origin is more significant only because it reflects the ongoing changes in the corporate governance and accounting standards in the former socialist countries for the last two decades. Those reforms and changes in the economic structure resulted in the rapid development of capital markets in those countries, which we assume is captured to some extent by the legal dummy.

[TABLE 3]

We modify the previous econometric specification and include only the common law dummy instead of the four dummies for legal origin. Table 4 shows that using only one dummy for common law origin improves the results. The main economic structure indicators enter the specifications with a negative sign and the coefficient is significant at 1% in all regressions. The results, however, remain less significant when we use the second economic structure. The common law dummy is positive and statistically significant in the majority of the specifications. The result is consistent with the existing findings that demonstrate that market-based financial systems are more likely to evolve in countries with common law legal systems. Consequently, the results show that a country's economic structure and legal system may determine the structure of the financial system.

[TABLE 4]

In Table 5, we extend these analyses and control for investor protection instead of legal origins. Including these controls help to isolate the independent association between economic structure and financial structure when controlling for the possible influences by creditor and shareholder protection in one country. Under both methodologies the main results still hold, suggesting again that if a country's economic structure moves to industries with more intangible assets, the capital market are likely to get larger and more efficient. The coefficients of creditor rights enter positively but insignificantly in all the specifications. In contrast, the coefficients of shareholder rights enter positively and statistically significantly in most of the specifications. These results indicate that there is no clear relationship between creditor rights protection and the relative development of market to banking sector. The improvement in shareholder protection may however be beneficial for capital market development in terms of size, activity and

efficiency, which is consistent with Djankov et al. (2008).

[TABLE 5]

Then, we modify the regression by adding the historical financial structure variables. Using the historical values, we proxy for the past structure of the financial system. Based on the theoretical model of Monnet and Quintin (2005), this should determine the present structure. In Table 6, the results only partially confirm the relationship between the past and present financial structure. The coefficients for the past financial structure are positive and significantly related to the present financial structure only when we use the OLS estimation technique. However, when we employ the GMM estimation method the coefficient for the past financial structure is significant only once and at the 5% level. Consequently, we do not find strong evidence confirming that the past financial structure influences the present structure of the financial system. The results indicate that great reversals are also possible, consistent with the findings of Rajan and Zingales (2003b). Moreover, the coefficients for economic structures remain negative and statistically significant in the majority of the specifications. Consequently, we find that the evolution of the economic structure has an impact on the current structure of the financial system rather than its history.

[TABLE 6]

Finally, we employ the variable UAI in the main regressions, which is a proxy for a country's national culture. The results in Table 7 are consistent with the results of Kwok and Tadesse (2006) and show that national culture may determine financial structure because the coefficient of the proxy enters the regression significantly at the 1% level. Although we lose certain observations because of the limited data with respect to national culture, the economic structure enters the regression with a negative sign and is statistically significant in the majority

of the specifications. Similarly, the coefficient for UAI, which reflects the country's national culture to risk aversion, enters the specifications with a negative sign and is statistically significant. This indicates that a country with stronger uncertainty avoidance is more likely to have a bank-based financial system, which is consistent with the findings of Kwok and Tadesse (2006). Hence, the results are consistent with the main results and confirm the observed relationship between the financial and economic structures when we control for a country's national culture.

[TABLE 7]

The results of the sensitivity analysis strongly support the general hypothesis of this paper. However, the results of the sensitivity analysis using a two-step dynamic GMM should be viewed with caution. In several regressions, the specification tests signal that there may be certain problems with the validity of instruments or the assumption that the error terms do not exhibit serial correlation. Consequently, we repeated all the regressions using the GMM *difference* estimator and compared the results with that of the one step *system* GMM estimator. We also consider additional specifications, such as a fixed lag length in the GMM instruments to avoid over fitting, which would remove the effect of instrumental variables estimation. The robustness checks, however, show that our results are not sensitive either to the methodology or the number of lags used as instruments because the coefficients do not change significantly from the reported main results.

5.2. Financial structure and economic structure during banking crisis

Allen et al. (2012) showed that the structure of the financial system may change as a result of a systematic banking crisis. Therefore, we repeat the estimation using annual data and control for systemic banking crises that occurred in the countries to examine if the relationship evolves

five years before, during, or five years after a banking crisis. In this section, however, we do not employ the GMM methodology because a small number of observations and a large number of instruments could bias our results. Table 8 shows that the coefficient of the economic structure is negative and statistically significant prior to and post crisis time and during the crisis period. Similarly, the coefficient for the alternative economic structure variable is also negatively related to the economic structure before, during, and after a crisis period. Consequently, the results show that a systematic banking crisis does not change the observed relationship between economic and financial structure.

We find that the coefficient for British legal origin is positive, yet significant only in three of the six specifications, whereas the coefficients for the other legal origins are insignificant and have mixed signs. Therefore, the results show that the relation between legal origin and financial structure is much weaker when we control for a banking crisis. At the same time, we find that the impact of the economic structure on the financial structure remains unchanged. Consequently, economic structure appears to exert a much stronger impact on the structure of the financial system than a country's legal origin.

[TABLE 8]

6. Robustness analysis

To check the robustness of our main results we conduct a wide array of additional analyses; however, for brevity we do not report them.[1] First, we check the consistency of the results after removing outliers. These outliers are eliminated after considering the scatter plot of the main financial and economic structure indicators. We eliminate those countries that fall particularly far from the regression line and then repeat the estimation on the new sample. After eliminating the

[1]These robustness results are available on request.

extreme observations, we still find a significant and negative relationship between financial and economic structure. Second, we increase the set of explanatory variables and add variables for country GDP, inflation, area, latitude, dummies for landlocked economies, transition economies, or developing countries. Including these variables does not affect either the significance level or the sign of the estimated coefficients. Third, we divide the countries in the sample into two groups based on their membership in the OECD. We assume that countries belonging to the OECD are on average more developed than non-OECD member countries. Using the two separate samples we compute again the baseline regressions. The results indicate that the relationship between financial structure and economic structure is much stronger in industrial countries than in developing countries. One possible explanation for this result is the different development stage of the financial system itself. In developing countries, the financial structure is emerging and adjusting to the needs of the real economy at the same time. Moreover, rapid changes in the financial structure are often caused by additional factors such as liberalisation or political transformation. Conversely, in most of the industrial countries, we may assume that the financial system may already have an optimal structure, whereas changes are only caused in case of significant changes in the economic structure, which takes substantial time.

Fourth, in case of the OECD countries the data availability on the composition of value added for most of the industries allows us to calculate an alternative measure of economic structures, where we controls for the firm assets characteristics in the given industry. In this analysis, the primary data source is the OECD STAN database for industrial analysis, which enables retrieval of gross value added for 47 industries representing nine main sectors of the economy in 25 countries. We divide the industries using firm specific characteristics from either an asset-intensive or knowledge sector, where we measured asset intensity as the ratio of tangible

assets (property, plant and equipment) to total book assets of the firm in the industry, whereas the company specific data was computed using data from the Bureau van Dijk's ORBIS database.

According to our theory, asset-intensive firms with tangible assets may use the assets to collateralise their bank debt. Hence, in countries dominated by asset-intensive industries bank-based financial system are more likely to emerge. In contrast, knowledge-based companies with a low level of tangible assets are often forced to use either equity or bonds to finance their needs. Therefore, countries dominated by industry with intangible assets are more likely to have a market-based financial system.

Classifying industries as either asset or tangible asset intensive, where we distinguish industries using ratios calculated on firm level data, we again construct two alternative measures for economic structure and employ them in the basic regression. The results of those regressions are similar to those we have presented previously and the coefficients of the economic structure were again negatively correlated and statistical significant

Concluding, the results of the robustness test using different methodology, data, and variables confirm our findings on the link between financial structure and economic structure. However, as in other studies, our empirical analysis has its limitations. The data for our study is available only for a short period, which prevents us from applying a causality test such as the Granger test. Nevertheless, we test the causal relationship using the beginning of period value for the real economy indicators and did not find any significant differences in our results. Consequently, we interpret our results as a causal relationship; however, we are aware that it is not a precise test of the direction of the relationship.

7. Conclusions

Our results provide new evidence concerning the causes and causality of the direction of evolution of the financial system structure. Using both panel OLS and dynamic panel techniques we document that the economic structure is closely linked to the shape of the financial system. We find that countries with asset-intensive sectors are more likely to have a bank-based system. Conversely, countries with sectors that are based on knowledge and intangible assets are likely to exhibit a market-based financial system. The results suggest that the structure of the real economy may influence the structure of the financial system. Additionally, when we control for banking crises we find that the relationship between economic and financial system structure is unchanged while the impact of the legal origin is weak, which has been emphasised as an important determinant in the literature.

In our opinion, these results present a missing link in the explanation as to why country financial structures still differ. The results, however, confirm that other factors may influence the structure of the financial system. Consequently, a financial system may not always have an optimal structure, which may be a result of political arrangements or the interests of incumbent groups (Rajan and Zingales, 2003). Therefore, we assume that financial systems may not always be able to reach their optimal structure. However, as existing barriers are removed the structure of a financial system may develop and gain ground, but it would be independent of further changes in the real economic structure. Finally, when the financial system has reached its optimal structure with respect to the characteristics of the real economy, our theory implies that any increase in the significance of fixed-asset-intensive sectors would lead to an increase in the role of banks with respect to the stock market.

The main policy implications of the model are that despite efforts from governments and

multilateral organisations, particular those from the emerging economies, country capital markets will not grow in size or activity as long as the economy remains asset-intensive. Therefore, governments should focus on improving the transparency or efficiency of the existing financial structure and less on the development of the stock market because the market will develop as soon as the economic structure changes. These results are consistent with Robinson (1952).

Finally, because the results show that a financial structure is related to the economy, this study contributes to the ongoing debate on the relative merits of bank-based versus market-based financial systems with respect to the promotion of economic growth (Levine and Zeros, 1998). Luintel et al. (2008) show that financial structure matters with respect to economic growth and our study presents plausible explanations for this conclusion.

References

Allen, F. (1993), Stock markets and resource allocation. In: C. Mayer, X. Vives (eds), *Capital markets and financial intermediation*, Cambridge: University Press, 81-77.

Allen, F., and D. Gale (1999), Diversity of opinion and financing of new technologies, *Journal of Financial Intermediation* 8, 1999, 68-89.

Allen, F., and D. Gale (2000), *Comparing financial systems*, Cambridge, MA: MIT.

Allen, F., X. Gu, and O. Kowalewski (2012), Financial crisis, structure and reform, *Journal of Banking and Finance* 36(11), 2960-2973.

Arellano, M., and S. R. Bond (1991), Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *Review of Economic Studies* 58, 277-297.

Arellano, M., and O. Bover (1995), Another look at the instrumental-variable estimation of error-components models, *Journal of Econometrics* 68, 29-52.

Beck, T., A. Demirgüç-Kunt, and R. Levine (2000), A new database on financial development and structure, *World Bank Economic Review* 14, 597-605.

Beck, T., and A. Demirgüç-Kunt, (2009), Financial institutions and markets across countries and over time: data and analysis, World Bank Policy Research Working Paper No. 4943.

Beck, T., A. Demirgüç-Kunt and D. Singer (2013), Is small beautiful? Financial structure, size and access to finance, *World Development*, 52, 19-33.

Beck, T., R. Levine, and N. Loayza. (2000), Finance and the sources of growth, *Journal of Financial Economics* 58, 261-300.

Beck, T., and R. Levine (2002). Industry growth and capital allocation: Does having a market- or bank-based system matter, *Journal of Financial Economics* 64(2), 147-180.

Beck, T., A. Demirgüç-Kunt, and R. Levine (2003), Law, endowment, and finance, *Journal of*

Financial Economics, 70, 137-181.

Biais, B., and E. Perotti (2002), Machiavellian privatization, *American Economic Review* 92, 240-258.

Binh K. B., S. Y. Park. B. S. Shin (2006), Financial structure does matter for industrial growth: Direct evidence from OECD countries, Working Paper.

Blundell, R. and S. Bond (1998), Initial conditions and moment restrictions in dynamic panel data models, *Journal of Econometrics* 87(1), 115-143.

Boot, A. and A. Thakor (1997), Financial system architecture, *Review of Financial Studies,* 10, 693-733.

Carlin, W and C. Mayer (2003), Finance, investment and growth, *Journal of Financial Economics* 69, 191-226.

Cihak, M., A. Demirgüç-Kunt, E. Feyen and R. Levine (2012), Benchmarking financial development around the world, World Bank Policy Research Working Paper 6175.

Cihak, M., A. Demirgüç-Kunt, E. Feyen and R. Levine (2013), Financial development in 205 economies, 1960 to 2010, NBER Working Paper No. 18946, April 2013.

Chandler, A. D. (1977), *The visible hand: the managerial revolution in American business,* Cambridge, MA: Harvard University Press.

Claessens, S. and L. A. Laeven,(2003), Law, property rights and growth, *Journal of Finance* 58(6), 2401-2436.

Cull, R. and L. C. Xu (2013), Job growth and finance: are some financial institutions better suited to the early stages of development than others?, *The World Bank Economic Review* 27(3), 542-572.

Demirgüç-Kunt, A., and R. Levine (1999), Bank-based and market-based financial systems:

Cross-country comparisons, World Bank Policy Working Paper No. 2143.

Demirgüç-Kunt, A., and R. Levine (2004), *Financial structure and economic growth: A cross-country comparison of banks, markets and development*, Cambridge, MA: MIT Press.

Demirgüç-Kunt, A., E. Feyen and R. Levine (2012), The evolving importance of banks and securities markets, *The World Bank Economic Review 27(3),* 476-490.

Djankov, S., C. Mcliesh, and A. Shleifer, 2007, Private credit in 129 countries, *Journal of Financial Economics* 84, 299–329.

Djankov, S., O. Hart, C. Mcliesh, and A. Shleifer, 2008, Debt enforcement around the world, *Journal of Political Economy* 116, 1105–1149.

Easterly, W. and R. Levine (2003), Tropics, germs, and crops: How endowments influence economic development, *Journal of Monetary Economics* 50, 3-40.

Ergungor, O. (2004), Market- vs. bank-based financial systems: does rights and regulation really matter? *Journal of Banking and Finance* 28, 2869-2887.

Goldsmith, R. (1969), *Financial structure and development*, New Haven: Yale University Press.

Gerschenkron, A. (1962), *Economic backwardness in historical perspective - A book of essays,* Cambridge, MA: Harvard University Press.

Harper, J. T and J. E. McNulty (2008), Financial system size in transition economies: the effect of legal origin, *Journal of Money, Credit and Banking* 40**,** 1263-1280.

Kwok, C. and S. Tadesse (2006), National culture and financial system, *Journal of International Business Studies,* 37, 227-247.

Laeven, L. and F. Valencia (2012), Systemic Banking Crises Database: An Update, IMF Working Paper, 12/163.

La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R. Vishny (1997), The legal determinants of

external finance, *Journal of Finance* 52, 1131-1150.

La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R. Vishny, (1998), Law and finance, *Journal of Political Economy* 106, 1113-1155.

Levine, R. (1997), Financial development and economic growth: views and agenda, *Journal of Economic Literature* 35, 688-726.

Levine, R., N. Loayza, and T. Beck, (2000), Financial intermediation and growth: causality and causes, *Journal of Monetary Economics* 46, 31-77.

Levine, R. (2002) Bank-based or market-based financial systems: Which is better?, *Journal of Financial Intermediation* 11, 398-428.

Lin, J. Y., X. Sun and Y. Jiang (2009), Toward a theory of optimal financial structure, World Bank Policy Research WPS No. 5038, September 2009.

Luintel K. B, M. Khan, P. Arestis, and K. Theodoridis (2008), Financial structure and economic growth, *Journal of Development Economics* 86, 181-200.

McKinnon, R., (1973), *Money and capital in economic development*, Washington, D.C.: Brookings Institution.

Monnet, C., and E. Quintin (2005), Why do financial systems differ? History matters, Working Paper Series No. 442, European Central Bank.

Modigliani, F. and E. Perotti (2000), Security versus bank finance: the importance of a proper enforcement of legal rules, FEEM Working Paper No. 37.

Pagano, M., and P. F. Volpin, 2005, The Political Economy of Corporate Governance, *The American Economic Review* 95, 1005–1030.

Perotti, E., and E. von Thadden (2006), The political economy of corporate control and labor rents, *Journal of Political Economy* 114, 145-174.

Perotti, E., and P. Volpin (2004), Lobbying on entry, working paper, University of Amsterdam.

Rajan, R., and L. Zingales (1995), What do we know about capital structure? Some Evidence from International Data, *Journal of Finance* 50, 1421-1460

Rajan, R., and L. Zingales (1998), Financial dependence and growth, *American Economic Review* 88**,** 559-586.

Rajan, R., and L. Zingales (2003a), Banks and markets: The changing character of European finance, in V. Gaspar, P. Hartmann and O. Sleijpen (eds.), *The Transformation of the European Financial System*, Frankfurt: European Central Bank, 169-172.

Rajan, R., and L. Zingales (2003b), The great reversals: The politics of financial development in the twentieth century, *Journal of Financial Economics* 69, 5-50.

Rajan, R., and L. Zingales (2004), *Saving capitalism from the capitalists*, Princeton, NJ: Princeton University Press.

Robinson, J. (1952), *The generalization of the General Theory* in: *The rate of interest, and other Essays*, London: Macmillan, 67-142.

Roodman, D., (2009), A note on the theme of too many instruments. *Oxford Bulletin of Economics and Statistics* 71, 135–158.

Rousseau, P., and P. Wachtel, (2002), Inflation thresholds and the finance - growth nexus, *Journal of International Money and Finance*, 21, 777-793.

Schmukler, S. L., J. C. Gozzi, and A. de la Torre (2007), Stock market development under globalization: Whither the gains from reforms?, *Journal of Banking and Finance* 16, 1731-1754.

Spamann, H. (2010), The "Antidirector Rights Index" Revisited, *Review of Financial Studies* 23, 467–486.

Song, F. and A. Thakor (2012), Notes on financial system development and political intervention,

The World Bank Economic Review, 27(3), 491-513.

Tadesse, S. (2002), Financial architecture and economic performance: international evidence, *Journal of Financial Intermediation*, 11, 429-454.

Tilly, R. (1967), *Germany 1815-1870*, in R. Cameron et. al. (eds.) *Banking in the early stages of industrialization: a study in comparative economic history*, New York: Oxford University Press, 1967, 151-182.

Torre, A., E. Feyen, A. Ize (2013), Financial development: structure and dynamics, *The World Bank Economic Review*, 27(3), 514-541.

Windmeijer, F. (2000), A finite sample correction for the variance of linear two-step GMM estimators, Institute for Fiscal Studies Working Paper, 00/19.

Table 1
Descriptive Statistics and Correlations. The data are averaged over the period 1972-2011.

	Size	Activity	Efficiency	Structure	Aggregate	ES_1	ES_2	H-S	H-A	H-S	L_B	L_F	L_G	L_S	L_R	CR	C_ADR	UAI
Panel A: Descriptive Statistics																		
Mean	-0.84	-2.75	2.48	-0.09	-0.06	0.46	0.68	-1.24	-3.43	-0.46	0.33	0.45	0.11	0.05	0.06	1.93	3.73	65.37
Std. Dev.	1.12	1.98	2.03	1.01	1.02	0.13	0.40	1.00	1.73	0.84	0.47	0.50	0.31	0.24	0.24	1.04	0.94	23.46
Min.	-5.05	-10.38	-3.58	-4.37	-3.75	0.07	0.07	-3.17	-7.97	-2.25	0	0	0	0	0	0	2	8
Max	1.63	1.30	7.42	2.02	2.32	0.81	4.02	0.27	-0.31	0.96	1	1	1	1	1	4	5	112
Obs.	520	537	368	514	360	687	687	160	240	160	800	800	800	800	800	720	352	456
Panel B: Correlations																		
Size	1																	
Activity	0.65*	1																
Efficiency	0.47*	0.92*	1															
Structure	0.91*	0.91*	0.80*	1														
Aggregate	0.72*	0.96*	0.93*	0.96*	1													
ES_1	-0.20*	-0.27*	-0.33*	-0.24*	-0.23*	1												
ES_2	-0.04	-0.10	-0.13	-0.07	-0.05	0.71	1											
H-Size	0.58*	0.21	0.14	0.43*	0.28	-0.13	-0.08	1										
H-Activity	0.30*	0.47*	0.34*	0.40*	0.37*	0.02	0.00	0.64*	1									
H-Structure	0.55*	0.33*	0.24	0.48*	0.36*	-0.02	0.03	0.92*	0.89*	1								
L_British	0.30*	0.09	0.08	0.22*	0.14	0.14*	-0.03	0.39*	0.14	0.32*	1							
L_French	-0.21*	-0.17*	-0.16	-0.21*	-0.19*	-0.06	0.07	0.03	0.00	0.01	-0.63*	1						
L_German	-0.08	0.10	0.06	0.01	0.03	-0.10	-0.04	-0.26	0.17	-0.05	-0.25*	-0.32*	1					
L_Scandinavian	-0.00	0.05	0.18	0.03	0.15	-0.18*	-0.10	-0.27	-0.43*	-0.43*	-0.16*	-0.21*	-0.08	1				
L_Russia	-0.07	-0.02	-0.10	-0.05	-0.09	0.15*	0.08	-	-	-	-0.18*	-0.23*	-0.09	-0.06	1			
CR	0.09	0.06	0.02	0.07	0.01	-0.10*	-0.01	0.25*	0.10	0.18*	0.25*	-0.34*	0.16*	-0.04	0.06	1		
C_ADR	0.17*	0.18*	0.29*	0.19*	0.30*	0.07	0.01	-0.05	-0.00	-0.09	0.21*	-0.32	0.10	0.09	-	0.19*	1	
UAI	-0.31*	-0.24*	-0.27*	-0.29*	-0.32*	0.00	0.02	-0.04	-0.10	-0.01	-0.61*	0.60*	0.20*	-0.29*	-	-0.32*	-0.20*	1

Note: * indicates statistical significance at 5 percent level.

Table 2

Financial Structure and Economic Structure

The dependent variables are five measures of financial structures .The explanatory variables included in the regressions are two measures of economic structure (ES). The specifications include constant and time dummies but we do not report the estimates in the table.

	Size		Activity		Efficiency		Structure		Aggregate	
Panel A: OLS										
ES_1	-4.16***		-12.91***		-5.98***		-6.83***		-2.12**	
	(0.57)		(1.13)		(1.42)		(0.66)		(0.88)	
ES_2		-1.51***		-2.81***		-0.84**		-1.56***		-0.04
		(0.32)		(0.50)		(0.42)		(0.30)		(0.23)
No. Obs.	487	487	503	503	352	352	481	481	344	344
R^2	0.039	0.001	0.071	0.010	0.108	0.018	0.058	0.005	0.054	0.002
Panel B: two-step system GMM										
ES_1	-2.78***		-11.81***		-14.63***		-3.90***		-5.92***	
	(0.63)		(1.12)		(2.79)		(0.44)		(1.06)	
ES_2		-0.87**		-4.01***		-5.40***		-1.44***		-2.12***
		(0.34)		(0.57)		(1.19)		(0.26)		(0.66)
No. Obs.	487	487	503	503	352	352	481	481	344	344
Hansen J	0.267	0.304	0.104	0.076	0.585	0.287	0.155	0.107	0.327	0.222
AR (2)	0.239	0.272	0.131	0.669	0.433	0.251	0.430	0.355	0.703	0.579

Note: ***, ** and * represent significance at 1, 5, and 10 percent level respectively; Robust standard errors are reported in parentheses.

Table 3

Financial Structure, Economic Structure and Legal Origin

The dependent variables are five measures of financial structures .The explanatory variables included in the regressions are two measures of economic structure (ES), dummies for the legal origin of the country (British, German, French and Russia). The specifications include constant and time dummies but we do not report the estimates in the table.

	Size		Activity		Efficiency		Structure		Aggregate	
Panel A: OLS										
ES_1	-4.26***		-9.11***		-5.89***		-4.30***		-2.11***	
	(0.55)		(0.92)		(1.09)		(0.50)		(0.62)	
ES_2		-0.60***		-1.59***		-0.81*		-0.66***		-0.03
		(0.22)		(0.37)		(0.42)		(0.20)		(0.23)
L_British	1.03***	0.67*	0.64	-0.02	-0.95	-1.48	0.63*	0.28	-0.29	-0.53
	(0.39)	(0.39)	(0.72)	(0.71)	(0.89)	(0.93)	(0.35)	(0.35)	(0.46)	(0.47)
L_French	0.03	-0.20	-0.24	-0.68	-1.68**	-2.02**	-0.11	-0.34	-0.77*	-0.93**
	(0.38)	(0.38)	(0.70)	(0.70)	(0.87)	(0.92)	(0.34)	(0.34)	(0.45)	(0.46)
L_German	0.00	-0.14	0.13	-0.13	-1.46	-1.66	-0.02	-0.16	-0.66	-0.74
	(0.45)	(0.44)	(0.81)	(0.81)	(1.01)	(1.06)	(0.40)	(0.39)	(0.52)	(0.53)
L_Russia	0.23	-0.31	0.55	-0.37	-1.73	-2.43**	0.26	-0.28	-0.72*	-1.06*
	(0.52)	(0.51)	(0.92)	(0.92)	(0.90)	(1.18)	(0.46)	(0.46)	(0.59)	(0.60)
No. Obs.	487	487	503	503	352	352	481	481	344	344
R^2	0.155	0.101	0.104	0.036	0.161	0.076	0.138	0.073	0.120	0.064
Panel B: two-step system GMM										
ES_1	-10.15***		-18.39***		-13.84***		-10.48***		-7.09***	
	(1.47)		(2.25)		(1.91)		(0.84)		(1.23)	
ES_2		-3.97***		-6.14***		-3.68***		-3.78***		-2.46***
		(0.88)		(0.92)		(0.94)		(0.54)		(0.61)
L_British	9.04	-0.73	0.40	2.66	-27.91	-16.55	1.85	-0.39	0.13	-2.02
	(11.64)	(15.27)	(21.92)	(20.31)	(19.20)	(19.74)	(7.96)	(8.22)	(2.05)	(2.88)
L_French	13.69	2.11	-2.33	-1.78	-29.76	-19.44	3.42	1.13	-3.77	-6.12
	(12.06)	(16.84)	(14.80)	(17.10)	(19.65)	(20.11)	(12.88)	(14.87)	(2.74)	(4.03)
L_German	-5.51	-15.52	-6.96	2.38	-34.11*	-24.52	-8.96	-7.80	-7.01***	-8.66***
	(12.84)	(16.69)	(19.34)	(20.06)	(18.96)	(19.62)	(10.22)	(10.49)	(2.65)	(3.15)
L_Russia	72.01	6.38	-107.82	8.73	-30.89	-20.21	-7.49	-48.53	-4.92	-11.19*
	(56.79)	(72.51)	(184.29)	(182.29)	(24.86)	(26.34)	(74.39)	(94.70)	(6.02)	(6.24)
No. Obs.	487	487	503	503	352	352	481	481	344	344
Hansen J	0.694	0.726	0.128	0.112	0.480	0.169	0.432	0.561	0.684	0.315
AR (2)	0.181	0.222	0.083	0.662	0.432	0.210	0.157	0.228	0.678	0.436

Note: ***, ** and * represent significance at 1, 5, and 10 percent level respectively; Robust t - statistics are reported in parentheses.

Table 4

Financial Structure, Economic Structure and Common Law

The dependent variables are five measures of financial structures .The explanatory variables included in the regressions are two measures of economic structure (ES), dummies for the common law legal origin . The specifications include constant and time dummies but we do not report the estimates in the table.

	Size		Activity		Efficiency		Structure		Aggregate	
Panel A: OLS										
ES_1	-4.18***		-9.05***		-6.12***		-4.24***		-2.23***	
	(0.54)		(0.91)		(1.08)		(0.49)		(0.61)	
ES_2		-0.61***		-1.63***		-0.87**		-0.68***		-0.07
		(0.22)		(0.37)		(0.43)		(0.20)		(0.23)
Common law	0.98***	0.85***	0.73**	0.48	0.57	0.37	0.68***	0.56***	0.40*	0.31
	(0.17)	(0.18)	(0.33)	(0.33)	(0.40)	(0.43)	(0.16)	(0.16)	(0.21)	(0.21)
No. Obs.	487	487	503	503	352	352	481	481	344	344
R^2	0.154	0.100	0.098	0.026	0.132	0.030	0.135	0.067	0.097	0.028
Panel B: two-step system GMM										
ES_1	-7.22***		-12.49***		-14.81***		-7.38***		-7.14***	
	(1.12)		(1.33)		(2.87)		(0.73)		(1.35)	
ES_2		-2.55***		-3.45***		-5.43***		-2.22***		-2.45***
		(0.55)		(0.66)		(1.19)		(0.44)		(0.68)
Common law	1.95***	1.37***	0.72	-1.27	2.38	2.30	1.89***	0.87***	3.72	2.15
	(0.43)	(0.44)	(0.93)	(0.87)	(4.84)	(4.90)	(0.38)	(0.32)	(2.90)	(1.78)
No. Obs.	487	487	503	503	352	352	481	481	344	344
Hansen J	0.692	0.565	0.105	0.079	0.521	0.236	0.343	0.245	0.477	0.270
AR (2)	0.192	0.263	0.113	0.650	0.433	0.251	0.217	0.286	0.680	0.496

Note: ***, ** and * represent significance at 1, 5, and 10 percent level respectively; Robust t - statistics are reported in parentheses.

Table 5

Financial Structure, Economic Structure and Legal Protection

The dependent variables are five measures of financial structures .The explanatory variables included in the regressions are two measures of economic structure (ES), creditor rights index and corrected anti-director index. The specifications include constant and time dummies but we do not report the estimates in the table.

	Size		Activity		Efficiency		Structure		Aggregate	
Panel A: OLS										
ES_1	-5.54***		-12.47***		-7.62***		-6.19***		-2.96***	
	(0.68)		(1.13)		(1.38)		(0.63)		(0.79)	
ES_2		-1.53***		-3.66***		-2.51***		-1.80***		-0.88**
		(0.33)		(0.56)		(0.65)		(0.31)		(0.36)
Creditor Rights	0.11	0.14	0.14	0.22	0.07	0.12	0.09	0.12	0.00	0.02
	(0.11)	(0.11)	(0.16)	(0.16)	(0.18)	(0.18)	(0.10)	(0.10)	(0.10)	(0.10)
Corrected ADR	0.23*	0.19	0.55***	0.47**	0.70***	0.66***	0.27**	0.23**	0.39***	0.38***
	(0.14)	(0.14)	(0.21)	(0.20)	(0.22)	(0.23)	(0.12)	(0.12)	(0.13)	(0.13)
No. Obs.	285	285	294	294	178	178	283	283	177	177
R^2	0.272	0.118	0.414	0.203	0.165	0.085	0.361	0.176	0.089	0.033
Panel B: two-step system GMM										
ES_1	-3.02***		-20.25***		-16.37***		-4.46***		-4.86***	
	(0.36)		(0.72)		(1.40)		(0.38)		(0.59)	
ES_2		-1.57***		-9.30***		-7.84***		-2.25***		-2.56***
		(0.17)		(0.27)		(0.73)		(0.11)		(0.27)
Creditor Rights	0.04	-0.05	-2.39***	-2.14***	-0.66	-0.69	-0.23	-0.27	-0.35	-0.22
	(0.13)	(0.13)	(0.18)	(0.16)	(1.48)	(0.92)	(0.19)	(0.22)	(0.44)	(0.33)
Corrected ADR	1.41***	1.38***	2.50***	1.44***	2.66**	1.96	1.26***	1.26***	1.70***	1.41**
	(0.20)	(0.17)	(0.75)	(0.47)	(1.16)	(1.23)	(0.22)	(0.17)	(0.51)	(0.59)
No. Obs.	285	285	294	294	178	178	283	283	177	177
Hansen J	0.280	0.285	0.516	0.497	0.527	0.599	0.226	0.225	0.263	0.451
AR (2)	0.277	0.293	0.025	0.219	0.427	0.893	0.151	0.243	0.411	0.585

Note: ***, ** and * represent significance at 1, 5, and 10 percent level respectively; Robust t - statistics are reported in parentheses.

Table 6

Financial Structure, Economic Structure and History

The dependent variables are the three main measures of financial structures. The explanatory variables included in the regressions the measure of economic structure (ES) and the historical values of the financial structure (H-Size, H-Activity and H-Structure). The specifications include constant and time dummies but we do not report the estimates in the table.

	Size		Activity		Structure	
Panel A: OLS						
ES_1	-3.36***		-9.49***		-4.60***	
	(0.69)		(1.04)		(0.64)	
ES_2		-1.26***		-2.93***		-1.82***
		(0.35)		(0.51)		(0.33)
H-Size	0.50***	0.52***				
	(0.09)	(0.08)				
H- Activity			0.27***	0.29***		
			(0.09)	(0.08)		
H-Structure					0.46***	0.48***
					(0.09)	(0.08)
No. Obs.	144	144	218	218	144	144
R^2	0.395	0.402	0.223	0.198	0.349	0.341
Panel B: two-step system GMM						
ES_1	0.39		-5.87***		-1.59*	
	(0.41)		(0.40)		(0.70)	
ES_2		0.58		-2.24***		-0.66**
		(0.33)		(0.19)		(0.29)
H-Size	0.29**	0.41				
	(0.13)	(0.24)				
H- Activity			-0.03	-0.07		
			(0.04)	(0.05)		
H-Structure					1.50	0.50
					(0.95)	(1.20)
No. Obs.	144	144	218	218	144	144
Hansen J	0.975	0.966	0.640	0.639	0.984	0.963
AR (2)	0.077	0.123	0.046	0.089	0.083	0.084

Note: ***, ** and * represent significance at 1, 5, and 10 percent level respectively; Robust t - statistics are reported in parentheses.

Table 7

Financial Structure, Economic Structure and Uncertainty Avoidance Index

The dependent variables are five measures of financial structures .The explanatory variables included in the regressions are two measures of economic structure (ES) and uncertainty avoidance index(UAI). The specifications include constant and time dummies but we do not report the estimates in the table.

	Size		Activity		Efficiency		Structure		Aggregate	
Panel A: OLS										
ES_1	-4.19***		-10.47***		-7.62***		-4.63***		-2.04***	
	(0.67)		(1.10)		(1.34)		(0.61)		(0.75)	
ES_2		-0.73**		-1.88***		-1.04*		-0.79***		0.11
		(0.29)		(0.49)		(0.55)		(0.27)		(0.30)
UAI	-0.02***	-0.02***	-0.02***	-0.02***	-0.03**	-0.03**	-0.02***	-0.02***	-0.02**	-0.02**
	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)
No. Obs.	329	329	344	344	220	220	326	326	217	217
R^2	0.105	0.100	0.143	0.073	0.174	0.091	0.127	0.095	0.141	0.113
Panel B: two-step system GMM										
ES1	-3.21***		-11.10***		-14.51***		-3.10***		-6.93***	
	(0.59)		(1.00)		(2.98)		(0.38)		(1.80)	
ES2		-0.80***		-2.55***		-3.98***		-0.94***		-1.91***
		(0.17)		(0.29)		(1.23)		(0.10)		(0.67)
UAI	-0.02***	-0.02***	0.01	0.01	0.01	0.00	-0.02	-0.01***	-0.05	-0.02
	(0.00)	(0.00)	(0.01)	(0.01)	(0.07)	(0.04)	(0.00)	(0.00)	(0.05)	(0.02)
No. Obs.	329	329	344	344	220	220	326	326	217	217
Hansen J	0.383	0.351	0.150	0.132	0.355	0.023	0.205	0.312	0.677	0.293
AR (2)	0.433	0.532	0.130	0.506	0.555	0.316	0.575	0.599	0.519	0.349

Note: ***, ** and * represent significance at 1, 5, and 10 percent level respectively; Robust t - statistics are reported in parentheses.

Table 8

Financial Structure and Economic Structure during Banking Crises.

In the Panel OLS estimation the dependent variable is size and we control for systematic banking crises. The explanatory variables included in the regressions are two measures of economic structure (ES), dummies for the legal origin of the country (British, German, French and Russia). The specifications include constant and time dummies but we do not report the estimates in the table.

	Pre-crisis		During-crisis		Post-crisis	
ES_1	-5.69***		-6.28***		-6.01***	
	(1.12)		(1.13)		(0.75)	
ES_2		-1.03**		-2.54***		-2.02***
		(0.48)		(0.58)		(0.34)
L_British	1.12*	0.58	1.40**	1.07*	0.61	0.08
	(0.65)	(0.61)	(0.61)	(0.63)	(0.66)	(0.67)
L_French	-0.02	-0.25	0.30	0.16	-0.50	-0.69
	(0.58)	(0.55)	(0.55)	(0.57)	(0.61)	(0.63)
L_German	0.01	-0.12	0.15	0.08	-0.37	-0.44
	(0.67)	(0.64)	(0.63)	(0.66)	(0.68)	(0.70)
L_Russia	1.73	1.36	1.57*	1.38	0.38	-0.12
	(0.98)	(0.93)	(0.84)	(0.88)	(0.80)	(0.82)
No. Obs.	124	124	127	127	394	394
R^2	0.138	0.091	0.155	0.090	0.111	0.056

Note: ***, ** and * represent significance at 1, 5, and 10 percent level respectively; Robust t - statistics are reported in parentheses.

Appendix

Table A.1 Definitions of main variables and data sources

Financial development		
Private credit	Equals the amount of private credit by money banks and other financial institutions divided by GDP	
Stock market capitalization	Equals stock market capitalization divided by GDP	Beck et al. (2001, 2010); Cihak, M. et al. (2012)
Stock market value traded	Equals stock market total value traded divided by GDP	
Financial structure		
Size	Equals the log of the ratio of stock market capitalization to private credit	
Activity	Equals the log of the ratio of value traded to private credit	
Efficiency	Equals the ratio of total value trade to banking overhead costs	Beck et al. (2001, 2010); Cihak, M. et al. (2012)
Structure	Equals the principal component of the two variables of *Size* and *Activity*	
Aggregate	Equals the principal component of the three variables of *Size*, *Activity* and *Efficiency*	
Economic structure		
ES1	Equals the ratio of the value added of agriculture and industry to total gross value added	World development indicators, the World bank
ES2	Equals the ratio of the value added of industry to service sector	World development indicators, the World bank
Law determinants		
Legal origin	Indices created by coding countries by legal origin, which can be divided into five categories-English Common Law, French Civil Law, German Civil Law, Scandinavian Civil Law and Russian Civil Law	LLSV (1997, 1998)
Creditor rights	Indices aggregating creditor rights, which range from 0 (weakest creditor rights) to 4 (strongest creditor rights)	Djankov et al. (2007)
Corrected ADR	Corrected indices of the original anti-director rights index, with improved data collection, coding and documentation	Spamann (2010)
Culture		
Uncertainty Avoidance Index (UAI)	An index based on Hofstede's surveys from 1967 to 1971. Equals a composite score of three empirical	Tadesse (2006)

	indicators: stress, employment stability and rule orientation	
Banking crises		
Systemic banking crises	Represents a banking crisis when a country's corporate and financial sectors experience numerous defaults.	Laeven and Valencia (2012)

Table A.2 Country-averages of the main regression variables

Country	Size	Activity	Efficiency	Structure	Aggregate	ES_1	ES_2	Law
Argentina	-0.67	-2.46	2.75	0.08	0.23	0.45	0.69	F
Armenia	-3.06	-5.59	-1.90	-1.87	-2.43	0.67	1.26	R
Australia	0.00	-1.21	4.35	0.74	0.92	0.36	0.51	B
Austria	-2.28	-3.77	2.49	-1.14	-0.58	0.36	0.52	G
Bangladesh	-1.77	-2.75	1.12	-0.59	-0.82	0.51	0.48	B
Barbados	0.03	-3.59	1.72	0.07	-0.18	0.27	0.28	B
Belgium	-0.40	-2.21	2.75	0.25	0.19	0.33	0.47	F
Bolivia	-1.85	-7.11	-1.73	-1.87	-2.49	0.51	0.69	F
Botswana	0.06	-3.25	1.14	0.23	-0.33	0.60	1.30	B
Brazil	-0.70	-1.44	4.60	0.32	0.97	0.45	0.69	F
Bulgaria	-2.07	-4.00	1.17	-0.96	-0.47	0.54	1.16	F
Canada	-0.46	-1.56	4.37	0.41	0.66	0.36	0.52	B
Chile	-0.07	-2.37	2.75	0.31	0.25	0.45	0.70	F
Colombia	-1.00	-3.69	2.44	-0.43	-0.11	0.49	0.64	F
Costa Rica	-1.18	-5.63	0.10	-1.23	-1.64	0.42	0.53	F
Croatia	-0.90	-3.50	1.44	-0.39	-0.73	0.39	0.52	G
Czech Rep.	-0.70	-1.51	3.24	0.31	0.26	0.42	0.65	F
Denmark	-0.63	-2.54	3.82	0.04	0.49	0.30	0.37	S
Ecuador	-1.18	-4.24	0.73	-0.72	-1.19	0.43	0.64	F
Egypt	-1.25	-3.36	1.57	-0.52	-0.38	0.51	0.65	F
El Salvador	1.19	-3.14	-0.42	0.82	-0.23	0.43	0.51	G
Estonia	-0.90	-2.28	2.65	-0.02	-0.16	0.34	0.45	G
Fiji	-1.49	-5.75	-0.95	-1.17	-2.02	0.41	0.38	B
Finland	-0.50	-2.49	3.45	0.44	0.55	0.41	0.60	S
France	-1.21	-2.10	3.95	-0.14	0.51	0.31	0.39	F
Georgia	-1.21	-4.50	-0.23	-0.81	-1.37	0.55	0.70	R
Germany	-1.38	-1.77	4.22	-0.12	0.41	0.37	0.59	G
Ghana	0.19	-4.09	1.00	0.20	-0.25	0.67	0.65	B
Guatemala	-3.04	-6.27	-1.73	-2.25	-2.69	0.43	0.51	F
Guyana	-1.27	-6.42	-1.21	-1.41	-2.06	0.60	0.80	B
Honduras	-1.13	-2.69	1.82	-0.04	-0.16	0.48	0.52	F
Hong Kong	0.57	-0.05	5.83	1.35	1.63	0.10	0.11	B
Hungary	-0.87	-2.20	2.52	0.20	0.21	0.50	0.92	G
Iceland	-0.96	-2.42	3.82	-0.07	0.27	0.42	0.55	S
India	-0.52	-1.07	4.36	0.56	1.15	0.54	0.56	B
Indonesia	-2.00	-3.49	3.23	-0.92	0.25	0.61	1.04	F
Iran	-0.95	-2.79	-3.28	-0.19	-1.38	0.53	0.85	F
Ireland	-0.96	-1.70	1.80	0.12	-0.20	0.44	0.65	B
Italy	-1.54	-2.37	3.75	-0.37	0.23	0.36	0.52	F
Jamaica	-0.01	-3.14	2.54	0.17	0.35	0.35	0.44	B
Japan	-1.04	-1.58	3.96	0.11	0.35	0.37	0.56	G
Jordan	0.06	-1.79	3.77	0.62	0.71	0.33	0.40	F

Country	Size	Activity	Efficiency	Structure	Aggregate	ES_1	ES_2	Law
Kazahstan	-0.38	-3.22	1.30	-0.02	-0.48	0.49	0.77	R
Kenya	-0.62	-3.82	1.77	-0.32	-0.35	0.50	0.38	B
Korea Rep.	-0.91	-0.82	4.80	0.39	0.94	0.49	0.74	G
Kuwait	0.23	-1.03	3.75	1.03	0.98	0.59	1.70	F
Kyrgyz Republic	-1.89	-1.27	2.15	-0.23	-0.24	0.62	0.78	R
Latvia	-1.56	-3.78	0.67	-0.78	-1.10	0.45	0.77	G
Lithuania	-0.77	-2.97	1.66	-0.11	-0.33	0.43	0.59	F
Luxembourg	0.33	-4.59	0.06	-0.06	-0.76	0.26	0.35	F
Macedonia	-1.94	-3.10	1.59	-0.78	-0.91	0.46	0.64	F
Malawi	0.36	-3.00	1.37	0.36	-0.24	0.60	0.58	B
Malaysia	0.11	-1.35	4.50	0.79	1.01	0.57	0.96	B
Malta	-1.53	-4.71	0.41	-1.03	-1.39	0.56	1.30	F
Mexico	-0.26	-1.72	3.55	0.58	0.69	0.39	0.53	F
Moldova	-1.10	-2.45	2.37	0.13	0.12	0.54	0.80	R
Mongolia	-1.47	-3.82	0.01	-0.74	-1.32	0.54	0.72	G
Morocco	-1.07	-3.40	2.23	-0.42	-0.14	0.48	0.60	F
Nepal	-0.97	-4.07	0.10	-0.58	-1.13	0.66	0.48	B
Netherlands	-0.59	-1.16	3.89	0.45	0.65	0.33	0.44	F
New Zealand	-0.63	-1.97	3.25	0.21	0.01	0.37	0.46	B
Nigeria	-0.65	-5.06	2.27	-0.56	-0.01	0.76	1.62	B
Norway	-1.33	-2.54	3.86	-0.31	0.26	0.40	0.61	S
Oman	-0.15	-1.60	1.92	0.55	0.26	0.61	1.78	F
Pakistan	-0.86	-1.41	4.52	0.33	1.02	0.51	0.49	B
Panama	-1.31	-5.22	-0.18	-1.03	-1.51	0.26	0.24	F
Papa New Guinea	1.57	-4.37	0.59	0.63	-0.13	0.70	1.27	B
Paraguay	-2.39	-5.57	0.02	-1.68	-1.89	0.48	0.45	F
Peru	-0.15	-2.93	2.68	0.33	0.36	0.43	0.59	F
Philippines	-0.45	-1.90	3.39	0.31	0.60	0.56	0.81	F
Poland	-0.86	-2.58	2.90	0.18	0.06	0.42	0.67	F
Portugal	-2.34	-4.22	2.94	-1.29	-0.20	0.40	0.49	F
Romania	-1.38	-3.49	1.73	-0.60	-0.38	0.60	1.25	F
Russian Fed.	-0.24	-1.29	4.50	0.59	1.17	0.48	0.83	R
Saudi Arabia	-0.03	-1.32	3.60	0.83	0.66	0.60	1.62	B
Serbia	-0.40	-3.92	1.74	0.12	0.02	0.44	0.52	F
Singapore	0.41	-0.77	4.25	1.13	1.06	0.33	0.49	B
Slovak Rep.	-2.00	-3.79	1.08	-0.97	-1.14	0.50	1.03	F
Slovenia	-1.31	-2.82	1.94	-0.39	-0.58	0.41	0.63	F
South Africa	0.36	-1.90	4.57	0.72	0.89	0.42	0.67	B
Spain	-1.09	-2.12	4.42	-0.07	0.59	0.39	0.55	F

Country	Size	Activity	Efficiency	Structure	Aggregate	ES_1	ES_2	Law
Sri Lanka	-0.58	-3.22	2.16	-0.11	-0.10	0.50	0.55	B
St Kitts	0.07	-4.79	-0.25	-0.24	-1.02	0.33	0.40	B
Swaziland	-0.89	-4.99	-1.17	-0.46	-1.55	0.57	0.93	B
Sweden	-0.95	-2.01	4.83	0.02	1.06	0.34	0.46	S
Switzerland	-0.36	-0.26	5.55	0.81	1.17	--	--	G
Tanzania	-0.68	-4.04	-0.36	-0.44	-1.15	0.58	0.46	B
Thailand	-1.48	-2.10	4.18	-0.26	0.45	0.52	0.76	B
Trinidad and Tabago	-0.36	-3.52	1.94	-0.13	-0.10	0.51	1.03	B
Tunisia	-1.79	-4.21	1.10	-1.02	-1.09	0.47	0.61	F
Turkey	-0.96	-1.55	4.83	0.33	1.28	0.48	0.56	F
Uganda	-0.80	-5.30	-1.14	-0.85	-1.62	0.63	0.38	B
United Kingdom	0.05	-0.70	4.83	0.90	0.95	0.34	0.51	B
United States	-0.54	-0.91	6.20	0.55	1.25	0.30	0.40	B
Uruguay	-3.81	-6.97	-2.40	-2.81	-3.33	0.40	0.50	F
Venezuela	-1.13	-3.73	-0.19	-0.55	-1.39	0.54	1.10	F
Vietnam	-2.74	-3.80	1.01	-1.38	-1.45	0.62	0.87	F
Zambia	0.04	-3.52	1.10	0.11	-0.27	0.59	1.08	B