Does Economic Structure Determine Financial Structure?

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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 influences the evolution of the financial system. Using both traditional cross-section regressions and dynamic panel techniques we find that economies dominated by physical-asset-intensive firms tend to have a bank-based financial system. Conversely, countries with many knowledge and intangible-asset-intensive firms will more likely have a market-based financial system. This suggests that financial institutions and markets develop in response to the financial needs of firms, hence to the characteristics of the real economy.

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1. INTRODUCTION

In recent years the relationship between financial development and economic growth has received considerable attention in the literature. Empirical studies provide evidence of a positive link between the functioning of the financial system and economic growth. Most of this empirical work suggests a positive and significant relationship between financial development and economic growth. While most of the research concentrates on the link between financial system development and economic growth, we still do not have a sufficient understanding of the emergence, development, and economic implications of different financial structures across countries. In empirical analysis the potential links between the structure of the economy and the evolution of the financial system has been neglected. As a consequence we do not have adequate explanations of the emergence of different financial structures across countries. In this paper we consider the link between the real economic structure and the financial system of a country. We define financial structure as the mix of financial markets, institutions, instruments and contracts that define how financial activities are organized at a particular date. In our research framework we use various financial measures, some of which have not been used before in the literature, which reflect the structure of financial systems across countries.

Our theoretical reasoning about the relationship between economic structure and the financial system can be traced back to the work of Joseph Schumpeter. In 1911, Schumpeter argued that the services offered by financial intermediaries are essential for economic development. In their empirical work Goldsmith (1969) and later McKinnon (1973) provided empirical evidence of the close ties between the financial system and economic development across countries. Since then numerous studies have shown that a well-functioning financial sector has a strong, positive effect on a country's aggregate growth opportunities. Levine (1997) is an excellent survey of the empirical work on the relationship between financial development and growth.

Our study does not consider growth but instead focuses on the effect of economic structure on the structure of the financial system. Robinson (1952) argued that financial intermediaries and markets appear when needed by industries. We consider the mix of intermediaries and markets that 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 firms engage in, has not been directly addressed in the literature before. Therefore, in modeling economic structure and financial structure, we hope to fill the existing gap by testing the empirical hypothesis that economic structure determines financial structure.

In order to provide evidence on our hypothesis, we need first to distinguish different financial structures across countries. However, even as attention has shifted in recent years to a more systematic classification of financial systems, the literature provides us only with very broad measures and definitions for classification. Nevertheless, we follow the literature and classify a country's financial system to be either bank-based (German or Japanese model) or market-based (Anglo-Saxon model). In the bank-based financial system, financial intermediaries play an important role by mobilizing savings, allocating credit and facilitating the hedging, pooling and pricing of risks. In contrast, in the market-based financial system, financial markets and not intermediaries are the main channels of finance in the economy (see Allen and Gale (2000)). While the literature provides a broad description of the two types of financial structure, we argue that we still do not fully understand what causes them to emerge and what determines the differences across countries.

An attempt to explain these causes has been provided by Levine (1997), building on the work of LaPorta, Lopes-de-Silanes, Shleifer and Vishny (1997, 1998) who use

the fact that legal systems originate from a limited number of legal traditions: English common law, German, Scandinavian and French civil law. Levine uses their measures of creditors' rights and shows that these can explain the development of bank-based financial systems. Recently Ergungor (2004) has tried to explain differences in financial structure by looking at the legal origin across countries. He presents evidence that civil law financial systems are more bank oriented than common law financial systems. He argues that common law countries enforce laws more effectively, and thus improve shareholders' and creditors' rights protection more effectively than civil law countries. Thus, in the literature a view has emerged that legal origin can be used to explain financial system structure.

These findings must be viewed with caution. For example, Rajan and Zingales (2003), argue, in contrast, that countries with an English common law system did not rely more on markets at the beginning of the last century than civil law systems. They report that in 1913 the ratio of France's stock market capitalization to GDP was twice as high as that in the United States, which theoretically has a legal environment more in favour of stock market development. Thus, it is not clear that legal origin determines financial structure. Therefore in our view distinguishing between English common law and other legal systems does not explain different financial structures across countries.

We argue that both the structure of the financial system and laws will adapt to the needs and demands of the economy. One example would be the regulation regarding branching in the United States. As technology improved the ability of banks to lend and borrow from customers at a distance, competition increased in the states, even when banks had no in-state branches. As the politicians could not prevent this competition, since they had no jurisdiction over it, they withdrew the regulations limiting branching (Rajan and Zingales, 2004). Another appealing example is also the removal of The Glass-Steagall Act, which had restricted banking activities in the United States since 1933. The introduction of the Financial Modernization Act in 1999 came after the creation of the biggest financial holding in the history of the United States, which was a result of the merger between Citibank and Travellers. Thus, we argue that the demand from the economy enhances the evolution of the financial structure and of the legal system, too.

The movement by governments in the last few decades to deregulate and liberate financial systems affected the legal system across countries. As a result the legal differences in countries with bank-based and market-based financial system are fading. Monnet and Quintin (2005) suggest that institutional convergence does not imply financial convergence. In their opinion financial systems will continue to differ for a long time even if their fundamental characteristics become identical. The argument is based on the assumption that the historical fundamentals of financial system matter and any change in the structure is costly. Thus, according to the authors the past structure of the financial system explains and influences the existing structures. The work of Monnet and Quintin (2005) provides some explanation why the financial structures prevail in countries after changing the institutional framework but it does not provide a clear explanation why they change over the time. Rajan and Zingales (2003, 2004) argue that structures of the financial system may experience large reversals when a political majority decides to alter the legal framework. Furthermore according to them the financial system will tend to develop toward the optimal structure, yet it will be prevented by politics, which are often influenced by powerful, incumbent groups. Thus, financial development and changes in the structure can take place only when the country's political structure changes, or when incumbents want the development to take place. Furthermore they argue that, when a government has a will for changes, civil law countries have a greater ability to translate governmental policy into laws because they emanate directly from the laws rather then evolving through judicial decisions as in common law countries. An example could be

the transition economies, which with ease adopted new commercial laws and corporate governance mechanisms after the fall of socialist economic systems. However, after great changes and reversals in economic policies bank-based systems evolved in those countries even as the protection offered to shareholders is similar or sometimes even better than in countries with market-based system.

There is a growing literature on the role of political factors in determining financial structure. Biais and Perotti (2002) model the incentives of governments to structure privatization policy so that financial shareholdings are diffused. Perotti and Volpin (2004) argue that established firms have an incentive to limit entry by retarding financial development. Perotti and von Thadden (2004) show how in democratic societies the distribution of income and wealth can determine the financial structure of the economy.

This variety of approaches suggests that the question as to what determines the structure of financial systems still remains open.

In a recent paper Beck and Levine (2004) investigate the role of the stock market and bank development on economic growth. Among other things, their findings suggest that stock markets provide different financial services from financial intermediaries. Also other various studies have suggested previously that the bank-based and market-based financial system may provide different functions to firms. Rajan and Zingales (2003) note 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. The authors argue 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. In their opinion loans are well collateralized by physical assets and therefore are liquid, so the concentration of information in the system will not be a barrier to financing these assets. Conversely they argue that market-based systems will have a comparative advantage financing knowledge industries with intangible assets. Their reasoning partially suggests that the real economic structure may determine the structure of a financial system as it would develop according to its current needs.

Additionally recent research presents evidence consistent with the view that the level of financial development affects the structure of economic development. Rajan and Zingales (1998) examine industries across a large sample of countries and test whether firms that are more dependent on external finance grow relatively faster in countries with a better developed financial system. They find that firms heavily dependent on external financing grow faster in countries with well-developed financial systems. Another interesting result is that within industries financial development is more important for younger firms. However, the authors use the United States as a benchmark to estimate industry needs for external finance worldwide, thus they use a market-oriented financial system as a benchmark for corporate behavior. As a result it is possible that in other countries with a different financial system the industries would have a different financial structure and would have different patterns for external finance. Therefore there are some doubts about their measures of an industry's needs for external finance and about the possibility to apply their results worldwide (Kahn, 2000). Nevertheless, in a related study Demirgüç-Kunt and Maksimovic (1998) investigate how differences in legal and financial systems affect firm's use of external financing. They find that an active stock market and a well-developed legal system are important in facilitating firm growth.

These empirical studies, as already mentioned, do not resolve the issue of causality. Rajan and Zingales (1998) note that the industrial structure of a country can determine the development of the financial system, rather than the other way around. However, in their view stock markets could capitalize the present value of growth opportunities, while financial institutions lend more to a specific sector if they believe that it will grow. Thus, financial markets and institutions can anticipate economic growth and develop in

anticipation of greater economic activity. In this scenario the economic structure and the needs of industry would determine the financial structure. This theory would explain the development of financial structures in transition economies. In these countries after the great political reversal and the introduction of a new legal framework a bank-based financial system has emerged, even as the development of the stock market has usually been pushed by the government along with privatization of state-owned companies. Transition economies are not analogous to traditional developing countries as their pre-transition environment differs significantly from the environment in other emerging markets. The inherited industrial sector consists of some companies that are highly developed with companies competing in global markets selling world-class products (Bonin and Wachtel, 2003). However, most of the companies are traditional, fixed-asset-intensive firms as access and transfer to new technology was prevented by law during the cold war. Thus, in transition economies the real economy is dominated by fixed-asset-intensive firms, while knowledge-based ones are at an early stage. Consequently, the composition of the economic structure may provide an explanation of the reason why in these countries the bank-based financial system has emerged and the stock market still does not play a significant role.

As we have seen the existing empirical research work provides us only weak guidance about the possible link between the economic and the financial structure. We suggest that specialization patterns in the financial system are influenced by the composition of the economy. In our view the financial structure may adapt to the needs of the economy, as has been reported by economic historians as Gerschenkron (1962), Tilly (1967), and Chandler (1977). However, we cannot expect the financial structure to develop linearly along a single dimension; intrinsic differences across countries also matter.

In this paper we test the hypothesis that the structure and changes in the real economy determine the direction of evolution of a country's financial system. We argue that the real economy is a leading indicator of the direction of development of the financial structure. Thus, in our reasoning we assume that economic development creates a demand for particular types of financial instruments, and the financial system responds automatically to this demand. As a consequence markets and intermediaries develop in response to the structure of the real economy. We suppose that countries with mostly physical-asset intensive industries and depending on external finance will more likely have a bank-oriented financial system. On the other hand stock markets should develop more strongly in countries with firms based on knowledge and intangible assets. We will represent this hypothesis identifying fixed-asset-intensive firms with the economic sector defined "Industry" in the standard system of classification of economic activity. Conversely the sector "Services" stands here as a proxy for knowledge and R&D based firms. The relative importance in an economy of the two types of firms will be represented here by the relative volume of activity of the different sectors. We test our hypothesis implementing two different econometric methods. First, we use a cross-section OLS regression, in order to compare our results to the previous studies and as a benchmark to our second methodology, a Generalized-Method-of-Moments (GMM) dynamic panel estimation. In studying financial system evolution, the dynamic panel approach has important advantages over cross-section regressions. First, estimation using panel data allows us to exploit the time-series nature of the relationship between the economic and the financial structure. Second, estimates will no longer be biased by any unobserved country-specific effects that is constant over time. In our panel procedures we control for country specific-effects and unlike many existing cross-country studies we control for the potential endogeneity of all explanatory variables.

Our results can be briefly summarized. We find that there is a positive and significant relationship between the economic structure and the financial system evolution.

Economies where the industrial sector is more important than services tend to have a bank-based financial system. Our results also provide evidence that in economies with fixed-asset-intensive firms the bank-based financial system is more likely to emerge. We also find that countries with firms based on intangible assets and knowledge often have a market-based financial system. These results confirm our hypotheses that the relative importance of financial intermediaries and markets is determined by the needs of the industries.

The rest of the paper is organized as follows. Section 2 presents the data and the descriptive statistics. Section 3 introduces the econometric methodology. Section 4 presents the main results and Section 5 concludes.

2. DATA AND DESCRIPTIVE STATICS

In this section we briefly discuss our data sources, variable definition and present the summary statistics.

Our data set comprises macro variables retrieved from the World Bank's database World Development Indicators. To address the robustness of the estimates and aiming at generality for our results, we have included as many countries as possible, depending on data availability. For the same reasons, and for examining the historical evolution of both the financial system and the real economic structure, we have retrieved data for the longest time period possible. We have therefore collected annual data for 80 countries over the period 1976-2003. In Table 1 - 3 we present relevant facts about the economic and financial and institutional structure in the sample countries. We checked our data for inconsistencies with the dataset available from Eurostat and the dataset of Demirgüç-Kunt and Levine (2001). We use two different datasets. The first is for cross-section regressions; it comprises data averaged for 70 countries over the years 1976-2000. We have excluded ten countries because they were outliers in our regression. In the second dataset for the panel analysis we use five-years averages as the frequency of observation. We end up with six observations for 72 countries. We use five-years averages because we are interested in long-term characteristics. Averaging data allows us to neutralize the effect of stock price fluctuations which may influence the Financial Structure indicator (via the market capitalization variable) and therefore alter our structural analysis. We chose five-years averages as shorter periods allows for more time variation in the data. This transformation is also in line with the traditional growth regressions we are making reference to. In the panel analysis missing data for one country reduces the number of observations, when we use the variable Private Credit instead of Bank Credit.

2.1. Data sources and variable definitions

Our hypothesis is that in countries where the industrial sector is predominant the financial system will probably be bank-based; on the other hand economies that have a strong service sector will more easily lead to the emergence of a market-based financial system. To test our idea we need appropriate indicators for the financial structure and the structure of the real economy. While the perfect indicators certainly do not exist, the literature on finance and growth has developed indicators that approximate relatively well for the importance of financial intermediaries and of the stock market. We concentrate only on these measures, which reflect the main channels through which savers finance borrowers. These traditional measures for financial systems have been used in many previous studies (e.g. Beck et al., 2000, Levine et al., 2000).

The main indicator we will be using is the ratio between a variable representing the

banking system size (we will use both Bank Credit and Private Credit) and another one representing the stock market (Market Capitalization). Thus, we have retrieved the following variables: Bank Credit, Private Credit, and Market Capitalization. Bank Credit equals the domestic credit provided by deposit money banks as a share of GDP. This indicator focuses only on the banking sector and its relationship to the economy. We assume that banking institutions are the dominant entities in providing financing to fixed-asset-intensive firms.

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, since it includes all other financial institutions, and not only deposit money banks. Additionally, Private Credit unlike Bank Credit excludes credit issued by the monetary authority. We use this ratio in order to reflect the functions of financial intermediaries and not only banks in the financial system and to exclude the central bank, whose credit activity is mainly with commercial banks and not with firms. Empirical evidence shows that credit granted by non-bank financial intermediaries to the private sector grows as a proportion of total credits by the financial system to the private sector as countries develop. As a consequence in many developed countries non-bank financial institutions are important contributors in channeling financial flows to the economy.

Market Capitalization is defined as the value of listed domestic shares divided by GDP. It is a measure of the size of the stock market. We are aware that market capitalization is not a perfect indicator for financial structure, but we have used this variable because it is easily retrievable and comparable for many countries and because we don't want to deviate from the literature, where market capitalization is always used for this purpose. One drawback is that unlike domestic bank credit this measure does not reflect the amount of financing actually obtained by agents in the economy. This measure captures instead the amount of equity listed and reflects the present value of current and future cash flows of listed companies. Another problem is that when there are a few companies with high capitalization it seems that there is an important equity market even when this is not the case. Finally, as we pointed out already, total market capitalization is highly influenced by the movements in stock prices: an increase in the variable may well be due only to rising prices, not to a higher number of shares listed. For all these reasons it would be more appropriate to use an indicator that reflects the amount of money raised through the initial and secondary public offerings. Unfortunately, these data have been collected only recently by the supervisory authorities and still in very few countries.

Based on these variables we construct indicators of the degree to which each country has a market- or bank-based financial system. Since there is not a single accepted definition of financial structure, we use different measures to test the robustness of our results. Each of these measures is constructed so that higher values indicate bank-based financial systems.

Financial Structure$_{B1}$ is defined as the ratio of Bank Credit to Market Capitalization; if it is greater than one, it means that in a given country the size of the banking system is larger than the size of the stock market, thereby suggesting that the financial system is bank-oriented. The indicator allows cross-country comparisons as economies with larger values are more bank-based than others.

Financial Structure$_{P1}$ is defined as the ratio of Private Credit to Market Capitalization. As we just said, Private Credit is a more comprehensive indicator of the activity of financial intermediaries because it includes both bank and non-bank intermediaries. We include Private Credit first as a robustness measure to Banking Credit and secondly because in more developed countries the functions of non-bank financial intermediaries are often quite large, hence missing this piece of information would lead to an underes-

timation of real borrowing by the private sector.

We assume that a country's financial structure will change in response to the demand of financing by firms. However, both our proxies for financial structure do not capture the causes of the changes across countries and over time. According to our measures a country's financial system can change from market-based to bank-based due to two reasons. First, the value of bank credit to GDP could grow faster then the value of domestic equities listed on a stock exchange to GDP. Second, the value of market capitalization could fall faster than the value of bank credit to GDP. Our measures do not distinguish which of the two changes occurs. In order to solve this problem we introduce two additional measures that compare the amount of funds lent by financial intermediaries (or raised through the stock market) to the total value of financing available in the financial system.

Financial Structure$_{B2}$ is Bank Credit divided by the sum of Bank Credit and Market Capitalization. This proxy for financial structure allows us to better control for causality as it isolates the changes in the size of the banking system and those of the market capitalization. Finance Structure$_{P2}$ has a similar construction as the one described above and is defined as Private Credit divided by the sum of Private Credit and Market Capitalization. These new measures range between zero and one, where higher values indicate more bank-based financial systems.

The main regressor, the one that we are checking to be correlated with the financial structure, is an indicator of the importance of the industrial sector in the real economy. As our main claim is that the predominance of the industrial sector, representing here fixed-asset-intensive firms, will induce a financial system to be bank-based, as opposed to a service-oriented real structure which may be better financed by a market-based financial system, the ratio will have an indicator of the industrial sector at the numerator, and a variable for the service sector as a denominator. Higher values of this indicator suggest that the industrial sector (fixed-asset-intensive firms) play a larger role in a given economy than the service sector (firms based on knowledge and intangible assets). For dividing the real economy in these sector components we have used Gross Value Added, as reported in national accounts statistics in accordance with the National Classification of Economic Activities (NACE). We do not use the agriculture component, because it does not influence the shape of the financial system, as the development of the agriculture sector is more and more dependent on state subsidies and transfers, rather then on funds raised through the financial system. GVA corresponds to the output of a sector after adding up all outputs and subtracting intermediate inputs. It is calculated without making deductions for depreciation of fabricated assets or depletion and degradation of natural resources.

The variable called Industry equals the value of GVA in the industrial sector divided by GDP. This measure reflects the ratio of gross value added in the economy generated by resident ISIC divisions 10-45. It comprises value added in mining, manufacturing, construction, electricity, water, and gas. We use Industry as a proxy for physical-asset-intensive industries.

The variable Service equals the GVA in the service sector divided by GDP. This measure presents the ratio of gross value added in the economy generated by resident ISIC divisions 50-99, which include wholesale and retail trade (including hotels and restaurants), transport and government, financial, professional and personal services, such as education, health care, and real estate services. We use this measure as a proxy for industries based on knowledge and intangible assets.

Using these two variables we construct two measures for the structure of the real economy, where each of these measures is constructed so that the higher is the ratio the more industry-oriented is the economy.

Real Structure$_1$ corresponds to the ratio between Industry and Service and reflects the structure of the real economy in a country. If the value of the indicator is greater than one, it means that in this country the fixed-asset-intensive firms are more important than those based on knowledge and intangible assets. Consistent with our hypothesis, we expect to find a bank-oriented financial system in countries with many fixed-asset-intensive firms. In other words, we expect to observe a positive correlation between the Financial Structure and the Real Structure indicators.

As we measure the structure of the real economy across countries over a long period we expect them to change. Unfortunately, similar to the financial structure measures, the value of this indicator does not provide information about the causes of the changes. A growing value of Real Structure$_1$ could be driven either by the growth of the Industry variable or by the fall of the Service measure. In order to address the problem of causality the way we did with the financial structure proxies, we introduce the variable Real Structure$_2$, defined as Industry divided by the sum of Industry and Service.

Nonetheless the changes of gross value added and therefore also of our proxies can sometimes give blurred information about a country's economic structure. In almost all countries the share of industry value added has been declining throughout last decades. However, a rising share of service gross value added does not necessarily mean that economies are becoming more service-oriented: in recent years many changes in the structure of economies have been due to the fact that many industrial enterprises have outsourced services activities that were previously carried out internally. An example is marketing activities, which previously were often provided internally by a firm belonging to the industrial sector, and therefore with the salaries of the employees forming part of the gross value added recorded for the industrial sector. If an industrial firm outsources these activities and subsequently purchases them from a specialist producer, it follows that the salaries of the employees will now be part of the gross value added of the service sector. As a consequence there will appear to have been a decline in the share of industry and a rise in the share of services sector although there may have been no changes in the quantity of services actually produced. We nevertheless consider that outsourcing shouldn't alter our results significantly.

Following the tradition of the regression equations used in the finance-and-growth literature, we also use some control variables, which influence growth in the aforementioned literature, but which could also influence the development of the banking system or of the market. These variables are the initial level of GDP, law (here included as a dummy variable, which equals 1 when the country has a civil law tradition) and inflation (annual growth rate of CPI).

We expect the initial level of GDP to be inversely correlated with the Financial structure indicators, meaning that richer countries are more likely to have market-based financial systems, as wealthier people are more interested in high riskier financial instruments. A large part of these instruments are, directly or indirectly, equities. These funds will be used to finance new, innovative companies. The supply of financing will depend on demand and on the quality of companies, evaluated by the stock market. Moreover initial income captures the convergence effect predicted by many growth models, which could also influence the evolution of the financial structure in a country.

As far as the law dummy is concerned, empirical evidence shows that countries with a civil law legal environment will more probably have a bank-based financial system: therefore we expect to observe a positive correlation between the legal dummy and the Financial Structure indicators.

The effect of inflation on the Financial Structure indicator is not so clear cut. Khan, Senhadji, and Smith (2001) document that the rate of inflation does affect financial market development adversely. Rousseau and Wachtel (2002) find that the level of

financial depth varies inversely with inflation in low-inflation environments and that disinflation is associated with a positive effect on financial depth. If we interpret that financial depth is represented by the development of the stock market, this is equivalent to say that inflation is inversely correlated with the emergence of market-based financial systems. Other authors, on the contrary, envisage a negative effect on the banking system. The negative effect of inflation on the banking system steams from the fact that in any economy agents hold real money balances either voluntarily or involuntarily. Higher rates of inflation in the economy will work as a tax on real balances or bank reserves and must lead to lower real returns on bank deposits and loans (Barnes, Boyd and Smith, 1999). We conclude that the level of inflation has an adverse effect on both banks and markets, but it is more damaging for financial intermediaries.

In the econometric analysis we will control for these potential determinants of financial system development, including the initial real GDP per capita, a law dummy and inflation. This simple conditioning information set has been used in many studies; the information set we are using here is very close to that of Demirgüç-Kunt and Maksimovic (1998).

2.2. Descriptive statistics

Table 4 presents the descriptive statistics of the country-specific variables and Table 5 shows the contemporaneous correlations between the financial system structure indicators and the dependent variables, i.e. the indicator for the real structure of the economy, inflation and initial GDP per capita. The summary statistics for the variables are averaged for 80 countries over the period 1976-2000. In this period we have the most continuous observations available for the variables and countries in our sample. Using twenty-five years of data allows us to abstract from business-cycle fluctuations and short-term political and financial shocks. Thus, we will use later this dataset in the cross-section regressions.

The results in Table 4 indicate a large variation across countries in financial systems' structures. The average value of Finance Structure$_{B1}$ and Finance Structure$_{P1}$ is respectively 4.848 and 3.087. These values indicate that most countries in our sample have a bank-based financial system and intermediaries play a significant role in providing credit to the economy. Finance Structure$_{B1}$ classifies Uruguay, Guatemala, Lebanon and Romania as the most bank-based financial systems; the figure for Uruguay could be due to measurement errors in the basic statistics. Conversely, Luxembourg, Singapore and Hong Kong are classified as countries with the most market-based financial systems. Similar results are obtained by using Finance Structure$_{P1}$, our second proxy for financial structure. However in this case the values are lower because the private credit ratio unlike the bank ratio excludes credit to the central and local government as well as public enterprises. Surprisingly when we use Finance Structure$_{P1}$, in addition to the countries mentioned before, Ghana is classified as one of the countries with the most market-based financial system. Our adjusted measures Finance Structure$_{B2}$ and Finance Structure$_{P2}$ provide a clearer but similar picture of the differences across countries in the financial structure. The results do not differ significantly, when we use the second set of proxies for financial structure. Also Real Structure$_1$ and Real Structure$_2$ (our proxies for the real economic structure) present considerable cross-country variation. Our proxies classify China, Oman and Nigeria as fixed-asset-intensive economies and Panama, Hong Kong and Kenya as intangible-asset-intensive economies. In the case of Panama and Kenya the results are driven by the importance of single sectors in their economy. In the case of Panama the country's economy is primarily based on the trade and transit sector and in Kenya it is tourism.

The statistics in Table 5 show that each of the Finance Structure$_B$ and Finance Structure$_{P2}$ indicators is positively correlated with real structure indicators, indicating a strong relationship between the financial system and economic structure. Only the Finance Structure$_{P1}$ is negatively correlated with each of the real structure indicators. Nevertheless it seems that countries with a bank-based financial system tend to have fixed-asset-intensive real economies. Conversely, countries with market-based financial systems have intangible-asset and knowledge intensive economies, that is to say, are more service-oriented. Additionally, as shown in other studies, there is a negative correlation between financial intermediation and both the initial level of real GDP per capita and inflation.

Table 5 and Table 6 shows that the dataset provides considerable cross-country variation for exploring the link between the characteristics of the financial system and the structure of the real economy.

3. METHODOLOGY

This section of the paper describes the two econometric methods that we use to assess the relationship between the structural characteristics of the real economy and the financial system. We use first ordinary least squares cross-section regressions with one observation per country over the 1976-2000 period. The cross-section estimator follows directly from traditional growth studies. Second, we use a generalized method of moments (GMM) dynamic panel to control for potential biases associated with the cross-section estimators. The panel information helps obtain more precise estimates and, most importantly, corrects for any bias associated with existing studies on financial system development. We briefly describe each estimation method below.

3.1. Cross-country regression

For the cross-section OLS analysis we use data averaged for 70 countries over 1976–2000, such that there is one observation per country. We estimate the following equation:

$$FS_i = \alpha + \beta RS_i + \gamma X_i + \varepsilon_i \tag{1}$$

where FS_i represents one of our four measure of *Financial Structure* over the period 1976-2000 for country i, RS represent one of the two indicators for *Real Structure*, X represents additional explanatory variables that control for macroeconomic factors associated with the financial structure, and ε is the error term.
There are limitations to this methodology: cross-country regressions may be influenced by omitted country-specific factors that induce omitted variable bias. Standard regressions do not control for endogeneity, which may also cause simultaneity bias. Additionally cross-country regressions do not exploit the time-series dimension of the data. Nevertheless this methodology has been used and is now standard in the growth and finance literature. In our sensitive analysis we will try to control for some of the mentioned problems, by introducing regional and law dummies.

3.2. Dynamic panel estimation

We implement a panel estimation to confront potential biases inherent in the cross-section estimator. The methodology we use is the Generalized-Method-of-Moments (GMM) estimator developed for dynamic panel data that was introduced by Holtz-Eakin et al. (1990), Arellano and Bond (1991), and Arellano and Bover (1995). We

construct a panel that consists of data for 72 countries over the period 1976-2003 for a total of 267 observations. We average data over nonoverlapping, five-year periods, so that (data permitting) there are six observations per country. The first period covers the years 1976-1980, the second period covers the years 1981-1985, and so on. The last period only comprises the years 2001-2003. The regression equation has the following form:

$$FS_{i,t} = \alpha X^1_{i,t-1} + \beta X^2_{i,t} + \mu_i + \lambda_t + \varepsilon_{i,t} \tag{2}$$

where $FS_{i,t}$ represents one of our measures for *Financial Structure*, X^1 is a set of lagged explanatory variables, and X^2 a set of contemporaneous explanatory variables. In the regression μ captures unobserved country-specific effects, λ is a time-specific effect, ε is time-varying error term, and i and t represent country and 5-year time period, respectively. We also use time dummies to account for period-specific effects, though these are omitted from the equations.

We are using a system GMM estimator: this estimator combines the first-differenced regression with the original regression in levels. A simpler alternative would have been to use the GMM difference estimator. This estimator helps to eliminate unobserved country-specific time invariant effects. We could have got rid of the correlation and endogeneity problem that may arise using this estimator by implementing a two-step estimation, but we still would have needed to address the problem of the large downward finite-sample bias that arises with this estimator when the sample size is small or the time series is highly persistent, as shown by Blundell and Bond (1998). As in fact we are dealing with highly persistent data and a relatively small sample size (we should not forget that panel data analysis is designed for micro-data, where thousands of cross-sections are available), we have used the system GMM estimator. The instruments for the first-difference equations are those that we should have used with the first-differenced regression (i.e. lagged levels dated t-2 and earlier), while the instruments for the regression in levels are the lagged differences of the dependent variables.

This model is estimated in a two-step GMM procedure. In the first step, the error terms are assumed to be independent and homoskedastic across countries and time. In the second step, the residuals obtained in the first step are used to construct a consistent estimate of the variance-covariance matrix, thus relaxing the assumptions of independence and homoskedasticity. We get an estimator that, under the validity of the instruments and the assumption that the error terms do not exhibit serial correlation, is consistent and efficient. In order to check for the validity of the instruments we have used a Sargan test for over-identifying restrictions; we have also checked the absence of serial correlation in the error term.

As the system GMM estimator uses many instruments, the results could be more biased than the first differencing and the level estimators. To tackle this eventual problem, and therefore to be sure about the robustness of our results, we use the two-step GMM difference estimator in the sensitivity analysis.

4. RESULTS

This section presents the results of the cross-country regression and of the dynamic panel regression. First, we discuss the results of the cross-country regressions and describe the results of the sensitivity analysis. Then we present the results of our panel analysis using the system GMM and describe also the outcome of the related sensitivity analysis. Finally, we discuss the problems regarding the causality link between the evolution of the financial system and the structural characteristics of the real economy.

4.1. Cross-section results

Tables 6 and 9 report the results of the cross-country regression using the ordinary least squares estimator with heteroskedasticity-consistent standard errors. In all regressions the dependent variable is one of our four proxies for financial structures in a particular country averaged over the period 1976 to 2000. We add the law dummy as an explanatory variable to our base regressions. Thus, each table has four columns, which correspond to the two different measures of the financial structure matched with one indicator for real economic structure. In the first column and third column we compute the base regression using real economic structure and the proxy for financial structure. In the second column and fourth we present the result of the regression with the added law dummy. Using the law dummy allow us to examine the impact of legal origin on financial structures in addition to the economic structure.

In Table 4 we use first as the dependent variable either Financial Structure$_{B1}$ and later Financial Structure$_{P1}$. The first indicator includes bank credit and the second private credit as outlined earlier. In the Table 5 we present the results, when we use the regressor Real Structure$_2$ instead of Real Structure$_1$. We use the second proxy for economic structure in order to control for the possible changes in the real economic structure as outlined above. Finally, we also control our financial measures and the driving force of eventual changes in the indicator. Thus, we repeat the regression with the two adjusted indicators for financial structure and the results are presented in Table 6 and 7. Consequently we run altogether sixteen different specifications in order to present robust results on the link between real economic structure and financial structure.

In all specifications the indicator is significantly different from zero and all the coefficients have the expected signs. However in one specifications, when we use Financial Structure$_{P1}$ as regressor our proxy Real Structure$_1$has a negative sign, yet the coefficient is small and. is not significant. In all other regressions the proxy for economic structure always has a positive sign and it enters in six specification as significant. Based on those regressions we assume that our results confirm partially our hypothesis that the growth of fixed-asset-intensive firms implies the evolution of the financial system towards a bank-based financial system. On the other hand the growth of firms based on intangible assets leads to the development of market-based financial systems.

The control macroeconomic variables also enter all the regressions with the expected signs. Inflation exerts a negative impact on a bank-based financial system and the results are consistent with the findings by Boyd et al. (2001). However, the inflation variable is never significant. In eight of the specifications, the log of initial income, has a significant has and negative sign as the theory and previous results would predict. Thus, it may confirm that the financial structure depends partially on a country's level of development. Finally the law dummy enters most of the specifications with a positive sign and the coefficient is significant at the 5 and 10 per cent levels in four regressions. These results confirm the previous findings of LLSV (1998) that law may exerts an impact on the financial structure. As in our regression the law dummy enters with a positive sign it shows that civil law may promote the development of a bank-based system. Conversely, common law seems to promote the development of a market-based financial system.

4.1.1. Sensitivity analysis

We discuss here the results of the robustness tests performed on the cross-country regression. First, we check the consistency of the results after removing further outliers. After dropping out the extreme observations we repeat our estimation. We still get a strong positive relationship between the financial system and the structure of the real

economy.

We then include regional dummy variables for the countries in our sample. After adding these regional dummies the results do not change either in the significance level or the sign of the estimated coefficients. We add also dummies in order to control for the regional origin of the different countries; again the results do not change.

Third, we use the same cross-country regressions but with 10-year averages and still our results do not change significantly. However, we cannot test the same procedure later with our panel model, because taking ten-year averages would reduce the available time observations to three.

Finally, there are not many ways of measuring the variables that enter the regression. Nevertheless as we want to ensure that the results are not due to our choice of indicators, we perform a number of sensitivity tests using different measures. We compute the regression exchanging ratios for both the dependent and the main regressor. In either case the signs of the estimated coefficients do not change.

4.2. Dynamic panel results

Tables 10 and 13 contain the results of the dynamic panel using the GMM system estimator with small sample correction and robust standard errors based on a small-sample correction as suggested by Windmeijer (2000). The tables also present the previously outlined diagnostic test to assess the validation of instruments and check for the second order autocorrelation of the error term. The panel estimation confirms our previous results from the cross-section regressions. As earlier, each table includes four columns and we present the results where we use two different indicators for financial structure as a dependent variable. As before, we first regress without our law dummy, and then do the estimation again with it. Also in this case we try to control and assess the impact of legal origin on financial structure. Consequently, we present again sixteen specifications computed this time with the dynamic panel technique.

Our results confirm the previous findings as in all sixteen specifications the indicator for real economic structure has a positive coefficient. The proxy for the real economic structure is significant in twelve of the sixteen specifications. In particular, the real economic indicator is always significant when we use the adjusted measures.

In all the regressions the one period lagged coefficient of the financial structure proxy is always positive and significant at the 1 per cent level. The results are consistent with the view presented by Monnet and Quintin (2005) that the past financial structure influences the present structure of the financial system.

In the dynamic panel the control variables have signs opposite to the ones we were expecting. Inflation exerts a positive and significant impact on the development of bank-based financial systems. This result provides evidence that inflation has a more adverse effect on the development of stock markets than on financial intermediaries. Also, initial income enters with a positive sign and is significantly related to financial structure in three specification. The positive sign of the macroeconomic control variables is consistent with the findings of Demirgüç-Kunt et al. (1998).

Finally, the real economic coefficients are only slightly changed by the addition of law to the specification, and there is no indication form these full sample regressions that the real economic structure and law origin are dependent on one another. Rajan and Zingales (1998) argue that in countries with poor legal systems the bank-based systems is more likely to evolve, while market-based systems have advantages as legal systems improve In all the specification, the law dummy, has a positive sign that this theory would predict, yet it is never significant. Thus, more research is needed in order

to understand the link between countries development, inflation, law origin and the structure of the financial system.

In all the regression our specification test indicates that we can reject the null-hypothesis of second-order serial correlation in the differenced error-term. The p-values for the Sargan test indicate the appropriateness of the instruments we used. Concluding, both the cross-section results and the dynamic panel procedure findings confirm that an industry-based economy exerts a positive influence on the emergence of a bank-based financial system. The results show that even after controlling for simultaneity bias, country fixed effects and the biases induced by including lagged variables in the regression, the economic structure indicator has a robust, positive relationship with the financial system one.

4.2.1. Sensitivity analysis

In the sensitivity analysis we use the GMM difference estimator and compared the results with the ones we obtained with the one step system GMM estimator. Furthermore we use a smaller number of variables in lagged levels as instruments. Since the system GMM estimator uses more instruments than the first differencing and the level estimators, the number of instruments relative to the sample size of the system GMM is larger than that of the first differencing and the level estimators. Thus, some authors reported that there can be a "many instruments problem", which can bias the estimation. Our results are not sensitive either to the methodology or the number of lags used as instruments as the coefficients do not alter from the results previously reported.

5. CONCLUSIONS

In this paper we examine the empirical link between the structure of the real economy and the characteristics of the financial system, which has been neglected by the existing literature. We use two different econometric methods. First, we use a cross-country regression with data averaged over the period 1976-2000. Then we estimate a dynamic panel, following the methodology developed by Arellano and Bover (1995) and Blundell and Bond (1997).

These estimations confirm the hypothesis that the real economic structure determines the shape of the financial system. The results confirm our hypothesis that in countries with many fixed-asset-intensive firms a bank-based system is more likely to emerge. Conversely, in countries with firms based on knowledge and intangible assets a market-based financial system tends to evolve. These results suggest that the structure of the real economy may determine the structure of the financial system.

Since Robinson (1952) noted that maybe the financial system simply anticipates the development of the financial needs of the economy and develops accordingly the debate has been on the direction of causation. We know that a potential problem in our study is the possibility of reverse causality and simultaneity bias. The data for our study is only available for a very short period, which prevents us from conducting a causality test such as the Granger test. As a consequence, so far we have just verified the existence of a robust correlation between the real economic structure and the characteristics of the financial system.

Even if we have not been able to prove the causality direction by means of econometrics, we hope we have added important evidence to the existing literature: we provide new empirical evidence on the question about the forces that drive the evolution of

the financial system by disentangling the economy into its main components, thereby identifying some interesting relationships.

Still, we are induced to conclude that the structure of the real economy may cause the characteristics of the financial system, because we believe that the main forces that determine the composition of the real economy are external to finance, like the geographical characteristics of a country (natural resources available and position, above all), industrial policy choices, etc. Our future research will look for better and more precise indicators and econometric ways for identifying the causality link uniquely.

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APPENDIX A: TABLES

TABLE 1: Financial and Economic Structure across Countries

Country	Financial Structure$_{B1}$	Financial Structure$_{P1}$	Financial Structure$_{B2}$	Financial Structure$_{P2}$	Real Structure$_1$	Real Structure$_2$	Inflation	GDP per capita	Law
Argentina	2.185	1.280	0.686	0.561	0.640	0.390	3.278	10 052	1
Australia	1.193	0.992	0.554	0.498	0.486	0.327	0.060	19 535	0
Austria	11.803	9.234	0.922	0.902	0.566	0.362	0.032	20 469	1
Bangladesh	11.810	7.323	0.922	0.880	0.477	0.323	0.054	1 143	0
Belgium	2.574	1.368	0.720	0.578	0.493	0.330	0.037	19 858	1
Brazil	3.556	2.480	0.780	0.713	0.719	0.418	5.070	6 176	1
Canada	1.398	1.239	0.583	0.553	0.528	0.346	0.047	21 228	0
Chile	1.177	0.913	0.541	0.477	0.683	0.406	0.258	5 861	1
China	3.826	3.666	0.793	0.786	1.625	0.619	0.072	1 872	1
Colombia	3.566	2.837	0.781	0.739	0.657	0.397	0.208	5 231	1
Cote d'Ivoire	5.202	4.310	0.839	0.812	0.394	0.283	0.075	1 717	1
Cyprus	2.416	2.062	0.707	0.673	0.458	0.314	0.049	10 370	0
Czech Republic	2.857	2.740	0.741	0.733	0.858	0.462	0.060	12 358	1
Denmark	2.317	1.876	0.698	0.652	0.390	0.281	0.050	22 216	1
Ecuador	3.507	3.122	0.778	0.757	0.659	0.397	0.332	3 092	1
Egypt, Arab Rep.	7.111	2.691	0.877	0.729	0.633	0.388	0.120	2606	0
Estonia	1.108	0.721	0.526	0.419	0.618	0.382	0.206	8 671	1
Finland	0.956	0.958	0.489	0.489	0.605	0.377	0.051	18 319	1
Fiji	2.970	2.448	0.748	0.710	0.411	0.291	0.057	4 096	0
France	2.989	2.600	0.749	0.722	0.467	0.318	0.050	19 517	1
Germany	4.268	3.578	0.810	0.782	0.618	0.382	0.021	19 628	1
Ghana	1.755	0.405	0.637	0.288	0.511	0.338	0.414	1 599	0
Greece	3.152	1.506	0.759	0.601	0.456	0.313	0.131	12 955	1
Guatemala	19.791	16.720	0.952	0.944	0.367	0.268	0.121	3 378	1
Hong Kong	0.804	0.861	0.446	0.463	0.296	0.228	0.030	17 261	0
Hungary	5.188	2.371	0.838	0.703	0.750	0.429	0.130	9 769	1
Iceland	1.254	1.159	0.556	0.537	0.534	0.348	0.216	21.652	1

TABLE 2: Financial and Economic Structure across Countries (continued)

Country	Financial Structure$_{B1}$	Financial Structure$_{P1}$	Financial Structure$_{B2}$	Financial Structure$_{P2}$	Real Structure$_1$	Real Structure$_2$	Inflation	GDP per capita	Law
India	2.526	1.369	0.716	0.578	0.622	0.383	0.081	1 593	0
Indonesia	3.105	2.703	0.756	0.730	1.031	0.508	0.118	2 086	1
Iran, Islamic Rep	3.717	2.083	0.788	0.676	0.715	0.417	0.197	5 074	0
Ireland	1.068	0.936	0.516	0.483	0.681	0.405	0.067	15 772	0
Italy	4.664	3.005	0.823	0.750	0.564	0.361	0.080	19 031	1
Jamaica	1 427	0.869	0.588	0.465	0.640	0.390	0.197	3 312	0
Japan	3.821	2.628	0.793	0.724	0.623	0.384	0.022	19 641	1
Jordan	1.459	1.086	0.593	0.521	0.393	0.282	0.067	3 747	1
Kenya	3.182	2.009	0.761	0.668	0.360	0.265	0.132	957	0
Korea Rep.	2.433	2.329	0.709	0.700	0.603	0.376	0.076	13 472	1
Kuwait	1.542	1.043	0.607	0.511	1.3414	0.568	0.026	15 413	1
Latvia	3.803	2.823	0.792	0.738	0.757	0.431	0.380	7 370	1
Lebanon	12.150	6.754	0.924	0.871	0.352	0.260	0.225	3 553	1
Lithuania	1.384	1.167	0.581	0.539	0.669	0.401	0.511	7 889	1
Luxemburg	0.541	0.557	0.351	0.358	0.435	0.303	0.037	30 603	1
Malaysia	0.913	0.817	0.477	0.450	0.993	0.498	0.034	5 558	0
Malta	2.976	2.624	0.748	0.724	0.719	0.418	0.034	10 186	0
Mauritius	2.112	1.319	0.679	0.569	0.527	0.345	0.090	6 484	0
Mexico	2.489	1.148	0.713	0.534	0.497	0.332	0.357	7 133	1
Morocco	4.346	2.318	0.813	0.699	0.627	0.386	0.059	2 940	1
Namibia	5.200	4.823	0.839	0.828	0.688	0.408	0.112	5 716	1
Netherlands	1.943	1.504	0.660	0.601	0.475	0.322	0.032	19 929	1
New Zealand	1.625	1.520	0.619	0.603	0.495	0.331	0.074	15 948	0
Nigeria	4.117	1.998	0.805	0.666	1.314	0.568	0.229	794	0
Norway	3.429	2.912	0.774	0.744	0.632	0.3876	0.052	24 760	1
Oman	1.219	1.363	0.549	0.577	1.618	0.618	0.004	9 928	0
Pakistan	5.026	2.762	0.834	0.734	0.485	0.327	0.077	1 431	0

TABLE 3: Financial and Economic Structure across Countries (continued)

Country	Financial Structure$_{B1}$	Financial Structure$_{P1}$	Financial Structure$_{B2}$	Financial Structure$_{P2}$	Real Structure$_{1}$	Real Structure$_{2}$	Inflation	GDP per capita	Law
Panama	3.823	3.619	0.793	0.784	0.212	0.175	0.024	4 797	1
Paraguay	7.775	7.132	0.886	0.877	0.519	0.342	0.165	4 310	1
Peru	1.667	1.284	0.625	0.562	0.574	0.365	4.677	4 437	1
Philippines	1.699	1.197	0.625	0.545	0.796	0.443	0.106	3 566	1
Poland	2.888	1.986	0.743	0.665	0.667	0.400	0.501	7 780	1
Portugal	5.323	4.389	0.842	0.814	0.564	0.361	0.122	11 839	1
Romania	14.866	2.762	0.937	0.734	1.079	0.519	0.986	5 485	1
Russian Federation	1.746	0.807	0.636	0.447	0.796	0.443	1.479	7 188	1
Saudi Arabia	1.613	1.293	0.617	0.564	1.187	0.543	0.020	13 883	1
Singapore	0.556	0.717	0.358	0.418	0.540	0.351	0.021	13 821	0
Slovak Republic	9.053	7.269	0.901	0.879	0.825	0.452	0.084	9 784	1
Slovenia	3.343	2.732	0.770	0.732	0.689	0.408	0.118	14 019	1
South Africa	0.915	0.748	0.478	0.428	0.684	0.406	0.113	9 321	0
Spain	3.224	2.516	0.763	0.716	0.582	0.368	0.084	14 281	1
Sri Lanka	3.125	1.680	0.758	0.627	0.559	0.359	0.108	2.243	0
Sweden	1.990	1.726	0.666	0.633	0.492	0.330	0.057	18 661	1
Switzerland	1.367	1.260	0.578	0.558	0.385	0.278	0.024	24 541	1
Thailand	3.275	2.878	0.766	0.742	0.731	0.422	0.051	4 088	0
Trinidad and Tobago	1.738	1.414	0.635	0.586	0.887	0.470	0.087	7 354	0
Tunisia	6.168	5.655	0.860	0.850	0.518	0.341	0.052	4 462	1
Turkey	2.761	1.380	0.734	0.580	0.501	0.334	0.576	4 707	1
United Kingdom	0.981	0.927	0.495	0.481	0.570	0.363	0.062	18 288	0
United States	2.338	2.020	0.700	0.669	0.423	0.297	0.045	25 642	0
Uruguay	62.559	48.623	0.984	0.980	0.544	0.352	0.474	6 954	1
Venezuela, RB	4.462	4.043	0.817	0.802	0.815	0.449	0.293	5 663	1
Zimbabwe	1.647	0.935	0.622	0.483	0.561	0.359	0.271	2 389	0

TABLE 4: Descripitve statistics, 1976 - 2000, 80 countries

Variable	Mean	Median	Std. Devn.	Minimum	Maximum
Financial Structure_{B1}	4.848	3.087	8.248	0.501	64.432
Financial Structure_{P1}	3.351	2.123	5.819	0.349	50.449
Financial Structure_{B2}	0.724	0.755	0.140	0.337	0.985
Financial Structure_{P2}	0.665	0.680	0.147	0.258	0.981
Real Structure_1	0.657	0.603	0.261	0.217	1.637
Real Structure_2	0.384	0.376	0.082	0.179	0.621
Inflation	0.357	0.089	0.955	0.007	5.815
GDP per capita	9 802	7 260	7 035	790	27 815
No. observation	80	80	80	80	80

TABLE 5: Correlations, 1976-2000, 80 countries

	Financial Structure$_{B1}$	Financial Structure$_{P1}$	Financial Structure$_{B2}$	Financial Structure$_{P2}$	Real Structure$_{1}$	Real Structure$_{2}$	Inflation	GDP per capita
Financial Structure$_{B1}$	1							
Financial Structure$_{P1}$	0.915	1						
Financial Structure$_{B2}$	0.531	0.475	1					
Financial Structure$_{P2}$	0.535	0.537	0.906	1				
Real Structure$_{1}$	0.022	-0.062	0.003	0.015	1			
Real Structure$_{2}$	0.017	-0.067	0.008	0.038	0.975	1		
Inflation	0.045	-0.126	0.073	0.006	0.063	0.102	1	
GDP per capita	-0.169	-0.003	-0.371	-0.223	-0.195	-0.193	-0.160	1

TABLE 6: Cross-country regression, OLS

	Financial Structure$_{B1}$	Financial Structure$_{B1}$	Financial Structure$_{P1}$	Financial Structure$_{P1}$
Constant	7.921	8.56	7.202**	8.309**
	(1.20)	(1.22)	(2.10)	(2.30)
Real Structure$_1$	8.989**	8.68**	0.539	0.014
	(2.46)	(2.27)	(0.285)	(0.007)
Inflation	-0.167	-0.201	-0.205	-0.263
	(-0.286)	(-0.333)	(-0.677)	(-0.849)
GDP per capita[a]	-1.024	-1.102	-0.521	-0.657**
	(-1.52)	(-1.50)	(0.141)	(-1.74)
Law		0.397		0.690
		(0.284)		(0.959)
No. observation	70	70	70	70
R^2	0.122	0.123	0.038	0.052

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

[a]In the regression, this variable is included as log(variable).

TABLE 7: Cross - country regression, OLS

	Financial Structure$_{B1}$	Financial Structure$_{B1}$	Financial Structure$_{P1}$	Financial Structure$_{P1}$
Constant	7.183	8.427	7.589**	9.01**
	(0.967)	(1.06)	(2.01)	(2.25)
Real Structure$_2$	17.901*	16.545	0.020	-1.53
	(1.78)	(1.57)	(0.004)	(-0.287)
Inflation	-0.101	-0.154	-0.189	-0.250
	(-0.168)	(-0.251)	(-0.619)	(-0.806)
GDP per capita[a]	-1.078	-1.207	-0.530	-0.676*
	(-1.57)	(0.111)	(-1.51)	(-1.79)
Law		0.656		0.749
		(0.460)		(0.301)
No. observation	70	70	70	70
R^2	0.085	0.08	0.037	0.053

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

[a]In the regression, this variable is included as log(variable).

TABLE 8: Cross-country regression, OLS

	Financial Structure$_{B2}$	Financial Structure$_{B2}$	Financial Structure$_{P2}$	Financial Structure$_{P2}$
Constant	1.079***	1.189***	0.772***	0.890***
	(6.34)	(6.75)	(4.05)	(4.50)
Real Structure$_1$	0.172*	0.120	0.183*	0.127
	(1.83)	(1.25)	(1.74)	(1.18)
Inflation	-0.002	-0.007	-0.010	-0.016
	(-0.145)	(-0.522)	(-0.562)	(-0.921)
GDP per capita[a]	-0.051***	-0.065***	-0.024	-0.039*
	(-2.95)	(-3.52)	(-1.24)	(-1.87)
Law		0.068*		0.073*
		(1.95)		(1.86)
No. observation	70	70	70	70
R^2	0.167	0.21	0.069	0.117

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

[a]In the regression, this variable is included as log(variable).

TABLE 9: Cross-country regression, OLS

	Financial Structure$_{B2}$	Financial Structure$_{B2}$	Financial Structure$_{P2}$	Financial Structure$_{P2}$
Constant	1.026***	1.157***	0.722***	0.864***
	(5.46)	(5.92)	(3.43)	(3.93)
Real Structure$_2$	0.440*	0.296	0.450	0.295
	(1.72)	(1.14)	(1.57)	(1.01)
Inflation	-0.002	-0.008	-0.009	-0.015
	(-0.139)	(-0.515)	(-0.542)	(-0.903)
GDP per capita[a]	-0.052***	-0.065***	-0.025	-0.040*
	(-2.97)	(-3.56)	(-1.27)	(-1.91)
Law		0.069*		0.075*
		(1.98)		(1.90)
No. observation	70	70	70	70
R^2	0.163	0.210	0.062	0.112

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

[a]In the regression, this variable is included as log(variable).

TABLE 10: GMM system estimator

	$\text{Financial Structure}_{B1}$	$\text{Financial Structure}_{B1}$	$\text{Financial Structure}_{P1}$	$\text{Financial Structure}_{P1}$
Constant	1.024	0.756	0.246	-0.115
	(1.18)	(0.789)	(0.249)	(-0.134)
$\text{Financial Structure}^{a}_{t-1}$	0.290^{***}	0.299^{***}	0.302^{***}	0.328^{***}
	(3.96)	(3.66)	(3.11)	(3.42)
$\text{Real Structure}^{a}_{1}$	0.721^{*}	0.730^{*}	1.019^{*}	0.990^{*}
	(1.66)	(1.74)	(1.82)	(1.74)
$\text{Real Structure}^{a}_{1,\ t-1}$	-0.664	-0.544	-0.800	-0.738
	(-1.57)	(-1.30)	(-1.46)	(-1.30)
Inflation[b]	0.294^{*}	0.291^{*}	0.228	0.215
	(1.83)	(1.75)	(1.57)	(1.39)
GDP per capita[a]	0.078	0.112	0.143	0.175
	(0.756)	(0.953)	(1.29)	(1.61)
Law		0.154		0.118
		(0.649)		(0.634)
Dummy 86 - 90	-0.832^{***}	-0.841^{***}	-0.8089^{***}	-0.826^{***}
	(-4.85)	(-4.43)	(-4.06)	(-3.77)
Dummy 91 - 95	-1.131^{***}	-1.146^{***}	-1.049^{***}	-1.061^{***}
	(-4.97)	(-4.43)	(-4.22)	(-3.99)
Dummy 96 - 00	-1.292^{***}	-1.303^{***}	-1.15^{***}	-1.161^{***}
	(-6.15)	(-5.55)	(-4.37)	(-4.31)
Dummy 01 - 03	-1.102^{***}	-1.086^{***}	-0.98^{***}	-0.973^{***}
	(-4.69)	(-4.20)	(-3.56)	(-3.31)
No. observation	267	267	265	265
Sargan test	0.343	0.377	0.333	0.395
Serial correlation test	0.277	0.261	0.149	0.155

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

[a]In the regression, this variable is included as log(variable).

[b]In the regression, this variable is included as log (1+variable).

TABLE 11: GMM system estimator

	Financial Structure$_{B1}$	Financial Structure$_{B1}$	Financial Structure$_{P1}$	Financial Structure$_{P1}$
Constant	1.031	0.843	0.539	0.168
	(1.03)	(0.803)	(0.618)	(0.210)
Financial Structure$^{a}_{t-1}$	0.302***	0.308***	0.304***	0.324***
	(3.25)	(3.27)	(3.00)	(3.10)
Real Structure$^{a}_{2}$	1.542**	1.606**	1.974**	1.994**
	(2.24)	(2.40)	(2.37)	(2.36)
Real Structure$^{a}_{2,\ t-1}$	-1.604**	-1.499**	-1.701*	-1.70*
	(-2.49)	(-2.05)	(-1.94)	(-1.84)
Inflation[b]	0.315**	0.318**	0.244*	0.236*
	(2.48)	(2.42)	(1.71)	(1.65)
GDP per capita[a]	0.062	0.095	0.124	0.160
	(0.581)	(0.796)	(1.21)	(1.63)
Law		0.167		0.13
		(0.725)		(0.793)
Dummy 86 - 90	-0.824***	-0.853***	-0.758***	-0.789***
	(-4.44)	(-4.32)	(-3.69)	(-3.50)
Dummy 91 - 95	-1.079***	-1.120***	-0.997***	-1.020***
	(-4.38)	(-4.26)	(-3.98)	(-3.84)
Dummy 96 - 00	-1.225***	-1.268***	-1.096***	-1.13***
	(-5.07)	(-5.17)	(-4.18)	(-4.25)
Dummy 01 - 03	-1.054***	-1.074***	-0.930***	-0.952***
	(-4.07)	(-4.07)	(-3.38)	(-3.27)
No. observation	267	267	265	265
Sargan test	0.381	0.349	0.364	0.442
Serial correlation test	0.298	0.283	0.170	0.181

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

[a]In the regression, this variable is included as log(variable).

[b]In the regression, this variable is included as log (1+variable).

TABLE 12: GMM system estimator

	$\text{Financial Structure}_{B2}$	$\text{Financial Structure}_{B2}$	$\text{Financial Structure}_{P2}$	$\text{Financial Structure}_{P2}$
Constant	-0.294	-0.406	-0.756*	-0.890**
	(-0.879)	(-1.28)	(-1.70)	(-2.12)
$\text{Financial Structure}^{a}_{t-1}$	0.349***	0.381***	0.330***	0.375***
	(3.45)	(3.61)	(2.85)	(3.08)
$\text{Real Structure}^{a}_{1}$	0.206	0.227	0.336	0.338
	(1.46)	(1.59)	(1.44)	(1.53)
$\text{Real Structure}^{a}_{1,\ t-1}$	-0.093	-0.071	-0.151	-0.119
	(-0.659)	(-0.514)	(-0.737)	(-0.554)
Inflation[b]	0.056	0.0517	0.078	0.076
	(1.42)	(1.39)	(1.60)	(1.52)
GDP per capita[a]	0.027**	0.037	0.078	0.093**
	(0.710)	(0.969)	(1.54)	(1.87)
Law		0.057		0.029
		(0.951)		(0.388)
Dummy 86 - 90	-0.095***	-0.089***	-0.116***	-0.113***
	(-3.33)	(-3.27)	(-3.31)	(-2.94)
Dummy 91 - 95	-0.157***	-0.144***	-0.183***	-0.177***
	(-3.08)	(-2.87)	(-3.16)	(-2.92)
Dummy 96 - 00	-0.197***	-0.186***	-0.229***	-0.213***
	(-4.16)	(-4.06)	(-3.97)	(-3.68)
Dummy 01 - 03	-0.145***	-0.126**	-0.175***	-0.154**
	(-2.68)	(-2.48)	(-2.86)	(-2.39)
No. observation	267	267	265	265
Sargan test	0.326	0.355	0.153	0.136
Serial correlation test	0.104	0.099	0.145	0.140

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

[a]In the regression, this variable is included as log(variable).

[b]In the regression, this variable is included as log (1+variable).

TABLE 13: GMM system estimator

	$\text{Financial Structure}_{B2}$	$\text{Financial Structure}_{B2}$	$\text{Financial Structure}_{P2}$	$\text{Financial Structure}_{P2}$
Constant	-0.075	-0.168	-0.515	-0.623**
	(-0.239)	(-0.566)	(-1.40)	(-1.73)
$\text{Financial Structure}^{a}_{t-1}$	0.343***	0.367***	0.333***	0.380***
	(3.52)	(3.52)	(2.91)	(3.25)
$\text{Real Structure}^{a}_{2}$	0.414*	0.449**	0.653*	0.671**
	(1.81)	(2.04)	(1.82)	(1.93)
$\text{Real Structure}^{a}_{2,\ t-1}$	-0.260	-0.249	-0.443	-0.420
	(-1.11)	(-1.13)	(-1.25)	(-1.12)
Inflation[b]	0.057	0.052	0.085*	0.084*
	(1.49)	(1.52)	(1.75)	(1.70)
GDP per capita[a]	0.013	0.023	0.065	0.080*
	(0.375)	(0.669)	(1.38)	(1.65)
Law		0.072		0.038
		(1.40)		(0.613)
Dummy 86 - 90	-0.091***	-0.085***	-0.119***	-0.115***
	(-3.40)	(-3.23)	(-3.28)	(-3.08)
Dummy 91 - 95	-0.145***	-0.132***	-0.185***	-0.176***
	(-2.94)	(-2.75)	(-3.39)	(-3.10)
Dummy 96 - 00	-0.191***	-0.185***	-0.234***	-0.217***
	(-4.50)	(-4.13)	(-4.08)	(-3.98)
Dummy 01 - 03	-0.140***	-0.128***	-0.182***	-0.162***
	(-2.86)	(-2.77)	(-3.03)	(-2.86)
No. observation	267	267	265	265
Sargan test	0.301	0.310	0.212	0.189
Serial correlation test	0.106	0.103	0.164	0.160

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

[a]In the regression, this variable is included as log(variable).

[b]In the regression, this variable is included as log (1+variable).

TABLE 14: Definition of Variables

Variable	Description	Source
Bank Credit	Domestic credit provided by the deposit money banks as a share of GDP	Word Development Inidicators
Private Credit	Ratio of financial resources provided to the private sector as a share of GDP.	Word Development Inidicators
Market Capitalization	Value of listed domestic equities divided by GDP	Word Development Inidicators Demirguc-Kunt, Levine (2001)
Service	Ratio of service value added as a share of GDP. Services corresponds to ISIC divisions 50 - 99	Word Development Inidicators
Industry	Ratio of industry value added as a share of GDP. Industry corresponds to ISIC divisions 10 - 45	Word Development Inidicators
Inflation	Annual growth of consumer prices index.	Word Development Inidicators
GDP per capita	Real per capita GDP for initial year of period	Word Development Inidicators
Law	Dummy variables for civil or common law legal origin	Country specific publication, LLSV (1998)
Financial Structure$_{B1}$	Bank Credit/Market Capitalization	own calculations
Financial Structure$_{B2}$	Bank Credit/(Market Capitalization + Bank Credit)	own calculations
Financial Structure$_{P1}$	Private Credit/Market Capitalization	own calculations
Financial Structure$_{P2}$	Private Credit/(Market Capitalization + Private Credit)	own calculations
Real Structure$_{1}$	Industry/Service	own calculations
Real Structure$_{2}$	Industry/(Service + Industry)	own calculations