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Finance for Growth:
Does a Balanced Financial Structure Matter?

by
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FINANCE FOR GROWTH:

DOES A BALANCED FINANCIAL STRUCTURE MATTER?

Lucía Cuadro-Sáez and Alicia García-Herrero[♣]

Abstract

In this paper we explore empirically a long-standing question in the literature on finance for growth, namely whether the financial structure -in terms of the size of the banking system relative to the capital markets- matters for economic growth. We build upon the existing literature by constructing a new measure of the "balancedness" of the financial structure which is broader, as it includes the domestic bond market as well as external sources of financing. It is also bounded and more linear than existing ones. We find that a more balanced financial structure -in terms of the size of banks relative to the capital markets- is associated with higher economic growth. Such finding points to banks and capital markets being more of a complement than a substitute. This is in line with Greenspan's idea of one market serving as "spare wheel" of the other.

Keywords: financial structure, banking system, capital markets, economic growth

JEL Codes: O16, G15, G21

[♣] Authors can be contacted at: lucia.cuadro@bde.es or Alicia.Garcia-Herrero@bis.org This paper represents the personal views of the authors and not necessarily those of Banco de España or the Bank for International Settlements. The authors gratefully acknowledge helpful comments from participants at the seminar in the Kiel Institute for the World Economy.

1. Introduction

Although Bagehot (1873) and Schumpeter (1911) had already introduced the idea, the financial sector started to be considered important for economic growth more recently than capital and labor or technology. Goldsmith (1969) and McKinnon (1973) were the first to argue that the manipulation of the financial sector to achieve development goals was undesirable and that flows of saving and investment should be decentralized in an open capital market operating with market-determined interest rates.

Since the early 1990s, a growing body of empirical literature, starting with King and Levine (1993a, b), has showed that financial development leads to growth. Among the different components of the financial system, the banking system has been analyzed most widely finding that a larger share of bank deposits, bank assets or bank credit to the private sector promote economic growth, after controlling for endogeneity. Equity markets have also received attention since they constitute and alternative channel of financing, particularly for large enterprises. Research on other sectors, such as the bond market, is scarce probably due to the data limitations.

An interesting and long-standing question is which financial structure – oriented toward the banking sector or the capital markets – performs better. The divergent opinions as to which financial structure is preferred are based on a number of arguments. On the one hand, banks constitute the best means to mobilize capital, identify good projects, monitor managers and manage risk (Levine, 1997). They also maintain the incentives for individual investors to acquire information, since they form long-run relations with firms (Boot et al., 1993) and information is not made public as in well-developed capital markets (Stiglitz, 1985). On the other hand, deeper capital markets enhance risk management and corporate control (Levine and Zervos, 1998). In addition, they can avoid excessive power concentration in banks' hands, which could allow them to extract informational rents and protect firms with close bank ties from competition (Hellwig, 1991; and Rajan, 1992). Capital markets are also better at fostering innovative but risky project which would lead to higher growth if successful. Finally, Bencivenga et al. (1995) show that more liquid stock markets reduce the disincentives to invest in long-duration projects because investors can easily sell their stake in the project in they need their saving before the project matures.

Most of the existing studies find that neither a bank-based financial structure nor a market-based one is clearly preferred (Rajan and Zingales, 1998; La Porta et al., 2000; Beck et

al., 2000; Levine et al., 2000; Beck et al., 2001; and Levine, 2002).[1] This had to hands-off policy recommendation (Levine, 2002, is probably the best example), namely that economic authorities should not aim at a specific financial structure but only at developing the financial system in whatever way.

The question we pose ourselves in this paper is related by slightly different: While developing only banks or only capital markets does not seem to bring more growth, the question still remains whether a balanced mix of the two might be preferable to extreme solutions. There are several reasons why this may be the case. One is that one market could serve as an alternative source of finding – i.e., as "spare wheel" using Greenspan's parallel - if the other market is under stress.[2] The other is that the two markets seem to influence economic growth through different -but complementary- channels.

The definitions of financial structure which have been used until now cannot really address such question because they do not really use measures of "balancedness" of the financial structure but, rather, whether the banking system or the capital market dominates. Furthermore, their concept of financial markets is very restrictive: first it only incorporates domestic sources of financing and, within the domestic capital markets, it only includes the stock exchange.

We build upon the existing literature by providing an appropriate measure of how balanced a country's financial structure is. We, then, use this measure to test whether it contributes to economic growth controlling for other determinants of economic growth. Our a-priori, based on the idea that complementarities should exist between bank and capital markets, is that a balanced financial structure should contribute to economic growth. Our results, based on 143 countries, do support that a priori. Our policy conclusion is, thus, quite different from the consensus one, namely that economic authorities should foster the growth of the banking system and the capital markets in a balanced way.

The paper is structure as follows. The next section describes our indicator of financial structure and the data used. Section 3 sets out the empirical strategy and the results and Section 4 concludes.

[1] Ergunor (2003), in turn, shows evidence that capital market development promotes economic growth relatively more than a bank-oriented financial system, as long as countries have flexible judiciary systems.
[2] See Greenspan (1999).

2. A New Measure of Financial Structure and Data Issues

In order to account for the differences in financial structure, several measures have been developed in the literature. The most common measure of financial structure is the logarithm of the ratio between the activity or size of stock market relative to the size of banks. Regarding the stock market, Levine (2002) and Ergunor (2003) take the stock market turnover, i.e., the total value of domestic equities traded on domestic exchanges while Levine (2002) also uses the value of all listed shares divided by GDP. As for the size of the banking system, the usual measure is credit to the private sector but also total banks' assets as in the case of Demirguc-Kunt and Detragiache, 1999. Formula 1 depicts such indicator of financial structure.

$$STRUCTURE = ln\left(\frac{stock\ market}{bank\ credit\ to\ \ private\ sec\ tor}\right) \qquad (1)$$

There are several problems with such indicator, at least when used to measure how balanced a country's financial structure is. First, the sources or financing included are quite limited: financing by foreign investors and the domestic bond market. Second, being the natural logarithm of a ratio, the indicator is neither bounded nor linear. Table 1 illustrates this point more carefully. Different sizes of the banking system and the stock market are entered into the formula. The first important problem is that the indicator equals infinite (or minus infinite) when the size of one of the two markets is zero. The second one is that an increase in the stock market size relative to the banking sector has a different impact on the indicator depending on the initial size of the markets' sector. More specifically, the impact of an increase in the market size for countries with low levels of capital markets will be stronger than the impact of the same increase in market size for countries with bigger capital markets. Such non linearity can certainly affect the empirical analysis.

[INSERT TABLE 1 AROUND HERE]

We construct a new indicator of "balancedness" of the financial structure, which tackles the above caveats. First, it includes more sources of financing, both external and domestic. Second, it is bounded and more linear than the previous one.

More specifically, our measure of the financial structure is the absolute value distance between the size of banks and markets relative to their joint size. That is:

$$UNBALANCED\ \ STRUCTURE\ =\ \frac{\left|banks - markets\right|}{banks + markets} \times 100 \qquad (2)$$

Such indicator decreases the more balanced the financial structure. The minimum value, which is zero, stands for a banking system of equal size of the bond and stock markets together. Table 2 illustrates, for different sizes of the banking system and the capital markets, that this indicator is bounded and more linear.

[INSERT TABLE 2 AROUND HERE]

As an example, we assume a constant size for the banking system (say 45% of GDP) and then consider an increase of 4% in the ratio of capital markets to GDP. Then, for a very small size of the capital markets initially (for instance, 1%), a 4% increase would raise the traditional measure of financial structure by 1.6, whereas for a higher initial level of capital markets (for instance 21%), such 4% increase would raise it by only 0.2 (see Figure 1). In turn, our indicator of "balancedness" of the financial structure would decrease by -0.2 and -0.1, respectively since the increase in the markets' size help get closer to the equilibrium between banks (at 45%) and markets (which move from 1% to 5% in one case and from 21% to 25% in the second case).

[INSERT FIGURE 1 AROUND HERE]

The second advantage of our indicator is much more comprehensive coverage of the sources of financing. First, it includes the bond market as an additional important component of domestic capital markets. Second, it incorporates financing from abroad, both from foreign banks and foreign capital markets.

Going in more detail on the data used for our indicator of financial structure, we measure the size of the banking system in a specific country as the sum of domestic credit from deposit money banks and other financial institutions to the economy as a whole and the country's borrowing from international banks. The first is drawn from the IMF International Financial Statistics (IFS) and the second from the BIS International Consolidated Banking Statistics. Figure 1 offers a snapshot of data definitions and sources ~~in a snapshot~~. The size of the capital markets is measured by the size of the domestic stock market and the bonds (private and public) which are outstanding and have been issued domestically. These data are drawn from the World Bank and the BIS, respectively. In addition, we included the bond issuances abroad from BIS statistics. Unfortunately, there is not enough cross-country information to include the financing in foreign stock markets.

[INSERT FIGURE 2 AROUND HERE]

Apart from constructing a broad indicator of the "balancedness" of the country's financial structure, which includes domestic and external financing, we also calculate a similar measure for domestic financing only. This will allow us to compare our results with previous ones in the literature although our measure is still more comprehensive as it includes the domestic bond market. For illustrative purposes, Figure 3 depicts the bivariate relation between our measure of "unbalancedness" of the financial structure against the income per capita each of the countries included on our analysis.

[INSERT FIGURE 3 AROUND HERE]

In order to evaluate whether the financial structure affects growth, we need to control for other potential determinants of growth. To that end, we borrow from the endogenous growth literature and test various sets of conditioning information.

The *narrow set* contains measures of initial income, human capital, health and the size of the financial system. For the first, we include the logarithm of initial real per capita GDP. For the second, we take the logarithm of the gross enrolment ratio for secondary education and for the third we use the logarithm of the life expectancy. For the fourth, we have two different definitions for the two different specifications of financial structure: for the broadest one, we include credit granted to the private sector both by the domestic banking system and international banks, as a percentage of GDP. For the narrower measure of financial structure, we only include domestic bank credit to the private sector, as a percentage of GDP.

The *full conditioning information set* contains the previously mentioned variables as well as other macroeconomic variables, such as the logarithm of one plus the rate of inflation, the logarithm of government expenditure as a share of GDP and the logarithm of exports plus imports as a share of GDP. Finally, the institutional characteristics of the country are proxied by an indicator of investment profile[3], in line with previous work by Levine, Loyza and Beck (2000). A short description of all variables is shown in Appendix 1. Tables I and II in Appendix 2 show the statistical properties and the bi-variate correlations of the explanatory variables included. Country averages are calculated for the period 1985 to1995, which will be later used for the cross section regression.

[3] The risk rating assigned to the investor profile depends on contract viability/expropriation, profits repatriation, payment delays. The index rages from 0 (very high risk) to 12 (very low risk).

All in all, we have yearly data for 143 countries, 115 of which are emerging economies. The time frame for which we intend to explain economic growth is ten years, namely from 1991 to 2001.

3. Empirical Strategy and Results

We use two different -but complementary- empirical strategies to assess whether a more balanced financial structure is associated with higher economic growth.

We, first, focus on the medium term with a cross section analysis à la Barro (Barro, 1991). We, thus, calculate the average yearly growth rate between 1991 and 2001 and regress it on the initial per capita income (i.e., that of 1990) to minimize endogeneity problems. In the same way, the rest of regressors are taken as the average over the period 1985-1995 except for financial structure variables and investment profile where the average is calculated for a shorter period, 1990-95, due to lack of data.

$$\begin{aligned} GROWTH_{i,1991-2001} = \; & \beta_0 + \beta_1 \cdot Initial\ income_i + \beta_2 \cdot Education_i + \beta_3 \cdot Life\ expectancy_i + \\ & + \beta_4 \cdot Unbalaced\ \ financial\ structure_i + \beta_5 \cdot Private\ credit_i + \beta_6 \cdot Inflation_i + \\ & + \beta_7 \cdot Government\ exp._i + \beta_8 \cdot Investment\ \ profile_i + \beta_9 \cdot Openness\ to\ trade_i \cdot + error_i \end{aligned} \quad (1)$$

Second, we look into the short term dynamics by estimating the same model with panel data. We include random effects to account for unobserved heterogeneity and we estimate the model using a Maximum Likelihood Estimator.

$$\begin{aligned} GROWTH_{i,t} = \; & \beta_0 + \beta_1 \cdot Initial\ income_{i,1990} + \beta_2 \cdot Education_{i,t} + \beta_3 \cdot Life\ expectancy_{i,t} + \\ & + \beta_4 \cdot Unbalaced\ \ financial\ structure_{i,t} + \beta_5 \cdot Private\ credit_{i,t} + \beta_6 \cdot Inflation_{i,t} + \\ & + \beta_7 \cdot Government\ exp._{i,t} + \beta_8 \cdot Investment\ \ profile_{i,t} + \beta_9 \cdot Openness\ to\ trade_{i,t} \cdot + error_{i,t} \end{aligned} \quad (2)$$

Both in the cross-section and in the panel specification (Tables 1 and 2, respectively below), we find a highly significant and negative coefficient for our financial structure indicator. This means countries where the banking system is of similar size that the capital markets (measured in terms of the stock exchange and the bond market) tend to grow faster, other factors given.

This is true when only local sources of financing are included in the definition of financial structure (column 1) or also external sources (columns 2-4). The result is also robust to increasing the number of controls (from the narrow to the full information set).

The results found for the control variables are in line with the existing literature. First, a lower initial income is associated with higher economic growth in all model specifications (cross-section and panel). This implies that countries tend to converge in income per capita terms. Second, a higher life expectancy is associated with faster economic growth in all model specifications. Third, better institutions, measured by the investor profile, are positively and significantly associated with economic growth. Fourth, inflation seems to hamper economic growth in the panel specification but it is not significant in the cross-section one.

The results are weaker for the size of the government sector, openness to trade and the size of the financial system. However, when significant, the sign is the expected one. It is interesting to note that the size of the financial system, measured as bank credit granted to the private sector, is significant only in the cross section but not when controlling for the quality of the institutions related to finance, namely the investment profile.[4] Although a more detailed analysis would be warranted, these results bear an important implication for the literature on finance for growth, namely that it is not so much the size that matters but rather the composition of the financial sector and the institutions behind. Finally, our proxy for human capital, namely secondary education, is never significant. This is probably associated with the high correlation between secondary education and life expectancy (over 80%).

[INSERT TABLES 1 and 2 AROUND HERE]

We, then, move to assessing whether there are differences between higher and lower income countries. We use the World Bank country classification to split the sample into high and upper-middle income countries, and low and lower-middle-income countries. In both cases, a more balanced financial structure is associated with higher economic growth. However, the coefficient is significant for the domestic financial structure in the case of higher income countries and for the total one (i.e., including foreign financing) for lower income ones. This result may be explained by the fact that lower income countries are generally more dependent from foreign financing that higher income ones.

[INSERT TABLES 5.A and 5.B AROUND HERE]

Finally, we perform several robustness exercises. First, we account for the fact that some outliers - i.e. countries which are growing specially fast or slowly - could be driving our results. We, thus, drop the upper and lower 5% of the distribution for economic growth. The results are in line with those of the baseline analysis (see Table 4).

[4] The results are basically the same when using a broader definition of the size of the financial system, which includes the capital markets. Results are available upon request.

[INSERT TABLE 6 AROUND HERE]

The second robustness exercise is related to the potential collinearity between education and life expectancy. We test whether results vary when dropping the variable education and we find no significant changes. We keep the variable education in the benchmark since it is a well-known determinant for growth and we prefer to have a model with a larger information content (Table 4).

[INSERT TABLE 7 AROUND HERE]

The next robustness exercise tackles issues related to autocorrelation and heteroskedasticity across panels, which would prevent us from using random effects. Namely, the disturbances could be heteroscedastic and contemporaneously correlated. To check the robustness of our baseline results, we use panel corrected standard error estimates and we obtain the same results (see Table 4).

[INSERT TABLE 8 AROUND HERE]

4. Conclusions

In this paper we explore empirically a long-standing question in the literature on finance for growth, namely which financial structure –in terms of the size of the banking system relative to the capital markets – performs better in terms of economic growth.

We build upon the existing literature by constructing a new measure of the "balancedness" of the financial structure. Compared to previous indicators, ours has two important advantages: First it is more comprehensive as it includes external financing and the domestic bond market. Second, it is bounded and more linear.

Using two different econometric specifications (cross section and panel) for a group of 143 countries for the period 1991 to 2001, we find that a more balanced financial structure -in terms of the size of banks relative to the capital markets- is associated with higher economic growth. This is true not only when the domestic financial structure is considered but also the external one. The results are robust to different sets of control and robustness tests.

Our findings point to a complementary role of banks and capital markets in fostering economic growth. This might be because one can serve as a "spare tyre" of the other in times of

stress, borrowing from Greenspan's metaphor, or simply because they perform different functions so that one market cannot reach the same clients as the other market.

Although our results are still preliminary to draw strong policy conclusions, they go in the direction of a encouraging a more hands-on approach from the part of economic authorities to foster a balanced financial structure. Given the preponderant role of the banking system, particularly in emerging countries, this means fostering the use of capital markets for financing. Several Asian countries, including China, are moving in that direction mainly through the stock market. Latin American countries also are but mostly through the bond market. Within the narrow scope of our paper, no difference is made between the two as long as they growth more than the financing through the banking system while the structure is still unbalanced.

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Tables and Figures

Table 1

Traditional indicator of financial structure

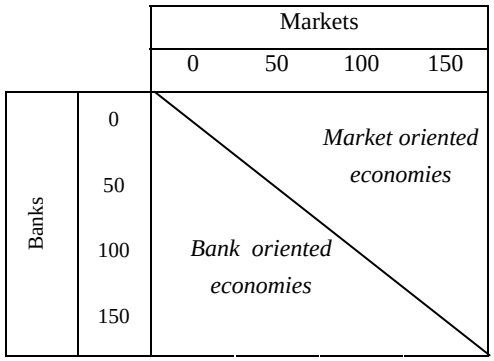
The table simulates different sizes of the banking system and the stock market to find out what the traditional measure of financial structure would yield, namely:

$$UNBALANCED\ \ STRUCTURE\ =\ \frac{|banks - markets|}{banks + markets} \times 100$$

The left panel shows the values that these measures would provide for the financial structure indicator, whereas the right panel exhibits the classification of countries in terms of financing.

		Markets			
		0	50	100	150
Banks	0	Undet.	$+\infty$	$+\infty$	$+\infty$
	50	$-\infty$	0	2/3	1
	100	$-\infty$	-2/3	0	2/5
	150	$-\infty$	-1	-2/5	0

Note: Banks and markets are considered as a share of GDP.



Note: Banks and markets are considered as a share of GDP.

Table 2

A new indicator of "balancedness" of the financial structure

This table simulates different sizes of the banking system and the capital markets to find out what the new measure for the "balancedness" of the financial structure would yield. Such indicator is:

$$UNBALANCED\ \ STRUCTURE\ \ =\ \ \frac{\left|\ banks - markets\right|}{banks + markets} \times 100$$

The left panel shows the values that the new measure would for different sizes of the banking sector and the capital market, whereas the right panel exhibits the classification of countries according to this new indicator of unbalanced financial structure.

		Markets			
		0	50	100	150
Banks	0	undet.	1	1	1
	50	1	0	1/3	1/2
	100	1	1/3	0	1/5
	150	1	1/2	1/5	0

Note: Banks and markets are considered as a share of GDP. For simplicity, coefficients in the table are divided over 100.

		Markets			
		0	50	100	150
Banks	0	undet.	UNBALANCED		
	50	UNBALANCED	BAL		
	100			BAL	
	150				BAL

Note: Banks and markets are considered as a share of GDP. BAL stands for balanced financial structure and, UNBALANCED for unbalanced financial structures.

Table 3

Cross section analysis for medium-term growth

Dependent variable: Growth Rate 1991 - 2001 (yearly avg.) (Per Capita GDP, USD 1995)	(1)	(2)	(3)	(4)
Initial income (1990)	-0.0062*	-0.0053*	-0.0052**	-0.0055**
	(0.053)	(0.055)	(0.012)	(0.011)
Education (a)	-0.0034	-0.0040	-0.0002	-0.0004
	(0.471)	(0.402)	(0.973)	(0.934)
Life expectancy (a)	0.0702***	0.0676**	0.0657**	0.0688***
	(0.008)	(0.012)	(0.011)	(0.009)
Unbalanced domestic financial structure (a)	-0.0001**			
	(0.028)			
Domestic private credit (a)	0.0002*			
	(0.072)			
Unbalanced total financial structure (a)		-0.0002***	-0.0001**	-0.0001*
		(0.006)	(0.041)	(0.065)
Total private credit (a)		0.0001**	0.0000	0.0000
		(0.022)	(0.600)	(0.670)
Inflation (a)			-0.0001	-0.0001
			(0.200)	(0.198)
Government expenditure (a)			-0.0005	0.0018
			(0.583)	(0.588)
Investment profile (a)			0.0043***	0.0044***
			(0.007)	(0.009)
Openness to trade (a)				-0.0024
				(0.525)
Constant	-0.2181**	-0.2068**	-0.2297**	-0.2377**
	(0.014)	(0.024)	(0.016)	(0.013)
Number obs.	119	119	88	87
R^2	0.24	0.24	0.42	0.42
Adjusted R^2	0.21	0.21	0.36	0.35
Log likelihood	303.884	304.167	245.435	242.737
Akaike Information Criteria	-595.767	-596.334	-472.870	-465.474

Notes: ***, **, * indicate significantly different from zero at the 1, 5, and 10 percent level, respectively.

Table 4

Panel data regression analysis: Baseline exercise

Dependent variable: Interanual Growth Rate, yearly data (Per Capita GDP, USD 1995)	(1)	(2)	(3)	(4)
Initial income	-0.0050***	-0.0052***	-0.0055***	-0.0045***
	(0.000)	(0.000)	(0.000)	(0.004)
Education	-0.0016	-0.0011	0.0001	-0.0004
	(0.695)	(0.794)	(0.991)	(0.923)
Life expectancy	0.0612***	0.0569***	0.0476***	0.0398**
	(0.001)	(0.001)	(0.004)	(0.018)
Unbalanced domestic financial structure	-0.0002***			
	(0.002)			
Domestic private credit	0.0000			
	(0.545)			
Unbalanced total financial structure		-0.0001***	-0.0002***	-0.0002***
		(0.007)	(0.007)	(0.003)
Total private credit		0.0000	0.0000	0.0000
		(0.782)	(0.564)	(0.299)
Inflation			-0.0002***	-0.0002***
			(0.004)	(0.004)
Government expenditure			0.0000	-0.0051*
			(0.979)	(0.074)
Investment profile			0.0028***	0.0026***
			(0.001)	(0.004)
Openness to trade				0.0055*
				(0.060)
Constant	-0.1817***	-0.1677***	-0.1355**	-0.1122*
	(0.003)	(0.006)	(0.018)	(0.053)
Number obs.	822	822	604	593
Wald Chi-2	34.366	32.496	52.395	55.554
p-value	0.000	0.000	0.000	0.000
Log likelihood	1477.304	1476.370	1126.967	1109.157
Akaike Information Criteria	-2938.608	-2936.739	-2231.935	-2194.313

Notes: ***, **, * indicate significantly different from zero at the 1, 5, and 10 percent level, respectively.

Table 5.A

Panel data regression analysis for High & Upper middle income countries

Dependent variable: Interanual Growth Rate, yearly data (Per Capita GDP, USD 1995)	(1)	(2)	(3)	(4)
Initial income	-0.0033**	-0.0040***	-0.0037**	-0.0027
	(0.043)	(0.006)	(0.045)	(0.123)
Education	0.0026	0.0029	0.0071	0.0128*
	(0.668)	(0.633)	(0.312)	(0.053)
Life expectancy	0.0352	0.0201	0.0189	0.0214
	(0.207)	(0.440)	(0.395)	(0.288)
Unbalanced domestic financial structure	-0.0001*			
	(0.084)			
Domestic private credit	-0.0001*			
	(0.097)			
Unbalanced total financial structure		-0.0001	0.0000	0.0000
		(0.216)	(0.596)	(0.782)
Total private credit		0.0000	0.0000	0.0000
		(0.741)	(0.516)	(0.160)
Inflation			0.0001	0.0000
			(0.852)	(0.935)
Government expenditure			0.0005	-0.0085***
			(0.533)	(0.007)
Investment profile			0.0038***	0.0035***
			(0.000)	(0.001)
Openness to trade				0.0093***
				(0.004)
Constant	-0.0995	-0.0362	-0.0848	-0.1358
	(0.387)	(0.733)	(0.370)	(0.117)
Number obs.	392	392	281	275
Wald Chi-2	12.210	8.445	24.285	36.485
p-value	0.0320	0.1333	0.0021	0.0000
Log likelihood	782.167	780.285	601.365	598.942
Akaike Information Criteria	-1548.334	-1544.570	-1180.731	-1173.884

Notes: ***, **, * indicate significantly different from zero at the 1, 5, and 10 percent level, respectively.

Table 5.B

Panel data regression analysis for Low & Lower middle income countries

Dependent variable: Interanual Growth Rate, yearly data (Per Capita GDP, USD 1995)	(1)	(2)	(3)	(4)
Initial income	-0.0084***	-0.0084***	-0.0101***	-0.0089***
	(0.000)	(0.000)	(0.001)	(0.005)
Education	-0.0064	-0.0063	-0.0049	-0.0061
	(0.256)	(0.268)	(0.469)	(0.369)
Life expectancy	0.0816***	0.0804***	0.0803***	0.0719***
	(0.001)	(0.001)	(0.002)	(0.008)
Unbalanced domestic financial structure	-0.0002*			
	(0.050)			
Domestic private credit	0.0001			
	(0.456)			
Unbalanced total financial structure		-0.0002*	-0.0002***	-0.0003***
		(0.052)	(0.006)	(0.003)
Total private credit		0.0001	-0.0002	-0.0002
		(0.506)	(0.191)	(0.148)
Inflation			-0.0002**	-0.0002**
			(0.017)	(0.018)
Government expenditure			0.0000	-0.0032
			(0.995)	(0.514)
Investment profile			0.0024*	0.0023
			(0.084)	(0.108)
Openness to trade				0.0035
				(0.477)
Constant	-0.2317***	-0.2272***	-0.2107**	-0.1798**
	(0.005)	(0.006)	(0.015)	(0.047)
Number obs.	430	430	323	318
Wald Chi-2	25.300	24.778	33.933	32.258
p-value	0.0001	0.0001	0.0000	0.0002
Log likelihood	721.299	721.038	556.901	546.802
Akaike Information Criteria	-1426.599	-1426.077	-1091.803	-1069.605

Notes: ***, **, * indicate significantly different from zero at the 1, 5, and 10 percent level, respectively.

Table 6

Robustness exercise: excluding outliers (below 5% and above 95% growth rate)

Dependent variable: Interanual Growth Rate, yearly data (Per Capita GDP, USD 1995)	(1)	(2)	(3)	(4)
Initial income	-0.0041***	-0.0043***	-0.0035**	-0.0023
	(0.002)	(0.001)	(0.018)	(0.138)
Education	-0.0016	-0.0009	0.0028	0.0018
	(0.683)	(0.817)	(0.527)	(0.681)
Life expectancy	0.0574***	0.0531***	0.0428***	0.0345**
	(0.001)	(0.002)	(0.009)	(0.038)
Unbalanced domestic financial structure	-0.0002***			
	(0.001)			
Domestic private credit	-0.0001			
	(0.368)			
Unbalanced total financial structure		-0.0001***	-0.0001**	-0.0001**
		(0.007)	(0.033)	(0.010)
Total private credit		0.0000	0.0000	0.0000
		(0.876)	(0.375)	(0.230)
Inflation			-0.0001***	-0.0001***
			(0.007)	(0.008)
Government expenditure			-0.0006	-0.0061**
			(0.288)	(0.030)
Investment profile			0.0034***	0.0032***
			(0.000)	(0.000)
Openness to trade				0.0060**
				(0.038)
Constant	-0.1741***	-0.1621***	-0.1551***	-0.1291**
	(0.004)	(0.007)	(0.007)	(0.026)
Number obs.	791	791	585	575
Wald Chi-2	33.310	28.810	61.384	65.465
p-value	0.0000	0.0000	0.0000	0.0000
Log likelihood	1544.007	1541.756	1164.935	1148.296
Akaike Information Criteria	-3072.013	-3067.513	-2307.869	-2272.592

Notes: ***, **, * indicate significantly different from zero at the 1, 5, and 10 percent level, respectively.

Table 7
Robustness exercise: excluding education as control variable

Dependent variable: Interanual Growth Rate, yearly data (Per Capita GDP, USD 1995)	(1)	(2)	(3)	(4)
Initial income	-0.0043***	-0.0048***	-0.0050***	-0.0042***
	(0.001)	(0.000)	(0.000)	(0.002)
Education				
Life expectancy	0.0557***	0.0532***	0.0552***	0.0485***
	(0.000)	(0.000)	(0.000)	(0.000)
Unbalanced domestic financial structure	-0.0002***			
	(0.000)			
Domestic private credit	-0.0001			
	(0.287)			
Unbalanced total financial structure		-0.0002***	-0.0001***	-0.0002***
		(0.000)	(0.003)	(0.001)
Total private credit		0.0000	-0.0001*	-0.0001**
		(0.897)	(0.086)	(0.029)
Inflation			-0.0002***	-0.0002***
			(0.002)	(0.002)
Government expenditure			0.0005	-0.0041
			(0.395)	(0.108)
Investment profile			0.0025***	0.0024***
			(0.000)	(0.001)
Openness to trade				0.0050*
				(0.056)
Constant	-0.1702***	-0.1593***	-0.1646***	-0.1458***
	(0.000)	(0.000)	(0.000)	(0.001)
Number obs.	1377	1377	969	951
Chi-2 Wald-test	42.309	40.264	59.353	64.588
p-value	0.0000	0.0000	0.0000	0.0000
Log likelihood	2418.044	2417.022	1751.180	1721.919
Akaike Information Criteria	-4822.088	-4820.044	-3482.360	-3421.837

Notes: ***, **, * indicate significantly different from zero at the 1, 5, and 10 percent level, respectively.

Table 8

Robustness exercise: controlling for heteroscedasticity and autocorrelation across panels
Panel corrected standard errors estimation

Dependent variable: Interanual Growth Rate (Per Capita GDP, USD 1995)	(1)	(2)	(3)	(4)
Initial income	-0.0052***	-0.0054***	-0.0055***	-0.0043***
	(0.001)	(0.000)	(0.000)	(0.001)
Education	-0.0013	-0.0012	-0.0002	-0.0007
	(0.814)	(0.828)	(0.983)	(0.928)
Life expectancy	0.0625**	0.0591*	0.0538	0.0451
	(0.047)	(0.053)	(0.130)	(0.203)
Unbalanced domestic financial structure	-0.0002**			
	(0.015)			
Domestic private credit	0.0000			
	(0.679)			
Unbalanced total financial structure		-0.0002**	-0.0002**	-0.0002**
		(0.034)	(0.033)	(0.013)
Total private credit		0.0000	0.0000	0.0000
		(0.821)	(0.375)	(0.210)
Inflation			-0.0002***	-0.0002***
			(0.000)	(0.000)
Government expenditure			-0.0003	-0.0065**
			(0.699)	(0.027)
Investment profile			0.0027**	0.0024*
			(0.043)	(0.071)
Openness to trade				0.0067**
				(0.019)
Constant	-0.1878*	-0.1742	-0.1613	-0.1357
	(0.099)	(0.112)	(0.210)	(0.290)
Number obs.	822	822	604	593
Chi-2 Wald-test	26.566	20.744	72.233	169.521
p-value	0.0001	0.0009	0.0000	0.0000
R^2	0.029	0.028	0.061	0.068

Notes: ***, **, * indicate significantly different from zero at the 1, 5, and 10 percent level, respectively.

Figure 1

Unbalanced Financial Structure vs. Financial Structure

The figure shows the evolution of the new indicator of unbalanced financial structure compared to the traditional indicator of financial structure. Ceteris paribus, an increase in the stock market size relative to the banking sector will have a different impact on the indicator depending on the initial size of the markets' sector. Concretely, the impact of an increase in the market size for countries with low levels of capital markets will be stronger than the impact of the same increase in market size for countries with bigger capital markets.

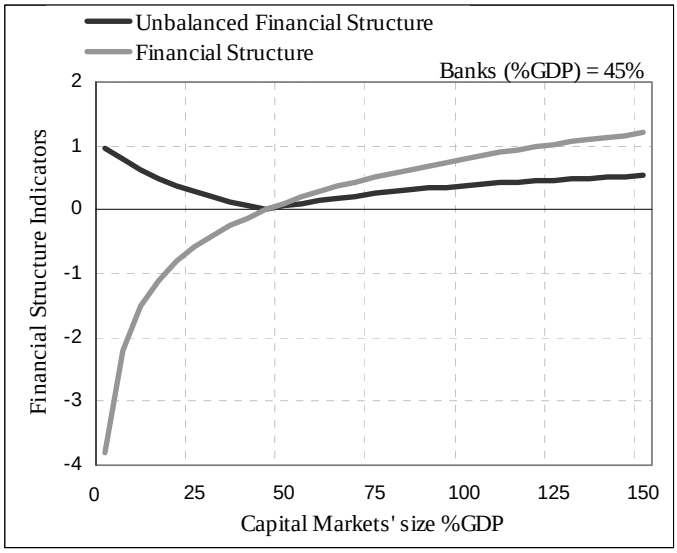


Figure 2

Composition of the indicator of "balancedness" of financial structure

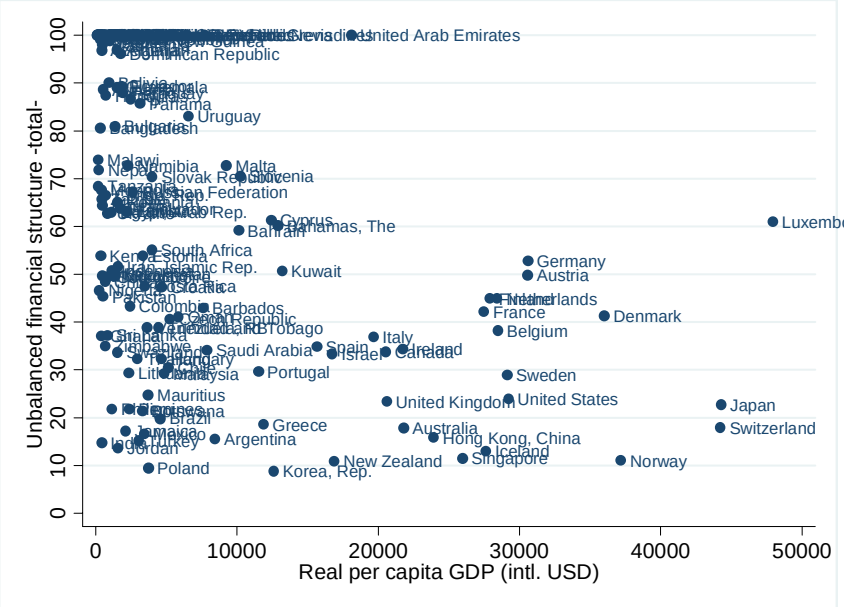
The figure describes the content of the unbalanced financial structure indicator. For each component of the new indicator, the table provides the name and the sources of the original variables.

Banks	Domestic Deposit Money Banks and Other Financial Institutions credit	Domestic DMB and OFI credit to the private sector [IFS, lines: 22d, 42d]
		Domestic DMB and OFI credit to the public sector [IFS, lines: 22(a+b+c), 42(a+b+c)]
	International banking claims	Consolidated international claims of BIS reporting banks on individual countries public sector [Bank for International Settlements, Table 9A:G]
		Consolidated international claims of BIS reporting banks on individual countries non-bank private sector [Bank for International Settlements, Table 9A:H]
Markets	Domestic markets	Domestic stock market capitalization [World Development Indicators]
		Domestic bonds outstanding (public & private): [Bank for International Settlements, Tables 16A+B]
	International bond markets	International bonds outstanding by residence of issuer [Bank for International Settlements, Table 14B]

Figure 3

Unbalanced financial structure vs. Per capita income

This figure represents the *unbalanced financial structure* (*total*, including domestic and international financing) against the real per capita income over the period (both on average 1991-2001).



Appendix 1. Variables and Sources

Variable	*Definition*	*Source*
Unbalanced financial structure - total -	$\frac{\lvert banks - markets \rvert}{banks + markets} \times 100$.	Own calculations
Unbalanced financial structure - domestic -	$\frac{\lvert dom.banks - dom..markets \rvert}{dom.banks + dom.markets} \times 100$.	Own calculations
Initial income	Ln (real per capita GDP) in 1990.	World Development Indicators
Education	Ln (gross enrolment ratio, secondary level). The ratio indicates the number of children of official secondary school age enrolled in school to the number of children of official secondary school age in the population.	UNESCO and World Development Indicators
Life expectancy	Ln (Life expectancy, total population).	World Development Indicators
Domestic private credit	Domestic credit by deposit money banks and other financial institutions to the private sector (IFS, lines 22d and 42d). (a)	International Financial Statistics and own calculations
Total private credit	Total private credit = domestic private credit + Consolidated international claims of BIS reporting banks on individual countries non-bank private sector (BIS Consolidated Banking Statistics, Table 9A: H). (a)	International Financial Statistics, Bank for International Settlements and own calculations
Inflation	Log difference of Consumer Price Index (CPI)	International Financial Statistics
Government expenditure	Ln (government expenditures as a share of GDP)	World Development Indicators

Notes: (a) Following Levine (2002) we calculate the variable according to the following transformation: $\frac{1}{2} \times \left(\frac{variable_t}{CPI_t^{end}} + \frac{variable_{t-1}}{CPI_{t-1}^{end}} \right) \Big/ \frac{GDP_t}{CPI_t^{avg}}$, where: $variable_t$ is the variable to be transformed, GDP_t is IFS line 99b, CPI_t^{end} is end-of period CPI (line 64) and CPI_t^{avg} is the average CPI for the year.

Variable	*Definition*	*Source*
Investment profile	The risk rating assigned is the sum of three subcomponents (contract viability/expropriation, profits repatriation, payment delays). A score of 0 points equates to very high risk and a score of 12 points to very low risk.	International Country Risk Guide
Openness to trade	Ln (exports + imports / GDP)	World Development Indicators
Banks	Domestic Deposit Money Banks and Other Financial Institutions credit to the public and private sectors (lines 22a+b+c+d + lines 42 a+b+c+d) plus + Consolidated international claims of BIS reporting banks on individual countries public and non-bank private sectors (BIS Consolidated Banking Statistics, Tables 9A:G and 9A:H). (a).	International Financial Statistics, Bank for International Settlements and own calculations
Domestic banks	Domestic Deposit Money Banks and Other Financial Institutions credit to the public and private sectors (lines 22a+b+c+d + lines 42 a+b+c+d) (a)	International Financial Statistics and own calculations
Markets	Domestic stock market capitalization (WDI) + domestic bonds outstanding (public & private) (BIS Securities Statistics, Tables 16A+B) + international bonds outstanding by residence of issuer (BIS Securities Statistics, Table 14B).	World Development Indicators and Bank for International Settlements
Domestic markets	Domestic stock market capitalization (WDI) + domestic bonds outstanding (public & private) (BIS Securities Statistics, Tables 16A+B).	World Development Indicators and Bank for International Settlements

Notes: (a) Following Levine (2002) we calculate the variable according to the following transformation: $\frac{1}{2}\times\left(\frac{variable_t}{CPI_t^{end}}+\frac{variable_{t-1}}{CPI_{t-1}^{end}}\right)\Big/\frac{GDP_t}{CPI_t^{avg}}$, where: $variable_t$ is the variable to be transformed, GDP_t is IFS line 99b, CPI_t^{end} is end-of period CPI (line 64) and CPI_t^{avg} is the average CPI for the year.

Appendix 2. Summary statistics

Table I
Main summary statistics. Country average data 1991 - 2001

This table contains the main summary statistics of the variables listed below. The summary statistics are calculated for the country average over the period 1985-1995 except for financial structure variables and investment profile, where lack of data forced us to reduce the sample period to 1990-1995.

Variable	*Units*	*Obs.*	*Mean*	*Std. Dev.*	*Min*	*Max*
Per capita income	Intl. 1995 USD	169	5406.1	8678.8	102.72	43708.65
Education	%	137	57.1	33.1	4.62	124.47
Life expectancy	Years	168	64.3	10.5	35.36	78.82
Unbalanced financial structure, domestic	%	142	68.3	34.6	4.41	100.00
Unbalanced financial structure, total	%	148	69.1	33.7	5.42	100.00
Credit to the private sector, domestic	%GDP	145	37.2	31.7	1.31	168.06
Credit to the private sector, total	%GDP	139	41.6	40.9	0.86	285.83
Size of the financial system, domestic	%GDP	142	59.9	68.8	0.02	342.85
Size of the financial system, total	%GDP	148	70.0	78.3	0.02	390.42
Inflation	% (interanual growth rate)	148	27.0	47.7	0.23	283.62
Government	%GDP	166	17.2	6.6	5.32	36.09
Investment profile	Points	117	5.7	1.4	1.54	9.45
Trade	%GDP	144	88.9	50.3	15.40	299.27

Table II

Pairwise correlations

This table contains the correlation matrix of the variables included in our analysis. The summary statistics are calculated for the country average over the period 1985-1995 except for financial structure variables and investment profile, where lack of data forced us to reduce the sample period to 1990-1995.

Variables	Per capita income	Education	Life expectancy	Unbalanced financial structure, domestic	Unbalanced financial structure, total	Credit to the private sector, domestic	Credit to the private sector, total	Size of the financial system, domestic	Size of the financial system, total	Inflation	Government	Investment profile	Trade
Per capita income	1												
Education	0.63	1											
Life expectancy	0.57	0.85	1										
Unbalanced financial structure, domestic	-0.57	-0.49	-0.53	1									
Unbalanced financial structure, total	-0.59	-0.52	-0.55	0.98	1								
Credit to the private sector, domestic	0.78	0.56	0.63	-0.53	-0.57	1							
Credit to the private sector, total	0.60	0.42	0.52	-0.41	-0.43	0.84	1						
Size of the financial system, domestic	0.80	0.51	0.55	-0.64	-0.65	0.88	0.73	1					
Size of the financial system, total	0.74	0.47	0.54	-0.60	-0.61	0.84	0.85	0.94	1				
Inflation	-0.22	0.01	-0.08	0.14	0.18	-0.27	-0.26	-0.29	-0.24	1			
Government	0.17	0.17	0.15	-0.06	-0.03	0.17	0.16	0.15	0.13	0.04	1		
Investment profile	0.66	0.53	0.55	-0.55	-0.56	0.66	0.47	0.68	0.60	-0.34	0.21	1	
Trade	0.10	0.19	0.22	0.10	0.12	0.19	0.21	0.16	0.17	-0.11	0.31	0.23	1