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MESTRADO
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TRABALHO FINAL DE MESTRADO
DISSERTAÇÃO

DOES FINANCIAL DEVELOPMENT PROMOTE ECONOMIC GROWTH?

SARA FILIPA MEIXEDO VENÂNCIO

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Abstract

This study investigates the relationship between financial development and economic growth, using two panel of 17 and 19 developed countries, covering the period from 1980 to 2011 and 2000 to 2011, respectively. This study includes variables that measure the development of the financial sector in order to explain the GDP *per capita* growth, using modified ordinary least squares, fixed and random effects estimations. The results indicate that domestic credit provided by banking sector and domestic credit to the private sector are (in most estimations) negatively correlated with growth. This may be explained by poor and inefficient credit allocation. The results also show that gross domestic savings and M2 play a significant role in economic growth. Moreover, the ratio non-performing loans/total loans is positively correlated with GDP, particularly for estimations where credit variables were excluded. Little evidence was found from the relationship between liquidity provided by the banking system and capital markets, and economic development.

Keywords: Financial development; Economic growth; OLS estimators

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1. Introduction

A large part of world economies registered a huge recession in 2011, a framework characterized by a deep international recession, mainly in Europe. It was composed by a global financial crisis 2007-09 and the triggering of deep problems associated with the management of public debt of many European countries. Given the heavy reliance on external credit, followed by limitations of public and private investment, economies continue to predict recessions for the next years. One of many reasons that help to explain these recessions is the fact that there is a malfunction of financial institutions and their intermediates. The recent crisis has underlined the importance of improving the financial system (more stable and reliable) in order to ensure the efficient operation of the economy. Thus, the financial crisis emphasized the need to change the role of financial institutions and the growing importance of the banking system to achieve economic growth.

This is a very important issue (discussed by many authors and along many years) because since we have well-functioning markets and financial institutions, we may decrease the transaction costs and asymmetric information problems.

An individual may not have sufficient knowledge or enough information to make profitable investments. Informational asymmetries and high information costs create savers who are risk averse, since savers will be hesitant to invest in activities with little information (Levine, 2004). Thus, we expect financial institutions to help us deal with market sectors and help us overcome problems of asymmetric information, namely, problems of adverse selection - i.e. the possibility of choosing an incompetent or

dishonest enterprise - and moral hazard - i.e. the possibility that financial intermediary will put their own interests before the interests of consumer.

Financial intermediaries perform an important role: identifying investment opportunities, financing profitable projects, facilitating trading, mobilizing savings, monitoring managers and improving corporate governance mechanisms (Khan and Senhadji, 2000; Ferreira, 2008). We expect the financial institutions to work well in order to facilitate the allocation of resources and allowing countries to develop. Moreover, through capital accumulation and technology innovation, each financial function will produce better information and influence savings and investment decisions, consequently leading to growth.

In this context, the interest of studying the relationship between the financial system and economic growth increases. In other words, the objective of this study is to test the relationship between financial development and economic growth. This is the question intended to be answered. Despite being a topic studied over the last years, there is still no consensus among most authors. In this way, with our work we pretend to add another useful insight into to the existing literature.

We perform an econometric analysis of the link between financial development and economic growth, using a panel data approach for two sub-sets of countries, covering different periods. Initially, we chose to include in our study the actual 28 member states of the European Union (E.U.). However, due to the lack of data, some were excluded. Note that, also due to the same reason, we decided to separate the sample of our work into two groups with the intention of examining the impact of a larger number of variables of finance development on growth.

The first group includes 15 E.U. countries (Germany, Austria, Belgium, Cyprus, Denmark, Spain, Finland, France, Greece, Hungary, Italy, Netherlands, Portugal, United Kingdom and Sweden), United States of America (U.S.A.) and China, and the time period 1980-2011. We decided to include these last two countries not only for the size of their economy but also due to the good data availability and for being two reference countries in this subject. The second group includes 18 E.U. countries (Germany, Austria, Belgium, Denmark, Spain, Estonia, Finland, France, Greece, Hungary, Ireland, Italy, Lithuania, Luxembourg, Netherlands, Portugal, Czech Republic and Sweden) and U.S.A., over the 2000-2011 period.

Our study contributes to the existing literature of finance and growth in a way that uses up to date data for developed countries and uses two different panels with two sub-sets of countries to analyse the role of financial.

The main conclusions that we reached in this work are the following: (1) domestic credit provided by banking sector and domestic credit to the private sector are (in most estimations) negatively correlated with growth; (2) gross domestic savings, M2 and the ratio non-performing loans/total loans play a significant role in economic growth; and (3) the results show little evidence in the relationship between liquidity provided by the banking system and capital markets, and economic development.

This dissertation is structured as follows: Section 2 presents the review of the relevant literature on finance and growth; Section 3 explains the data and variables used in this study; Section 4 provides the details of the empirical methodology and the results achieved and Section 5 summarizes the main findings.

2. Literature Review

Due to the existence of a large amount of literature on the present subject, the selection of works is based on: (1) pioneering and recent works; (2) representative and conceptualized studies and (3) the methodology used.

One of the most influential and pioneering studies on the relationship between financial development and economic growth is King and Levine (1993a). This study used data from over 80 countries during the time period from 1960 to 1989. It empirically analysed the relationship between four financial indicators (liquid liabilities over GDP, bank credit divided by the sum of bank and central bank credit, credit issued to nonfinancial private firms divided by total credit and credit issued to nonfinancial private firms divided by GDP) and four growth indicators (real GDP *per capita* growth, capital accumulation growth, ratio of domestic investment to GDP and one measure of the efficiency of physical capital allocation). They concluded that there is a strong and robust positive link between financial development and economic growth. In a different study, the authors supported the same theory (King and Levine (1993b)).

Since their contribution on the subject, there has been an increase of empirical studies on the role that financial system performs in economic growth and development, including in most cases, cross-country regressions, time-series analysis and panel studies.

Some recent studies still support King and Levine's theory as Rousseau and Wachtel (2001), Jude (2010), among others. Furthermore, Ferreira (2008), beyond confirming that financial development implies output growth, reached some differences

related to the level of European Union countries' integration and their historical evolution.

By contrast, in a study carried out before King and Levine (1993a and 1993b), Lucas (1988) showed that the impact of finance in economic growth is "over-stressed". Some other authors argued that finance is not a strong contributor to economic development as Robinson (1952), Demetriades and Hussein (1996) and Shan (2005), among others.

However, King and Levine's (1993a) approach had some limitations, namely, it did not include stock market development indicators and did not address a bi-directional causality analysis between financial development and economic growth.

Levine and Zervos (1998), contrarily to King and Levine (1993a), included measures of stock markets functioning to explain the same relationship. The stock market development measures used by the authors were: size, volatility and integration with world capital markets. They concluded that stock market liquidity and banking development are both positively correlated with economic growth, capital accumulation, productivity improvements and saving rates. However, they also did not address a causality effect between finance and growth and they did not use non-banking financial institutions to describe the financial sector.

Some authors argued that the direction of causality between financial development and economic growth is important and had different consequences for countries' development policies. On one hand, there is a relationship from financial development to economic growth in a way that the creation of financial institutions and markets may increase the supply of financial services and consequently lead to growth.

On the other hand, the relationship goes from economic growth to financial development when an increase of demand for financial services might induce an expansion in the financial system as the economy grows (Calderón and Liu, 2003).

Levine et al. (2000) complemented the studies on finance and growth investigating a possible causality effect between: financial intermediary development (as creditor rights and accounting standards) and economic growth. Their results supported the hypothesis that accounting policies, which reinforce creditor rights, will promote financial development and lead to economic growth.

Calderón and Liu (2003) aimed to study the direction of causality between financial development and growth. Beyond confirming that finance implies growth, the results indicated that there is evidence of bi-directional causality when the sample is divided in developing countries and industrial countries. They also found the role of financial intermediaries is bigger in developing countries.

In opposition of this theory, Christopoulos and Tsionas (2004) reached results that bear the hypothesis of a single causality relation existing: from financial development to economic growth.

More recently, Hassan et al. (2011) studied the same relationship across geographic regions and income groups using time-series analysis. Examining 169 countries during 1980-2007, they concluded in agreement with Shan et al. (2001) and Caporale et al. (2004), among others, that there is a causality relationship between finance and growth for most of the regions but not for the poorest regions. However, they believe "financial development may be necessary" but "is not sufficient to attain a

steady economic growth rate in developing countries" since "other variables (...) are important determinants of growth" (Hassan, et al., 2011, page 100).

As mentioned before, this study aims to test the relation that goes from financial development to economic growth. Due to the extension limitations of this work, causality analysis will be left for further studies.

Apart from the subjects of the studies mentioned before, it is also important to investigate the relationship between economic growth and investment. Abdelhafidh (2012), examined links between sources of investment and economic growth in North African countries over the 1970-2008 period using VAR estimation models. The results denoted that growth implies domestic savings on all the samples. For some countries, it was also observed that growth led to direct foreign investment and foreign capital inflows.

Another relevant factor to consider when studying the relationship between finance and growth, is the type of financial structure within a country. The majority of the developed countries have a similar culture, quality of life, technological development and similar political systems. However, their financial structure may differ generally between two types: those based in the banking system (the cases of France and Germany) or those dependent on capital markets (as U.K. and U.S.A.).

Usually, countries with strong banking systems have higher stability, greater opportunities to implement profitable projects in the long term and lower risk of lending but they have lower ability to respond to sudden changes in the market. Typically, countries financed by capital markets can easily respond to rapid changes in the market, allowing them to have a competitive advantage over other financial structures.

However, due to the fact of having greater transparency, they are more vulnerable to certain transactions. In addition, they seek to invest only in short-term projects in order to get rapid results.

A large part of empirical literature as Levine (1997), Demirguç-Kunt and Levine, (1999), Beck et al. (2000), among others, included a comparison between bank-based financial systems and market-based systems. It was found that banks and stock markets, among other intermediaries, tend to be greater in wealthy countries, where financial development tends to be larger.

An important advantage of a stock market is that "it constitutes a liquid trading and price determining mechanism for a diverse range of financial instruments" (Caporale et al. (2004)). This enables risk spreading by capital raisers and investors which will promote investment and economic growth.

Levine (1997) argued that both banks and markets offer positive implications for economic growth, although Arestis et al. (2001) concluded that the effects of banking systems are stronger than stock market volatility. Furthermore, Andrianaivo (2008) suggested that banks and markets are complementary to achieve growth in developed countries.

To summarise, it is increasingly important to examine, within a country, how the financial structure influences economic growth[2]. However this issue will not be subject of study in our work.

[2] See, for example, (Stulz, 2000) for a deep review of how financial structures affect economic growth.

Examining more recent studies on the subject of economic growth and financial development, Cecchetti and Kharroubi (2012) investigated the importance of financial development as a significant factor of aggregate productivity growth. The authors concluded that finance is good for growth, only up to a certain level. Moreover, for developed countries, a burst of the financial sector becomes harmful for aggregate productivity growth. Arcand et al. (2012), showed that this negative effect starts when credit to private sector reaches 100% of GDP.

Moreover, Ayadi et al. (2013) investigated the relationship between finance and growth using a panel data approach with particular attention to the southern Mediterranean countries over the period 1970-2009. The authors used both quantity and quality (e.g. banking efficiency) measures of financial sector. It was found, as in a previous study (as Gaytan and Ranciere (2004), among others), that credit to the private sector and bank deposits contribute negatively to growth and, by contrast, stock market size, liquidity and investment contribute importantly to development. This indicates that some regions suffer from poor credit allocation, revealing that there are deficiencies in the concession of credit (mainly high levels of corruption and poor protection of creditor rights, as explained in Demirgüç-Kunt and Levine (1999)). On the other hand, regions with better institutions and with low levels of inflation, tend to have higher levels of income. A large part of empirical literature concluded that the positive link between financial intermediation and economic growth varies with the level of wealth of the economy.

Despite the existence of a vast empirical literature around the relationship between financial development and economic growth, the subject still creates results that are not consensual. One of the conclusions that many authors reached is that “finance is good

for growth" (Ayadi, et al., 2013, page 3). Does this conclusion apply to all countries and to all financial structures? And what is the impact of finance on income distribution in general? Some theories showed that the poor do not benefit from investment opportunities provided by financial sector, since they don't have the necessary collateral to seek bank credit (Levine, 2004).

The results of the studies concerning the relationship between financial development and economic growth will always be sensitive to: the period for analysis; the indicators used to translate the relationship; the estimation method and the selection of countries for analysis (Khan and Senhadji (2000)). Effectively, and in accordance with much of the literature, it is difficult to create precise and consistent measures of financial development for a broad range of countries.

(Table A.I in Appendix A presents the summary of the main conclusions achieved in the studies mentioned on this chapter).

3. Data and Variables

3.1 The sample

As mentioned before, we aim to test the existence of a positive link between development of financial markets and economic growth. For this, we use two data sets consisting of panel data observations with 17 and 19 countries, for the periods 1980 to 2011 and 2000 to 2011, respectively. All the measures of financial development and economic growth were retrieved from the World Bank's World Development Indicators (WDI) database. The period of our data is annual.

Table I and Table II present a summary of indicators of the variables used in the study.

Table I - Descriptive statistics for panel 1 – 17 countries, time period: 1980-2011

Variable	**N**	**Mean**	**S.Dev.**	**Min**	**Max**
Domestic credit provided by banking sector (% of GDP)	544	115.08	45.98	36.20	330.13
Domestic credit to the private sector (% of GDP)	544	94.99	47.99	21.70	298.40
Claims on central government (% of GDP)	544	19.41	14.90	-7.16	74.19
GDP *per capita* growth (annual %)	544	2.10	2.93	-11.89	13.70
General government final consumption expenditure (% of GDP)	544	20.04	4.09	9.74	29.79
Gross domestic savings (% of GDP)	544	22.38	6.64	7.11	52.65
Inflation, GDP deflator (annual %)	544	4.94	5.28	-1.25	38.47

Sources: World Development Indicators - World Bank .
Note: *N* is the number of observations.

Table II - Descriptive statistics for panel 2 – 19 countries ,time period: 2000-2011

Variable	N	Mean	S.Dev.	Min	Max
Domestic credit provided by banking sector (% of GDP)	228	125.30	53.66	15.16	244.43
Domestic credit to the private sector (% of GDP)	228	112.85	52.35	13.18	234.54
Claims on central government, etc. (% of GDP)	228	11.72	11.04	-12.97	47.63
Claims on other sectors of the domestic economy (% of GDP)	228	113.83	53.09	12.90	233.55
GDP *per capita* growth (annual %)	228	1.75	3.68	-14.27	14.84
General government final consumption expenditure (% of GDP)	228	20.67	3.41	10.13	29.79
Gross domestic savings (% of GDP)	228	24.12	8.36	7.11	53.23
Money and quasi money growth (annual %)	228	8.70	11.29	-19.73	103.12
Bank nonperforming loans to total gross loans (%)	228	3.43	3.77	0.10	29.30
Bank liquid reserves to bank assets ratio (%)	228	4.91	6.45	0.24	44.36
Stocks traded, total value (% of GDP)	228	62.09	71.89	0.21	450.19
Inflation, GDP deflator (annual %)	228	2.47	2.19	-4.64	11.64

Sources: World Development Indicators - World Bank .
Note: *N* is the number of observations.

3.2 Variable definition

The results achieved will always be sensitive to the choice of financial development proxies. Effectively, as already stated, it is difficult to choose precise and consistent measures of financial development for a broad range of countries and there are no ideal choices.

The dependent variable in our study is gross domestic product *per capita* growth *(GROWTH).* For Panel 1 we use four variables to measure financial development.

The first variable is domestic credit provided by the banking sector as a percentage of GDP *(CBANK).* A higher value of *CBANK* implies a higher degree of reliance upon the banking sector. This fact also implies financial development since banks are more likely to ensure the main financial functions, as they can facilitate trading, hedging, diversifying and pooling risk; acquire information about investments

and allocate resources; monitor managers and exert corporate control; mobilize savings and reduce asymmetric information. This variable is crucial to measure the level of development in the banking system, providing also information about the bank's performance and size.

Additionally, we include domestic credit to private sector as a percentage of GDP *(CPRIV)* which refers to financial resources provided to the private sector, such as loans and trade credits. This variable not only indicates the level of domestic investment, but also measures the level of development of the financial institutions. Ideally, a higher value of *CPRIV* indicates that the credit provided will lead to economic growth.

The third explanatory variable is gross domestic savings as percentage of GDP *(SAVINGS)*. Hassan et al. (2011) confirmed a long-run positive relationship between savings and growth, which means that converting savings to investment is one channel through which financial development affects economic growth.

We also include the variable claims on central government as a percentage of GDP *(CLAIMS_GOV)*.

For Panel 2 we add five different measures of financial development: claims on the other sector of the domestic economy as percentage of GDP *(CLAIMS_OTHERS)*, money and quasi money growth *(M2)*, bank nonperforming loans to total gross loans *(NPL/LOANS)*, bank liquid reserves to bank assets ratio *(LIQUID/ASSETS)* and, lastly, the stocks traded as percentage of GDP *(STOCKS)*.

Some authors defend that monetary aggregates (as M2 and M3) are not suitable measures of financial development because they just "enter" the economy if there are people interested in seeking credit. Levine and Zervos (1998) argued that M3/GDP only

measures financial depth since it "(…) does not measure whether the liabilities are those of banks, the central bank or other financial institutions (…)" and "(…) does not identify where the financial system allocates capital" (Levine and Zervos (1998), page 12). Shan (2005) resumed that "(…) increases in M3/GDP are not necessarily associated with increases in credit" (Shan, (2005), page 1357) and thus did not influence economic growth. Nevertheless, we decided to include monetary aggregates in our study in order to assess the impact on our panels data. Due to the scarcity of data for some countries under analysis, we only include M2.

NPL/LOANS measures the weakness of the banking system, since higher values of non-performing loans in an economy imply less assets quality, more credit risk and less efficiency in the allocation of resources. In other words, this variable measures the banking system's capacity to reduce information asymmetries. Otherwise, the ratio *LIQUID/ASSETS* establishes the liquidity of the banking system. The total value of stocks traded *(STOCKS)* is included to measure the liquidity of the market provided by domestic capital market. This variable refers to the total value of shares traded during the period relative to economic activity. Greater liquidity provided by the stock markets implies a greater number of financial assets traded with a lower risk. Indeed, "(…) less-risky assets and easy access to capital markets improve the allocation of capital, an important channel of economic growth (…) and makes investment less risky" (Arestis, et al., 2001, page 18). Nevertheless, the same authors argued that the process to buy and sell can also quickly "(…) lead to disincentives to exert corporate control, thus affecting adversely corporate governance and hurting economic growth in the process" (Arestis, et al., 2001, page 18).

Additionally, we assume that the relationship between finance and growth can depend on economic policy variables. Thus, and following Gaytan and Ranciere (2004), all regressions include two control variables for macroeconomic stability. Inflation rate *(INF),* as annual percentage of the GDP deflator, to control price distortions and government final consumption expenditure as percentage of GDP *(GOV_EXP)* to measure the size of the government and the weight of fiscal policy.

Table III presents a summary of the variables explained in this section. (for a complete description and method of calculation, see Table A.II Appendix A)

Table III - Summary of the variables presented in the study for both panels

Variable	**Unit of measure**	**Name**
Domestic credit provided by banking sector	% of GDP	*CBANK*
Domestic credit to the private sector	% of GDP	*CPRIV*
Claims on central government	% of GDP	*CLAIMS_GOV*
Claims on other sectors of the domestic economy	% of GDP	*CLAIMS_OTHERS*
General government final consumption expenditure	% of GDP	*GOV_EXP*
Gross domestic savings	% of GDP	*SAVINGS*
Money and quasi money growth	annual %	*M2*
Inflation, GDP deflator	annual %	*INF*
Bank nonperforming loans to total gross loans	%	*NPL/LOANS*
Bank liquid reserves to bank assets ratio	%	*LIQUID/ASSETS*
Stocks traded, total value	% of GDP	*STOCKS*

4. Empirical estimations and results

To test the influence of the financial system on economic growth we perform an empirical analysis using panel econometric procedures. A set of panel data is a set of observations for a number of sectional units. Thus, a panel data has two dimensions: the sectional units (countries) and their observations (time). Existing literature suggests that there are several benefits from using a panel data approach: to control individual heterogeneity, to provide more observations for regressions, more variability, more degrees of freedom, more efficiency and to minimize the risk of multicolinearity among the different variables[3].

Firstly, we are interested in estimating the following equation:

$$GROWTHt,i = \beta_0 + \beta_1 FDt,i + \beta_2 INFt,i + \beta_3 GOV\_EXPt,i + ut,i \qquad (1)$$

Where:

- *GROWTHt,i* is the GDP *per capita* growth observed for the i^{th}country at time *t;*
- β_j, $_{j=0,1,2,3}$, are regression coefficients;
- *FDt,i* represents the measures of financial development;
- *INFt,i* and *GOV_EXPt,i* are control variables;
- *ut,i* is an error term.

For Panel 1 *FDt,i* = {*CBANK, CPRIV, SAVINGS, CLAIMS_GOV*} and for Panel 2 we have *FDt,i* = {*CBANK, CPRIV, SAVINGS, CLAIMS_GOV, CLAIMS_OTHERS, M2, NPL/LOANS, LIQUID/ASSETS, STOCKS}*. The vector of financial variables will depend from regression to regression.

[3] See Baltagi (2005) for a depth review of the advantages of panel data.

We begin to analyse the correlations between variables in both panels of countries. As expected, there is a significant correlation between *CPRIV* and *CBANK* for both panel. Additionally, *CLAIMS_OTHERS* is highly correlated with *CBANK* and *CPRIV* for Panel 2. Hence, we perform separate regressions to test the influence of finance on economic growth. (see Table B.I and Table B.II which present the correlation matrices for both panels in Appendix B).

Also, we perform the *statistic-F* test in order to investigate the robustness of the variables for our regression. This analysis is critical for the success of our regression and for having greater confidence in the results obtained. For the first panel, the results show that the variables *CBANK*, *CPRIV* and *CLAIMS_GOV* are not, individually, statistically significant for the model. However, they become relevant to the model when they make part of the regression along with others variables. The same happens for *CBANK, CPRIV, CLAIMS_GOV, CLAIMS_OTHERS, LIQUID/ASSETS* and *STOCKS* for panel 2. Nonetheless, we decide to include all the variables in the model believing they are all economically significant to explain financial development. (the results are presented in Table B:III in Appendix B)

4.1 Panel unit root tests

The preliminary step is to study stationary of the variables contained in equation (1). In other words, we want to test the existence of a long-run relationship among *GROWTH*, *FD* and control variables, *INF* and *GOV_EXP*. Stationary variable is one whose value is not permanently affected by errors contained in past observations.

There are several tests to detect non-stationary of the data. However, due to the small sample size in both panels, we choose Levin et al. (2002) test. This test may be

viewed as a pooled Dickey-Fuller test or as an augmented version of Dickey-Fuller test when lags are included, whereas the null hypothesis is that the panels contain a unit root and the alternative is that the panels are stationary. Further, the test allows for individual effects, time effects and possibly a time trend. Also, it only works for a balanced datasets.

The results for the Levin-Lin-Chu test (see Table B.IV and Table B.V in Appendix B) show that there is strong evidence against the null hypothesis of a unit root and therefore conclude that variables are stationary at least for some of the considered lags. The exceptions are: *CBANK, CPRIV* and *CLAIMS_GOV* for Panel 1 and the ratio *LIQUID/ASSETS* for Panel 2. (These variables will also be included in the model with first differences.)

4.2 OLS regressions

In order to test the possible effect that finance has on growth, we perform ordinary least squares (OLS) regressions. Although there may exist endogeneity problems, we believe that it is the simplest and most transparent way to look at the data.

In addition to the OLS regression, we perform the Hausman specification test to verify whether the fixed effects (FE) or random effects (RE) model is more appropriate for our panel data regression. With the fixed effects we can control omitted variables that differ between assumptions but are constant over time, so we can use the changes in the variables over time to assess the effects of the explanatory variables on explained variable. By contrast, if there is evidence that some omitted variables may be constant over time but vary between assumptions, or vice-versa, we should use random effects. The null hypothesis is that the preferred model is random effects, meaning that errors

(*ut,i*) are un-correlated with the regressors. We run a fixed effects model and save the estimates. Similarly, we run a random model and save the estimates. Then, we are able to perform the test. For a large and significant Hausman statistic (p-values lower than 0.05), we reject the null hypothesis and have evidence in favor of fixed effects. Rather, for p-values higher than 0.05, we use random effects.

The estimation results for equation (1) are simply reported in Table B.VI, Table B.VII, Table B.VIII and Table B.IX in Appendix B for the two panels of countries. Table B.VI and Table B.VIII show the estimation of regression (1) through OLS regression and Table B.VII and Table B.IX present the results with fixed or random effects. As already mentioned, we make separate analyses in order to not include in the same regressions correlated variables.

Starting with the first panel, Table B.VI shows that the banking sector development measured by the variables domestic credit provided by banking sector (*CBANK*) is negatively and significantly associated with economic growth (if we increase one unit of *CBANK*, then growth decreases in 0.017 units). The same happens for the level of domestic investment measured by domestic credit to the private sector (if we increase one unit of *CPRIV*, then growth also decreases in 0.017 units). This can be explained by a poor credit allocation and a poor financial regulation. Banking system may be channeling credit for projects that do not provide future economic benefits and, consequently, do not improve growth.

Financial liberalization may be the cause of these negative effects. Effectively, the increase of banking system competition and the elimination of ceilings on deposit rates may increase financial fragility and cause inefficient allocation of investable funds. This

means that the banking sector needs to be adequately supervised in order to improve its reputation between potential borrowers and creditors.

To summarise, the conclusion we make from these results is that, for our countries, the effect of the banking sector on growth is weak. Thus, it does not matter the size of the banking system (measured by domestic credit in our study) to achieve growth, but the quality and the performance of its activities.

As expected, the results confirm a positive and overwhelmingly significant relationship between growth and savings (if we increase one unit of gross domestic savings, then growth increases in 0.2028 units, on average). This is consistent with the approach that the better performances of financial intermediaries result in more savings which can be channeled into productive investments. Furthermore, banks are required to guarantee the indirect financing of the economies under analysis, since they are the intermediaries between savers and investors. Hence, banks can not only channel savings into productive investments but also secure financing facility (creating money to secure funding, even when there is a shortage of savings). Through this mechanism, financial development clearly influences economic growth.

Finally, we verify that *CLAIMS_GOV* is not statistically significant to explain economic growth, and at the same time control variables, inflation and size of the government have a negative and significant impact on dependent variable (on average, it is -0.1102 and -0.1808, respectively). This negative impact of inflation on growth is due to high inflation episodes during the time period of our first panel (from 1980 to 1995 the inflation was 7.34, on average, for the average of 17 countries).

These results remain similar with the inclusion of fixed effects (Table B.VII). The only exception is that *GOV_EXP* is no longer a good control variable to explain growth, which means there is a decrease of the direct effect of financial development on economic growth in the fixed effects estimations. Table IV resumes the results for panel 1.

Table IV - Summary of results for panel 1

	OLS regression		Fixed and random effects	
GROWTH	Estimation I	Estimation II	Estimation I	Estimation II
CBANK	**- (***)**		**- (***)**	
CPRIV		**- (***)**		**- (***)**
SAVINGS	**+ (***)**	**+ (***)**	**+ (***)**	**+ (***)**
CLAIMS	-	**- (**)**	**+ (*)**	-
INF	**- (***)**	**- (***)**	**- (***)**	**- (***)**
GOV_EXP	**- (***)**	**- (***)**	-	-
_CONS	**+ (***)**	**+ (***)**	+	+
Hausman			**+ (***)**	**+ (***)**

Note: the asterisks *, ** and *** represent significance at 10, 5 and 1% level, respectively. The signs + and - represent the sign of the estimated coefficients.

Hausman is the p-value for the Hausman's random effect test. For p-values lower than 0.05 we used fixed effects. Otherwise, for p-values higher than 0.05 there are included random effects.

Regarding the results of the second panel, Table B.VIII shows that domestic credit provided by the banking system, domestic credit to the private sector and claims on other sectors of domestic economy indicate, separately, a significant negative relationship with growth (if we increase one unit of these variables, growth decreases 0.0215, 0.0221 and 0.0227 units, respectively). Money and quasi-money growth appear as positively significant in all of the estimations (on average, 0.0636). Gross domestic savings continue to have a positive impact on growth, but weaker when compared with the results of the first panel (on average, 0.1043). We find once more that *CLAIMS_GOV* continues to be not significant to explain growth.

The results show that liquidity provided by the banking system and capital markets are not good variables to describe economic growth. This could be explained by some difficulties faced by the banks and markets during the last decade, as new market conditions and issues associated with the recent global financial crisis. In theory, there is usually a positive relationship between liquidity and potential changes in economic conditions (availability of money supply, interest rates, investments, consumption and general price level) which may promote growth in a stable economy. However, this stimulus might not be channeled to promote economic growth (at least for recent years) since bank credit is not always channeled into productive investments. Nowadays, most of the credit is intended for consumption and not for investment. Also, we have situations of bad loans and indebtedness of households, enterprises, banks and also governments. So we can conclude that *LIQUID/ASSETS* and *STOCKS* do not offer much incremental explanatory power. Its statistical significance is very weak to explain growth, for the period under analysis. Unlike Levine and Zervos (1998) and Caporale et al. (2004), our results show that when stock market liquidity enters the

regression (along with financial development) a weak relationship with GDP *per capita* growth is found.

Similar to the first panel, both control variables remain statistically significant. *GOV_EXP* maintains negative association with growth (on average, it is -0.1804), whereas the *INF* has positive association (on average, it is 0.3334).

Additionally, we verify that *NPL/LOANS* is only statistically significant in three out of six regressions. We believe this is due to the fact that banks non-performing loans are influenced by credit variables and macroeconomic shocks, represented by *CBANK*, *CPRIV* and *STOCKS*. In this sense, if we exclude these variables of our regression, *NPL/LOANS* becomes negatively correlated with economic development. Although the impact is small, higher values of the ratio non-performing loans/total loans (meaning a weaker structure of the banking system) imply less economic growth (-0.111, on average).

The results slightly worsen with the inclusion of fixed effects (Table B.IX), although the main conclusions remain equal.

Table V resumes the results for panel 2.

Table V - Summary of results for panel 2

	OLS regression					
GROWTH	Estimation I	Estimation II	Estimation III	Estimation IV	Estimation V	Estimation VI
CBANK	**- (***)**			**- (***)**		
CPRIV		**- (***)**			**- (***)**	
SAVINGS	**+ (**)**	**+ (**)**	**+ (**)**	**+ (**)**	**+ (**)**	**+ (**)**
CLAIMS_GOV	+	-	-	+	-	-
CLAIMS_OTHERS			**- (***)**			**- (***)**
M2	**+ (***)**	**+ (***)**	**+ (***)**	**+ (***)**	**+ (***)**	**+ (***)**
NPL/LOANS	-	-	-	**- (*)**	**- (*)**	**- (*)**
LIQUID/ASSETS	+	+	+	+	+	+
STOCKS	+	+	+			
INF	**+ (***)**	**+ (***)**	**+ (***)**	**+ (***)**	**+ (***)**	**+ (***)**
GOV_EXP	**- (***)**	**- (***)**	**- (***)**	**- (***)**	**- (***)**	**- (***)**
_CONS	**+ (**)**	**+ (**)**	**+ (**)**	**+ (**)**	**+ (**)**	**+ (**)**
	Fixed and random effects					
GROWTH	Estimation I	Estimation II	Estimation III	Estimation IV	Estimation V	Estimation VI
CBANK	**- (*)**			**- (***)**		
CPRIV		**- (*)**			**- (***)**	
SAVINGS	**+ (***)**	**+ (***)**	**+ (***)**	**+ (**)**	**+ (**)**	**+ (**)**
CLAIMS_GOV	**+ (**)**	**+ (*)**	**+ (*)**	+	-	-
CLAIMS_OTHERS			**- (*)**			**- (***)**
M2	**+ (**)**	**+ (**)**	**+ (**)**	**+ (***)**	**+ (***)**	**+ (***)**
NPL/LOANS	**- (**)**	**- (**)**	**- (**)**	**- (*)**	**- (*)**	**- (*)**
LIQUID/ASSETS	+	+	+	+	+	+
STOCKS	+	+	+			
INF	**+ (**)**	**+ (**)**	**+ (**)**	**+ (***)**	**+ (***)**	**+ (***)**
GOV_EXP	**- (*)**	**- (*)**	**- (**)**	**- (***)**	**- (***)**	**- (***)**
_CONS	+	+	+	**+ (**)**	**+ (**)**	**+ (**)**
Hausman	**+ (**)**	**+ (**)**	**+ (**)**	+	+	+

Note: the asterisks *, ** and *** represent significance at 10, 5 and 1% level, respectively. The signs + and - represent the sign of the estimated coefficients.

Hausman is the p-value for the Hausman's random effect test. For p-values lower than 0.05 we used fixed effects. Otherwise, for p-values higher than 0.05 there are included random effects.

In order to consider the possible endogeneity problem between financial development and economic growth pointed to by several authors, we use the first lag of the financial development variables and establish some possible comparisons with the results already achieved.

So equation (1) can be written as:

$$GROWTHt,i = \beta_0 + \beta_1 FDt-1,i + \beta_2 INFt,i + \beta_3 GOV\_EXPt,i + ut,i \quad (2)$$

Where:

- *GROWTHt,i* is the GDP *per capita* growth observed for the i^{th}country at time *t;*
- β_j, j=0,1,2,3, are regression coefficients;
- *FDt-1,i* is the first lag of financial development indicators;
- *INFt,i* and *GOV_EXPt,i* are control variables;
- *ut,i* is an error term.

The estimation results for equation (2) are simply reported in Table B.X and Table B.XI in Appendix B for the two panels of countries. As we can see in Table B.X, the values of the estimated parameters for panel 1 slightly improve but are broadly similar to those already obtained with equation (1). On the other hand, we get much worse results for panel 2 with the inclusion of the first lag of financial development in the estimated equation (Table B.XI). This can be explained by the low number of observations present in panel 2 and by the time period which covers essentially the financial crisis 2007-09 and its subsequent years.

In our work, we also perform other tests of other estimates (namely, we include first differences for the non stationary variables). However, we found that there is not an improvement of results. (The results are not presented in the study, but available upon request)

5. Conclusion

In this study, we investigated the empirical relationship between financial development and economic growth in panels of 17 and 19 countries, over the periods 1980-2011 and 2000-2011 respectively, using different indicators of financial development to explain GDP *per capita* growth. This is an important issue in the sense that the role of financial markets and institutions consist in reducing the costs of acquiring information and making transactions, through the influence of saving rates, investment decisions, technological innovation and long-run growth rates.

As a preliminary step, we performed panel unit root tests to examine the stationary properties of the data in order to examine the degree of integration of each variable. The results showed that there is strong evidence against the null hypothesis of a unit root and therefore we concluded that the majority of variables are stationary at least for some of the considered lags.

Then, we used modified OLS, FE and RE estimations to assess the relationship between finance and growth. Our main findings were:

- Although not desirable, the results indicate that domestic credit provided by the banking sector and domestic credit to the private sector are (in most estimations) negatively correlated with GDP *per capita* growth. The results seem to indicate that countries suffer from poor and inefficient credit allocation, revealing that there are deficiencies in the concession of credit. This conclusion is consistent with the recent work of Ayadi et al. (2013) Therefore, we can conclude that the volume of the banking system is not relevant to achieve growth, but rather the quality and the performance of their activities.

- We saw that gross domestic savings and M2 play a significant role in economic growth. This implies that the better the performances of financial intermediaries are, more savings are directed to investment. Also, the ratio non-performing loans/total loans is positively correlated with GDP, particularly for estimations where credit variables were excluded. This suggests that financial development promotes economic growth for countries with a banking system characterized by: higher assets quality, little credit risk and efficient allocation of resources;

- Surprisingly, little evidence was found from the relationship between liquidity provided by the banking system and capital markets, and economic development. This reveals the difficulties faced by financial institutions to adapt themselves to the new market and global conditions. Also, we could not establish a significant association between the claims on central government and GDP *per capita* growth;

- The conclusions mentioned above were similar for both periods under analysis.

Although we have been able to provide some consistent and substantial contributions to the debate between finance and growth, there are some limitations in our analysis important to mention: (1) the number of observations is slightly low, which may influence some of the results achieved; (2) the measures of financial development should mirror the functions provided by the financial system, which remains a difficult task. We verified that there is very little consensus among authors, on how to suitably measure the financial system; (3) we used only one measure of stock market liquidity. Due to the growing importance of stock markets around the world it may be

advantageous to introduce other important indicators to measure these markets, namely their size and efficiency.

The direct continuation of the present study goes on to extend the analysis to other countries, especially developing countries and to use distinct financial development variables. Furthermore, it would reveal interest adding differences in legal and political structures across countries to the model, as levels of corruption, accounting standards and protection of creditor rights. However, it must be taken into account that these parameters are not easily measurable.

It would also reveal interest for further studies to investigate the causality analysis between financial development and economic growth.

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Appendix A – Literature review summary and variables description

Table A.I – Literature review summary

LITERATURE	MAIN CONCLUSIONS
King and Levine (1993a e b) Rousseau and Wachtel (2001) Jude (2010) Ferreira (2008)	There is a strong and robust positive link between financial development and economic growth.
Robinson (1952) Demetriades and Hussein (1996) Shan (2005)	Finance is not a strong contributor to economic development.
Levine and Zervos (1998)	Stock market liquidity and banking development are both positively correlated with economic growth, capital accumulation, productivity improvements and saving rates.
Levine et al (2000)	Accounting policies will promote financial development and lead to economic growth.
Calderón and Liu (2003)	There is evidence of bi-directional causality between finance and growth.
Christopoulos and Tsionas (2004)	The results bear the hypothesis of a single causality relation, from financial development to economic growth.
Hassan et al (2011)	Strong long-term relationship between financial development and economic growth. The weak financial development of the countries with the lowest GDP per capita does not contribute to economic growth.
Shan et al (2001) Caporale et al (2004)	There is a causality relationship between finance and growth for most of the regions excepting for the poorest regions.
Abdelhafidh (2012)	Growth implies domestic savings on all the samples and also leads to direct foreign investment and foreign capital inflows.
Levine (1997) Demirguç-Kunt and Levine (1999) Beck et al (2000)	Banks and stock markets tend to be greater in wealthy countries, where financial development tends to be greater.
Arestis et al. (2001)	The effects of banking systems are stronger than stock market volatility.
Andrianaivo (2008)	Banks and markets are complementary to achieve growth in developed countries.
Cecchetti and Kharroubi (2012)	Finance is good for growth, only up to a certain level. Moreover, for developed countries, a burst of the financial sector becomes harmful for aggregate productivity growth.
Ayadi et al (2013) Gaytan and Ranciere (2004)	Credit to the private sector and bank deposits contribute negatively to growth and, by contrast, stock market size, liquidity and investment contribute importantly to development.

Table A.II - Detailed variables description for both panels

Variable	Unit of measure	Name	Source	Description
Domestic credit provided by banking sector	% of GDP	*CBANK*	*World Development Indicators, World Bank*	Domestic credit provided by the banking sector includes all credit to various sectors on a gross basis, with the exception of credit to the central government, which is net. The banking sector includes monetary authorities and deposit money banks, as well as other banking institutions where data are available.
Domestic credit to the private sector	% of GDP	*CPRIV*	*World Development Indicators, World Bank*	Domestic credit to private sector refers to financial resources provided to the private sector, such as through loans, purchases of nonequity securities, and trade credits and other accounts receivable, that establish a claim for repayment.
Claims on central government	% of GDP	*CLAIMS_GOV*	*World Development Indicators, World Bank*	Claims on central government include loans to central government institutions net of deposits.
Claims on other sectors of the domestic economy	% of GDP	*CLAIMS_OTHERS*	*World Development Indicators, World Bank*	Claims on other sectors of the domestic economy include gross credit from the financial system to households, nonprofit institutions serving households, nonfinancial corporations, state and local governments, and social security funds.
General government final consumption expenditure	% of GDP	*GOV_EXP*	*World Development Indicators, World Bank*	General government final consumption expenditure (formerly general government consumption) includes all government current expenditures for purchases of goods and services.
Gross domestic savings	% of GDP	*SAVINGS*	*World Development Indicators, World Bank*	Gross domestic savings are calculated as GDP less final consumption expenditure (total consumption).
Money and quasi money growth	annual %	*M2*	*World Development Indicators, World Bank*	Money and quasi money comprise the sum of currency outside banks, demand deposits other than those of the central government, and the time, savings, and foreign currency deposits of resident sectors other than the central government.

Table A.II (cont.) - Detailed variables description for both panels

Inflation, GDP deflator	annual %	*INF*	*World Development Indicators, World Bank*	Inflation as measured by the annual growth rate of the GDP implicit deflator shows the rate of price change in the economy as a whole. The GDP implicit deflator is the ratio of GDP in current local currency to GDP in constant local currency.
Bank nonperforming loans to total gross loans	%	*NPL/LOANS*	*World Development Indicators, World Bank*	Bank nonperforming loans to total gross loans are the value of nonperforming loans divided by the total value of the loan portfolio (including nonperforming loans before the deduction of specific loan-loss provisions).
Bank liquid reserves to bank assets ratio	%	*LIQUID/ASSETS*	*World Development Indicators, World Bank*	Ratio of bank liquid reserves to bank assets is the ratio of domestic currency holdings and deposits with the monetary authorities to claims on other governments, nonfinancial public enterprises, the private sector, and other banking institutions.
Stocks traded, total value	% of GDP	*STOCKS*	*World Development Indicators, World Bank*	Stocks traded refers to the total value of shares traded during the period. This indicator complements the market capitalization ratio by showing whether market size is matched by trading.

Appendix B – Estimation results

Table B.I - Correlation matrix of variables of equation (1), for panel 1, time period: 1980-2011

	GROWTH	*CBANK*	*CPRIV*	*SAVINGS*	*CLAIMS_GOV*	*INF*	*GOV_EXP*
GROWTH	1.0000						
CBANK	-0.2138	1.0000					
CPRIV	-0.1544	0.9428	1.0000				
SAVINGS	0.5463	-0.1842	-0.1166	1.0000			
CLAIMS_GOV	-0.1982	0.0319	-0.2690	-0.2419	1.0000		
INF	-0.0537	-0.3426	-0.4112	-0.0451	0.3050	1.0000	
GOV_EXP	-0.3183	-0.0130	0.0663	-0.1271	-0.2274	-0.2682	1.0000

Table B.II - Correlation matrix for panel 2, time period: 2000-2011

	GROWTH	*CBANK*	*CPRIV*	*SAVINGS*	*CLAIMS_GOV*	*CLAIMS_ OTHERS*	*M2*	*NPL/ LOANS*	*LIQUID/ ASSETS*	*STOCKS*	*INF*	*GOV_EXP*
GROWTH	1.0000											
CBANK	-0.6497	1.0000										
CPRIV	-0.5501	0.9699	1.0000									
SAVINGS	0.2094	-0.2741	-0.2607	1.0000								
CLAIMS_GOV	-0.3244	-0.0137	-0.2565	-0.0076	1.0000							
CLAIMS_OTHERS	-0.5458	0.9683	1.0000	-0.2626	-0.2630	1.0000						
M2	0.3779	-0.3368	-0.2338	-0.0259	-0.3820	-0.2296	1.0000					
NPL/LOANS	-0.4627	0.3523	0.2140	-0.4081	0.5173	0.2108	-0.4806	1.0000				
LIQUID/ASSETS	0.6046	-0.5164	-0.3861	0.0273	-0.4673	-0.3815	0.4212	-0.4791	1.0000			
STOCKS	-0.1980	0.4994	0.4752	-0.3328	0.0319	0.4739	-0.0011	-0.0256	-0.3527	1.0000		
INF	-0.0976	-0.1594	-0.1961	-0.1820	0.1724	-0.1969	-0.1099	0.3154	0.0417	-0.0713	1.0000	
GOV_EXP	-0.4348	0.4795	0.4959	0.0325	-0.1310	0.4954	-0.2531	0.0091	-0.0461	-0.1494	-0.1902	1.0000

Table B.III – Statistic-F test

Panel 1 - 17 countries, time period: 1980-2011

Variables	*statistic-F*	*p-value*
CBANK	1.3500	0.2461
CPRIV	0.0000	0.9631
SAVINGS	67.2300	0.0000
CLAIMS_GOV	0.0000	0.9496
INF	26.3000	0.0000
GOV_EXP	22.0000	0.0000
CBANK, CPRIV	50.6900	0.0000
CBANK, CLAIMS_GOV	4.8400	0.0890
CBANK, SAVINGS	67.6400	0.0000
CBANK, CPRIV, CLAIMS_GOV	52.3500	0.0000
CBANK, SAVINGS, CLAIMS_GOV	82.1900	0.0000
CBANK, CPRIV, SAVINGS	127.7600	0.0000

Panel 2 - 19 countries, time period: 2000-2011

Variables	*statistic-F*	*p-value*
CBANK	0.1200	0.7341
CPRIV	0.6600	0.4171
SAVINGS	5.5900	0.0180
CLAIMS_GOV	0.1500	0.7011
CLAIMS_OTHERS	0.3300	0.5635
M2	10.1900	0.0014
NPL/LOANS	2.2400	0.1343
LIQUID/ASSETS	0.5000	0.4782
STOCKS	0.1400	0.7092
INF	10.4200	0.0012
GOV_EXP	5.4000	0.0201

Table B.IV - Panel unit root tests - Levin-Lin-Chu for panel 1

Variables	Lags	Coefficient	t-value	P > t
GROWTH	0	-0.5645	-14.1940	0.0000
	1	-0.5891	-12.3540	0.0000
	2	-0.6082	-11.0870	0.0037
CBANK	0	-0.0180	-1.3130	0.9990
	1	-0.0496	-3.6530	0.8145
	2	-0.0610	-4.1710	0.6965
CPRIV	0	-0.0133	-1.1110	0.9980
	1	-0.0392	-3.4200	0.7014
	2	-0.0501	-4.0500	0.5067
SAVINGS	0	-0.1253	-6.1850	0.0044
	1	-0.1464	-7.5750	0.0001
	2	-0.1391	-6.6480	0.0070
CLAIMS_GOV	0	-0.0780	-4.3650	0.6780
	1	-0.0721	-3.9950	0.8862
	2	-0.0837	-4.5500	0.7516
INF	0	-0.2174	-8.8110	0.0000
	1	-0.1824	-6.9890	0.0164
	2	-0.1687	-6.6910	0.0417
GOV_EXP	0	-0.0947	-5.7330	0.0729
	1	-0.1136	-6.7230	0.0119
	2	-0.1192	-6.7870	0.0123

Table B.V - Panel unit root tests - Levin-Lin-Chu for panel 2

Variables	Lags	Coefficient	t-value	P > t
GROWTH	0	-0.6371	-9.5620	0.0000
	1	-0.6975	-8.5890	0.0014
	2	-0.6669	-6.3620	0.9232
CBANK	0	-0.1597	-6.0220	0.0000
	1	-0.1309	-6.2500	0.0003
	2	-0.1928	-7.5150	0.0001
CPRIV	0	-0.1772	-6.6160	0.0000
	1	-0.1589	-6.7020	0.0004
	2	-0.2328	-10.1840	0.0000
SAVINGS	0	-0.2701	-5.3990	0.0039
	1	-0.3117	-5.4600	0.0112
	2	-0.3153	-4.7710	0.1338
CLAIMS_GOV	0	-0.2834	-7.2390	0.0000
	1	-0.3452	-6.5080	0.0089
	2	-0.4583	-7.4780	0.0232
CLAIMS_OTHERS	0	-0.1158	-4.8000	0.0074
	1	-0.1579	-7.0980	0.0000
	2	-0.2190	-9.3950	0.0000
M2	0	-0.6291	-9.4900	0.0000
	1	-0.7016	-9.3250	0.0001
	2	-0.7557	-7.6000	0.2991
NPL/LOANS	0	-0.4790	-16.3820	0.0000
	1	-0.0284	-0.4920	1.0000
	2	-0.3521	-4.9830	1.0000
LIQUID/ASSETS	0	-0.2758	-4.3270	0.7806
	1	-0.3895	-5.5670	0.5184
	2	-0.3400	-6.5330	0.0870
STOCKS	0	-0.6002	-10.1530	0.0000
	1	-0.7580	-11.2090	0.0000
	2	-2.2293	-18.0740	0.0000
INF	0	-0.4366	-7.5560	0.0000
	1	-0.6207	-10.2710	0.0000
	2	-0.6078	-6.9210	0.0540
GOV_EXP	0	-0.2008	-4.3270	0.2916
	1	-0.2973	-5.4540	0.1421
	2	-0.2705	-4.0560	0.8488

Table B.VI - Results of estimation of equation (1) using OLS regression, for panel 1

	CBANK	*CPRIV*	*SAVINGS*	*CLAIMS_GOV*	*INF*	*GOV_EXP*	*_CONS*
Estimation I							
Estimated Coefficient	-0.0176		0.2039	-0.0015	-0.1117	-0.1816	3.7746
Standard Error	0.0025		0.0244	0.0094	0.0219	0.0371	1.1774
t-statistic	-7.0500		8.3600	-0.1600	-5.1000	-4.9000	3.2100
***p*-value**	0.0000		0.0000	0.8730	0.0000	0.0000	0.0010
Estimation II							
Estimated Coefficient		-0.0170	0.2018	-0.0186	-0.1087	-0.1801	3.7029
Standard Error		0.0025	0.0244	0.0093	0.0218	0.0370	1.1729
t-statistic		-6.9400	8.2900	-2.0000	-4.9800	-4.8600	3.1600
***p*-value**		0.0000	0.0000	0.0460	0.0000	0.0000	0.0020

Table B.VII - Results of estimation of equation (1) using fixed or random effects, for panel 1

	CBANK	*CPRIV*	*SAVINGS*	*CLAIMS_GOV*	*INF*	*GOV_EXP*	*_CONS*	*Hausman-statistic (p-value)*
Estimation I								194.55 (0.000)
Estimated Coefficient	-0.0220		0.2605	0.0204	-0.1332	-0.0578	0.2251	
Standard Error	0.0026		0.0389	0.0110	0.0224	0.0537	1.7505	
t-statistic	-8.3600		6.7000	1.8500	-5.9400	-1.0800	0.1300	
***p*-value**	0.0000		0.0000	0.0650	0.0000	0.2820	0.8980	
Estimation II								106.00 (0.000)
Estimated Coefficient		-0.0213	0.2549	-0.0010	-0.1296	-0.0581	0.2395	
Standard Error		0.0026	0.0389	0.0107	0.0224	0.0538	1.7540	
t-statistic		-8.2200	6.5500	-0.1000	-5.7900	-1.0800	0.1400	
***p*-value**		0.0000	0.0000	0.9230	0.0000	0.2810	0.8910	

Note: Hausman-test: for p-values lower than 0.05 we used fixed effects. Otherwise, for p-values higher than 0.05 there are included random effects.

Table B.VIII - Results of estimation of equation (1) using OLS regression, for panel 2

	CBANK	*CPRIV*	*SAVINGS*	*CLAIMS_ GOV*	*CLAIMS_ OTHERS*	*M2*	*NPL/ LOANS*	*LIQUID/ ASSETS*	*STOCKS*	*INF*	*GOV_EXP*	*_CONS*
Estimation I												
Estimated Coefficient	-0.0226		0.1040	0.0132		0.0618	-0.1026	0.0363	0.0040	0.3351	-0.1854	4.5930
Standard Error	0.0053		0.0484	0.0216		0.0194	0.0647	0.0389	0.0035	0.1044	0.0682	2.0596
t-statistic	-4.2900		2.1500	0.6100		3.1800	-1.5900	0.9300	1.1700	3.2100	-2.7200	2.2300
***p*-value**	0.0000		0.0320	0.5400		0.0010	0.1130	0.3500	0.2430	0.0010	0.0070	0.0260
Estimation II												
Estimated Coefficient		-0.0230	0.1058	-0.0102		0.0619	-0.1008	0.0332	0.0036	0.3349	-0.1792	4.5021
Standard Error		0.0053	0.0479	0.0222		0.0194	0.0646	0.0389	0.0034	0.1041	0.0676	2.0313
t-statistic		-4.3500	2.2100	-0.4600		3.1800	-1.5600	0.8600	1.0600	3.2200	-2.6500	2.2200
***p*-value**		0.0000	0.0270	0.6460		0.0010	0.1190	0.3930	0.2880	0.0010	0.0080	0.0270
Estimation III												
Estimated Coefficient			0.1038	-0.0095	-0.0227	0.0613	-0.1043	0.0360	0.0042	0.3351	-0.1844	4.5906
Standard Error			0.0485	0.0225	0.0054	0.0195	0.0649	0.0391	0.0035	0.1046	0.0683	2.0715
t-statistic			2.1400	-0.4200	-4.2100	3.1400	-1.6100	0.9200	1.2000	3.2000	-2.7000	2.2200
***p*-value**			0.0320	0.6720	0.0000	0.0020	0.1080	0.3570	0.2290	0.0010	0.0070	0.0270
Estimation IV												
Estimated Coefficient	-0.0205		0.1038	0.0154		0.0657	-0.1118	0.0348		0.3320	-0.1802	4.4550
Standard Error	0.0049		0.0472	0.0207		0.0193	0.0638	0.0382		0.1039	0.0661	2.0074
t-statistic	-4.2100		2.2000	0.7400		3.4000	-1.7500	0.9100		3.2000	-2.7200	2.2200
***p*-value**	0.0000		0.0280	0.4580		0.0010	0.0800	0.3620		0.0010	0.0060	0.0260
Estimation V												
Estimated Coefficient		-0.0212	0.1043	-0.0067		0.0653	-0.1093	0.0314		0.3310	-0.1741	4.4201
Standard Error		0.0049	0.0467	0.0210		0.0193	0.0636	0.0382		0.1036	0.0655	1.9790
t-statistic		-4.3100	2.2300	-0.3200		3.3800	-1.7200	0.8200		3.2000	-2.6600	2.2300
***p*-value**		0.0000	0.0250	0.7510		0.0010	0.0860	0.4100		0.0010	0.0080	0.0260
Estimation VI												
Estimated Coefficient			0.1040	-0.0048	-0.0203	0.0654	-0.1133	0.0348		0.3326	-0.1792	4.4201
Standard Error			0.0473	0.0212	0.0049	0.0194	0.0640	0.0384		0.1041	0.0663	2.0181
t-statistic			2.2000	-0.2300	-4.1200	3.3700	-1.7700	0.9100		3.1900	-2.7000	2.1900
***p*-value**			0.0280	0.8200	0.0000	0.0010	0.0770	0.3640		0.0010	0.0070	0.0290

Table B.IX - Results of estimation of equation (1) using fixed or random effects, for panel 2

	CBANK	*CPRIV*	*SAVINGS*	*CLAIMS_ GOV*	*CLAIMS_ OTHERS*	*M2*	*NPL/ LOANS*	*LIQUID/ ASSETS*	*STOCKS*	*INF*	*GOV_EXP*	*_CONS*	*Hausman-statistic (p-value)*
Estimation I													19.51 (0.0212)
Estimated Coefficient	-0.0180		0.2473	0.0929		0.0483	-0.1708	0.0359	0.0011	0.2698	-0.3402	3.9643	
Standard Error	0.0096		0.0927	0.0416		0.0199	0.0722	0.0563	0.0064	0.1185	0.1732	4.8974	
t-statistic	-1.8700		2.6700	2.2300		2.4300	-2.3600	0.6400	0.1700	2.2800	-1.9600	0.8100	
***p*-value**	0.0620		0.0080	0.0270		0.0160	0.0190	0.5240	0.8650	0.0240	0.0510	0.4190	
Estimation II													20.08 (0.0174)
Estimated Coefficient		-0.0182	0.2471	0.0753		0.0483	-0.1710	0.0347	0.0011	0.2692	-0.3402	3.9892	
Standard Error		0.0096	0.0925	0.0418		0.0199	0.0721	0.0564	0.0064	0.1184	0.1730	4.8948	
t-statistic		-1.9100	2.6700	1.8000		2.4300	-2.3700	0.6200	0.1700	2.2700	-1.9700	0.8100	
***p*-value**		0.0580	0.0080	0.0730		0.0160	0.0190	0.5390	0.8660	0.0240	0.0510	0.4160	
Estimation III													19.86 (0.0188)
Estimated Coefficient			0.2473	0.0756	-0.0175	0.0478	-0.1737	0.0363	0.0014	0.2684	-0.3454	4.0163	
Standard Error			0.0933	0.0419	0.0099	0.0199	0.0721	0.0564	0.0064	0.1187	0.1732	4.9232	
t-statistic			2.6500	1.8100	-1.7700	2.4000	-2.4100	0.6400	0.2200	2.2600	-1.9900	0.8200	
***p*-value**			0.0090	0.0720	0.0790	0.0170	0.0170	0.5200	0.8260	0.0250	0.0470	0.4160	
Estimation IV													10.24 (0.2483)
Estimated Coefficient	-0.0205		0.1038	0.0154		0.0657	-0.1118	0.0348		0.3320	-0.1802	4.4550	
Standard Error	0.0049		0.0472	0.0207		0.0193	0.0638	0.0382		0.1039	0.0661	2.0074	
t-statistic	-4.2100		2.2000	0.7400		3.4000	-1.7500	0.9100		3.2000	-2.7200	2.2200	
***p*-value**	0.0000		0.0280	0.4580		0.0010	0.0800	0.3620		0.0010	0.0060	0.0260	
Estimation V													9.53 (0.2993)
Estimated Coefficient		-0.0212	0.1043	-0.0067		0.0653	-0.1093	0.0314		0.3310	-0.1741	4.4201	
Standard Error		0.0049	0.0467	0.0210		0.0193	0.0636	0.0382		0.1036	0.0655	1.9790	
t-statistic		-4.3100	2.2300	-0.3200		3.3800	-1.7200	0.8200		3.2000	-2.6600	2.2300	
***p*-value**		0.0000	0.0250	0.7510		0.0010	0.0860	0.4100		0.0010	0.0080	0.0260	
Estimation VI													13.17 (0.1061)
Estimated Coefficient			0.1040	-0.0048	-0.0203	0.0654	-0.1133	0.0348		0.3326	-0.1792	4.4201	
Standard Error			0.0473	0.0212	0.0049	0.0194	0.0640	0.0384		0.1041	0.0663	2.0181	
t-statistic			2.2000	-0.2300	-4.1200	3.3700	-1.7700	0.9100		3.1900	-2.7000	2.1900	
***p*-value**			0.0280	0.8200	0.0000	0.0010	0.0770	0.3640		0.0010	0.0070	0.0290	

Note: Hausman-test: for p-values lower than 0.05 we used fixed effects. Otherwise, for p-values higher than 0.05 there are included random effects.

Table B.X - Results of estimation of equation (2) using the first lag of financial indicators for panel 1

	CBANK(-1)	*CPRIV(-1)*	*SAVINGS(-1)*	*CLAIMS_ GOV(-1)*	*INF*	*GOV_EXP*	*_CONS*
Estimation I							
Estimated Coefficient	-0.0153		0.0984	0.0095	-0.0997	-0.2352	6.6806
Standard Error	0.0025		0.0242	0.0097	0.0223	0.0381	1.1786
t-statistic	-6.1100		4.0600	0.9800	-4.4800	-6.1800	5.6700
***p*-value**	0.0000		0.0000	0.3260	0.0000	0.0000	0.0000
Estimation II							
Estimated Coefficient		-0.0151	0.0980	-0.0054	-0.0979	-0.2324	6.5865
Standard Error		0.0025	0.0242	0.0097	0.0222	0.0380	1.1725
t-statistic		-6.1100	4.0500	-0.5600	-4.4100	-6.1100	5.6200
***p*-value**		0.0000	0.0000	0.5730	0.0000	0.0000	0.0000

Table B.XI - Results of estimation of equation (2) using the first lag of financial indicators for panel 2

	CBANK (-1)	*CPRIV (-1)*	*SAVINGS (-1)*	*CLAIMS_ GOV(-1)*	*CLAIMS_ OTHERS(-1)*	*M2(-1)*	*NPL/ LOANS(-1)*	*LIQUID/ ASSETS(-1)*	*STOCKS (-1)*	*INF*	*GOV_EXP*	*_CONS*
Estimation I												
Estimated Coefficient	-0.0092		0.0569	0.0025		0.0440	0.1219	0.0498	-0.0029	0.5284	-0.1258	2.0458
Standard Error	0.0055		0.0506	0.0225		0.0211	0.0672	0.0412	0.0036	0.1074	0.0711	2.1251
t-statistic	-1.6600		1.1200	0.1100		2.0800	1.8100	1.2100	-0.8100	4.9200	-1.7700	0.9600
***p*-value**	0.0970		0.2610	0.9110		0.0370	0.0700	0.2270	0.4170	0.0000	0.0770	0.3360
Estimation II												
Estimated Coefficient		-0.0096	0.0576	-0.0075		0.0438	0.1224	0.0480	-0.0030	0.5268	-0.1223	2.0234
Standard Error		0.0055	0.0502	0.0233		0.0211	0.0671	0.0412	0.0036	0.1072	0.0706	2.0977
t-statistic		-1.7300	1.1500	-0.3200		2.0700	1.8200	1.1600	-0.8300	4.9200	-1.7300	0.9600
***p*-value**		0.0840	0.2510	0.7460		0.0380	0.0680	0.2450	0.4040	0.0000	0.0830	0.3350
Estimation III												
Estimated Coefficient			0.0566	-0.0067	-0.0092	0.0437	0.1213	0.0496	-0.0029	0.5287	-0.1253	2.0505
Standard Error			0.0507	0.0235	0.0056	0.0212	0.0673	0.0414	0.0036	0.1074	0.0712	2.1328
t-statistic			1.1200	-0.2900	-1.6400	2.0600	1.8000	1.2000	-0.7900	4.9200	-1.7600	0.9600
***p*-value**			0.2640	0.7750	0.1010	0.0390	0.0710	0.2310	0.4320	0.0000	0.0780	0.3360
Estimation IV												
Estimated Coefficient	-0.0109		0.0541	-0.0032		0.0425	0.1301	0.0487		0.5265	-0.1187	2.0520
Standard Error	0.0051		0.0491	0.0214		0.0209	0.0660	0.0403		0.1063	0.0680	2.0487
t-statistic	-2.1500		1.1000	-0.1500		2.0300	1.9700	1.2100		4.9500	-1.7500	1.0000
***p*-value**	0.0320		0.2700	0.8820		0.0420	0.0490	0.2260		0.0000	0.0810	0.3170
Estimation V												
Estimated Coefficient		-0.0113	0.0553	-0.0150		0.0424	0.1312	0.0470		0.5252	-0.1150	2.0067
Standard Error		0.0051	0.0487	0.0219		0.0210	0.0659	0.0403		0.1060	0.0674	2.0234
t-statistic		-2.2000	1.1400	-0.6900		2.0300	1.9900	1.1700		4.9500	-1.7100	0.9900
***p*-value**		0.0280	0.2560	0.4910		0.0430	0.0460	0.2430		0.0000	0.0880	0.3210
Estimation VI												
Estimated Coefficient			0.0537	-0.0141	-0.0110	0.0422	0.1289	0.0482		0.5265	-0.1181	2.0671
Standard Error			0.0491	0.0220	0.0051	0.0210	0.0661	0.0404		0.1063	0.0680	2.0546
t-statistic			1.0900	-0.6400	-2.1400	2.0100	1.9500	1.1900		4.9500	-1.7400	1.0100
***p*-value**			0.2740	0.5220	0.0320	0.0440	0.0510	0.2330		0.0000	0.0830	0.3140