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FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH: A STUDY FOR OECD COUNTRIES IN THE CONTEXT OF CRISIS*

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Abstract

We revisit the relationship between economic growth and financial development in OECD countries during the period 1990-2016, paying special attention to the recent economic crisis. Using a random effects model, we find that an increase in domestic credit provided by the financial-sector, in market capitalization and in the turnover ratio of domestic shares entails a significant positive effect on per capita GDP. We also find different effects during the period of the crisis on domestic credit provided by the financial-sector and on market capitalization. Among other socioeconomic determinants related to economic growth, expenditure in education, inflation and unemployment rates appear highly significant for economic growth of the analysed countries.

Keywords: Financial development, Economic growth, Panel data, Random effects model

JEL: G0, O1, O47

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1. INTRODUCTION

The relationship between economic growth and the financial development of countries has been an extensively researched subject. There are many aspects that can be treated as economic growth determinants. The empirical evidence seems conclusive in showing that financial development is an important source of economic growth insofar as it promotes a more efficient allocation of resources and fosters the necessary competition in the provision of funds for the benefit of savers and investors.

A well-developed financial system is essential in a market economy. According to Calvo et al. (2014) 'the financial system of a country is made up of the set of institutions, means and markets whose primary purpose is to channel the savings generated by surplus spending units towards borrowers or deficit spending units'. The authors also point out that the financial system has a fundamental mission in a market economy since, in general, there is no coincidence between the wishes of savers and investors regarding the degree of liquidity, security and profitability. Similarly, economic growth has a lot of priority for institutions and economic policy makers, since the concept of economic growth is often associated with the prosperity and well-being of a country.

The theoretical and empirical literature has reached a growing consensus about the significant impact the development of the financial system has on economic growth. In the most extended literature, the main result is that financial development positively influences economic growth (see, for example, King and Levine (1993), Levine (1997), Rajan and Zingales (1998), Beck et al. (2000), Levine et al. (2000), Levine (2003), Beck and Levine (2004) and Beck et al. (2007). In this sense, a more developed financial system affects investment decisions and savings, improving the allocation of resources in the economy and thus driving economic growth. Goldsmith (1969) was the first to show empirically the existence of a positive relationship between financial development and Gross domestic Product (GDP) per capita. But which of the variables of the financial system contribute most to explaining economic growth in OECD countries? The value of providing an answer to this question lies in offering further evidence of the features of the financial system that help policy makers determine the more adequate policy measures that might be implemented to stimulate convergence in terms of economic growth across OECD countries.

Thus, this paper provides useful evidence on the relationship between economic growth and the main determinants of financial development in developed countries during the period 1990-2016. This study uses a panel data-set for 30 OECD countries while existing papers

largely address diverse developed and developing countries, or deal with a specific country. This is the first attempt in the literature that deals with the extent to which economic growth may be connected to different variables of financial development in the group of OECD countries in the context of the recent crisis. Using different specifications through a random effects model, our intention is to show what aspect of financial development is more determinant to economic growth for the period examined.

The remainder of the paper is as follows. Section 2 reviews the literature. Section 3 describes the data and the variables used in this work and discusses the methodology. Section 4 presents the results. Section 5 concludes.

2. LITERATURE

In the field of economic growth, there is a growing body of literature on the study of the relationship between financial development and economic growth. Since Schumpeter (1911), and later with Goldsmith (1969), McKinnon (1973) and Shaw (1973), this issue has been extensively researched, yielding considerable evidence that financial development correlates with growth. Theoretically, Schumpeter (1911) submits that a well-developed financial system catalyses technological innovation and economic growth through the provision of financial services and resources to those entrepreneurs who have the highest probability of successfully implementing innovative products and processes. Schumpeter's prediction that finance promotes growth arose from using annual time series data from South Africa. The remarkable writings of Goldsmith (1969), McKinnon (1973) and Shaw (1973) have also contributed significantly to this view.

More recently, numerous authors have contributed to examining the relationship between financial development and economic growth, contributing important theoretical and empirical arguments (Gupta, 1984; Jung, 1986; Demetriades and Hussein, 1996; Levine, 1997; Arestis and Demetriades, 1997; Levine et al., 2000; Arestis et al., 2001; Calderón and Liu, 2003; Christopoulos and Tsionas, 2004, among others). In the most extended literature, the main result is that financial development positively influences economic growth and, simultaneously, growth propels financial development, as the expansion of the real sector may have a notable influence on the development of the financial sector, although there are some exceptions¹.

¹ On the one hand, Lucas (1988) and Stern (1989) have maintained that finance is not a significant determinant of economic growth, and on the other hand, De Gregorio and Guidotti (1995) find a negative relationship between economic growth and financial development in a group of 12 Latin American countries for the period 1950–1985.

The study of Goldsmith (1969) was pioneering in analysing the effects of financial development on economic growth by empirically showing, for the first time, the existence of a positive relationship between financial development and GDP per capita.

King and Levine (1993) analyse the effects of financial development on economic growth among 80 countries during the period 1960–1989. They find a positive relationship between development and economic growth in the sense that the development of the financial sector exhibits a significant impact on the pace of economic growth, accumulation of physical capital and improvement of effectiveness of financial capital use.

De Gregorio and Guidotti (1995) study a group of 100 countries and find that there is a positive relationship between financial sector development and economic growth from 1960-1985, and they also report 12 Latin American countries showing a negative relationship between financial development and economic growth in the period 1950-1985. The only variable used in their work is the ratio of domestic credit for the private sector to GDP.

Choe and Moosa (1999) analyse the link between the development of the financial sector and economic growth in South Korea from 1970-1992 and find that the development of the financial sector is positively correlated with economic growth. Their causality tests indicate that the improvement of the financial sector's economic performance is highlighted for expansionary periods, which means that the financial sector influences economic growth.

Beck et al. (2000) conclude, on performing an analysis by level of income per capita, that the level of economic development of a country plays an important role in the impact of financial development to the extent that the lower a country's levels of income, the weaker its financial development will be.

Shan et al. (2001) study 9 OECD countries plus China for the periods from the sixties to 1988 and the seventies to 1988 showing a bilateral causal relationship between the financial sector and economic growth in around half of the countries studied. They also find in three countries that there is a unilateral relationship between the financial sector and economic growth, indicating that the development of the financial sector is the result of rapid economic growth.

In developing countries, we find the study by Christopoulos and Tsionas (2004) that shows in 10 developing countries for the period 1970-2000 that there is a long-term relationship between the financial sector and economic growth and it is unilateral in the sense that financial sector development significantly contributes to economic growth. Meanwhile, the reverse

relationship does not take place.

As far as we know, studies on the relationship between the different aspects of financial development and economic growth in OECD countries are limited for recent years, though we may highlight the article by Prochniak and Wasiak (2017) in which different variables are used to measure development and stability of the financial sector in OECD countries to study economic growth. In this study, a regression analysis is performed where the GDP growth rate is estimated against each of the variables of the financial sector through a quadratic model.

However, we allow for control for variables that change over time from year to year, using a linear model. Likewise, in our work, a model is analysed in which all the variables of financial development are included to evaluate the influence of each of them on economic growth when they collectively interact. For each of the variables of the financial sector the above authors use a different period for their regression analysis for the period 1993-2013, whereas we analyse all the variables for the same period of time (1990-2016). Thus, our results are comparable for the same countries and the same period of time.

Therefore, this article analyses on the one hand the main determinants of financial development on the evolution of GDP per capita paying special attention to the financial crisis, while other determinants of economic growth are controlled for in order to check which of these variables of financial development are the most determinant of economic growth in the OECD countries during 1990-2016.

3. DATA, VARIABLES AND METHODOLOGY

In this section we describe the database and discuss the methodology used in this work with the objective of studying the relationship between economic growth and financial development in 30 OECD countries.

We use World Bank development datasets and we build a panel database data for the period 1990-2016 with statistical information on GDP per capita, the main variables of the financial system, and a number of control variables.

3.1. Data and variables

We work with an unbalanced panel for 30 OECD countries for the period 1990–2016, with statistical information on financial development variables, GDP per capita, and a number of control variables, involving 363 observations. All variables are taken from the World

Development Indicators (World Bank, 2018).

In general, the rate of growth of the GDP or GDP per capita is used as an indicator of economic growth, despite the fact that there is a broad debate about the consideration of whether this is the best indicator of the well-being of a country or whether other non-material aspects should be considered, as indicated by Stiglitz et al. (2009). In this study we use the variable GDP per capita (GDP) which corresponds to real GDP per capita in constant 2011 international US dollars, adjusted for differences across countries at purchasing power parity (PPP).

On the other hand, the concept of financial development, in general, is equivalent to an improvement in the quality of the financial system. In this sense, Gehringer (2013) defines financial development as improving the quality of financial transactions. Levine (2004) points out that there is financial development when financial instruments, markets and intermediaries improve (although not necessarily eliminate) information and transaction costs and, therefore, do their corresponding work better in terms of compliance with the functions of financial markets.

However, indicators are needed to measure financial development. The choice is a complex task, since there is no single indicator. There are authors, such as Law and Singh (2013), who use only indicators related to banking activity, such as the volume of credit to the private sector or the size of liquid liabilities. In this sense, Prochniak and Wasiak (2017) use bank nonperforming loans and bank capital-to-assets ratio to measure financial development. Other authors, such as Goldsmith (1969), emphasize the role of financial intermediaries using the value of intermediated assets. King and Levine (1993), for example, use both types of indicators.

Following King and Levine (1993), Levine and Zervos (1998), Beck et al. (2000), Levine et al. (2000) and Odhiambo (2010), the level of financial services is commonly measured by domestic credit to the financial sector as a percentage of GDP. Ahmed and Ansari (1998) use the ratio of domestic credit to nominal GDP, and De Gregorio and Guidotti (1995) also use the ratio of domestic credit for the private sector to GDP. Likewise, Prochniak and Wasiak (2017) also use domestic credit provided by the financial sector. All authors find a positive and significant relationship between domestic credit and economic growth.

Moreover, Beck and Levine (2004) find that stock markets and banks positively influence economic growth. Dökmen et al. (2015) use market capitalization showing a positive and statistically significant relationship between market capitalization rate shock and economic

growth. In this sense, the positive and significant relationship between stock market capitalization and economic growth produces a potential avenue for promoting economic growth (Jalloh, 2015). In this context, it has been found that market capitalization to GDP does not exert a significant effect upon economic growth in Jordan, but the turnover ratio has a significant effect upon economic growth (Abdul-Khaliq, 2013). Juma Rashid et al. (2016) explain that there is a short-run causality running from turnover ratio to economic growth and market capitalization ratio to economic growth. Likewise, Prochniak and Wasiak (2017) show that market capitalization of listed companies, turnover ratio of stocks traded, and the monetization ratio influence economic growth.

According to the literature previously mentioned, and the available panel data we use the following financial development variables (FDV) in our study:

- Domestic credit provided by the financial sector as a percentage of GDP (*Domestic credit*), which includes all credit to various sectors on a gross basis, with the exception of credit to the central government, which is net. The financial sector includes monetary authorities and deposit money banks, as well as other financial corporations where data are available (including corporations that do not accept transferable deposits but do incur such liabilities such as time and savings deposits). Examples of other financial corporations are finance and leasing companies, money lenders, insurance corporations, pension funds, and foreign exchange companies.
- Market capitalization of listed domestic companies as a percentage of GDP (*Market capitalization*), which is the share price times the number of shares outstanding (including their several classes) for listed domestic companies. Investment funds, unit trusts, and companies whose only business goal is to hold shares of other listed companies are excluded. Data are end of year values.
- Stocks traded, turnover ratio of domestic shares as a percentage (Turnover ratio), which is the value of domestic shares traded divided by their market capitalization. The value is annualized by multiplying the monthly average by 12.

Likewise, there are other determinant variables of economic growth apart from financial development.

There has been considerable debate on the nature of the relationship between inflation and growth. Inflation has been identified as one of the most important determinants of growth (Ghosh and Phillips, 1998). Beck et al. (2000) use inflation as determinant of the economic

growth of countries. Babatunde and Isa Shuaibu (2011) find a significant long-term relationship between inflation and economic growth between 1975 and 2008 in Nigeria. Inflation is thus included as a control variable in this study.

In its most basic form, Okun's law investigates the statistical relationship between a country's unemployment rate and the growth rate of its economy (Okun, 1962). That rule of thumb describes the observed relationship between changes in the unemployment rate and the growth rate of real GDP. Thus, Okun's law states that adjustment within the labour market over major economic cycles comes mainly through employment and hence there is a strong association between changes in real GDP and in the employment rate. For this reason, in our study, we use the unemployment rate as determinant of economic growth.

Finally, in line with Beck et al. (2000) in order to control for level of education and for the general government final consumption expenditure, we include the variable government expenditure in education as a percentage of total government expenditure. The author concludes that the educational level influences the effect of financial development and therefore, countries with higher income per capita benefit more. Consequently, it seems necessary to include this variable as a control variable because if a country invests more than another in education it tends to have a comparatively higher educational level.

For this reason, apart from using FDV, according to the literature previously mentioned, we consider the following variables for the period examined:

- *Inflation rate*, which consists in inflation as measured by the annual growth rate of the GDP implicit deflator showing the rate of price change in the economy as a whole.
- *Unemployment rate*, which refers to the share of the labour force that is without work but available for and seeking employment.
- *Government expenditure*, which consists in general government expenditure on education (current, capital, and transfers) expressed as a percentage of total government expenditure. It includes expenditure funded by transfers from international sources to government. General government usually refers to local, regional and central governments.

For a detailed summary table with definitions, acronyms and sources the reader should consult Appendix 1.

Additionally, we take into account the global economic and financial crisis in line with Afonso and Jalles (2013), since financial crisis is detrimental for growth. Obviously, the

presence of a financial crisis in countries could have a negative impact on economic growth. In this sense, the subprime crisis, which was generated by financial problems occurred on the United States housing market, has constituted a serious impact on the global economy, in particular, in developed countries. Thus, this paper tries to offer further evidence of the major economic downturn, which began at the end of 2007, on the impact of international finances.

3.2. Methodology

The most common method used in researching the relation between finances and growth is cross-sectional regressions and panel data techniques. In this study, with the objective of analysing the effects of the main variables of financial development on economic growth in the OECD countries during the period 1990-2016, we estimate a model with panel data.

For instance, in the study carried out by Baltagi (2001), some of the advantages and disadvantages of the use of panel data are listed. Among the advantages mentioned is the control over individual heterogeneity, greater variability, less collinearity between variables, more degrees of freedom, greater efficiency, better adaptation to the study of adjustment dynamics, better adequacy for identifying and measuring effects that are not detectable in pure cross-sectional or time-series data, and also better analysis capacity in more complicated behaviours. As disadvantages, panel data presents the problem of data collection, distortions due to measurement errors and the short time dimension that is generally found in the data sets. According to Hausman and Taylor (1986), one of the most noteworthy characteristics of the use of panel data is the ability to control specific individual effects that may be correlated with other variables.

Firstly, we could consider the basic approach to regression analysis with panel data such as pooled regression. The advantage of estimation through Ordinary Least Squares (OLS) lies in the simplification that results from being able to determine the value of a certain endogenous variable through a linear relationship with all the exogenous variables that participate in the system. In contrast, the main drawback of this method lies precisely in that simplification of the model (Breusch and Pagan, 1980), which does not correct the correlation of individual errors with observations and, therefore, the estimates will be biased. In this direction, the null hypothesis of no country effects is rejected², implying that a pooled regression model is inappropriate, as estimates made with pooled OLS would be biased (Breusch and Pagan, 1980).

Therefore, the use of panel data seems fundamental since it allows for considering the

² For a more ample discussion of this test, see Breusch and Pagan (1980).

existence of individual effects not controlled by the explanatory variables observed in the model and, in addition, allows controlling for variables that change over time. In addition, the use of panel data gives more informative data and, as stated before, more variability, less collinearity, and a greater degree of freedom (Hsiao, 2003 and Klevmarcken, 1989). Thus, we opt for the estimation based on panel data since the considered series is sufficiently long. In this sense, the estimator of random effects allows that differences between states are not constant correlation as it considers that the differences between countries, in this case, are random. In this way, applying the random effects model assumes that the error is composed of a random variable (with a mean value and a non-zero variance) for each country in addition to another part corresponding to the disturbance, which is equivalent to obtaining a different trend for each country giving each country a different point of origin, which will make it possible to include in the same model all the trends in the different countries of our study.

Therefore, first, we propose three alternative models: Model [1] a linear model that tests for the effect of all *FDV* on the GDP per capita; additionally, we introduce the effect of crisis through a dummy variable that takes a value of 1 if it covers the period of crisis (2008-2011) and, 0 otherwise in Model [2]. Finally, we introduce the interactions between economic crisis and *FDV* in Model [3]. Note that in models [1], [2] and [3], we introduce all control variables and according to the literature on economic growth, and we also include the initial value of GDP per capita.

Thus, we estimate the following panel data model:

$$y_{it} = \beta_0 + \beta_1 y_{it0} + \beta_2 FDV_{it} + \gamma x_{it} + \zeta_i + \omega_{it} \quad [1]$$

$$y_{it} = \beta_0 + \beta_1 y_{it0} + \beta_2 FDV_{it} + \beta_3 crisis_{it} + \gamma x_{it} + \zeta_i + \omega_{it} \quad [2]$$

$$y_{it} = \beta_0 + \beta_1 y_{it0} + \beta_2 FDV_{it} + \beta_3 crisis_{it} + \beta_4 (crisis * FDV)_{it} + \gamma x_{it} + \zeta_i + \omega_{it} \quad [3]$$

where y_{it} is the GDP per capita, y_{it0} denotes the initial value of GDP per capita³, FDV_{it} refers to the respective variable of financial development⁴, x_{it} are other control variables mentioned earlier, ζ_i is the intercept for each country, and ω_{it} are the individual level residuals.

Second, we estimate the same three above-mentioned models but with a quadratic form in *FDV* in Models [1'], [2'] and [3']. Thus, the quadratic model intends to capture the possible non-linear relationship between *FDV* and GDP per capita.

³ The initial value of GDP per capita refers to its average between 1990 and 1994.

⁴ Due to the characteristics of the Domestic credit variable, it is introduced with a lag.

4. RESULTS

4.1. Baseline analysis

According to the methodology presented in the previous section, the results of the regression analysis of the random effects model for OECD countries are reported in Table 1A.

[Table 1A]

As expected, the results show that there is a positive and statistically significant relationship between the three indicators of financial development and per capita GDP across 30 OECD countries during the period 1990-2016. When analysing the three indicators, we find that all of them significantly correlate with higher levels of economic growth. However, it is the higher index of domestic credit provided by the financial system that positively affects the evolution of GDP to a greater degree.

Thus, on the one hand, we observe that *FDV* have a significant positive linear impact on promoting economic growth in a proportional way. On the other hand, the application of a quadratic model permits verifying the non-linear relationship between per capita GDP and *FDV*. Given the quadratic functional form, the effect of these non-linear estimators has a negative impact on economic growth. In addition, it is worth mentioning that all models include the three explanatory control variables and they are statistically significant in the expected direction.

In addition, regarding the inflation rate, the results show a negative, statistically significant influence on the evolution of GDP per capita, in such a way that an increase in the inflation rate tends to reduce economic growth in the OECD country sample.

As regards the unemployment rate, there is a negative and statistically significant relationship between the unemployment rate and the GDP per capita, suggesting that those OECD countries that have higher unemployment rates tend to have reduced economic growth.

Spending on education is a determinant variable of economic growth as higher educational spending on the part of governments results in an increase in GDP per capita.

Moreover, the effect of the dummy variable for the crisis does not seem determinant on economic growth surprisingly. However, the effect of the crisis is determinant on market capitalization, which has a positive and significant repercussion during the period of crisis.

The results are robust for the European Union (EU) countries (see Table 1B). However, in the case of EU countries the effect of crisis on Domestic credit variable is negative and statistically significant on the evolution of GDP per capita, mainly due to the fact that European countries suffered in a greater way the recent global economic and financial crisis.

[Table 1B]

4.2. Robustness analysis

As an additional robustness test, we introduce a dynamic variant of the static model. We apply the system generalized method of moments (GMM) estimator developed by Arellano and Bover (1995) and Blundell and Bond (1998). This method estimates a system of equations in both first differences and levels, in which the instruments in the level equations are lagged first differences of the variables. This dynamic approach allows the inclusion of lagged values of FDV as an explanatory variable, which controls for omitted variables that change over time, in contrast with random effects estimations that control for country characteristics.

Results are similar for the random effects models with some exceptions: first, *Turnover ratio* is only statistically significant for OECD countries for linear models. Second, *Inflation rate* is not statistically significant for OECD countries and finally, regarding EU countries, the effect of inflation is positive on economic growth (see Tables 2A and 2B). Finally, it is worth point out that in the case of dynamic models the effect of crisis is negative and statistically significant on the evolution of GDP per capita. Nevertheless, now the effect of crisis on market capitalization is not determinant on economic growth.

[Table 2A]

[Table 2B]

5. CONCLUSION

In this paper we have analysed the empirical relationship between the main determinants of the financial system and GDP per capita in order to find evidence of the features of the system that help policy makers determine those policies that might be implemented to stimulate convergence in terms of economic growth across 30 OECD countries and covering the period 1990-2016.

Results show that there is a positive and statistically significant relationship between the three indicators of financial development and the GDP per capita. We find that all of them significantly correlate with higher levels of GDP per capita. However, it is the higher index of domestic credit provided by the financial system that positively affects the evolution of GDP to a greater degree. Additionally, application of a quadratic model permits verifying the non-linear relationship between the rate of GDP per capita and Financial Development Variables. Thus, we find, on the one hand, *FDV* have a significant positive linear impact on promoting economic growth in a proportional way and on the other hand, the effect of non-linear estimators has a

negative impact on economic growth.

Therefore, we can conclude that Schumpeter may be right in theorizing that finance promotes economic growth. In fact, our empirical results are consistent with Goldsmith (1969), King and Levine (1993), Beck et al. (2000), Christopoulos and Tsionas 2004, Beck et al. (2007), who also provide empirical evidence to this effect. Thus, in political terms, it is worth pointing out that policy makers should implement adequate measures to foster the development of countries' financial systems.

Likewise, the results of the regression analysis show that if one wants to have economic growth sustained and stimulated by the financial development of countries, anti-inflationary measures must also be implemented, along with effective labour market policies to reduce the high rates of unemployment registered in some countries, and to stimulate educational spending, all of which in the long term make way for higher economic growth.

Our findings provide new insight into the effects of the indicators of financial development on economic growth at the OECD countries level. These findings could be complemented by specific country studies in order to reveal configurations of particular measures of relevance for stimulating convergence in terms of economic growth across OECD countries, notably during economic crises. Indeed, we have confirmed that in the two samples analysed, EU and OECD countries, the global economic and financial crisis negatively impinged on the evolution of per capita GDP.

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APPENDIX 1. VARIABLES AND SOURCES

<i>VARIABLES</i>	<i>ACRONYM</i>	<i>DEFINITION</i>
Dependent variable		
GDP per capita	GDP	Real GDP per capita in constant 2011 international US dollars, adjusted for differences across countries at purchasing power parity (PPP).
Financial development variables (FDV)		
Domestic credit provided by the financial sector (% GDP)	Domestic credit	All credit to various sectors on a gross basis, with the exception of credit to the central government, which is net. The financial sector includes monetary authorities and deposit money banks, as well as other financial corporations where data are available (including corporations that do not accept transferable deposits but do incur such liabilities such as time and savings deposits). Examples of other financial corporations are finance and leasing companies, money lenders, insurance corporations, pension funds, and foreign exchange companies.
Market capitalization of listed domestic companies (% GDP)	Market capitalization	The share price times the number of shares outstanding (including their several classes) for listed domestic companies. Investment funds, unit trusts, and companies whose only business goal is to hold shares of other listed companies are excluded. Data are end of year values.
Stocks traded, turnover ratio of domestic shares (%)	Turnover ratio	The value of domestic shares traded divided by their market capitalization. The value is annualized by multiplying the monthly average by 12.
Proxies variables		
Inflation rate	Inflation rate	Inflation as measured by the annual growth rate of the GDP implicit deflator showing the rate of price change in the economy as a whole.
Unemployment rate	Unemployment rate	The share of the labour force that is without work but available for and seeking employment.
Government expenditure on education (% of government expenditure)	Government expenditure	General government expenditure on education (current, capital, and transfers) expressed as a percentage of government expenditure. It includes expenditure funded by transfers from international sources to government. General government usually refers to local, regional and central governments.

Source: World Development Indicators (World Bank, 2018)

Table 1A. Regression results: Random effects model for OECD countries (1990-2016).

<i>Explanatory-variables</i>	Model 1	Model 2	Model 3	Model 1'	Model 2'	Model 3'
<i>FDV</i>						
<i>GDP initial value</i>	0.825*** [0.079]	0.825*** [0.079]	0.831*** [0.073]	0.799*** [0.076]	0.794*** [0.077]	0.800*** [0.069]
L.Domestic credit	0.076*** [0.005]	0.076*** [0.005]	0.076*** [0.005]	0.161*** [0.014]	0.164*** [0.015]	0.167*** [0.016]
L.Domestic credit* L.Domestic credit				-0.000*** [0.000]	-0.000*** [0.000]	-0.000*** [0.000]
Market capitalization	0.033*** [0.005]	0.033*** [0.005]	0.030*** [0.005]	0.051*** [0.011]	0.050*** [0.011]	0.043*** [0.012]
Market capitalization*Market capitalization				-0.000** [0.000]	-0.000* [0.000]	-0.000 [0.000]
Turnover ratio	0.011*** [0.003]	0.011*** [0.003]	0.010*** [0.004]	0.027*** [0.007]	0.028*** [0.007]	0.028*** [0.008]
Turnover ratio*Turnover ratio				-0.000** [0.000]	-0.000** [0.000]	-0.000** [0.000]
<i>Control variables</i>						
<i>Inflation rate</i>	-0.061** [0.030]	-0.061** [0.030]	-0.065** [0.031]	-0.051* [0.028]	-0.052* [0.028]	-0.056* [0.029]
<i>Unemployment rate</i>	-0.588*** [0.051]	-0.588*** [0.051]	-0.578*** [0.052]	-0.450*** [0.052]	-0.449*** [0.051]	-0.446*** [0.053]
<i>Government education</i>	0.454*** [0.095]	0.455*** [0.096]	0.415*** [0.097]	0.355*** [0.090]	0.348*** [0.091]	0.309*** [0.093]
<i>crisis</i>		0.034 [0.319]	0.261 [0.823]		-0.275 [0.301]	-1.042 [0.802]
<i>Domestic*crisis</i>			-0.007 [0.006]			0.004 [0.005]
<i>Market*crisis</i>			0.015** [0.007]			0.011* [0.007]
<i>Turnover*crisis</i>			-0.003 [0.007]			-0.008 [0.007]
Constant	0.526 [2.688]	0.506 [2.698]	1.067 [2.558]	-4.854* [2.671]	-4.890* [2.694]	-4.271* [2.528]
<i>Observations</i>	363	363	363	363	363	363
<i>Number of groups</i>	30	30	30	30	30	30

Sources: World Development Indicators (World Bank, 2018)
Standard deviations in brackets. *** p<0.01, ** p<0.05, * p<0.1

Table 1B. Regression results: Random effects model for EU countries (1990-2016).

<i>Explanatory-variables</i>	Model 1	Model 2	Model 3	Model 1'	Model 2'	Model 3'
FDV						
<i>GDP initial value</i>	0.777*** [0.094]	0.780*** [0.097]	0.780*** [0.092]	0.779*** [0.071]	0.787*** [0.069]	0.805*** [0.065]
L.Domestic credit	0.073*** [0.007]	0.071*** [0.007]	0.074*** [0.007]	0.155*** [0.031]	0.144*** [0.032]	0.126*** [0.036]
L.Domestic credit* L.Domestic credit				-0.000*** [0.000]	-0.000** [0.000]	-0.000* [0.000]
Market capitalization	0.042*** [0.006]	0.043*** [0.006]	0.041*** [0.006]	0.063*** [0.018]	0.062*** [0.018]	0.048** [0.020]
Market capitalization*Market capitalization				-0.000* [0.000]	-0.000* [0.000]	-0.000 [0.000]
Turnover ratio	0.009** [0.004]	0.009** [0.004]	0.008* [0.004]	0.002 [0.011]	-0.002 [0.011]	-0.008 [0.012]
Turnover ratio*Turnover ratio				0.000 [0.000]	0.000 [0.000]	0.000 [0.000]
Control variables						
<i>Inflation rate</i>	0.110 [0.082]	0.120 [0.082]	0.107 [0.082]	0.082 [0.091]	0.093 [0.095]	0.098 [0.103]
<i>Unemployment rate</i>	-0.479*** [0.069]	-0.469*** [0.069]	-0.467*** [0.070]	-0.345*** [0.090]	-0.356*** [0.092]	- 0.384*** [0.098]
<i>Government education</i>	1.003*** [0.227]	1.062*** [0.231]	0.991*** [0.229]	0.577** [0.231]	0.536** [0.234]	0.406* [0.235]
<i>crisis</i>		0.396 [0.433]	1.572 [1.263]		0.275 [0.506]	1.424 [1.620]
<i>Domestic*crisis</i>			-0.015* [0.008]			-0.009 [0.011]
<i>Market*crisis</i>			0.025*** [0.009]			0.020* [0.012]
<i>Turnover*crisis</i>			-0.007 [0.010]			-0.013 [0.012]
Constant	-3.502 [3.805]	-4.282 [3.904]	-3.560 [3.778]	-4.598 [3.885]	-3.308 [3.893]	-0.028 [3.949]
<i>Observations</i>	226	226	226	226	226	226
<i>Number of groups</i>	21	21	21	21	21	21

Sources: World Development Indicators (World Bank, 2018)
Standard deviations in brackets. *** p<0.01, ** p<0.05, * p<0.1

Table 2A. Regression results. Dynamic model for OECD countries (1990-2016).

<i>Explanatory-variables</i>	Model 1	Model 2	Model 3	Model 1'	Model 2'	Model 3'
<i>FDV</i>						
<i>L.GDP</i>	0.872*** [0.025]	0.870*** [0.024]	0.868*** [0.025]	0.826*** [0.029]	0.810*** [0.029]	0.804*** [0.030]
<i>GDP initial value</i>	0.123*** [0.034]	0.125*** [0.033]	0.129*** [0.034]	0.107*** [0.035]	0.100*** [0.034]	0.101*** [0.034]
Domestic credit	-0.002 [0.003]	0.000 [0.003]	-0.001 [0.003]	0.021** [0.010]	0.032*** [0.010]	0.033*** [0.010]
Domestic credit*Domestic credit				-0.000** [0.000]	-0.000*** [0.000]	-0.000*** [0.000]
Market capitalization	0.011*** [0.002]	0.011*** [0.002]	0.012*** [0.002]	0.018*** [0.004]	0.018*** [0.004]	0.021*** [0.004]
Market capitalization*Market capitalization				-0.000** [0.000]	-0.000** [0.000]	-0.000** [0.000]
Turnover ratio	0.002** [0.001]	0.002** [0.001]	0.003** [0.001]	0.004 [0.003]	0.004 [0.003]	0.005* [0.003]
Turnover ratio*Turnover ratio				-0.000 [0.000]	-0.000 [0.000]	-0.000 [0.000]
<i>Control variables</i>						
<i>Inflation rate</i>	-0.015 [0.012]	-0.019 [0.012]	-0.019 [0.012]	-0.014 [0.012]	-0.017 [0.012]	-0.017 [0.012]
<i>Unemployment rate</i>	-0.056*** [0.020]	-0.056*** [0.020]	-0.061*** [0.020]	-0.056*** [0.020]	-0.055*** [0.020]	-0.062*** [0.020]
<i>Government education</i>	0.102** [0.050]	0.088* [0.049]	0.088* [0.049]	0.109** [0.050]	0.100** [0.048]	0.101** [0.048]
<i>crisis</i>		-0.351*** [0.097]	-0.500** [0.248]		-0.429*** [0.099]	-0.612** [0.246]
<i>Domestic*crisis</i>			0.002 [0.002]			0.003* [0.002]
<i>Market*crisis</i>			-0.002 [0.002]			-0.002 [0.002]
<i>Turnover*crisis</i>			0.000 [0.002]			-0.001 [0.002]
<i>Observations</i>	323	323	308	323	323	308
<i>Number of groups</i>	29	29	29	29	29	29

Sources: World Development Indicators (World Bank, 2018)
Standard deviations in brackets. *** p<0.01, ** p<0.05, * p<0.1

Table 2B. Regression results. Dynamic model for EU countries (1990-2016).

<i>Explanatory-variables</i>	Model 1	Model 2	Model 3	Model 1'	Model 2'	Model 3'
<i>FDV</i>						
<i>L.GDP</i>	0.884*** [0.026]	0.887*** [0.025]	0.878*** [0.027]	0.839*** [0.030]	0.839*** [0.030]	0.821*** [0.031]
<i>GDP initial value</i>	0.054 [0.041]	0.067* [0.041]	0.089** [0.041]	0.035 [0.043]	0.046 [0.042]	0.047 [0.042]
Domestic credit	-0.002 [0.003]	-0.000 [0.003]	-0.001 [0.003]	0.020* [0.012]	0.024** [0.012]	0.035*** [0.013]
Domestic credit*Domestic credit				-0.000* [0.000]	-0.000* [0.000]	-0.000*** [0.000]
Market capitalization	0.015*** [0.003]	0.014*** [0.003]	0.015*** [0.003]	0.022*** [0.006]	0.021*** [0.005]	0.023*** [0.006]
Market capitalization*Market capitalization				-0.000 [0.000]	-0.000 [0.000]	-0.000* [0.000]
Turnover ratio	0.002 [0.001]	0.002 [0.001]	0.002 [0.001]	0.003 [0.003]	0.003 [0.003]	0.003 [0.003]
Turnover ratio*Turnover ratio				-0.000 [0.000]	-0.000 [0.000]	-0.000 [0.000]
<i>Control variables</i>						
<i>Inflation rate</i>	0.044 [0.027]	0.039 [0.026]	0.050* [0.028]	0.050* [0.027]	0.044* [0.027]	0.061** [0.027]
<i>Unemployment rate</i>	-0.022 [0.023]	-0.027 [0.023]	-0.033 [0.023]	-0.013 [0.024]	-0.017 [0.023]	-0.017 [0.023]
<i>Government education</i>	0.209** [0.089]	0.163* [0.091]	0.143 [0.094]	0.235*** [0.091]	0.189** [0.091]	0.170* [0.093]
<i>crisis</i>		-0.288** [0.139]	-0.651 [0.403]		-0.315** [0.139]	-0.977** [0.415]
<i>Domestic*crisis</i>			0.003 [0.003]			0.006** [0.003]
<i>Market*crisis</i>			-0.001 [0.003]			-0.002 [0.003]
<i>Turnover*crisis</i>			-0.000 [0.003]			-0.002 [0.003]
<i>Observations</i>	212	212	197	212	212	197
<i>Number of groups</i>	20	20	20	20	20	20

Sources: World Development Indicators (World Bank, 2018)
Standard deviations in brackets. *** p<0.01, ** p<0.05, * p<0.1