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Financial development, financial stability and economic growth in European Union: a panel data approach

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Abstract

The relationship between the financial development, financial stability and economic growth constitutes a field of academic research in recent years. For this purpose, dynamic panel data techniques are applied for the investigation of the impact of financial development and stability on economic growth. The empirical analysis is based on a sample of 28 countries of the European Union over the period 2004 – 2014. The results indicate that the development of banking system has a negative impact on economic growth. Therefore, the allocation of private credit is inefficient and does not improve the economic growth. Moreover, the results for the impact of financial markets development are mixed. Specifically, the size of the stock markets has a positive effect on economic growth, whereas the market liquidity negatively influences the economic growth. In addition, financial instability has a negative impact on economic growth. The rates of non-performing loans have increased in affected by financial crisis European Union countries and constitute a detrimental factor for economic growth. Finally, factors such as investment and trade openness play a significant role and promote the economic growth. However, inflation and government expenditure have a negative relationship with economic growth.

JEL classification numbers: O10
Keywords: panel data, economic growth, financial development, financial stability, GMM estimator.

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1. Introduction

The relationship between finance and economic growth constitutes a field of academic research in the last decades. There are contradictory views concerning the role of financial systems in economic growth. The first view originated from Schumpeter (1912) who insisted that a well-functioning financial system can contribute to the economic growth, through the financing of innovation. The alternative view expressed by Robinson (1952) who suggested that financial development appears to respond passively to economic growth. As a third view, Lucas (1988) proposed the relationship between financial development and economic growth is "over-stressed".

In accordance to Čihák et al. (2010), several measures for the features of financial institutions and markets are provided in order to quantify the financial development. The four characteristics of the financial system are the depth, the access, the efficiency, and the stability. In fact, the most studies of the literature have focused on the financial depth. In other words, proxies for the size of financial institutions and markets are utilized and the empirical evidence from different econometrics or statistics techniques mainly demonstrates the existence of a positive relationship between financial development and economic growth (King and Levine, 1993a,b; Levine and Zervos, 1998; Beck et al., 2000; Rioja and Valev, 2004; etc). However, the recent economic and financial crisis has emerged that the financial stability[3] is an important factor for the efficient economic activity and the economic growth.

The purpose of this study is to investigate the relationship between the financial development, financial stability and economic growth.This study contributes to the literature in several respects. First, the 28 countries of European Union over the period 2004 – 2014 are chosen to carry out the empirical analysis. Second, in order to assess the relationship between finance and growth, both indicators of the depth and stability of the banking system and stock markets are taken into consideration.

The rest of the paper is organized as follows. In Section 2, we discuss the relatively recent literature on finance and economic growth. Section 3 introduces the methodology,as well as the econometric specification and discusses the data sources, definitions of the variables used in empirical analysis. Empirical results are presented in Section 4. Some concluding remarks are presented in Section 5.

[3]Schinasi (2004) defines financial stability as the capacity of financial system to facilitate the performance of an economy, and to dissipate financial imbalances that arise endogenously or as a result of significant adverse and unanticipated events.

2. Literature Review

In literature, there is a large amount of empirical studies which examine the relationship between financial development and economic growth applying several econometric methods. The pioneering empirical study about financial development and economic growth appears with Goldsmith (1969). He attempts to assess whether finance, both banks and stock markets operating in an economy, exerts a causal impact on economic growth. Using data for 35 developed and developing countries during the period 1860-1963, the results indicate a positive correlation between financial development and economic growth. King and Levine (1993a,b) examine the relationship between financial development and growth using cross-country data for 80 countries between 1960–1989 and constructing four measures [4] of financial development. They show that the financial indicators are positively and significantly correlated with economic growth and its sources. Levine and Zervos (1998) develop a number of measures of the stock market developmentto assess the relationship between the development of stock markets and economic growth for a sample of 42 countries over the period 1976–1993 using cross-sectional regressions. They find that the stock markets liquidity and the banking development are positively and significantly related to the economic growth, productivity growth and capital accumulation.

On the other hand, studies utilize panel data techniques in order to capture the dynamic relationships for the finance and growth nexus[5]. Most of panel data studies result in that financial development has a positive effect on economic growth. Beck et al. (2000) evaluate the relationship between financial development and the sources of economic growth using data for 77 countries over the period 1960–1995. The results show asignificant relationship between financial development and both real per capita GDP growth and productivity growth, however, an ambiguous relationship between financial development and both physical capital growth and private savings rates. Beck and Levine (2004) investigate the impact of stock markets and banks on economic growth using a panel data set of 40 countries for the period 1976–1998. The results indicate that both stock markets and banks have a positive influence on economic growth and these findings are not due to potential biases induced by simultaneity, omitted variables or unobserved country-specific effects.

[4]These variables are the ratio of liquid liabilities to GDP, the ratio of deposit money bank domestic assets to deposit money bank domestic assets plus central bank domestic assets, the credit issued to nonfinancial private firms divided by total credit (excluding credit to banks) and the credit issued to nonfinancial private firms divided by GDP.

[5]Combining the benefits of cross-country analysis and time series, the literature moved to dynamic panel estimation techniques.

Rioja and Valev (2004a) examine the impact of financial development on growth and the sources of growth in a sample of 74 countries grouping them according to their income per capita. The results show that the effect of financial development on economic growth in low-income countries is negative but insignificant on growth, while for the medium- and high-income countries the correlations are positive, with the largest effect occurring in the high-income group. Rioja and Valev (2004b) divide countries based on the level of financial development. For the region with low levels of financial development, the results show an uncertain effect on growth. In contrast, financial development has a large, positive effect on growth in the region with medium financial development and in the high region, the effect is also positive, but smaller. Rioja and Valev (2012) examine the impact of stock markets and banks on the sources of economic growth using data for 62 countries, which include high- and low-income countries, for the period 1980–2009. The results show that, in low income countries, banks have a positive effect on capital accumulation, but, stock markets do not contribute to capital accumulation or productivity growth. Conversely, in high-income countries, stock markets are found to have positive effects on both productivity and capital growth, while banks only affect capital accumulation.Naceur and Ghazouani (2007) utilize data for the 11 MENA countries over the period 1979–2003 in order to examine the relationship between stock markets, banks and economic growth. The results show that there is no significant relationship since the financial development is unimportant or even harmful for economic growth in the MENA region. Saci et al. (2009) focus exclusively on annual data for 30 developing countries and use as proxies for financial development, variables which capture both banking sector and stock market effects. The resultsprovide evidence that the stock market variables are positively and significantly related to growth, however, the banking sector variables, credit to the private sector and liquid liabilities, have negative effects on growth. Kim et al. (2014) analyze the effect of financial and stock market development on economic growth considering the different levels of the development for 94 countries during the period 1976-2005. The results show that for high-income countries, the financial and stock market development has a negative relationship with the economic growth.

More recently, in many studies, it has been proposed that the relationship between finance and growth is a non-linear and specifically an inverted U-shape, where there is a turning point in the effect of financial development. Cecchetti and Kharroubi (2012) find that the turning point of banking development measured by private credit is close to 90% of GDP. Arcand et al. (2012) also highlight that for high-income countries the finance–growth relationship turns negative, when credit to the private sector reaches 100% of GDP. Law and Singh (2014) use data for 87 developed and developing countries during the period 1980-2010 and suggest that there is a finance threshold about 88% of GDP in the finance–growth nexus. For financial development below the threshold, finance will exert a positive effect on

economic growth otherwise, if the financial development exceeds the threshold, the impact of finance on growth will turn negative.

The literature suggests that the stability of the financial system is crucial in economic growth. Kindleberger (1978) and Minsky (1991) suggest that the financial instability indicates a negative influence on economic growth. Kindleberger argues that investment falls due to the loss of confidence and trust in institutions. According to Minsky's (1991) "financial instability hypothesis", economic growth encourages the adoption of a riskier behavior of the financial institutions and speculative economic activities. Such an overleveraged situation provides congenial conditions for a crisis caused by firms default events on their loan repayments due to higher financial costs. Consequently, higher financial costs and lower income can both lead to higher delinquency rates and hence to the economic recession. Manu et al. (2011) examine the relationship between financial stability and economic growth in a sample of 29 countries, covering the period 1996–2006 and the results reveal that financial stability impacts positively on economic growth.

3. Empirical Analysis

3.1. Econometric Model

The empirical model is based on a growth equation developed by Barro (2003), to examine the relationship between financial development, financial stability and economic growth. The model takes the following form:

$$\begin{aligned} \boldsymbol{GDPG_{it}} = \boldsymbol{\alpha_i} + \boldsymbol{\beta_0 GDPG_{it-1}} + \boldsymbol{\beta_1 PRIV_{it}} + \boldsymbol{\beta_2 LLY_{it}} + \boldsymbol{\beta_3 CCB_{it}} + \boldsymbol{\beta_4 MCAP_{it}} \\ + \boldsymbol{\beta_5 VTR_{it}} + \boldsymbol{\beta_6 TOR_{it}} + \boldsymbol{\beta_7 NPL_{it}} + \boldsymbol{\beta_8 SPOL_{it}} + \boldsymbol{\beta_9 INV_{it}} \\ + \boldsymbol{\beta_{10} INF_{it}} + \boldsymbol{\beta_{11} TOP_{it}} + \boldsymbol{\beta_{12} GEXP_{it}} + \boldsymbol{\beta_{13} HC_{it}} + \boldsymbol{\eta_i} + \boldsymbol{\varepsilon_{it}} \end{aligned}$$

where $GDPG$ is the growth rate of GDP per capita, $GDPG_{it-1}$ is the lag of economic growth, $PRIV$ is the log of private credit, LLY is the log of liquid liabilities, CCB is the log of bank assets, $MCAP$ is the log of market capitalization, VTR is the log of value traded, TOR is the log of turnover ratio, NPL is the log of non-performing loans, $SPOL$ is the log of stock market volatility, INV is the log of investment, INF is the log of inflation, TOP is the log of trade openness, $GEXP$ is the log of government expenditure, HC is the log of human capital, *i*denotes the different European Union countries in the sample, *t* denotes the time period, α is a constant, β is a scalar vector of coefficients, η is an unobserved country-specific effect and ε represents the error term.

3.2. Data and Variables

This study employs annual panel data for the 28[6] countries of the European Union covering the period 2004-2014. The data were obtained from the databases of World Bank. Specifically, the data for the financial depth and stability were obtained from the Global Financial Development Database and the data for the control variables were obtained from the World Development Indicators, except the data of human capital which were obtained from the Penn World Tables.

Since it does not exist a direct measure for the financial development, the explanatory variables for finance are not only associated with the two components of financial system, the financial institutions and the stock markets, but also with the two financial characteristics, the depth and the stability. The most common used indicators in the literature are chosen to ease the comparison of the results. Thus, following Beck et al. (2000) and Levine and Zervos (1998), three measures of banking development and three measures of stock markets development and activity are used and the financial instability is captured by a set of two variables[7]. Particularly, the measures of financial development are the following indicators:

- *private credit* is defined as the credit provided by all financial intermediaries, excluding central banks, to the private sector as a percent of GDP.
- *liquid liabilities* which are equal the money and quasi money (M2) as a percent of GDP and measure the size of the banking system relative to the economy.
- *bank assets* which are equal the ratio of deposit money bank assets divided by deposit money bank assets and central bank assets and measures the degree to which commercial banks or the central bank allocate society's savings.
- *market capitalization* is the total value of all shares in the stock market as a percent of GDP and measures the size of the stock market.
- *value traded* is the value of all shares traded in the stock market as a percent of GDP and measures the liquidity and activity of the stock market as a share of the economy.
- *turnoverratio* expressed by the value of the traded shares in the domestic stock market divided by the total value of shares in the market, measures how active or liquid the stock market is relative to its size.

[6]Specifically, the countries of the sample are Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, United Kingdom.

[7]Due to the difficulty to measure the financial stability, two indicators for financial instability are included as explanatory variables.

- *ratio of non-performing loans to gross loans* is relevant as a warning signal for systemic banking solvency (Cihak and Schaeck, 2010) and measures the asset quality in the loan portfolio. An increase in this ratio signals deterioration in the financial sector's credit portfolio and therefore in the financial institutions' payment flows, net revenue and solvency (Dyrberg, 2001). This could undermine the intermediation process, decrease investments and subsequently retard growth. Hence, this ratio is expected to have a negative relationship with the dependent variable.
- *stock market volatility* is defined as the average of the 360-day volatility of the national stock market index. Excessive volatility in stock prices may be detrimental because it hampers the orderly functioning of the financial system and negatively influences the economic growth. Volatility on the stock market is harmful to the economy in a number of ways. The fall in stock prices reduces consumer spending. Moreover, for investors, volatility is an indicator of uncertainty. In times of high stock price fluctuations, liquidity or credit problems may arise, leading investors to lower risk investments (Becketti and Sellon, 1989).

Economic growth is the dependent variable and is measured by the growth rate of GDP per capita as an annual percentage. To assess the relationship between finance and economic growth, other potential determinants of economic growth are included in regressions as control variables. First, the *lagged growth rate* of GDP per capita[8] is included to control for convergence[9]. Furthermore, two indicators for both physical and human capital are used. *Investment* as a measure of physical capital is defined as the gross capital formation as a percent of GDP and constitutes a key factor for the economic growth with a positive effect. *Human capital* is measured by an index based on the average years of schooling from Barro and Lee (2013) and the returns of education, and is positively related to economic growth, since the higher the educational level of the population, the faster the economic growth. For the policy conditioning set, *inflation* is chosen as the main indicator of a country's fiscal and monetary policies, shows the stability of the price level and is expected to have a negative impact on economic growth. Additionally, *trade openness*, calculated as the sum of exports and imports of goods and services as a percent of GDP, is positively related to growth[10]. But the richer an economy is, the less this effect is, which may end up being even negative. Finally, *government expenditure* is vital to the assessment of fiscal policy on the provision of public goods for both individuals and businesses,

[8]The *lagged growth rate* of GDP per capita is the lag of the dependent variable which is the growth rate of GDP per capita in constant US dollars.

[9]When the convergence is confirmed, a country with a relatively lower level of initial per-capita GDP will grow faster, since it is much farther away from its steady state and must catch up.

[10]Economies that are more open to international trade can grow more rapidly by expanding their markets and becoming more efficient.

particularly in education, healthcare and infrastructure. However, government expenditures result in reducing growth when they do not directly affect productivity and entail distortions on private decisions.Descriptive statistics for the above variables are provided in Table 1 and Table 2presents the correlations between thevariables.

Table 1: Descriptive Statistics of Variables

Variables	**Mean**	**St. Dev.**	**Min**	**Max**	**Obs.**
Growthrate	1.538532	4.07178	-14.55984	12.92044	308
PrivateCredit	4.397534	0.5212049	2.58298	5.56636	306
LiquidLiabilities	4.360113	0.4722041	3.46275	6.23735	306
Bank Assets	4.593131	0.0211082	4.438256	4.60517	285
Market Capitalization	3.638916	0.8302021	1.316067	5.521282	284
ValueTraded	2.181404	1.950502	-3.588926	5.208853	292
TurnoverRatio	3.127375	1.722424	-3.605734	5.832575	284
Non-performingLoans	1.19658	1.198846	-2.501036	3.806042	300
Stock Market Volatility	2.972681	0.4023641	2.10045	4.116339	307
Investment	3.113325	0.2123043	2.440573	3.729316	305
Inflation	1.126838	0.6674756	-2.921857	2.799141	303
Trade Openness	4.624866	0.4412366	3.820108	5.924651	305
Government Expenditure	2.984536	0.1379083	2.633018	3.334496	305
Human Capital	1.150133	0.0984918	0.8021967	1.317556	308

Notes: N=28 countries of European Union and T=2004-2014

Table 2: Correlations

	Growthrate	PrivateCredit	LiquidLiabilities	Bank Assets	Market Capitalization	ValueTraded	TurnoverRatio	Non performingLoans	Stock Market Volatility	Investment	Inflation	Trade Openness	Government Expenditure	Human Capital
Growthrate	1.0000													
PrivateCredit	-0.5265	1.0000												
LiquidLiabilities	-0.4046	0.5506	1.0000											
Bank Assets	0.0245	-0.0095	-0.0545	1.0000										
Market Capitalization	-0.0316	0.3882	0.5323	0.0732	1.0000									
ValueTraded	-0.2239	0.4227	0.1784	-0.0271	0.5410	1.0000								
TurnoverRatio	-0.1886	0.2718	-0.0721	-0.0797	0.1483	0.8973	1.0000							
Non-performingLoans	-0.2849	-0.0386	-0.1022	-0.2984	-0.4595	-0.2238	-0.0565	1.0000						
Stock Market Volatility	-0.5008	0.1602	0.0435	-0.0508	-0.2202	0.0470	0.0903	0.3008	1.0000					
Investment	0.5267	-0.4587	-0.4303	0.1494	-0.0812	-0.1088	-0.0823	-0.4340	-0.2134	1.0000				
Inflation	0.3399	-0.3093	-0.2582	0.0493	-0.1284	-0.1866	-0.1470	-0.1747	-0.1825	0.4769	1.0000			
Trade Openness	0.1687	-0.2127	0.1420	0.1672	-0.1237	-0.5648	-0.6061	-0.1150	-0.1275	0.0756	0.0960	1.0000		
Government Expenditure	-0.3370	0.3079	0.0778	0.0092	0.3240	0.5574	0.4855	-0.0848	0.0916	-0.2909	-0.2430	-0.1733	1.0000	
Human Capital	0.0884	-0.2451	-0.1278	0.2617	-0.0335	-0.0510	-0.0527	-0.1392	0.0364	0.0428	0.0740	0.2733	0.0983	1.0000

Notes: Correlations between the growth rate of real GDP per capita and financial system's indicators.

3.3 Methodology

The relationship between the financial development, financial stability and economic growth is evaluated using the dynamic panel data techniques by applying the generalized method of moments (GMM) estimator as proposed by Arellano and Bond (1991) based on Holtz-Eakin et al. (1988). The Arellano and Bond estimator is based on a set of instrumental variables that utilize the orthogonality conditions which may exist between the lagged values and the error term.

In this framework, the regression has the following dynamic specification:

$$y_{i,t} = \alpha y_{i,t-1} + \beta X_{i,t} + \eta_i + \varepsilon_{i,t} \quad (1)$$

where $y_{i,t}$ is the dependent variable, $y_{i,t-1}$ is the lagged dependent variable, $X_{i,t}$ is the set of explanatory variables, η is an unobserved country-specific effect, ε is the error term and the subscripts $i$and t represent the country and the time period, respectively.

First, the problem of correlation between the lagged dependent variable and the country-specific effect has to be dealt with, in order to obtain consistent estimates. The most common approach is first differencing the equation to remove the country-specific effects.

$$(y_{i,t} - y_{i,t-1}) - (y_{i,t-1} - y_{i,t-2}) = \alpha(y_{i,t-1} - y_{i,t-2}) + \beta(X_{i,t} - X_{i,t-1}) + (\varepsilon_{i,t} - \varepsilon_{i,t-1}) \quad (2)$$

While differencing eliminates the country-specific effect, a new bias by construction is introduced, since the new error term $(\varepsilon_{i,t} - \varepsilon_{i,t-1})$ is correlated with the lagged dependent variable$(y_{i,t-1} - y_{i,t-2})$. Under the assumptions that the error term, ε, is not serially correlated, and the explanatory variables, X, are weakly exogenous, Arellano and Bond proposed the following moment conditions.

$$E[y_{i,t-s}(\varepsilon_{i,t} - \varepsilon_{i,t-1})] = 0 \; for s \geq 2; \; t = 3, \dots, T \quad (3)$$
$$E[X_{i,t-s}(\varepsilon_{i,t} - \varepsilon_{i,t-1})] = 0 \; for s \geq 2; \; t = 3, \dots, T \quad (4)$$

Using these moment conditions, Arellano and Bond (1991) propose a two-step GMM estimator. In the first step the error terms are assumed to be independent and homoscedastic across countries and over time. In the second step, the residuals obtained in the first step are used to construct a consistent estimate of the variance–covariance matrix, thus relaxing the assumptions of independence and homoscedasticity. Thus, the two-step estimator is asymptotically more efficient relative to the first-step estimator.

The consistency of the GMM estimator depends on the validity of the assumption that the error terms are not serially correlated and the validity of the instruments. Arellano and Bond (1991) construct a test in order to validate no second-order serial correlation for the error terms of the first-differenced equation. When the null hypothesis of this test (no serial correlation) is not rejected, validation of the orthogonality conditions and instrumental variables is obtained. A Sargan specification test is also conducted which is a test of over-identifying restrictions and is asymptotically distributed as χ^2 with *p–k* degrees of freedom. The Sargan test is used to verify independence between the instruments and the error term. The null hypothesis in this case is that the instruments and the error term are independent. Thus, a failure to reject the null hypothesis for the test would be clear evidence in favor of the fact that the instruments

are indeed valid. Therefore, failure to reject the null hypothesis for both tests implies robustness of the model.

4. Results

The results of estimations for the relationship between financial development and stability and economic growth are provided in Table 3. The p-values are presented in column 2 of the Table 3 and calculated based on the two-step estimator of the first difference GMM estimator (Arellano and Bond, 1991). Table 3, also, illustrates the results of test for serial correlation and the Sargan test. The null hypothesis of the Sargan test is that the instruments are not correlated with the residuals. The null hypothesis of the test for autocorrelation is that the errors in the first-difference regression exhibit no second-order serial correlation. The null-hypothesis of both tests is not rejected, therefore the estimations are robust and consistent.

Table 3: Finance and Growth: Dynamic Panel Regression, first difference estimator (initial model)

Explanatory Variables	**C**oefficient	p-value
Lag of Economic Growth	-0.3485698	(0.000)
PrivateCredit	-8.442961	(0.004)
LiquidLiabilities	0.280163	(0.919)
Bank Assets	-70.25784	(0.202)
Market Capitalization	2.493603	(0.001)
ValueTraded	-2.082224	(0.033)
TurnoverRatio	0.4811267	(0.321)
Non-performingLoans	-1.187722	(0.000)
Stock Market Volatility	-0.01966541	(0.785)
Investment	15.33157	(0.000)
Inflation	-0.4164984	(0.008)
Trade Openness	12.02941	(0.000)
Government Expenditure	-17.62679	(0.008)
Human Capital	5.850979	(0.874)
constant	302.4932	(0.238)
Sargan test (p-value)	(0.5982)	
Autocorrelation test AR(1) (p-value)	(0.1246)	
Autocorrelation test AR(2) (p-value)	(0.5839)	
Wald test (p-value)	(0.0000)	
Number of observations	171	

Notes: Dependent variable: growth rate of real per capita GDP. All explanatory variables are transformed as ln(variable), except inflation as ln(1 + variable).

In Table 3, the initial model includes all the variables concerning the financial development, stability and the control variables which are both statistically and no statistically significant. Afterthat, a stepwise procedure is applied to conclude to the set of explanatory variables that are statistically significant. The estimations are presented in Table 4. As a result of this procedure, the coefficients of the variables Liquid Liabilities, Bank Assets, Turnover Ratio, Stock Market Volatility and Human

Capital are not statistically significant and these factors do not contribute to economic growth.

Table 4: Finance and Growth: Dynamic Panel Regression, first difference estimator

Explanatory Variables	Coefficient	p-value
Lag of Economic Growth	-0.3552403	(0.000)
PrivateCredit	-11.18761	(0.000)
Market Capitalization	1.918269	(0.001)
ValueTraded	-1.864357	(0.000)
Non-performingLoans	-1.382914	(0.000)
Investment	14.45876	(0.000)
Inflation	-0.4172245	(0.000)
Trade Openness	11.56019	(0.000)
Government Expenditure	-19.01998	(0.000)
constant	10.97359	(0.640)
Sargan test (p-value)	(0.5244)	
Autocorrelation test AR(1) (p-value)	(0.1246)	
Autocorrelation test AR(2) (p-value)	(0.4229)	
Wald test (p-value)	(0.0000)	
Number of observations	184	

Notes: Dependent variable: growth rate of real per capita GDP. All explanatory variables are transformed as ln(variable), except inflation as ln(1 + variable).

The Table 4 shows the results of financial development and financial stability on economic growth. The coefficient of private credit is statistically significant at 1 percent significance level and negatively associated with economic growth. The coefficient indicates that a 1 percent increase in private credit leads to an 11.18 percent decrease in economic growth. The coefficient of market capitalization is statistically significant at 1 percent significance level and has a positive impact on economic growth. In other words, a 1 percent increase in market capitalization leads to a 1.91percent increase in economic growth. In contrast, the coefficient of value traded is statistically significant at 1 percent significance level and has a negative influence on economic growth. This means that a 1 percent increase in value traded leads to a 1.86 percent decrease in economic growth. The coefficient of non-performing loans is statistically significant at 1 percent significance level and has a negative impact on economic growth. The coefficient indicates that a 1 percent increase in non-performing loans leads to a 1.38 percent decrease in economic growth.

For control variables, the coefficients of investment and trade openness are statistically significant at 1 percent significance level and have a positive impact on economic growth. Hence, a 1 percent increase in these variables leads to a 14.45 and an 11.56 percent, respectively, increase in economic growth. The coefficients of inflation and government expenditure are statistically significant at 1 percent significance level and negatively influence the economic growth. These results indicate that a 1 percent increase in these variables leads to a 0.41 and a 19.01 percent, respectively, decrease in economic growth. Finally, the estimated coefficient of initial GDP has a significantly negative impact on growth, which implies that poorer countries are catching up richer countries by displaying higher growth rates.

The empirical findings show that the development of banking sector measured by the private credit has a negative impact on economic growth. A possible explanation is the poor and inefficient private credit allocation to projects that are not beneficial for the economic activity and do not improve the economic growth. The stock market liquidity has also a negative effect on economic growth. This means that there is not efficient capital allocation and due to the risk differentiation, the investors choose more riskless investments, as a result, to harm the economic growth. These results are not in line with the positive relationship between finance and growth that is reported in the most studies in the literature. However, these results are consistent with Kim et al. (2014). According to them, for high-income countries, the financial development has negative impact on economic growth. On the other hand, the market capitalization has a positive impact on economic growth. Thus, the size of stock market promotes the economic growth and this result confirms the literature and the positive relationship between stock market development and economic growth. In addition, financial instability influences negatively the economic growth and the result is consistent with Kindleberger (1978) and Minsky (1991). The rates of non-performing loans constitute a detrimental factor for economic growth which indicates ineffectiveness in the credit allocation process, reduce profitability, increase financial costs, bind the bank capital and negatively impact credit supply to the private sector and ultimately decelerate economic growth. Finally, factors like investment and trade openness have a positive impact on economic growth, while inflation and government expenditure hinder the economic growth.

5. Conclusions

This study provides new evidence that sheds light on the impact of finance on growth. Specifically, this study examines the relationship between financial development, financial stability and economic growth in a sample of 28 countries of European Union over the period 2004–2014 applying dynamic panel data techniques such as the generalized method of moments by Arellano-Bond (1991). The results indicate that the development of banking system measured by the private credit does not promote economic growth. The size of the stock markets has a positive effect, whereas the stock market liquidity affects negatively the economic growth. The rates of non-performing loans have increased in European Union countries which were more affected by financial crisis and have a negative impact which ultimately decelerate economic growth. Finally, factors like investment and trade openness have a positive impact on economic growth, while inflation and government expenditure have a negative impact on economic growth.

The empirical findings suggest that the financial development is definitely not always better and it tends to harm economic growth. In terms of policy implications, even though financial development has been identified as one of the most powerful determinants of growth, policy makers could focus less on the financial expansion and more on improving the function of the financial system. The non-performing loans have been shown to be damaging for economic growth, measures need to be undertaken to strengthen the assets quality in order to foster the economic growth since the financial stability is an important component.

The investigation of the causality analysis between financial development, financial stability and economic growth, the extension of the analysis in other countries

including more explanatory variables regarding the financial system's characteristics are some potentially important issues as future research topics.

References

[1] Arcand, J.L., Berkes, E., Panizza, U., 2012. Too Much Finance? IMF Working Paper 12/161. International Monetary Fund, Washington, D.C.
[2] Arellano, M. and Bond, S., 1991. Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. The review of economic studies, 58(2), pp.277-297.
[3] Baltagi, B., 2008. Econometric analysis of panel data. John Wiley & Sons.
[4] Barro, R.J., 2003. Determinants of economic growth in a panel of countries. Annals of economics and finance, 4, pp.231-274.
[5] Beck, T., Levine, R., 2004. Stock markets, banks, and growth: panel evidence. Journal of Banking and Finance 28 (3), 423–442.
[6] Beck, T., Levine, R., Loayza, N., 2000. Finance and the sources of growth. Journal of Financial Economics 58 (1–2), 261–300.
[7] Becketti, S. and SellonJr, G.H., 1989. Has financial market volatility increased?. Economic Review-Federal Reserve Bank of Kansas City, 74(6), p.17.
[8] Cecchetti, G., Kharroubi, E., 2012. Reassessing the Impact of Finance on Growth. BIS Working Papers No. 381, Bank for International Settlements.
[9] Čihák, M.,Schaeck, K., 2010. How well do aggregate prudential ratios identify banking system problems?. Journal of Financial Stability, 6(3), pp.130-144.
[10] Dyrberg, A., 2001. Indicators of Financial Instability. DanmarksNationalbank Monetary Review 1st Quarter, p.57.
[11] Goldsmith, R.W., 1969. Financial Structure and Development. Yale University Press, New Haven.
[12] Holtz-Eakin, D., Newey W. and. Rosen H.S, 1989. The revenues–expenditures nexus: Evidence from local government data, International Economic Review 30, 415–429.
[13] Kim, T.Y., Shin, J., Kim, Y., Lee, J.D., 2014. The Relationship Among Stock Markets, Banks, Economic Growth, and Industry Development. In Economic Growth (pp. 279-292). Springer Berlin Heidelberg.
[14] Kindleberger, C.P., 1978. Economic response: comparative studies in trade, finance, and growth. Harvard University Press.
[15] King, G.R., Levine, R., 1993a. Finance and growth: Schumpeter might be right. Quarterly Journal of Economics 108 (3), 717–737.
[16] King, G.R., Levine, R., 1993b. Finance, entrepreneurship and growth. Journal of Monetary Economics 32 (3), 1–30.
[17] Law, S.H., Singh N., 2014. Does too much finance harm economic growth?. Journal of Banking & Finance 41, 36–44.
[18] Levine, R., 2005. Finance and growth: theory and evidence.Handbook of economic growth, 1, pp.865-934.
[19] Levine, R., Zervos, S., 1998. Stock markets, banks and economic growth. American Economic Review 88 (3), 537–558.
[20] Lucas R. (1988). On the Mechanics of Economic Development. Journal of Monetary Economics22: 3-42.
[21] Manu, L.P., Adjasi, C.K., Abor, J., Harvey, S.K., 2011. Financial stability and economic growth: a cross-country study. International Journal of Financial Services Management, 5(2), pp.121-138.

[22] Naceur, S.B., Ghazouani, S., 2007. Stock markets, banks, and economic growth: Empirical evidence from the MENA region. Research in International Business and Finance 21, 297–315.
[23] Rioja, F., Valev, N., 2004a. Does one size fit all? Are examination of the finance and growth relationship. Journal of Development Economics 74 (2), 429–447.
[24] Rioja, F., Valev, N., 2004b. Finance and the sources of growth at various stages of economic development. Economic Inquiry 42 (1), 127–140.
[25] Rioja, F. and Valev, N., 2012. Stock markets, banks and the sources of economic growth in low and high income countries. Journal of Economics and finance, 38(2), pp.302-320.
[26] Robinson J, 1952. "The Generalization of the General Theory. In: the Rate of Interest and Other Essays" London: MacMillan.
[27] Saci, K., Giorgioni, G., Holden, K., 2009. Does Financial Development Affect Growth?. Applied Economics, Taylor & Francis (Routledge), 41 (13), 1701-1707.
[28] Schinasi, M.G.J., 2004. Defining Financial Stability (EPub) (No. 4-187). International Monetary Fund.
[29] Schumpeter, J. A., 1934.The theory of economic development. Cambridge, Harvard University Press.