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FINANCIAL MARKET DEVELOPMENT AND ECONOMIC GROWTH. NEW OR OLD NEXUS IN THE EURO AREA?

Abstract

The problems of the nexus of financial development, financial market development, and economic growth have so far been controversial. Some authors have questioned the linearity of that nexus or the general idea of nexus. In recent literature devoted to those problems, authors emphasise the changes in the link between financial development and economic growth. The consequences of financialization and the last financial crisis have become the premises for a new hypothesis concerning the nonlinearity of the financial development and economic growth nexus. Some authors indicate that this nexus probably has the shape of inverted letter U. When financialization measured by the relation of financial assets to GDP reaches too high a level, the impact of financial development on economic growth will be negative (after reaching the inflection point on the U curve). There are a number of arguments that indicate that the use of quadratic terms leads to statistical illusions, which are connected with specific mathematical and statistical features of the quadratic function form. Therefore, the authors have implemented the traditional method of the dynamic panel data model, which is unbalanced (because some of the data is not available).

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The aim of our research is to answer the question: does the nexus of financial market development and economic growth exist?

Thus our hypothesis is as follows: financial market development influences economic growth in the euro area in an economically and statistically significant way.

We investigate this phenomenon based on the euro area countries and implemented panel data models (unbalanced), and use annual data concerning main financial market development and macroeconomic control variables.

Keywords: financial development, economic growth, financial market, dynamic panel model.
JEL Classification: G10, G15, G44.

1. Introduction

The beginnings of research on the importance of financial development for economic growth, and in particular the importance of financial markets, should be sought in the works of J. Schumpeter (1960), which pointed to the functions of financial intermediation and financial markets as essentials for economic growth and development.

It should also be noted that despite scientific theories and empirical research recognizing the impact of financial development on economic growth, economists have for a long time had different perspectives on the development of financial intermediation institutions and development and their positive impact on economic growth. However, this dependence, both from a theoretical point of view and from the point of view of empirical research using various econometric methods, is not explicit. For example, R. Lucas (1988) believed that the importance of finance in scientific and unscientific discussions is exaggerated. For Nobel Prize winner M. Miller (1998), "that financial markets contribute to economic growth is a proposition almost too obvious for serious discussion".

Hence, the variety of studies on financial development and economic growth is presented in this paper.

The definition of financial development according to N. Roubini and X. Sala-i-Martin (1992) is based on the theory of transaction costs. They identify financial development as a reduction in the transaction costs of replacing illiquid assets with liquid assets. They claim that an increase in the volume of transactions is necessary to reduce transaction costs, because then the benefits will be available to both the lender and the borrower. This is due to the balance model of demand and supply functions. Only then do sellers benefit when the price falls and buyers gain when the price increases.

J. D. Von Pischke (1991), in turn, defines financial development as an increase in the set of financial instruments, while it is necessary to maintain a balance between risk and the rate of return for individual instruments.

Referring to the Schumpeter's theory, R. Levine (2004) defined financial development as a phenomenon increasing the effectiveness of information, reducing transaction costs and disciplining financial market participants. He has attributed an important role to financial markets, financial intermediaries and financial instruments that may positively affect (but not necessarily eliminate) the effectiveness of information, discipline and the transaction costs. Activities relate to qualitative changes and, in the long run, lead to an increase in capital accumulation. Thus, financial development affects savings and investment decisions and, consequently, economic growth.

The aim of our research, the results of which we present in this article, is to answer the following question: does financial market development influence economic growth in the euro area?

We have formulated the following hypothesis: financial market development influences economic growth in an economically and statistically significant way.

To verify the above hypothesis, we critically analyzed the results of previous studies by different authors and implemented our econometric dynamic panel data model (unbalanced). Of course there are many voices in the literature concerning this subject, which criticizes the traditional approach to the connection between financial development and economic growth. Some authors emphasize that the connections are nonlinear. We agree with them, of course. The problem is as follows: how to encapsulate that nonlinearity in econometric models. Some trials with nonlinear or quasi-nonlinear models ended unsucessfully. The most popular method is to add quadratic terms for variables to test a second order effect of the impact of finance on growth (Carré & L'œillet 2018). The authors who implemented this method received a negative sign associated with the quadratic term and they concluded that the relationship between financial development and economic growth is decreasing, but many other authors argued that this is merely a statistical illusion, because in convergence--type econometric modelling, the coefficient of the explanatory variable is usually negative. W. Cline (2015) argued that implementation of quadratic terms in the regression equation leads to a false sign and false results. We received too much finance, too many telephones, and too many doctors in relation to economic growth (measured by GDP per capita) (Cline 2015).

We believe that, to date, modern methods – based on the linearity assumption – of specifying the model's equation and estimation as a dynamic panel data model have produced valid results. Thus, we implemented dynamic panel data models to research the connections between financial market development and economic growth in the euro area. Philosophically, all of our models in different disciplines are only a proxy of reality. In the economics and finance especially, people have a tendency to reshape all connections which are nonlinear to linear by using logarithms. But so far that method has been efficient. Of course, we are not against econometric and statistical experiments. On the contrary, we support new methods of economic investigation. But in this article, like the many authors we cite, we adopt a traditional approach.

2. Literature Review

The analysis of the relationship between financial development and economic growth has been the subject of empirical research for many years. R. W. Goldsmith (1969) presented ground-breaking research on this subject, analyzing and comparing empirical data from 35 countries. Based on this data, he stated that there is a positive relationship between finance and economic growth. However, based on the variables used and the limited number of countries, it was impossible to determine whether this relationship was accidental or not. In addition, limitations in the availability of statistical data forced him to focus on a comparative analysis of Germany and the United Kingdom.

This, in turn, prompted more researchers to conduct further research. In their research, they used other, increasingly complex econometric models. They broadened the range of control variables taken into account and used longer time series. Also, the fact that the research was carried out in later years allowed subsequent researchers to access more data. Below we present an overview of selected studies on the relationship between broadly--understood financial development and economic growth.

R. G. King and R. Levine (1993) referred in their research to the work of R. W. Goldsmith. They added more control variables to the applied regression model and applied a data set covering a larger group of countries. Cross-sectional regression equations were performed for 77 countries in the 1960–1989 period, and the model was supplemented with additional factors influencing economic growth. These included the volume of trade, expenditure on education and political stability.

G. M. Caporale, P. G. Howells and A. M. Soliman (2005) provide evidence that investment productivity is the channel through which stock market development enhances economic growth in the long run, especially in less-developed countries. Well-functioning stock markets can properly fulfil its allocative function, lower the cost of capital, improve allocation of investment resources and, in turn, enhance economic growth.

In their research, R. Levine and S. Zervos (1998) supplemented the regression model in use with measures regarding the securities market and factors determining the development of the banking sector. These factors fulfilled the role of variables affecting long-term economic growth. The results of the study showed that the liquidity of the securities market and the development of the banking sector allow economic growth to be predicted.

T. Beck and R. Levine (2001, 2004) came to the conclusion that securities markets and the banking sector exert a positive impact on economic growth as well. In their analysis, the authors used a generalized method of moments for dynamic panels and the data was averaged for a 5-year period. The study concerned 40 countries in the years 1976 to 1998.

As indicated by the study by G. M. Caporale, P. G. Howels and A. M. Soliman (2004) on the relationship between stock exchanges, investment, and economic growth, investment efficiency is the channel through which stock exchanges contribute to the long-term rate of growth. The development of stock exchanges contributes to economic growth due to the impact that stock exchanges have on investment performance in the long run and by the ever-increasing importance of the allocation function of stock exchanges. The study referred to 4 countries (Chile, South Korea, Malaysia and the Philippines) in the 1979–1998 period (quarterly data).

S. Bukowski (2013) analyzes financial markets in the Czech Republic, Slovakia, Slovenia and Hungary. The tests cover the 1995–2010 period. In the first part, the analysis of the relationship between selected indicators of the development of financial markets and economic growth gives a positive answer – the development of financial markets is important for economic growth. However, the author himself stresses that the strength of the impact of individual segments of the financial market on economic growth is diversified. The results of research regarding the stock exchange market and the importance of stock exchanges in the process of capital accumulation and financing of innovation seem to be unambiguous. They confirm the importance of financial development and the impact of financial market integration on economic growth in the selected countries.

M. Próchniak and K. Wasiak's (2016) study of 26 EU countries in the 1993–2013 period shows that domestic credit and the market capitalization of listed companies both have a nonlinear impact on economic growth reflected by a downward sloping parabola. At the same time, non-performing loans have a clear negative influence on GDP dynamics.

The findings of a study of the Polish financial market by Gurgul and Lach (2012) were based on quarterly data for the 2000 Q1–2011 Q4 period. Five independent variables were used in the econometric models: the ratio of bank claims on the private sector to nominal GDP, the ratio of bank deposits to nominal GDP, the ratio of Warsaw Stock Exchange (WSE) turnover to nominal GDP, the reserve bank discount rate, and the interbank offer rate. The authors applied the econometric method of the vector error correction model (VECM). They examined financial development for the full period and for the 2008 pre-crisis subsample (2000 Q1–2008 Q3). The empirical research performed in two variants (bank- and stock market-oriented approaches) shows that there is a causality between stock market development and economic growth and between economic growth and banking sector development. The results also indicate that the development of the Warsaw Stock Exchange (WSE) had a strong impact on economic growth before the 2008 crisis, and the banking sector had a significant impact on economic growth during the 2008 crisis. The authors conclude that stock market development was a factor in the development of the banking sector in Poland during the analyzed period.

In his research on financial development and the impact of the development of the stock exchange sector on economic growth, S. Bukowski (2009) conducted a study on Poland, Greece, Italy and Ireland in the 1994–2007 period. Based on the indicators used, he showed that the impact of financial development on economic growth was statistically significant in Poland, Italy and Ireland, and weaker in Greece.

At the same time, the analysis of the impact of the development of the treasury bond market indicates a strong and negative impact on economic growth. The increase in capitalization on the treasury bond market in Poland and Ireland in 1994–2007 shows the negative impact of physical capital on the growth rate in these countries, which seems to confirm the negative impact of the crowding out effect on economic growth (Bukowski 2010).

Table 1. Selected Studies on the Financial Development – Economic Growth Nexus

Research	Independent variables	Sample, period	Estimation method	Results
King and Levine (1993)	Secondary school enrolment, government consumption/GDP, inflation rate, trade value/GDP, growth rate of capital stock per capita, investment/GDP, liquid liabilities/GDP, deposit money bank domestic credit/deposit money bank plus central bank domestic credit, initial ratio of claims on the nonfinancial private sector to domestic credit, initial ratio of claims on the nonfinancial private sector/GDP	Annual dataset, 77 countries, 1960–1989	Ordinary Least Squares (OLS)	Strong causality between financial development and growth
Levine and Zervos (1996)	Market capitalization/GDP, total value of trades/GDP, total value of equity transactions/GDP, stock market integration measured by International Arbitrage Pricing Model (IAPT), liquid liabilities/GDP	Data on stock market size and liquidity for 41 exchanges, 1976-1993. IAPM data covers 24 countries, 1976-1993. First observation: 1976–1985. Second observation: 1986–1993	Cross-country regressions	Stock market development is positively associated with economic growth

Table 1 cnt'd

Research	Independent variables	Sample, period	Estimation method	Results
Levine, Loayza and Beck (2000)	30 variables, including: government size, growth rate of terms of trade, inflation rate, population growth rate, liquid liabilities, private credit, bank assets, legal origin, accounting rule, law, bureaucratic efficiency, corruption, property rights	Annual panel dataset, 71 countries, 1960–1995	Cross sectional instrumental variable regression, Generalized Method of Moments (GMM)	Financial intermediary development positively associated with growth. Substantial factors are: organization of the legal system, differences in standards and accounting systems
Rousseau and Wachtel (2000)	M3/GDP, market capitalization/GDP, value traded/GDP	Annual data, 47 countries, 1980–1995	Vector Auto Regression (VAR), short 5-year time series	Strong impact on the growth of liquidity on stock exchanges and increased market activity of financial intermediaries and on economic growth
Beck and Levine (2001, 2004)	Turnover ratio, bank credit/GDP	Annual data. Data averaged for 5-year period, 40 countries, 1976–1998	GMM	Positive impact of securities markets and the banking sector on economic growth
Rousseau and Wachtel (2002)	Standard financial development, inflation and growth indicators	Annual data, 84 countries, 1960–1995	Rolling panel regressions	The process of disinflation has a positive effect on the level of financial depth and economic growth. Inflation threshold, the achievement of which results in the discontinuation of the finance-growth relationship is in the

Table 1 cnt'd

				13–25% range and seem to be more typical for countries with lower income and less developed financial markets
Caporale, Howells and Soliman (2004)	Market capitalization/GDP, total value of shares traded on stock exchange/GDP, bank deposit/GDP and ratio of bank claims on the private sector/GDP	Argentina, Chile, Greece, Korea, Malaysia, Philippines and Portugal, 1977 Q1–1998 Q4, quarterly data	VAR and VAR causality tests	Well developed stock markets can foster economic growth in the long run
Guiso, Jappelli, Padula and Pagano (2004)	Stock market capitalization/GDP, value of claims of banks and other financial institutions/GDP, and an indicator of accounting standards. Measure of creditor rights, two indicators of the quality of private and public enforcement, duration of the judicial process, a measure of the cost efficiency of the judiciary, and an indicator of the rule of law. Firm--level data for employees, sales, and value added	Industry-level data: annual frequency, 1981–1995, 61 countries, 36 branches of industry, 2,196 observations per year. Firm-level data: panel data, 1981–2001, 70,679 firms. The maximum interval for which data are observed for a firm is 1996–2001	OLS	Financial development can still affect growth. The results vary when looking at countries, sectors and size of the firm

Table 1 cnt'd

Research	Independent variables	Sample, period	Estimation method	Results
Eschenbach and François (2005)	20 variables describing financial sector, including: M3/GDP, commercial banks' domestic assets, credit to the non-financial private sector/GDP, stock market turnover ratio, stock market value traded/GDP	130 countries (including 26 transition economies), 1990–1999	OLS	Links between financial development, banking sector competition and growth. Institutional services tend to be significantly associated with growth, but capital account openness is not
Coricelli, Masten, and Masten (2008)	Human capital measured by level of educational attainment, institutional factors (protection of property rights, administrative barriers, etc.), international financial integration, inflation rate and share of market capitalization/GDP, domestic credit provided by the banking sector/GDP and domestic credit/GDP	Annual data. Country level data: 31 European countries (EU27, Croatia, Ukraine, Russian Federation, Iceland and Norway), 1996–2004. Industry-level data: 30 European countries (EU 25 countries plus Iceland, Norway, Croatia, Russian Federation and Ukraine), 26 manufacturing industries, 1996–2003	GMM	Significant non-linear effects, with less developed European countries gaining more from financial development. At higher levels of financial development financial integration benefits tend to be more significant.
Cappiello, Lo Duca and Maddaloni (2008)	Compounded returns on stock indices (calculated as the difference between returns on each portfolio and the risk free rate), long-term 10-year bond indices (calculated as the long-term government bond index minus the 3-month Euro deposit rate)	Cross country and industry level study – France, Germany, Italy the Netherlands, Spain plus 6 equity industry portfolios in each country, weekly data from April 1991 to December 2007	Multivariate GARCH, Kalman filter, ICAPM	Markets were integrated in the studied period of 1991 Q2–2007 Q4 and market premium was the main determinant of total premium

Table 1 cnt'd

Bukowski (2010)	Stock exchange market capitalization of shares/GDP, stock exchange bond market capitalization/GDP	Annual data, Poland: 1994–2007, Ireland: 1996–2007	Double Ordinary Least Squares (2OLS)	Positive and statistically significant relationship between stock market capitalization and the growth rate of real physical capital per capita in both countries
Gurgul and Lach (2012)	Ratio of bank claims on the private sector to nominal GDP, ratio of bank deposits liability to nominal GDP, ratio of Warsaw Stock Exchange (WSE) turnover to nominal GDP, reserve bank discount rate, and interbank offer rate	Poland, quarterly data, 2000 Q1–2011 Q4	Vector error correction model (VECM).	Causality between stock market development and economic growth and between economic growth and banking sector development
Kendall (2012)	Credits and deposits of commercial banks	209 Indian districts across 9 Indian states, 1991–2001	Regression analysis	Banking sector development was positively linked with economic growth
Arcand, Berkes and Panizza (2012)	16 variables, including: accumulation of human capital, trade openness, inflation, government expenditure/GDP, credit to private sector/GDP, liquid liabilities/GDP	Annual data, 42 countries. Number of countries varies across calculations due to data unavailability, 1960–2010 and sub-periods	GMM, OLS	When the level of finance measured by private sector credit reaches 80–100% of GDP it starts to have a negative effect on output growth

Table 1 cnt'd

Research	Independent variables	Sample, period	Estimation method	Results
Bukowski (2012)	Stock exchange market capitalization of shares/ GDP, stock exchange bond market capitalization/ GDP, credit to private sector/GDP	Annual data, EA-12 countries, 1991–2009	OLS	A statistically significant relationship between the development of financial markets and economic growth, especially in the corporate bonds segment
Doumbia (2016)	M3/GDP, domestic credit to private sector/GDP, domestic credit provided by financial sector/GDP	43 advanced and developing economies, 1975–2009	Panel Smooth Transition Regression (PSTR), System GMM	Financial development supports economic growth in low income and lower middle income countries by enhancing saving and investment behaviour
Próchniak and Wasiak (2016)	domestic credit to private sector/GDP, ratio of non-performing loans, market capitalization/ GDP, number of listed companies per million residents	Annual data, 26 EU countries without Malta and Cyprus, 1993–2013	Fixed effects regression equation. Estimations calculated for 3 groups of countries: full group (EU26), 15 countries of Western Europe (UE15) and 11 countries of Central and East Europe (New Member States – CEE11). Paper also uses 5-year overlapping periods analysis (rolling panel – 1994–1998, 1995–1999, …, 2008–2012, 2009–2013)	Domestic credit and market capitalization of listed companies both have a nonlinear impact on economic growth reflected by a downward sloping parabola. Non-performing loans have a clear negative influence on GDP dynamics

Source: authors' own compilation.

3. Data and Model

We have used data from the following databases: EUROSTAT, AMECO online Financial Structure Dataset, the Warsaw Stock Exchange, and the World Trade Organization. The data cover the 1999–2017 period and 19 member countries of the Economic and Monetary Union. We constructed panel data, but this panel was unbalanced, because part of the data was not available. All the data used in the investigation were in the constant prices (the year 2000).

In our research we implemented a dynamic panel model with not only an endogenous variable lagged by one period, but also lagged exogenous variables. Our research with econometric modelling concerned the direct impact of financial market indicators on GDP per capita and also on the one of the main factors of economic growth – net capital per capita.

The form of these models is as follows:

$$GDPc_{i,t} = a_{01} GDPc_{i,t-1} + \sum_{n=0}^{3} a_{1n} STOCK_{i.t-n} + \sum_{n=0}^{3} a_{2n} CBOND_{i.t-n} + \\ + \sum_{n=0}^{3} a_{3n} TBOND_{i.t-n} + \sum_{n=0}^{3} a_{4n} CREDIT_{i.t-n} + \sum_{n=0}^{3} a_{5n} DB_{i.t-n} + \\ + \sum_{n=0}^{3} a_{6n} I_{i.t-n} + \sum_{n=0}^{3} a_{7n} DFL_{i.t-n} + \sum_{n=0}^{3} a_{8n} OP_{i.t-n} + a_1 + u_{i,t}$$

$$NCc_{i,t} = a_{01} NCc_{i,t-1} + \sum_{n=0}^{3} a_{1n} STOCK_{i.t-n} + \sum_{n=0}^{3} a_{2n} CBOND_{i.t-n} + \\ + \sum_{n=0}^{3} a_{3n} TBOND_{i.t-n} + \sum_{n=0}^{3} a_{4n} CREDIT_{i.t-n} + \sum_{n=0}^{3} a_{5n} DB_{i.t-n} + \\ + \sum_{n=0}^{3} a_{6n} I_{i.t-n} + \sum_{n=0}^{3} a_{7n} DFL_{i.t-n} + a_1 + u_{i,t},$$

where:

GDPc – natural logarithm of real GDP per capita,

I – natural logarithm of net investment to GDP,

NCc – natural logarithm of net capital to GDP,

STOCK – natural logarithm of stock exchange equity market capitalization to GDP,

CBOND – natural logarithm of stock exchange corporate bond market capitalization to GDP,

TBOND – natural logarithm of stock exchange treasury bond market capitalization to GDP,

CREDIT – natural logarithm of credit to households and companies to GDP,

DFL – natural logarithm of the GDP deflator as a measure of the rate of inflation,

OP – natural logarithm openness as a relation of foreign trade turnover to GDP,

DB – natural logarithm of public debt to GDP.

4. Results of the Model Estimations

The results of the first model estimation are presented in Tables 2 and 3.

The AR test indicates that there are no autocorrelations. The results of the Sargan over-identification test indicate that all instruments are valid. The signs associated with the variables are valid from the theoretical point of view. Of course, it is controversial that the CREDIT variable has a negative sign. But we can explain that: massive credit for companies and households in the current period, as an expenditure decreasing economic growth rate, but if we take into account the lagged CREDIT variable (by one period), we can observe that the sign is positive, because it is a proxy of the lagged influence of the economic growth rate. The negative sign in the case of the main financial development indicators is statistically significant and influences economic growth. Bank credit influences economic growth the strongest followed by stock market exchange capitalization to GDP (STOCK). But it must be emphasised that the same is true in the case of CREDIT lagged by one period.

In this model too, as in the case of the previous model, the AR test indicates that there are no autocorrelations. The results of the Sargan over-identification test indicate that all instruments are valid. The signs associated with the variables are valid from the theoretical point of view. The STOCK and CREDIT variables are economically and statistically significant, but the CREDIT variable influences the NCc variable stronger than the STOCK variable.

5. Concluding Remarks

The results of our investigation confirm the results achieved by many other authors, among them: G. M. Caporale, P. G. Howells, A. M. Soliman (2005), J. Kendall (2012), R. Levine (2004), T. Beck and R. Levine (2004).

Table 2. 1-step Dynamic Panel, Using 111 Observations Including 15 Cross-sectional Units. Time-series Length: Minimum 3, Maximum 9. H-matrix as per Ox/DPD. Dependent Variable: I_GDPc. Asymptotic Standard Errors

Specification	Coefficient	Std. Error	*z*	*p*-value	Statistical significance of variables
l_GDPc(-1)	0.621742	0.113334	5.486	< 0.0001	***
const	0.00954873	0.00443806	2.152	0.0314	**
l_STOCK	0.0573689	0.0155474	3.690	0.0002	***
l_STOCK_1	–0.00831872	0.0191884	–0.4335	0.6646	
l_STOCK_2	–0.0189053	0.0193882	–0.9751	0.3295	
l_STOCK_3	0.0292603	0.0155240	1.885	0.0595	*
l_CBOND	0.0146658	0.0158455	0.9255	0.3547	
l_CBOND_1	–0.00632958	0.0225111	–0.2812	0.7786	
l_CBOND_2	0.0261195	0.0225873	1.156	0.2475	
l_CBOND_3	–0.0295854	0.0127409	–2.322	0.0202	**
l_TBOND	–0.0299689	0.0359527	–0.8336	0.4045	
l_TBOND_1	–0.0147838	0.0529799	–0.2790	0.7802	
l_TBOND_2	0.0315489	0.0546176	0.5776	0.5635	
l_TBOND_3	–0.0201608	0.0347838	–0.5796	0.5622	
l_CREDIT	–0.142609	0.0653971	–2.181	0.0292	**
l_CREDIT_1	0.229270	0.0908189	2.524	0.0116	**
l_CREDIT_2	–0.0925905	0.0599861	–1.544	0.1227	
l_CREDIT_3	0.0224445	0.0426610	0.5261	0.5988	
l_DB	0.0541753	0.0335340	1.616	0.1062	
l_DB_1	–0.0794368	0.0351171	–2.262	0.0237	**
l_DB_2	0.0379147	0.0396979	0.9551	0.3395	
l_DB_3	–0.0170340	0.0345638	–0.4928	0.6221	
l_I	0.247264	0.0617005	4.007	< 0.0001	***
l_I_1	–0.0722439	0.0679322	–1.063	0.2876	
l_I_2	–0.0594295	0.0639108	–0.9299	0.3524	
l_I_3	–0.0485692	0.0447027	–1.086	0.2773	
l_DFL	–0.469006	0.331250	–1.416	0.1568	
l_DFL_1	0.232293	0.415780	0.5587	0.5764	
l_DFL_2	–0.0948342	0.265124	–0.3577	0.7206	
l_DFL_3	–0.118206	0.185359	–0.6377	0.5237	
l_OP	0.150614	0.0421610	3.572	0.0004	***
l_OP_1	–0.0383622	0.0479577	–0.7999	0.4238	

Table 2 cnt'd

Specification	Coefficient	Std. Error	*z*	*p*-value	Statistical significance of variables
l_OP_2	–0.00358199	0.0359503	–0.09964	0.9206	
l_OP_3	–0.0153214	0.0435009	–0.3522	0.7247	
Sum squaredresid 0.047590			S.E. of regression 0.024861		
Number of instruments = 97					
Test for AR(1) errors: $z = -4.7684$ [0.0000]					
Test for AR(2) errors: $z = 2.19182$ [0.0284]					
Sargan over-identification test: Chi-square(63) = 64.9483 [0.4086]					
Wald (joint) test: Chi-square(33) = 652.951 [0.0000]					

Source: authors' own calculations using GRETL.

Table 3. 1-step Dynamic Panel, Using 111 Observations Including 15 Cross-sectional Units. Time-series Length: Minimum 3, Maximum 9. H-Matrix as per Ox/DPD. Dependent Variable: I_NCc. Asymptotic Standard Errors

Specification	Coefficient	Std. Error	*z*	*p*-value	Statistical significance of variables
l_NCc(-1)	0.610065	0.112437	5.426	< 0.0001	***
const	0.00833953	0.00297353	2.805	0.0050	***
l_STOCK	0.0209688	0.0103044	2.035	0.0419	**
l_STOCK_1	–0.00559511	0.0126607	–0.4419	0.6585	
l_STOCK_2	0.0139086	0.0131807	1.055	0.2913	
l_STOCK_3	–0.00807971	0.0106132	–0.7613	0.4465	
l_CBOND	0.00642868	0.0122561	0.5245	0.5999	
l_CBOND_1	–0.00723133	0.0170991	–0.4229	0.6724	
l_CBOND_2	0.00678812	0.0164684	0.4122	0.6802	
l_CBOND_3	–0.00445618	0.00961173	–0.4636	0.6429	
l_TBOND	–0.0306030	0.0273105	–1.121	0.2625	
l_TBOND_1	0.0220074	0.0395961	0.5558	0.5784	
l_TBOND_2	0.00213423	0.0407287	0.05240	0.9582	
l_TBOND_3	0.0143859	0.0266505	0.5398	0.5893	
l_CREDIT	0.0178617	0.0546452	0.3269	0.7438	
l_CREDIT_1	0.0123348	0.0713997	0.1728	0.8628	
l_CREDIT_2	–0.0185846	0.0440323	–0.4221	0.6730	
l_CREDIT_3	0.0669688	0.0334020	2.005	0.0450	**

Table 3 cnt'd

Specification	Coefficient	Std. Error	*z*	*p*-value	Statistical significance of variables
l_I	0.133921	0.0431415	3.104	0.0019	***
l_I_1	–0.0381509	0.0426689	–0.8941	0.3713	
l_I_2	–0.0486718	0.0456214	–1.067	0.2860	
l_I_3	0.0445552	0.0353181	1.262	0.2071	
l_DFL	–0.188772	0.242101	–0.7797	0.4356	
l_DFL_1	–0.134527	0.302979	–0.4440	0.6570	
l_DFL_2	0.173486	0.198176	0.8754	0.3813	
l_DFL_3	–0.0220039	0.133954	–0.1643	0.8695	
l_OP	–0.0148927	0.0330028	–0.4513	0.6518	
l_DB	0.0139598	0.0233189	0.5986	0.5494	
l_DB_1	–0.0187115	0.0263473	–0.7102	0.4776	
l_DB_2	0.00701257	0.0286401	0.2449	0.8066	
l_DB_3	–0.0296347	0.0270261	–1.097	0.2728	
Sum squaredresid 0.028349			S.E. of regression 0.018824		
Number of instruments = 94					
Test for AR(1) errors: $z = -4.38219$ [0.0000]					
Test for AR(2) errors: $z = 2.52741$ [0.0115]					
Sargan over-identification test: Chi-square(63) = 61.1553 [0.5424]					
Wald (joint) test: Chi-square(30) = 405.93 [0.0000]					

Source: authors' own calculations using GRETL.

Our investigation allows us to formulate following conclusion:

– There exists an economically and statistically significant connection between financial market development and economic growth in the euro area countries.

– Credit for households and companies positively influences economic growth in euro area countries but with a one-year delay.

– Current stock exchange equity capitalization and three-year delay influence economic growth in the euro area positively.

– The impact of credit for households and companies on economic growth in the euro area is much stronger than the impact of stock exchange equity capitalization on economic growth.

– The impact of treasury bond market capitalization and corporate bond market capitalization on economic growth in the euro area is statistically insignificant.

– There exists an economically and statistically significant connection between financial market development and the growth of net capital per capita in the euro area, wherein credit for households and companies influences the growth of net capital stronger than stock exchange capitalization influences the equity market.

– In the case of the model with net capital per capita growth as an explained variable, treasury bond market capitalization and corporate bond market capitalization are statistically insignificant variables.

The economies of the euro area are bank-oriented. This is the reason why bank credit in the economy plays a much more important role than the stock exchange market.

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Abstract

Rozwój rynku finansowego a wzrost gospodarczy. Stary czy nowy związek w obszarze euro?

Problemy związku między rozwojem finansowym, rozwojem rynków finansowych i wzrostem gospodarczym są do chwili obecnej kontrowersyjne. Niektórzy autorzy kwestionują liniowość tego związku lub też samą jego ideę. W literaturze zwracają uwagę na modyfikacje dotyczące wpływu rozwoju finansowego na wzrost gospodarczy wywołane finansjalizacją oraz ostatnim kryzysem finansowym. Niektórzy autorzy wskazują, że zależność między rozwojem finansowym a wzrostem gospodarczym ma charakter odwróconej litery U, a zatem jest nieliniowa. Próbują oni również zastosować w badaniach naukowych w modelowaniu ekonometrycznym równania regresji z wykorzystaniem funkcji kwadratowej. Inni wskazują zaś, że prowadzi to do iluzji statystycznej. Autorzy niniejszego artykułu zastosowali w swoich badaniach dynamiczny model panelowy.

Celem artykułu jest odpowiedź na pytanie: czy istnieje związek między rozwojem rynków finansowych a wzrostem gospodarczym? Sformułowano następującą hipotezę: rozwój rynków finansowych wpływa na wzrost gospodarczy, co ma uzasadnienie teoretyczne i z punktu widzenia badań empirycznych wpływ zmiennych charakteryzujących ten rozwój na zmienną niezależną „wzrost gospodarczy" jest statystycznie istotny. Badania przeprowadzono na podstawie danych dotyczących rynków finansowych krajów obszaru euro.

Słowa kluczowe: rozwój finansowy, wzrost gospodarczy, rynek finansowy, dynamiczny model panelowy.