DEVELOPMENT OF FINANCIAL MARKETS AND ECONOMIC GROWTH: POLAND AGAINST THE BACKGROUND OF SELECTED EU COUNTRIES

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INRODUCTION

- The research which has resulted in this paper aimed at answering the following questions:

  1) What are the relationships between financial development and economic growth from the point of view of the theory of economics and finance?

  2) Does the development of the financial market in Poland stimulate economic growth in comparison with selected EU countries and, if yes, in what way?

  3) How strong is the influence of the financial market development on economic growth in Poland in comparison with selected EU countries?

INTRODUCTION

The research was conducted in three stages:

- The first stage embraced literature review in the field of relationships between the financial market development and economic growth in the theory of economics from the point of view of results of empirical studies conducted by different authors.
- The second stage consisted of statistical data collecting and selecting and an analysis of the main trends in the financial market development in Poland and selected EU countries.
- The third stage included an analysis of relationships between financial market development and economic growth in Poland and selected EU countries in the years 1994-2007 on the basis of the financial development indicators possible to use.

Financial market development and economic growth – a review of theoretical aspects

- Financial market (including monetary market, capital market, credit-deposit market, currency market and derivative instrument market) is one of the key markets in economy related to the market of products and services and labour market through demand-supply and price coupling.
- On the one hand, it is a plane on which short-, medium- and long-term financial transactions are accomplished and, on the other hand, it is the mechanism of short- and long-term capital mobilisation and its allocation in order to finance investment ventures .

Financial market development and economic growth – a review of theoretical aspects

<u>Financial market performs crucial functions in economy:</u>

- ensuring liquidity in economy,
- appropriation of financial claims,
- mobilisation of part of national income above current expenditure for investment purposes,
- strengthening of the motivating role of profit,
- allocation of capital in economy,
- economic shock absorption through the risk sharing mechanism.

Financial market development and economic growth – a review of theoretical aspects

- The role of financial markets in economy depends on the financial structure of economy.
- The financial structure of a given country's economy is shaped by: institutions, financial technology, rules of the game, which determine how financial activities are organised at a point in time.
- R. Stulz uses an analogy that „ (...) financial structure is to financial system what a foundation is to a house. Many different houses can be built on the same foundation. However, at the same time, a foundation makes it impossible to build some types of houses. If the foundation is designed for a one floor house, it cannot be used to build a skyscraper"

Financial market development and economic growth – a review of theoretical aspects

The financial systems functioning in different countries can be divided into two categories:

- market-oriented financial systems, referred to as Anglo-Saxon ones - financial markets play main role
- bank-oriented financial systems, also known as the continental ones – banking sector play main role

Financial market development and economic growth – a review of theoretical aspects

J. Schumpeter, pointed out specific functions of financial intermediation and financial markets, essential for economic growth and development and consisting in:

- mobilisation of savings,
- capital allocation,
- risk management,
- facilitating transactions,
- company monitoring.

Taking into account Schumpeter's theory of entrepreneur and innovation one can propose a thesis that also in the case of financial institutions and financial intermediation a process of „creative destruction" occurs which results in financial development being a component of economic development.

Financial market development and economic growth – a review of theoretical aspects

<u>R. Levine referred to J. Schumpeter's concept. Levine's definition:</u>

- "Financial development occurs when financial instruments, markets, and intermediaries ameliorate – though do not necessarily eliminate – the effects of information, enforcement, and transactions costs and therefore do a correspondingly better job at providing the five financial functions:
- production of ex ante information about possible investments and capital allocation,
- monitoring of investments and exert of corporate governance after providing finance,
- facilitating trading of financial instruments, risk diversification, management of risk,
- mobilizing and pooling of savings,
- ease the exchange of goods and services.

Each of these financial functions may influence savings and investment decisions and hence economic growth"

Financial market development and economic growth – a review of theoretical aspects

- Financial development means, first of all, changes of qualitative character.
- Functions of financial development are implemented by financial markets and financial intermediaries.
- In the long run implementation of these functions leads to an increase in capital accumulation.
- Through creating possibilities of risk diversification and creating finance sources, they stimulate increase in technological innovations.
- Together, functions stimulate economic growth.

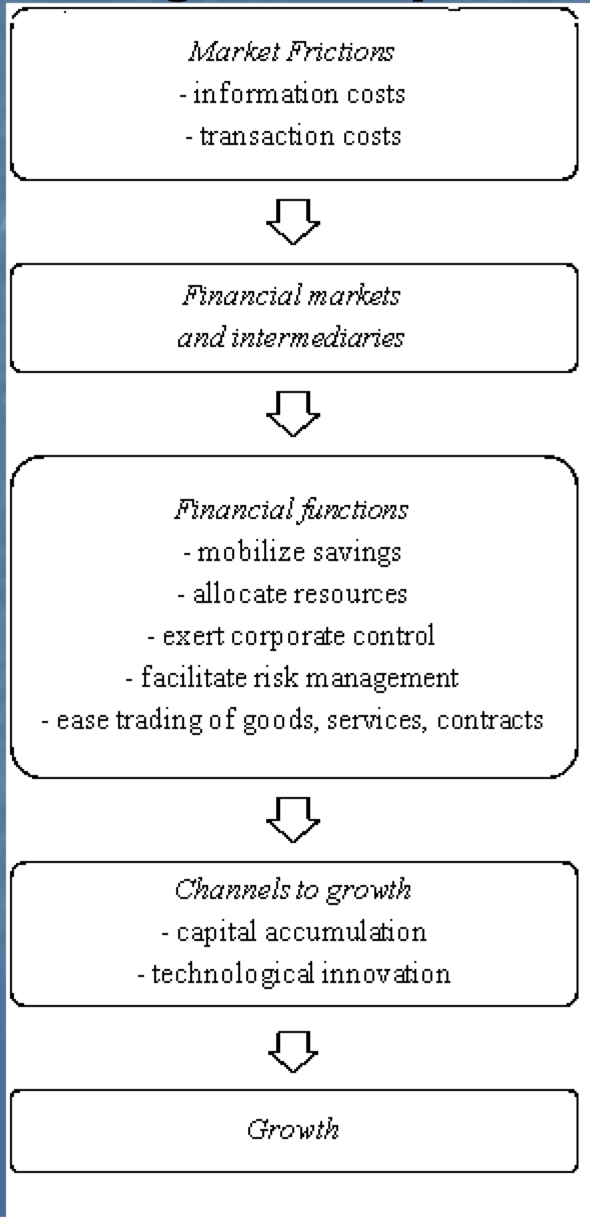
Financial market development and economic growth – a review of theoretical aspects

J. Greenwood and B. Jovanovich indicated parallels and interdependencies in financial market development and economic growth.

According to them, economic growth provides means thanks to which financial markets and financial intermediation develop.

In turn, this process accelerates economic growth by supporting capital allocation.

Figure 1 Theoretical relationship between finance and economic growth by R. Levine



Financial market development and economic growth – a review of theoretical aspects

In recent years there were several publications which were highly skeptical about the impact of financial development on economic growth. These include publications by, among others, P. Wachtel, M.J. Manning and P. L. Rousseau.

Review of methods and results of selected empirical investigations

- Majority of empirical research into relationships between financial development and economic growth is based on panel data and thus concerns not particular countries but their groups.
- A basic econometric model used in the research into relationships between financial development and economic growth is R. Levine and R.G. King's version of the R. Barro's model of economic growth regression.

Review of methods and results of selected empirical investigations

- This model assumes the following form:

$$Y_{it} = \alpha_0 + \alpha F_{it} + \beta X_{it} + u_{it}$$

- where *Yit* is the growth rate of real GDP per capita in i-th country over the period t, *Fit* - is a financial development index in the i-th country over the period t (the ratio of the financial sector's liquid liabilities to GDP, the ratio of credit for the non-financial private sector to GDP, the ratio of credit for the non-financial private sector to total domestic credits, the ratio of domestic assets of deposit banks to domestic assets of the entire banking sector), *Xit* – the vector of basic, predetermined instrumental variables explaining economic growth in the i-th country over the period of t

Review of methods and results of selected empirical investigations

Predetermined, exogenic (controls) instrumental variables explaining economic growth in the i-th country over the period of t:

- the natural logarithm of initial GDP per capita,
- the natural logarithm of the scholarisation index – the ratio of children registered in secondary schools to the total number of children at the school age,
- the share of foreign trade turnover in GDP, the ratio of government consumption to GDP,
- the ratio of budget deficit to GDP).

The model is estimated with the use of the double ordinary least square (2OLS) method.

Review of methods and results of selected empirical investigations

- GDP per capita has been replaced in the equation with the per capita capital growth rate, and next with the per capita efficiency growth rate, and the investment rate in GDP – the authors investigated the influence of financial development indicators on these quantities using the same model form.

Review of methods and results of selected empirical investigations

- R. King and R. Levine carried out research into relationships between the figures of real GDP per capita and the size of financial intermediation measured by the ratio of the financial system's liquid liabilities to GDP, based on a sample consisting of 80 countries and covering the 1960-1989 period.
- Next, they investigated the influence of financial development indicators on long-term economic growth rates per capita, capital accumulation and productivity growth.
- In each case the correlation indicators were high and statistically significant but different depending on a group of countries – divided into countries of low, medium and high economic development.
- Further research based on panel data also confirmed a relatively strong impact of financial development, including that of financial markets, on economic growth.

Review of methods and results of selected empirical investigations

P.L. Rousseau and P. Wachtel's research did not fully confirm the results obtained by the above mentioned authors.

P.L. Rousseau and P. Wachtel applied the same research method as R. Levine and R.G. King, and used in their research the annual panel data comprising statistical data from 84 countries for the 1960-2003 period.

Review of methods and results of selected empirical investigations

- M. Neimke investigated the relationships among the selected financial development indicators (among others, the ratio of M3 to GDP, the ratio of stock-exchange capitalization to GDP, the ratio of bank credit for enterprises to GDP, the share of state bank assets in total bank assets) and GDP growth, and investments and productivity in the countries undergoing transformations (countries of Central and Eastern Europe and former Soviet republics in Asia).
- He used the panel data for the period of 1990-2000 and constructed 18 equations.
- For their estimation he applied the Ordinary least square methods (OLS Method) and for some of the equations also a generalized method of moments (GMM).
- On the basis of empirical investigations he proved that also in transition economies (including Poland), there is a significant positive correlation between the financial market development (and, in particular, capital market) and investments, productivity and GDP per capita.

Review of methods and results of selected empirical investigations

- However, it is worth mentioning that taking into account the magnitude of the coefficient of determination R2 (values ranging from 0.008 to 0.25 and in one case – 0.48), the results obtained to a very small degree explain relationships between financial development and economic growth.
- What is more, the economies examined are remotely comparable. It is difficult to compare Central European economies with those of the former Soviet republics in Asia due to extreme differences in their financial structures, financial market development and levels of economic growth.

Results of empirical research into relationships between financial market development and economic growth in Poland and selected EU countries in the years 1994-2007

- The research used statistical data comprised in the database *„Financial structure dataset (Nov. 2008)"* developed by T. Beck and E. Al.-Hussainy according to the methodology described in *„A New Database on Financial Development and Structure"* by T. Beck, A. Demiurguç – Kunt and R. Levine.
- The statistical data used in the research and concerning shaping of financial development indicators are derived entirely from this database. On the other hand, the data referring to GDP per capita and physical capital and investments are derived from the databases of Eurostat and the Central Statistical Office (GUS), as well as the World Development Indicator base of the World Bank.

Results of empirical research into relationships between financial market development and economic growth in Poland and selected EU countries in the years 1994-2007

- The data referring to Poland, Greece, Italy cover the years 1994-2007 (14 years) and for Ireland cover the years 1996-2007(12 years). In the case of Ireland, available date for years 1994-1995 are not existing.
- The author has chosen the above period for his analysis due to the fact that in Poland only since 1994 it has been possible to speak about significant financial development indicators in relation to GDP.
- Thus, the work covers 14 observations concerning the following quantities: the growth rate of real GDP per capita (*GDPp*), the growth rate of real gross physical capital (*CAPITAL*), efficiency growth rate (*EFF*), the growth rate of real gross investment per capita (*GINV*) and the five financial indicators presented below.

Results of empirical research into relationships between financial market development and economic growth in Poland and selected EU countries in the years 1994-2007

- A relatively small sample entailed several problems.
- Due to the restricted number of degrees of freedom in an econometric model, the number of explanatory variables had to be restricted, which, obviously affected the quality of obtained models.
- Moreover, data inconsistency may have occurred due to the fact that not all needed quantities were available in statistics of one database.
- Particularly, the data referring to the growth rates of real gross investment per capita and physical capital per capita were taken from other sources than the World Development Indicators of the World Bank, and more specifically from the databases of EUROSTAT and GUS.

Results of empirical research into relationships between financial market development and economic growth in Poland and selected EU countries in the years 1994-2007

In order to determine the efficiency growth indicator (*EFF*), combining in itself effects of technology use, human resource and labour productivity, the method applied by R.G. King and R. Levine was used.

The starting point is an economic growth equation in the form:

$$y = k^a x,$$

where *y* stands for real GDP per capita , *k* represents real physical capital per capita, x stands for remaining determinants of per capita GDP growth (joint factor of technology, human resources and labour), *a* –is a parameter of production function.

Results of empirical research into relationships between financial market development and economic growth in Poland and selected EU countries in the years 1994-2007

This equation can be transformed by logarithming the sides of the equation to the form:

$$ln\, y = a ln k + ln x.$$

by changing symbols, this dependence can be converted (as R.G. King and R.Levine did it) to the form: *GDPp = aCAPITAL + EFF*, where *GDPp* represents the growth rate of real GDP per capita, *CAPITAL* – stands for the growth rate of physical capital per capita, and *EFF* indicates the efficiency growth rate, *a* – is a share of physical capital growth in real per capita GDP growth. Hence, *EFF* can be determined in the following way:

$$EFF = GDPp - aCAPITAL.$$

Following R.G. King and R.Levine, the value $a = 0.3$

- Additionally, the growth rate of real gross investment per capita (*GINV*) was used in the study.

Results of empirical research into relationships between financial market development and economic growth in Poland and selected EU countries in the years 1994-2007

Financial market development indicators were constructed in the following way:

- *STOCK* – the ratio of the stock-exchange capitalization on the stock market to GDP
- *{0,5[STOCKt/P_et + STOCKt-1/P_et-1]}/GDPt/P_at,*

- *PBONDS* – the ratio of the stock-exchange capitalization on the bonds market to GDP
- *{0,5[PBONDSt/P_et + PBONDSt-1/P_et-1]}/GDPt/P_at* ,
- In the above formulas the following symbols were adopted: *P_et* –stands for an inflation rate (CPI) at the end of the year, *P_et-1* is an inflation rate (*CPI*) at the beginning of the year, *P_at* – represents the average yearly inflation rate (*CPI*), *GDPt* - GDP in the year *t, t* – year.

Results of empirical research into relationships between financial market development and economic growth in Poland and selected EU countries in the years 1994-2007

- In the study an econometric multi-equation model (simple model) was used.
- The model consists of 3 equations, each of which is estimated separately by the OLS method.
- These equations were constructed in such a way as to show the effect of both the real sphere and the financial sphere on economic growth, or on its major factors: capital growth and efficiency growth.

Results of empirical research into relationships between financial market development and economic growth in Poland and selected EU countries in the years 1994-2007

- The first equation characterizes the correlation between per capita real GDP growth and its main factors:

$$(1)\ \ l\_GDPp = l\_a_{10} + a_{11}\, l\_EFF + a_{12}\, l\_CAPITAL + u_1,$$

- where *l_GDPp* – represents the logarithm of per capita GDP growth, *l_EFF* – stands for the logarithm of efficiency growth rate, *l_CAPITAL* – is the logarithm of the growth rate of capital per capita, *l_ a10* – stands for the logarithm of the constant.

Results of empirical research into relationships between financial market development and economic growth in Poland and selected EU countries in the years 1994-2007

- The second equation characterizes the correlation between the growth rate of real GDP per capita and efficiency growth (*EFF*) and the ratios of the stock market capitalization to GDP and the bond-market capitalization to GDP (*PBONDS*).

$$(1) \quad GDPp = a_{30} + a_{31}EFF + a_{32}STOCK + a_{33}PBONDS + u_3$$

Results of empirical research into relationships between financial market development and economic growth in Poland and selected EU countries in the years 1994-2007

- The third equation characterizes the relationship between the growth rate of real physical capital per capita (*CAPITAL*) and the growth rate of gross investment, and the ratios of the stock market capitalization to GDP *(STOCK)* and bond market capitalization to GDP (*PBONDS*).

$$(3)\ CAPITAL = a_{40} + a_{41}GINV + a_{42}STOCK + a_{43}PBONDS + u_4$$

Results of empirical research into relationships between financial market development and economic growth in Poland and selected EU countries in the years 1994-2007

- The first equation reveals the obvious significant stochastic relationships between GDP per capita and explanatory (independent) variables being the economic growth factors.
- The relationship between per capita GDP growth and per capita physical capital growth and efficiency growth is obvious from the point of view of economic growth models (see: Tables 1A,B,C,D).
- Due to the non-linear dependence (power function), the author used logarithms of the per capita real GDP growth rate and logarithms of the growth rates of real physical capital per capita and efficiency.

Table 1A Poland. Equation 1: OLS Method estimation with the use of 14 observations 1994-2007
Dependant variable: l_GDPp

	Coefficient	*Standard error*	*t-Student*	*p value*	
Const	-0.154094	0.227312	-0.6779	0.51184	
l_CAPITAL	0.204385	0.0646612	3.1609	0.00906	***
l_EFF	0.658898	0.0214507	30.7169	<0.00001	***

Mean of dependent variable	-3.161880		Standard deviation of dependent variable	0.549790
Sum of squared residuals	0.041929		Standard error of residuals	0.061739
Unadjusted R-squared	0.989330		Adjusted R- squared	0.987390
F(2, 11)	509.9452		p value for the F-test	1.43e-11
Log - Likelihood	20.81067		Durbin-Watson statistics	2.541708
Autocorrelation of Residuals - rho1	-0.303210			

*** the variable is significant at the significance level of 0.01, ** the variable is significant at the significance level of 0.05, * the variable is significant at the significance level of 0.1
Source: the author's own calculations with the use of the GRETL programme.

Table. 1B Greece. Equation 1: OLS Method estimation with the use of 14 observations 1994-2007 Dependant variable: l_GDPp

	Coefficient	*Standard terror*	*t-Student*	*p value*	
Const	0.13191	0.0632669	2.0850	0.06117	*
l_EFF	0.771421	0.0217344	35.4930	<0.00001	***
l_CAPITAL	0.189911	0.0110391	17.2034	<0.00001	***

Mean of dependent variable	-3.473576		Standard deviation of dependent variable	0.340671
Sum of squared residuals	0.004326		Standard error of residuals	0.019832
Unadjusted R-squared	0.997132		Adjusted R- squared	0.996611
F(2, 11)	1912.495		p value for the F-test	1.04e-14
Log - Likelihood	36.70934		Durbin-Watson statistics	1.973208
Autocorrelation of Residuals - rho1	-0.069453			

*** the variable is significant at the significance level of 0.01, ** the variable is significant at the significance level of 0.05, * the variable is significant at the significance level of 0.1
Source: the author’s own calculations with the use of the GRETL programme.

Table 1C Ireland. Equation 1: OLS Method estimation with the use of 14 observations 1994-2007
Dependent variable: l_GDPp

	Coefficient	*Standard terror*	*t-Student*	*p value*	
Const	0.142907	0.0692364	2.0640	0.06342	*
l_EFF	0.843363	0.0105352	80.0517	<0.00001	***
l_CAPITAL	0.121753	0.0163836	7.4314	0.00001	***

Mean of dependent variable	-2.695873		Standard deviation of dependent variable	0.344828
Sum of squared residuals	0.002611		Standard error of residuals	0.015405
Unadjusted R-squared	0.998311		Adjusted R- squared	0.998004
F(2, 11)	3251.224		p value for the F-test	5.65e-16
Log - Likelihood	40.24567		Durbin-Watson statistics	1.952762
Autocorrelation of Residuals - rho1	-0.050234			

*** the variable is significant at the significance level of 0.01, ** the variable is significant at the significance level of 0.05, * the variable is significant at the significance level of 0.1
Source: the author’s own calculations with the use of the GRETL programme.

Table 1D Italy. Equation 1: OLS Method estimation with the use of 14 observations 1994-2007
Dependent variable: l_GDPp

	Coefficient	*Standard terror*	*t-Student*	*p value*	
Const	0.22232	0.116282	1.9119	0.08819	*
l_EFF	0.717412	0.0116509	61.5759	<0.00001	***
l_CAPITAL	0.268867	0.0296523	9.0673	<0.00001	***

Mean of dependent variable	-4.071400		Standard deviation of dependent variable	0.427651
Sum of squared residuals	0.003583		Residual standard error	0.019953
Unadjusted R-squared	0.998219		Corrected R squared	0.997823
F(2, 11)	2521.968		p value for the F-test	4.25e-13
Log - Likelihood	31.67119			
Autocorrelation of Residuals - rho1				

*** the variable is significant at the significance level of 0.01, ** the variable is significant at the significance level of 0.05, * the variable is significant at the significance level of 0.1
Source: the author’s own calculations with the use of the GRETL programme.

Results of empirical research into relationships between financial market development and economic growth in Poland and selected EU countries in the years 1994-2007

- In the case of Poland Equation 2 indicates a statistically significant positive relationship between real GDP growth per capita and the ratio of stock-market capitalization to GDP. An increase in stock-market capitalization by 1 percentage point causes an increase in per capita GDP growth rate by 0.021 percentage point.
- On the other hand, the relationship between the ratio of bond-market capitalization to GDP and the growth rate of GDP per capita is negative, hence an increase in the share of the bond-market capitalization in GDP by 1 percentage point causes a decrease in the growth rate of real GDP per capita by 0.051 percentage point (see: Table 2A).
- The influence of both variables on the growth rate of real GDP per capita is definitely lower than that of efficiency.

Table 2A Poland. Equation 2: OLS Method estimation with the use of 14 observations 1994-2007
Dependent variable: *GDPp*

	Coefficient	*Standard value*	*t-Student*	*p value*	
Const	0,0159835	0,00161021	9,9263	<0,00001	***
EFF	1,04013	0,0206821	50,2914	<0,00001	***
STOCK	0,0219688	0,0057401	3,8273	0,00333	***
PBONDS	-0,0511506	0,00926045	-5,5236	0,00025	***

Mean of dependent variable	0,047357		Standard deviation of dependent variable	0,019069
Sum of squared residuals	0,000019		Standard error of residuals	0,001361
Unadjusted R-squared	0,996079		Adjusted R- squared	0,994902
F(2, 11)	846,7375		p value for the F-test	2,51e-12
Log - Likelihood	74,87862		Durbin-Watson statistics	3,209570
Autocorrelation of Residuals - rho1	-0,629110			

*** the variable is significant at the significance level of 0.01, ** the variable is significant at the significance level of 0.05, * the variable is significant at the significance level of 0.1
Source: the author’s own calculations with the use of the GRETL programme.

Results of empirical research into relationships between financial market development and economic growth in Poland and selected EU countries in the years 1994-2007

- In the case of Greece the relationship between the ratio of stock-market capitalization to GDP and the growth rate of real GDP per capita is statistically insignificant, whereas the relationship between the ratio of bond-market capitalization to GDP and the growth rate of real GDP per capita is statistically significant and positive.
- It must be noted, however, that the applied equation does not explain these relationships very well because the low value of the Durbin- Watson test points to autocorrelation of the random component (see also: Table 2B).

Table 2B Greece. Equation 2: OLS Method estimation with the use of 14 observations 1994-2007
Dependent variable: *GDPp*

	Coefficient	*Standard terror*	*t-Student*	*p value*	
Const	-0.0115715	0.00499579	-2.3162	0.04305	**
EFF	1.14482	0.0818234	13.9914	<0.00001	***
STOCK	0.00197107	0.00175339	1.1241	0.28721	
PBONDS	0.0172936	0.00690463	2.5046	0.03120	**

Mean of dependent variable	0.032643		Standard deviation of dependent variable	0.010493
Sum of squared residuals	0.000044		Standard error of residuals	0.002088
Unadjusted R-squared	0.969524		Adjusted R- squared	0.960381
F(2, 11)	106.0417		p value for the F-test	7.03e-08
Log - Likelihood	68.88855		Durbin-Watson statistics	0.594337
Autocorrelation of Residuals - rho1	0.836106			

*** the variable is significant at the significance level of 0.01, ** the variable is significant at the significance level of 0.05, * the variable is significant at the significance level of 0.1
Source: the author’s own calculations with the use of the GRETL programme.

Results of empirical research into relationships between financial market development and economic growth in Poland and selected EU countries in the years 1994-2007

- Irish economy reveals a statistically significant positive relationship between the ratio of stock-market capitalization to GDP and the growth rate of real GDP per capita.
- However, the effect of this explanatory variable on the explained variable is weaker than in Poland. An increase in the ratio of stock-market capitalization to GDP by 1 percentage point causes an increase in the growth rate of GDP per capita by 0.0093 percentage point.
- The relationship between the ratio of bond-market capitalization to GDP and the growth rate of real GDP per capita is negative, but statistically insignificant (see: Table 2C).

Table 2C Ireland. Equation 2: OLS Method estimation with the use of 12 observations 1996-2007 Dependent variable: *GDPp*

	Coefficient	*Standard error*	*t-Student*	*p value*	
Const	0.00567257	0.00386259	1.4686	0.18013	
EFF	0.998107	0.031766	31.4206	<0.00001	***
STOCK	0.00931736	0.00469812	1.9832	0.08264	*
PBONDS	-0.00144696	0.0124469	-0.1163	0.91032	

Mean of dependent variable	0.070250		Standard deviation of dependent variable	0.025641
Sum of squared residuals	0.000013		Standard error of residuals	0.001284
Unadjusted R-squared	0.998177		Adjusted R- squared	0.997493
F(2, 11)	1459.978		p value for the F-test	2.72e-11
Log - Likelihood	65.30044		Durbin-Watson statistics	1.409016
Autocorrelation of Residuals - rho1	0.265218			

*** the variable is significant at the significance level of 0.01, ** the variable is significant at the significance level of 0.05, * the variable is significant at the significance level of 0.1
Source: the author's own calculations with the use of the GRETL programme.

Results of empirical research into relationships between financial market development and economic growth in Poland and selected EU countries in the years 1994-2007

- Italian economy reveals a positive, statistically significant relationship between the ratio of stock-market capitalization to GDP and the growth rate of real GDP per capita and between the bond-market capitalization to GDP ratio and the growth rate of real GDP per capita.
- It is noteworthy, however, that the ratio of stock-market capitalization to GDP has a weaker impact on the growth rate of real GDP per capita in Italy than in Poland and Ireland.

Table 2D Italy. Equation 2: OLS Method estimation with the use of 14 observations 1994-2007
Dependent variable: *GDPp*

	Coefficient	*Standard error*	*t-Student*	*p value*	
const	-0.0070465	0.00325218	-2.1667	0.05548	*
EFF	1.00648	0.0256856	39.1847	<0.00001	***
STOCK	0.00419153	0.00151216	2.7719	0.01972	**
PBONDS	0.0108575	0.00337861	3.2136	0.00928	***

Mean of dependent variable	0.016214		Standard deviation of dependent variable	0.009358
Sum of squared residuals	5.47e-06		Standard error of residuals	0.000739
Unadjusted R-squared	0.995199		Adjusted R- squared	0.993759
F(2, 11)	690.9587		p value for the F-test	6.89e-12
Log - Likelihood	83.42789		Durbin-Watson statistics	1.385148
Autocorrelation of Residuals - rho1	0.303317			

*** the variable is significant at the significance level of 0.01, ** the variable is significant at the significance level of 0.05, * the variable is significant at the significance level of 0.1

Source: the author’s own calculations with the use of the GRETL programme.

Results of empirical research into relationships between financial market development and economic growth in Poland and selected EU countries in the years 1994-2007

- Stock-market capitalization affects also the growth of real physical capital per capita. In the case of Poland this effect is higher than the influence of the growth rate of real gross investment (see: Table 3A).
- An increase in the ratio of stock-market capitalization to GDP by 1 percentage point increases the growth rate of real GDP per capita by 0.066 percentage point (0.027 percentage point in the case of the growth rate of real gross investment).
- A negative impact of the bond-market capitalization to GDP ratio on the growth rate of real physical capital per capita is also significant (an increase by 1 percentage point causes a decrease in the growth rate of GDP per capita by 0.153 percentage point).

Table 3A Poland. Equation 3: OLS Method estimation with the use of 14 observations 1994-2007 Dependent variable: *CAPITAL*

	Coefficient	*Standard error*	*t-Student*	*p value*	
const	0.053085	0.00519872	10.2112	<0.00001	***
GINV	0.0275522	0.0128545	2.1434	0.05770	*
STOCK	0.0665638	0.0187168	3.5564	0.00521	***
PBONDS	-0.153156	0.0301973	-5.0718	0.00048	***

Mean of dependent variable	0.030564		Standard deviation of dependent variable	0.008354
Sum of squared residuals	0.000194		Standard error of residuals	0.004407
Unadjusted R-squared	0.785905		Adjusted R- squared	0.721676
F(2, 11)	12.23608		p value for the F-test	0.001104
Log - Likelihood	58.43247		Durbin-Watson statistics	3.084796
Autocorrelation of Residuals - rho1	-0.569964			

*** the variable is significant at the significance level of 0.01, ** the variable is significant at the significance level of 0.05, * the variable is significant at the significance level of 0.1
Source: the author's own calculations with the use of the GRETL programme.

Table 3B Greece. Equation 3: OLS Method estimation with the use of 14 observations 1994-2007
Dependent variable: *CAPITAL*

	Coefficient	*Standard error*	*t-Student*	*p value*	
const	-0.0369099	0.0190626	-1.9362	0.08159	*
GINV	-0.00735161	0.0546895	-0.1344	0.89573	
STOCK	0.0104382	0.00654888	1.5939	0.14205	
PBONDS	0.0693212	0.0253515	2.7344	0.02103	**

Mean of dependent variable	0.022511		Standard deviation of dependent variable	0.010825
Sum of squared residuals	0.000635		Standard error of residuals	0.007971
Unadjusted R-squared	0.582904		Adjusted R- squared	0.457775
F(2, 11)	4.658431		p value for the F-test	0.027575
Log - Likelihood	50.13788		Durbin-Watson statistics	0.827001
Autocorrelation of Residuals - rho1	0.617020			

*** the variable is significant at the significance level of 0.01, ** the variable is significant at the significance level of 0.05, * the variable is significant at the significance level of 0.1
Source: the author’s own calculations with the use of the GRETL programme.

Results of empirical research into relationships between financial market development and economic growth in Poland and selected EU countries in the years 1994-2007

- In the economy of Ireland, like in Poland, a positive and statistically significant relationship between stock-market capitalization and the growth rate of real physical capital per capita is revealed.
- What is more, an increase in the stock-market capitalization to GDP ratio has a stronger impact on the growth of real physical capital per capita in Ireland than in Poland.
- Like in the case of Poland, the relationship between bond-market capitalization and the growth rate of real GDP per capita is negative and statistically significant (see: Table 3C).

Table 3C Ireland. Equation 3: OLS Method estimation with the use of 12 observations 1996-2007
Dependent variable: *CAPITAL*

	Coefficient	*Standard terror*	*t-Student*	*p value*	
const	0.0225292	0.006179	3.6461	0.00653	***
GINV	0.0850699	0.0241618	3.5208	0.00784	***
STOCK	0.0369639	0.00768274	4.8113	0.00134	***
PBONDS	-0.0701747	0.0218971	-3.2048	0.01252	**

Mean of dependent variable	0.036066	Standard deviation of dependent variable	0.005147
Sum of squared residuals	0.000057	Standard error of residuals	0.002681
Unadjusted R-squared	0.802723	Adjusted R- squared	0.728744
F(2, 11)	10.85071	p value for the F-test	0.003420
Log - Likelihood	56.46559	Durbin-Watson statistics	2.180682
Autocorrelation of Residuals - rho1	-0.090415		

*** the variable is significant at the significance level of 0.01, ** the variable is significant at the significance level of 0.05, * the variable is significant at the significance level of 0.1

Source: the author’s own calculations with the use of the GRETL programme.

Results of empirical research into relationships between financial market development and economic growth in Poland and selected EU countries in the years 1994-2007

- In the case of Italy, the relationship between the ratio of stock-market capitalization to GDP and the ratio of bond-market capitalization and the growth rate of real physical capital per capita is positive and statistically significant.

Table 3D Italy. Equation 3: OLS Method estimation with the use of 14 observations 1994-2007 Dependent variable: *CAPITAL*

	Coefficient	*Standard terror*	*t-Student*	*p value*	
Const	-0.0161529	0.0120238	-1.3434	0.20883	
GINV	0.044347	0.0390344	1.1361	0.28241	
STOCK	0.0110963	0.00536525	2.0682	0.06548	*
PBONDS	0.0281834	0.0125623	2.2435	0.04872	**

Mean of dependent variable	0.014519		Standard deviation of dependent variable	0.003461
Sum of squared residuals	0.000054		Standard error of residuals	0.002327
Unadjusted R-squared	0.652474		Adjusted R- squared	0.548216
F(2, 11)	6.258276		p value for the F-test	0.011559
Log - Likelihood	67.37760		Durbin-Watson statistics	1.371166
Autocorrelation of Residuals - rho1	0.301120			

*** the variable is significant at the significance level of 0.01, ** the variable is significant at the significance level of 0.05, * the variable is significant at the significance level of 0.1
Source: the author's own calculations with the use of the GRETL programme.

Results of empirical research into relationships between financial market development and economic growth in Poland and selected EU countries in the years 1994-2007

- It is interesting that in the case of Greece and Italy a high ratio of public debt to GDP (above 100%) and a positive relationship between the bond-market capitalization to GDP ratio and economic growth are indicated.
- However, in the case of Poland and Ireland the ratio of public debt to GDP is relatively low (below 60%) and the relationship between the bond-market capitalization to GDP radio and economic growth is negative.
- This phenomenon requires a thorough investigation on a bigger sample and with the use of panel data comprising two groups of countries: countries of high public debt with reference to GDP and countries of a relatively low ratio of public debt to GDP.

Conclusions

- An analysis of relationships between selected indicators of financial market development and economic growth in Poland in the period from 1994 to 2007 points to the following stylized facts:
- In the analyzed period, there was a statistically significant relationship between financial market development and economic growth in Poland, Greece, Ireland and Italy;

Conclusions

- An increase in the government bond-market capitalization (result of increased budget deficit and public debt) has a negative and relatively strong impact on the rate of real economic growth and the rate of real physical capital growth in Poland and Ireland, hence it may confirm a negative effect "portfolio crowding out" caused by increased budget deficit and public debt on economic growth; in the case of Greece and Italy, i.e. the countries of a high ratio of public debt to GDP, there is a statistically significant, positive relationship between the bond-market capitalization to GDP ratio and economic growth;

Conclusions

- There is a statistically significant but relatively weak, positive relationship between the stock-market capitalization and growth rates of real GDP per capita and real physical capital per capita; this relationship is stronger in the case of Poland than in the case of other examined countries.

Conclusions

- To sum up, the conducted analysis revealed a statistically significant and meaningful impact of financial market development on economic growth in Poland, Ireland and Italy, but weaker in the case of Greece. The research done is of preliminary character and the conclusions formulated above require further verification by extensive studies covering a larger number of explanatory variables and a larger number of observations.

THANK YOU FOR YOUR ATTENTION