ARTICLES

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The impact of the banking sector on economic growth in Poland – an econometric analysis

Abstract

The paper analyses the impact of the banking sector on economic growth in Poland. The aim of the paper was to analyse if the banking sector has a significant effect on economic growth in the case of Poland. Hence, the following hypothesis was formulated: there is a statistically significant relation between the development of the banking sector and economic growth in Poland. On the basis of the applied econometric methods, it has been possible to demonstrate that the banking sector's development has an economically and statistically significant impact on economic growth in Poland.

Key words: financial development, economic growth, financial market, credit, stock exchanges, banking sector, econometric model.

JEL classification code: G10, G15, G44.

Paper type: Theoretical research article

Introduction

The issue of relations between financial development (of financial markets) and economic growth is not new to economics or finances. It emerged as early as J. Schumpeter's work (1960). He pointed to a major significance of finance to the stimulation of economic growth and development. J. Schumpeter's ideas were taken up by R. King and R. Levine (1993), who intensified the discussion. R. Levine defined financial development, too, stating: 'Financial development occurs when financial instruments, markets,

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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. Thus, financial development involves improvements in the (i) production of ex ante information about possible investments, (ii) monitoring of investments and implementation of corporate governance, (iii) trading, diversification, and management of risk, (iv) mobilization and pooling of savings, and (v) exchange of goods and services. Each of these financial functions may influence savings and investment decisions and hence economic growth. Since many market frictions exist and since laws, regulations, and policies differ markedly across economies and over time, improvements along any single dimension may have different implications for resource allocation and welfare depending on the other frictions at play in the economy' (Levine 2004, pp. 5-7).

The development of banking and the corresponding development of the deposit and credit markets (including instruments like bank deposits, credits and loans) can be distinguished as part of the financial development. The research whose interim results have provided the starting point for this paper is intended to answer the question, does the banking sector have a significant effect on economic growth in the case of Poland?

Hence the following hypothesis: there is a statistically significant relation between the development of the banking sector and economic growth in Poland.

Econometric methods are applied.

1. The connection between the development of the banking sector and economic growth in some empirical research

The cost of information, transactional costs, and investment risk are the major problems of investing in financial markets. They are solved by the operation of financial intermediaries, primarily banks.

The literature offers a range of results, mostly concerning the effect of the development of financial markets on economic growth. They are scarcer in relation to the impact of the bank sector on economic growth. Nonetheless, some results of selected authors can be cited here. Beck and Levine (2001, 2004) indicate, after an analysis of econometric model estimation results (dynamic panel data model for 40 countries |in the period 1976-1998, the data averaged for a 5-year period), a positive impact of securities markets and the banking sector on economic growth

The results by M. Próchniak & K. Wasiak (2016) show that domestic credit and market capitalization of listed companies both have a non-linear impact on economic growth reflected with a downward sloping parabola. In their research, they used data from 26 EU countries for the period of 1993-2013.

Gurgul & Lach (2012) have concentrated on the Polish financial market and banking sector. Their research is based on quarterly data for the period 2000-2011. They use the following independent variables in their econometric models: the ratio of bank claims on private sector to nominal GDP, the ratio of bank deposit liabilities 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 apply the econometric method of vector error correction model (VECM). They examine financial development for the full period and a pre-2008 crisis subsample (2000 Q1–2008 Q3). They construct two variants: bank- and stock market-oriented approaches. The authors indicate that there is a causality from stock market development to economic growth and from economic growth to banking sector development. The results of their research also suggest 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 the stock market development was a factor of the banking sector development in Poland in the analysed period. It is a very important conclusion which indicates that stock exchanges and banking sector (banking market) are connected in their impact on economic growth.
Bukowski and Zięba (2019) apply a dynamic data model to investigate 19 countries of EMU for the period of 1999-2017. The results of model estimation suggest a significant impact of the banking sector development on economic growth.

2. The measures of the bank sector's impact on economic growth
From the viewpoint of empirical research, the following measures of the bank sector's impact on economic growth can be distinguished:
- Banks' financial results – ROA and ROE,
- The ratio of credits to bank deposits,
- The ratio of credits and deposits to GDP,
- The relation of credits to the private deposits from the private sector/ GDP,
- The M3 monetary aggregate to GDP,
- Spread – the relation of credit rate of interest to deposit rate of interest,
- The net interest margin of banks,
- The relation of charter capital to risk-weighted assets.
Only some of them are used in this study due to the lack of data. At least quarterly figures are of particular importance to apply the models like VAR or VECM. Regrettably, they aren't always available.

3. The bank sector and economic growth in Poland – the model approach

3.1 Data and model

The study employs the statistics of the World Bank, namely, the Global Financial Development GFDD Data Bank Financial Structure Development Database, AMECO ONLINE. They cover the period from 1998 to 2017. The base is selected to ensure comparability with other studies using the same statistics. The Ameco Online figures are processed to produce the same comparability as in the case of the World Bank data.

The model is founded on the following standard GDP growth:

$Y_t = f\ (K_t, L_t, F_t, Z_t)$ – where Y stands for GDP, K_t – capital, L_t - labour, F_t for the financial factor, Z_t.

It should be mentioned a similar model, based on Solow model, is used in research into the impact of the financial sector on economic growth (cf. Hshin-Yu Liang, Alan Reichert 2006).

After an analysis of statistical data, the following econometric model is built of the bank sector's effect on economic growth for Poland:

$$lnGDP_t = a_0 + a_1 lnM3GDP_t + a_2 ln_t + a_3 lnP_t + a_4 X_t + u_{t,,}$$

where:

ln – the natural logarithm,

GDP_t - GDP for Poland in terms of 2000 constant prices,

$M3GDP_t$ - the M3 monetary aggregate to GDP in terms of 2000 constant prices as a proxy for money creation by banks,

IN_t - gross investments in the economy (as gross fixed formation in terms of 2000 constant prices) to the GDP,

P_{t-} population at the end of a given year,

X_t – exports to the GDP in terms of 2000 constant prices as a proxy for the remaining factors influencing economic growth,

u_t - random factor.

The model is constructed using the method of backward stepwise regression. The tests of autocorrelation and heteroscedasticity, normal distribution, and time series co-integration are carried out. The test results provide the grounds for selecting the generalised least squares method as the method of estimation. The rate of GDP growth in Poland as the natural logarithm (ln) of the GDP value is the dependent variable in the model.

The results of Engle–Granger co-integration test are presented below.

Augmented Dickey-Fuller test for uhat
including one lag of (1-L)uhat
sample size 18
unit-root null hypothesis: a = 1

test without constant
model: (1-L)y = (a-1)*y(-1) +... + e
estimated value of (a - 1): -0.671916
test statistic: tau_ct(5) = -3.31857 with the critical value -1.95 (significance level 0.05)
asymptotic p-value 0.5838
1st-order autocorrelation coeff. for e: -0.185

As we see above the time series are cointegrated.

3.2 The results of model estimation
The results of model estimation are included in Table 1.

Table 1. Cochrane-Orcutt, using observations 1998-2017 (T = 19)
Dependent variable: l_GDP
rho = 0.053368

	Coefficient	Std. Error	t-ratio	p-value	
const	−33.0303	17.3571	−1.903	0.0778	*
l_M3GDP	0.447461	0.0702704	6.368	<0.0001	***
l_IN	0.0661552	0.0585106	1.131	0.2772	
l_P	2.27768	0.988263	2.305	0.0370	**
l_X	0.213180	0.0223627	9.533	<0.0001	***

Statistics based on the rho-differenced data:

Sum squared resid	0.004616		S.E. of regression	0.018158
R-squared	0.994214		Adjusted R-squared	0.992561
F(4, 14)	538.3929		P-value(F)	3.73e-15
rho	0.019271		Durbin-Watson	1.863885

Statistics based on the original data:

Mean dependent var	7.250250		S.D. dependent var	0.210527

Source: The author's own calculation with using GRETL.
The independent variable, a proxy for the development of the financial sector, in this case of the banking sector (M3), is statistically significant. The model explains the variance of the dependent variable in 99%, a very good measure of matching.
The estimation results point to a significant and relatively strong impact of the development of the banking sector on economic growth in Poland.

4. The effect of banking regulations (Basel III) on economic growth in Poland in the light of empirical research

M. Marcinkowska, P. Wdowiński (eds.) *Wpływ regulacji kapitałowych i płynnościowych sektora bankowego na wzrost gospodarczy Polski* (Łódź 2016) is a fundamental work on the effect of banking regulations (Basel III) on economic growth in Poland. The authors attempt to determine how these regulation will affect the economic growth in our country both theoretically and empirically. S.I. Bukowski's chapter in (2016) is worth quoting as the author conducts a theoretical analysis of the effects of more stringent banking regulations on economic growth. He suggests an adverse impact of a higher solvency ratio that works by:
- Limiting the supply of bank credits and raising the short-term rate of interest and cost of bank customer service;
- Lowering investments as a result of growing interest rates in the long term,
- An increase of interest rate and a lower value of assets, which will reduce J. Tobin ratio.

The idea of a financial transaction tax comes in for particular criticism. The author stresses the growing costs of borrowing, bound to hit small and medium-sized enterprises in the first place and consequently impair economic growth in Poland, where these enterprises make an overwhelming contribution to GDP creation and employment. After the so-called bank tax has been introduced, which is in fact a charge on banks' assets and thus credits, the issue as as topical as ever. The question arises in this connection if it's a good idea to additionally tax banks for their effective management. An answer certainly requires more research (Bukowski 2016, pp. 25-40)

Returning to the banking sector regulations in Basel III, the authors points out the new regulations slow the rate of GDP growth and propose a range of recommendations for prudential policies (Marcinkowska, Wdowiński, 2016, pp. 290 and ff.). The effects of the principles incorporated in the so-called Basel III regulations definitely require more studies, especially as the most recent regulations were introduced in 2018 subject to a vacatio legis.

Conclusion

The analysis undertaken in this paper has demonstrated the banking sector's development has an economically and statistically significant impact on economic growth in Poland. A range of similar studies, both of individual and many economies (based on panel models), indicate the impact of the financial development, including the development of the banking sector, on economic growth is of paramount importance

and statistical significance. The effects of banking regulations (Basel III) on economic growth matter, too, as proven with reference to a number of economies, including that of Poland.

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