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Banking Sector Development and Economic Growth in Central and Southeastern Europe Countries

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Abstract The aim of this paper is to empirically examine the relationship between banking sector development and economic growth in 16 transition countries in Central and Southeastern Europe in the period from 1995 to 2010. We apply fixed-effects panel model and control for other relevant determinants of economic growth and endogeneity. We measure the level of banking sector development using the amount of bank credit allocated to the private sector as a share of GDP. The second variable for the level of financial sector development is the margin between lending and deposit interest rates. According to our results the amount of bank credit allocated to the private sector, apparently does not speed up economic growth in transition countries. The second variable, interest rate margin is negatively but not significantly associated with economic growth.

Keywords Banking sector development · Economic growth · Central and Southeastern Europe

JEL Classification E44 · G21

Introduction

According to the finance-growth nexus theory financial development promotes economic growth through channels of marginal productivity of capital, efficiency of channeling saving to investment, saving rate and technological innovation Levine (1997). Affecting economic growth through the channels is realized by functions of financial intermediaries. The functions include the provision of means for clearing and settling payments to facilitate the exchange of goods, the provision of a

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mechanism for pooling resources, services and assets, and the subdivision of shares in various enterprises, risk management, resource allocation price information to help coordinate decentralized decision making in various sectors of the economy, and the means to deal with the incentive problems created when one party of a financial transaction has the information that the other party does not, or when one party acts as an agent of the other Merton and Bodie (1995).

In transition countries, the link between financial sector development and economic growth in transition economies seems to be ambiguous at best (Krkoska 2001; Berglöf and Bolton 2002). They note most investment in transition countries has been financed from cash flows and foreign direct investment has substituted domestic financing. Even in central Europe, where financial sectors tend to be better developed than in Southeastern Europe countries, the banks have sometimes concentrated on granting loans to the public sector. The level of loans granted to the private sector is still considerably lower than the EU average. For these reasons, one might infer that emerging domestic financial sectors have only modestly affected economic growth in transition countries.

The aim of this paper is to examine empirically whether relatively larger, more efficient banking sectors play a growth-supporting role in economic growth in transition economies. We concentrate on banking sectors as they typically have dominated financial intermediation in transition countries. We apply the fixed-effects panel model and at a first stage we use the ordinary least squares estimation method. In order to control for endogeneity at the next stage we estimate parameters of the model using the two stage least squares method. In both cases we control for other determinants of economic growth.

The paper is organized as follows. “[Literature Review](#)” highlights literature on theoretical and empirical findings between banking sectors and economic growth. “[Data and Methodology](#)” presents methodology and data, which we incorporate in the analysis. The results of the empirical research are given in “[Empirical Results](#)”. The paper finishes with some concluding remarks and suggestions for the future work that are outlined in “[Conclusion](#)”.

Literature Review

In this section first we present the theoretical research and highlight the most relevant findings in the field of the financial sector (with particular emphasis on the banking sector) and economic development. The theoretical frameworks usually are followed by the empirical investigation of the developed models, so in the first part of the literature review we will highlight both the models and the empirical findings, where they are present. Then we proceed to the empirical studies which for the most part evaluate the impact of the banking sector on economic growth.

Theoretical Studies

In order to explain arguments for the existence of financial intermediaries, the theory of financial intermediation adds specific frictions to models of resource

allocation based on the perfect market. Namely, if there is the perfect market, all the traders are price takers, there is no private information, and allocation of resources is Pareto optimal. Thus, in a pure neoclassical framework there is no role of financial intermediation to add value. But, according to the traditional theory of financial intermediation the real-world market is characterized by frictions that include transaction costs and asymmetric information. Financial intermediaries have an advantage over direct financing in economies of scale that result from costs shared. The reduction in transaction costs, as the main function of financial intermediaries, was first introduced by Gurley (1960). According to the traditional theory of financial intermediation the real-world market is characterized by frictions that include transaction costs and asymmetric information.

In order to show the channels that through financial development affect economic growth we follow Pagano (1993). According to the endogenous growth “AK” model economy produces a single good and aggregate output Y in period t is function of the aggregate capital stock K :

$$Y_t = AK_t \tag{1}$$

with A being marginal productivity of capital. The capital stock in the period t is

$$K_t = I_t - 1 + (1 - \delta)K_{t-1} \tag{2}$$

with I investment that is equal to non-consumed good that depreciate at the rate δ per period. The capital market equilibrium condition requires that gross saving equals gross investment. Since one part of saving $(1 - \varphi)$ is lost in the process of channeling of savings to investment, the funds available for investment are:

$$\varphi S_{t-1} = I_t - 1 \tag{3}$$

The growth rate g at time t is $g_t = (Y_t/Y_{t-1}) - 1 = (K_t/K_{t-1}) - 1$. Using Eqs. (2) and (3) the steady-state growth rate is

$$g = As\varphi - \delta \tag{4}$$

with s symbolizing saving rate (S/Y).

The model shows three channels from financial development to economic growth: the marginal productivity of capital, the proportion of saving funneled to investment, and the savings rate.

Harrison et al. (1999) construct a model in which causality runs both ways between economic growth and financial sector development. Basically, they argue, economic growth increases banking activity and profits, which promotes the entry of more banks. The greater availability of banking services reduces the non-physical and physical distance between banks and client, which, in turn, lowers transaction costs.

The endogenous growth theory argues that a higher savings rate leads to higher economic growth. Generally speaking, the development of the financial sector affects the savings rate in three ways. First, financial markets can reduce idiosyncratic risks and thus lower the level of precautionary saving by households and slow down growth Tsuru (2000). Second, a reduction in the rate-of-return risks

by portfolio diversification has ambiguous effects on saving Tsuru (2000). Third, lowering liquidity constraints in the financial sector may lower the savings rate. For example, Jappelli and Pagano (1994) develop a model in which the younger generation borrows extensively when no liquidity constraints accompany the liberalisation of consumer credit and mortgage markets.

Review of the Empirical Literature

In this section we present a brief sublimite of empirical literature concerning the relationship between development of banking sector and economic growth. For the purposes of our analysis we focus on panel studies because the results are less affected by the specific characteristics of individual countries.

Koivu (2002) examined the link between the banking sector and real GDP growth in transition economies. He used a fixed-effects panel model and data from 25 transition countries for the period 1993–2000. As a measure the level of banking sector development he used the two variables interest rate margin and amount of bank credit allocated to the private sector. He found that the interest rate margin is negatively and significantly associated with economic growth. This has important policy implications: the interest rate margin tends to shrink as reform in the financial sector advances. The second variable apparently does not speed up economic growth in transition countries. Its lagged value is even negatively related to economic growth and the causality between the growth of credit and real GDP growth is unclear. This result contradicts many earlier results and probably reflects the characteristics typical to transition economies, where the growth of domestic credit was often unsustainable.

A study by Tang (2006) examines the impact of banking development of the 14 countries members of APEC in the period 1981–2000. In this study, GDP per capita is a function of: liquid liabilities, assets of commercial banks placed bank loans, capital inflows and outflows and indicator of restrictions on capital flows. The last two indicators are indicators for interaction with depth of the banking sector which aims to assess how the capital flows will be affected on economic growth through banking channels. However, although intuitive, this approach remains theoretical unexplained. The group was used as control variables in the regression standard of growth. The obtained results show that the development of the banking sector significantly affects the economic system in all countries of APEC. However, the interactive indicators of capital flows and credit to the private sector expected positive only in developing countries. Thus, the increase in capital flows (inflows and outflows) and bank loans to GDP ratio by 1 % will cause the GDP per capita to rise by 4.7 %. This ratio may indicate that countries that have low economic growth may affect its acceleration through capital flows, if they have developed a structure of the banking system. For illustration, the developing members of APEC managed to revive economic growth by restructuring the banking sector strengthened by introducing stronger supervisory controls and international standards. However, the increase in capital inflows (not outflows) and bank loans to GDP ratio by 1 % implies a GDP per capita dropped to 5.3 % which makes the study of sensitive checks on the reliability of results.

Dawson (2008) in his study examines the impact of bank development on economic growth of the Group of 44 developing countries for the period 1974–2001. Following the two basic factors of production capital and labor, banking development is added, as measured by M3 monetary aggregate to the GDP ratio. The results suggest that M3 growth by 1 % leads to an increase of the economic growth by 0.10 %. The flaw of this test is that as a measure of development of the banking system is used only one variable, which can be acceptable but questionable from the perspective of the range of channels through which banks can affect growth. On the other hand, the study used some control variables, which can also affect the impartial evaluation of the variable coefficient for banking development.

Data and Methodology

In our research of banking sector development and economic growth nexus, we estimate standard growth equation using a panel (cross-country, time-series) dataset consisting of 16 countries in Central and South-Eastern Europe (Albania, Belarus, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Macedonia, Moldova Poland, Romania, Slovak Republic, Slovenia and Ukraine) over the period of 1995–2010. Data are obtained from various sources. Private credit, interest margin, export, GDP per capita, investment and inflation rate are obtained from World development indicators (WDI) database. Government spending is obtained from the Heritage Foundation. Education is obtained from EdStats, World Bank. The reform index is obtained from Transition report published by the EBRD. Table 1 presents the descriptive statistics for all the variables used in the regressions.

Economic growth is measured by the growth rate of GDP per capita. As noted, development of the financial sector is difficult to measure, but we attempt to get beyond earlier studies that only measure development with a variable for size of the financial sector. Factors that we use as control variables that may explain economic

Table 1 Descriptive statistics

Variable	Mean	Median	Minimum	Maximum	Std. Dev.
Economic growth	3.68945	4.50000	−18.0000	13.3000	5.00396
Private credit	43.1758	43.0000	0.300000	121.000	22.8707
Interest margin	9.30234	6.00000	−27.3000	216.400	18.4860
GDP per capita	6.10333	4.54100	0.321000	27.0330	5.24548
Export	50.5078	50.0000	10.0000	103.000	16.5664
Investment	25.2266	25.0000	9.00000	41.0000	5.51393
Education	91.0273	93.0000	71.0000	108.000	7.54459
Government consumption	49.9035	50.3000	0.100000	85.7000	17.1159
Inflation	21.6719	6.20000	−3.70000	987.100	81.8423
Reform index	2.52051	2.67000	1.00000	3.67000	0.710364

growth include the following: private credit, interest margin, GDP per capita, export, investment, education, government consumption Inflation and Reform index.

Following a similar approach used by Koivu (2002), we use two measures for the level of banking development. The first variable is bank credit to private sector in relation to GDP (private credit). Despite the drawbacks of this variable discussed above, private credit still appears a superior option to the pure ratio of broad money to GDP used in some studies, because it excludes credits by development banks and loans to the government and public enterprises. We expect a positive relationship between private credit and economic growth. The second variable is interest margin measured by the spread between bank's lending and borrowing rate. The interest margin is likely a good estimator for efficiency in the banking sector as it describes transaction costs within the sector. If the margin declines due to a decrease in transaction costs, the share of savings going to investments increases. As growth is positively linked to investment, a decrease in transaction costs should accelerate economic growth. This variable is closely linked to the theoretical model of Harrison et al. (1999). The interest rate margin may also reflect an improvement in the quality of borrowers in the economy. We use the banking variables both current and one period lagged as in (Koivu 2002; Fink et al. 2009).

The next control variable is the initial level of economic development, measured by GDP per capita. This variable is introduced in the model to capture the convergence effect, or the tendency of the economic growth rate to converge across countries. The expected sign of the parameter of the initial level of economic development variable is positive.

The next variable used in our research as a determinant of economic growth is exports. As a measure of exports, we use the exports of goods and services in relation to GDP. Export is one of the factors, considered even in the traditional Keynesian theory that can facilitate economic growth. Empirical studies have confirmed that export positively affects economic growth (Marin 1992; Vohra 2001). We expect that exports are positively related to economic growth.

The following control variable is investment. We follow the common practice for this variable by using gross capital formation (formerly gross domestic investment) as a proxy for investment. Gross capital formation consists of outlays on additions to the fixed assets of the economy plus the net changes in the level of inventors. The expected sign of the coefficient is positive.

A positive sign is also expected for the coefficient of education variable. Education accounts for human capital. Although there are a number of measures of the education variable, in the empirical studies of determinants of economic growth, the most commonly used measures are primary or secondary enrollments. We use the secondary gross enrollment ratio, which indicates ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the level of education shown.

The government has an important role for the establishment of framework for private sector development in every economy. However, numerous theoretical and empirical researches suggest that the larger government consumption the less developed will be the financial system. Therefore, general government consumption

is usually used as a control variable when depicting economic growth (Levine 1998; Berthelemy and Varoudakis 1996; Ahlin and Pang 2008). We measure government expenditure as a ratio of general government expenditures to GDP. We hypothesise negative relationship between government expenditures and economic growth.

The next variable used to control for other influences on economic growth is the inflation rate. It is expressed by the GDP deflator (annual percentage). A number of studies have found significant effects of inflation and reforms on economic growth in transition countries (De Melo et al. 1996; Havrylyshyn et al. 1998; Berg et al. 1999). In addition to macroeconomic variables and variables representing structural reforms, the initial conditions at the beginning of transition also determine later economic development (De Melo et al. 1996; Havrylyshyn et al. 1998). Here, however, we leave out initial conditions as control variables. With this variable, we expect a negative correlation with economic growth.

The reform index (RI) consists of eight indices published by the EBRD. These indices are: large scale privatisation, small scale privatisation, enterprise restructuring, price liberalisation, trade and forex system, competition policy, banking reform and interest rate liberalisation, securities markets and non-bank financial institutions. For each country, we have taken a simple average of these indices for each year. The bigger the index is for a country, the more advanced it is in regard to the reforms in the eight areas. Due to the nature of the reforms, their effects on the economy can be seen with a lag of 1 or 2 years.

Given the cross-sectional and time-series data, we use the country specific fixed effects panel data regression model with common coefficients across all cross-section members of the pool. The general equation to be estimated using pooled least squares is:

$$y_{it} = \alpha_i + x_{it}\beta + u_{it} \tag{5}$$

where y_{it} is a dependent variable, x_{it} is a vector of independent variables, u_{it} is a scalar disturbance term, i indexes country in a cross section, and t indexes time measured in years. Since the error terms u_{it} are potentially serially correlated and heteroskedastic, we propose an autoregressive process of first order: $u_{it} = \rho u_{it-1} + \epsilon_{it}$, where ϵ_{it} is white noise. The model incorporates White's consistent covariance matrix (White 1980), for dealing with heteroskedasticity. In the model, we use one-period lagged regressors.

The model that we use in our research is the fixed-effects model for next specification:

$$\begin{aligned} (\text{GDP growth})_{it} = & \alpha_i + \beta_1(\text{Private credit})_{it} + \beta_2(\text{Interest margin})_{it} \\ & + \beta_3(\text{GDP per capita})_{it} + \beta_4(\text{Export})_{it} + \beta_5(\text{Investment})_{it} \\ & + \beta_6(\text{Education})_{it} + \beta_7(\text{Government spending})_{it} \\ & + \beta_8(\text{Inflation rate})_{it} + \beta_9(\text{Reform index})_{it} + u_{it} \end{aligned} \tag{6}$$

Before running the regression an Im, Pesaran and Shin panel unit-root test, which is based on the Dickey-Fuller procedure, was employed to test the stationarity of the variables in order to avoid the spurious regression. Im, Pesaran and Shin denoted IPS proposed a test for the presence of unit roots in panels that combines

information from the time series dimension with that from the cross section dimension, such that fewer time observations are required for the test to have power. Since the IPS test has been found to have superior test power by researchers in economics to analyze long-run relationships in panel data, we will also employ this procedure in this study. IPS begins by specifying a separate ADF regression for each cross-section with individual effects and no time trend:

$$\Delta y_{it} = \alpha_i + \rho_i y_{i,t-1} + \sum_{j=1}^{p_i} \beta_{ij} \Delta y_{i,t-j} + \varepsilon_{it} \tag{7}$$

where $i = 1, \dots, N$ and $t = 1, \dots, T$

IPS use separate unit root tests for the N cross-section units. Their test is based on the Augmented Dickey-Fuller (ADF) statistics averaged across groups. After estimating the separate ADF regressions, the average of the t -statistics for p_1 from the individual ADF regressions, $t_{iT}(p_i)$:

$$\bar{t}_{NT} = \frac{1}{N} \sum_{i=1}^N t_{iT}(p_i \beta_i) \tag{8}$$

The t -bar is then standardized and it is shown that the standardized t -bar statistic converges to the standard normal distribution as N and $T \rightarrow \infty$. Im, Pesaran and Shin (2003) showed that t -bar test has better performance when N and T are small. They proposed a cross-sectionally demeaned version of both test to be used in the case where the errors in different regressions contain a common time-specific component.

The results of the unit root test are presented in Table 2. While the null hypothesis of the unit-root was rejected for four of the ten variables, the obtained results indicate that there was a unit root in GDP per capita, export, investment and education. To solve the problem of non-stationarity, the series were differenced.

At the first stage the parameters are estimated by using a fixed-effects panel model. Some researchers in empirical literature use this model Koivu (2002) while

Table 2 Panel unit root test—Im, Pesaran and Shin (IPS)

Variable	Im, Pesaran and Shin test	Order of integration
Economic growth	-2.87061	I(0)
Private credit	-0.413572	I(0)
Interest margin	-2.67306	I(0)
GDP per capita	-0.085528	I(1)
Export	-1.52057	I(1)
Investment	-1.72058	I(1)
Education	-1.63101	I(1)
Government consumption	-3.08686	I(0)
Inflation	-7.67748	I(0)
Reform index	-2.33537	I(0)

*, ** and *** indicates test statistic is significant at the 10, 5 and 1 % level

some criticise Wachtel (2001). In his view, fixed effects dominate the equation since the differences in the level of financial sector are larger between countries than over time. However, in transition economies, this is not the case normally. Banking sectors developed quickly and the level of financial development changes substantially over time Koivu (2002). But, the equations estimated above mentioned method ignore the effects in other direction. Since there is a possibility of reverse causality between banking sector development and economic growth, in the next stage we extend the analysis to the estimation by using instrumental variables that accounts for some endogeneity in the explanatory variables. We apply two-stage least squares (2SLS) estimators. As instruments, we use one-period lagged regressors.

Empirical Results

The estimates of the parameters of the models are presented in the following tables. Table 3 presents parameters of panel estimations, while the coefficients estimated by 2SLS are reported in Table 4.

According to the results from Table 3 interest rate margin variable enters negatively in growth equations, but it lacks significance. These results are in line with the theory presented in Harrison et al. (1999), i.e. an efficient banking sector decreases transaction costs and the margin between lending and deposit rates. The share of savings allocated to the investments increases and, according to the endogenous growth theory, leads to higher economic growth.

The amount of credit allocated to the private sector is negatively and significantly associated with economic growth. In contrast to many earlier studies, the amount of credit does not seem to accelerate economic growth. The reason for these results is because soft budget constraints that are prevalent in many transition countries and lending to enterprises applying soft budget constraints may have resulted in counterproductive investments and financial losses. According to Mitchell (2001), banks may even make the situation worse by keeping such loans on their balance sheets. As a result, growth in credit has not been profitable. Another phenomenon linked to the negative coefficient may be a number of banking crises that transition countries experienced in the 1990 s. Unsustainable credit growth precipitated banking crises that hurt transition economies (Tang et al. 2000). Thus, the size of the sector does not correlate with the qualitative development of the financial sector in transition countries.

The coefficients of all others control variables, but GDP per capita and education, have the expected sign.

Regarding coefficients estimated using instrumental variables that account for endogeneity in the explanatory variables, the private credit coefficients are negatively and significantly at 5 % level associated with economic growth, while interest rate margin coefficients have negative signs, but it lacks significance. Regarding the control variables, all of the coefficients, except for GDP per capita, education and reform index, have the expected sign. The results suggest that the effectiveness of the banking sector in funneling financial resources from surplus to deficit units is an important determinant of growth. An efficient banking sector

Table 3 Estimation results—fixed-effects panel regressions using one-period lagged regressors

Variable	Coefficient	<i>P</i> value	
Const	−0.57005 (2.37759)	0.81076	
Private credit	−0.071402 (0.0321132)	0.02731	**
Interest margin	−0.0116733 (0.0246467)	0.63629	
GDP per capita	−1.02693 (0.308261)	0.00103	***
Export,	0.0463247 (0.0688061)	0.50156	
Investment	0.381779 (0.085903)	0.00001	***
Education	−0.0922604 (0.126372)	0.46621	
Government consumption	0.0224152 (0.0264121)	0.39708	
Inflation	−0.0104204 (0.00714648)	0.14638	
Reform index	1.60978 (0.900635)	0.07540	*
Mean dependent var.	3.895536	SD dependent var	4.832539
Sum squared resid.	4,083.294	SE of regression	4.529798
R-squared	0.215930	Adjusted R-squared	0.121368
F(24, 199)	2.283488	<i>P</i> value (F)	0.001054
Log-likelihood	−642.9797	Akaike criterion	1,335.959
Schwarz criterion	1,421.251	Hannan–Quinn	1,370.387
rho	0.198898	Durbin–Watson	1.482211

Standard errors in parentheses. ***, **, * denote statistical significance at the 1, 5, 10 % level

lowers the cost of channeling saving into investments and promotes economic growth. On the other hand the amount of credit and economic growth seems to be much more unclear. The results are in line with those of Koivu (2002).

Conclusion

Using the endogenous growth model and fixed effects models for panel data estimation techniques we examined whether the banking sector contributed to economic growth across a sample of 16 transition countries in Central and Southeastern Europe in the period from 1995 to 2010. We used two variables to measure the level of the banking sector: amount of bank credit allocated to the private sector as a share of GDP and interest rate margin.

Table 4 Estimation results—two-stage least squares using one-period lagged regressors

	Coefficient	<i>P</i> value	
Const	3.74705 (1.79511)	0.03686	**
Private credit	−0.0459855 (0.023722)	0.05256	*
Interest margin	−0.0150681 (0.0197061)	0.44449	
GDP per capita	−0.862006 (0.603953)	0.15350	
Export,	0.0502348 (0.075823)	0.50763	
Investment	0.365282 (0.109143)	0.00082	***
Education	−0.0889645 (0.118458)	0.45264	
Government consumption	0.0238054 (0.0157561)	0.13082	
Inflation	−0.00401855 (0.00601346)	0.50397	
Reform index	−0.114777 (0.590119)	0.84579	
Mean dependent var.	3.895536	SD dependent var	4.832539
Sum squared resid.	4,525.405	SE of regression	4.598560
R-squared	0.131036	Adjusted R-squared	0.094491
F(9, 214)	3.585582	<i>P</i> value (F)	0.000355
Log-likelihood	−654.4937	Akaike criterion	1,328.987
Schwarz criterion	1,363.104	Hannan–Quinn	1,342.758

Standard errors in parentheses. ***, **, * denote statistical significance at the 1, 5, 10 % level

According to our results the amount of bank credit allocated to the private sector, apparently does not speed up economic growth in transition countries. Its value is negatively related to economic growth and the causality between the growth of credit and GDP growth is unclear. This result contradicts many earlier results and probably reflects the characteristics typical to transition economies, where the growth of domestic credit was focused on household lending and had limited impact on lowering enterprise financing constraints.

Our second variable, interest rate margin is negatively but not significantly associated with economic growth. This result is consistent with theoretical models that find banking sector efficiency important for economic growth. This has important policy implications: the interest rate margin tends to shrink as reform in the financial sector advances.

The findings could be suggestive for bank's policy makers. The key is to implement the policies that are going to provide institutional improvements,

encourage competition, and contribute to increasing efficiency, especially in risk management, and product development of banks. Bank should better use their unique position among financial intermediaries regarding the function of providing a mechanism of payment which enables them to collect important information on users of their services. The bank efforts should be helped by institutional reforms, too. Besides those providing for a competitive bank market structure and adequate banking regulation, improvements are needed in the field of forming a public creditor register, the valuation of collateral and creditor rights protection. With all of these improvements, the banking sector would have more potential to contribute to economic growth.

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