Financial Development and Economic Growth: Evidence from Ten New EU Members

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Abstract

This paper reviews the main features of the banking and financial sector in ten new EU members, and then examines the relationship between financial development and economic growth in these countries by estimating a dynamic panel model over the period 1994-2007. The evidence suggests that the stock and credit markets are still underdeveloped in these economies, and that their contribution to economic growth is limited owing to a lack of financial depth. By contrast, a more efficient banking sector is found to have accelerated growth.

Keywords: Financial Development, Economic Growth, Causality Tests, Transition Economies
JEL classification codes: E44, E58, F36, P26

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1. Introduction

The relationship between financial development and economic growth has been extensively analysed in the literature. Most empirical studies conclude that the former, together with a more efficient banking system, accelerates the latter (Levine, 1997, 2005; Wachtel, 2001). Levine (2005) suggests that financial institutions and markets can foster economic growth through several channels, i.e. by (i) easing the exchange of goods and services through the provision of payment services, (ii) mobilising and pooling savings from a large number of investors, (iii) acquiring and processing information about enterprises and possible investment projects, thus allocating savings to their most productive use, (iv) monitoring investment and carrying out corporate governance, and (v) diversifying, increasing liquidity and reducing intertemporal risk. Each of these functions can influence saving and investment decisions and hence economic growth. Since many market frictions exist and 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 other frictions in the economy.

A particularly case is that of the Central and Eastern European countries (CEECs), where reforming the banking sector was the first crucial step towards financial development. From the 1990s foreign banks were allowed to enter the market, and within a decade they held a majority share in most CEEC banks and had turned a heavily regulated industry into a highly competitive one, stimulating economic growth to some extent. Their entry into the market has resulted in considerable benefits for the sector and the economy in general, but they have had to face various challenges deriving mostly from the underdevelopment of key institutional support for banking growth.

Although accession to the European Union (EU) has helped the reform process in the CEE countries, real convergence in terms of real GDP per capita remains a challenge. The present study investigates whether financial development can be instrumental in reducing the gap vis-a-vis the other EU members. Specifically, after reviewing the main features of the banking and financial sectors in these countries, it examines the empirical linkages between financial development and economic growth by estimating a Barro–type growth regression augmented with the inclusion of financial variables using panel data for ten transition countries over the period 1994-2007. As financial development varies considerably across these countries, we split

them into three more homogenous groups: Central and Eastern European countries (CEE-5), Baltic countries (B-3) and Southeastern European countries (SEE-2). We analyse these issues by employing the system GMM method to control for endogeneity and measurement errors and obtain unbiased, consistent and efficient estimates.

The layout of the paper is the following. Section 2 provides a brief review of the literature on the relationship between finance and growth. Section 3 analyses the evolution of the financial and banking sector in ten transition economies. Section 4 discusses the data and the econometric \approach, as well as the panel evidence on the nexus between financial development and economic growth. Section 5 offers some concluding remarks.

2. Literature Review

The relationship between financial development and economic growth is a controversial issue. Some authors consider finance an important element of growth (Schumpeter, 1934; Goldsmith, 1969; King and Levine (1993b), whilst for others it is only a minor growth factor (Robinson, 1952; Lucas, 1988). Schumpeter (1934) sees the banking sector as an engine of economic growth through its funding of productive investment. On the contrary, Lucas (1988) argues that the role of finance has been overstressed.

Goldsmith's paper (1969) was the first to show empirically the existence of a positive relationship between financial development and GDP per capita. King and Levine (1993b) used mostly monetary indicators and measures of the size and relative importance of banking institutions and also found a positive and significant relationship between several financial development indicators and GDP per capita growth. Levine and Zervos (1996) included measures of stock market development and found a positive partial correlation between both stock market and banking development and GDP per capita growth. More precisely, they reported a positive and significant link between liquidity of stock markets and economic growth, but no robust relationship between the size of stock markets and economic growth. Levine et al. (2000) found that the development of financial intermediation affects growth positively, and that cross-countries differences in legal and accounting system largely account for different degrees

of financial development. A positive effect of financial development on economic growth through its sources (capital accumulation and productivity), and even on income inequality and poverty, has also been reported (de Haas, 2001; Levine, 2005).

Only a few studies have focused on the transition economies from Central and Eastern Europe (Bonin and Wachtel 2003, Bonin et al., 2005; Hermes and Lensink, 2000; Berglöf and Bolton, 2002; Kenourgios and Samitas (2007), mostly finding a positive relationship between several financial indicators and economic growth. Hermes and Lensink (2000) provide an overview of the main relevant issues, in particular the role of stock markets in the process of financial intermediation (with an emphasis on the importance of regulation in these markets), and the role of deposit insurance to improve stability of the banking sector. Berglöf and Bolton (2002) find that the link between financial development and economic growth does not appear to be very strong during the first decade of transition, at least when one looks at the ratio of domestic credit to GDP. Kenourgios and Samitas (2007) examined the long-run relationship between finance and economic growth for Poland and concluded that credit to the private sector has been one of the main driving forces of long-run growth.

Fink et al. (2009) investigated the impact of the credit, bond and stock segments in nine EU-accession countries over the early transition years (1996–2000) and compared these to mature market economies and to countries at an intermediate stage. They found that the transmission mechanisms differ, and that financial market segments with links to the public sector (but not to stock markets) contributed to stability and growth in the transition economies. Winkler (2009) reviews the process of rapid financial deepening and the associated vulnerability and risks for the Southeastern European countries. He argues that the strategy of pursuing financial development through the entry of foreign banks does not guarantee financial stability. Finally, a strong consensus has emerged in the last decade that well-functioning financial intermediaries have a significant impact on economic growth (Bonin and Watchel, 2003).

3. The Banking and Financial Sector in the Transition Economies

In the centrally planned economies, money played only a limited role as a medium of exchange. In the banking sector, the central bank combined the standard functions of monetary authorities

with some of those of a commercial bank. Besides, in most economies there were banks specialising in different sectors, namely export trade operations, financing of long-term investment, and the agriculture and food industry. At the time, there was only a state savings bank collecting available resources and household deposits. Thus, banking activities were characterised by segmentation along functional lines. The transactions within the state sector, including those between state-owned production enterprises, involved no monetary payment while households used cash for transactions.

The first step in the transition process for the financial sector was the development of market-oriented financial institutions, banks being the most visible and often the dominant ones. The transition to a market economy started in the CEE countries in 1991 with reforms of the banking sector. In all transition countries, the first step was the abolition of the mono-bank system. New banking legislation was introduced allowing private banks to develop and foreign financial institutions to enter the domestic banking sector. Banks were allowed to operate as universal trade banks, whilst the new Central Bank remained in charge of monetary policy, including exchange rate policy, and monitoring of the newly created banking sector. The new system was very similar to that already existing in EU. Thus, most transition countries experienced a rapid expansion of the banking sector due to the entry of new (foreign) banks and the decline in state ownership.

The transition generated macroeconomic turbulence and made any new bank lending extremely risky. During the 1990s, the increase in non-performing loans led to banking crises in many transition countries. The stock of bad loans evolved partly as a result of the gradual recognition of the quality of existing relationships in state-owned banks (the stock issue), and partly because of continuing bad lending practices (the flow problem) (Bonin and Wachtel, 2003). The privatisation of the state-owned banks and the participation of foreign strategic investors in banking represented effective ways to solve these problems. Thus, progress in the banking sector in the CEE countries has led to a smaller amount of non-performing loans.

Foreign banks have played an important role in the development of the financial system of the CEE countries by increasing credit availability, technology transfers and competition. They have been more innovative in terms of the number and range of new products offered, some of them already available in the foreign banks' home markets. Besides, they have helped consolidate the CEE's banking systems, producing waves of mergers and acquisitions that have decreased the number of banks. The majority of banks in the newly privatised banking sector are in fact foreign –owned.

Financial indicators of the development of the banking sector in several transition economies are shown in Table 1.

Table 1: Main financial indicators of banking sector development

	Total number of banks		Number of foreign owned banks		Asset share of state owned banks (%)		Asset share of foreign owned banks (%)	
Year / Country	1996	2008	1996	2008	1996	2008	1996	2008
Bulgaria	49	30	3	22	82.2	2.07	29.3	83.9
Czech.Rep	53	36	3	14	69.9	2.3	19.0	85.8
Estonia	15	17	4	15	6.6	0.0	1.6	98.2
Hungary	42	39	26	25	15.3	3.5	46.2	84.0
Latvia	34	27	18	16	6.9	4.5	51.5	65.7
Lithuania	12	17	3	5	54.0	0.0	28	92.1
Poland	81	70	28	60	51.6	18.3	16	76.5
Romania	31	32	10	27	80.9	5.6	10.7	87.7
Slovakia	29	26	14	16	54.2	0.8	12.7	99.2
Slovenia	36	24	4	11	40.7	15.4	5.3	31.1

Source : EBRD

As can be seen, the majority of banks have been privatised and foreign banks hold the largest share of assets. This has increased sharply in the past decade in all transition countries, while the level of state ownership has fallen below 20 % in each country. Thus, the influence of the state-owned banks has declined substantially. In 2008, no state-owned bank existed any longer in

Estonia and Lithuania. The entry of foreign banks into the local market had a positive influence by increasing competition and efficiency of the banking system, encouraging better regulation of the financial sector in the form of banking supervision, and enhancing access to international capital. In addition, the higher efficiency of foreign banks has stimulated economic growth, and the participation of foreign strategic investors in banking is an effective way to avoid bad loans.

Almost all transition countries have experienced a decline in the number of banks. For example, in Bulgaria this has fallen from 49 in 1996 to 30 in 2008. Many smaller banks became insolvent owing to stricter regulations for banking supervision. An exception is Lithuania, where the number of banks increased from 12 in 1996 to 17 in 2008.

3.1 Liquid Liabilities

The ratio of liquid liabilities to GDP is an indicator of the size of the financial sector. The highest monetisation ratios are found in Slovakia (53% in 2008). Romania has recorded a decline in this ratio (from 46% in 1991 to 34% in 2008) and has now the lowest one. Generally, the ratio of broad money to GDP is at least 60% in high-income countries with developed banking sectors. Thus, the banking sectors in the transition economies cannot be considered to be highly developed with a few exceptions.

3.2 Private sector lending growth

Most transition countries have recorded high private sector lending growth in recent years. This expansion of credit has been a feature of the transition countries, foreign banks being the main source of credit for the private sector (see Table 2).

Table 2. The evolution of the ratio of private sector credit to GDP (in percent)

Year / Country	2000	2001	2002	2003	2004	2005	2006	2007	2008
Bulgaria	12.5	14.8	19.4	26.7	35.2	42.9	47.1	62.8	71.7
Czech.Rep	44.0	33.0	29.4	30.7	31.6	35.8	40.0	41.0	47.3
Estonia	23.3	24.3	26.0	30.7	39.7	57.0	78.2	86.1	91.7
Hungary	29.9	30.9	33.6	41.0	44.6	49.8	54.1	59.5	67.3
Latvia	21.5	26.3	29.5	40.2	50.8	68.2	87.5	88.3	90.1
Lithuania	11.3	13.5	16.2	22.9	28.8	41.3	50.6	60.4	63.0
Poland	26.9	28.0	28.2	29.2	27.5	29.2	33.4	44.6	55.0
Romania	7.2	8.7	10.1	13.7	15.7	20.0	26.1	35.6	38.5
Slovakia	43.7	33.0	30.8	31.6	30.1	34.7	38.6	42.4	44.7
Slovenia	36.7	38.8	38.6	41.3	48.1	56.4	65.9	78.8	85.2

Source: EBRD

Empirical studies suggest a positive relationship between credit to the private sector and per capita income in the transition economies (Cottarelli et al., 2005). However, the banking system in the CEE countries appears to be more and more dependent on the activities of foreign banks. These, mainly from the EU countries, control the majority of assets and capital flows in the financial markets. Their entry has indeed boosted economic growth, enhanced competition and contributed to attract foreign direct investment. However, the lack of effective anti-trust legislation and mergers and acquisitions can lead to excessive concentration, while anti-competitive practices and abuse of dominant position may also occur. In most CEE countries the financial architecture has converged towards a bank-based system with substantial foreign ownership.

3.3 Household lending growth

Another feature of the transition economies was the rapid growth of consumer credit resulting from an increase of public confidence in the banking sector as well as in per capita income. Currently, the main business in the banking sector is indeed consumer credit (including credit

cards and mortgage loans). Its growth also reflects the anticipation of higher future income and "consumption smoothing". However, this contributes to widening current account deficits through increased demand for imported consumer goods and currency appreciation. One of the reasons for the boom in consumer lending is the relative unattractiveness of wholesale lending owing to institutional weaknesses, above all the poor functioning of the legal system. Table 3 gives some information about the evolution of household lending growth.

Table 3 Evolution of credit to households in percent of GDP

Year / Country	2000	2001	2002	2003	2004	2005	2006	2007	2008
Bulgaria	2.1	2.8	3.7	7.1	10.0	14.4	16.6	23.0	26.0
Czech.Rep	5.6	5.9	7.3	9.1	11.2	13.8	16.5	20.0	22.3
Estonia	7.1	8.4	10.6	14.3	19.7	28.1	38.2	43.3	46.9
Hungary	3.2	4.7	7.4	10.9	12.8	15.6	18.5	21.7	27.4
Latvia	3.3	4.6	7.3	11.6	17.6	26.8	38.0	42.7	39.2
Lithuania	1.3	1.5	2.4	4.2	7.1	12.0	17.9	24.4	24.4
Poland	7.5	8.7	9.4	10.3	10.6	12.4	15.6	20.0	27.0
Romania	1.2	1.7	1.9	3.8	4.8	7.2	11.2	17.7	18.8
Slovakia	4.7	5.1	5.5	7.0	8.6	11.2	13.1	16.3	18.5
Slovenia	11.3	10.9	10.5	10.8	12.2	14.8	17.0	19.2	19.9

Source: EBRD

Widening current account imbalances are a concern for policy-makers, and measures might be necessary to slow down the growth in credit to households and to allocate more resources to productive investments. At the same time, the financial infrastructure should be improved as creditors need protection through the enforcement of bankruptcy and insolvency legislation meeting international standards. In addition, improving corporate governance and providing better credit information might help banks channel resources towards the productive corporate sector.

3.4 Stock market capitalisation

The market capitalisation ratio measures the size of the stock market and is equal to the value of listed domestic shares divided by GDP. Stock market capitalisation in the transition countries grew due to the privatisation process. However, the development of the stock market was affected by the economic and financial crisis that the transition economies have experienced. At the end of 2008, these countries still displayed different levels of stock market development, its capitalisation ranging from 5.4 % to 23.5 % in the countries covered in this study, being at its lowest in Slovakia and at its highest in Slovenia (see Table 4) .

Table 4 Evolution of stock market capitalisation in percent of GDP

Year / Country	2000	2001	2002	2003	2004	2005	2006	2007	2008
Bulgaria	4.8	3.7	4.2	7.9	10.4	19.7	31.1	48.2	17.8
Czech.Rep	18.9	14.1	19.4	17.6	24.5	31.6	31.6	37.4	17.9
Estonia	31.5	24.1	29.9	38.4	47.1	25.2	34.6	25.9	8.6
Hungary	25.1	18.7	17.2	18.3	25	31.6	33.8	32.5	13.0
Latvia	7.3	8.4	7.3	9.5	11.5	16.5	12.9	10.2	5.0
Lithuania	13.9	9.9	9.3	16.9	26.1	31.7	32.6	24.2	8.0
Poland	17.4	13.2	13.6	16.5	23	31.1	40.9	43.6	21.0
Romania	3.4	5.8	10.1	9.2	13.9	22.2	24.4	26.6	11.0
Slovakia	6.3	7.4	6.8	7.4	9.4	9.4	8.8	7.7	5.4
Slovenia	16.8	16.8	24.1	22.5	26.2	22	37.2	57.5	23.5

Source: EBRD

Despite an upward trend, the figures still remain below the corresponding ones for the EU developed economies. Capital market development is complicated by the need to support the development of institutional infrastructure and regulatory mechanisms. Overall, there has been significant progress in the banking sector, as also indicated by the EBRD index of banking sector reform (see Table A2 in the Appendix).

4. Financial Development and Economic Growth: Empirical Analysis

In this section, we analyse the linkages between financial development/efficiency and economic growth using panel data for ten transition countries during the period 1994-2007. First, we estimate the impact of financial indicators over the whole sample. Second, we split the data into subpanels corresponding to three more homogenous groups of countries and compare the results.

4.1 The Model

To study the relationship between finance and growth we estimate an augmented Barro-growth regression including financial development variables which takes the following form:

$$GROWTH_{i,t} = \alpha_i + \beta_i [FINANCE]_{i,t} + \gamma_i [CONDITIONINGSET]_{i,t} + \varepsilon_{i,t} \quad (1)$$

or

$$g_{i,t} = y_{i,t} - y_{i,t-1} = \alpha_i + \beta_i f_{i,t} + \gamma_i C_{i,t} + \mu_i + \varepsilon_{i,t} \quad (2)$$

where y is real GDP per capita, $g_{i,t}$ its growth rate, $f_{i,t}$ an indicator of financial development, $C_{i,t}$ a set of conditioning variables, μ_i and $\varepsilon_{i,t}$ error terms, i (where i = 1,2…,.N) the observational unit (country), and t (where t =1,2,…,T) the time period, while ε is a white noise error with zero mean, and μ a country-specific component of the error term that does not necessarily have a zero mean. The parameter α_i is the country-specific intercept which may vary across countries.

One important issue concerning the link between financial sector development and growth is the difficulty to identify proxies for measuring them. Beck et al. (2000) discuss different indicators of financial development capturing the size, activity and efficiency of the financial sector, institutions or markets. In our analysis, we consider several indicators, namely: the ratio of credit to the private sector to GDP as a measure of financial depth; indicators of the size of stock markets as stock market capitalisation (as a percentage of GDP); monetisation variables such as the ratio of broad money to GDP as a measure of the size of the financial sector; indicators of the efficiency and competitiveness of the financial system such as the margin between lending

and deposit interest rates and the EBRD transition index of financial institutional development. Details are provided below.

Activity of the financial sector:

- The ratio of credit to the private sector to GDP (DCPS), which is the value of loans made by banks to private enterprises and households divided by GDP, is used as a measure of financial depth and banking development. This indicator isolates credit issued by banks, as opposed to credit issued by the central bank, and credit to enterprises, as opposed to credit issued to governments (Levine and Zervos, 1996).

Size of the financial sector

- The stock market capitalisation to GDP ratio (STMC), which is an indicator of the size of the financial sector given by the market value of listed shares divided by GDP. Although large markets do not necessarily function effectively and taxes may distort incentives to list on the exchange, the market capitalisation ratio is frequently used as an indicator of market development.

- Liquid liabilities to GDP ratio (LLG), which equals liquid liabilities of the financial system divided by GDP. It is used as a measure of "financial depth" and thus of the overall size of the financial intermediation sector (King and Levine,1993a).

Efficiency of the financial sector

- The interest rate margin (INT), which measures the difference between deposit and lending rates in the banking market is used to measure the efficiency of the sector.

Levine (1997) suggested several possible indicators for economic growth: real per capita GDP growth, average per capita capital stock growth and productivity growth. Here we use real per capita GDP growth. Other variables influencing economic growth were introduced in our model, including per capita income, average education, political and stability indicators as well as

indicators reflecting trade, fiscal and monetary policy such as government consumption or trade openness and inflation.

In the estimation we used real GDP per capita with a one-year lag as initial income per capita to control for the steady-state convergence predicted by the neoclassical growth model. For human capital, we introduced a proxy for educational attainment, more precisely the secondary school enrollment ratio whose expected influence on growth is positive through its effect on productivity. International trade openness is proxied by an international trade policy variable, i.e. the trade to GDP ratio, with an expected positive coefficient. Higher openness enhances growth through higher competition and technological progress (see Winter, 2004). Inflation measures the degree of uncertainty about the future market environment, firms becoming more reluctant to make long-run commitments in the presence of higher price variability; the expected sign of this variable is therefore negative.[1]

The estimated model, which includes a proxy for financial development, is the following:

$$RGDPC_{i,t} = \alpha_i + \beta_1 RGDPC_{i,t-1} + \beta_2 INV_{i,t} + \beta_3 TOP_{i,t} + \beta_4 INFL_{i,t} + \beta_5 GVE_{i,t} + \beta_6 HC_{i,t} + \\ + \beta_7 DCPS_{i,t} + \beta_8 STMC_{i,t} + \beta_9 LLG_{i,t} + \beta_{10} RI_{i,t} + \beta_{11} INT_{i,t} + u_i + \varepsilon_{i,t} \quad (3)$$

where: RGDPC = real per capita GDP growth; RGDPC = initial income per capita; INV = investment/GDP (percentage); TOP = trade/GDP (percentage); INFL = inflation, average consumer prices; GVE = government expenditure/GDP; HC = secondary school enrollment ratio; DCPS = domestic credit to the private sector (as a percentage of GDP); STMC = stock market capitalisation (as a percentage of GDP); LLG = liquid liabilities (as a percentage of GDP); RI = Reform index of financial institutional development (which is the average of the EBRD's indices of banking sector reform and of reform of non-bank financial institutions); INT = interest rate margin.

[1] Other studies on the finance-growth nexus for the transition economies including inflation as a conditioning variable are: Rousseau and Wachtel, 2002; Gillman and Harris, 2004.

4.2 Data

Our panel consists of data for ten transition countries from Central and Eastern Europe over the period 1994-2007. The data are annual and the countries included in the sample are: Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia. We also carry out the analysis for three more homogeneous sub-groupings: (a) the Baltic countries (B-3): Estonia, Latvia and Lithuania; (b) the CEE-5: the Czech Republic, Hungary, Poland, Slovakia and Slovenia; (c) Southeastern Europe (SEE-2): Bulgaria and Romania. The data were obtained from the EBRD database and the International Monetary Fund (IFS). For more details on data sources and definitions, see the Appendix.

4.3 Methodology

The most common methods for investigating the finance-growth nexus are cross-country regressions and panel data techniques. Note that the estimates of β_i (financial development indicators) can be biased for a variety of reasons, among them measurement error, reverse causation and omitted variable bias. Therefore, a suitable estimation method should be used in order to obtain unbiased, consistent and efficient estimates of this coefficient. To deal with these biases, we use dynamic panel regressions with lagged values of the explanatory endogenous variables as instruments. Such methods have several advantages over cross-sectional instrumental variable regressions. In particular, they control for endogeneity and measurement error not only of the financial development variables, but also of other explanatory variables. Note also that, in the case of cross-section regressions, the lagged dependent variable is correlated with the error term if it is not instrumented (see Beck, 2008).

The dynamic panel regression takes the following form:

$$g_{i,t} = \alpha_i + \beta f_{i,t} + \gamma_1 C^1_{i,t} + \gamma_2 C^2_{i,t} + \delta y_{i,t-1} + \mu_i + \lambda_t + \varepsilon_{i,t} \qquad (4)$$

where C^1 represents a set of exogenous explanatory variables, C^2 a set of endogenous explanatory variables, and λ a vector of time dummies.

In our analysis, we employ the system GMM estimator developed by Arellano and Bover (1995), which combines a regression in differences with one in levels. Blundell and Bond (1998) present Monte Carlo evidence that the inclusion of the level regression in the estimation reduces the potential bias in finite samples and the asymptotic inaccuracy associated with the difference estimator.

The consistency of the GMM estimator depends on the validity of the instruments used in the model as well as the assumption that the error term does not exhibit serial correlation. In our case, the instruments are chosen from the lagged endogenous and explanatory variables. In order to test the validity of the selected instruments, we perform the Sargan test of over-identifying restrictions proposed by Arellano and Bond (1991). In addition, we also check for the presence of any residual autocorrelation.

4.4 The estimation results

The dynamic panel regressions were run both for the ten transition economies as a whole and the three subgroupings mentioned before. The estimation results are presented in Tables 5 and 6.

Table 5: The financial development and economic growth nexus: dynamic panel regression

Variables	(1) RGDPC	(2) RGDPC
L.RGDPC	0.229	0.201
	(3.40)***	(4.62)***
INV	0.292	0.342
	(4.50)***	(5.50)***
TOP	0.015	0.011
	(2.21)**	(2.33)**
INFL	-0.008	-0.006
	(3.59)***	(4.01)***
GVE	-0.057	-0.066
	(2.56)**	(5.66)***
HC	0.018	0.020
	(3.61)***	(3.61)***
DCPS		0.007
		(0.23)
STMC		0.004
		(2.95)***
LLG		0.013
		(2.42)**
RI		0.493
		(1.82)*
INT		-0.027
		(5.64)***
Constant	0.070	-0.059
	(2.84)***	(0.58)
Observations	140	140
Arellano-Bond AR(2)	-0.17	0.15
Prob > z	(0.867)	(0.878)
Sargan test chi2	27.45	30.94
Prob > chi2	(0.237)	(0.156)
Absolute value of z statistics in parentheses		
* significant at 10%; ** significant at 5%; *** significant at 1%		

The first regression represents a standard growth equation with the GDP per capita growth rate as an endogenous variable. The results suggest that capital accumulation, i.e. investment, is the most relevant determinant of the growth process. As expected, human capital and trade openness have a positive and significant impact on economic growth, the former through improved

productivity, and the latter (resulting from the signing of regional agreements) through higher competition and technological progress.

To analyse the link between financial sector development and economic growth we added to the standard growth regression (1) three financial indicators, i.e. the ratio to GDP of private credit, liquid liabilities and stock market capitalisation respectively. We find that credit to the private sector has a positive but insignificant effect on economic growth, possibly as a result of the numerous banking crises caused by the large proportion of non-performing loans (and thus unsustainable credit growth) at the beginning of the transition process in the countries of Central and Eastern Europe. However, credit granted to private companies is essential for financing investment projects, which in turn affect positively long-run growth.

Further, the stock market capitalisation to GDP ratio has a positive but minor effect on economic growth. Despite an upward trend for this indicator in the CEE countries during the period being investigated, their stock markets still have a small size, and it is therefore very important to attract foreign investors. The ratio of liquid liabilities as a proportion of real GDP has a positive and significant coefficient, consistently with the idea that money supply helps growth by facilitating economic activity.

As the size of the financial sector by itself might not be sufficient to estimate the role of financial development in the growth process, we added to the model two indicators of financial efficiency: the interest margin rates between the lending and deposit as a measure of efficiency in the banking sector, and the EBRD index of institutional development which measures the progress in reforming the financial sector. The former variable measures transaction costs within the sector but may also reflect an improvement in the quality of borrowers in the economy. If the margin declines due to a decrease in transaction costs, the share of saving going to investment increases and economic growth accelerates. Both these variables appear to be highly significant (see column (2) of Table 5). The margin between lending and deposit interest rates is negatively correlated with economic growth, consistently with theory (see Harrison et al., 1999). This means that a shrinking interest margin rate can increase economic growth. In all transition

countries from Central and Eastern Europe efficiency increased over time but reached different levels (see Table A3 appendix), depending on the privatisation methods and the influence of more efficient foreign banks (Bonin et al., 2005). The other financial efficiency indicator, i.e. the EBRD index, has a positive effect, implying that reforms in the banking and financial sector such as market regulation and monitoring, increase economic growth.

The results for the three subgroups are reported in Table 6. The private credit to GDP ratio is found to have a positive but insignificant effect in all three groups. As for stock market capitalisation, this has a positive, small effect in the case of the CEE-5 countries, and a still positive but insignificant one in the SEE-2 and B-3 countries. In the former group the stock market expanded more rapidly due to early privatisation and the entry of foreign investors, but it is still relatively underdeveloped.

Table 6: The financial sector and economic growth nexus in the tree subgroups: dynamic panel regression

Subgroup / Variables	CEE-5	B-3	SEE-2
	(1)	(2)	(3)
	RGDPC	RGDPC	RGDPC
L1.RGDPC	0.236	0.045	-0.083
	(2.69)***	(0.33)	(0.65)
INV	0.181	0.032	0.089
	(5.85)***	(1.70)*	(6.99)***
TOP	0.025	0.221	0.023
	(3.31)***	(3.96)***	(0.47)
INFL	-0.004	-0.003	-0.016
	(1.84)*	(1.67)*	(2.70)***
GVE	-0.023	-0.034	-0.237
	(1.86)*	(0.68)	(3.30)***
HC	0.022	0.142	0.078
	(2.42)**	(2.97)***	(1.74)*
DCPS	0.042	0.014	0.058
	(1.70)	(0.79)	(1.05)
STMC	0.010	0.015	0.002
	(2.61)**	(0.68)	(1.31)
LLG	0.008	0.006	0.002
	(2.10)**	(2.44)**	(1.81)*
RI	1.046	0.634	0.311
	(4.74)***	(2.62)**	(2.17)**
INT	-0.031	-0.011	-0.067
	(2.85)**	(2.33)**	(4.89)***
Constant	0.098	-0.252	0.267
	(2.31)**	(1.20)	(1.50)
Observations	70	42	28
Arellano-Bond AR(2)	-0.57	0.15	-1.30
Prob > z	(0.570)	(0.878)	(0.193)
Sargan test chi2	10.45	30.94	7.65
Prob > chi2	(0.235)	(0.156)	(0.364)
Absolute value of z statistics in parentheses			
* significant at 10%; ** significant at 5%; *** significant at 1%			

The index of financial institutional development also has a positive effect in all three groups, especially so in the CEE-5, followed by the B-3 and the SEE-2, reforms of the financial system being more advanced in the two former groups. Monetisation is also significantly and positively correlated with real per capita GDP growth in all three cases. In most high-income countries with developed banking sectors, the ratio of broad money to GDP is at least 60 percent (Bonin and Wachtel, 2003). In the transition countries, the highest monetisation ratio in 2007 is found in Slovenia (75.4), and the lowest in Romania (36.6). The degree of monetisation can be seen as an indicator of macroeconomic stability, which represents an incentive for foreign investors.

The efficiency of the banking sector has an important role in economic growth. This indicator is negatively correlated with economic growth in all cases. Achieving higher efficiency remains a challenge for these three groups of countries. The CEE-5 have recorded an increase of this indicator due to the early privatisation of the banking sector and the entry of foreign banks. The SEE-2 countries instead have started privatisation later and seen high interest rate margins during the transition period (for example, 20.8 in Romania in 2000 in comparison with 7.2 in Poland and 2.1 in Hungary). Overall, underdevelopment of the stock and credit markets, and therefore lack of financial depth, remains one of the main features of these countries compared with the other EU countries.

6. Conclusions

In this paper we have reviewed the main features of the banking and financial sector in ten new EU members, and then investigated the relationship between financial development and economic growth in these economies by estimating a dynamic panel data model over the period 1994-2007. To summarise, financial depth is found to be lacking in all ten countries, and therefore the contribution of the relatively underdeveloped credit and stock markets to growth has been rather limited, with only a minor positive effect of some indicators of financial development. This might be a consequence of the large stock of non-performing loans and the banking crises experienced by these economies at the beginning of the transition period. In general, the CEE-5 have more developed financial sectors than the B-3 and SEE-2 countries. By

contrast, the implementation of reforms, the entry of foreign banks and the privatisation of state-owned banks have reduced transaction costs and increased credit availability. This has improved the efficiency of the banking sector, which has played an important role as an engine of growth. Better regulation and supervision was partly motivated by the European integration process and the need to adopt EU standards. Thus, many of the banking sector weaknesses traditionally characterising emerging markets have gradually been eliminated. Given the prospect of EU accession, foreign banks, mainly from the euro area, seized the opportunity and established subsidiaries in all CEE countries, seeing them as an extension of the common European market and becoming dominant players in their banking sectors.

However, the massive presence of foreign banks has also increased contagion risks, and the consolidation process (with the majority of banks being foreign–owned) could limit competition. Thus, a financial crisis produced in the mature markets of the euro area could also reach the CEE countries. A strategy of financial development based on foreign entry from the anchor currency area is no guarantee for a smooth process of finance and growth, an example being the current crisis which started in the mature economies in the summer of 2007 and caused a sudden stop of capital flows to Southeastern Europe (Winkler, 2009).

Overall, the underdevelopment of stock and credit markets, with the consequent lack of financial depth, remains one of the main features of these economies. However, elements of market-oriented intermediation are now the rule rather than the exception throughout them and appropriate policies can reduce financial sector instability that could impair growth. The adoption of the euro could have a further positive impact on financial development and economic growth in these countries, but this issue is beyond the scope of the present paper.

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APPENDIX A

Table A1: List of variables

VARIABLE (series)		Source
CODE	**NOM**	
DCPS	Domestic credit to private sector (in per cent of GDP)	EBRD database
GVE	General government expenditure to GDP	EBRD database
HC	Secondary school enrollment ratio	UNESCO database
INFL	Inflation, average consumer prices	IMF database
INV	Investment/GDP (in per cent)	EBRD database
INT	Interest margin rates between lending and deposit (in per cent)	Authors' calculation using EBRD database
LLG	Liquid Liabilities (in per cent of GDP)	EBRD database
RGDPC	Real GDP per capita growth	Authors' calculation using EBRD database
RI	Reform index of financial institutional development	Authors' calculation using EBRD database
STMC	Stock market capitalisation (in per cent of GDP)	EBRD database
TOP	Trade openness to GDP	EBRD database

Table A2. EBRD indicators of reform

Indicator	EBRD index of banking sector reform		EBRD index of reform of non-bank financial institutions	
Year / Country	1996	2008	1996	2008
Bulgaria	2.0	3.7	2.0	3.0
Czech.Rep.	4.3	4.3	2.7	3.0
Estonia	4.0	4.0	2.0	3.7
Hungary	4.3	4.0	3.0	4.0
Latvia	4.0	4.0	2.0	3.0
Lithuania	4.0	4.3	2.0	3.3
Poland	4.3	4.3	2.7	3.7
Romania	3.0	3.3	1.0	3.0
Slovakia	4.3	4.3	3.0	3.0
Slovenia	4.3	4.3	2.0	3.0

Source EBRD

Table A3 : Interest rate margin (%)

Year / Country	2000	2001	2002	2003	2004	2005	2006	2007	2008
Bulgaria	8.4	8.2	6.6	5.9	5.8	4.9	4.9	6.3	6.4
Czech.Rep	3.8	6.1	4.8	4.8	4.8	4.5	4.3	4.6	3.8
Estonia	2.1	5.6	2.9	2.7	4.1	6.2	3.6	4.2	5.1
Hungary	2.9	2.6	2.3	2.5	1.9	2.2	1.8	2.0	2.4
Latvia	7.7	5.5	2.3	2.4	4	2.7	3.7	3.8	4.8
Lithuania	9.7	7.4	5.8	4.8	5.4	5.3	5.2	1.5	0.8
Poland	7.2	8.8	7.4	6.7	7.4	4.2	4.1	4.5	3.6
Romania	20.8	19.5	16.2	14.4	14.1	13.2	9.2	6.7	5.5
Slovakia	4.5	5	3.6	3.2	5	4.3	4.1	4.3	2.0
Slovenia	5.7	5.3	5	4.8	4.9	4.6	4.6	2.5	3.0

Source: EBRD