

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



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Introduction

- Relationship between financial development and economic growth extensively analysed in the literature, e.g. Levine 1997 and 2005, Wachtel, 2001. Some channels:
 - Provision of payment services
 - Mobilising and pooling savings
 - Information about enterprises and investment projects (better allocation of savings)
 - More liquidity and diversification, less risk
- Central and Eastern European countries (CEECs): reform of banking sector first step towards financial development, slow process, real convergence still under way. Barro-type growth regressions with financial variables for a panel of 10 countries, 1994-2007, to examine finance-growth nexus.



Structure of the presentation

- Literature Review
- Banking and Financial Sector in the CEECs
- Econometric Analysis
- Empirical Results
- Conclusions



Literature Review (CEECs)

- Only a few studies. Positive link generally found (Bonin and Wachtel 2003, Bonin et al. 2005, etc.)
 - Hermes and Lensink (2000): role of stock markets in financial intermediation and deposit insurance for banking stability
 - Fink et al. (2009): credit, bond and stock segments in CEECs and mature economies, different transmission mechanisms, links to public sector important in transition economies
 - Winkler (2009): financial development through entry of foreign banks can create instability
 - Bonin and Wachtel (2003): impact of financial intermediaries on growth



Banking and Financial Sector in the CEECs

- In centrally planned economies central banks also had some functions of commercial banks. First step in the transition process was banking legislation allowing private (including foreign) banks
- Macro instability and bad loans leading to banking crises
- Privatisation of state-owned banks and entry of foreign banks reduced non-performing loans

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 (%)	
	1996	2008	1996	2008	1996	2008	1996	2008
Year								
Country								
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

- Most banks privatised and foreign banks holding largest share of assets
- Generally a decline in the number of banks

Table 2

Private Sector Credit to GDP Ratio

Increasing, positively related to per capita income
(Cottarelli et al., 2005)

Country \ Year	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



Table 3

Credit to Households as a % of GDP

- Sharp increase, main business in banking sector
- Widening current account deficit

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

Table 4

Stock Market Capitalization as a % of GDP

- Upward trend, but still below corresponding figures for developed EU economies

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



Econometric Analysis

- Barro-type growth regression:

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

or

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

y: real GDP per capita

g: growth rate

f: indicators of financial development

C: set of conditioning variables

ε and μ : error terms



Financial proxies

- Activity of the financial sector: ratio of credit to the private sector to GDP (DCPS), i.e. value of loans made by banks to private enterprises and households divided by GDP.
- Size of the financial sector: stock market capitalisation to GDP ratio (STMC), i.e. market value of listed shares divided by GDP.
- Financial depth: liquid liabilities to GDP ratio (LLG), i.e. liquid liabilities of the financial system divided by GDP.
- Efficiency of the financial sector: interest rate margin (INT), i.e. difference between deposit and lending rates.



Estimated model

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

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 enrolment 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 (average of the EBRD's indices of banking sector reform and of reform of non-bank financial institutions); INT = interest rate margin.



Data

Panel with 10 CEECs, 1994-2007.

Annual data for: Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia.

Also 3 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.

Data sources: EBRD database and IMF's IFS.



Dynamic Panel Regression

$$g_{i,t} = \alpha_i + \beta f_{i,t} + \gamma_1 C_{i,t}^1 + \gamma_2 C_{i,t}^2 + \delta y_{i,t-1} + \mu_i + \lambda_t + \varepsilon_{i,t}$$

- Advantages over cross-section regressions: control for endogeneity and measurement errors
- System GMM estimator (Arellano and Bover, 1995)
- Consistency depends on validity of instruments. Here lagged endogenous and explanatory variables. Sargan test of over-identifying restrictions.

Empirical Results/1

Variables	(1)	(2)
	RGDPC	RGDPC
L.RGDPC	0.229 (3.40)***	0.201 (4.62)***
INV	0.292 (4.50)***	0.342 (5.50)***
TOP	0.015 (2.21)**	0.011 (2.33)**
INFL	-0.008 (3.59)***	-0.006 (4.01)***
GVE	-0.057 (2.56)**	-0.066 (5.66)***
HC	0.018 (3.61)***	0.020 (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 (2.84)***	-0.059 (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%		



Empirical Results/1

- Investment main driver of growth
- Positive effect of human capital and trade openness
- Minor positive effect of stock market capitalization, positive effect of liquid liabilities to GDP ratio, negative effect of interest rate margin, positive effect of EBRD index of institutional development

Empirical Results/2

Subgroup	CEE-5	B-3	SEE-2
	(1)	(2)	(3)
Variables	RGDPC	RGDPC	RGDPC
L1.RGDPC	0.236 (2.69)***	0.045 (0.33)	-0.083 (0.65)
INV	0.181 (5.85)***	0.032 (1.70)*	0.089 (6.99)***
TOP	0.025 (3.31)***	0.221 (3.96)***	0.023 (0.47)
INFL	-0.004 (1.84)*	-0.003 (1.67)*	-0.016 (2.70)***
GVE	-0.023 (1.86)*	-0.034 (0.68)	-0.237 (3.30)***
HC	0.022 (2.42)**	0.142 (2.97)***	0.078 (1.74)*
DCPS	0.042 (1.70)	0.014 (0.79)	0.058 (1.05)
STMC	0.010 (2.61)**	0.015 (0.68)	0.002 (1.31)
LLG	0.008 (2.10)**	0.006 (2.44)**	0.002 (1.81)*
RI	1.046 (4.74)***	0.634 (2.62)**	0.311 (2.17)**
INT	-0.031 (2.85)**	-0.011 (2.33)**	-0.067 (4.89)***
Constant	0.098 (2.31)**	-0.252 (1.20)	0.267 (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%			



Empirical Results/2

Small positive effect of stock market capitalization in CEE-5

Positive effect of EBRD index, especially in CEE-5, followed by B-3 and SEE-2

Positive effect of monetisation

Important role for efficiency of banking sector



Conclusions/1

- Review of Banking and Financial Sector and econometric analysis (dynamic panel regression) of Finance-Growth nexus in 10 CEECs, 1994-2007
- Lack of financial depth, small contribution to growth of credit and stock market
- But more financial intermediation conducive to growth
- CEE-5 more developed than B-3 and SEE-2
- Reforms, entry of foreign banks and privatisation improved efficiency of banking sector and increased growth



Conclusions/2

But foreign banks increased contagion risks and consolidation reduced competition

Policies to reduce financial instability

Adoption of the euro could stimulate growth further