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Markus Neimke

**Financial Development and
Economic Growth in
Transition Countries**

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Financial Development and Economic Growth in Transition Countries

Abstract:

To explain the growth dynamics in the transition economies of Eastern Europe and the former Soviet Union the relative importance of different monetary variables is analysed. A theoretical as well as an empirical approach are employed to make predictions about how financial development will affect economic growth. In a simple growth model it is shown that enhanced financial market development should increase the overall growth rate unambiguously.

The empirical analysis, following approaches conducted for industrial and developing countries, includes a wide set of indicators, each of them capturing different aspects of financial development. Actually, on the basis of different econometric estimations a significant growth impact of financial development is identified for the economies under study. Beside increasing investment, total factor productivity has to be considered as an important transmission channel, which is influenced by financial development.

JEL-Klassifikation: C21, C23, E44, O11, O16, P21, P24.

Keywords: Growth, financial markets, estimation

1. INTRODUCTION

Since the collapse of the communist system in 1989, the countries in Central and Eastern Europe (CEE), the Baltic states, Russia as well as the other former Soviet Union experienced drastic macroeconomic changes. Figure 1 illustrates the growth rates of real GDP per capita for individual country groups from 1989 until 2000. The graphic shows similar *u-shaped growth dynamics* of each group. At the beginning of transition, all economies underwent a decline in their growth rates that was pronounced but different in intensity. The countries were able, each after a different time span, to overcome the reduction and to achieve positive growth.

- Insert figure 1 here -

CEE as well as the Baltic states recovered more quickly than the other transition countries, while it took Russia and the other economies in the Commonwealth of Independent States (CIS) longer to achieve positive growth again. After a renewed decline in 1997/98, all country groups seem to have embarked on a positive course that even seems to point to a convergence of growth rates of per capita income.

Over the past few years a number of studies have tried to explain the characteristic growth pattern of the transition economies.¹ They identified complementing determinants concerning the real and the monetary sector. But none of them uses the wide interpretation of the financial sector developed in recent studies and employs an econometric approach to distinguish between different financial transmission channels. This paper tries to overcome these shortcomings. The focus lies primarily on analysing the question to what degree and through which transmission channels a functional and efficient financial sector contributes to the development path shown in figure 1, because the financial sector plays a crucial role, e.g. thanks to its function of channel-

1 See for example Barbone and Zaldueno (1997); Blanchard (1997); De Melo et al. (1997, 2001); Christoffersen and Doyle (2000); Berg et al. (1999); Falcetti et al. (2002); Fischer and Sahay (2000); Havrylyshyn (2001); Campos (2002); Fidrmuc. (2001); Merlevede (2002).

ling savings into investment projects. And these investments are themselves relevant for the replacement of the capital stock "inherited" from communist times that has meanwhile become widely obsolete. Consequently, if an efficient financial sector is able to stimulate investments, it can contribute to increasing the standard of living in the transition economies.

In section 2 a review of different transmission channels of the financial sector and a simple endogenous model of economic growth are presented. The model highlights the role of the financial sector to influence the fraction of savings that is channelled into investment projects and by this fuelling capital accumulation and economic growth. After these theoretical considerations in section 3 different indicators are discussed to picture the development of the financial sector in transition economies. In section 4 the descriptive analysis is brought together with the theoretical findings in an econometric evaluation. Section 5 concludes.

2. FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH

This section outlines selective links between financial market development and the real economic sector. In particular, it shows which supplementing transmission channels of the financial sector can be identified. The different approaches to detect causal combinations between financial development of an economy and its per-capita growth rate were motivated by two factors: the upcoming of the "new growth theory" and empirical phenomena such as specific convergence processes in the world economy. The aim of this section is not to review the extensive literature on the finance-growth nexus, but to give some intuitive indications on the basis of a simple growth model. This model extends the existing finance-growth literature because it includes not only a long-run component but also a convergence component of economic growth.

2.1. Transmission channels of the financial sector

In growth theory the evolution of the financial sector represents only one determinant of country-specific differences in growth processes. Nevertheless, the financial sector appears to have special importance in two ways. First, the financial sector has the function to *canalise savings into investment*.² Second, it is possible to interpret the degree to which the financial sector is developed as a measure of *broad macroeconomic efficiency*. Thus financial development influences total factor productivity and the long-run growth rate.³ These two characterisations of the financial sector as a determinant of economic growth already reflect the competing approaches of *neoclassical* and *endogenous growth theory*. In neoclassical growth theory only increases in the level of macroeconomic efficiency are responsible for a permanent growth of per capita income, which is attained by presuming an exogenous productivity growth rate. Consequently, an increase, for example, of the savings rate induces a growth effect that is only *transitory*. Endogenous growth models, by contrast, permit also the possibility of a *permanent* stimulation of the per capita income growth rate. However, the endogenous growth approaches are often not able to explain the convergence dynamics, that can be discovered empirically and constitute a special characterisation of neoclassical models. With the following analysis of the link between financial development and economic growth it is not attempted to discriminate within neoclassical and endogenous models.⁴ The purpose of this section is rather to discuss the different *transmission channels*, identified in both neoclassical *and* endogenous growth models. These characteristics will also be implemented in a simple *integrated growth-model* in the next section.

2 This view is based on the work of McKinnon (1973) and Shaw (1973). One of the first analyses of the finance-growth nexus is Goldsmith (1969).

3 See King and Levine (1993 a, b); Levine (1998); Rajan and Zingales (1998).

4 For an extensive summary of this discussion see Levine (1997).

The degree of financial development can be measured in terms of different components, namely the *size*, the *structure* and the *efficiency* of the financial sector.⁵ Indicators that measure the size of the financial sector basically include information about the "depth" of financial intermediation, facilitating economic activity and reducing transaction costs. Structural indicators give information about the allocation of resources and the relevance of different financial institutions, e.g. the impact of private and state-owned banks. Using efficiency indicators the level of transaction cost, the importance information asymmetries and in particular the competition environment can be recorded. Recent literature emphasise the importance of the legal structure for the efficiency of the financial sector.⁶

The financial sector affects both driving forces of growth, *factor accumulation* and *efficiency of allocation*. Literature identified different channels linking financial market development and economic growth:

Supply of credits for investment A developed, competitive financial sector ensures relatively small deviations between lending and deposit interest rates, which in turn enlarges savings that can be transformed into credits for investment projects of the non-banking sector.⁷ According to the analysis of McKinnon (1973) and Shaw (1973) a functioning financial sector ensures high private *saving rates* due to an attractive interest rate. High private savings facilitate investment activities of private firms and enables an economy to grow at a fast speed. This saving rate effect is intensified when the growth dynamics are also driven by human capital accumulation. Hence, the financial sector can raise the formation of human capital through the

5 See King and Levine (1992) for this classification.

6 See for instance La Porta et al. (1998) or Levine (1998).

7 See Pagano (1993); Berthélemy and Varoudakis (1996); Atje and Jovanovic (1993); King and Levine (1993 b) and Bencivenga and Smith (1991).

provision of credit to private households which use such financial means for private education investments.⁸

Provision of information In economic theory the task of the financial sector also is to channel savings into the most profitable investment projects. A developed financial sector facilitates this role if banks and insurance companies monitor investment projects and provide information about potentially innovative enterprises to their customers.⁹

Insurance of risks Since more profitable investment projects are usually associated with higher risks, improving the possibilities to insure oneself against these risks can significantly increase investments financed by given savings.¹⁰ This insurance function is the more important the more economic growth is driven by technological innovations that are linked to high sunk costs.¹¹ Through *spillover-effects* R&D drives the technological knowledge stock of an economy which in turn increases total factor productivity.

To summarise, following economic theory the growth rate is basically driven by factor accumulation and improvements in macroeconomic efficiency, i.e. growth of total factor productivity. A functioning financial sector is in part responsible for the accumulation of input factors as well as for the efficiency with which the input factors can be used. The degree of the financial sector's development can be measured in terms of its size, structure and efficiency.

2.2. A simple endogenous growth model with financial intermediation

Endogenous growth models opposed to traditional neoclassical approaches have the advantage to give a convincing explanation of the direct influence the financial development has on an

8 See De Gregorio (1996) and Jappelli and Pagano (1994).

9 See Greenwood and Jovanovic (1990); Holmström and Tirole (1997).

10 See Obstfeld (1994).

11 See Saint-Paul (1992).

economy's long-run growth rate. A major disadvantage of endogenous growth models is that they frequently imply parameter dependencies. This results in an immediate "jump" of economies on their equilibrium growth path which is incompatible with the empirical regularity of income convergence that takes a long time. In the model briefly outlined below the transmission channels of a functioning financial services sector can be merged to a theoretically consistent approach. Furthermore, the model seems to be capable of analysing the impact of increasing financial market development. The chosen approach is based on a production technology that allows to represent characteristics of both endogenous and neoclassical growth models. First, it includes the empirically observed phenomenon of convergence within specific groups of countries (conditional convergence), derivable from neoclassical models. Second, it implements main characteristics of endogenous growth models with a long-term positive growth rate that are independent of exogenous technological processes. Under the assumptions of the model it is shown that the convergence behaviour as well as the equilibrium growth rate can be directly influenced by the development of the financial market.

The underlying macroeconomic production function Y exhibits constant returns to scale and transitional declining marginal products of capital and labour in $F(K,L)$:

$$Y = AK + F(K, L). \quad (1)$$

Y stands for macroeconomic output, K for capital stock and L for the labour force of the representative economy. A describes the level of technology or, in a more wider definition, macroeconomic efficiency.¹² In per capita terms (1) can be written as:

$$y = Ak + f(k), \quad (2)$$

with k standing for capital intensity K/L .

12 This kind of production function is based on Jones and Manuelli (1990). Time indices are suppressed.

Although decreasing marginal products are assumed for the neoclassical part of the macroeconomic production function - $f(k)$ in (2) - the endogenous part Ak guarantees a long-run constancy of the marginal product of capital so that a permanently positive growth rate is generated.

Capital intensity k evolves depending on investment activity I , population growth rate n and depreciation of the existing capital stock δK according to:

$$\frac{\dot{k}}{k} := \hat{k} = \frac{\dot{K}}{K} - n = \frac{I - \delta K}{K} - n = \frac{I}{K} - (\delta + n). \quad (3)$$

Following Pagano (1993), the financial sector determines which part of savings is channelled into investment, i.e. into accumulation of the economy's capital stock. Only a fraction λ of overall savings is available for investment activity:

$$\lambda S = \lambda_s Y = I, \text{ with } 0 < \lambda < 1. \quad (4)$$

The other fraction of savings $(1 - \lambda)$ "vanishes" in the financial sector. According to Pagano (1993) the financial component in the growth model can be described, for example, by the spread between lending and deposit interest rates. Therefore, a reduction in this spread, e.g. due to an increase in competition pressure, leads to a rising fraction of savings being channelled into investment. For the evolution of capital intensity this means:

$$\hat{k} = \frac{\lambda_s Y}{K} - (\delta + n) = \lambda_s (A + f(k)/k) - (\delta + n). \quad (5)$$

Modification of (5) results in a fundamental equation for the capital intensity:

$$\hat{k} = \underbrace{[\lambda_s A - (n + \delta)]}_{\text{long-term component}} + \underbrace{\lambda_s \frac{f(k)}{k}}_{\text{convergence component}}. \quad (6)$$

By means of equation (6) a positive dependence of the growth rate on capital intensity can be identified when looking at both the long-term component and the convergence component. The influence of the convergence component decreases in time with increasing capital accumu-

lation due to the decrease in the marginal product of capital. Countries that are already at an advanced stage of development show smaller growth rates than countries whose capital intensity falls relatively far below their equilibrium value.¹³ In the long-run (i.e. $k \rightarrow \infty$) \hat{k} approaches a permanently positive and exogenous value which is determined by the difference between λsA and $(\delta + n)$. Hence, as a condition for a positive growth rate in the long-run the validity of $\lambda sA > (\delta + n)$ must be guaranteed.

In the steady state all considered variables grow at the same rate. Accordingly, the dependence on a convergence component $\hat{y}^t(\lambda)$ and a long-run component $\hat{y}^*(\lambda)$ is also valid for the growth rate of per-capita income:

$$\hat{y} = \underbrace{[\lambda sA - (n + \delta)]}_{\text{long-run component } \hat{y}^*(\lambda)} + \underbrace{\lambda s \frac{f(k)}{k}}_{\text{convergence component } \hat{y}^t(\lambda)}. \quad (7)$$

According to (7) financial markets influence both the long-term component of the evolution of per-capita income growth and the transitional component. The level of λ is crucial determined by the level of development of the financial services sector. A shift in parameter λ following enhanced financial market development, e.g. because increased competition reduces the interest rate spread, causes a rise in the equilibrium growth rate due to a higher growth rate of total factor productivity. This effect is similar to the efficiency function of the financial sector described above. Moreover, a catching-up process can be identified that results in a higher transitional growth rate on the way to a new steady state. This second effect is induced by the accumulation function of the financial sector which stimulates investment into the macroeconomic capital stock. However, the extent of this catching-up effect depends on the stage of economic

13 In the context of the convergence discussion it is clear that this means conditional convergence. As a consequence the considered countries that show income convergence exhibit similar characteristics of the other relevant growth determinants.

development a country is experiencing at the respective moment. This means that only a conditional convergence effect can be generated.

- Insert figure 2 here -

Figure 2 represents this way of formulating the finance-growth nexus graphically. Obviously, a shift in the degree of the financial sector's development resulting in an increase in the part of savings that are transformed into investment ($\lambda_1 > \lambda_0$) leads to a higher growth rate. The shift in development can be measured in terms of an increase in the financial sector's size or efficiency or, a change in its structure. Hence, financial market development induces a short-run acceleration of the growth rate of per capita income. Furthermore, the long-term growth rate can be raised as well. The first effect can be called the "short-run growth bonus", the second one the "long-run growth bonus" of financial market development.

Financial market development enhances an economy's growth possibilities through the channels mentioned above: higher supply of credits for investment, better provision of information and more efficient insurance of risks. For example, when financial market development is connected with an increase in competition, it leads to lower profitability and overhead expenses (personal and other non-interest expenses) for banks, and this enhances economic growth by promoting banking efficiency. Besides this, enhanced competition in connection with external economies of scale forces domestic institutions to apply more modern human skills and technology. Furthermore, the presence of foreign financial companies stimulates the development of the underlying legal framework as banking supervision and enhances a country's access to international capital.

To summarise, in this section long-term and transitional links between financial markets and economic growth are identified from a macroeconomic perspective in a simple approach. Using an integrated growth model that highlights both neoclassical and endogenous growth characteristics therefore constitutes an extension of the analysis of Pagano (1993). This is an important

aspect because, based on the convergence component, the entire macroeconomic effect that is generated by a shift in the degree of the financial sector's development results in a greater total growth bonus.

3. FINANCIAL DEVELOPMENT IN TRANSITION ECONOMIES

Before the start of transition from plan to market, in CEE and in the former Soviet Union a functional financial sector to allocate private savings to investment projects did not exist. This task was carried out exclusively by state-controlled institutions. Consequently, in order to provide companies with the necessary credit volume at the beginning of the transition process, all economies first needed to establish a functioning financial sector.¹⁴ Some of the most relevant approximations of financial market development are summarised in table 1, which gives an impression of the progress achieved in 2000 based on different indicators following the above-mentioned classification.

- Insert table 1 here -

Size of the financial sector The amount of M3 as a percentage of GDP (MONEY), acts as an indicator of the "depth" of the financial sector. This monetary aggregate has changed significantly in CEE and in the Baltic countries since the beginning of transition, but in different directions. On the one side, the FYR Macedonia and Romania have recorded a significant decline in their degree of monetarisation, which decreased to 23% in 2000. On the other side, the Slovak Republic (69%) and Slovenia (55%) increased M3 relative to GDP. Russia (17%) as well as the other former Soviet Republics, have experienced a drastic decline in domestic money to under 20% of their GDP in 2000. If one assumes that the provision of money is important for growth because it facilitates economic activity and reduces transaction costs, e.g. in comparison to bar-

14 For recent contributions see Hermes and Lensink (2000); Fries and Taci (2002); Fries et al. (2002) and Pissarides (2001).

ter, we find that especially some countries in CEE have a more favourable position than the remaining transition economies.

In terms of their stock market capitalisation (STOCKS) CEE and the Baltic countries are also in a better position. Particularly Estonia, Hungary and Slovenia show a clear upward trend with the relative value of all public corporations listed on the stock exchange in 2000 of 35, 26 and 24 percent of GDP. Nevertheless, these figures still remain considerably below the relevant quotients of Western industrialised economies. Because the stock market is of relevance in financing enterprises, further efforts especially to attract foreign investors can be very important. This holds true even more for the CIS, where the rare data points to less developed stock markets.

Finally, after a rise in the beginning due to privatisation, nearly all transition economies have experienced a significant decline in the number of domestic banks (BANKS) in the last years. In Bulgaria, for example, the number of banks has decreased from 79 in 1992 to 35 in 2000. In Georgia this decline is even more pronounced (from 263 in 1994 to 30 in 2000). This development is primarily a result of stricter regulations for banking supervision as well as of numerous bank crises. Over the whole time span there are also some economies that experienced a rise in their bank number, e.g. Tajikistan from only 1 bank in 1991 to 17 banks in 2000.

Structure of the financial sector Loans granted to private companies are crucial in financing investment projects which, in turn, have a positive influence on long-term income dynamics. This structural factor as a percentage of GDP (CREDIT) has decreased, in part considerably in some transition economies. In Albania (3% in 2000), the FYR Macedonia (11%) and Romania (11%) this has been caused, among other aspects, by more severe equity capital requirements. Although some countries experienced a rise in CREDIT the relevant values of other CEE are below those of the Western neighbours where the proportion of loans to private companies and GDP is often more than 100%. Again, the former Soviet Republics have a greater

potential for adjustment, because nearly all available observations are of a magnitude below 10% in 2000.

When taking a closer look at the efforts that transition economies are undertaking to privatise their enterprises, it is not surprising that the influence of state-owned banks is declining substantially in most of the countries. The biggest success has been recorded in Hungary, where the share of state-owned banks among total bank assets (STATE) has been reduced from over 80% to below 10% in 2000, in the FYR Macedonia and in Kazakhstan to under 2% in the last 10 years. In Estonia and Georgia in 2000 even no state-owned bank existed. This development should be considered positive because one would expect banks with private owners to guarantee a more efficient allocation of existing funds for investment projects and thus to stimulate economic growth. Some economies of the former Soviet Union, such as Turkmenistan (97%) and Uzbekistan (78%), but also Western states, such as Albania (65%) and the Slovak Republic (50%), still have a great need for ongoing privatisation.

Efficiency of the financial sector The relatively high interest rates for loans at the beginning of transition and the concurrent low deposit interest rates characterised a situation of insufficient competition in the banking sector. This implied a poor efficiency of the financial markets. The losses that went along with this inefficiency could be linked to the fact that the volume of financing for investment activities lagged behind the volume that would be possible if based on all existing savings. As expected, the spreads were relatively high. We observe, however, a considerable decline in interest rate spreads as transformation is progressing, which is mainly a result of intensified competition in the domestic banking sector, driven by privatisation and cross-border capital flows. Meanwhile, almost all transition economies have reached lower interest rate spreads in 2000 - some are even comparable to those in Western industrialised nations. But other economies still need to reverse the continually high spreads, for instance Belarus

(30%), Romania (20%) and Albania (16%). These are also the economies that still have a high degree of state control of their banking sector and a low intensity of competition.

Moreover, we have seen the share of foreign banks (FBS) rise significantly in all transition economies. Usually, it is argued that facilitating the entry of foreign financial firms into the local market intensifies competition, improves efficiency and quality of the financial infrastructure, forces domestic institutions to apply more modern human skills and technology, stimulates the development of the underlying legal framework, for example, banking supervision, increases the number of available products, and enhances a country's access to international capital. As such, foreign firms can be seen as an important catalyst for the sort of financial development that promotes growth. It is important to mention that Hungary, with a share of foreign banks of almost 80%, is one of the economies that were able to reduce state control by privatising significantly. That is to say, former state-owned banks in Hungary are now mostly owned by foreigners. Albania, on the other hand, has a 92% share of foreign banks, but the share of state-controlled banks among the domestic bank is still at a very high degree. In contrast to other CIS countries Russia can be characterised as a closed economy because of its very low foreign bank share.

In spite some isolated positive developments in the transition economies the need for reforms continues to be important, most notably in the former Soviet Republics. Partly insufficient bank capitalisation, inefficient bank and stock exchange supervision as well as the non-compliance with international standards in banking law or minority protection in shareholder rights can be listed as factors that impede the growth processes.

4. ESTIMATION RESULTS

The endogenous growth model in section 2 showed that financial development undoubtedly enhances economic growth. In the last section the theoretical considerations have been sup-

plemented with a descriptive analysis of different indicators measuring financial development in the transition countries of Eastern Europe and the former Soviet Union. In this chapter the theoretical perception will be combined with the empirical evidence. For this purpose it is necessary to employ econometric analysis. First, this enables to quantify the direction of possible growth effects. Second, insights of the importance of different transmission channels can be identified, i.e. the relevance of the mentioned influence of financial development for capital accumulation and total factor productivity growth.

The theoretical model stresses the role of capital accumulation, i.e. investment as the most relevant engine of growth. Actually, detailed studies reveal that substantial investment is of special importance in the transition economies. Only the economies that are able to create a positive investment climate to advance the exchange of the inherited and obsolete capital stock are expected ultimately to achieve high growth paths. An analysis of the investment time series confirms these results: First, before the beginning of transition CEE and the former Soviet Union were characterised by higher investment quotas than those of Western industrialised nations. However, these investments were mostly controlled by state authorities and predetermined by principles of a planned economy. The collapse of the system necessarily went hand in hand with a *decline in investment* in all countries, which was particularly pronounced in the initial transition phase as figure 3 reveals.

- Insert figure 3 here -

Second, it has to be acknowledged that the transition economies suffered from completely *outdated capital stocks*, which did not fulfil modern production requirements. Therefore, international competitiveness was not given, making sizeable investment necessary to replace the existing capital goods. Despite these similar patterns, the situation is not the same in all economies under study. While we see a relatively quick recovery in CEE and in the Baltic states, the

investment quotas are falling especially in the former Soviet Republics. Consequently, the long-term growth perspectives there are not very favourable.

Following these observations it has to be dealt with the question whether this expectation is confirmed by the empirical evidence. Beside the investment rate, in correspondence with traditional growth models, other determinants have to be considered to give a detailed answer. First, human capital (HC) is expected to have a positive growth impact. Second, the existing capital intensity is reduced each period due to depreciation (DEPR), including primarily population growth. Third, neoclassical growth models imply a (conditional) convergence effect, i.e. economies that are far away from their steady-state are expected to grow faster than more advanced countries. Consequently, it must be controlled for the income level at the beginning of the period (STARTBIP). Fourth, when capital accumulation comes to an end and the steady-state is reached, technological progress (TREND) acts as the engine of economic growth in the long run. All these variables are used to explain the variation in the growth rates of GDP per capita of the 25 transition economies that correspond to the countries presented in table 1. The longest time period that is available is 1989 – 2000.

- Insert table 2 here -

Following the different regression results of table 2, only the investment rate and the common time trend show the expected positive sign using cross-section (*Reg1*) and panel data techniques (OLS with a common constant in *Reg2*, OLS with fixed effects in *Reg3* and GLS with random effects in *Reg4*).¹⁵ Moreover, the coefficient differs significantly from zero in the last three approaches. Hence, it can be concluded that factor accumulation and factor productivity growth that is captured by the trend term are the most relevant determinants of the growth

15 Due to missing data deviations in the number of observations occur.

process since the beginning of transition in Central and Eastern Europe and the former Soviet Union.¹⁶

Consequently, realising the important role that investment plays in the growth dynamics of the transition economies, we are faced with the question whether the outlined financial development has had lasting influence on investment mentioned in the growth model in section 2. The answer is given in large part with the help of the estimation results in table 3.¹⁷ Another interesting question, based on the theoretical reflections, is whether we can identify an additional “bonus growth” thanks to an increase in total factor productivity (table 4).

- Insert table 3 here -

To identify the impact of the investment transmission channel, the relevant indicators measuring size, structure and efficiency of the financial markets in the transition countries are employed. Simultaneously, some complementing variables that control for the special circumstances the economies under study are faced with are considered (table 3). These are at first initial conditions at the beginning of the transition process (INITIAL), e.g. composition of GDP, years of communism, proximity to western markets etc. It is expected that extensive distortions exert a negative influence on capital accumulation, in particular in the early years.¹⁸ Second, the inflation rate (INFL) measures the degree of uncertainty about the future market environment. Hence, for a high inflation rate a negative influence on the investment activity is expected. At last, with the aggregated reform indicator of the EBRD (RI and RI(-1)) actual and lagged meas-

16 Although the coefficient for HC does not differ from zero in a significant way it is expected that in the long-run especially the influence of human capital increases, because the education level of the labour force is relatively high in the transition economies.

17 The analysis follows Neimke et al. (2003).

18 Initial conditions are condensed using principle component analysis. The resulting variable is negatively defined, so a positive sign signals negative distortions. See De Melo et al. (2001) and Falcetti et al. (2002) for further explanations how this variable is constructed.

ures for price, trade and exchange rate liberalisation, for privatisation of state-owned enterprises etc. are included. A positive sign is expected for this variable.

Following the regression results of table 3 the control variables largely show the expected signs. Obviously, high inflation constitutes a disadvantage to stimulate investment which in turn is connected with low growth rates. The same applies to initial conditions. Lower distortions at the beginning of the transformation process are connected with higher investment activity to replace the obsolete capital stock. Admittedly, not all of the coefficients differ from zero in a significant way. For reforms only in *Reg5* and *Reg10* a significant impact is identified. It has to be mentioned that actual reforms reduce investment activity, but that this reduction is more than compensated by reforms in the last period.¹⁹

The regression analysis enable us to uncover how different elements of financial market development contribute to investment activity. Obviously, the development of the financial sector is responsible for divergent investment activities in the transition economies under study. With regard to the variables of interest - the indicators of financial development - table 3 reveals that the size, the structure as well as the efficiency of the financial markets influence the investment activity in Eastern Europe and the countries of the former Soviet Union significantly. In particular, the amount of money (MONEY) has a stimulating effect as well as the stock market capitalisation (STOCKS). From this we can derive the significance of the financial sector's "depth" for investment and thus overall economic growth. The number of domestic banks (BANKS) plays a positive, but insignificant role. With regard to the structure, we can determine a significantly positive influence of the credit volume granted to the private sector (CREDIT). This is not surprising if we assume that privatised or newly founded companies have a substantial need for financing and will use the funds granted to them immediately to build up the necessary capital stock. A large share of state-owned banks (STATE), however, together with an inefficient alloca-

19 This results correspond to the findings of Falcetti et al. (2002).

tion of existing savings, has a negative (but insignificant) impact on investment. In terms of efficiency, a developed financial sector ensures a relatively small variation between lending rate and deposit rate, which is expressed in a small interest spread (SPREAD). This implies minor losses in the allocation of existing savings for investment projects. The share of foreign banks (FBS) does not have a significant competitive effect in stimulating investment.

In the last step the impact of the total factor productivity channel in Eastern Europe and the economies of the former Soviet Union is tested empirically. To estimate the extent to which financial development influences total factor productivity growth it is necessary to revert to former results: following growth theory the constants generated in table 2 represent the growth of total factor productivity, often termed as *Solow residual* (the “long-term component” in the theoretical discussion of section 2). Here these country-specific residuals are defined as dependent variables explained by different indicators of financial development.²⁰ Because we have only one observation for each country, merely a cross-country analysis can be adopted.²¹ The relevant control variables are considered as averages over time, with the distinctiveness that CRI is an indicator that includes *accumulated* previous reforms.

- Insert table 4 here-

Admittedly, the results of the different cross-section OLS estimations in table 4 are not overwhelming. None of the coefficients of the control variables differ significantly from zero. Moreover, the explanatory power of the approaches to explain total factor productivity growth is very low in all seven regressions. The presence of foreign banks now even turns out to have a significant negative effect on the utilisation of other production factors. On the one hand, this can

20 The decision to employ the country specific random effects of *Reg4* rests on the result of a Durbin-Wu-Hausman-test, which says that the underlying model is more efficient than a fixed effect model. See for the relevant test procedure Greene (2000), p. 576f.

21 For this approach see Olson et al. (2000).

be explained by pointing to the foreign banks' strict requirements concerning accounting, share of equity capital, etc. On the other hand, due to data limitations the presence of foreign banks can only be measured in terms of their pure number and not, e.g. in terms of their asset share. Anyhow, the analysis reveals that a rise in the number of domestic banks and in the volume of lending to private companies is connected with a "growth bonus" in form of increased total factor productivity. For all other elements of financial development, however, obviously only the transmission channel of investment is remarkable. All in all, we observe the change in factor productivity as another channel to transmit financial development to the economic growth rate of per-capita income in transition economies.

The econometric results should not be read without some remarks about the reliability of the estimated coefficients: First, in growth regressions, as well as in investment regressions the problem might occur that regressors are endogenous. This can be solved, e.g. by using *instrumental estimation techniques* or in the case of panel data approaches by employing *generalised methods of moments* (GMM) regressors. Second, further insights can be derived by relating financial development *directly* to growth. Third, with a wider set of control variables at hand the "quality" of the estimated coefficients can be improved. Consequently, the findings should be seen as a first attempt to identify the role of financial development in the growth process in the transition economies.

5. CONCLUSIONS

Theoretical explanations on the basis of neoclassical and endogenous approaches as well as empirical results point to financial markets having significant effects for investment and the development of factor productivity as the foundation for long-term positive growth. This is particularly true for Central and Eastern Europe as well as the former Soviet Union, economies that are

suffering, on the one hand, from sharp declines in their growth rates and have inherited widely obsolete capital stocks on the other hand.

In accordance with existing studies, the financial sector of the transition economies can be depicted with the help of appropriate macroeconomic indicators. These indicators are divided into the categories size, structure, and efficiency. By doing so, far-reaching new insights into the transition process can be gained, for instance strong progress among the CEE countries in approaching Western financial market standards, and by this increasing investment and growth significantly. At the same time, however, the republics of the former Soviet Union continue to require reforms and changes in their economic policy that facilitates financial development.

The empirical discussion confirms the theoretical results: All transition economies suffer from outdated capital stocks. Hence, it not surprising that differences in investment rates in physical capital account for the major part in the variation of GDP per capita growth rates. Consequently, only the economies that have stimulated investment have embarked on a positive income growth path. At the same time high investment rates are tied to substantial improvements in the size, structure and efficiency of financial markets. Beside the investment channel the financial sector influences the overall growth rate through the total factor productivity channel. All in all, the continuous establishment of functional and efficient financial markets plays an important role in guiding the transition economies into the direction of higher growth paths and better standards of living.

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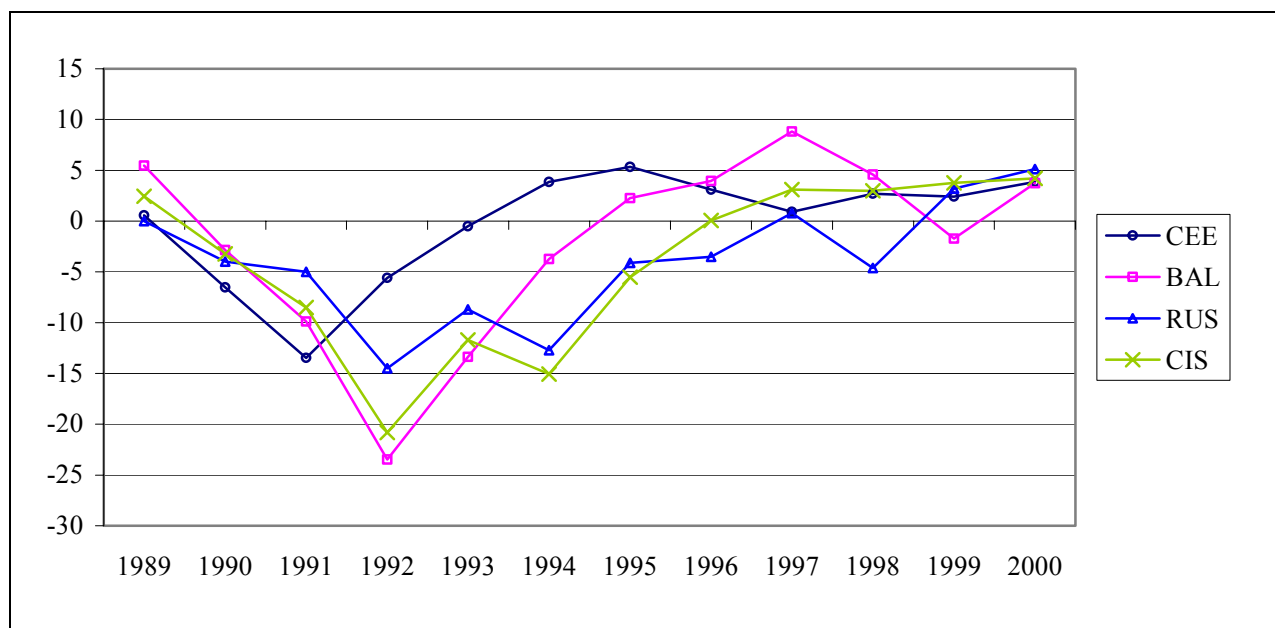


FIG. 1. Growth rates of GDP per capita (%) *Source.* Own presentation. EBRD (1999, 2001).

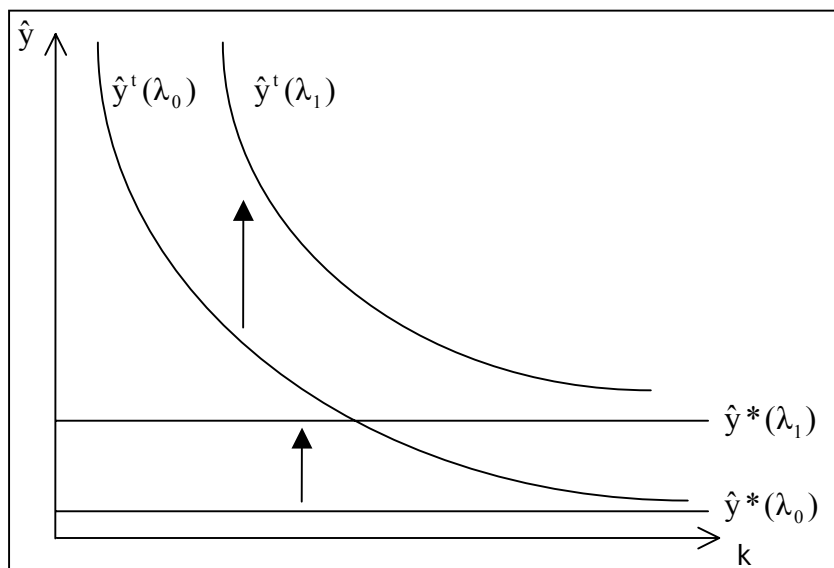


FIG. 2. Financial development bonus

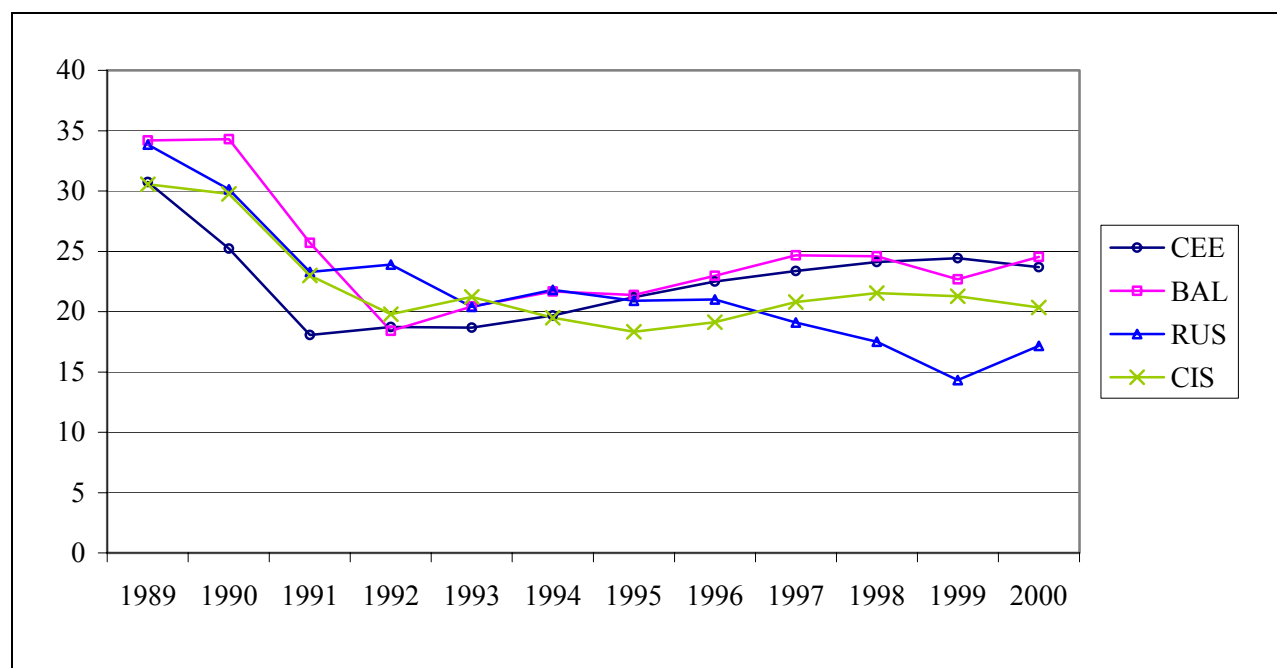


FIG. 3. Gross fixed capital formation (% of GDP). *Source.* Own presentation. EBRD (1999, 2001). WORLD BANK (2002).

TABLE 1

Selected indicators of financial development in transition economies in 2000

	MONEY	STOCKS	BANKS	CREDIT	STATE	SPREAD	FBS
CEE							
Albania	60.9	na	13	3.0	64.8	16.0	92.3
Bulgaria	36.5	5.1	35	12.2	19.8	8.4	71.4
Croatia	46.6	14.1	44	22.0 ^a	5.7	7.1	45.5
Czech Republic	77.4	23.2	40	43.8 ^a	28.2	3.6	40.0
FYR Macedonia	23.0	0.2	22	11.2	1.1	8.3	31.8
Hungary	46.8	26.3	38	23.6	8.6	3.3	78.9
Poland	42.7	18.8	74	18.8	24.0	7.2	63.5
Romania	23.2	3.8	33	10.5 ^a	50.0	20.3	63.6
Slovak Republic	68.5	3.9	23	37.6	49.1	5.2	56.5
Slovenia	54.7	24.0	28	35.8 ^a	42.2	5.4	21.4
Baltics							
Estonia	48.1	35.2	7	25.9	0.0	2.1	57.1
Latvia	29.4	8.3	21	19.6	2.9	7.6	57.1
Lithuania	23.1	14.0	13	10.1	38.9	10.0	46.2
Russia	16.5	16.1	1311	11.5 ^a	41.9 ^b	13.0	2.5
CIS							
Armenia	14.6	0.8	31	7.5	2.6	13.1	35.5
Azerbaijan	11.6	na	59	na	60.4	15.0	8.5
Belarus	9.9 ^a	4.1	31	9.7 ^a	66.0	30.4	19.4
Georgia	7.7 ^a	na	30	6.1	0.0	23.0 ^a	26.7
Kazakhstan	15.3	7.5	48	10.6	1.9	4.3	33.3
Kyrgyzstan	11.8	0.3	22	5.0 ^a	21.4a	13.0 ^b	27.3
Moldova	20.3	0.1	20	12.8	9.8	8.0	55.0
Tajikistan	8.8	na	17	11.3	6.8	-8.4	23.5
Turkmenistan	20.3	na	13	9.5 ^b	96.6 ^a	11.3	30.8 ^a
Ukraine	18.5	6.9	154	8.6 ^a	11.9	34.0 ^a	9.1
Uzbekistan	11.9	1.1	34	na	77.5	18.0 ^a	17.6

a. 1999. b. 1998. *Source.* Own calculations. EBRD (1999, 2001).

TABLE 2

Traditional determinants of economic growth

Coefficient	<i>Reg1</i>	<i>Reg2</i>	<i>Reg3</i>	<i>Reg4</i>
Intercept	0.14 (0.56)	-0.58*** (-2.86)	-	-0.58*** (-3.62)
STARTGDP	-0.05* (-1.96)	0.07*** (3.68)	0.10** (2.25)	0.07*** (4.13)
INV	0.04 (0.75)	0.04** (2.20)	0.06* (1.84)	0.04** (2.12)
HC	0.55* (1.94)	-0.18 (-0.86)	-0.47 (-1.05)	-0.17 (-0.93)
DEPR	-0.16 (-1.28)	0.02 (0.44)	0.03 (0.47)	0.02 (0.43)
TREND	-	0.02*** (7.02)	0.02*** (7.18)	0.02*** (6.19)
R ² (adj.)	0.23	0.22	0.23	0.22
Observation	25	208	208	208
Method	cross-section (OLS)	common constant (OLS)	fixed effects (OLS)	random effects (GLS)

Note. The regression results depend on different estimations of a traditional growth equation with the GDP per capita growth rate on the LHS. All explaining variables are employed in natural logarithms. t-values are below the coefficients. *, ** and *** refer to different significance values of 10%, 5% and 1% respectively.

TABLE 3

Financial development and investment

Coefficient	<i>Reg5</i>	<i>Reg6</i>	<i>Reg7</i>	<i>Reg8</i>	<i>Reg9</i>	<i>Reg10</i>	<i>Reg11</i>
Intercept	-1.50*** (-8.18)	-1.95*** (-5.71)	-1.42*** (-9.42)	-1.16*** (-4.88)	-1.51*** (-8.66)	-1.87*** (-9.84)	-1.63*** (-5.60)
INFL	-0.02 (-0.95)	-0.00 (-0.08)	-0.05*** (-2.93)	-0.05** (-2.23)	-0.08*** (-3.58)	0.05** (2.04)	-0.04 (-1.53)
INITIAL	0.01 (0.43)	-0.03* (-1.98)	-0.05*** (-3.36)	-0.01 (-0.44)	-0.05** (-3.58)	-0.02 (1.22)	-0.05*** (-2.95)
RI	-0.90* (-1.65)	0.74 (1.17)	-0.78 (-1.61)	-0.44 (-0.75)	-0.67 (-1.03)	-1.71*** (3.26)	-0.78 (-1.20)
RI(-1)	1.06** (2.37)	-0.06 (-0.10)	0.31 (0.71)	0.28 (0.55)	0.35 (0.60)	1.93*** (4.36)	0.66 (1.10)
MONEY	0.18*** (3.54)						
STOCKS		0.04** (2.25)					
BANKS			0.01 (0.50)				
CREDIT				0.20*** (4.82)			
STATE					-0.02 (-0.65)		
SPREAD						-0.11*** (-3.38)	
FBS							-0.02 (-0.52)
R ² (adj.)	0.13	0.24	0.11	0.24	0.17	0.17	0.11
Observations	198	105	197	150	146	165	159
Sample	91-00	91-00	90-00	90-00	90-00	91-00	91-00

Note. The dependent variable in all (pooled) OLS regressions is the investment rate. This variable as well as the inflation rate and the indicators of financial development are employed in natural logarithms. t-values are below the coefficients. *, ** and *** refer to different significance values of 10%, 5% and 1% respectively.

TABLE 4:

Financial development and total factor productivity growth

Coefficient	<i>Reg12</i>	<i>Reg13</i>	<i>Reg14</i>	<i>Reg15</i>	<i>Reg16</i>	<i>Reg17</i>	<i>Reg18</i>
Intercept	-0.001 (-0.14)	0.005 (0.86)	-0.005 (-0.99)	0.12** (2.34)	-0.001 (-0.15)	-0.001 (-0.26)	-0.005 (-1.07)
INFL	0.001 (1.11)	0.000 (0.60)	0.001 (0.86)	0.001 (1.58)	0.001 (0.76)	0.001 (0.57)	0.000 (0.51)
INITIAL	0.000 (0.62)	-0.000 (-0.64)	0.000 (0.41)	0.001 (1.45)	0.000 (0.50)	0.000 (0.69)	0.000 (0.29)
CRI	0.000 (0.24)	-0.001 (-0.93)	0.000 (0.001)	-0.001 (-1.07)	0.000 (-0.07)	0.000 (0.32)	0.000 (0.35)
MONEY	0.001 (0.32)						
STOCKS		0.000 (0.18)					
BANKS			0.001** (2.13)				
CREDIT				0.004*** (3.81)			
STATE					-0.001 (-0.95)		
SPREAD						0.000 (0.46)	
FBS							-0.002** (-2.29)
R ² (adj.)	0.04	-0.11	0.22	0.48	0.08	0.05	0.24
Observations	25	20	25	24	25	25	25

Note. The dependent variable of all OLS regressions is the country-specific random effect of *Reg4* which corresponds to total factor productivity growth. The inflation rate and the indicators of financial development are all employed in natural logarithms. t-values are below the coefficients. *, ** and *** refer to different significance values of 10%, 5% and 1% respectively.