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DRIVING FORCES OF ECONOMIC GROWTH IN THE SECOND DECADE OF TRANSITION

ABSTRACT: *This paper examines driving forces of economic growth in the second transition decade, by testing which determinants from the first decade remain dominant, and which new factors appear in explaining growth. To this end a panel simultaneous equation model is estimated based on a sample of 27 transition countries in the period 1999-2009. According to the main findings of the paper initial conditions do not play a role in determining economic growth in the second decade, but macroeconomic stabilisation and structural reforms still matter. However, in contrast to the first decade, the overall impact of structural reforms is not positive, indicating that difficult progress with reforms in the second decade could slow down economic growth. Moreover, EU*

membership seems to have the additional effect of slowing down the growth of the accessing countries, meaning that once a transition country becomes an EU member it has a similar growth path to other EU countries in terms of lower growth rates. All this indicates that only countries that undertook fast reforms in the early phase of transition experienced significant benefits from reforms, achieving higher levels of economic development and becoming closer to developed EU countries. Finally, investments and openness of the economy appear as new important determinants of growth.

KEY WORDS: *economic growth, transition economies, panel data model, EU enlargement process.*

JEL CLASSIFICATION: C33, O47, P27, P52

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1. INTRODUCTION

The main focus of policy makers in emerging countries is achieving high and sustainable economic growth. This is hopefully also an outcome of a successful transition process. However, the abandonment of a central planned system, followed by reallocation of resources into productive sectors, and comprehensive institutional, political, and social reforms at the beginning of the transition process, resulted in significant output decline in all transition countries.

Despite the similarities in the economic system of the various transition countries, the characteristics of these economies differed widely in the starting years of transition. The magnitude of negative growth tendency (in depth and length) as well as the period of recovery differed across these countries. This was influenced by different inherited initial conditions, as well as the speed of reforms[1]. Countries that advanced significantly in structural and stabilisation reforms in the earliest period of transition recovered faster from the output decline and had higher cumulative growth after 1989 (Central and Eastern European countries, CEE). These countries experienced better macroeconomic performances than other transition countries such as the Former Soviet Union (FSU), and were first in the process of joining the European Union (EU).

By the end of the first transition decade, positive economic growth seemed to appear across all transition countries[2]. The period of decline in most countries lasted up to 1998, when output in over 20 out of 25 countries started to grow. The issue of identifying the factors that influence such differences in economic growth across countries produced numerous empirical studies in the first decade of the transition process[3]. The results in transition countries seem to differ significantly from those in non-transition countries based on economic growth models. While the traditional factors that economic growth theories suggest, such as investments in physical and human capital, appeared to be significant in

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[1]   For instance Poland and the Baltic countries were among those with the worst initial conditions, but they were quick to undertake structural reforms and so did not experience sharp output decline and a long period of transition recession. This shows that it was possible to overcome the problem of bad initial conditions by faster reforms.

[2]   Two exceptions to this tendency were Ukraine and Turkmenistan, where output continued to decline (Havrylyshin, Izvorski, & van Rooden, 1998).

[3]   De Melo et al. (1997), Fisher, Sahay, and Verg (1998), Havrylyshin, Izvorski, and van Rooden (1998), Berg et al. (1999), Barro (2003), Campos (2001), Campos and Coricelli (2002), Popov (2007), and so on.

explaining economic growth in non-transition countries, the same could not be said for the group of transition countries, at least in the first decade of transition.

Within the empirical literature on transition economies, there is a consensus about the key elements of transition and economic growth determinants. Most of the studies emphasise the existence of the effects of macroeconomic stabilisation, initial conditions and structural reforms on growth in the first ten years of transition, but also underline the role of institutions. Initial conditions had the main effect on economic output decline, but it diminished over time, while other factors of economic growth became dominant in the recovery phase of transition.

Testing the results from the first decade of the transition process in the second decade constitutes the core of the analysis in this paper. The purpose of the paper is twofold: (1) to test whether factors that were found significant in the first transition decade are still dominant in explaining economic growth paths and to discover which new factors are gaining in importance during the second decade, and (2) to analyse the effects of the EU enlargement process on the economic growth of the transition countries involved in that process. Although each country's accession has its particularities there are some broadly accepted common aspects of the accession process, so that stages in that process can be captured by specific dummy variables. The sample used in this paper consists of 297 panel observations: 27 countries in the period 1999-2009. As in most previous studies the empirical analysis is based on panel econometric methodology. More precisely we used the Balestra-Krishnakumar G2SLS method (*Generalised Two Stages Least Squares Method*) for the estimation of the panel simultaneous equation model, which has never been used in any previous research. This method enables us to estimate the random effect model, taking into account the possible endogeneity problem of some determinants, namely their correlation with one or both components of the composite error term.

The paper is organised as follows. After this introduction Section 2 gives an overview of the literature on growth determinants in transition countries. Section 3 presents a comparative analysis of economic growth across transition countries in the first and the second transition decade. Section 4 deals with the econometric analysis of the economic growth determinants, based on a panel data model, and the main conclusions are given in Section 5.

2. THE OVERVIEW OF EMPIRICAL LITERATURE

The diversity of theoretical models resulted in a variety of variables as potential growth determinants in empirical literature. One of the first studies that provide a general overview of economic growth determinants in developing countries was undertaken by Barro (1991, 1996). Barro's study (1996) confirms that for a given level of other variables, growth is negatively related to the initial level of real GDP per capita, which is an empirical support of the neoclassical growth model idea on conditional convergence. Furthermore, for a given initial level of real GDP per capita, economic growth is stimulated by a higher initial level of schooling and life expectancy, and improvements in terms of trade, inflation, and government consumption. Levin and Renelt (1992) produced another paper often cited in the literature on economic growth. As is expected from the augmented Solow model, the authors find negative growth effects of the initial level of GDP per capita and population growth, and positive effects of investments in fixed and human capital.

The econometric results of the studies of Barro and Levin-Renelt were extensively used in various empirical papers for the purpose of forecasting per capita GDP growth rates[4]. However both models are based on samples of non-transition countries, and perform poorly in the case of transition economies (Campos, 2001). This can be explained by the fact that transition countries and market-oriented economies at a similar level of GDP per capita are not structurally identical, as is assumed in the models. Hence numerous empirical papers appeared in the first ten years of transition that tried to identify the factors influencing economic growth tendencies and differences across transition countries[5]. Although the empirical studies used different samples, lengths of time dimension, and methodologies, common conclusions on economic growth determinants in the first decade of transition could be derived. The main factors seem to be classified into three groups: initial conditions, structural reforms, and macroeconomic stability. Since the transition countries are the focus of this paper the following detailed overview of empirical findings refers only to determinants of economic growth in this group of countries.

In the literature there is a common result that different starting points are important in explaining economic performance and differences in economic

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4   See for example Fischer, Sahay, and Verg (1998).
5   The first comprehensive papers that deal with this issue are those of De Melo, Denizer, and Gleb (1997), and De Melo et al. (1997).

growth among transition countries. As stated earlier, *initial conditions* which represent macroeconomic distortion at the beginning of transition (in terms of the initial, pre-transition level of GDP per capita) are negatively correlated with economic growth, indicating that poor countries grow faster than less poor ones. However this inverse relationship exists only in the initial phase of transition and fades out over time, while structural reforms stimulated by macroeconomic stability became a more important determinant of economic growth in the period of recovery[6]. Based on these results the convergence in growth rates would continue, since the effects of initial conditions are expected to decrease further. Despite the diminishing direct effects of initial conditions over time, this factor may also continue to indirectly influence growth through its persistent impact on the structural reform level (Falcetti, Raiser, & Sanfey, 2002). Moreover the feedback from growth to reforms suggested that convergence in reform levels could also occur.

Different *reforms* were conducted to get sustainable growth, from price and trade liberalisation and small-scale privatisation in the early transition phase to corporative governance competition policy and financial sector reforms in later phases. Their overall impact on growth was positive in the first transition decade, implying that faster reforms resulted in higher growth rates and faster recovery. However there is also different empirical evidence on their effects in the different phases of transition. On the one hand Berg et al. (1999) find that the net effects of structural reforms on economic growth are positive even in the first transition years, despite the fact that they could affect state and private sectors in opposite ways[7]. On the other hand Havrlyshin, Izvorski, and van Rooden (1998) showed that a negative impact of structural reforms may appear in the initial transition phase, but despite this, once the early decline is overcome, greater progress in applying reforms has a favourable impact on growth performance. Some authors point out that the high positive impact of structural reforms on growth could be due to econometric problems: endogeneity bias (Berg et al., 1999; Falcetti, Lysenko, & Sanfey, 2006) or multicollinearity problem due to highly correlated transition reform indicators (Staehr, 2005). When these problems are accounted for in the models the positive effects of reforms on growth seem to be less robust

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6 For instance Falcetti, Raiser, and Sanfey (2002) found that the strong effects of initial conditions on average growth dominated the effect of structural reforms up to year seven of transition. However, these effects, as well as the relationship between reforms and growth, weaken over time, since as later reforming countries start to catch up on CEE countries in terms of economic growth.

7 Similar findings on common patterns for countries at similar stages of structural reform can be found in De Melo, Denizer, and Gelb (1997) and Fisher and Sahay (2000).

than previously stated. Moreover if lag structure is included in the growth model then the contemporary effect of advances in transition reforms on growth is negative, but there is a strong positive effect with one year lag[8].

Most countries faced high inflation and fiscal deficit in the first years of the transition process, indicating that *macroeconomic stability* is an important condition for economic recovery and growth in the transition period. When the influence of macroeconomic stability is measured only by inflation, as was done in many studies, then its effect on growth is significant: the lower the inflation, the faster the growth[9]. However studies which included both fiscal balance and inflation brought mixed results. The difficulties in separating the effects of inflation and fiscal deficit on growth could be explained in several ways: regression models did not include possible simultaneous determination of inflation and growth (Havrylyshin, 2001), or it is due to endogeneity of the fiscal balance variable (Berg et al., 1999; Falcetti, Raiser, & Sanfey, 2002). When, for instance, fiscal balance is treated as an endogenous variable, its effect on growth becomes positive and significant. Large government could also influence growth through high taxation and large bureaucracies, but there is no consensus on the direction of these effects. Generally for a given level of initial per capita GDP, lower government spending can result in higher long-run growth rates, but its impact could also depend on type of government consumption[10] and distortion associated with its financing (Fisher, Sahay, & Verg, 1998).

It is well known from the economic growth theories that standard growth factors in the medium and long term are *investments in physical and human capital*. Following the empirical literature it can be concluded that these factors play no role in explaining economic growth in transition countries, at least in the first years of the transition process. An explanation of this result could be that initially the transition process was not based on increasing new investments, but on reallocation of the existing resources (Havrylyshyn, Izvorski, & van Rooden, 1998). Despite the relatively high level of investments in the period of central planning, investments in physical capital shrank due to inherited inefficiency

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8   Havrylyshyn, Izvorski, and van Rooden (1998), Falcetti, Lysenko, and Sanfey (2006).
9   Havrylyshyn, Izvorski, and van Rooden (1998) calculated that reducing inflation to a level lower than the range of 20%-30% was a necessary condition for sustainable growth.
10 The size of government can influence economic performance through enterprises, markets, and institutions that allow the market to work. For instance, properly directed government spending on reform (improving the quality of government administration, building of market-based institutions, etc.) would have positive effects on the economic growth of transition countries.

and under-utilized capacity. The impact of these traditional factors of input stated by growth models, as well as other types of investments, may become more important during the second transition decade (Havrylyshin, 2001).

So far empirical literature on the effects of *economic integration* (particularly the EU enlargement process) on the economic growth of transition countries involved in that process has been very scarce. Most empirical studies have analysed the growth effects of economic integration within European Union member and OECD countries. The results concerning the significance and direction of the growth effects of economic integration are very mixed[11]. While some studies did not find any significant effect of economic integration on members' growth, others found positive effects, emphasizing that economic integration can promote growth through trade liberalisation and boosting investment in physical capital and knowledge capital, i.e. technology. These effects may even be asymmetric in the sense that they might differ between core region and peripheral regions (Baldwin & Forslid, 2000). Different results seem to depend on the methodological approaches, the way in which integration enters the specification and specificities of a given regional integration (Brodzicki, 2005).

Summing up all the findings of the literature overview, stabilisation and structural reforms turn out to be key contributors to economic growth in the recovery phase of the first transition decade; growth was more rapid in countries with faster and earlier macroeconomic stabilisation and structural reforms.

3. ECONOMIC GROWTH IN TRANSITION COUNTRIES: A COMPARATIVE ANALYSIS

In this section we give an illustration of growth differences in the observed transition countries, throughout the period of the transition process (1989-2009). In particular, economic growth in 27 transition countries[12], in terms of the growth rate of real GDP, is compared with economic growth in the major economies

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11 For instance: Baldwin and Seghezza (1996), Henrekson, Torstensson, and Torstensson (1997), Vanhoudt (1999), Badinger (2005).

12   Countries in the sample are: Bulgaria, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic, Slovenia, Albania, Bosnia and Herzegovina, Croatia, Macedonia, Russia, Serbia, Ukraine, Czech Republic, Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyz Republic, Moldova, Tajikistan, Turkmenistan and Uzbekistan. Due to the lack of relevant data, Montenegro and Mongolia are not included in the analysis.

as well as the world average growth. Furthermore a distinction is made among different groups of transition countries and between the two transition decades.

In the total observed period countries that are technological leaders[13] have experienced accelerated economic growth while other major economies have lagged behind[14]. In the same period CEE and FSU countries were involved in the transition process and witnessed a sharp output decline in the first transition years. While world average economic growth was 2.9% in the period 1989-1998 and 3.5% in the period 1999-2009, in emerging transition countries it was -4.7% in the first and 5.5% in the second transition decade. More precisely by the end of the first transition decade all transition countries except Poland and Slovenia experienced a decrease in economic performance. The FSU countries suffered from the largest decrease in that period (Tajikistan -13.2%, Georgia -11.7%, Moldova -11.2%, and Ukraine -10%), but this was compensated by the largest growth in the second transition decade (Azerbaijan 14.4%, Turkmenistan 13.8%, etc.). On the other hand, average economic growth for CEE countries was -1.8% in the first decade, and 3.9% in the second decade. This analysis shows obvious different dynamics of economic growth across countries and over time. For this reason we have to differentiate among groups of countries, starting with regional criteria: Baltic countries, CEE-7, West Balkan[15], and FSU countries. Due to heterogeneity within the FSU countries a distinction is made between countries with lower (FSU-7) and higher economic performance (FSU-5)[16].

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13 Canada, France, United States, Japan, China, Germany, United Kingdom (IMF source).

14 As established in: Bassanini and Scarpetta (2001).

15 Baltic countries: Estonia, Latvia, Lithuania; CEE-7: Poland, Czech Republic, Slovak Republic, Hungary, Romania, Bulgaria, Slovenia; West Balkans: Albania, Bosnia and Herzegovina, Croatia, Macedonia, Serbia.

16 We use differentiation as in Fischer and Sahay (2004): FSU-5 includes more developed countries: Belarus, Kazakhstan, Russia, Turkmenistan, and Ukraine. FSU-7 includes: Armenia, Azerbaijan, Georgia, Kyrgyz Republic, Moldova, Tajikistan, and Uzbekistan.

Figure 1. Real GDP indices in groups of countries
over the transition period (1989=100)
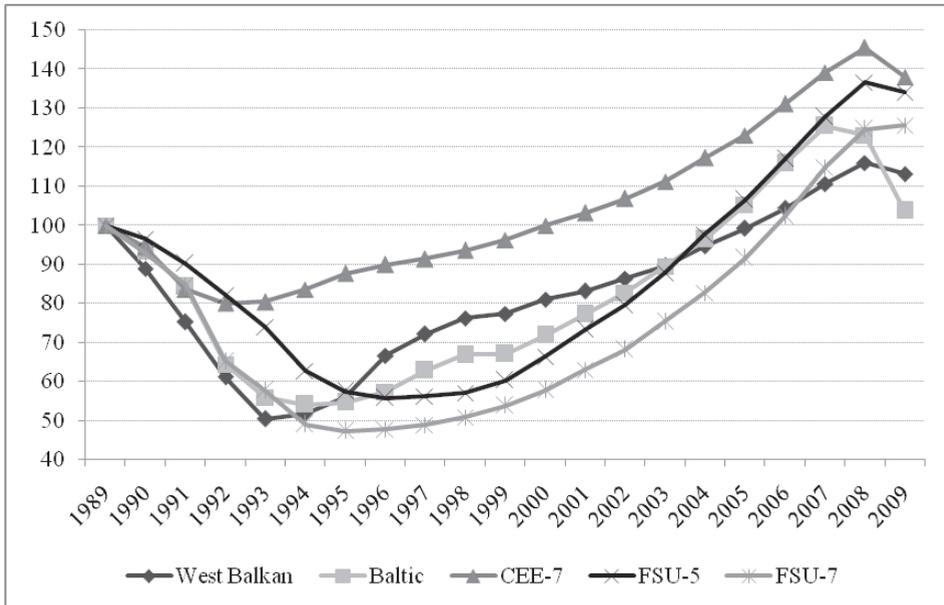
Source: EBRD database

Figure 1 shows that real GDP decline was much larger in other transition countries than in CEE-7. Consequently the economic performance recovery lasted longer in most of these countries than in CEE-7, due to the late start of the transition process and a delay in achieving the same level of GDP as existed in the first transition year. An exception to this tendency is the group of West Balkan countries in which the recovery was the fastest, so that after 1997 this group got growth dynamics similar to CEE-7, although on the lower level[17].

Apart from the different level of GDP decline between groups of countries, a different dynamic of economic performance over time is also observed during the first and second decades of the transition process. These differences in growth performance could be attributed to different determinants of economic growth. After the initial real GDP decline in the first transition years countries started to grow more rapidly, owing to the stimulation of transition reforms. This growing

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[17] West Balkan countries were pushed into the European 'super-periphery' characterized by deindustrialization and high unemployment, ethnic, political turmoil and instability, hence, economic growth was slower. See more in: Bartlett (2009).

dynamics has continued across all transition countries in the second decade as well, but with different outcome, introducing the question of whether transition reforms still determine economic growth dynamics. In order to answer this question we compared the relationship between economic growth and transition reforms in the two transition decades. While a positive correlation coefficient (0.51) between economic growth and reforms[18] in the first decade indicates that undertaken reforms bring some lasting benefits, the same coefficient in the second decade is negative (-0.36)[19]. This may suggest that countries that reformed more intensively in the first decade grew faster, while those that began a late transition progress in the second decade did not experience a strong positive effect of reforms on economic growth. This hypothesis will be tested in the econometric part of the paper.

Bearing in mind extremely heterogeneous performances during the observed period, characterised by large discrepancies in economic growth dynamics between the two transition decades and different transition phases, the focus of our further analysis is the more homogenous period 1999-2009. Since our aim is to answer the question of what driving forces influenced transition countries to grow in the second decade, we continue with the investigation of whether different dynamics of economic growth exist in different groups of transition countries in that period.

Concerning one of the paper's purposes, to examine the growth effects of the EU enlargement process, we also observed differences in economic growth dynamics between the group of the new EU member countries[20] and the rest, the non-member transition countries. As Figure 2 shows, faster economic growth was achieved in non-member countries, probably due to the lower starting level of the real GDP.

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[18] Intensity of transition reforms is represented by the average of the EBRD transition indicators. For more details see Section 4.

[19] Moreover, the same negative correlation was found in cross-section analysis for each observed year in the period 1999-2009.

[20] These are: Estonia, Latvia, Lithuania, Poland, Czech Republic, Slovak Republic, Hungary, Romania, Bulgaria, and Slovenia.

Figure 2. Real GDP growth in transition countries:
**EU members and non-EU members (1999=100)**
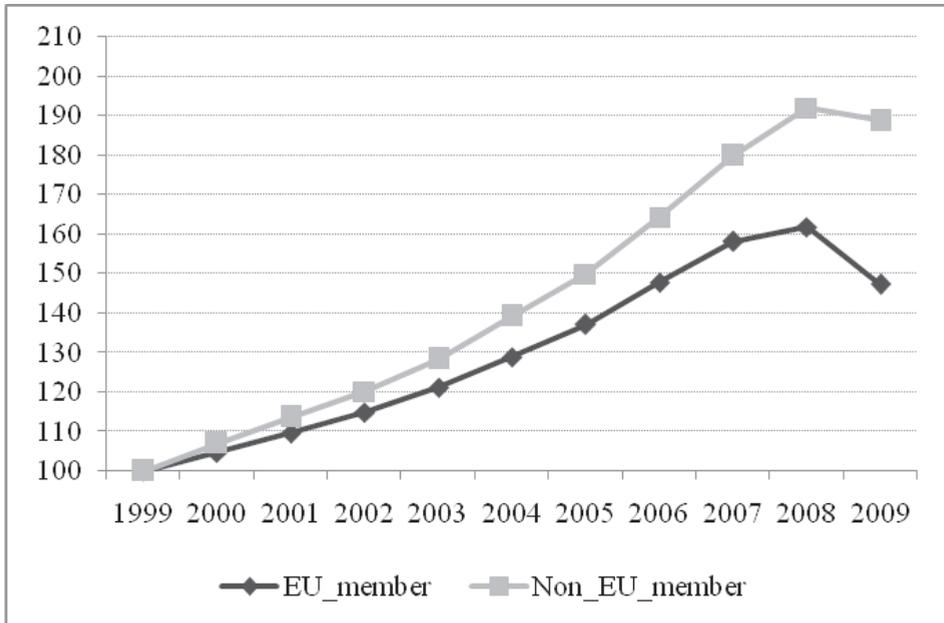
Source: EBRD database

Within the non-EU member transition countries we can see that similar dynamics of economic growth exist in the groups of countries that are in the same phase of the EU enlargement process[21]. Therefore we form the following groups of countries according to the phase of EU accession process: new EU member countries, countries in which the Stabilisation and Association Agreement (SAA) has entered into force (Croatia, FYR Macedonia), potential candidates (Bosnia and Herzegovina, Serbia, Albania) and as yet non-potential EU candidate countries, which have not been captured by the enlargement process (FSU-5 and FSU-7 countries). As is apparent in the next diagram, economic growth in non-potential EU candidate countries is the fastest, with the highest growth in the emerging FSU-7 countries. On the other hand countries in which the SAA entered into force experienced the slowest growth.

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[21]   The dynamic of each country's economic growth is given in Figure A1 in the Appendix.

**Figure 3. Real GDP dynamics in transition countries:
different groups of countries (1999=100)**
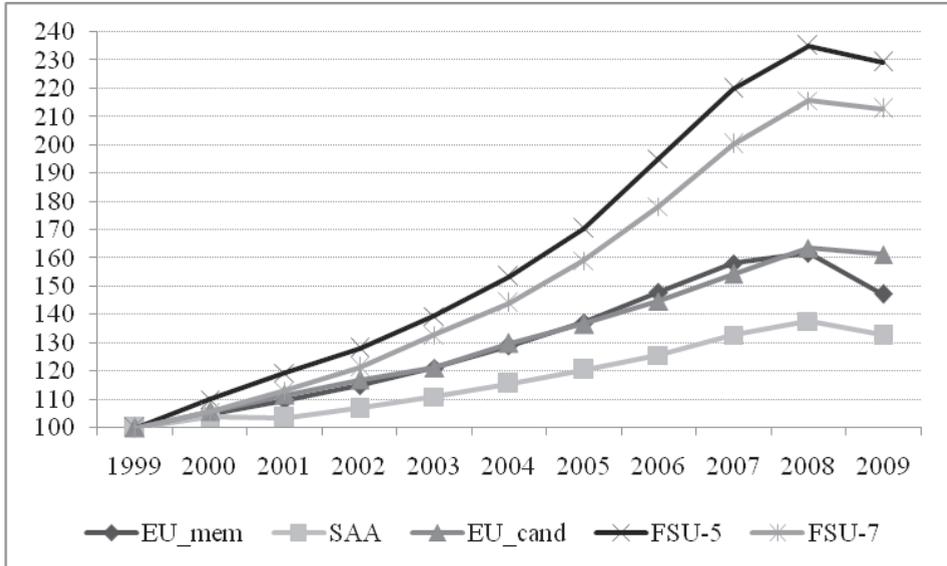
Source: EBRD database

In accordance with the common belief that less developed countries grow faster, this analysis shows that non-potential EU member countries grow faster than countries involved in some stage of the EU enlargement process. Nevertheless this is not the only differentiation in economic growth dynamics in transition countries. An analysis within the group of countries covered by the EU enlargement process also gives some indication of different growth dynamics depending on the EU accession phase, but this will be explained in detail in the econometric part of the paper.

Previous analysis shows that dynamics of economic growth across transition countries obviously imply that besides a similar growth path there are also some individual (country specific) effects, and their importance will be tested by the panel growth model. Additionally, due to the global economic instability, most transition countries experienced a decline in their economic activities in 2009, and some of them even in 2008, so that time dummy variables for these years can also be tested for significance[22].

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22   The exceptions from high GDP decline are Poland, Albania and Azerbaijan. The highest decrease of economic growth due to the economic crisis was in the Baltic countries, even in 2008.

4. GROWTH AND ITS POTENTIAL DETERMINANTS: A PANEL DATA MODEL

In this part of paper we intend to establish the main factors that influenced differences in the dynamics of economic growth during the second decade of the transition process. The results of econometric analysis should help us answer the following main questions:

(1) Do factors that were dominant in the first transition decade remain important in the second transition decade and what are the new determinants?
(2) Do structural reforms and the whole transition process still bring benefit in terms of faster growth?
(3) What are the consequences of the EU enlargement process on the economic growth of transition countries?

For the purpose of econometric analysis we used the EBRD database as the most comprehensive source of data on selected economic indicators, as well as on structural change and transition indicators[23]. As stated earlier, the analysis is based on a panel data sample of 27 transition countries in the period 1999-2009. Of course for some of these countries transition to an open developed market economy can be considered as already finished, but for the sake of our analysis it is important to compare the economic growth dynamics of the whole set.

In order to answer the question of whether key growth factors from the first transition decade still determine economic growth, we follow results established by the majority of previous studies, which include as significant initial conditions, macroeconomic stabilisation and structural reform variables in the model. In addition we consider some new potential growth determinants, like investment in human and fixed capital and openness of the economy, as well as dummy variables representing different stages of the EU enlargement process.

As far as *initial conditions* are concerned, several measures are used in previous empirical studies: the level of development (GDP per capita), the nature and extent of macroeconomic distortions, and the level of institutional development. Some papers consolidated a number of different measures of initial conditions into one EBRD index, based on a principal components analysis (De Melo et al., 1997; Falceti, Raiser, & Sanfey, 2002). We use initial level of GDP per capita

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[23] Some relevant data for the last observed year were not available from the EBRD database for some transition countries. In order to create a balanced panel data model, other sources of data are also used for some variables: UNCTAD International Trade Statistics, IMF and WB databases. For details on data sources and measurement see the Appendix.

(*GDPini*) in different starting years of transition for each country, in order to capture better different inherited initial conditions across countries[24]. Time trend and its interaction with the initial level of real GDP per capita are also included in the model to capture general increase of economic growth rates and to test diminishing effects of initial conditions over time.

In creating the *reform* variable (*Ref*), we use a set of EBRD transition indicators, related to three goals of the transition process: macroeconomic stability, liberalisation, and privatisation, as structure reform variables. However the conclusion concerning the effects of structural reforms on growth may depend on whether the reform variable is observed as an aggregate index, or components of reform are considered separately. Due to the problem of multicollinearity among single EBRD transition indicators, a combination of different reform policies is considered as more influential on growth than any single aspect of reform[25]. In defining the aggregate reform variable, the average (or the sum) of reform indicators could be used, or new mutually uncorrelated variables derived from the principal components analysis, as a linear combination of original variables (Falcetti, Raiser, & Sanfey, 2002; Staehr, 2005). Since the results based on the average of transition indicators do not differ much from those based on principal components analysis, we use the former as the aggregate measure of reforms.

The effects *of macroeconomic stabilisation* are captured by two economic variables: *fiscal balance* (*FB*) and *consumer price indices* (*CPI*, with logarithmic transformation to avoid extreme observations), while the size of government is measured by the share of *government expenditures* in GDP *(Gov)*. The effects of *investments in fixed and human capital* on growth are tested by including two variables in the model: the share of *investments* in *GDP* (*Inv*) and upper secondary *education* (*Edu*). In addition to this, *trade* effects on growth are also included. We use the basic measure of trade *openness* of the country, which is the share of total volume of trade in GDP (*Open*). For the purpose of estimating the effects of the *EU enlargement process* on the economic growth in transition countries, we created dummy variables for specific status in that process. Namely, several

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[24] Although early empirical papers used level of GDP per capita in 1989 as a pre-transition year, there are several more recent papers that use transition time, rather than calendar time, to define the different starting years of transition for each country (for instance, Fischer and Sahay, 2004; Falcetti, Lysenko, and Sanfey, 2006). Hence we use the following years as the starting points of transition: 1990 for Poland, Hungary, Slovenia, Croatia, Macedonia, Serbia and Bosnia and Herzegovina, 1991 for the Czech Republic, the Slovak Republic, Bulgaria, Romania and Albania, and 1992 for the Baltic states and FSU countries.

[25] Fisher, Sahay, and Verg, (1998); Havrlyshin, Izvorski, and van Rooden (1998).

stages in the EU enlargement process are represented by dummy variables for: (1) becoming a potential candidate country (*EU_cand*), (2) the SAA entering into force (*SAA*) and (3) new EU members (*EU_mem*)[26]. Finally, the effects of global instability are captured by time dummies.

Among all the above-mentioned variables, economic growth as dependent variable shows the highest correlation with government expenditures (-0.35), fiscal balance (0.37) and structural reforms (-0.36). As mentioned in the previous chapter, non-potential EU candidate countries had the fastest growth, possibly due to the fact that initial conditions still have some role in determining economic growth in those countries. However the correlation coefficient between the two variables is very low (-0.16). Correlation between the growth and initial level of GDP per capita in new EU member countries is even lower (-0.003), indicating that in the second decade initial conditions are not a dominant determinant of economic growth. Simple correlation analysis also indicates a multicolinearity problem among some of the explanatory variables in the model. The structural reform variable is highly correlated with the dummy variable that represents the stage of the SAA entering into force (correlation coefficients is 0.74). This shows that countries had to fulfil the criteria of reform evaluation in order to obtain a more favourable status in the EU enlargement process. Therefore the possible insignificance of some of the EU enlargement dummies in the econometric model could mean that these effects have already been captured by reform variables. Furthermore, the reform variable is highly correlated with the education variable (0.76), which is in line with findings in literature that transition countries with a higher level of political and macroeconomic stability also have a higher level of education.

The following analysis is based on an econometric approach to panel data, allowing us to analyse a number of important economic questions that cannot be answered using cross-section or time-series data sets[27]. In particular it allows the investigation not only of the different effects on economic growth across transition countries, but also of the changes of these effects over time. We start with the following form of panel data model:

$$y_{it} = \beta_0 + \beta_1 X_{it} + \gamma\ Z_i + v_{it}; \qquad i=1, 2, …, N; t=1, 2, …, T; \qquad (1)$$

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[26] Description of these dummies is given in Table A2 in the Appendix.

[27] This brings a number of benefits since it enables us to simplify identification of economic relationships between variables, to allow estimation of dynamic process and identification of individual and time effects, to increase the number of degrees of freedom with more observations, and to reduce problems caused by multicollinearity of explanatory variables (Hsiao, 2003; Baltagi, 2008).

where dependent variable y_{it} is growth rate of real GDP of country i in year t (*GDPgrowth*), X_{it} contains a set of growth determinants which vary over i and t (*FB*, *CPI*, *Open*, *Gov*, *Inv*, *Edu*, *Ref*, *EU_cand*, *SAA*, *EU_mem*), while *Zi* refers to time invariant variable which varies over countries but takes the same value over time (*GDPini*). Composite error term, v_{it}, can contain two or three components: individual effects (μ_i) and/or time effects (l_t) and the disturbance term (u_{it}). As is usual when working with panel data with a larger number of individuals (*N*) than time dimension (*T*), we used the following econometric tests in the procedure of choosing the appropriate estimation method. In trying to find out whether there is a different pattern of economic growth among transition countries, individual (country) specific effects are tested by the F test and the Breusch-Pagan (BP) test. Since panel data contain a time dimension, the Bhargava-Franzini-Narandharadhan Durbin-Watson test for autocorrelation of the disturbance term u_{it} is also applied. To test the single endogeneity problem (correlation of regressors with individual effects μ_i, or with the disturbance term u_{it}), the Hausman misspecification test and test for simultaneity are used.

In the presence of correlation between regressors and individual effects, applying the error components generalized least square method (ECGLS) on random effects (RE) specification of the model (1) produces biased estimates. On the other hand the estimates of the fixed effects (FE) specification of the model (1) are still consistent. However if we use the later specification we cannot estimate the growth effect of the initial conditions, since the covariance method eliminates time invariant regressors, along with individual effects. Hence any indication of the endogeneity problem leads us to estimate RE specification by using either the Hausman-Taylor instrumental variable method or the Balestra-Krishnakumar generalized two-stage least squares (G2SLS) method, depending on the type of endogeneity. Then the validity of the chosen instruments should be checked by Hausman-Taylor (HT) identification test.

The initial model, containing the whole set of regressors as possible growth determinants, is estimated in the forms of FE and RE specifications (Columns (1) and (2) in Table 1). The results of the F test and the Breusch-Pagan test show that individual (country specific) effects should be included in both specifications. Also it is notable that the growth effects of the initial level GDP per capita cannot be estimated in the FE specification, due to the earlier-mentioned specificity of the applied covariance method. However both specifications are to be estimated in order to apply the Hausman specification test and find out whether the single endogeneity problem exists in the RE model. The result confirms that some of the regressors in the RE model are correlated with individual effects as an error component

(Hausman c^2 = 40.28, p-value = 0.000). In the regression of estimated individual effects on explanatory variables we find two variables as potentially correlated with the individual effects: consumer price indices and openness of the economy.

Table 1. Growth determinants – panel data model
(Dependent variable: Annual growth rate of real GDP)

	(1) FE	(2) ECGLS	(3) G2SLS	(4) G2SLS
t	0.319 * (1.77)	0.348***	0.400***	0.355**
		(2.58)	(2.85)	(2.87)
GDPini	-	-0.00011	-0.00005	
		(-0.46)	(-0.19)	
t * GDPini	-0.00002	-0.00002	-0.00003	
	(-0.70)	(-0.08)	(-0.72)	
FB	0.117**	0.120**	0.093*	0.123**
	(1.97)	(2.22)	(1.63)	(1.95)
CPI	-6.457*	-3.887	-6.017*	-4.792*
	(-2.17)	(-1.45)	(-1.92)	(-1.58)
Gov	0.047	-0.144***	-0.157***	-0.160***
	(0.70)	(-3.97)	(-3.89)	(-4.69)
Ref	-1.597	-2.500**	-2.204**	-2.156***
	(-0.57)	(-2.97)	(-2.32)	(-3.55)
Edu	0.014	0.018	0.030	
	(0.31)	(0.76)	(1.14)	
Inv	-0.092	-0.030	-0.045	
	(-1.41)	(-0.47)	(-0.69)	
Inv(-1)	0.087	0.130**	0.120**	0.188**
	(1.41)	(2.14)	(1.75)	(1.98)
Open	0.099 ***	0.032***	0.088***	0.101***
	(5.49)	(2.74)	(4.66)	(4.19)
EU_cand	-0.878	-1.006	-0.396	
	(-0.53)	(-1.23)	(-0.43)	
SAA	1.715	-0.052	-0.991	
	(1.20)	(-0.06)	(-0.97)	
EU_mem	-1.136	-1.119	-2.080**	-1.898**
	(-1.33)	(-1.38)	(-2.39)	(-2.20)
D2008	-3.638***	-3.442***	-3.426***	-3.472***
	(-4.48)	(-4.13)	(-3.99)	(-4.01)
D2009	-12.231***	-12.841***	-12.321***	-12.428***
	(-13.18)	(-13.80)	(-12.75)	(-13.06)
Constant	29.515*	30.218**	35.275**	31.074**
	(1.61)	(2.27)	(2.29)	(1.97)
R^2	0.303	0.641	0.576	0.647
F test	29.90 (0.000)			
Wald test			400.61 (000)	398.54 (000)
F test ind. effect	3.06 (0.000)			
BP test		3.92 (0.047)		
Hausman test		40.28 (0.000)		
HT test			21.82 (0.0824)	7.77 (0.651)

***statistical significance at the 1% level, **significance at the 5% level, *significance at the 10% level (in parenthesis are *t* values for regression coefficients).

The empirical results from the first decade showed that reforms and fiscal balance may not be exogenous to the growth of transition countries. To establish whether correlation of these variables with the disturbance term u_{it} exists in the second decade, we use the Hausman test for simultaneity[28].

Table 2. Testing for simultaneity – structural form equation
(Dependent variable: Annual growth rate of real GDP)

Variable	Coefficient	Significance level
FB	0.235	0.08
res_FB	-0.129	0.04
Ref	-2.120	0.00
res_Ref	-0.431	0.87
CPI	-3.456	0.21
Gov	-0.132	0.00
Inv(-1)	0.110	0.01
Open	0.028	0.01
EU_mem	-0.625	0.44
D2008	-3.339	0.00
D2009	-12.217	0.00
T	0.248	0.11
Constant	14.910	0.000
R^2	0.63	

According to the significance of the residuals (res_FB and res_Ref) in the structural form (Table 2), we can conclude that simultaneous interdependence exists only between fiscal balance and the dependent variable. This result leads us to a two-stage estimation procedure for the panel simultaneous equation, i.e. to the G2SLS method. The set of instruments should include instrumental variables for regressors correlated with individual effects μ_i (*Open* and *CPI*), as well as for those correlated with the disturbance term u_{it} (*FB*). Regarding singly endogenous variables *Open* and *CPI*, we created a Hausman-Taylor set of instruments: transformations of the original variables in the form of their deviations from individual means. For endogenous fiscal balance one possibility is to use the original variable with one period lag as the instrument, which is highly correlated with its current level, but not with the disturbance term u_{it}. However this can

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28   First, we estimated two reduced form equations, where reforms and fiscal balance are functions of other predetermined variables of the structural equation. Estimated disturbance terms ($\hat{u}_{it}$) from these equations are used as additional regressors in structural form.

be the appropriate instrument only in the case when the autocorrelation of the disturbance term u_{it} is not present. Additional testing confirms that there is no autocorrelation problem, so we applied the lagged value of fiscal balance as an instrumental variable.

Applying the Hausman-Taylor identification test to the estimated simultaneous equation with the above-mentioned set of instruments, we found that the chosen set of instruments is valid. This proves the property that G2SLS method (column (3), Table 1) gives consistent estimates compared to the ECGLS estimates of the RE specification, and efficient ones compared to those of the FE specification.

As can be seen from Table 1, the variables education, initial level of GDP per capita, and current level of investments, and dummy variables for the stages of the EU enlargement, turned out to be insignificant in all phases of estimation and testing, so they were eliminated from the growth model in the general to specific modelling procedure[29].

According to the final model with only significant variables (column (4), Table 1), we could state that some of the growth determinants that were dominant in the first decade do not remain important during the second transition decade. Namely, it appears that neither effects of the initial level of GDP per capita nor its diminishing effects on growth dynamics (its interaction with time) are significant in the second decade of transition. This confirms the general result from the first decade that the impact of the inherited initial conditions was significant only in the first transition phases, while in later phases other factors prevail. Also the education variable is not significant, which is an expected result due to the relatively high level of education investment in the pre-transition period in all former socialist countries and low level of variation during the transition process. In contrast, variables that represent macroeconomic stabilisation remain dominant in determining economic growth. The effect of fiscal balance remains positive and significant, implying the importance of macroeconomic stabilisation for growth in the second decade. The effect of another macroeconomic variable *CPI* also appears to be of an expected sign and significant at the 10% level. Additionally the regression coefficient of government expenditures is significant, implying a negative impact of policy-generated distortions on growth in transition countries. This can indicate that government spending is not properly directed

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29   After eliminating insignificant variables, we repeated the explained econometric procedure to obtain the final model, and the tests again indicated the same G2SLS method as appropriate.

in order to influence faster growth, or that government size is at a level where it slows down the economic growth.

Possibly the most interesting result and a quite different one compared to those of the first decade, refers to the effects of structural reforms on economic growth. While there was a positive effect of the reforms on growth in the first decade the opposite is true in the second decade. The significant negative regression coefficient in all panel data specifications[30] leads us to conclude that vigorously proceeding with reforms in the second decade without creating other development mechanisms could slow down economic growth. On the one hand more developed transition countries that undertook reforms in the early phases of transition experienced benefit in terms of higher growth rates. These countries have entered the second decade with high reform levels, and their growth relies on the economic driving forces more than on reforms. On the other hand transition countries that were late with the reforms could be faced with further time taking reforms and slower growth in the second decade, despite the fact that they undertake them properly.

As far as the new growth determinants are concerned, investment in fixed capital seemed to boost the economic growth of transition countries in the observed period[31]. The positive and significant regression coefficient of the investment variable with one-year lag proves that traditional factors from economic growth theories also become dominant in later phases of transition. In addition, openness of the economy also appears as a new important determinant of growth. The expected positive regression coefficient of that variable supports the common belief that trade promotes growth through a number of channels (comparative advantages, technology transfers, and economies of scale).

Regarding the effects of the EU enlargement process, it seems that only the phase of full EU membership has an impact on growth dynamics. The negative and significant coefficient of this variable indicates slower economic growth in these countries. This could be explained by the fact that there are common patterns for countries at a similar level of development. Namely, once the transition country

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[30]   It is worth noting that this negative relationship was obtained when we used the average of all nine transition indicators (including the first-phase reform indicators, i.e. privatisation, trade and price liberalisation) as well as only average of the second-phase reform indicators (enterprise restructuring, banking and non-banking reforms, competition policy and infrastructure reforms).

[31]   This result is in line with the econometric results of two recent papers: Cerovic and Nojkovic (2009); Iradian (2009).

improves its general welfare, which happens along with its accession to the EU, it follows a similar growth path to other EU countries in terms of lower growth rates. However, this can still signify much higher absolute GDP increases than in less developed countries.

Rapid average economic growth in the second decade of transition was abruptly interrupted by the influence of the global economic instability[32]. The smallest negative effect of the economic crisis is observed in non-potential EU member countries, while within the group of countries involved in the EU enlargement process the negative effects were larger and obvious even in 2008, predominantly in the Baltic countries. In 2009, after importing the crisis, all new EU member and potential EU member transition countries experienced a slowing down of economic activity. This indicates that the more closely the country was connected with other countries (developed EU members) the sooner it experienced the crisis[33]. However these countries should not have more serious effects and they are more likely to recover sooner, because a higher level of their openness and investments tend to increase economic growth.

5. CONCLUSIONS

Despite tendencies to achieve sustainable economic growth, transition countries suffered from sharp output decline in the first years of transition. After the period of transition crisis, economic growth paths across these countries differed widely. The empirical literature of the first decade of transition explained these differences by three groups of determinants: different starting points of the transition process, structural reforms, and macroeconomic stability. After two decades of transition an especially important question is whether growth determinants, found to be predominant in the first transition decade, also remained important in the second decade, and whether new driving forces appeared as more significant in stimulating economic growth. Since empirical literature on this issue is still rather scarce the main focus of this paper was to examine the above stated question.

In trying to find out which factors determined economic growth of transition countries in the second decade the econometric methodology of panel data is applied on a sample of 27 transition countries over the period 1999-2009.

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[32]   The effect of the global instability on economic growth is captured by time dummies in the model (Table 1). More about impact of the global instability on transition countries see in: Nuti (2009).

[33]   Jovicic, (2010).

The paper's findings indicate government expenditures, fiscal balance, price index, reforms, openness, investment and EU membership as most important in explaining growth dynamics in the second decade. Therefore the answer to the main question is that initial conditions no longer have a role in explaining economic growth, but macroeconomic stability still matters in achieving faster economic growth. Beyond driving forces from the traditional economic theories of economic growth, it was shown that acquiring new markets and new technology become important in the second decade. Namely, economies that pursue an orientation toward international trade, as well as those that attract more investment will achieve faster economic growth.

The second question in the paper was whether structural reforms and the overall transition process still bring benefits in terms of faster economic growth. According to our findings structural reforms seem to have a role in influencing economic growth in the second decade, but in an opposite way compared to the first decade of transition. However this result does not necessarily imply that growth rate of each country is influenced by reforms first positively (in the first decade) and then negatively (in the second decade), since the heterogeneity across countries has already been captured by individual specific effects in the model. The negative relationship may mean that prolonged pursuing of reforms in the second decade (without more orientation on country's own economic mechanisms for sustainable growth) could slow down economic growth. This could be the case with less developed transition countries which were late and slow in reforms process. For developed transition countries that have already access the EU, it is expected that they no longer have high growth rates, but this can still denote their higher absolute GDP increases compared to other transition countries.

The final question addressed in the paper is whether the EU enlargement process influences the economic growth of transition countries. We found that accession to the EU brings some changes in economic growth dynamics. Namely, once a transition country becomes an EU member, and this implies achieving a higher level of development, it follows a growth path common to other EU countries at a similar level of development. Of course the negative effect on the growth rate of the dummy variable for EU membership or the average assessment of the progress in reforms does not mean that a country should give up these tendencies. It is clear that the higher the level of economic development achieved, the more difficult it becomes to sustain a high rate of growth.

Summing up the main findings, our analysis reveals that while transition countries exhausted the positive effects of structural reforms in the first decade, harsh reforms in the second decade turned out as insufficient in themselves to generate sustainable growth, which could be attained only by other driving forces. Hence, new determinants such as higher investment in new technologies and reaching an increased degree of openness of the country become more important in achieving sustainable growth.

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APPENDIX

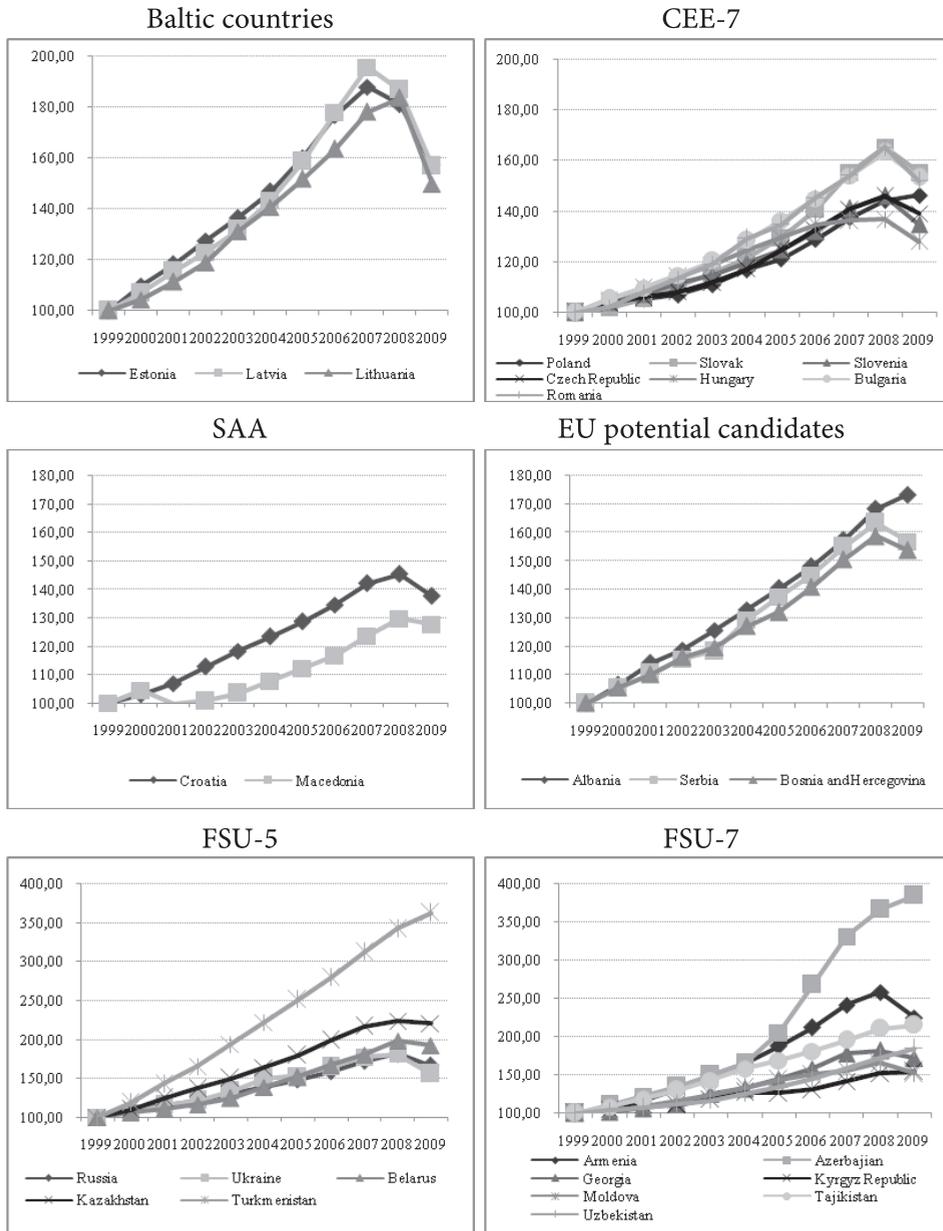### Figure A1. Economic growth dynamic in transition countries (1999=100)

Baltic countries

CEE-7

SAA

EU potential candidates

FSU-5

FSU-7

Table A1. List of variables

Variable	Description	Measure	Source
CPI	Consumer price index	Percentage change	EBRD
D2008	Dummy variable for the year 2008	1 – year 2008, 0 – else	
D2009	Dummy variable for the year 2009	1 – year 2009, 0 – else	
Edu	Upper secondary enrolments (ISCED3, all programmes)	Gross rates,% of population aged 15-18	EBRD, UNESCO
Eu_cand	Dummy variable for the phase of becoming a potential EU candidate country	1 – the period of becoming a potential EU candidate, 0 – otherwise	EU Commission
Eu_mem	Dummy variable for the phase of becoming an EU member	1 – the period when country became an EU member, 0 – otherwise	EU Commission
FB	Share of fiscal balance in GDP	In percentage	EBRD
GDPgrowth	Economic growth rate	Percentage change of GDP in real terms	EBRD
GDPini	Level of real GDP per capita in the first transition year (the first year of transition is chosen according to Fisher and Sahay (2004))	in US dollars	EBRD, IMF
Gov	Share of government expenditure in GDP	In percentage	EBRD
Inv	Share of investments in GDP	In percentage	IMF, WB
Open	Openness as the share of total trade (exports and imports) in GDP	In percentage	EBRD, UNCTAD International Trade Statistics
Ref	Average of all transition indicators	Scale from 1 to 4.33 for each transition indicator	EBRD
SAA	Dummy variable for the phase from the entry into force of the SAA	1 – the period from the year when SAA entered into force, 0 – otherwise	EU Commission