1 Economic Growth and Countries in Transition*

Andrea Mervar**

Abstract

The purpose of this paper is to reexamine the results of earlier empirical studies on economic growth in transition economies by implementing panel regression analysis on an extended data set. Furthermore, the analysis stresses the need for distinguishing among various groups of transition countries as well as between the periods of fall and recovery of economic activity. After the dominant influence of "transition" factors, such as structural reforms, macroeconomic stability and initial conditions in the early transition years, increasing importance in explaining economic activity during later years is attributed to the openness of an economy as well as indicators of institutional development.

Keywords: economic growth, transition economies, panel estimation
JEL classification: O40, O57, P20, P27

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** *Andrea Mervar, Institute of Economics, Zagreb.*

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1 Introduction

The *transition* of former socialist countries is an unprecedented process in the world history. Its analysis is a difficult task, due to a complex and multifaceted nature of the phenomenon, which entails not only economic transition from centrally planned economies to market-oriented systems but also profound political, institutional and social reforms undertaken in parallel by these countries, as well as the fact that this is a still ongoing process. The first decade of the economic transition witnessed a sharp decline in economic activity, which has by now been successfully mitigated in most countries, some of which have seen upturn in economic activity over the past several years. All transition countries have started to build institutional environment in support of a functioning market economy, significantly liberalized prices and trade and achieved various degrees of progress with the process of economic restructuring and privatization.

The decade-long experience of transition has motivated numerous efforts to reveal regularities and patterns of transition, detect similarities and account for differences among the countries. Two approaches can be identified in the literature analyzing these issues. The first focuses on empirical research and determinants of economic activity in transition while the second is more narrowly scoped and attempts to propose a basic theoretical framework for explaining the transition process as a whole. In this paper we shall review the body of literature influenced by the former approach. This literature seems to suggest that after the dominant influence of "transition" factors, such as *structural reforms, macroeconomic stability and initial conditions*, in the early transition years, increasing importance in explaining economic activity during later years has been attributed to the factors posited by neoclassical and endogenous growth theories, as well as the results of a number of empirical studies of the 1990s based on samples of "non-transition" economies.

A brief overview of the empirical literature on the growth performance of transition economies is provided in Section 2 of this paper. Apart from many similarities to previous studies, the empirical analysis in Section 3 is based on extended data sets and can therefore be broadened to include different sub-periods and more homogenous subgroups of transition countries. Using panel data, the basic growth equation for transition countries is estimated, and the results are then used to analyze the impact of

different determinants of growth on transition economies. The paper closes with a summary of the main conclusions put forth in Section 4. Finally, it should be noted that the purpose of this paper is not so much to delve into the particular aspects of national economies, as it is to extract lessons learnt from the overall transition experience.

2 Lessons from the First Decade of Transition: A Survey of Empirical Literature

In the first decade of transition, the prime area of interest in *empirical* studies on growth in transition countries largely revolved around identifying the determinants of economic recovery and growth and establishing their relative importance. Methodology in these studies heavily relied on panel data regression analyses with specifications relating output performance to a set of explanatory variables, including initial conditions, structural reforms and macroeconomic policy. Whereas the size of the data sample, the length of time series, the degree of econometric sophistication, and the range of explanatory variables differed across the studies (see Table 1), they supported the view that slow progress in macroeconomic stabilization and structural reforms coupled with unfavorable initial conditions (such as, for example, overindustrialization, loss of external markets or war) was associated with weaker output performance. Initial conditions were key factors explaining negative output performance in the early years of transition while structural reform had positive output effect, stimulated to a lesser extent by improved macroeconomic stability. There were some differences, however, in the answers to more specific questions, especially those regarding the relative importance of these explanatory variables.

In the initial transition phase, improvements in the efficiency were achieved with the existing factors of production rather than by increases in their quantities, i.e. investments in physical capital or higher levels of employment. Thus, although generally regarded as a fundamental determinant of economic growth, investments did not play a significant role in explaining the patterns of economic performance during the early transition years. Indeed, investment in physical capital, which was relatively high under central planning, shrank in most countries in the first few years of transition. As a result, correlation between the physical capital investment and growth

in transition economies has been weak.[1] Neither relatively high levels of human capital accumulation in transition economies have shown success in accounting for a decline and recovery pattern of economic activity in these countries. Initial conditions were found to be positively correlated to the economic growth in transition countries - the more favorable initial conditions, the faster their economic recovery - and they were generally believed to be an important factor in explaining growth rate differences across countries. On the other hand, most empirical studies based on data for non-transition countries found evidence that the per capita GDP growth was inversely related to initial income levels and that, all other factors being equal, poor countries grew faster than rich ones. Such evidence suggested that the determinants governing economic activity in transition countries were rather specific, and hence could be very different from those found in other economies.[2]

Empirical analyses from the early transition years mainly focused on establishing the direction and strength of the correlation between growth and the degree of structural reform undertaken by the economies undergoing transformation. Using the unweighted sum of nine different indicators of institutional changes in transition countries, Sachs (1996) was among the first to offer evidence that the growth rates in the period 1989 - 1995 were significantly and positively associated with the extent of structural reforms. These results are consistent with the findings of De Melo, Denizer and Gelb (1996), and Selowsky and Martin (1997) who, based on a similar indicator called the "liberalization index", concluded that in addition to the intensity of structural reforms, success at restoring growth was also related to a *sustained* progress of reforms and macroeconomic stability. Selowsky and Martin (1997) went on to argue that reforms have different effects on performance in Central and Eastern Europe and the former Soviet Union. In particular, while liberalization had immediate positive effect on performance in CEE, it was associated with initial deterioration in the FSU. They also provided evidence of a significant and adverse impact of war on the growth in war-torn transition countries.

Fischer, Sahay and Végh (1996a, 1996b) were among the first to combine variables describing progress made with structural reforms with various indicators of

[1] Havrylyshyn, Izvorski and van Rooden (1998) concluded that in explaining output performance, the role of new investments was relatively unimportant during initial stages of recovery while Wolf (1997) found a negative correlation between investment and economic growth.

[2] For comprehensive surveys of empirical studies on long-term growth for samples of "non-transition" countries see, among others, Barro and Sala-i-Martin (1995) and Temple (1999).

macroeconomic stability. They concluded that the countries that had achieved macroeconomic stability (reduced inflation and fiscal deficit) and implemented more comprehensive structural reforms exhibited higher growth rates.

Generally speaking, empirical literature on growth in transition economies has identified the following groups of growth determinants:

- structural reforms and liberalization (de Melo, Denizer and Gelb, 1996; de Melo et al., 1997; Fischer, Sahay and Végh, 1996a, 1996b; Hernández-Catá, 1997; Berg et al., 1999);
- macroeconomic stability as measured by inflation (Fischer, Sahay and Végh, 1996a, 1996b; Hernández-Catá, 1997; Loungani and Sheets, 1997; Christoffersen and Doyle, 1998; Berg et al., 1999) and fiscal deficit (Berg et al., 1999; Fischer, Sahay and Végh, 1996a, 1996b); and
- initial conditions (de Melo, Denizer and Gelb, 1996; de Melo et al., 1997; Heybey and Murrell, 1998; Berg et al., 1999).

While there is a broad agreement in literature that these factors have determined growth in transition economies, the debate on their relative importance is likely to continue for some time.

First and least disputed conclusion is that macroeconomic stabilization is a necessary (but not sufficient) condition for economic recovery, with a majority of the studies placing emphasis on inflation as a measure of stabilization. Another conclusion emerging from empirical studies is that fixed exchange rate regimes tend to speed up disinflation (Fischer, Sahay and Végh, 1996a) and contribute significantly to financial stabilization. The group of studies that include both inflation and a fiscal deficit variable show varying results. Thus, for example, in Berg et al. (1999) the sign of the estimated coefficient on fiscal deficit varies with different specifications; Fischer, Sahay and Végh (1996a, 1996b) find that fiscal deficit adversely affects growth while in Loungani and Sheets (1997) its effect is positive.

Table 1 **MOST FREQUENTLY USED EXPLANATORY VARIABLES IN GROWTH EQUATION FOR TRANSITION COUNTRIES (DEPENDENT VARIABLE: REAL GDP GROWTH RATE / REAL GDP PER CAPITA GROWTH RATE)**

VARIABLE	Åslund, Boone and Johnson (1996)		De Melo, Denizer and Gelb (1996)	Fischer, Sahay and Végh (1996a)	Fischer, Sahay and Végh (1996b)	Sachs (1996)	De Melo et al. (1997)	Hernández-Catá (1997)	Loungani and Sheets (1997)	Selowsky and Martin (1997)	Wolf (1997)
Structural reforms (current and lagged)	✔		✔	✔	✔	✔	✔	✔	✔	✔	✔
Initial conditions			✔				✔		✔		✔
Inflation (current and lagged)		✔			✔			✔			✔
Budget surplus/deficit (current and lagged)				✔	✔				✔		✔
War dummy	✔	✔	✔				✔	✔	✔	✔	✔
1992 dummy (due to the collapse of the CMEA and FSU)									✔		
Ruble zone dummy	✔	✔						✔			
Exchange rate dummy				✔				✔			✔
Other variables					✔ external assistance/ GDP			✔ various dummies	✔ GDP growth rate lagged one period		✔ investments /GDP; export growth rate; dummy for radical reformers
R^2 / adjusted R^2	0.77	0.79	0.65	0.72	-	0.38	0.43	0.82	0.46	0.58	0.57
Cross-country data	✔	✔	✔			✔				✔	
Panel data				✔ fixed effects	✔		✔	✔ fixed effects	✔		✔
Number of countries	24	22	26	25	20	25	28	26	25	25	25
Period	1989-95		1989-94	1992-94	1992-94	1989-95	until 1996	1990-95	1991-94	1990-95	1989-95
Calendar time	✔		✔	✔	✔	✔		✔	✔	✔	✔
Transition time							✔				

Table 1 - continued												
VARIABLE	Christo-ffersen and Doyle (1998)	Fischer, Sahay and Végh (1998)	Havrylyshyn, Izvorski and van Rooden (1998)	Heybey and Murrell (1998)	Van Elkan (1998)	Berg et al. (1999)	Havrylyshyn and van Rooden (1999)	Abed and Davoodi (2000)	Falcetti, Raiser and Sanfey (2000)	Fischer and Sahay (2000)		Radulescu and Barlow (2000)
Structural reforms (current and lagged)	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Initial conditions			✔	✔		✔	✔		✔	✔		✔
Inflation (current and lagged)	✔		✔		✔	✔	✔	✔	✔		✔	
Budget surplus/deficit (current and lagged)		✔				✔		✔			✔	
War dummy	✔					✔					✔	✔
1992 dummy (due to the collapse of the CMEA and the USSR)		✔										✔
Ruble zone dummy												
Exchange rate dummy		✔										
Other variables	✔ export market growth		✔ general government expenditure		✔ general government expenditure; FDI	✔ interaction between certain variables and private sector share	✔ indicators of institutional development	✔ corruption index; initial GDP; life expectancy		✔ years of macroeconomic stability; time trend		✔ GDP growth rate lagged one period
R^2 / adjusted R^2	0.65	0.70	0.76	0.63	0.75	0.86	0.76	0.54	0.63	0.45	0.43	0.53
Cross-country data				✔					✔			
Panel data	✔ fixed effects	✔ fixed effects	✔		✔	✔	✔	✔		✔	✔	✔ fixed effects
Number of countries	22	25	25	26	25	26	25	25	25	25		25
Period	1990-97	1992-95	1990-97	until 1995	1993-96	until 1996	1991-98	1994-98	1989-98	until 1998		1991-99
Calendar time	✔	✔	✔				✔		✔			✔
Transition time				✔	✔	✔				✔		

Note: In empirical studies, it is common to estimate several alternative specifications; the table lists the specifications considered to be most representative of each study.
Source: Author's selection.

A second group of conclusions relates to additional conditions associated with favorable growth performance, such as liberalization and other structural reforms. Whether simple (correlating growth to the structural reform index) or more complex (attempting to identify the role of stabilization as well as initial conditions and structural reforms), empirical analyses in this area are consistent in that the more reform-enthusiastic countries have had more successful macroeconomic performance and higher growth rates, except certain countries which have been regarded as exceptions, notably Belarus and Uzbekistan.[3] Finally, structural reforms allow a more efficient use of available resources and bring about technological progress, pushed by increased trade openness and foreign investment.

Whereas the theoretical literature on transition argues that a gradual approach to reform leads to relatively small output declines in the initial years,[4] the empirical evidence points strongly in the other direction by demonstrating how rapid progress in structural reforms positively affects recovery and growth rates.[5] However, it has become clear that rapid policy action was possible only in some areas of reform, such as price and trade liberalization, inflation stabilization and privatization of small and medium enterprises, and that in other areas reform took longer than expected. Wolf (1997) demonstrates that the choice of transition strategy (gradual vs. radical reform policy) is endogenous to initial conditions in transition countries. Looking into the relationship between structural reforms and growth, Falcetti, Raiser and Sanfey (2000) find little evidence of a feedback effect from growth to reforms while Radulescu and Barlow (2000) show that rapid growth is associated with slower progress in implementing reforms.

A third group of conclusions relates to initial conditions and other country-specific factors such as internal conflicts and wars. Although various empirical studies generally agree that initial conditions do affect growth in transition countries, there is considerable dispute over their relative importance and a broad definition of the concept undoubtedly adds to the controversy. The former Soviet Union countries, for instance, were less familiar with market-based institutions and had 20-30 years more of

[3] *For more details, see Fischer and Sahay (2000). The decline in output in Uzbekistan and Belarus has been relatively mild compared to other transition economies, despite their hesitant approach to reforms. See also Zettelmeyer (1998) for a more thorough account of Uzbekistan's experience.*

[4] *See, for example, Aghion and Blanchard (1994).*

[5] *See, for example, Fischer and Sahay (2000).*

communist rule than other transition countries. Furthermore, many socialist countries suffered from overindustrialization and underdeveloped service sectors while external trade flows were highly concentrated within the CMEA (Council for Mutual Economic Assistance) area. They also had very different macroeconomic conditions, geographical location and natural resources. Geographical proximity to the European Union has greatly benefited the countries of Central and Eastern Europe in facilitating their access to Western markets and attracting foreign investment. On the other hand, natural resources are more abundant in some former Soviet Union countries like Azerbaijan, Kazakhstan, Turkmenistan and Russia than in the CEE countries.

One of the first comprehensive efforts to analyze the role of initial conditions in economic growth was undertaken by De Melo et al. (1997). Whereas their analysis of eleven variables characterizing initial conditions does offer evidence of a strong relationship between initial conditions and growth, they conclude that economic policies have been the dominant determinant of the economic growth in transition countries. In a similar vein, Selowsky and Martin (1997) attribute the differences in the immediate impact of reforms on Central and Eastern Europe and the former Soviet Union to the degree of macroeconomic and structural distortions at the outset of reforms. Fischer, Sahay and Végh (1996a) also find that initial conditions, particularly dependence on CMEA trade, have played an important role in explaining economic activity, together with initial income levels. Havrylyshyn, Izvorski and van Rooden (1998) say that initial conditions do matter but are of opinion that their impact has been less important than economic policy choices and that their negative effects could be relatively easily overcome by stepping up progress in structural reforms. Heybey and Murrell (1998) challenge their results and underscore the importance of initial conditions over structural reforms in determining growth performance, at least during the first four years of transition. This is consistent with the conclusions reached by Falcetti, Raiser and Sanfey (2000), who go on to allow the impact of initial conditions to diminish over time.[6]

A final, fourth, group of conclusions associates growth with institutional development (for example, the rule of law, degree of corruption, tax burden, equity of taxation, and so on). Institutional development factors are generally difficult to measure and, due to the short time span that covers the experience of transition, data available for the

[6] *Falcetti, Raiser and Sanfey (2000) use a cross-country and panel regression analysis. The cross-country results indicate significantly greater impact of initial conditions than the panel estimates.*

empirical analysis are limited. However, the existing literature clearly shows that growth is higher in countries that have built more effective market-enhancing institutions. Havrylyshyn and van Rooden (1999) thus attempt to compile available institutional indicators for transition economies and design a simple econometric test of how much explanatory value was added by such institutional indicators in growth regressions for transition economies. Empirical evidence has demonstrated that in a large number of developed and developing countries, institutional indicators significantly contribute to explaining the economic growth process. Havrylyshyn and van Rooden's (1999) results, on the other hand, suggest that in transition economies macroeconomic policies and structural reforms are more important factors in explaining output developments than institutional indicators. Abed and Davoodi (2000) evaluate the relative importance of structural reforms vis-a-vis corruption indicators in explaining macroeconomic developments in transition countries. They also confirm that a structural reform variable has more explanatory power than the corruption index, which they use as a proxy for structural and institutional weaknesses. When variables representing the level of development of market institutions are included in the analysis, it becomes clear that the amount of the variations in GDP which are attributable to these variables are not nearly as high as the percent explained by structural reforms. It should be noted, however, that while the impact of adverse initial conditions declines over time, the importance of establishing a sound institutional environment increases with the passage of time.

A number of studies attempt to test the relative importance of other variables as well (Hernández-Catá, 1997; Fischer, Sahay and Végh, 1998; Havrylyshyn, Izvorski and van Rooden, 1998; Berg et al., 1999). Although they confirm that macroeconomic stabilization, progress with structural reforms and initial conditions are key factors explaining the dynamics of transition, their conclusions regarding the more specific issues are much less clear-cut. Thus, for instance, Fischer, Sahay and Végh (1998) argue that a fixed exchange rate regime affects growth positively. The other studies, however, find little evidence supporting this view. Berg et al. (1999) show that structural reforms have an overall positive effect on economic performance already from the beginning of the transition, provided that the effects of reform on state and private sectors are considered separately, while Havrylyshyn, Izvorski and van Rooden (1998) and Hernández-Catá (1997), on the other hand, find that reforms initially had a considerable negative impact.

Christoffersen and Doyle (1998) examine the role of export market growth (growth in export markets being weighted by export market shares) and find this variable to be strongly associated with growth in transition. They also provide evidence that inflation exceeding a threshold rate of about ten percent affects growth negatively while disinflation does not have a negative impact on economic activity. Non-linearity in the relationship between the rate of inflation and growth is confirmed also by Radulescu and Barlow (2000). They find no evidence of a linear relationship between liberalization and growth either, and argue that the additional gains in terms of growth from further liberalization decrease at higher levels of liberalization.

Van Elkan (1998) supports the view that, alongside the extent of structural reforms, inflation and the size of the government were also statistically and economically significant determinants of the growth patterns in transition countries in 1993-97, with higher levels of inflation and government consumption adversely affecting growth and structural reforms having the opposite effect. The analysis also includes foreign direct investment (FDI) and confirms its high explanatory power in accounting for the economic growth in transition countries. The estimated regression coefficient here shows that an increase of one percentage point in the share of foreign direct investment in GDP pushes the growth rate up by 0.94 percentage points.[7]

The panel regression results give robust conclusions on the overall importance of a core set of variables, but the approach also suffers from limitations and methodological weaknesses. Studies based on this approach come to different conclusions regarding more specific issues. Also, panel regressions do not perform too well in explaining the growth performance of individual countries. From a methodological point of view, panel studies tend to ignore the fact that economic policy variables (used as explanatory variables) are not exogenous but, rather, depend on the economic environment. They also do not take into account that some factors, such as initial conditions, can influence growth both directly and indirectly. Finally, it should be noted that only in Hernández-Catá (1997) estimated equation is derived from a formal theoretical model.

[7] *Similar results are obtained in Borensztein, De Gregorio and Lee (1995). Based on a sample of 69 developing countries, they report that FDI represents a significant channel of technology transfer, whose contribution to economic growth is relatively more important than that of domestic investments, provided that the country receiving FDI has met minimal human capital requirements. The estimated regression coefficient on FDI implies that a one-percentage point increase in the share of foreign direct investment in GDP pushes the growth rate up by 0.85 percentage points.*

3 A Stylized Empirical Analysis: Decline and Recovery

The following empirical analysis uses data for 25 transition countries over the 1990-2000 period. Detailed description and sources of variables used in the analysis are provided in Appendix I. The sample is, for the purposes of the analysis, broken down in two groups: the countries of Central and Eastern Europe, including the Baltic States, and the countries of the former Soviet Union.

It is widely known that there are a number of problems in modeling data for transition economies. Besides technical problems arising from poor statistical data coverage, initial phase of transition was characterized in these countries by large output declines and high inflation rates. In addition, there are methodological problems related to the use of data for such a diverse group of countries in a single regression equation. Finally, one should not ignore the limitation of any econometric analysis. Economic growth is a complex process, influenced by a number of factors, and growth theory has provided little guidance as to the correct model specification. The dilemma whether to use the growth rate of GDP or the GDP level as a dependent variable in the analysis of growth has also been left unresolved in the literature. In a majority of studies, however, the growth rate of GDP is chosen as the dependent variable while explanatory variables are expressed in levels, a method which is also favored in the analysis presented here.[8]

The regression analysis has been performed in both calendar and transition time.[9] The calendar time analysis refers to the 1990-2000 period, which enables us to make comparisons with the results of previous studies that, due to a limited availability of data series and the problem of the omission of relevant variables, mainly used data in calendar time. However, it should be noted that the use of the same calendar years for all countries in the sample implies that different phases of the post-communist economic cycle are included in observations for different transition countries, which

[8] *This makes sense if the changes in explanatory variables are believed to have a permanent effect on growth rates of GDP. It is reasonable to assume that the explanatory variables are stationary as they are expected to tend to the values characteristic of market-oriented economies. In this context, the problem becomes determining the stationarity of the endogenous variable. Berg et al. (1999) and Mervar (2002) analyze stationarity properties of GDP data for different transition countries but their results are inconclusive.*

[9] *It should be noted that the start of the transition process for each country is also not free from controversy. The choice of the initial year is based in this study on Berg et al. (1999) and Fischer and Sahay (2000). They take the first year of transition to be 1992 for the Baltic States and the countries of the former Soviet Union (as in other studies; it is the first year in which these countries arose as independent countries after the breakup of the former Soviet Union in late 1991); 1991 for Albania, Bulgaria, the Czech Republic, Romania and Slovakia, and 1990 for Croatia, Hungary, FYR Macedonia, Poland and Slovenia.*

is hardly acceptable, and this is even more so when the data is split into sub-periods. The second part of the analysis is based on data in transition time. Since the countries that were the last to embark on the process of transformation were nine years into the transition in 2000, our analysis relates to the first nine years of the transition process. The results of the regression analysis of the GDP dynamics in calendar time are given in Table 2 and the results of the analysis in transition time are provided in Table 3.

How does this analysis differ from previous studies? First of all, a longer period of data was used, including both periods of decline and recovery of economic activity, allowing us to break down the analysis on the two sub-periods and test the hypothesis that these periods of economic activity in transition countries are determined by different factors. A compromise was made between simple specifications that included only one or two explanatory variables (as in, for example, Sachs, 1996; Selowsky and Martin, 1997; de Melo, Denizer and Gelb, 1996), and more complex ones involving different distributions of time lags, whose results are difficult to interpret (as in, for example, de Melo et al., 1997; Berg et al., 1999). The advantage was given to specifications with a smaller number of explanatory variables.

The purpose of the analysis is to reexamine the results of previous studies by implementing panel regression analysis on an extended data set and to provide new insights by introducing sub-periods, subgroups of countries and additional variables.[10]

In short, the growth equation that will be estimated, can be written as:

Real GDP real growth = *constant* + ß$_1$ *structural reforms* + ß$_2$ *initial conditions* + ß$_3$ *inflation (and/or fiscal deficit)* + *other variables*

Assuming that structural reforms have a positive effect on growth, we expect the coefficient ß$_1$ to be positive. However, both theoretical and empirical studies show that structural reforms can have initial negative impact on growth, which is over time transformed into a positive effect. For this reason, in the growth specification that includes structural reforms in time t and time (t– 1), we expect the first coefficient to be negative and the second to be positive. Their sum is expected to be positive, implying that reforms have an overall positive effect on growth over time.

[10] *A similar empirical analysis of growth performance can be found in Havrylyshyn, Izvorski and Rooden (1998) and Radulescu and Barlow (2000). In Havrylyshyn, Izvorski and Rooden (1998), the coefficient of determination R^2 is significantly larger for the second period, with much better t-statistics and a higher coefficient on structural reforms, which the authors attribute to the positive cumulative effect of structural reforms. Radulescu and Barlow (2000) obtain much worse results for the recovery period. Such contradictory results have provided additional motivation for the analysis presented here.*

Initial conditions are approximated by adjusted indices obtained by employing the principal components method, originally developed by De Melo et al. (1997). We use the first principal component of initial conditions, which reflects the degree of macroeconomic distortions and development of market processes. Since the analysis is based on the assumption that the impact of initial conditions diminishes over time, the initial conditions variable is defined as (first principal component/t), with t increasing from 1 to 11 in calendar time and from 1 to 9 in transition time.[11] In other words, initial conditions here reflect macroeconomic distortions at the onset of transition. Since higher distortions tended to be associated with lower growth rates, the coefficient $ß_2$ is expected to have a negative sign.

Macroeconomic stability is proxied by the rate of inflation, or fiscal deficit. We expect higher inflation (and/or larger fiscal deficit) to have a negative impact on economic growth, which is reflected in a negative sign on the coefficient $ß_3$.

The empirical analysis is based on a panel data set covering 25 countries and 11 years (1990-2000) that is used to obtain regression estimates. Since the data were not available for all 25 countries for each year over the sample period, the sample is therefore an "unbalanced" panel. Indeed, the panel regression approach has been the most common method for dealing with data covering a larger number of countries in a relatively short time span. One of the most important comparative advantages of the panel regression analysis is that it allows more flexibility in modeling behavioral differences among countries than cross-country analyses. Panel regressions take two general forms, a fixed effects model and a random effects model. The fixed effects model assumes that differences across countries can be captured in differences in the constant term. The method is a reasonable choice when dealing with databases that include a larger number of countries because differences across countries, in effect, cause parametric shifts in the regression function (Greene, 2000), which is precisely why the fixed effects model is chosen for the analysis presented here. As shown in Tables 2 and 3, the F-test in most cases rejects the hypothesis that there is no significant difference between intercept terms across countries while the Hausman test strongly favors the fixed effects model.[12]

[11] *A similar definition of initial conditions can be found in Havrylyshyn, Izvorski and Rooden (1998) and Berg et al. (1999).*

[12] *For more details on various aspects of the panel data approach, see Hsiao (1986), Baltagi (1995) or Greene (2000).*

Table 2	**REGRESSION ESTIMATES OF GDP PERFORMANCE FOR 25 TRANSITION COUNTRIES, CALENDAR TIME: 1990-2000 (DEPENDENT VARIABLE: REAL GDP GROWTH RATE)**									
Explanatory variables	Equation									
	1c	2c	3c	4c	5c	6c	7c	8c	9c	10c
	25 countries	25 countries	25 countries	25 countries	25 countries	25 countries	CEEB	CEEB	CIS	CIS
Transition index		-0.381 (-0.101)								
Transition index (-1)	5.820** (3.839)	6.064* (2.086)	3.780* (2.327)	4.784** (3.176)	7.369** (4.065)	6.361** (3.261)	4.036** (4.534)	3.894* (2.033)	8.788* (2.421)	4.939 (1.371)
Log (inflation)	-4.487** (-4.522)	-4.516** (-4.565)		-3.699** (-3.607)	-3.292** (-3.056)	-2.781* (-2.532)	-5.517** (-4.226)	-3.834** (-4.014)	-3.411* (-2.188)	-2.528 (-1.661)
Log (inflation)#			0.547 (1.145)							
Log (inflation)-log (threshold)# threshold=10%			-3.795** (-5.093)							
Log (fiscal deficit)				-35.976 (-1.815)		-29.968 (-1.717)		-69.846** (-5.066)		-15.798 (-0.896)
Initial conditions /t					-6.036** (-2.813)	-5.269* (-2.348)		-2.421 (-0.961)		-11.638* (-2.301)
Fixed effects:										
1 Albania	-5.719	-5.353	-0.547	0.632	-12.112	-6.122	-1.576	5.605		
2 Armenia	-6.898	-6.528	-2.013	-1.513	-10.033	-5.257			-14.078	-3.031
3 Azerbaijan	-9.656	-9.340	-4.737	-7.003	-9.199	-7.226			-15.726	-1.395
4 Belarus	-2.947	-2.668	3.059	-1.899	-5.813	-4.665			-9.204	-1.666
5 Bulgaria	-11.847	-11.452	-5.319	-8.625	-18.955	-15.491	-7.048	-6.315		
6 Czech Republic	-16.547	-16.056	-11.312	-12.666	-26.075	-21.794	-10.867	-11.034		
7 Estonia	-13.608	-13.121	-7.416	-10.889	-17.940	-15.416	-8.189	-7.840		
8 Georgia	-10.712	-10.326	-5.973	-6.300	-12.540	-8.742			-17.991	-4.683
9 Croatia	-10.835	-10.406	-5.221	-7.807	-18.872	-15.465	-5.588	-5.933		
10 Kazakhstan	-9.200	-8.812	-4.039	-6.099	-10.478	-7.846			-16.550	-2.477
11 Kyrgyz Republic	-13.480	-13.068	-7.254	-7.945	-15.038	-10.788			-21.141	-6.162

Table 2 - continued										
Explanatory variables	Equation									
	1c	2c	3c	4c	5c	6c	7c	8c	9c	10c
	25 countries	25 countries	25 countries	25 countries	25 countries	25 countries	CEEB	CEEB	CIS	CIS
12 Latvia	-15.835	-15.389	-10.136	-8.888	-20.008	-13.429	-10.826	-5.408		
13 Lithuania	-15.390	-14.935	-9.183	-10.945	-20.059	-15.877	-10.219	-6.867		
14 Macedonia	-11.560	-11.216	-5.953	-8.538	-19.178	-15.788	-6.682	-6.626		
15 Hungary	-15.350	-14.848	-9.043	-10.062	-24.675	-19.250	-9.514	-6.890		
16 Moldavia	-17.778	-17.384	-12.096	-13.367	-20.725	-16.793			-25.110	-13.547
17 Poland	-12.213	-11.735	-5.785	-8.034	-19.677	-15.409	-6.475	-5.161		
18 Romania	-10.629	-10.235	-3.476	-7.647	-17.082	-13.898	-5.949	-5.320		
19 Russia	-13.108	-12.698	-6.287	-8.876	-16.550	-12.715			-21.170	-9.170
20 Slovakia	-14.646	-14.178	-9.629	-10.149	-23.257	-18.572	-9.163	-7.613		
21 Slovenia	-12.126	-11.676	-6.759	-9.203	-20.869	-17.469	-6.880	-8.134		
22 Tajikistan	-9.265	-8.963	-3.579	-5.942	-9.603	-6.882			-15.369	-2.185
23 Turkmenistan	-2.145	-1.922	2.007	-1.372	-1.432	-0.950			-7.392	4.752
24 Ukraine	-13.297	-12.936	-7.982	-9.749	-15.963	-12.774			-20.311	-9.516
25 Uzbekistan	-6.288	-5.963	-0.265	-3.127	-6.834	-4.232			-12.904	1.064
Number of observations	225	225	225	220	225	220	117	113	108	107
R^2	0.612	0.612	0.624	0.608	0.637	0.628	0.646	0.624	0.569	0.606
Adjusted R^2	0.561	0.558	0.573	0.553	0.587	0.573	0.598	0.562	0.510	0.541
F-test A,B=A_t,B	F(24, 198) =2.511 [0.000]	F(24, 197) =1.907 [0.009]	F(24, 197) =2.439 [0.000]	F(24, 192) =2.138 [0.003]	F(24, 197) =3.2231 [0.000]	F(24, 191) =2.652 [0.000]	F(12, 102) =2.680 [0.004]	F(12, 96) =4.391 [0.000]	F(11, 94) =2.650 [0.005]	F(11, 91) =2.358 [0.013]
Hausman test	5.369 [0.068]	6.459 [0.091]	4.542 [0.033]	4.502 [0.212]	6.065 [0.048]	4.913 [0.178]	3.952 [0.139]	886.670 [0.000]	1.605 [0.448]	8.848 [0.065]

*Notes: t-statistics (heteroskedasticity consistent, following White, 1980) are given in the parentheses under the coefficient estimates; * significant at the 5-percent level; ** significant at the 1-percent level; P-values are reported in brackets; # inflation expressed in percent.*
Source: Author's estimates.

Table 2 shows the results of the growth analysis conducted in *calendar time*. As expected, the results confirm the findings of previous studies and indicate that the most important determinants of economic performance in the first decade of transition were macroeconomic stability, initial conditions and the extent of structural reforms.

The *equation 1c* regresses the growth rate of GDP on the transition index (lagged one period) as a proxy for structural changes, log of inflation as a proxy for macroeconomic stability, and country fixed effects. Many studies employ the natural logarithm of inflation to obtain a better-balanced distribution of original values. The use of the original figures for inflation would place greater weight on the observations with the highest inflation rates. Whereas in the *equation 1c* this specification is applied to all 25 countries in the sample, in the *equation 7c* it is applied to the CEEB (Central and Eastern European and Baltic) countries and in the *equation 9c* to the CIS (Commonwealth of Independent States) countries. Such a simple specification shows that just two variables can explain more than 50 percent of variations over the eleven years of transition. For the sample as a whole and for the subgroups of transition countries, both estimated regression coefficients have the expected signs and are statistically significant at the 5 percent level.

The *equation 2c* seeks to reexamine the results of those empirical analyses which argue that structural reforms have a negative initial impact but that it is outweighed by their subsequent positive effect on economic performance, where the positive effect of lagged reforms is expected to be stronger than the negative impact of the contemporaneous level of reform. The estimated coefficients of the *equation 2c* provide empirical evidence in support of such an argument. However, it should be noted that although it has the expected negative sign, the regression coefficient on the transition index without lag considerably loses its significance.

Some authors point out the possible non-linearity in the relationship between the rate of inflation and growth. The approach used in this paper is similar to that of Sarel (1996), who examines structural breaks in the relationship between inflation and growth for a combined sample of 87 industrial and developing countries, and the procedure employed by Christoffersen and Doyle (1998), who perform analysis on data for transition economies. Consequently, our analysis also includes an additional inflation variable in the *equation 3c* along with the natural log of the rate of inflation. The additional inflation variable is introduced in order to demonstrate that the negative impact of inflation on economic growth becomes much more pronounced

once inflation exceeds a certain threshold. This additional variable is calculated by subtracting the threshold (10 percent in our case) from inflation, taking logarithms of the resulting positive values and setting the values below and equal to 0 to zero. Whereas Sarel (1996) finds a pronounced structural break in the inflation-growth relationship at an inflation level of 8 percent for his sample of 87 heterogeneous countries over the 1970-1990 period, Christoffersen and Doyle (1998) identify the presence of a break at a 13 percent inflation level for 25 transition countries over the 1990-1997 period. These results provide evidence that there is a threshold for the inflation rate below which the effect of inflation on growth is insignificant (and may even be slightly positive) but above which the effect is negative, large and statistically significant.

When the relationship between inflation and growth is non-linear, the coefficient on the logarithm of inflation is expected to be significantly different from zero and have a positive sign while the coefficient on the additional inflation variable is expected to be significantly different from zero and negative. When the coefficient on the additional variable is significantly different from zero and negative, and the inflation coefficient has a positive sign but is not significantly different from zero, the inflation threshold represents the point above which the presence of negative effects of inflation on growth can be detected. If the additional inflation variable is not significantly different from zero, there is no evidence of a non-linear relationship.

The results of our analysis, calculated for a threshold of 10 percent, are consistent with the results obtained by Christoffersen and Doyle (1998). As the estimated coefficients of the *equation 3c* show, when the coefficient on the additional inflation variable is significantly different from zero and has a negative sign, the positive coefficient on the log of inflation loses its significance. The results thus clearly show that growth is negatively affected once inflation exceeds the 10 percent threshold level but that otherwise inflation seems to be relatively uncorrelated with growth performance. Alternatively, when the threshold levels of 15 and 20 percent are specified (not reported), the coefficients on the additional inflation variable are not significantly different from zero.

In the *equation 4c*, another proxy for macroeconomic stability has been added to the transition index and inflation - the fiscal deficit variable. In spite of the assumed collinearity between fiscal deficit and inflation, the statistical properties of the equation are satisfactory.

The *equation 5c* includes the initial conditions variable, the transition index and inflation. The estimated regression coefficient on the initial conditions variable has a negative sign and is significantly different from zero at the 5 percent level, as expected.

Finally, in the *equation 6c* we include the transition index, inflation, fiscal deficit and initial conditions as explanatory variables. All the coefficients have the expected signs and all with the exception of the fiscal deficit coefficient, which is significantly different from zero at the 10 percent level, are significantly different from zero at 5 percent. These four variables explain more than 60 percent of the variations in economic activity in the sample of 25 countries over the eleven years of transition. It is worth noting that the attempts to break down the overall transition index into its sub-components demonstrate that the large-scale privatization, enterprise restructuring and price liberalization indices make the most important, stable and positive contributions to growth (results not reported here). The *equation 6c* specification is also applied to the CEEB countries in the *equation 8c*, and to the CIS countries in the *equation 10c*.

Interestingly, the reliability of the coefficients in the equations estimated for different subgroups of countries varies considerably, although they are of the correct sign. The importance of initial conditions in explaining economic performance in the CEEB countries is insignificant but the estimated regression coefficients on inflation, fiscal deficit and the transition index are significantly different from zero at the 5 percent level. Quite the opposite is true of the CIS countries, where the regression coefficient on initial conditions is significantly different from zero at 5 percent, with only the coefficient on inflation being significantly different from zero at the 10 percent level.

Table 3 shows the results of the regression analysis conducted in transition time. The equations from Table 2 were re-estimated and some modified specifications covering the entire transition period were run as well. As these results do not differ much from those that we have already discussed, they can be omitted from our present discussion. However, since it will be used later on in the analysis, the specification used in the *equation 6c* reappears in the *equation 1t* from Table 3, but this time it is applied to the transition time series data. Other equations from Table 3 refer to the estimation results for the two sub-periods: the first four years of transition (the decline) and the subsequent period of five years (the recovery).

Table 3 **REGRESSION ESTIMATES OF GDP PERFORMANCE FOR 25 TRANSITION COUNTRIES, TRANSITION TIME: T TO T+8 (DEPENDENT VARIABLE: REAL GDP GROWTH RATE)**

Explanatory variables	Equation									
	1t	2t	3t	4t	5t	6t	7t	8t	9t	10t
	t to *t*+8	*t* to *t*+3			*t*+4 to *t*+8					
	25 countries	25 countries	CEEB	CIS	25 countries	25 countries	CEEB	CEEB	CIS	CIS
Transition index (-1)	5.059** (3.103)	8.920** (3.810)	9.002** (3.124)	5.007 (0.961)						
Δ transition index					7.964** (2.926)	7.670* (2.172)	11.934* (2.213)	14.459* (2.058)	6.369 (1.766)	7.791 (1.786)
Log (inflation)	-3.176** (-3.405)		-2.992 (-1.396)		-7.966** (-8.183)	-6.641** (-4.317)	-7.552** (-3.735)	-7.693** (-3.731)	-8.922** (-8.645)	-8.747** (-8.471)
Log (fiscal deficit)	-28.816* (-1.795)	-40.560* (-2.579)	-49.907 (-1.412)	-42.904* (-2.520)	-81.871** (-4.750)	-103.254** (-5.726)	-114.889** (-6.036)	-119.494** (-5.952)	-42.355 (-1.966)	-37.953 (-1.863)
Initial conditions / *t*	-3.420 (-1.733)									
Export share in GDP					17.648** (2.971)	11.189* (2.023)	8.842 (1.566)	12.345 (1.836)	22.216** (3.089)	21.586** (2.828)
Corruption index						0.571 (1.286)		0.837 (1.850)		
Foreign direct investment										0.009 (1.109)
Fixed effects:										
1 Albania	-2.406	-3.928	-0.601		13.941	14.424	17.758	14.639		
2 Armenia	0.953	-3.076		3.313	7.175	6.878			4.409	3.430
3 Azerbaijan	-4.788	-24.859		-19.896	4.255	6.457			2.021	-0.960
4 Belarus	-2.251	-22.242		-16.406	4.819	5.632			2.557	2.469
5 Bulgaria	-11.648	-16.319	-14.184		-1.011	-1.727	2.950	-3.076		
6 Czech Republic	-16.558	-22.211	-21.926		-4.578	-5.143	-0.296	-7.249		
7 Estonia	-11.617	-23.955	-22.877		-3.345	-4.362	1.206	-7.230		
8 Georgia	-3.431	-18.435		-12.993	7.688	8.886			5.153	4.067
9 Croatia	-10.364	-25.080	-17.805		1.932	0.731	3.490	-1.443		
10 Kazakhstan	-7.371	-21.380		-15.397	-0.591	2.102			-2.679	-6.030

Table 3 - continued										
Explanatory variables	Equation									
	1t	2t	3t	4t	5t	6t	7t	8t	9t	10t
	t to *t*+8	*t* to *t*+3			*t*+4 to *t*+8					
	25 countries	25 countries	CEEB	CIS	25 countries	25 countries	CEEB	CEEB	CIS	CIS
11 Kyrgyz Republic	-8.205	-27.268		-19.560	8.573	11.342			3.517	2.681
12 Latvia	-9.783	-20.750	-19.785		0.868	0.935	3.828	-0.528		
13 Lithuania	-12.222	-25.968	-23.214		0.383	0.407	4.944	-0.979		
14 Macedonia	-11.787	-19.710	-12.329		-3.456	-4.899	-0.961	-6.934		
15 Hungary	-13.950	-20.327	-19.289		2.509	1.487	6.768	-0.786		
16 Moldavia	-13.787	-24.388		-17.435	-10.633	-1.914			-7.737	-8.370
17 Poland	-9.895	-17.091	-15.972		-3.928	3.185	8.004	1.014		
18 Romania	-9.987	-14.077	-10.730		1.278	0.362	3.978	-0.702		
19 Russia	-10.432	-24.783		-16.113	2.134	3.064			-0.967	-1.515
20 Slovakia	-13.383	-22.076	-21.283		-0.713	-0.117	4.301	-1.735		
21 Slovenia	-12.592	-18.816	-16.913		-2.994	-4.835	0.874	-7.813		
22 Tajikistan	-4.548	-21.965		-16.737	-1.649	0.710			-5.151	-5.267
23 Turkmenistan	-0.640	-19.482		-15.386	-1.043	-13.773			-3.180	-4.136
24 Ukraine	-11.530	-24.560		-19.109	-4.615	-2.246			-7.108	-7.474
25 Uzbekistan	-2.883	-13.163		-7.141	2.910	2.902			0.361	0.285
Number of observations	194	69	33	36	125	99	65	58	60	60
R^2	0.608	0.698	0.820	0.514	0.666	0.740	0.677	0.710	0.704	0.709
Adjusted R^2	0.541	0.511	0.661	0.227	0.569	0.630	0.569	0.586	0.602	0.601
F-test A,B=A_i,B	F(24, 165) =2.910 [0.000]	F(24, 42) =2.519 [0.004]	F(12, 17) =3.699 [0.007]	F(11, 22) =1.870 [0.102]	F(24, 96) =5.300 [0.000]	F(24, 69) =6.282 [0.000]	F(12, 48) =3.931 [0.000]	F(12, 40) =3.829 [0.001]	F(11, 44) =5.839 [0.000]	F(11, 43) =5.803 [0.000]
Hausman test	6.691 [0.082]	8.240 [0.016]	50.414 [0.000]	0.012 [0.913]	17.675 [0.000]	22.759 [0.000]	53.681 [0.000]	139.880 [0.000]	0.524 [0.469]	0.590 [0.443]

*Notes: t-statistics (heteroskedasticity consistent. following White. 1980) are given in the parentheses under the coefficient estimates; * significant at the 5-percent level; ** significant at the 1-percent level; P-values are reported in brackets.*
Source: Author's estimates.

As expected, the fragility of the estimates is especially pronounced at the onset of transition. In this period, which is characterized by the *decline* of economic activity *(equations 2t, 3t* and *4t)*, the most important explanatory variables are the transition index and fiscal deficit. However, whereas their coefficients are significantly different from zero at the 5 percent level for the entire sample of 25 countries, they are very sensitive to changes in the country sample. When the same variables are used to explain economic performance developments in the two subgroups of countries, the estimates clearly show that these coefficients are not robust. In case of CEEB countries, the regression coefficient on the transition index is highly significant while the significance of the variables taken as proxies for macroeconomic stability diminishes. In case of the CIS countries, the coefficient on fiscal deficit is significantly different from zero at the 5 percent level and the coefficient on the transition index is insignificant, which is not surprising given the relatively modest advances in structural reforms in the early years of transition in these countries.

In the *recovery* period, along with the transition index, inflation and fiscal deficit *(equations 5t-10t)*, particular importance is attributed also to the export share in GDP. The robustness of the estimated coefficients in this period is considerably higher. In all six estimated equations, regardless of changes in the country sample and the inclusion of additional variables, the coefficients on the four variables mentioned above have the expected signs and are significantly different from zero at the 5-10 percent level. In the *equations 5t, 7t* and *9t*, these four variables and country fixed effects explain over 60 percent of the variations in the dependent variable.

Alternative specifications for our country samples also include the corruption index both for the entire sample *(equation 6t)* and the CEEB countries *(equation 8t)*, and the FDI variable for the CIS countries *(equation 10t)*. The estimated regression coefficient on the corruption index, which serves here as a proxy for the level of institutional development, has the expected positive sign (higher index indicates lower corruption) and is significantly different from zero at the 10 percent level for the CEEB countries. The estimate for this group of countries is more robust than that for the entire sample. This is quite expected since a considerable progress in institutional development has been made in these countries and its relationship with growth can be therefore empirically identified, which is not the case with the CIS countries. Our results confirm the conclusion of previous empirical studies (Havrylyshyn and van Rooden, 1999; Abed and Davoodi, 2000) that structural reforms contribute more to growth

than improvements in corruption indicators, used as a proxy for institutional development. When structural reforms are left out of the specification, however, the significance of the coefficient on corruption considerably increases; otherwise, corruption seems to be of relatively little importance.

Although different specifications were estimated, foreign direct investments have not turned out to be significant in explaining economic activity during the first decade of transition. This is rather surprising since some studies have found a strong relationship between FDI and economic performance. FDI is generally perceived as a major engine of recovery in transition economies. Such a result might be explained by the assumption that the level of FDI is significantly correlated with the extent of structural reforms, as well as the fact that FDI have clearly contributed to the export performance of some transition countries. In addition, the data series are still relatively short to determine the relationship between FDI and growth. However, neither Havrylyshyn, Izvorski and van Rooden (1998) find evidence of a significant relationship between FDI and growth.

It should be noted that, unlike previous studies, the empirical results reported in Tables 2 and 3 show that, in addition to inflation and structural reforms, openness also plays a very important role in the recovery of economic activity in transition countries. The analysis by sub-periods reveals that the further along a country is in the transition process, the greater the weight on the standard determinants of growth, such as the openness of an economy (the export share in GDP) or corruption. The openness of an economy in the specification for the period of economic decline (not reported) indicates that the relationship is negative. The economies with a larger degree of openness experienced greater declines of economic activity at the onset of transition due to a high concentration of external trade flows within the CMEA area.

The results of the empirical analysis presented here largely confirm the conclusions of previous studies. Furthermore, the use of extended data sets has allowed us to stress the need to distinguish among various groups of transition countries, as well as between the periods of decline and recovery of economic activity. There is certainly a number of other variables, such as the share of investment in GDP or the influence of financial market development and income distribution on growth, that also deserve consideration and further investigation but, due to the unreliability and unavailability of data, this sort of research will have to be postponed for the time being.

Table 4 summarizes the main empirical results and provides insights into the impact of different groups of factors on economic performance during the transition process. By using the *equation 1t*, which was estimated on the whole sample for the entire transition period, and the fitted values of output growth for 8 transition years (from t+1 to t+8), we are able to obtain individual contributions of major groups of variables to growth.

It should be noted that the differences among the subgroups of countries and between the periods of decline and recovery of economic activity in transition countries are thus being disregarded. For each period, the contributions are obtained by multiplying regression coefficients with variable values for each country in the sample, and then averaging the resulting products across the specific groups of countries.

It can be concluded that the impact of the factors serving as proxies for macroeconomic stability, namely inflation and fiscal deficit, was very significant in the early years of transition. The impact of initial conditions diminished over time (as we have assumed by defining the variable as initial conditions/t) but it had not been particularly large at the onset of transition, either. On the other hand, the impact of structural reforms increased rapidly over time. The less delayed and more far-reaching structural reforms were, the more significantly they outweighed the negative effects of other groups of factors.

Differences between the CEEB countries, on the one hand, and the CIS countries, on the other, largely stem from the differences in the extent of structural reforms undertaken by these two groups of countries, rather than unfavorable initial conditions. When different initial conditions are taken into consideration, variations in the GDP growth rates can mainly be attributed to the progress in controlling inflation and implementing structural reforms.

Table 4 **CONTRIBUTIONS OF EXPLANATORY VARIABLES TO FITTED GDP GROWTH RATES**
- in %, unweighted averages

	t+1	*t*+2	*t*+3	*t*+4	*t*+5	*t*+6	*t*+7	*t*+8
	25 countries							
Actual rate of GDP growth	-10.59	-8.62	-2.05	2.37	3.68	1.92	2.96	4.97
Fitted rate of GDP growth (equation 1t)	-7.61	-6.02	-2.23	1.12	2.67	2.94	3.27	3.97
Inflation	-5.64	-5.49	-3.04	-1.43	-0.72	-0.81	-0.68	-0.49
Fiscal deficit	-2.72	-1.68	-1.26	-1.19	-1.10	-1.17	-1.20	-0.76
Transition index	7.89	9.14	10.30	12.08	12.89	13.35	13.59	13.68
Initial conditions	1.35	0.51	0.26	0.15	0.10	0.07	0.05	0.03
Constant=-8.49								
	CEEB							
Actual rate of GDP growth	-9.72	-2.38	1.29	4.96	4.45	1.30	2.16	3.26
Fitted rate of GDP growth (equation 1t)	-0.72	-1.67	-0.31	1.91	2.91	2.63	3.52	4.07
Inflation	-2.27	-2.61	-1.91	-0.92	-0.60	-1.11	-0.37	-0.24
Fiscal deficit	-1.45	-1.34	-1.13	-0.86	-0.86	-0.95	-1.13	-0.92
Transition index	9.16	10.73	12.02	13.43	14.39	14.90	15.38	15.69
Initial conditions	5.08	2.80	1.95	1.50	1.22	1.03	0.89	0.78
Constant=-11.25								
	CIS							
Actual rate of GDP growth	-11.46	-14.86	-5.40	-0.23	2.91	2.53	3.75	6.68
Fitted rate of GDP growth (equation 1t)	-14.50	-10.37	-4.16	0.33	2.44	3.26	3.01	3.88
Inflation	-9.00	-8.37	-4.17	-1.95	-0.85	-0.51	-0.99	-0.75
Fiscal deficit	-3.98	-2.01	-1.40	-1.52	-1.34	-1.39	-1.27	-0.60
Transition index	6.61	7.55	8.58	10.73	11.39	11.80	11.80	11.68
Initial conditions	-2.38	-1.79	-1.43	-1.19	-1.02	-0.89	-0.79	-0.72
Constant=-5.74								

Note: For simulation purposes, missing values of the transition index are substituted by indices in time t+1 while missing values of fiscal deficit are substituted by the subgroup sample average in time t. Source: Author's estimates.

4 Conclusions

Empirical studies on the transition experience so far show that, during the first decade of transition, economic growth was strongly influenced by *initial conditions*, the extent of *structural reforms* accompanied by the development of market-oriented infrastructure and sound economic policies designed to promote *macroeconomic stability*. In this context, macroeconomic stabilization and progress in implementing market-oriented reforms emerged as the most important determinants of recovery, which relatively quickly neutralized the negative effects of more unfavorable initial conditions experienced by some countries (particularly those in the Baltic region) during the early stages of transition. The countries that implemented more comprehensive reform packages quite early in the transition process also had a quicker and stronger recovery later on.

The studies demonstrate that initial conditions were also very important in determining economic performance in transition countries although there is some disagreement among researchers about their relative importance. Since their impact is believed to diminish over time, initial conditions are typically given greater weight in explaining economic decline in transition economies, rather than recovery. Standard growth-enhancing factors like investment in physical and/or human capital have turned out to be statistically insignificant so far, which is not surprising since the transition process is, at least in its early phase, primarily based on the reallocation and efficiency improvements of the existing resources. Institutional factors have not been found to play a particularly important role in explaining growth performance of transition economies, either. Still, while the importance of adverse initial conditions diminishes over time, the results confirm the growing importance of establishing a sound institutional environment for a country's economic performance.

As time passes, the portion of growth determined by the so-called "transition" factors is expected to diminish. Experience of the more advanced transition economies shows that the portion of growth attributable to improved allocative efficiency of the newly installed market mechanism decreases over time, meaning that in the future these economies will not be able to expect achieving any substantial efficiency improvements from redressing distortions inherited from central planning. Their growth will thus become increasingly influenced by the standard determinants of growth suggested by neoclassical and endogenous growth theories, as well as the results of numerous empirical studies.

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Appendix I

Data Description and Sources

The data used in the empirical analysis:

- *corruption, index:* data compiled from Abed and Davoodi (2000) for 1994-1998 and Transparency International (1996, 1997, 1998, 1999, 2000) for 1996-2000. Indices range from 0 to 10, where higher scores indicate lower levels of perceived corruption.

- *exports, percentage share in GDP:* EBRD "Transition Report" and "Transition Report Update" (various issues), most recent data available. Source of data for Croatia: Central Bureau of Statistics of the Republic of Croatia.

- *fiscal deficit, deficit of the general government in percent of GDP, excluding privatization proceeds:* EBRD "Transition Report" and "Transition Report Update" (various issues), most recent data available. Fiscal deficit is defined as: (1+(share of fiscal deficit in GDP/100)).

- *foreign direct investment, in US$:* EBRD "Transition Report" and "Transition Report Update" (various issues), most recent data available. Source of data for Croatia: Croatian National Bank. It is here defined as cumulative FDI inflows per capita.

- *GDP, real growth rates:* EBRD "Transition Report" and "Transition Report Update" (various issues), most recent data available. Source of data for Croatia: Central Bureau of Statistics of the Republic of Croatia.

- *inflation, rate:* EBRD "Transition Report" and "Transition Report Update" (various issues), most recent data available. Source of data for Croatia: Central Bureau of Statistics of the Republic of Croatia. Inflation is defined as: (1+(inflation rate/100)).

- *initial conditions:* the source is Falcetti, Raiser and Sanfey (2000). The initial conditions data set relies on the indices originally compiled by De Melo et al. (1997) using the method of principal components. The adjustment of the original indices is explained in more detail in Box 2.1 of the EBRD's "Transition Report 1999".

- *population, number:* EBRD "Transition Report" and "Transition Report Update" (various issues), most recent data available. Source of data for Croatia: Central Bureau of Statistics of the Republic of Croatia.

- *transition index:* the source is the EBRD's "Transition Report 2000". Since 1994, the EBRD has been publishing annually the following indicators: large-scale privatization, medium- and small-scale privatization, enterprise restructuring, competition policy, price liberalization, trade liberalization, banking reform and reform of non-banking financial institutions. Indices range from 1 to 4+, where higher values imply more progress towards the conditions in an advanced market economy. The transition index is an unweighted average of the eight transition indicators listed above. In calculating the averages, X+ is set equal to X + 0.3 while X− is set at X − 0.3. In its 2000 issue, the EBRD extended the series back to 1991 based on the indices computed by De Melo, Denizer and Gelb (1996). Fore more details, see "Transition Report 2000", Annex 2.1.