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Recovery and Growth in Transition Economies 1990–97: A Stylized Regression Analysis

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Abstract

This paper analyzes the determinants of growth in 25 transition economies during 1990–97. The paper's main finding is that macroeconomic stabilization, structural reform, and reduction of government expenditures are key to achieving sustainable growth. Although the initial effect of reforms on output may be negative, over time the best growth performances are in those countries with the greatest progress in implementing reforms. The analysis also confirms that although adverse initial conditions hurt growth, their effect is small compared to the other factors.

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SUMMARY

After almost a decade of transition, growth is becoming widespread in the countries of Central and Eastern Europe and in the Baltics, Russia, and other countries of the former Soviet Union, although growth rates are widely divergent and the recovery is still very recent and fragile.

This paper analyzes the determinants of growth in transition economies, using panel data for 25 countries for the period 1990–97. The econometric specification is a compact, "stylized facts" compromise between simple regressions relating growth to a single measure of reform and much more complex specifications.

The paper's main finding, in line with previous work, is that macroeconomic stabilization and structural reform are key to achieving sustainable growth. Growth performance is clearly better where stabilization has been achieved earliest and where structural reforms have progressed most. Regarding the elements of reform, the paper finds that a combination of policies is more critical for growth than any single type of reform. A crucial component of the reform package, however, is a reduction in government size and expenditures.

The paper also finds evidence of "pain" at the start of reforms, as their destructive effect on the "old" preceeds the positive effect on the "new." Over time, however, the positive effects outweigh the negative effects. In the early transition years, the output decline was least in those countries that implemented either very limited or very strong reforms, while intermediate reformers experienced a steeper output decline. However, in the later years of transition the best performers were those with the greatest progress in reforms.

The analysis also confirms that adverse initial conditions hurt growth, but their effect is found to be small in comparison to the other factors. It is economic policies, and not initial conditions, that ultimately matter for the recovery of growth.

"The opening up of new markets, foreign or domestic, and the organizational development from the craft shop and factory to such concerns as U.S. Steel illustrate the same process of industrial mutation—if I may use that biological term—that incessantly revolutionizes the economic structure *from within,* incessantly destroying the old one, incessantly creating a new one."

Joseph Schumpeter, "Capitalism, Socialism and Democracy".

I. INTRODUCTION AND OVERVIEW

1.   The process of transition is a unique historical event, and analyzing it is not easy since this is a complex, multidimensional process encompassing not only economic changes but also profound changes in political, and social relations. If one were to seek a simplifying core theme, perhaps the common thread tying together the different country experiences of transition is the objective of improved economic well-being of the population, in a word, economic growth. It has been nearly a decade since the transition began—first in Central Europe in 1989–90, then further East—and a first glance at statistics would suggest growth is becoming widespread (Table 1), with only two countries, Ukraine and Turkmenistan, still experiencing a continued decline through 1997. Three others, Albania, Bulgaria and Romania, experienced a (perhaps) premature burst of growth in mid-nineties suffering a reversal in 1996–97. But even for the others, the growth rates are with a few exceptions (Estonia, Georgia, Poland) not extraordinarily high by historical standards—certainly not high enough to allow these countries to catch-up quickly even to low income Western European countries.[2]

2.   While the average growth rate for the twenty growing countries was in 1997 4.8 percent, in seven countries the rate was below 3 percent. Further, the recovery is very recent as only eleven countries have entered a period of thus far sustained growth of 3 or more years, and only in 1995 did half of the 25 transition countries reach positive growth. It is also still fragile, as demonstrated by the three cases of reversal. Therefore this paper asks what factors are associated with recovery or lack of it in transition economies, in order to draw some conclusions for appropriate policies to promote sustained growth.

3.   The early years of transition have been characterized by a sharp contraction in output following the disruption of traditional trade and financial links, and the abandonment of old central plan lines of production. This was generally followed by attempts to maintain

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[2]On catch-up see Fischer, Sahay and Vegh (1996) and Sachs, Warner (1996). The former, for example, calculate that with a per capita growth rate of 4.75 percent annually it would take on average 35 years to catch up to the average OECD level. With a growth rate of 4 percent it would take 45 years.

Table 1. GDP Growth in Transition Economies

	1990	1991	1992	1993	1994	1995	1996	1997	Year growth started
(Percentage change from previous year)									
Central and Eastern Europe									
Albania	-10.0	-28.0	-7.2	9.6	9.4	8.9	9.1	-7.0	--
Bulgaria	-9.1	-11.7	-7.3	-1.5	1.8	2.9	-10.1	-6.9	--
Croatia	-7.1	-21.1	-11.7	-8.0	5.9	6.8	6.0	6.5	1994
Czech Republic	-1.2	-14.3	-3.3	0.6	2.7	6.4	3.9	1.0	1993
FYR Macedonia	-10.2	-12.1	-8.0	-9.1	-1.8	-1.2	0.8	1.5	1996
Hungary	-3.5	-11.9	-3.1	-0.6	2.9	1.5	1.3	4.4	1994
Poland	-11.6	-7.0	2.6	3.8	5.2	7.0	6.1	6.9	1992
Romania	-5.6	-12.9	-8.8	1.5	3.9	7.1	3.9	-6.6	--
Slovak Republic	-2.5	-14.6	-6.5	-3.7	4.9	6.9	6.6	6.5	1994
Slovenia	-8.1	-8.9	-5.5	2.8	5.3	4.1	3.1	3.7	1993
Average	-7.0	-14.7	-5.9	-0.4	4.1	5.2	3.3	1.0	1994
Baltics									
Estonia	-8.1	-7.9	-21.6	-8.2	-1.8	4.3	4.0	10.8	1995
Latvia	2.9	-10.4	-35.2	-16.1	2.1	0.3	3.3	6.5	1994
Lithuania	-5.0	-13.4	-21.3	-16.2	-9.8	3.3	4.7	5.7	1995
Average	-3.4	-10.6	-26.0	-13.3	-3.4	2.8	4.0	7.9	1995
CIS									
Armenia	-7.4	-17.1	-52.3	-14.8	5.4	6.9	5.8	3.3	1994
Azerbaijan	-11.7	-0.7	-22.1	-23.1	-18.1	-11.0	1.3	5.7	1996
Belarus	-3.0	-1.2	-9.6	-7.6	-12.6	-10.4	2.8	10.4	1996
Georgia	-12.4	-13.8	-44.8	-25.4	-11.4	2.4	10.5	11.0	1995
Kazakstan	-0.4	-13.0	-5.3	-9.2	-12.6	-8.2	0.5	2.0	1996
Kyrgyz Republic	3.2	-5.0	-13.9	-15.5	-20.1	-5.4	7.1	6.5	1996
Moldova	-2.4	-17.5	-29.7	-1.2	-31.2	-1.4	-7.8	1.3	1997
Russia	-4.0	-5.0	-14.5	-8.7	-12.6	-4.0	-2.8	0.4	1997
Tajikistan	-1.6	-7.1	-29.0	-11.0	-18.9	-12.5	-4.4	2.2	1997
Turkmenistan	2.0	-4.7	-5.3	-10.2	-19.0	-8.2	-7.7	-25.0	--
Ukraine	-3.4	-11.9	-17.0	-14.2	-22.9	-12.2	-10.0	-3.2	--
Uzbekistan	1.6	-0.5	-11.0	-2.3	-4.2	-0.9	1.6	2.1	1996
Average	-3.3	-8.1	-21.2	-11.4	-15.4	-5.8	-0.4	1.3	1997

Sources: National authorities; and IMF staff estimates.

production and employment at previous levels by running large fiscal and quasi-fiscal deficits, resulting in high rates of inflation—particularly after countries had introduced their own currencies—and further collapses in output. After this common experience, most transition countries engaged in comprehensive stabilization and reform programs, often supported by the IMF. Although countries that implemented such programs generally succeeded in bringing down inflation to low levels, the success in achieving sustained growth has been more varied. Those that started stabilization earlier experienced earlier recovery, but the timing, strength and sustainability of growth also depended on progress in structural reforms.

4.   In Table 2 it is seen that for Central and Eastern European countries and the Baltics,[3] inflation reached its peak in 1992 and reasonably low rates of inflation were established by 1994, the same year in which growth resumed. In the CIS countries[4] this process took place on average two years later, with growth resuming only in 1996/97. Table 2 also shows that countries in Central and Eastern Europe started earlier in implementing structural reforms and on average have made considerably more progress, as indicated by the higher level of the reform index.[5] Progress on structural reforms in CIS countries has been much slower, with the median value of the reform index in 1997 still only at the 1991 level of Central and Eastern European countries. Although this hasn't prevented the resumption of growth on average two to three years after the start of the disinflation process, the economic rebound in the CIS countries has been weaker. As can be seen in Table 1, the group average for the CIS became positive only in 1997, at 1.3 percent, whereas in the Baltics, it has been positive for three years averaging 4.9 percent and in Central and Eastern Europe for four years averaging 2.6 percent. While slower progress in reforms is one possible explanation, another is less favorable initial conditions in CIS countries compared to Central and Eastern European countries.

5.   Though positive GDP growth in transition is a very recent phenomenon, a large number of studies have used econometric analysis to analyze the determinants of growth. The present study does not purport to improve upon the methodology of those studies, and only differs from them in four ways. First the data available cover the period through 1997 and therefore provide a much longer period of positive growth observations[6]; most earlier studies

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[3]Albania, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, FYR of Macedonia, Poland, Romania, Slovak Republic, and Slovenia.

[4]Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyz Republic, Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan.

[5]We use the reform index constructed by de Melo, Denizer and Gelb (1996) for the years 1990–93, updated to 1997 by linking it to the EBRD transition indicators.

[6]Through 1995, for 25 countries, one would have 35 observations with positive growth of a total 125 observations; through 1996 this would be 54 of 175, while including 1997 gives 74 of 200.

Table 2. Summary Statistics of Growth, Inflation and Structural Reforms in Transition Countries

	1990	1991	1992	1993	1994	1995	1996	1997
Growth								
All countries								
Average	-4.7	-10.9	-15.7	-7.5	-5.9	-0.3	1.6	2.0
Median	-4.0	-11.9	-11.0	-8.2	-1.8	1.5	3.1	3.3
Highest	3.2	-0.5	2.6	9.6	9.4	8.9	10.5	11.0
Lowest	-12.4	-28.0	-52.3	-25.4	-31.2	-12.5	-10.1	-25.0
Central and Eastern Europe and Baltics								
Average	-6.1	-13.4	-10.5	-3.5	2.4	4.5	3.3	2.5
Median	-7.1	-12.1	-7.3	-1.5	2.9	4.3	3.9	4.4
Highest	2.9	-7.0	2.6	9.6	9.4	8.9	9.1	10.8
Lowest	-11.6	-28.0	-35.2	-16.2	-9.8	-1.2	-10.1	-7.0
CIS								
Average	-3.3	-8.1	-21.2	-11.4	-15.4	-5.8	-0.4	1.3
Median	-2.7	-6.1	-15.8	-10.6	-15.4	-6.8	0.9	2.1
Highest	3.2	-0.5	-5.3	-1.2	5.4	6.9	10.5	11.0
Lowest	-12.4	-17.5	-52.3	-25.4	-31.2	-12.5	-10.0	-25.0
Inflation								
All countries								
Average	63.4	115.1	741.8	1,071.1	1,311.8	178.1	87.0	72.6
Median	8.4	98.0	853.8	534.2	136.7	39.5	23.5	14.7
Highest	585.8	333.5	1,925.2	4,734.9	15,606.5	1,005.3	992.0	1,082.2
Lowest	3.0	34.8	10.1	20.8	10.2	2.0	2.3	2.9
Central and Eastern Europe and Baltics								
Average	117.4	134.8	495.7	224.7	56.3	23.2	24.2	11.5 1/
Median	22.0	122.2	210.4	85.1	35.9	25.1	18.8	9.1
Highest	585.8	333.5	1,925.2	1,515.6	136.7	62.1	123.0	1,082.2
Lowest	5.1	34.8	10.1	20.8	10.2	2.0	2.3	2.9
CIS								
Average	4.9	93.7	1,008.5	1,988.0	2,672.0	346.0	155.1	37.7
Median	4.2	93.4	940.8	1,426.2	1,616.4	247.3	43.6	16.6
Highest	10.3	111.6	1,515.7	4,734.9	15,606.5	1,005.3	992.0	98.0
Lowest	3.0	78.5	492.9	534.2	228.7	30.2	18.7	3.9
Reform index								
All countries								
Average	0.19	0.33	0.51	0.57	0.61	0.60	0.62	0.64
Median	0.04	0.24	0.49	0.60	0.67	0.60	0.62	0.63
Highest	0.68	0.79	0.86	0.90	0.88	0.81	0.81	0.85
Lowest	0.00	0.04	0.13	0.13	0.29	0.26	0.26	0.35
Central and Eastern Europe and Baltics								
Average	0.33	0.55	0.71	0.77	0.76	0.69	0.71	0.73
Median	0.20	0.62	0.72	0.79	0.79	0.68	0.71	0.73
Highest	0.68	0.79	0.86	0.90	0.88	0.81	0.81	0.85
Lowest	0.00	0.24	0.45	0.58	0.63	0.56	0.56	0.61
CIS								
Average	0.04	0.10	0.29	0.36	0.45	0.50	0.53	0.54
Median	0.04	0.10	0.29	0.34	0.42	0.50	0.56	0.58
Highest	0.04	0.22	0.49	0.60	0.71	0.68	0.68	0.70
Lowest	0.04	0.04	0.13	0.13	0.29	0.26	0.26	0.35

Sources: national authorities, de Melo et al (1996), EBRD Transition Reports; and IMF staff estimates.
'1/ The 1997 average excludes Bulgaria and Romania, where inflation reached very high levels after the growth reversal.

include data only through 1995 or at best 1996. Second, the period covered is long enough to allow separate econometric analysis of two subperiods, defined broadly as the decline or negative growth period (1990–93), and the recovery or positive growth period (1994–97). This permits a test of the hypothesis that explanations for decline are different from explanations of growth. Third, we address more explicitly than other studies the trade-off between unfavorable initial conditions and favorable policies. Fourth, the econometric model specification here is a compact, "stylized facts," compromise between models using very simple regressions relating growth and a single measure of reform progress (e.g., Selowsky and Martin (1996), Sachs (1996)), and much more complex specifications including a large number of variables, time-lag effects, and dynamic inter-relations (e.g., De Melo et al. (1997), Berg et al. (1998)). The former are clearly under-specified, while the latter are not always easy to interpret because of the complex lags and inter-relationships, and the unmeasurable country-specific fixed effects estimates.

6.   The rest of the paper is organized as follows. Section II briefly reviews a selected set of writings on growth in general and in transition countries specifically; while Section III specifies the model used and data sources. Section IV describes the results of regression analysis, and Section V presents the key conclusions and policy implications.

II. Review of Transition Literature

A. General Growth Theory

7.   A revival of interest in economic growth in the mid-1980s led to the development of a new wave of models which established a synthesis now known as *endogenous growth theory*. The first element of this synthesis is the earlier prevailing doctrine on economic growth, the neoclassical model of Solow-Swan and Cass-Koopmans from the 1950–60s which attributed growth to the expansion of capital and labor, augmented by exogenous technological progress. Simple factor input and factor productivity calculations of the sources of growth are based on this paradigm and continue to be used widely.[7]

8.   The second element is the set of models developed in the mid-1980s, synthesized in Romer (1990) and Barro and Sala-i-Martin (1995). While retaining the role of factor inputs, these models added an explanation of technical progress based on increasing returns, R&D and imperfect competition, human capital, and—an important addition—government policies. The role of policies was initially focused narrowly on economic measures such as macroeconomic stability, openness of the economy, and degree of distortion in key price signals. A third element, property rights policies, has been added, borrowing from political economy models. Olson (1997), in particular, summarized well the role of policy areas such as property rights, rule of law, institutions, and corruption. Olson argues that both of the

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[7]An effective critique of factor input models as a basis for growth projections is given in Easterly (1997).

preceding models assume, incorrectly, that countries (and policy makers) make the most efficient use of resource inputs and available technology; instead, he posited that many countries are poor simply because they waste a lot of resources. On the basis of earlier work on the political economy of interest groups, he then added that the waste was greatest where the institutional basis of property rights and rule of law was least well developed or poorly observed in practice; a negative association between growth and corruption readily follows from this.

9.   The past decade has seen numerous empirical studies based on this synthesized model seeking to explain the observed wide differences in growth patterns across countries and over time, including as determinants: *factor inputs* (investment, human capital); *government policies* (monetary and fiscal policy, price distortions); and *indicators of property rights security* (tax burden and its fairness, corruption, transparency, political stability, etc.). It is useful to review briefly the key conclusions from this recent literature.[8]

10.   *First, initial conditions are important* in explaining cross-country differences in growth. In particular, most studies have found that per capita growth is inversely related to the initial level of output, and once other factors are accounted for, poor countries tend to grow faster than rich ones. Further, greater availability of resources does not necessarily ensure growth, while unfavorable geographic circumstances (tropical climate, a land-locked position) can hinder it. *Second, good economic policy (macroeconomic stability and nondistortive interventions) has a strong effect on growth.* Thus, reducing inflation not only to levels below 30 to 40 percent as thought earlier but even lower seems to be a necessary condition for achieving sustained growth.[9] Policies that lower or distort the rate of return on private capital, such as high taxes, exchange or import controls and price regulations are highly likely to reduce the growth performance of a country. *Third, the legal, political and institutional framework* also matters a great deal. Most recent empirical studies make some attempt to capture the latter and usually find that growth is higher with better institutional quality, political stability, government credibility and similar indicators of a market-friendly environment.

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[8]The list is long and we note here a central example: Barro (1997). As the authors of these many studies themselves warn, all of these results, however plausible, need to be interpreted with caution due to the measurement and methodology problems involved, not least because many of the variables used are likely to be highly correlated. The pitfalls are well reflected in a recent paper by Sala-i-Martin (1997): "I Just Ran Four Million Regressions."

[9]Bruno and Easterly (1996) suggest the higher range; others, such as Fischer (1993), Sarel (1996), Ghosh and Phillips (1998), find the breaking point to be much lower. Later in the paper we report on some results from transition economies.

B. Applicability to Transition Economies

11.   In this section we first consider what kind of core framework of transition is available as a basis for analyzing growth; second, we use this to infer which conclusions from general growth literature apply to the process of transition; and third, we review briefly previous empirical studies of growth in transition economies.

12.   It continues to be popular to say that there is no theory to guide the practical process of transition, only theories of capitalism and socialism. This may still be true in the sense that a new consensus paradigm has not emerged from the vast literature on transition, but it is not at all clear how much a unified, cohesive theory is needed to understand the main developments. Besides, to the extent it is useful to have a compact rather than complex analytical framework, it is not that difficult to cobble together from a selected few of the key writings a workable "model" of transition or transformation. Kornai (1994), in describing the special circumstances of the "transformational" recession compared to a market economy recession, highlights two key changes that are needed: *forcing a move from a sellers' to a buyers' market* (via price liberalization), and *enforcing a hard budget constraint* (via privatization and elimination of various government support mechanisms such as budget subsidies, directed low cost credits, and tax exemptions). These provide the two principal incentives for profit-maximizing market behavior of all economic agents. Blanchard (1997) defines the core process of actual change as comprising two elements: *reallocation of resources from old to new activities* (via closures and bankruptcies combined with establishment of new enterprises); and *restructuring within surviving firms* (via labor rationalization, product line change, and new investment). These can be thought of as the dynamic movements resulting from the establishment of the new incentives and are very reminiscent of the Schumpeterian concept of "creative destruction" by entrepreneurial activity, though with much greater and faster impact than Schumpeter's model envisioned.[10] The policy actions needed to put in place Kornai's new incentives are described in many works (including Kornai and Blanchard), and are well exemplified by an early study of Fischer and Gelb (1991) who outline the key measures of reform:

- •   macroeconomic stabilization; price and market liberalization;
- •   liberalization of the exchange and trade system;
- •   privatization of state-owned firms;
- •   establishing a competitive environment with easy market entry and exit;
- •   redefining the role of the state as the provider of macro stability, a stable legal framework, enforceable property rights, and occasionally as a corrector of market imperfections.

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[10]The EBRD *Transition Report (1997)* provides an excellent review of the conceptual framework in the "creative destruction" spirit, as well as empirical analysis of such changes in the transition so far.

13.   From such a core concept of transformation there follow some implications for growth which differentiate the transition economies from market economies and which provide the basis for empirical analysis of determinants of recovery in transition. *First, output will necessarily decline initially* under the new buyer's market and hard budget constraints, since unsaleable goods accumulate and signal the need for cutbacks in production. Further elimination of the wastage found under the old regime necessarily precedes creation of the new, adding to the production cuts. *Second, growth of the new will not occur until the new incentives are in place and made credible;* that is, the sooner reforms achieve a hard budget and liberal price environment, the sooner reallocation and the restructuring of the old and the creation of new production can begin. *Third,* the *proximate mechanisms in the early recovery period are most likely a variety of efficiency improvements rather than expansion of factor inputs, either investment or labor.* There is a consensus in the general growth literature that investment is a major engine of growth in the medium to long term; but in transition economies with substantial inherited inefficiencies as well as under-utilized capacity, the short-run role of new investment is likely to be relatively less important, at least for the initial recovery.[11] Some suggestive evidence comes from trends in the investment to GDP ratio. Of 17 countries with so far sustained growth and adequate data on investment, the most common pattern for the investment to GDP ratio is a decline from the central plan period levels of 30 percent and more to near 20 percent or even lower.[12] Further, for the 17 an upturn in the ratio of investment to output preceded the recovery in only 3 cases, while it coincided with the beginning of recovery in 5 countries and actually lagged the upturn in output in 9 cases. It is therefore not surprising that the recent empirical studies on growth during transition, while borrowing strongly from the new growth theory, ignore the long-term factors such as investment, and focus on efficiency-improving factors such as macro policies, structural reforms and property rights climate. This paper continues in that spirit.

14.   We conclude this section with a brief summary of earlier empirical studies. The *first* and probably least controversial conclusion is that stabilization is a necessary (but not sufficient) condition for recovery of output (Havrylyshyn and Botousharov (1995) and Fischer, Sahay and Vegh (1996)). The apparent exceptions of Bulgaria and Romania fell into line when their growth and then stabilization reversed in 1997, but two exceptions exist at present—Belarus and Uzbekistan, and we discuss later their similarity to the reversal cases.

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[11]It should be clear that while net aggregate investment need not be high to promote recovery, the reallocation to new sectors and products could allow for large net investment in the growing areas while the old ones experience negative net investment. Recent studies of survey data suggest that even at the firm level, very high productivity growth is seen during the transition. See Pohl et al. (1997).

[12]Based on a recent IMF study, "Growth Experience of Transition Economies" (1998 forthcoming).

15.   *Second,* but somewhat more controversial, emphasis was also put on the additional, necessary conditions to promote growth, i.e., liberalization and structural reforms. Whether the framework was a simple one relating only growth and some index of structural reforms (Sachs (1996), Selowsky and Martin (1996)), or a more complex one reflecting also effects of stabilization, initial conditions, conflicts, etc. (Åslund et al. (1996), Fischer, Sahay and Vegh (1996), Hernández-Catá (1997), De Melo et al. (1997), Berg et al. (1998)), the conclusion was firm: more reforms are associated with better growth performance. The results are not without exceptions, Belarus and Uzbekistan today being the key ones, Bulgaria and Romania earlier. Taube and Zettelmeyer (1998) show for Uzbekistan that structural and macroeconomic policies alone cannot explain the better than average performance and find that initial conditions, in particular the low degree of industrialization and cotton export potential, helped cushion the decline and perhaps promote an earlier recovery. Åslund et al. (1996) point to a dichotomy in the literature concerning the pace of reforms: while theoretical work on transition has often shown a gradual pace might lead to less early decline of output (Aghion and Blanchard (1993)), empirical studies generally conclude that fast and early reforms result in early and strong recovery.

16.   A *third* set of conclusions relates to initial conditions (e.g., high degree of industrialization) and other factors specific to countries such as wars; it is generally agreed these do have an effect that is country-specific, though different studies attribute a different magnitude of importance. De Melo et al. (1997) in a study which groups many different initial conditions, find a substantial impact; Åslund et al. (1997) also argue the more inward looking and generally over-industrialized economies in the former U.S.S.R. faced a bigger hurdle than did central Europe. Berg et al. (1998) conclude that achievement of stabilization and progress in structural reforms (i.e., policies) explain most of the difference between, for example, the better growth performance of central and eastern Europe and the poorer performance of the CIS. A different way of looking at this will be addressed in the present paper: *how much of a trade-off* is there between better policies and less favorable initial conditions.[13]

17.   A *fourth* set of conclusions relates to the market-enhancing nature of institutions such as rule of law, corruption climate, tax burden and its fairness. These factors are even less easily measured than the degree of liberalization, hence not surprisingly the statistic used varies a great deal among studies. Despite this, many studies such as Brunetti, Kisunko, Weder (1997), Johnson, Kaufman and Shleifer (1997), Olson, Sarna and Swamy (1997), all concur growth is higher where market-enhancing institutions are strongest.

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[13]Yet a third way of looking at this is to hypothesize that initial conditions play an indirect role through the politics of determining how committed a government is to stabilize and undertake structural reforms. Wolf (1997) takes this approach.

III. MODEL SPECIFICATION

18.   To determine the relative importance of the factors described above in explaining variations in countries' economic performance, we have conducted a simplified econometric analysis of economic growth in transition economies. At the start it is useful to remember the limitations of any econometric analysis. Growth is a complex process having many possible determinants, and theory does not provide a clear consensus on the "correct" model specification. Harberger (1998) usefully points out that at heart, growth is the sum of a "thousand and one" individual initiatives by entrepreneurs and managers to make improvements in products and production processes, therefore he contends regression analysis does not "explain" growth, but can at best illustrate its nature by organizing stylized facts. The present paper takes such an approach and opts for a limited specification, which focuses on a few of the key factors that can be thought as the stylized facts of growth in transition economies. However, for purposes of comparability with other studies with a more elaborate specification, we also present results of a model with fixed effects and a full lag structure on policy variables.

19.   A second important limitation is posed by the considerable data caveats that apply, particularly regarding output data, which are likely to be seriously biased for both conceptual and measurement reasons. At the conceptual level, the prices at which output was valued before the transition process began were out of line, while the calculation of volume changes suffers from the use of often arbitrary "comparative" prices. At the measurement level, coverage is poor because the statistical systems that were designed to collect information from state-owned enterprises are likely to miss a large part of the emerging private sector. In addition, while state-owned enterprises used to have an incentive to over-report their production, both state-owned and private enterprises now have an incentive to underreport in order to avoid taxation or regulations. We do not attempt here to take account of the well-known problem of the "unofficial economy."[14]

20.   All of the estimated equations have the growth rate of real gross domestic product (GR) as the dependent variable. As independent variables we include variables that represent those factors believed to be important in explaining economic performance as discussed in Section II.B. Thus, to represent economic policies we include the natural logarithm of inflation (LNP) representing macroeconomic policies; a structural reform index (RI) representing the level of structural reforms achieved; and the size of the government, measured by general government expenditures as a percent of GDP (EXP), representing factors such as crowding out, distortions through high taxation, and large bureaucracies. To represent initial conditions we use two "clusters" of initial conditions, the first capturing

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[14]Johnson (et al.),1997, provide the most comprehensive set of estimates of the unofficial economy for 17 countries over the period 1989–95. They show values ranging from 5 percent to 13 percent in Slovakia, Czech Republic Poland and Estonia, to 50 to 60 percent in Ukraine, Georgia and Azerbaijan.

macroeconomic distortions and unfamiliarity with market processes (INCOND1)[15] and the second the level of socialist development and its associated distortions (INCOND2).[16] For a simpler, stylized interpretation of initial conditions, we also used 1989 levels of per capita income (INC), the degree of industrialization in 1990 (ID), and the deviation from the average degree of industrialization in 1990 (IDDEV) separately. The data commonly used in growth studies to represent evolution of market-enhancing institutions—corruption indices, rule of law, country risk values—are available only for a handful of transition countries in this period. We do, however, use an indicator for the extensiveness and effectiveness of the legal framework (LEG) for which data are available for the period 1995–97.

21.   Data on growth and inflation (CPI, year-on-year change) are official data provided by the authorities, while data for the reform index were taken from de Melo, Denizer and Gelb (1996) for the years 1990–93, then linked through 1997 to the transition indicators in the EBRD Transition Reports. Data on government expenditures are official data and Fund staff estimates. Variables representing initial conditions were taken from de Melo et al. (1997).

22.   Berg et al. (1998) argue that it would not be correct to test the significance of different variables one or two at a time, as many of the variables might be correlated. Thus, to ensure a certain degree of robustness of the results (to the extent possible given the serious caveats on data problems that apply and uncertainty regarding the correct model), we started out by testing a specification including current and two lagged values of all policy variables. This was done estimating country specific constants (fixed effects), assuming that these constants capture the effect of relevant initial conditions. Thus, our estimated specification was of the following general form:

(1) $Gr_{i,t} = a_i + b_0 LNP_{i,t} + b_1 LNP_{i,t-1} + b_2 LNP_{i,t-2} + c_0 RI_{i,t} + c_1 RI_{i,t-1} + c_2 RI_{i,t-2} +$

$d_0 EXP_{i,t} + d_1 EXP_{i,t-1} + d_2 EXP_{i,t-2} + \epsilon_{i,t}$

As a next step, we estimated equation (1) without country specific constants but with the inclusion of variables representing initial conditions, while simplifying the lag structure, resulting in the following basic equation which we refer to as a stylized regression:

(2) $GR_{i,t} = a_0 + b_0 LNP_{i,t} + c_0 RI_{i,t} + c_1 RI_{i,t-1} + c_2 RI_{i,t-2} + d_0 EXP_{i,t} + e_0 INCOND1_i$

$+ e_1 INCOND2_i + \epsilon_{i,t}$

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[15]Including: repressed inflation, black market premium, trade dependency, market memory, existence as independent state prior to 1989, and location.

[16]Including: 1989 per capita income, the level of urbanization and over-industrialization, prior economic growth and the richness of natural resources.

These equations were estimated with panel data for the 25 transition economies for the years 1990–97 (which provides up to 200 observations, depending on data availability of individual variables), with i and t indexing the country and the time period.

23.   In general, one would expect higher inflation to have a negative impact on economic growth, i.e., that b_0, b_1 and $b_2 < 0$. Greater degrees of structural reforms would be expected to have a positive overall effect on growth. However, both theory and earlier empirical studies suggest that reforms may have at first a negative effect on growth—Schumpeter's "destruction"— but after a lag, the effect becomes positive, increasing in proportion to the accumulated stock of reforms—Schumpeter's "creation". Thus, in specifications including the contemporaneous value of the reform index, as well as two lagged values, we then would expect $c_0 < 0$, and c_1 and $c_2 > 0$, and that $c_1 + c_2 > |c_0|$ so that reforms have an overall positive effect on growth over time.

24.   The expected effect of government size is less clear-cut. While it is well known that the share of government spending is positively associated with the level of development (World Bank 1996), this correlation, known as Wagner's Law, is not the same as saying more government gives higher growth. One could also expect a negative impact of "large government" on growth because of high tax rates, crowding out and restrictive red tape. Indeed, growth literature (Barro (1996, 1998), Barro and Sala-i-Martin (1996)) demonstrates on a cross-section of countries that for a given initial level of per capita GDP, lower government consumption is associated with higher long-run growth rates. For transition countries it has sometimes been argued that after an initial stabilization, looser fiscal policy and increased government spending may boost growth in the short run through an aggregate demand stimulus. But as Kornai (1994) noted, the latter, Keynesian effects would be relevant only after a hard budget environment is solidly in place; as long as the "socialist" bias of government expenditures toward less productive sectors continues, the effect is likely to be negative. Thus on balance we expect that d_0 or $d_0 + d_1 + d_2 < 0$.

25.   The first cluster of initial conditions from the de Melo et al. study represents macroeconomic distortions at the start of transition; the greater such distortions, the less growth (thus $e_0 < 0$). Similarly for the second cluster representing structural distortions, greater distortions result in less growth ($e_1 < 0$). The simpler alternative variables for initial conditions are also expected to be negatively correlated with growth. INC, the 1989 level of per capita income, is included to test the common hypothesis in growth theory that incomes converge, i.e. low income countries grow faster. ID, the share of industry in GDP, is considered to be a proxy of degree of distortions inherited from the socialist period, i.e. higher values impede or slow recovery.

IV. EMPIRICAL RESULTS

A. Explanatory Power of the Regression Model

26.   Tables 3, 4 and 5 present the econometric results. Table 3 gives the panel estimates for the entire sample period, 1990–97, with individual constants estimated for each country (fixed effects). Table 4 shows panel estimates, also for the entire sample period, without constants but with variables representing initial conditions, while the two panels of Table 5 provide estimates for the two sub-periods, 1990–93 and 1994–97. Two equations representing the main results (B5 and B11) are reported also below:

$$Gr_{i,t} = -1.98 * LNP_{i,t} - 8.16 * Ri_{i,t} + 16.94 * RI_{i,t-1} + 11.08 * RI_{i,t-2} - 0.11 * EXP_{i,t} - 2.55 * INCOND2_i \qquad B5$$
$$\quad (-10.44) \qquad (-1.61) \qquad (2.94) \qquad (2.40) \qquad (-3.00) \qquad (-4.23)$$

$$R^2 \text{ adj.} = 0.76$$

$$GR_{i,t} = -1.10 * LNP_{i,t} - 0.62 * LNP_{i,t-1} - 8.76 * Ri_{i,t} + 20.31 * RI_{i,t-1} + 7.04 * RI_{i,t-2} - 0.15 * EXP_{i,t} - 0.08 * IDDEV_i \qquad B11$$
$$\quad (-4.89) \qquad (-2.68) \qquad (-2.20) \qquad (4.36) \qquad (3.39) \qquad (-5.50) \qquad (-2.41)$$

$$R^2 \text{ adj.} = 0.77$$

27.   We start with the general observation that most of the coefficient signs are as hypothesized above, with many of them statistically significant (t-values in brackets), and the goodness of fit, measured by the adjusted R^2 statistic, is very high, being no less than 0.48 and ranging up to 0.93 in the fixed-effects panel estimates. Table 6 and Figures 1 and 1a, show the actual and fitted[17] real GDP growth rates for the 25 countries in the sample. While overall the fitted values track the actuals reasonably well over the period, it is notable that the BRO countries have a somewhat worse fit than the Central European countries, especially in the early years. For Armenia, Georgia, Latvia, and to a lesser degree, Lithuania, the predicted values are significantly higher than the actual one for the beginning of the simulation period, while no such deviations are observed for others. For Belarus and Uzbekistan, the model underpredicts throughout the sample period, a result which is consistent with a frequently held view that these cases are a "puzzle" because they have done little reform, and continue to have much higher inflation, yet both have positive growth. Taube and Zettelmeyer (1998) attribute part of this puzzle in Uzbekistan to the favorable initial condition of cotton resources, though they argue that with this factor considered, there is little puzzle remaining, and that in late years growth is more or less as might be expected given reforms. In Figure 1, the late years indeed show smaller deviations. It is surprising that the actual growth rates for Poland are also higher than predicted throughout the simulation period, although by a much smaller margin than for Belarus and Uzbekistan. Inasmuch as Poland has progressed a lot on reforms, and the growth rates have been high and positive since 1992, it is more reasonable to

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[17]Equation B11 is used to generate the fitted values.

Table 3. Growth Determinants: Fixed-Effects Panel Estimates for Policy Variables 1990-1997

Dependent variable: GR

Independent variables

	LNP	LNP-1	LNP-2	RI	RI-1	RI-2	EXP	EXP-1	EXP-2	LIP	LIP-1	LIP-2	LEN	LEN-1	LEN-2	LEX	LEX-1	LEX-2	R2 Adj.
A1	-2.04	0.17	-0.36	-4.07	12.53	11.74	-0.27	0.20	-0.18										0.93
	(-4.92)	(0.36)	(-1.39)	(-0.72)	(2.94)	(4.00)	(-4.51)	(3.07)	(-5.10)										
A2	-2.68	0.41	0.10	-7.39	13.15	11.51													0.90
	(-8.30)	(1.02)	(0.50)	(-1.16)	(2.94)	(4.93)													
A3	-1.86	0.52	0.27							-18.04	4.97	3.15	-9.04	0.78	3.51	18.15	4.19	5.01	0.78
	(-4.02)	(1.04)	(0.71)							(-2.58)	(0.94)	(0.83)	(-1.23)	(0.11)	(0.65)	(3.56)	(0.86)	(1.40)	
A4	-2.29	0.43	0.24	5.83	15.86	4.98				-14.76	2.66	4.30							0.89
	(-6.54)	(1.03)	(1.00)	(0.84)	(2.48)	(1.27)				(-2.10)	(0.67)	(1.51)							
A5	-2.16	0.42	0.05	0.28	7.85	6.74							-5.13	6.41	4.48				0.78
	(-4.85)	(0.86)	(0.15)	(0.04)	(1.40)	(2.20)							(-0.74)	(0.94)	(0.93)				
A6	-1.87	0.64	0.01	-30.85	7.15	6.04										17.08	6.38	5.06	0.78
	(-4.30)	(1.39)	(0.03)	(-3.69)	(0.98)	(1.07)										(3.58)	(1.37)	(1.40)	

Note: Reform index (RI) excludes subcomponent when subcomponent is included separately in the specification.

Table 3A. Fixed-Effects Panel Estimates: Country-Specific Constants

Equation	A1	A2	A3	A4	A5	A6
Country						
Albania	11.9	3.2	-5.1	1.7	-2.1	-5.1
Armenia	14.5	-0.9	-7.5	-2.7	-6.4	-7.2
Azerbaijan	5.4	-3.7	-5.0	-2.7	-8.6	-5.7
Belarus	15.2	4.0	1.7	2.2	-0.4	1.5
Bulgaria	6.6	-3.4	-13.5	-5.3	-8.4	-13.2
Crotia	7.0	-3.7	-9.1	-7.2	-8.1	-7.2
Czech Republic	2.6	-6.4	-9.3	-10.5	-10.1	-6.8
Estonia	5.7	-3.8	-9.7	-7.4	-8.4	-7.3
Georgia	9.0	-2.1	-6.2	-3.8	-6.9	-5.5
Hungary	6.9	-5.5	-10.2	-9.3	-9.5	-7.9
Kazakhstan	8.2	1.6	-5.8	-0.6	-3.7	-5.3
Kyrgyz Republic	4.2	-3.0	-9.5	-6.7	-7.9	-8.0
Latvia	6.4	-6.8	-12.9	-8.9	-11.6	-11.7
Lithuania	2.3	-5.8	-11.7	-9.0	-10.7	-10.0
FYR of Macedonia	5.2	-6.9	-14.2	-9.6	-11.7	-13.3
Moldova	-0.5	-7.7	-14.5	-9.7	-12.7	-14.0
Poland	9.5	-1.1	-6.4	-5.1	-5.3	-4.2
Romania	9.7	2.0	-5.9	-0.8	-3.3	-5.3
Russian Federation	4.7	-2.9	-8.5	-6.0	-7.9	-6.9
Slovenia	6.4	-4.2	-9.8	-7.8	-8.4	-7.7
Slovak Republic	7.2	-5.6	-8.6	-9.0	-9.3	-6.5
Tajikistan	9.0	-2.7	-3.6	-2.3	-7.7	-4.4
Turkmenistan	4.7	-0.5	-3.9	-2.1	-5.0	-3.9
Ukraine	5.4	-4.4	-9.2	-6.4	-9.2	-8.8
Uzbekistan	11.3	5.2	4.2	3.6	0.6	5.0
Average	7.1	-2.6	-7.8	-5.0	-7.3	-6.8
Highest	15.2	5.2	4.2	3.6	0.6	5.0
Lowest	-0.5	-7.7	-14.5	-10.5	-12.7	-14.0
Standard deviation	3.6	3.5	4.5	4.1	3.4	4.2

Table 4. Growth Determinants: Panel Estimates for Policy Variables and Initial Conditions 1990-1997

Dependent variable: GR
Independent variables

	LNP	LNP-1	LNP-2	RI	RI-1	RI-2	EXP	EXP-1	EXP-2	INCOND1	INCOND2	INC	ID	IDDEV	IDT	FSUDUM	R2 Adj.
B1	-1.71 (-4.66)	0.15 (0.34)	-0.22 (-0.80)	1.97 (0.34)	10.89 (1.52)	13.01 (3.35)	-0.23 (-3.06)	0.20 (2.32)	-0.18 (-3.48)	0.19 (0.35)		-1.20 (-2.04)					0.76
B2	-2.57 (-17.54)			11.34 (10.67)													0.54
B3	-2.07 (-11.92)			-14.80 (-2.85)	14.74 (2.37)	11.96 (4.19)											0.72
B4	-2.32 (-11.28)			-10.77 (-2.09)	15.80 (2.74)	10.60 (4.58)				0.34 (0.66)		-2.77 (-4.53)					0.75
B5	-1.98 (-10.44)			-8.16 (-1.61)	16.94 (2.94)	11.08 (2.40)	-0.11 (-3.00)					-2.55 (-4.23)					0.76
B6	-1.96 (-8.64)			-8.11 (-1.60)	16.88 (2.92)	11.07 (4.58)	-0.11 (-2.99)					-2.55 (-4.22)				-0.15 (-0.17)	0.76
B7	-1.75 (-9.14)			-6.76 (-1.26)	15.53 (2.59)	12.51 (4.91)	-0.10 (-2.88)						-0.001 (-2.92)				0.74
B8				-21.20 (-3.82)	26.96 (4.07)	11.80 (3.85)	-0.28 (-8.53)				-2.10 (-5.54)	-1.63 (-2.44)					0.66
B9				-16.89 (-2.71)	27.15 (4.11)	11.85 (3.99)	-0.23 (-6.29)				1.67 (0.73)	-1.49 (-2.24)				-7.64 (-1.94)	0.68
B10				-16.11 (-2.76)	31.70 (4.82)	12.94 (3.91)	-0.22 (-6.15)						-0.001 (-2.59)	-0.11 (-3.29)			0.63
B11	-1.10 (-4.89)	-0.62 (-2.68)		-8.76 (-2.20)	20.31 (4.36)	7.04 (3.39)	-0.15 (-5.50)							-0.08 (-2.41)			0.77
B12	-0.79 (-3.58)	-0.76 (-3.63)		-5.88 (-1.56)	20.69 (4.75)	4.20 (1.72)	-0.13 (-4.92)								-0.24 (-2.45)		0.78

Dependent variable: GR
Independent variables

	LNP	RI	RI-1	RI-2	EXP	INCOND2	LIP	LIP-1	LEN	LEN-1	LEX	FDI-1	R2 Adj.
B13	-1.53 (-6.52)				-0.11 (-3.20)	-2.07 (-3.28)	-13.00 (-2.51)	6.85 (1.66)	-11.34 (-1.84)	24.42 (4.76)	8.52 (2.64)		0.72
B14	-2.12 (-10.61)	-3.71 (-0.74)	10.92 (1.74)	5.89 (1.51)								-0.04 (-0.31)	0.87
B15	-0.82 (-5.76)											0.71 (4.02)	0.22

Table 5. Growth Determinants: Panel Estimates for Sub-Periods

	Dependent variable: GR			Time period: 1990-1993			
	Independent variables						
	LNP	RI	LIP	LEN	LEX	LEG	R2 Adj.
C1	-2.08	2.51					0.48
	(-12.00)	(1.53)					
C2	-1.91	13.75	-12.40				0.53
	(-11.01)	(2.99)	(-2.58)				
C3	-2.00		1.38				0.51
	(-11.67)		(0.82)				
C4	-2.08	-0.81		4.42			0.48
	(-12.00)	(-0.27)		(1.15)			
C5	-2.09			3.52			0.49
	(-12.66)			(1.76)			
C6	-2.02	-3.03			4.08		0.50
	(-11.36)	(-0.57)			(1.09)		
C7	-2.08				2.28		0.48
	(-12.70)				(1.67)		

|	Dependent variable: GR			Time period: 1994-1997			
	Independent variables						
	LNP	RI	LIP	LEN	LEX	LEG	R2 Adj.
D1	-2.44	14.11					0.81
	(-16.05)	(21.12)					
D2	-2.84	3.01	12.47				0.77
	(-11.88)	(1.10)	(3.45)				
D3	-2.30		16.00				0.76
	(-14.04)		(17.15)				
D4	-2.64	13.08		-0.43			0.74
	(-12.21)	(3.73)		(-0.12)			
D5	-2.30			13.91			0.80
	(-16.01)			(20.41)			
D6	-2.39	5.75			6.09		0.75
	(-13.47)	(1.38)			(1.93)		
D7	-2.34				10.26		0.74
	(-13.00)				(16.73)		
D8	-2.05	15.37				-2.25	0.87
	(-12.43)	(10.08)				(-1.97)	
D9	-1.42					9.78	0.74
	(-6.77)					(12.91)	

Note: Reform index (RI) excludes subcomponent when subcomponent is included
separately in the specification.

Table 6. GDP Growth in Transition Economies: Actual and Fitted Values

	Albania		Armenia		Azerbaijan		Belarus		Bulgaria	
	Actual	Fitted	Actual	Fitted	Actual	Fitted	Actual	Fitted	Actual	Fitted
1992	-7.2	-15.3	-52.3	-13.5	-22.1	-18.6	-9.6	-17.2	-7.3	-10.0
1993	9.6	-4.9	-14.8	-18.1	-23.1	-16.4	-7.6	-19.2	-1.5	0.0
1994	9.4	2.2	5.4	-15.0	-18.1	-12.3	-12.6	-16.5	1.8	-2.0
1995	8.9	3.9	6.9	-8.5	-11.0	-8.6	-10.4	-12.9	2.9	-2.9
1996	9.1	2.0	5.8	-2.9	1.3	-3.4	2.8	-6.2	-10.1	-5.0
1997	-7.0	1.6	3.3	0.2	5.7	0.7	10.4	-6.7	-6.9	-7.3

	Croatia		Czech Republic		Estonia		Georgia		Hungary	
	Actual	Fitted	Actual	Fitted	Actual	Fitted	Actual	Fitted	Actual	Fitted
1992	-11.7	-4.5	-3.3	-3.1	-21.6	-13.9	-44.8	-14.1	-3.1	-2.1
1993	-8.0	-4.3	0.6	2.7	-8.2	-6.8	-25.4	-13.5	-0.6	-0.4
1994	5.9	-1.1	2.7	4.0	-1.8	0.7	-11.4	-12.8	2.9	1.1
1995	6.8	5.8	6.4	5.0	4.3	3.6	2.4	-8.3	1.5	2.6
1996	6.0	4.2	3.9	3.8	4.0	2.9	10.5	-2.5	1.3	2.7
1997	6.5	4.1	1.0	3.6	10.8	3.3	11.0	3.3	4.4	2.5

	Kazakhstan		Kyrgyz Republic		Latvia		Lithuania		FYR of Macedonia	
	Actual	Fitted	Actual	Fitted	Actual	Fitted	Actual	Fitted	Actual	Fitted
1992	-5.3	-14.8	-13.9	-16.8	-35.2	-12.6	-21.3	-13.0	-8.0	-7.4
1993	-9.2	-11.6	-15.5	-15.5	-16.1	-8.4	-16.2	-9.7	-9.1	-8.3
1994	-12.6	-10.7	-20.1	-6.4	2.1	-1.8	-9.8	-1.7	-1.8	-2.9
1995	-8.2	-7.1	-5.4	0.1	0.3	1.7	3.3	3.3	-1.2	0.8
1996	0.5	-2.7	7.1	3.1	3.3	0.8	4.7	1.9	0.8	1.2
1997	2.0	1.8	6.5	2.6	6.5	2.4	5.7	2.9	1.5	2.4

	Moldova		Poland		Romania		Russian Federation		Slovenia	
	Actual	Fitted	Actual	Fitted	Actual	Fitted	Actual	Fitted	Actual	Fitted
1992	-29.7	-19.8	2.6	-2.9	-8.8	-11.7	-14.5	-22.0	-5.5	-3.8
1993	-1.2	-11.7	3.8	-0.2	1.5	-9.3	-8.7	-13.5	2.8	-0.6
1994	-31.2	-7.8	5.2	0.8	3.9	-6.2	-12.6	-8.2	5.3	2.7
1995	-1.4	-3.7	7.0	2.0	7.1	-1.0	-4.0	-3.1	4.1	3.6
1996	-7.8	0.0	6.1	1.5	3.9	-0.4	-2.8	-2.6	3.1	3.3
1997	1.3	1.1	6.9	1.9	-6.6	-3.7	0.4	0.1	3.7	3.0

|	Slovak Republic		Tajikistan		Turkmensitan		Ukraine		Uzbekistan	
	Actual	Fitted	Actual	Fitted	Actual	Fitted	Actual	Fitted	Actual	Fitted
1992	-6.5	-5.6	-29.0	-18.0	-5.3	-13.3	-17.0	-19.2	-11.0	-12.1
1993	-3.7	1.8	-11.0	-17.5	-10.2	-13.9	-14.2	-17.5	-2.3	-10.9
1994	4.9	2.2	-18.9	-15.4	-19.0	-12.6	-22.9	-19.6	-4.2	-13.4
1995	6.9	3.4	-12.5	-8.7	-8.2	-8.7	-12.2	-14.3	-0.9	-8.5
1996	6.6	2.8	-4.4	-5.1	-7.7	-8.3	-10.0	-6.4	1.6	-1.2
1997	6.5	3.3	2.2	-3.1	-25.0	-7.7	-3.2	-2.1	2.1	0.0

Sources: National authorities; and IMF staff estimates, and authors' estimates based on equation B11.

Figure 1. Growth in Transition Economies: Actual and Fitted GDP Growth Rates for the CIS and the Baltics 1/
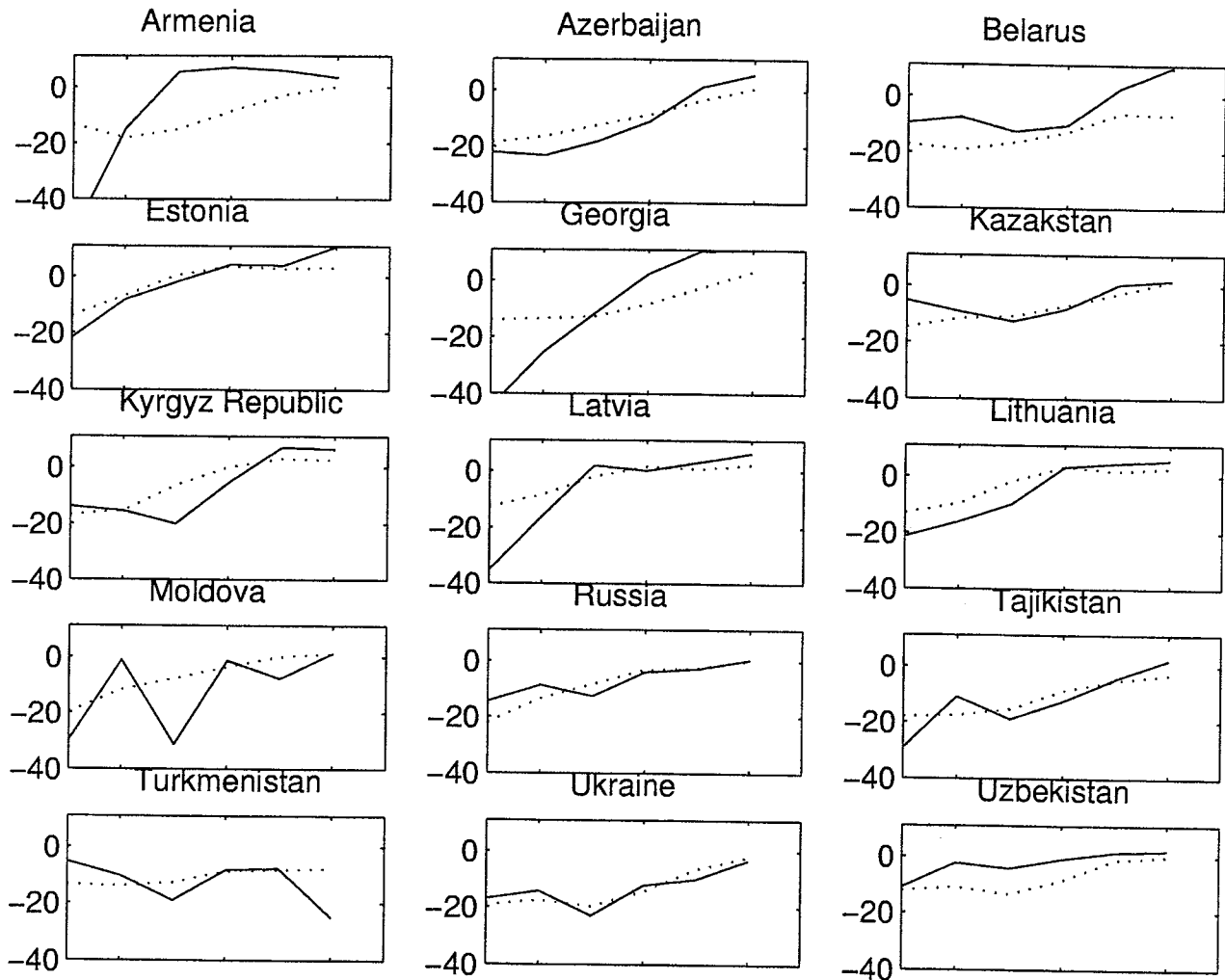
Sources: National authorities; and IMF staff estimates; and authors' estimates based on equation B11.

Figure 1A. Growth in Transition Economies: Actual and Fitted GDP Growth Rates for Eastern Europe 1/
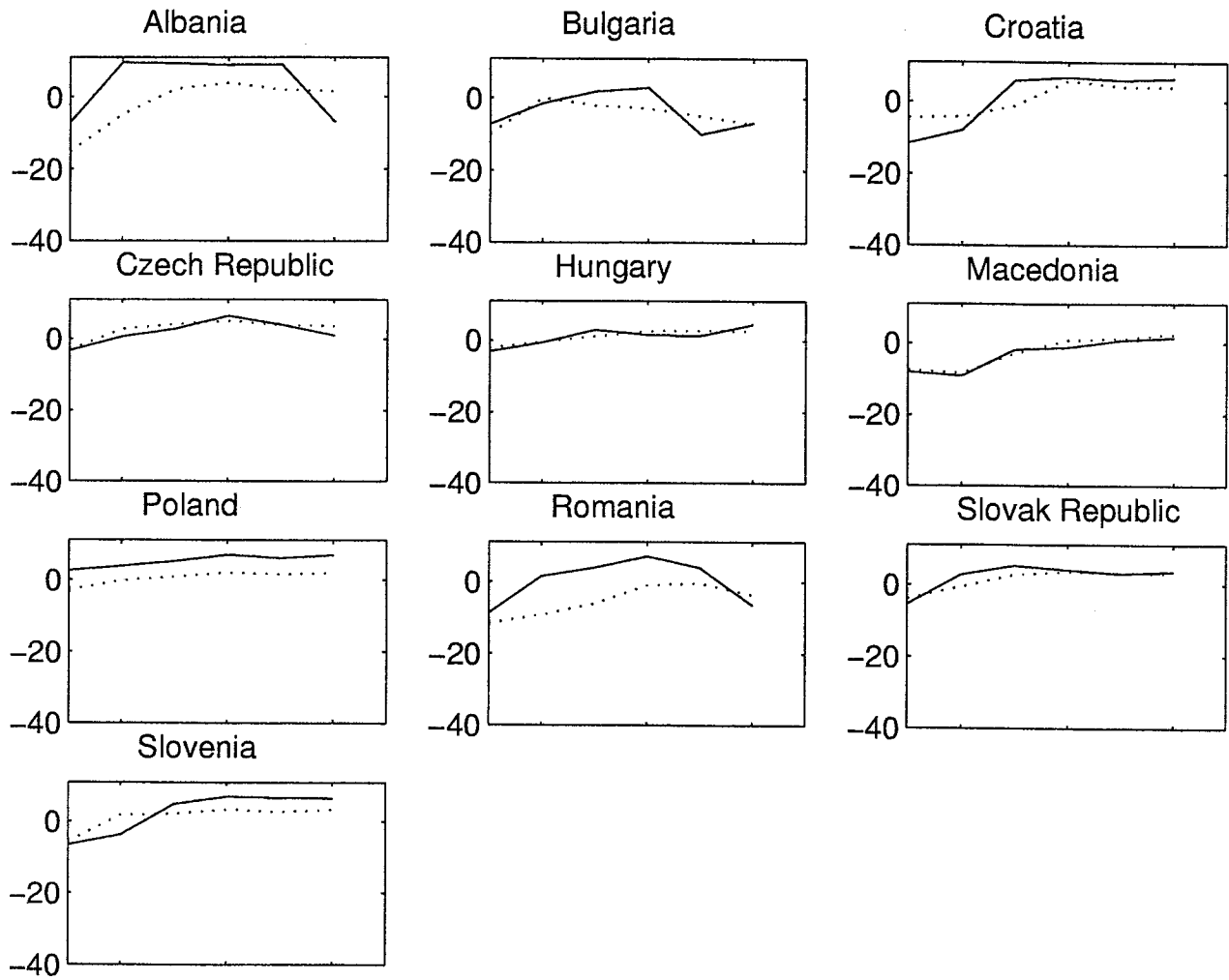
Sources: National authorities; and IMF staff estimates; and authors' estimates based on equation B11.

think of Poland not as a puzzle but as the outstanding case of exceptionally strong growth performance. One possible explanation, which neither we or others have tested, is the role of an early and fast start in reform.

28. Table 3A shows the country-specific constants of the fixed-effects panel estimates. The dispersion of these constants is quite large, as indicated by the range from the highest to the lowest value and by their standard deviation. In all equations, Belarus or Uzbekistan have the highest constants, while Moldova has the lowest value in all but one equation. In effect, it appears that the country-specific constants act much like country dummies, increasing the goodness of fit, but its difficult to give objective interpretation of the factors explaining the variation in economic performance among countries. For this reason, and also because the equations without country-specific constants still offer a very reasonable fit while the signs and statistical significance of the coefficients remain intact, we favor the results in Table 4 over those in Table 3.

29. Before we go on to discuss the results for individual variables in the model, we note that factor expansion which usually plays a large role in statistical studies of long-term growth in other economies—proxied by the investment ratio—was not found to show a significant statistical association with growth in this study (results not shown). This confirms the results of Wolf (1997) who even found a negative effect of investment on growth. Although it should be recalled that investment data are particularly weak, this seems to suggest that so far the recovery in transition economies has not depended as much on new investment as on a re-allocation of existing resources. The nature of transition is such that efficiency improvements are an important source of early growth. The impact of resource re-allocation will of course be temporary and over time growth will come to depend on the more traditional factors, such as the expansion of physical and human capital. In this connection, we may note that foreign direct investment (FDI), which is sometimes thought to be an easy solution to stimulate growth, only gives statistically significant results when structural reforms are not accounted for in the model specification (see equation B14), and even then its association with growth is much weaker than that of reforms. When the reform index is included in the specification, we find no significant effect of FDI on growth. Although one can observe a broad association—better performing economies have more FDI—this may actually reflect a reverse causation. That is, the same factors that promote growth (stabilization, reforms) also attract FDI and hence the strong correlation between structural reforms and FDI.[18]

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[18]As other empirical studies, we also were unable to find a statistically significant association for openness-trade to GDP ratio. This may reflect a problem of trade data especially in early years, or a difficulty with this simple measure of trade openness which does not control for the size of an economy. IMF (1998) does, however, report a non-econometric result of a broad association for groups of countries. Those with a more sustained growth record tend to have higher growth rates of export than those with very recent growth, or no growth, or reversals.

B. Role of Principal Policy Variables

30.   As expected, the coefficient for *inflation* is negative (Figure 2). Only when more than one lagged value is included in the specification do lagged coefficients become insignificant or change sign. Finding that inflation is bad for growth is neither new nor surprising[19]; to explore this effect further on the importance of disinflation, we have also tried to determine at what level inflation starts to have a significant adverse effect on growth. To do this, we added dummies to the most basic equation B2, with the dummies having a value of 1 when inflation is above a certain threshold, and a value of 0 otherwise. Subsequently we estimated the equation using various levels of inflation as the breaking point. We found that the dummy becomes statistically significant (at the five percent level) with a negative sign at a rate of inflation of 31 percent. An alternative test, where the dummies have a value of 1 when inflation is below a certain threshold, found a significative positive coefficient for values below 22 percent. This suggests that inflation levels higher than the range of 20–30 percent significantly hurt growth.[20] These higher values for transition countries may themselves be "transitional." That is, transition economies beginning a successful stabilization combined with a good beginning on reforms, may induce growth simply by pushing inflation from very high levels to well below 100 percent. But unless the trend continues—lower inflation, more reforms—growth may stall, as it did in Albania, Bulgaria, and Romania.[21] The fact that the two tests do not yield the same cut-off point suggests that the relationship between inflation and growth is a non-linear one.

31.   *Structural reforms* have a particularly strong and positive overall impact on growth. Consistent with earlier empirical results from studies by de Melo, Denizer and Gelb (1996), Selowsky and Martin (1997), de Melo et al. (1997), and Wolf (1997), when lagged values of the reform index are added, we find that the effect of reforms occurs over a longer period of time. In fact growth appears to be negatively affected by the level of contemporaneous

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[19]As noted in paragraph 14, this was the earliest important conclusion in studies of growth in transition and the least controversial; our results merely affirm this effect still holds, despite the fact that a few countries have attained low inflation without seeing recovery. Ukraine and to some extent Turkmenistan are examples, but they also serve to make the point that stabilization while necessary may not be sufficient for growth.

[20]Our result is consistent with the findings of Bruno and Easterly (1996). Others, such as Fischer (1993), Sarel (1996), and Ghosh and Phillips (1998) find the threshold to be much lower (6 to 10 percent), although these studies did not include transition economies. Another Fund study, by Christoffersen and Doyle (1998), finds a value of 13 percent.

[21]IMF (1998) argues that the cases of Belarus and Uzbekistan are analogous to Bulgaria and Romania in the use of directed credits to stimulate growth. As noted above, Taube and Zettelmeyer (1998) explain at least part of the Uzbekistan puzzle by its reliance on cotton exports.

Figure 2. The Impact of Inflation on Growth: Fitted Regression Values 1/
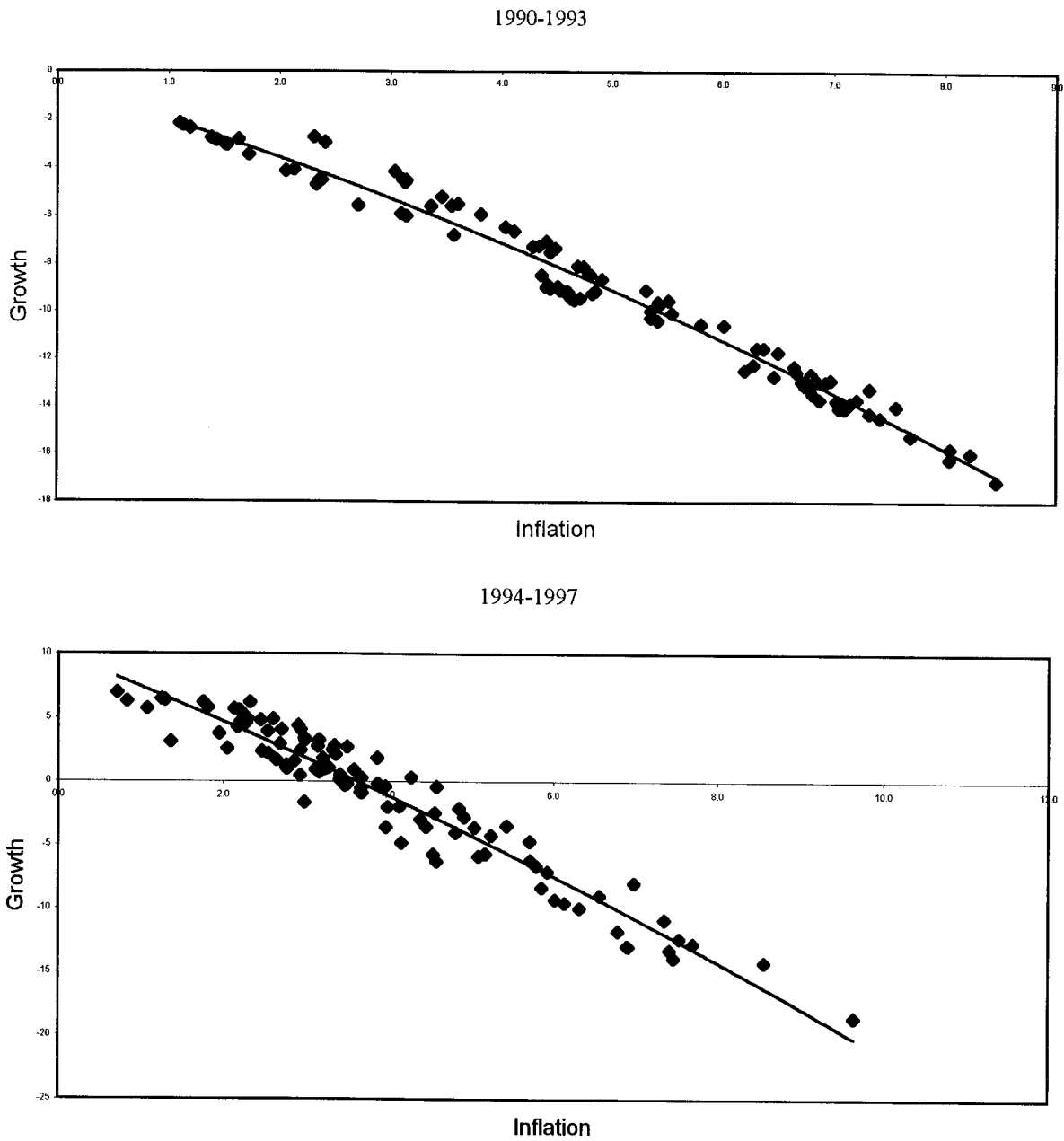
1990-1993

Inflation

1994-1997

Inflation

Sources: Authors' estimates and EBRD (1997).

1/ The fitted values are obtained from the multivariate panel data regression B1 from Table 4 (top panel) and C1 from Table 4 (bottom panel). A polynomial trend line has been added to the fitted regression values.

reforms; this is quickly compensated if reforms continue, and on balance growth is affected positively by the accumulated stock of reforms (indicated by the sum of the coefficients). Thus, reforms have an initial cost, but this is more than offset in following years. Reforms foster resource re-allocation as well as investment in physical and human capital, both of which take time to yield positive effects on economic performance. By not including the lag structure for the reform index, one would miss this initial adverse effect on growth and misrepresent the short and long run effects of structural reforms.

32.   The statistical association between growth on the one hand, and inflation and structural reforms on the other hand, is quite strong. In the econometric results, about 70 percent of the variation in output is explained by these two factors alone (equation B3).[22] Figure 3 also illustrates the point: countries with better growth performance had generally lower inflation and a higher degree of progressive structural reforms. The relationship is also fairly robust; estimating specifications with different lag structures and/or adding or eliminating other variables does not affect the statistical significance much, nor does it result in a much different magnitude of the steady state effect of both variables on growth.

33.   Next we turn to analyze whether some *elements of reforms* are more important than others. Indices for individual components of structural reforms were added or substituted for the overall reform index. When individual components were added, the overall index was corrected for these components. The subindices include an index for internal price liberalization (LIP), private entry in markets (comprising privatization, enterprise reform and financial sector reform; LEN), liberalization of the trade and exchange regimes (LEX), and legal reform (LEG, only available for the period 1995–97). Again, these indices are due to de Melo, Denizer and Gelb (1996) for the years 1990-93, updated until 1997 using the transition indicators from the EBRD Transition Reports.

34.   We do not find that adding the various reform subcomponents to the fixed effects specification or substituting them for the overall index improved the explanatory power. When replacing the overall reform index in the fixed-effect estimates by the three subcomponents for which data are available for the entire period, we also find that the goodness of fit deteriorated somewhat. We find that price liberalization has an initial negative impact on growth, while its lagged values have a positive effect. Thus, price liberalization initially has a "destructive" effect, as existing enterprises find it harder to compete, while new enterprises take time to develop. Berg et al. (1998) using a full period specification and time lags, also find these negative effects for current year price liberalization in some regressions but not in those which include initial conditions. Hernández-Catá (1998) finds, as we do, stronger evidence for the early "pain" of price liberalization. Enterprise reform also appears to have a negative contemporaneous effect on growth, while lagged values show a positive association, reflecting

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[22]Using fixed-effects panel estimates, 90 percent of the total variation is explained by inflation and structural reforms.

Figure 3. The Impact of Reform and Inflation on Growth, 1990-97
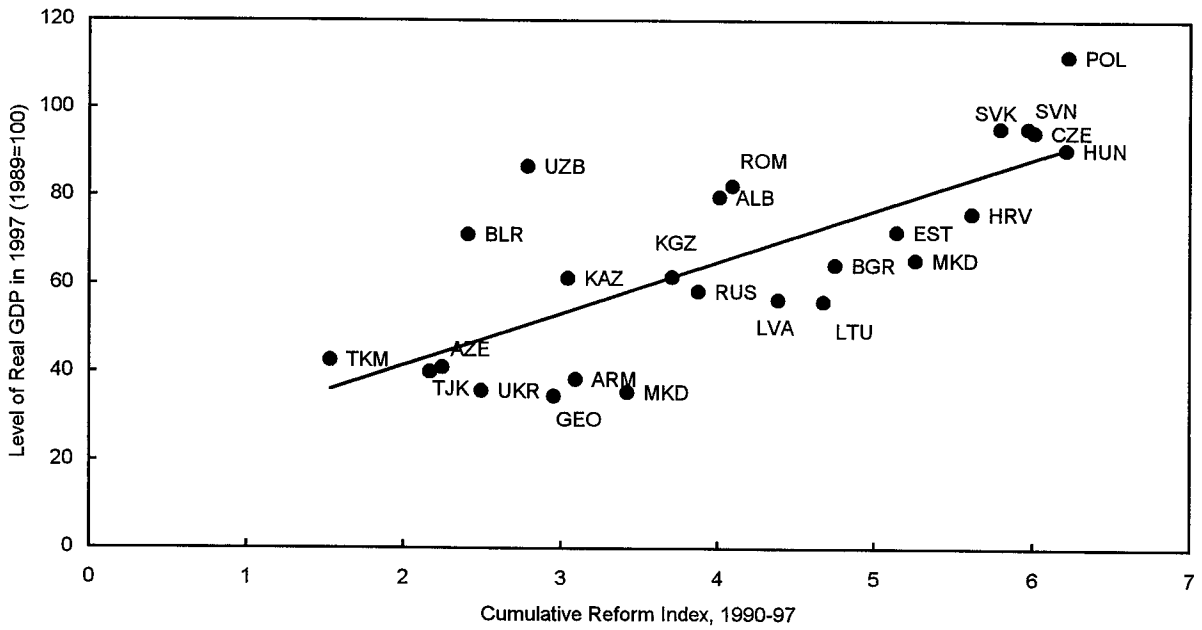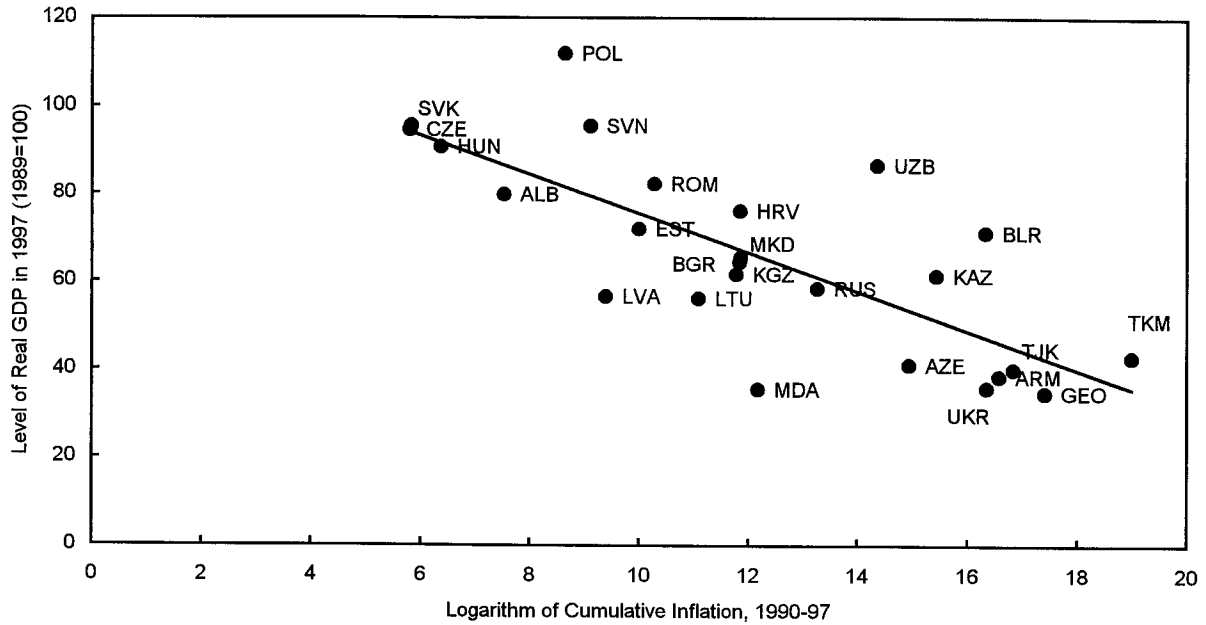
Sources: Authors' estimates and EBRD (1997).

that enterprises need time to restructure. Trade and exchange reform has an immediate positive effect on growth.

35.   The effect of *large governments* on growth, which has been given less attention in the literature, is negative and significant (Tables 3 and 4). This seems to suggest, as Kornai posited, that the recession is not a Keynesian one as long as soft budgets continue, and/or that any government spending impulse that stimulates growth, is at most temporary, as suggested by equations A1 and B1 that show a positive coefficient for the one-year lagged value of government expenditure, and is outweighed by the adverse effects of large bureaucracies, high tax rates and crowding out. However, we found that the impact of the size of the government is less important than stabilization and structural reforms. Still, the econometric results suggest that each percentage point decline in the ratio of government expenditure to GDP results in 0.10–0.25 percent higher annual growth.

36.   The size of the government can be expected to affect economic performance in transition economies along the following channels. A market economy has three main components: (i) enterprises; (ii) markets; and (iii) the institutions allowing markets to work. How well these components work and interact depends very much on the role the government plays in the economy. In most transition economies, particularly in the CIS, the role of the government in each of these three components is, albeit to a varying degree, still significant. Typically, expenditures are tilted heavily towards unproductive sectors, such as subsidies to enterprises, a large bureaucracy, and an untargeted social safety net. This diversion of so many resources to government-funded activities is itself an impediment to growth. Beyond this, the continued interference of the government in many aspects of economic life as well as deficiencies in the institutional framework create serious obstacles to the development of a favorable business climate and the realization of the country's economic potential. The counterpart of the large size of the government is a heavy tax burden, which is an additional factor deterring the development of the enterprise sector. The high tax rates create an incentive to conceal production or to increase the use of barter transactions, which not only drive economic activity to the shadow economy, but in so doing discourage expansion of this activity. Adding to the tax burden on enterprises are "unofficial" taxes, as government officials try to supplement their low wages by requiring side-payments from enterprises for services rendered, such as the granting of licenses. In addition, the inability to reduce government expenditures substantially has caused budget deficits to remain relatively high, the financing of which crowds out the enterprise sector.

C. Decline Period vs. Recovery Period

37.   Apart from estimating the relationship between growth, disinflation and (components of) structural reforms for the entire period, the data set was also broken down into two subperiods. Although somewhat arbitrary, it is useful to consider the period of "decline" (1990–93), during which at most a handful of countries had seen the beginnings of recovery; and the period of "recovery" (1994–97) during which nearly a dozen countries experienced

three or more years of growth and most others either began to grow or at least saw the decline approaching bottom.

38.   It is notable that the explanatory power, the statistical significance (t-values), and even size of coefficients for the reform variables, is higher in panel D of Table 5, that is for the period 1994–97 which can be considered as the recovery period[23]. The stronger results for reform variables in the second period compared to the first period can be interpreted as saying that at first the effect of reforms in helping slow the decline is positive but mild, but over time as reforms continue, their cumulative effect strengthens and leads to recovery or positive growth. This phenomenon is well illustrated by Figure 4 showing the predicted relation between growth and degree of reforms in the two subperiods. It shows that in the early period 1990–93, reforms had a "U-curve"effect: limited reforms helped prevent a strong decline in output, while very strong reforms did not preclude decline, but that decline was not as great as for intermediate reformers. Once the early decline was overcome, however, the effect of reforms on growth for the period 1994–97 was unequivocally favorable. Those with the strongest reforms were the best performers, those with least reform did most poorly.

39.   When the estimation period was divided in two, we find that price liberalization has an adverse effect on growth in the early years, while it has a clear positive effect in the later years (Table 4 equation C2 versus D2). This supports the notion that price liberalization has an initial destructive effect. Trade and exchange liberalization has a significant positive effect in the recovery period. Otherwise we find that the subindices are each close substitutes for the general index, but do not have additional separate significance in the statistical analysis. The generally very close association of the various subcomponents of reform is similar to the results for nontransition economies in Aziz and Wescott (1997), namely that it is a *combination* of policies that is more critical for growth than any single type of policy.

D. Role of Initial Conditions

40.   There is a negative association between economic growth and the variables capturing the initial macroeconomic and structural conditions (Table 4, equations B4–B12). These findings are consistent with those of de Melo et al. (1997). Contrary to their results, however, we find here that the negative effect of initial structural conditions, including elements such as level of per capita income, over-industrialization and urbanization, is statistically stronger than that of initial macroeconomic conditions. The coefficient of INCOND1 is of the wrong sign and not statically significant in equations that include inflation (equation B4 versus equation B8). Individual components such as the (deviation from the average) degree of industrialization and initial per capita income also show an adverse association with growth

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[23]Because of the short estimation periods, no lagged values of the reform index were included in the specification. Hence, no distinction can be made between the first-year effect of reforms and the effects in subsequent years.

Figure 4. The Impact of Reform on Growth: Fitted Regression Values 1/
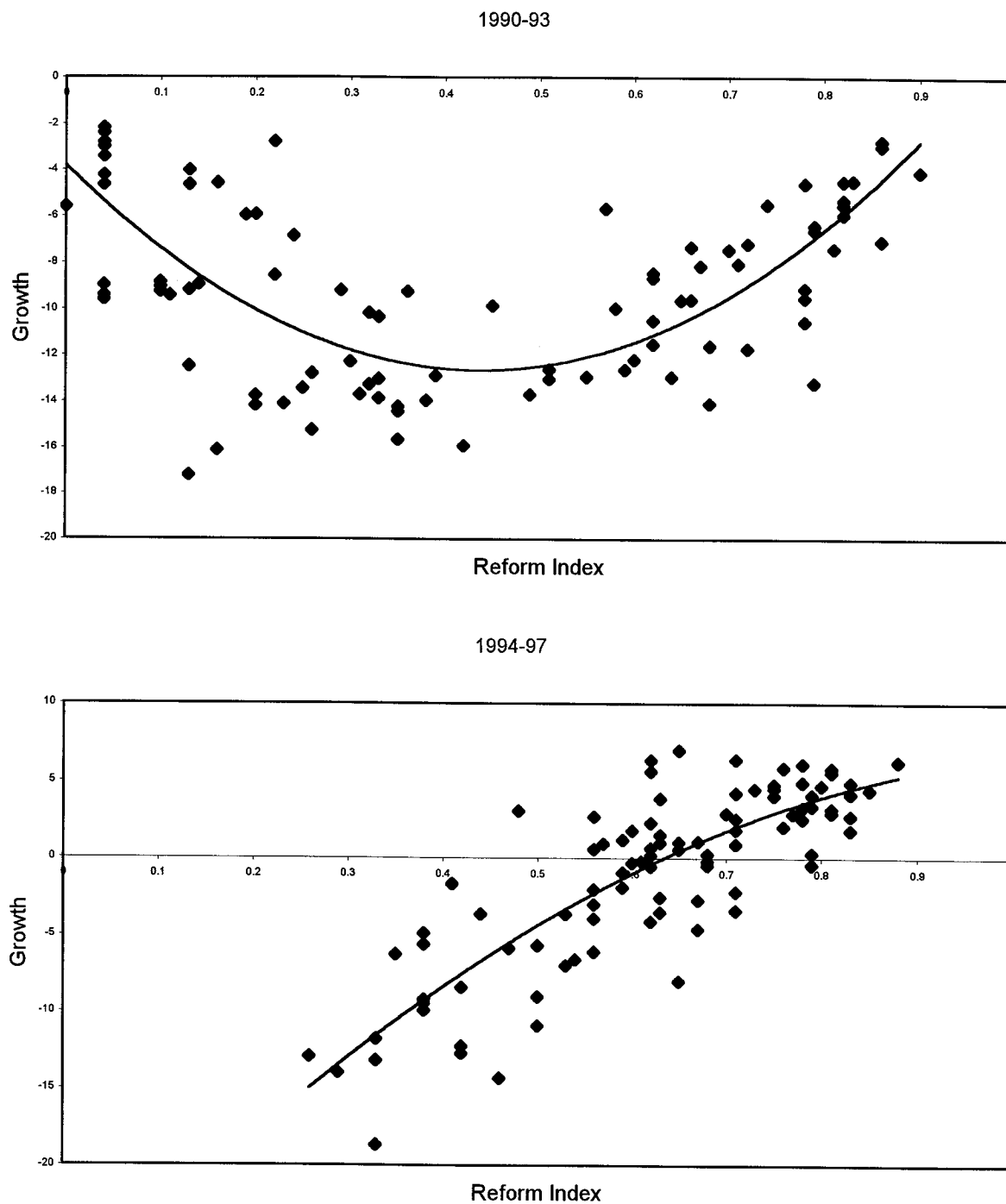
1990-93

1994-97

Sources: Authors' estimates and EBRD (1997).

1/ The fitted values are obtained from the multivariate panel data regression B1 from Table 4 (top panel) and C1 from Table 4 (bottom panel). A polynomial trend line has been added to the fitted regression values.

(equations B7, B10 and B11), although the level of industrialization is not statistically significant when inflation is included. The results using individual components are very similar to those using the clusters representing various initial conditions (equation B10 vs. B8). The specifications we used presuppose that initial conditions continue to have the same effect throughout the transition period, which might be too strong an assumption; it would seem reasonable to expect that the effect of adverse initial conditions would diminish over time. Berg et. al. (1998) test for this effect and do find a decline over time. When we included a linear transformation of the degree of industrialization (IDT = ID/t with t=1,...,8) that imposes a declining weight over time on the initial degree of industrialization, we found the statistical significance of this variable to be stronger than that of the level of industrialization itself (equation B12).

41.   To assess the relative importance of policies versus initial conditions, we first followed the methodology applied by de Melo et al. (1997) which uses the adjusted R^2 to determine the contribution of each group of variables to the total variation explained by the complete set of factors. We find that policies, macroeconomic, structural and the size of the government, account for about 95 percent of the total variation explained, while initial conditions account for only 5 percent. The latter is considerably lower than what de Melo et al. found, but their specification did not include a variable representing macroeconomic policies. From this we may conclude that policies are the most important factor explaining differences in growth performance between countries.

42.   As an alternative approach, we posed the same question as a trade-off between unfavorable initial conditions and more reforms. We calculated what it would require in terms of additional structural reforms to offset the effects of relatively more adverse initial conditions. Our findings imply that if countries do suffer from an unfavorable starting point, it requires relatively little effort from structural policies to compensate for this. Using for example either equation B10, B11 or B12, it can be calculated that the adverse impact of a 10 percent of GDP higher degree of industrialization can be offset by increasing the intensity of reforms by only 0.04 on a scale between 0 and 1. We also compared CIS countries to the countries in Central and Eastern Europe. Equation B5 suggests that the negative impact of the relatively more adverse initial situation in CIS countries could be offset by increasing the reform index by only 0.06. For the western CIS countries, which suffered more from a higher degree of overindustrialization, the additional reform effort would be to increase the index by 0.15. Alternatively, to compensate for the relatively worse initial conditions, the average size of the government in CIS countries would need to be reduced by about 6 percent of GDP. Of course, combinations of both policy responses could be chosen as well to achieve the same result. For a country such as for example Ukraine, the relatively more unfavorable initial conditions compared to other CIS countries could be overcome by stepping up structural reforms so as to increase the reform index from a level of 0.57 in 1997 to 0.65. The latter is comparable to the level of more advanced reformers in the CIS, such as Kazakhstan.

43.   The model specification describes economic performance in the former Soviet Union countries or CIS countries equally well as that in the countries of Central and Eastern Europe; when dummies for either one of these groups were added to equation B5, they were found to be insignificant (equation B7).[24] This confirms the earlier findings of Berg et al. (1998). Only when a variable capturing macroeconomic policies is omitted from the specification do we find dummy variables for the former Soviet Unions or CIS countries to be statistically significant (equation B9). This underlines the important role of macroeconomic policies in explaining differences in economic performance.

V. SUMMARY AND CONCLUSIONS

44.   The paper has analyzed growth performance of 25 transition countries in the period 1990–97, attempting to relate it statistically to the main factors which are thought to promote recovery and sustained growth: initial conditions, stabilization, and structural reforms. The econometric analysis, utilizing a larger data set then most earlier studies, demonstrates that compact "stylized facts" specifications turn out to have nearly as much explanatory power and statistical significance as more elaborate specifications. The results broadly confirm not only expectations based on theory, but also the results of several preceding studies; that is, macroeconomic stabilization and structural reforms are key to the economic recovery. Growth performance is clearly better where stabilization has been achieved earliest and where structural reforms have progressed the most. In the category of structural reforms, we find that there is no single simple reform that provides a magic solution for growth; rather, it is a combined package of reforms that is needed; it is "the thousand and one little daily improvements" of Harberger that bring results. A crucial component of this reform package which has not been explicitly tested in earlier statistical work, is the reduction of government size and expenditures; the paper demonstrates the positive and statistically significant effect of a reduction in the size of the government on economic performance.

45.   The impact of structural reforms on growth are different in the decline and recovery phases, with clear evidence of some "pain" at the beginning of reform. We find that in the early period 1990–93, when most of the twenty-five countries experienced output decline, reforms had a "U-curve" effect: limited reforms helped prevent a strong decline in output, intermediate reforms resulted in a stronger output decline, while very strong reforms did not preclude decline, but that decline was not as great as for intermediate reformers. Once the early decline was overcome, however, the effect of reforms on recovery and positive growth for the period 1994–97 was unequivocally favorable. Those with the greatest amount of reform were the best performers, those with least reform did most poorly.

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[24] A CIS dummy provided the same results.

46.   As far as the effects of unfavorable initial conditions on economic performance are concerned, the paper confirms earlier findings that a higher degree of the distortions that were characteristic for the Soviet period acted as a deterrent to growth and recovery. However, the magnitude of this effect was found to be very small in comparison to the other factors affecting growth and its retarding effect on growth is easily compensated by a modest acceleration of structural reforms.

47.   Indeed, given the clearly substantial achievements in stabilizing inflation in the majority of transition countries, the most important additional measures in promoting growth are a combination of reducing government size, and stepping up progress on structural reforms. As this is done, however, sustaining growth will also require continued effort to reduce inflation levels to low single digits. While the early success of bringing inflation down to low double digits may have been enough to permit the first shoots of economic growth to sprout, as the transition progresses, the threshold at which inflation hurts growth will fall to the levels found for market economies which is well below 10 percent.[25] Not only is inflation control not a magic elixir leading to growth, the effort to control inflation must be sustained permanently.

48.   The quest for good policies which promote growth must recognize that, as Fischer (1998) writes, "it is a long and arduous task, a matter of many people doing many things right, over many years, to make a country grow."

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[25]See Ghosh and Phillips (1998) for a recent econometric study on this and a review of other works; the range is from as low as 3 percent to not higher than 8 percent.

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