

# Will the Future Be Better Tomorrow? The Growth Prospects of Transition Economies Revisited<sup>1</sup>

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The favored approach in the literature on the growth prospects for transition economies is based on specifications from Barro (1991) and Levine and Renelt (1992). This paper examines this literature critically by identifying and testing for the underlying assumptions. Our main finding is that this approach performs poorly in the transition context. Our results indicate that, almost a decade after the transition began, the former centrally planned economies are still structurally different from market economies at similar levels of per capita income. The legacies of central planning are more resilient than previously thought. *J. Comp. Econ.*, December 2001, 29(4), pp. 663–676. University of Newcastle, Newcastle upon Tyne, and Centre for Economic Policy Research, London, United Kingdom; and The William Davidson Institute at the University of Michigan, Ann Arbor, Michigan. © 2001 Elsevier Science

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## 1. INTRODUCTION

In Central and Eastern Europe, the extensive growth strategy pursued under socialism worked well until the 1960s. However, the two following decades witnessed an uninterrupted decline in growth rates. The demise of central planning brought renewed hopes for prosperity and, in its immediate aftermath, the expectations of the populace were optimistic. These economies were neither full-fledged market economies nor poor developing countries. As economies in transition, the substitution of market for plan was expected to generate accelerated growth that would promote quick convergence to the average incomes of richer countries. At the outset, the questions were just how rapidly these economies could grow and how long would it take for them to catch-up with the richer countries of Europe.

The burgeoning literature addressing these questions focuses on growth prospects and involves estimating, or forecasting, long-run growth rates. The favored methodology is referred to as the Barro-Levine-Renelt (hereafter, BLR) approach and consists of two steps. First, coefficients from growth regressions are estimated or taken from specifications in Barro (1991) and/or Levine and Renelt (1992). Second, these coefficients are imposed on cross-sectional data from the transition economies to calculate future expected growth rates.

The first systematic analysis of the growth prospects for transition economies appeared in a chapter of the *World Economic Outlook* (IMF, 1996) entitled "Long-Term Growth Potential in the Countries in Transition." Coefficients from Barro (1991) and from Levine and Renelt (1992) are used to simulate the effects both of lowering the share of public expenditures to 15% of GDP and of raising investment rates to 30% of GDP. The report finds, not surprisingly, that both changes would increase growth substantially.

Denizer (1997) uses only the Levine-Renelt specification because it "includes variables that are shown to be robust in various specifications of the growth equation" (1997, p. 13). The author considers a broader sample of transition economies by adding Mongolia, China, and Vietnam. As a simulation exercise, Denizer evaluates the impact of raising all investment rates to 30% from their current levels on the number of years that these economies will need to reach current OECD income levels. He finds that this would result in a reduction in the number of years from 45 to 30.

A chapter of the European Bank for Reconstruction and Development's *Transition Report for 1997* compares the findings on the growth prospects for transition economies from the Levine-Renelt specification with those from an alternative specification that includes, inter alia, an index of institutional development (EBRD, 1997). The inclusion of this index yields a downward revision of the forecasted long-run growth rates. Even for those transition economies with relatively high-quality institutions, the absence of further institutional change is found to lower long-term growth rates by 1.5 percentage points.

Fischer et al. (1997) use the BLR approach with cross-sectional data for 1994 from 15 transition economies to forecast GDP and per capita GDP growth rates. They also conduct two simulation exercises. The first uses the Barro coefficients to investigate the consequences, in terms of the number of years needed to reach current OECD income levels, of lowering government consumption from current levels to 10% of GDP. The second simulation uses the Levine and Renelt specification to look at the impact on growth of raising the investment rates to 30% of GDP from current levels. The authors find that the result of these two exercises is a substantial reduction in the number of years needed to catch-up with the income levels of OECD economies.

In subsequent work, Fischer et al. (1998) use the BLR approach with a smaller sample of transition economies, only the Central European and Baltic countries, to assess their prospects for catching-up with the European Union countries. They carry out two simulation exercises to estimate the number of years needed for these transition economies to converge to the income levels of the three lower income EU countries, i.e., Greece, Portugal, and Spain, assuming that the latter will grow at 2% per annum. The first simulation uses the Barro specification to investigate the consequences of lowering government consumption from current levels to 10% of GDP. The second uses the Levine and Renelt specification to look at the impact on growth of raising the investment rates to 30% of GDP, from their current levels. An innovation of this paper is the quantification of the income losses during the socialist period. Using 1937 data for 6 countries, these authors estimate that approximately two-thirds of GDP per capita was lost under socialism.

Departing from EBRD (1997), Crafts and Kaiser (2000) combine the Barro and Levine and Renelt equations and include a term for institutional development. These authors also address measurement issues with respect to human capital, the informal economy, and the initial scope for catch-up. Controlling for institutional development leads to a severe downward revision of the forecasted long-run growth rates and reduces their range to a much more plausible set of values than previous studies, even though these rates are still high in historical perspective.

In summary, various studies examine the growth prospects for transition economies using the BLR approach.<sup>2</sup> They do so in uncritical fashion as this literature has yet to identify and test the assumptions underlying the BLR approach. Our objective is to discuss the limitations of this method for assessing the growth prospects of transition economies and contribute to the study of growth determinants in these economies.<sup>3</sup> Our main finding is that the BLR approach performs poorly in the

<sup>2</sup> Other studies are Barbone and Zalduendo (1997), Havlik (1996), Sachs and Warner (1996), Barta and Url (1996), and Fidrmuc (2000).

<sup>3</sup> For surveys of the literature on economic growth, see Barro and Sala-I-Martin (1995) and Aghion and Howitt (1998). For surveys of the methodology and empirical evidence, see Islam (1995), Lee et al. (1998), Temple (1999), and Durlauf and Quah (1999). For a survey of the literature on growth in transition, see Campos and Coricelli (2000).

transition economies. We test for the different reasons for such poor performance. Our results indicate that, almost a decade after the transition started, the former centrally planned economies are still structurally different from market economies at similar levels of per capita income. Further, they suggest that the legacies of central planning are more resilient than previously thought.

The paper is organized as follows. The next section presents the BLR approach and highlights its main shortcomings. Section 3 discusses the data set used to test for the BLR assumptions. Section 4 discusses our main results. Section 5 concludes.

## 2. BLR APPROACH

The BLR approach involves first estimating coefficients from growth regressions on large samples of market economies or, more often, simply using the ones found in Barro (1991) and in Levine and Renelt (1992). The Barro equation with its ordinary least squares estimates is given by

$$GDPGROWTH = 0.0302 - 0.0075 * Y0 + 0.025 * PRIM \\ + 0.0305 * SEC - 0.119 * GOV, \quad (1)$$

where *GDPGROWTH* is predicted per capita real GDP growth, *Y0* is the initial level of per capita income, *PRIM* is the gross primary school enrollment rate, *SEC* is the gross secondary school enrollment rate, and *GOV* is the share of government consumption in GDP. The Levine and Renelt equation with its ordinary least-squares estimates is given by

$$GDPGROWTH = -0.83 - 0.35 * Y0 - 0.38 * POP + 3.17 * SEC + 17.5 * INV \quad (2)$$

where, in addition to the variables already identified, *POP* is the rate of population growth and *INV* is the share of investment in GDP.

In the second step, the coefficients from these equations are imposed on the data for transition economies. First, data for a set of transition economies are collected on all the variables, often for either 1994 or 1995. Second, for each country, these values are multiplied by their respective coefficients and summed with the constant term. The result is the estimated long-run growth rate for transition economies.

The sign of the coefficients in Eqs. (1) and (2) provides support for the predictions from the augmented Solow model. Investment and human capital are expected to be positively related to growth, while initial income and population growth are expected to be negatively related to growth. The negative coefficient on government consumption follows from more recent endogenous growth interpretations that identify a negative impact of policy generated distortions on the long-run growth rate (Barro and Sala-I-Martin, 1995).

Using the BLR approach, the projected long-term growth rates tend to be high because transition economies have higher stocks of physical and human capital, ignoring obsolescence, and lower rates of population growth relative to market economies at similar levels of development.<sup>4</sup> By imposing these regression coefficients on the transition economies, the approach implicitly assumes that the transition countries are structurally identical to market economies at similar levels of development. The fact that this crucial assumption remains untested is a limitation of the approach. To test this assumption, one should estimate Eqs. (1) and (2) using data from the transition countries. If the resulting coefficients are similar to those found in the BLR equations, the approach is justified.

Before turning to our results, several smaller problems with the BLR approach should be noted. One is that the Barro specification used in this literature cannot be found in Barro's 1991 paper. There is one specification that contains the coefficients shown above (Eq. (1) in Table 1, pp. 410–11), but it also contains three other variables: the number of revolutions and coups per year, the number of political assassinations per capita per year, and the magnitude of the deviation of the 1960 PPP value for the investment deflator (U.S. = 1) from the sample mean (Barro, 1991). This is a problem because the coefficients in our equation (1) are more often taken from Barro's estimation than reestimated. Naturally, by excluding the three variables noted above, the value of the coefficients in a reestimated equation (1) would be different. A second problem is that although the Levine and Renelt specification can be found in the original paper, this specification does not include only variables that are robust in explaining growth as claimed by various authors. Indeed, the results in Levine and Renelt's Table 1 (1992, p. 947) indicate that population growth is not a robust determinant of growth.

### 3. DATA

A caveat about the quality and comparability of the data sets is needed at the outset (see Bartholdy, 1997). Socialist statistical offices had a comparative advantage in measuring quantities and were poorly equipped to deal with issues such as price changes and unemployment. Moreover, the systemic transformation led to radical changes in incentives from fulfilling plan targets to evading taxes, that is, from overreporting to underreporting output. The difficulties in measuring quantity and prices combined with the changes in incentives caused De Broeck and Koen (2000) to state that, in the transition, there is no single, true real GDP series. Furthermore, the initial years of the transition witnessed an explosion in size of

<sup>4</sup> To give examples of the magnitudes involved, according to the estimates provided by Denizer (1997), transition economies are expected to grow at an average rate of 5.2% in the long run with rates ranging from 1.8% for Bulgaria to 11.6% for Turkmenistan. Using Barro (1991), the average long-term growth rate projected by Fischer et al. (1998) is 5.77%, with rates ranging from 4.66% for Bulgaria to 8.29% to Albania. Using Levine and Renelt (1992), their estimates average 5.46% and range from 4.34% for the Czech Republic to 7.45% for Albania.

the hidden economy (Campos, 1999). All of these factors affect the data used in this paper and should be kept in mind when examining our results.

The data set contains all the variables in the two equations underlying the BLR approach, namely, initial per capita income, real annual GDP growth rates, population growth, gross domestic investment as a share of GDP, gross enrollment ratios in primary and secondary school, and government consumption as shares of GDP covering the period from 1989 to 1998. The appendix provides information on the data sources.

Identifying which countries are at similar levels of development is difficult because, although the transition economies started out clustered in the World Bank's upper-middle income group,<sup>5</sup> 10 years later after output had declined greatly in some countries they are found distributed widely across various lower income groups. Hence, the dispersion of GDP per capita increased substantially in the transition group after 1989. Despite starting out clustered, most of the former Soviet Union countries end this period as low income or lower-middle income countries, while the majority of the Central and Eastern European (and Baltic) countries are classified as upper-middle income economies in the late 1990s.<sup>6</sup>

Table 1 provides the 1989 level of per capita income and the growth rates in the 1990s for the countries in the sample. First, as can be seen from the last column, only two countries have surpassed the 1989 level of per capita GDP by 1998. Second, the countries of Eastern Europe experienced output declines that were much smaller than the ones occurring, at a later date, in the CIS economies. Finally, there seems to be a Baltic puzzle in that, although Estonia, Latvia, and Lithuania all had output contractions comparable to other CIS countries, their recovery has been much faster.

What explains these differences? At least part of the answer is given by the variables used in the BLR approach. The data series we use in this paper for investment, population growth and initial income have good coverage in terms of country and time periods, but the same is not true with respect to the human

<sup>5</sup> The World Bank ranks countries by their level of economic development using 1998 GNP per capita and exchange rates conversion. The groups are as follows: low-income, \$760 or less; lower-middle-income, \$761–\$3030; upper-middle-income, \$3031–\$9630; and high-income: \$9361 or more. (World Bank, *1999/2000 World Development Report*, p. 291).

<sup>6</sup> With respect to levels of development, income per capita is not sufficient to represent the years of effort to improve social conditions that characterized the socialist regimes. UNDP (1998) ranks 174 countries according to their Human Development Index, which reflects life expectancy and educational attainment in addition to per capita income. Of the 25 transition economies, Slovenia ranks 37th, preceded immediately by Argentina and followed by Uruguay. At the other extreme, Tajikistan ranks 118th, preceded immediately by Cape Verde and followed by Honduras. The median country is Macedonia in 80th place, preceded immediately by Lithuania and followed by Syria. In other words, dispersion also increased according to these measures making it harder to identify precisely which countries are at similar levels of development at different points in time.

TABLE 1  
Annual Growth Rates and Initial Level of Per Capita Income for 25 Transition Economies

	1989 PPP level	1990	1991	1992	1993	1994	1995	1996	1997	1998	Real GDP in 1998 (1989 = 100)
Albania	1400	-10.0	-27.7	-7.2	9.6	9.4	8.9	9.1	-7.0	8.0	86
Bulgaria	5000	-9.1	-11.7	-7.3	-1.5	1.8	2.1	-10.1	-7.0	3.5	66
Croatia	6171	-7.1	-21.1	-11.7	-8.0	5.9	6.8	6.0	6.5	2.3	78
Czech Republic	8600	-1.2	-11.5	-3.3	0.6	3.2	6.4	3.8	0.3	-2.3	95
Estonia	8900	-8.1	-13.6	-14.2	-9.0	-2.0	4.3	3.9	10.6	4.0	76
Macedonia	3394	-9.9	-7.0	-8.0	-9.1	-1.8	-1.2	0.8	1.5	2.9	72
Hungary	6810	-3.5	-11.9	-3.1	-0.6	2.9	1.5	1.3	4.6	5.1	95
Latvia	8590	2.9	-10.4	-34.9	-14.9	0.6	-0.8	3.3	8.6	3.6	59
Lithuania	6430	-5.0	-6.2	-21.3	-16.0	-9.5	3.5	4.9	7.4	5.2	65
Poland	5150	-11.6	-7.0	2.6	3.8	5.2	7.0	6.1	6.9	4.8	117
Romania	3470	-5.6	-12.9	-8.8	1.5	3.9	7.1	4.1	-6.9	-7.3	76
Slovakia	7600	-2.5	-14.6	-6.5	-3.7	4.9	6.9	6.6	6.5	4.4	100
Slovenia	9200	-4.7	-8.9	-5.5	2.8	5.3	4.1	3.5	4.6	3.9	104
<i>CEEB</i>		-6.6	-10.7	-3.6	0.4	3.9	5.5	4.0	3.6	2.4	95
Armenia	5530	-7.4	-17.1	-52.6	-14.8	5.4	6.9	5.8	3.1	7.2	41
Azerbaijan	4620	-11.7	-0.7	-22.6	-23.1	-19.7	-11.8	1.3	5.8	10.1	44
Belarus	7010	-3.0	-1.2	-9.6	-7.6	-12.6	-10.4	2.8	10.4	8.3	78
Georgia	5590	-12.4	-20.6	-44.8	-25.4	-11.4	2.4	10.5	110	2.9	33
Kazakhstan	5130	-0.4	-13.0	-2.9	-9.2	-12.6	-8.2	0.5	2.0	-2.5	61
Kyrgyzstan	3180	3.0	-5.0	-19.0	-16.0	-20.0	-5.4	7.1	9.9	1.8	60
Moldova	4670	-2.4	-17.5	-29.1	-1.2	-31.2	-3.0	-8.0	1.3	-8.6	32
Russia	7720	-4.0	-5.0	-14.5	-8.7	-12.7	-4.1	-3.5	0.8	-4.6	55
Tajikistan	3010	-1.6	-7.1	-29.0	-11.0	-18.9	-12.5	-4.4	1.7	5.3	42
Turkmenistan	4230	2.0	-4.7	-5.3	-10.0	-18.8	-8.2	-8.0	-26.1	4.2	44
Ukraine	5680	-3.4	-11.6	-13.7	-14.2	-23.0	-12.2	-10.0	-3.2	-1.7	37
Uzbekistan	2740	1.6	-0.5	-11.1	-2.3	-4.2	-0.9	1.6	2.4	3.3	90
<i>CIS</i>		-3.7	-6.0	-14.2	-9.3	-13.8	-5.2	-3.5	0.9	-3.5	53
<i>ALL</i>		-5.0	-8.1	-9.5	-5.0	-6.0	-0.5	-0.2	2.0	-1.2	65

Source: EBRD (2000).

capital and government consumption series. To address this issue, we collected data on government expenditures and three different data series on education. The education series from UNESCO and World Bank contain a large number of missing observations (see the Appendix). The UNICEF series is more complete but uses a slightly different definition of education status. According to the latter, basic education lasts from age 6 or 7 to age 14 or 15 and thus encompasses both primary and lower secondary education as defined by UNESCO and the World Bank. The match between the UNICEF series and both the UNESCO and the World Bank series is not perfect. In this paper, we report results using the UNICEF series on human capital and the series on government consumption. Although not reported

for the sake of space, we discuss the results from using all three education data series as well as from using the series on government expenditures.

#### 4. BACK TO THE FUTURE

In this section, we estimate Eqs. (1) and (2) using the data for transition economies described above to assess whether or not the resulting coefficients diverge from the ones found in the BLR approach. As discussed in Section 2, we expect the investment rates and school enrolment ratios to be positively related, while initial per capita income, government consumption and population growth should be negatively related to economic growth.<sup>7</sup>

The first two columns of Table 2 show these results for the Barro (1991) specification. First, there are few statistically significant coefficients. This is surprising because these variables have been identified as the long-run determinants of growth so that we would expect them to be significant. Second, the sign of the initial income per capita coefficient is positive, although the expected sign for this coefficient is negative from Barro's equation. Third, basic education does have the expected positive sign and is statistically significant throughout.<sup>8</sup> Fourth, although not statistically significant, secondary education and government consumption have opposite signs from those found in the BLR approach.<sup>9</sup> Fifth, including a CIS dummy variable, which assumes the value of 1 for CIS countries and zero otherwise, yields the expected negative sign, i.e., CIS countries experienced output declines that were larger than the ones in the Central European economies, while the signs and levels of statistical significance remain the same for all the other variables. Finally, we report the  $p$ -values for the Ramsey regression specification error test (RESET). They indicate that these specifications do not seem to suffer from omitted variables problem.

Table 2 also presents cross-sectional coefficients for the Levine and Renelt specification. Once again, the lack of statistically significant coefficients is evident. The signs for initial income per capita, secondary education, and population growth are opposite to what we should expect. The addition of a CIS dummy does make the coefficient on investment statistically significant at the 10% level, which is a rare result in the literature on growth in transition. The CIS dummy variable carries a negative sign as expected. In summary, when the BLR equations are reestimated using data for transition economies, the coefficients seldom show the expected signs and, when they do, they are seldom statistically significant. Most results are

<sup>7</sup> Arguably, the most controversial of these results is the negative effect of government consumption. The current consensus is that different types of government expenditures have different effects on economic growth. See Devarajan et al. (1996) and the references therein.

<sup>8</sup> If UNESCO or World Bank primary education figures are used, the coefficient becomes statistically insignificant. These results are available upon request from the author.

<sup>9</sup> If government expenditures figures are used, the relevant coefficient becomes statistically significant and remains positive.



TABLE 2  
 Cross-Sectional Coefficients for Transition and Nontransition Economies, Averages  
 for 1990 to 1998<sup>a</sup>

	Barro specification			Levine and Renelt specification		
	Transition	Transition	Nontransition	Transition	Transition	Nontransition
Constant	-60.89*** (12.01)	-47.09*** (11.85)	-0.185 (1.128)	-8.49* (4.29)	-7.02** (3.15)	1.32 (1.03)
Initial income per capita	0.0002 (0.0005)	0.0001 (0.0005)	-0.0005 (0.0009)	0.008 (0.0005)	0.0005 (0.0003)	-0.0016 (0.007)
Basic education	0.589*** (0.12)	0.448*** (0.11)	0.009 (0.013)			
Secondary education	-0.055 (0.065)	-0.018 (0.064)	0.0277* (0.0147)	-0.075 (0.072)	-0.007 (0.074)	0.003 (0.012)
Government consumption	0.177 (0.147)	0.172 (0.148)	-0.0403 (0.035)			
Population growth				0.041 (1.23)	1.57 (1.16)	-1.09*** (0.264)
Investment				0.161 (0.136)	0.163* (0.092)	0.102*** (0.023)
CIS dummy		-2.854* (1.489)			-5.54*** (1.64)	
RESET	0.6618	0.9146	0.724	0.7139	0.9215	0.189
Adj. R2	0.4609	0.5446	0.087	0.0430	0.4405	0.309
N	25	25	115	24	24	115

*Note.* \*\*\* denotes statistically significant at the 1% level, \*\* denotes statistically significant at the 5% level, \* denotes statistically significant at the 10% level. Standard errors, corrected for heteroskedasticity, are in parentheses. For Ramsey's RESET, *p*-values are reported.

<sup>a</sup> Dependent variable is average annual GDP growth rate.

in stark contrast with the original BLR results.<sup>10</sup> Thus, we conclude that the BLR approach performs poorly in the transition context.

One possible reason may be that the BLR coefficients change when they are estimated using data for the 1990s.<sup>11</sup> Barro (1991) and Levine and Renelt (1992) use data from Summers and Heston (1991), which has not been updated for the 1990s.

<sup>10</sup> Notice that these results do not improve if we use pooled cross-section time series data. Using pooled data, we tried estimating Eqs. (1) and (2) for the recession and recovery phases and separately for the periods before and after the year 1994. Last, we estimated these equations rebasing our data in four different ways, namely, using transition time from Berg et al. (1999), using years of transition from Blanchard (1997), using postreform time from Aslund et al. (1996), and using stabilization time from Fischer et al. (1998). None of these led to estimated coefficients resembling those in the BLR approach. These results are available from the author upon request.

<sup>11</sup> I am thankful to an anonymous referee for this suggestion.

Therefore, to reestimate Eqs. (1) and (2) for the period from 1990 to 1998, we use the Global Development Network database (GDN, 2000). The country coverage in the GDN database is similar to that in the database from Summers and Heston (1991); the main difference is that the GDN database includes a larger number of variables.<sup>12</sup> Table 2 contains the reestimated equations using data covering the 1990s for a large sample of nontransition economies. Although only a few of the coefficients are statistically significant, all coefficients have the same signs as in Eqs. (1) and (2), with the exception of the constant term. Thus, the different data period does not seem to be the most likely explanation for the poor performance of the BLR equations in the case of the transition economies.

There are at least two possible reasons for the poor performance of the BLR approach. First, the transition economies remain structurally different from market economies at comparable levels of per capita income. In other words, the legacies from central planning still dominate the relationship between growth and investment rates, population growth, and education levels. If this assessment is correct, the only role that the BLR estimates play is to provide a long-run benchmark that will be relevant once the transition economies have converged with market economies at similar levels of development. However, the BLR estimates cannot be used to derive growth projections for transition economies during the convergence phase. If convergence proves to be a long-lasting process, e.g., because of institutional reforms, the BLR approach will not be applicable for transition economies in the near future. A second possible reason is that the poor BLR results may be simply a consequence of econometric problems, including data quality issues. Given the relatively small size of the sample, substantial heterogeneity among the transition economies, and poor data quality, the BLR regressions that include only the transition economies are unlikely to give statistically significant and robust results.

One way to investigate whether structural differences or econometric issues are the main culprit is to reestimate the BLR equations for the 1990 to 1998 period for a sample that includes both transition and market economies, using interactive dummy variables for the transition countries with each coefficient. The null hypothesis is that the coefficients of these interaction terms are jointly equal to zero. In other words, we test whether or not the coefficients of the original variables are the same for transition and nontransition economies. The first column of Table 3 shows these results for the Barro specification and the second column shows the results for the Levine and Renelt specification. For these two specifications, our test leads to a similar conclusion. Our results suggest that econometric and data problems are much less severe than the structural differences remaining after almost a decade of transition. In other words, almost 10 years after the transition started, there are still substantial structural differences between the transition and

<sup>12</sup> It contains all the variables in Eqs. (1) and (2), except government consumption. The source of the government consumption series is the World Development Indicators database.

TABLE 3  
 Cross-Sectional Coefficients for Transition and Nontransition Economies, Averages  
 for 1990 to 1998<sup>a</sup>

	Barro specification	Levine and Renelt specification
Constant	-0.773 (1.229)	1.008 (1.149)
Initial income per capita	0.0003 (0.0004)	0.0002 (0.407)
Basic education	0.0229 (0.014)	-0.0027 (0.0117)
Secondary education	0.0132 (0.0123)	
Government consumption	-0.056 (0.0414)	
Population growth		-1.019*** (0.306)
Investment		0.112*** (0.026)
Initial income per capita interacted with transition dummy	0.0041 (0.003)	0.00523 (0.0042)
Basic education interacted with transition dummy	-0.039 (0.038)	
Secondary education interacted with transition dummy	-0.091* (0.052)	-0.1318*** (0.036)
Government consumption interacted with transition dummy	0.231 (0.144)	
Population growth interacted with transition dummy		1.53 (1.015)
Investment interacted with transition dummy		0.0789 (0.135)
RESET	0.661	0.349
Adj. R2	0.348	0.451
N	140	139
F test for all interacted coefficients equal to zero	12.71***	19.51***

*Note.* \*\*\* denotes statistically significant at the 1% level, \*\* denotes statistically significant at the 5% level, \* denotes statistically significant at the 10% level. Standard errors, corrected for heteroskedasticity, are in parentheses. For Ramsey's RESET, *p*-values are reported.

<sup>a</sup> Dependent variable is average annual GDP growth rate.

nontransition countries. This contradicts the key underlying assumption of the BLR approach and helps explain its poor performance in the transition context.

## 5. CONCLUSIONS

In this paper, we show that the BLR approach used in the literature to forecast growth is inappropriate for analyzing short- to medium-term output fluctuations

in transition economies. The reestimated BLR coefficients are mainly insignificant using transition data. Among themselves, the transition economies differ significantly, as other authors have pointed out and our CIS dummy confirms. Econometric and data problems seem much less severe than the structural differences remaining after almost a decade of transition. Consequently, it may be a long time before BLR-type coefficients that are intended to identify the determinants of long-term growth can be estimated for the transition countries as a group.

This paper adds to a growing literature that discusses the specific nature of the transition economies, e.g., Gros and Suhrcke (2000) and Ofer (2000). Our results indicate that initial conditions differentiate transition economies from other groups of developing and developed countries, but also that the legacies of central planning are resilient. Roland (2000) and Boeri (2000) call attention to the temporary nature of the transition. Analyzing the prospects for growth informs the determination of the extent of this temporariness. The strength of our finding about the lingering legacies from central planning suggests that, although transition is a temporary phenomenon, it may last longer than initially thought.

This paper establishes that transition economies differ as a group from a not well-defined rest of the world. However, it is not clear how these economies differ from better defined groups. Gros and Suhrcke (2000) provide some interesting tests and further comparisons of transition economies to other regional and income groups of countries can throw light on the issue of the specificity of these economies. The role of institutions in the transition process is not yet well understood and this is particularly true from an empirical perspective. Work that incorporates institutional features in evaluating growth prospects may be the best way to proceed.

## APPENDIX

### Basic Statistics and Sources

Variables	Period	Mean	Standard deviation	Min	Max	No. missing	Source(s)
GNP per capita PPP, US\$	1989	5593	2111.8	1400	9200	0	De Melo et al. (1997)
GDP per capita, current dollars	1990–1998	2135	1784.5	220	9851	5	WDI (2000), UNECE (1995)
GDP growth, annual, %	1990–1998	-4.3	10.2	-52.6	12.7	0	EBRD (various years)
Gross primary school enrollment (1), %	1990–1995	94.8	9.1	76.0	118.0	94	UNESCO (1997)
Gross primary school enrollment (2), %	1990–1996	96.0	8.7	75.9	121.8	76	WDI (2000)
Basic education gross enrollment, (3) %	1990–1998	91.6	5.1	78.8	99.8	11	UNICEF (1999)
Gross secondary school enrollment, (1) %	1990–1995	80.8	12.9	35.0	102.0	84	UNESCO (1997)

## APPENDIX—Continued

Variables	Period	Mean	Standard deviation	Min	Max	No. missing	Source(s)
Gross secondary school enrollment, (2) %	1990–1997	85.1	11.8	37.5	103.8	76	WDI (2000)
General secondary gross enrollment, (3) %	1990–1998	26.5	7.6	8.8	45.6	15	UNICEF (1999)
Gross domestic fixed investment, % GDP	1990–1998	20.7	7.0	1.6	44.3	25	WDI (2000), WDR (various years)
Population annual growth rates, %	1990–1998	0.2	1.2	−4.9	6.9	0	WDI (2000)
Government consumption, % GDP	1990–1998	17.6	5.0	5.9	29.4	16	WDI (2000), WDR (various years)
Government expenditure, % GDP	1990–1998	39.3	11.6	10.4	82.9	26	UNICEF (1999)

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