IMF Working Paper

Real Convergence to EU Income Levels: Central Europe from 1990 to the Long Term

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Abstract

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The paper discusses factors likely to shape the nature and pace of economic growth of five Central European transition countries now engaged in accession to the European Union. It is organized around the standard growth accounting framework. The paper reviews the growth of these countries since 1990 and draws lessons from the growth experiences of other regions since the 1950s, shedding light on long-term growth prospects for these countries. It discusses a set of growth calculations and highlights the key uncertainties in them.

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I. INTRODUCTION

1.   The prospects for the real sector in the EU-accessant transition countries will be critical in determining the appropriate policy frameworks for those countries both before and after accession. This paper discusses the key factors likely to shape the nature and pace of growth in five of these countries in Central and Eastern Europe that form the focus of this paper: Poland, the Czech Republic, the Slovak Republic, Hungary, and Slovenia (CEEC-5).

2.   The discussion is based on the standard growth accounting framework that decomposes growth into the growth of factor inputs and a residual—total factor productivity (TFP).[2] The paper begins by reviewing the growth performance of the CEEC-5 over the past decade, noting that the available evidence points to a significant diversity—with the most rapidly growing countries exhibiting growth that is intensive in TFP rather than in factor inputs, while the less successful countries exhibit the reverse tendencies over this period. It also discusses evidence of differential productivity growth in the tradable vis-à-vis the non-tradable sectors and its impact on consumer prices, finding that growth has been broad-based, occurring in both tradable and non-tradable sectors, in this group of countries.

3.   The prospects for growth in the CEEC-5 are then discussed in relation to the patterns of growth in Europe from the 1950s onwards and of East Asia from the early 1960s. This review, alongside more formal studies of the determinants of economic growth in the long run from a wide sample of countries, suggests that TFP rather than growth of factor inputs is expected to continue to be the driving force behind output growth in the CEEC-5.

4.   Finally, a set of growth calculations for the accessants is outlined, drawing on the evidence that TFP growth will be the major contributor to growth. These calculations highlight significant uncertainties about the investment that will be required to sustain projected growth, the flow of private domestic savings that will be forthcoming to finance it, and the nature of the business environment that will be most conducive to promoting TFP-intensive growth in these countries. These uncertainties will form central inputs into the design of appropriate fiscal and structural policies.

II. SOURCES OF GROWTH DURING TRANSITION: CEEC-5

5.   Perhaps the most fundamental economic criticism leveled at the planning mechanisms in place prior to 1990 in these countries was that they inhibited TFP growth. During that era, these economies grew—sometimes at impressive rates—on the back of heavy investment in fixed capital and in shifts of production from agriculture into industry. These sources of growth

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[2] The growth accounting framework utilizes the following identity:

$dY/Y = \alpha dK/K + \beta dL/L + dA/A$, where the production function takes the form of $Y = AK^{\alpha}L^{\beta}$, and α and β are the elasticity of output with respect to growth of capital and labor. In practice, α and β are approximated by the profit and labor shares in national income, and dA/A (total factor productivity growth) is calculated as a residual.

eventually ran their course, and from the 1960s onwards, growth slowed inexorably under the weight of external shocks and lackluster if not negative TFP growth. By the eve of transition, inefficiencies and shortages were pervasive, labor and capital were fundamentally misallocated, and the range and quality of goods and services produced left much to be desired.

6.   Against this background, it is little surprise that in the early phase of transition, when these inefficiencies were exposed by the liberalization of prices and international trade, output fell sharply. This was accompanied by decreases in employment and the capital stock, and by declines in productivity in the wake of labor hoarding. Between 1989 and 1991, 10 percent of jobs were lost in the CEEC-5 countries on average (losses ranged from 5½ percent in the Czech Republic to 17 percent in the Slovak Republic). A sizeable part of the capital stock became obsolete overnight.

7.   After bottoming out in 1991–93, output recovered (Figure 1). GDP troughed in 1991 in Poland, in 1992 in the Czech Republic and Slovenia, and in 1993 in Hungary and the Slovak Republic. The strength of the recovery since then has generally been modest, though with significant variation between countries. The cumulative increase in GDP between 1991 and 1999 was only 9 percent in the Czech Republic and ranged from 17 to 26 percent in Hungary, the Slovak Republic and Slovenia. Poland has been the outlier, with a cumulative increase of 48 percent.[3]

8.   Job losses generally continued long after the immediate post-transition recessions. Though many new (especially service sector) firms were opening up, it took time before these were sufficient to absorb the steady ongoing flow of labor released from older contracting enterprises. After the initial collapse of output in 1991, with overall growth still modest, continued restructuring led to significant further reductions in employment in Hungary and, to a lesser extent, in the Czech Republic and Slovenia (18, 7, and 10 percent, respectively, between 1991 and 1999). In Poland employment decreased by only 2.4 percent in this period, whereas in the Slovak Republic employment actually increased (by almost 10 percent) as fiscal and privatization policies were adjusted so as to slow the pace of restructuring.[4]

9.   As a result of these output and employment trends, Poland, Hungary, and Slovenia have experienced strong labor productivity growth: 52, 40, and 40 percent, respectively. In the Czech

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[3] Between 1989 and 1999, the cumulative increase in GDP ranged from—6 percent in the Czech Republic to 28 percent in Poland (and in Hungary, the Slovak Republic, and Slovenia it was—0.8, 2, and 5.8 percent, respectively).

[4] The fall in employment during transition led to a significant decrease in the participation rate, the ratio of employment to total population. This fall was particularly steep in Hungary: around 15 percent, compared to some 5–8 percent in the other countries. The particularly large fall in employment in Hungary has not led to a relatively large increase in measured unemployment as many laid-off people withdrew from the labor force altogether.

and Slovak Republics, the increase in labor productivity was significantly lower during this period: 17 and 11 percent, respectively.

10.   As output growth resumed, however, the ratio of investment to GDP rose, although differences in the level of those ratios between countries have persisted. The share of investment to GDP bottomed in 1991–93 in all countries, at roughly the same time as output, but after 1991, the investment to GDP ratios increased gradually (Figure 2). However, during the 1990s, the share of investment to GDP has been substantially lower in Hungary, Slovenia, and Poland than in the Czech and, in particular, the Slovak Republic.

11.   The remarkable increases in labor productivity achieved in the more successful economies—notably Poland and Hungary—appear to reflect TFP growth, rather than increases in the capital stock. Even before examining the statistical evidence for this, the strength of this proposition at an intuitive level is apparent. For capital accumulation to have accounted for a large part of growth during transition, a very large part of the pre-transition capital stock must have been made redundant upon transition or/and the depreciation rates on capital were low: either or both of these would imply that the fixed investment during transition caused rapid growth of the capital stock during transition.

12.   The estimates of TFP reported here are the result of an exercise to estimate the path of the capital stock in the CEEC-5 during the past decade and a half. The key elements of the exercise are described in Box 1. They suggest that in most cases, the ratio of the capital stock to GDP in 1999 still appears to be below that of 1989. According to these estimates, only in the Czech Republic was the capital stock to GDP ratio significantly higher in 1999 than in 1989. In Hungary, Poland, and Slovenia, the relatively modest investment rates in the 1990s were not enough to offset the assumed 1991 decline in the capital stock. In the Slovak Republic, where the capital stock was relatively high just before transition (due to historically high investment in its heavy engineering, armaments, and other capital-intensive industries), the high investment to GDP ratios during the 1990s were just enough to restore the capital stock to GDP ratio to its 1990 level.

13.   The estimates of the capital stock suggest that the contribution of growth in the capital stock to GDP growth between 1991 and 1999 ranged from 9 percentage points in Hungary to 24 percentage points in Poland.

14.   The resultant measures of the sources of growth in the 1990s emphasize the key role of TFP in the more successful of these countries (Table 1). These estimates are based on the estimation of a Cobb-Douglas production function for the period 1985–99, with assumed

Box 1. Estimating the Capital Stock in CEEC-5

The starting points for this exercise are official estimates of the capital stock for Hungary in 1985, and for Poland and the Czech Republic in 1998.

For the Slovak Republic and Slovenia, the assumption was made that their capital/GDP ratios in 1985 were the same as for Hungary. For Poland and the Czech Republic, in light of the observation in Borensztein and Montiel (1991) that Poland has traditionally had relatively low investment to GDP ratios while Czechoslovakia has had high ratios, it was assumed that in 1985 the capital output ratio in Poland was 10 percent lower than in Hungary while that in the Czech Republic was 20 percent higher than in Hungary. These procedures gave estimated capital stocks in 1985.

To derive the subsequent capital stock series in each country, the officially reported fixed investment data from the national accounts were added to the base period capital stocks, and an allowance made for depreciation. The assumed rate of depreciation was 8 percent in all cases except Poland. There, the rate is assumed to be 5.5 percent, as a relatively large share of the capital stock is buildings instead of machinery, and has therefore a longer economic life. This assumption, alongside those yielding Poland's estimated capital stock in 1985, has the merit of yielding the officially estimated capital stock in 1998.

The initiation of transition clearly rendered a sizeable portion of each country's capital stock obsolete. There is no clear means of estimating the size of this effect, so for purposes of this exercise, it is assumed that transition rendered 35 percent of the capital stock obsolete in 1991. This follows the assumption made in earlier work on Hungary (IMF 1999). The exception to this for purposes of this exercise is the Czech Republic, where the loss is assumed to have been only 20 percent. This assumption is made because alongside the assumptions about the 1985 capital stock, depreciation, and fixed investment in the Czech Republic, it yields a capital stock in 1998 that is consistent with the official estimate for that year.

The resulting estimates of the capital stock are shown in Figure 1. Clearly, they rest on many assumptions and should therefore be regarded as indicative. But they serve to allow some estimates of TFP growth to be derived. As noted in the main text, these estimates are robust to sizeable changes in the assumptions yielding the capital stock series.

weights of capital and labor of 35 and 65 percent.[5] In Hungary, Poland, and Slovenia, TFP is estimated to have contributed 20–21 percentage points to output growth in the 1990s. However, in the Czech and Slovak Republic, the contribution is estimated to have been negligible (4½ and 2 percentage points, respectively). Hence, in the latter cases the increase in output appears to have been particularly factor-intensive, in contrast to the former cases where improvements in productivity and efficiency have played the dominant role. Given evidence of labor hoarding during the initial transition-related recessions in all these countries, the marked differences in estimated TFP growth would appear to reflect fundamental structural differences between them rather than different cyclical influences on labor hoarding in the recessions of the early 1990s.

15.   Though there is considerable doubt as to the precise size of the capital stock in these countries during transition due to conceptual and practical measurement difficulties, the initial stock of capital and its depreciation rates would have to be implausibly low for the output growth during the 1990s in the more successful countries to substantially reflect capital accumulation from new fixed investment during that period (See Box 2).

16.   Productivity growth is an inevitable part of the transition process, but the nature of this growth as between tradables and non-tradables has important implications for the real exchange rate, via the so-called Balassa-Samuelson effect (see Box 3). Some studies find significant productivity-related real exchange rate appreciations, while others find more modest effects. The estimates on the lower side may reflect rapid productivity growth in the services sector, after suppression of this sector under central planning. Clearly, these estimates of the size of the effect of divergent productivity trends on prices and real exchange rates are subject to uncertainty, but there is consensus about its existence.

III. DIVERGENT SOURCES OF GROWTH IN CEEC-5 DURING TRANSITION

17.   The main question prompted by the evidence that growth has come from different sources in the CEEC-5 is whether these divergent patterns will continue. This section explores this question by discussing whether the divergent patterns can be related to the policy approaches adopted by the different countries. Since this concerns the sources of growth rather than its rate, the focus is on microeconomic factors (though macroeconomic factors may have some role to play in the short-run in determining the sources of growth.) The discussion draws heavily on the EBRD 1999 Transition Report, noting the nature of the transition in economic structures and institutions and their effects on the enterprise performance and productivity growth so far.

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[5] Ideally, these weights would be determined according to the share of capital and labor respectively in GDP. But data on these shares in the CEEC5 is weak. For example, where the share of self-employed in employment is high, as in Poland, the official estimate of profit share in national income is exaggerated. The assumption of 35 and 65 percent simply follows evidence from other countries. As noted in Box 2, however, the overall results are not sensitive to even quite large adjustments in these assumptions.

Box 2. Total Factor Productivity Sensitivity Analysis

Sensitivity analysis suggests that the results concerning the difference in estimated TFP growth between on the one hand Hungary, Poland, and Slovenia and on the other hand the Czech and Slovak Republics are robust to changes in assumptions.

The impact of starting assumptions on for the capital stock fade out over time because of depreciation. Thus, differences in capital output ratios at the end of the 1990s are explained predominantly by differences in investment to GDP ratios during the 1990s, rather than by the starting capital output ratios. In a similar vein, the impact of the specification of the production function on the differences in TFP performance is dominated by the differences in factor intensity as measured by investment to GDP ratios and increases in labor productivity between 1991 and 1999.

For example, assuming a 20 percent higher capital stock in 1991 in the Czech Republic (increasing the capital output ratio from 2.8 to 3.3, and compared to an average ratio of 1.9 in Hungary, Poland, and Slovenia) would increase the estimated contribution of TFP growth to cumulative output growth between 1991–99 by around 5 percentage points to 9.5 percentage points. This would still be far lower than the contribution of TFP growth to cumulative output growth in Hungary, Poland, and Slovenia (20–21 percentage points). To yield a contribution of TFP to Czech growth between 1991–99 similar to that in Hungary, Poland, and Slovenia would require either an increase in the depreciation rate to 12.1 percent from 8 percent in the base scenario, or an increase in the weight of labor in the production function to 0.8, from 0.65.

Other technical assumptions—notably the differential starting value for the capital output ratio in 1985 in the Czech Republic and Poland, a smaller drop in the capital stock in 1991 in the Czech Republic, and a smaller depreciation rate in Poland—all tend to weaken the estimated difference in TFP growth between on the one hand Hungary, Poland, and Slovenia and on the other hand the Czech and Slovak Republics. The fact, therefore, that this cross country pattern survives the assumptions indicates its robustness.

At a more conceptual level, the TFP results reported also implicitly assume that the quality of labor and of capital is unchanged over this time period. This is a strong assumption, perhaps especially for capital, because the replacement of the pre-existing capital stock is one of the fundamental goals of transition. But like the other assumptions, it likely causes the findings on cross country TFP growth patterns to understate the difference between the high and lower growth countries. This is because the lower growth countries in the CEEC5 also exhibited relatively high rates of fixed investment during transition. And if this investment augmented the capital stock, then the role of TFP in the high investment and relatively low growth countries is overstated compared with the faster growing but relatively lower investment countries.

Box 3. Balassa Samuelson Effects in Eastern Europe

If productivity growth is faster in the tradable than in the non-tradable sectors, that is reflected in a rise in the relative price of non-tradables—this is the Balassa Samuelson effect. With only a few studies of it for Eastern Europe, its size is uncertain, but it appears to lie in the range of 1-3 percent per year. One study of this effect on quarterly data for a panel of Eastern European countries between 1996–99 suggests that the effect is small, i.e., that productivity growth is not greatly differentiated between the tradable and non-tradable sectors over this period, and that this differential explains perhaps 1 percentage point of observed inflation (Cipriani (2000)). The estimates of De Broeck and Sløk (2001) for a similar group of countries suggest that further income catch up will be associated with further real exchange rate appreciation probably not exceeding 1.5 percent per year. In the case of Slovenia, Rother (2000), using data for 1993–98, found that the Balassa-Samuelson effect accounted for about 2½ percentage points of CPI inflation (compared to around 0.8 percentage points in the core EU). Jakab and Kovács (1999), using Hungarian data for 1993–98, found strong support for the Balassa-Samuelson effect. These estimates are all affected by short data sets. Moreover, cyclical effects are not eliminated, and proxies for tradable and non-tradable prices may be inappropriate. Summarizing the existing estimates, Begg and others (forthcoming) conclude that Balassa-Samuelson related real exchange rate appreciation could reach 1.5 to 2.5 percent per year under plausible assumptions.

A. Privatization

18.   Hungary and Poland pursued a privatization strategy that relied primarily on direct sales to foreign strategic investors, while the Czech Republic and most other transition economies adopted a privatization strategy that primarily relies on management-employee buy-outs and voucher privatization (Table 2).

19.   Among these different methods of privatization, firms controlled by a foreign strategic investor performed consistently better in deep restructuring (development of new products, markets and new management techniques and business strategies for renewed growth and job creation) and deep restructuring is associated with improved performance measured by sales growth and labor productivity growth. According to EBRD, the explanation lies in the concentrated outside ownership structure, which strengthens corporate governance and introduce new skills/technology/investment. Management-employee buy-outs and voucher privatization leads to dispersed ownership structure, which tends to impede deep restructuring as the mechanisms of corporate governance do not function well yet. (Figure 3).

B. Hardening Budget Constraints

20.   Progress has been varied among these economies in this regard. State intervention in privatized firms tends to slow down restructuring (Figure 4). Enterprises facing a softer budget constraint, measured by arrears to the state, were more involved in reactive restructuring, and lagged behind in deep restructuring (Figure 5). Most enterprises in Hungary, followed by

Poland and Slovenia faced hard budget constraints, while about 40 percent of enterprises in the Czech Republic and Slovak Republic reported tax arrears to the state. The investment climate perceived by the enterprises is less favorable in the Czech Republic and Slovak Republic, compared with Hungary and Slovenia (Figures 6 and 7).

C. Banking Restructuring

21.   Hungary has one of the most competitive banking systems among the CEEC5, as the controlling shares of the state owned banks were sold to strategic foreign investors early on, and the privatization of the banking sector has been largely completed. Poland, in the past two years also followed similar strategy and banks controlled by foreign capital effectively have a market share of about 70 percent by mid-2000. In contrast, the Slovak Republic and the Czech Republic still suffered from weak banking sectors, as early voucher privatization left controlling stake of the large banks with the state, which led to continued soft lending practices and repeated bailouts.

D. Investment Climate

22.   The positive effect of investment climate on enterprise performance is found to be mainly through the successful entry and expansion of new enterprises into the market. While new private enterprises have been the major sources of growth and employment creation, the EBRD found that the successful entry need to be facilitated by the exit of productivity decreasing enterprises to release the resources as well as supported by a good investment climate.

23.   In this regard, Poland and Hungary performed best both in terms of desirable expansions and desirable contractions. Slovak Republic and Slovenia lagged behind, not only in terms of less rigorous desirable expansions, but also in terms of the lack of desirable contractions (Figure 8). Well designed bankruptcy laws, and financial discipline lead to desirable contraction, and corruption and anti-competitive practices are the major barriers for new entrant enterprises. In particular, access to business services, licenses, and access to finance are the greatest barriers to the new entrants.

E. Shareholder and Creditor Rights

24.   The protection of shareholder and creditor rights is an important complement to privatization in creating the incentives for enterprise restructuring and improving corporate governance, and for the supply of finance. International comparative studies (see La Porta, Lopez de Silanes, Shleifer and Vishny, 1997, and Levine, 1997) showed that countries offering good protection of a shareholder and creditor rights tend to have more developed capital market and banking system, less concentrated ownership structures, and enjoy higher growth rates in the long run.

25.   The EBRD assesses that legislation in central Europe and the Baltic states offers excellent protection for creditor rights, and good though less well developed protection for

shareholder rights (Figures 9 and 10). However, application and enforcement of existing laws have been weak in general. The EBRD's Legal Indicator Survey, which assesses the extensiveness and effectiveness of a number of commercial and financial laws and regulations (Table 3), finds that the Czech Republic, Poland and Slovak Republic need to improve the effectiveness of their commercial laws, while Czech Republic, and to a less extent, the Slovak Republic and Slovenia need to strengthen the effectiveness of their financial regulations.

26.   This review is suggestive of a correlation between the nature and depth of structural reform and the composition and pace of subsequent output growth, though initial conditions may also have some role to play. It is consistent with more formal studies of the transition which find statistical evidence of a positive long run correlation between structural reform and economic growth (Fischer and others 1996, Christoffersen and Doyle, 1998). Where structural reform has made less progress, investment ratios have been higher but appear to have been less productive and associated with weaker output growth. This suggests that there is significant scope for the less successful of the CEEC-5 countries to raise the contribution of TFP to growth by strengthening structural policy in these areas.

IV. INTERNATIONAL EVIDENCE ON THE DETERMINANTS OF LONG-RUN GROWTH

27.   Despite substantial advances made in growth and productivity gains in the past five years, the income and productivity levels in these economies are well below those of their EU neighbors. This section discusses the implications for prospective growth in the CEEC-5 that can be derived from a historical perspective on growth elsewhere in the world. The evidence from European and Japanese growth after World War II to mid-1970s, as well as the experience of the tiger economies in East Asia are particularly instructive. During those periods, real output per hour worked grew at 4.7 percent per year in Western Europe and Japan, and reached 4.6 percent per year in selected East Asia countries.

28.   The sources of growth were very different comparing Europe and Japan on the one hand, with the East Asian tigers on the other (Table 4). TFP growth dominated the growth in Western Europe and Japan, while increased application of factor inputs was predominantly responsible in East Asia.

29.   Four factors appear to be key in explaining these divergent patterns:

•   First, the differences in initial income levels (relative to the US). Western European countries had a much higher per capita GDP relative to US in 1950 than the East Asian countries in 1960.

•   Second, demographic trends. Western Europe had completed the demographic transition prior to its postwar golden age, while East Asia experienced a rapid rise in the working age population.

•   Third, the quality of the labor force. This was much higher in Western Europe than in East Asia, as reflected in average years of education.

- Last, the economic systems. Western Europe had already established a well functioning market system with supporting political, legal and financial infrastructure well before 1950, supported by wage moderation. In contrast, Japan, and later most of the East Asian countries adopted policies that encouraged institutional innovations that relied on large vertically integrated enterprises and financial systems, with a major role for the state in investment decisions.

30.   All four factors help account for the predominance of TFP growth in Western Europe and Japan and for factor-input-intensive growth elsewhere. The higher initial income level meant that the scope for growth simply by increased capital intensity of production was less than was the case in East Asia. The demographic trends meant that labor was available in East Asia to make a significant contribution to growth whereas this was not the case in Western Europe. The relatively high education of Western Europe and Japanese labor meant that it was better able to identify, assimilate, and manage new technologies and efficiencies. And though the relative merits of different economic systems remains controversial, a case can be made that the systems in Eastern Asia effectively accelerated the increased capital intensity of production and promoted domestic savings, that they were less effective in promoting innovation and improving efficiency.

31.   The determinants of TFP growth have also been the subject of much formal analysis. Cross country growth regression by Benhabib and Spiegel (1994) provided empirical evidence that while the catch up effect is significant on growth, countries with higher level of education tend to close the technology gap faster than others. Their results suggest that the standard of education contributes to growth not only through the improvement of human capital as a factor of production, but more importantly as a determinant of the rate of change of TFP and ultimate level of TFP through catch-up. This evidence also finds support in a study by Ghosh and Phillips (1999) of 145 countries over 1960–96 which finds that investment and human capital are the key determinants of growth among 12 potential determinants.

32.   The significance of this international experience is that the CEEC-5 closely resembles Western Europe at the outset of its golden age in all four of the areas highlighted above. The current income levels in these economies relative to the US (at current international prices) range from 27 percent in Poland to 47 percent in Slovenia in 1999, in the range of Western European countries in 1950. The labor force is projected to shrink in four out of the six countries over the next ten years (with modest increase in Poland and Slovak Republic). The average number of years of education in the transition countries is close to levels prevailing at the outset of Western Europe's growth spurt, though the quality and nature of that schooling may have some drawbacks.[6] And the CEEC-5 have already made significant strides in

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[6] The 2000 EBRD Transition Report (Chapter 6) highlights a number of ways in which the education systems during the socialist period as well as worker experience during that era badly prepared workers for the market economy, including relatively highly educated workers. It notes that these shortcomings have not yet been overcome and will slow growth.

establishing the sort of market mechanisms that were supportive of Western Europe's growth. And, underscoring this, the most successful of the CEEC-5 have already achieved TFP intensive growth.

33.   Thus, the international evidence, alongside that of the transition so far, is strongly suggestive that TFP, rather than mobilization of factor inputs, has the greatest potential to spur growth in the CEEC-5 in the medium- to long-run. That does not mean that growth will in practice conform to this pattern, but that with a supportive policy framework, it could do so.

V. Growth Scenarios for CEEC-5 in the Long Run

34.   This section discusses projections for growth in the CEEC-5, based on estimated TFP growth rates using the equation reported by Benhabib and Spiegel (1994) reflecting the role of the income gap and the level of education. This procedure yields projected TFP growth rates which range from 1.7 percent for Slovenia to 3 percent for Poland (Table 5).

35.   Long-run steady state growth can be derived by solving a growth equation holding the capital/output ratio constant.[7] On this basis, and on the simplifying assumptions that the derived TFP growth rates would be maintained during the catch-up process and that ratios of fixed investment to GDP would be roughly equal to the group average in recent years, it would take three decades or more for the CEEC-5 to catch up with the EU average, also assuming EU average per capita GDP grows at 2 percent a year. Of course, such a calculation is speculative by nature. If the TFP growth rates were to slow as the CEEC-5 approach EU income levels (i.e., as the catch-up effect diminishes), it might take longer. On the other hand, faster catch-up is of course possible, particularly with appropriate economic policies and/or increasing capital/output ratios.[8] And, convergence of nominal GDP in euros (using current prices and exchange rates) would be faster to the extent that Balassa-Samuelson effects lead to real exchange rate appreciation.[9]

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[7] At the steady state, the capital output ratio will remain constant, and $dY/Y=(dA/A)/\beta+dL/L$. As a result, per capita GDP growth at the steady state will be total factor productivity growth over the labor share plus changes in the quality of the labor force.

[8] Fischer and others (1998) estimate that it would take the CEEC5 between 11 and 24 years to catch up with the "low income EU countries" of Greece, Portugal, and Spain.

[9] If the Balassa-Samuelson effects prove to be strong, with corresponding high inflation of non-traded prices, nominal GDP expressed in euros will rise more rapidly towards EU levels. But in the context of significant differences between tradable and non-tradable inflation, convergence of real incomes will only be apparent from income comparisons at PPP rather than market exchange rates.

36.   The capital-output ratio is a key issue in the growth prospects of these countries. The calculations above assume that the capital/output ratio remains constant, but given the somewhat arbitrary size and nature of the capital stock inherited from the transition era, it could rise or fall. To the extent that increases occur, (and assuming those increases are "efficient"), the CEEC-5 would achieve faster than steady-state growth until they achieve their optimal capital to output ratio. Until that time, they would also converge more rapidly on EU income levels, and they would do so by accumulating capital, and to that extent replicating the experience of the East Asian tigers.

37.   In an alternative set of calculations, the growth equation is inverted to solve for the growth and investment rates required to achieve full real convergence with the EU in 20 years. Since the exercise holds TFP growth constant at the levels derived from the Benhabib and Spiegel equation, the accelerated growth shown implicitly emanates entirely from increasing the capital intensity of output. These results indicate that in most cases investment would need to rise substantially from the levels seen in the recent past, and considerable extra effort would be required to mobilize domestic savings to finance such investment.

38.   These results suggest that the CEEC-5 have the potential for rapid growth. But the growth-scenario exercise also highlights three closely related uncertainties about whether that potential will be realized. These uncertainties have significant implications for the policy frameworks that will be most appropriate in the run up to and after EU accession.

39.   The first uncertainty concerns the investment ratios that will be realized in the CEEC-5. Assuming 8 percent annual depreciation of the capital stock, the results of the inverted growth equation are relatively comforting in this regard as the required investment ratios are, broadly, within recent historical experience. But even assuming that the annual depreciation rate is 10 percent rather than 8 has significant effects on the investment ratio. This apparently innocuous adjustment raises the investment ratios required to achieve the projected GDP growth rates by five percentage points of GDP for this group. It is also apparent that the investment ratios are sensitive to the estimates of the starting capital stocks. A historical international perspective on this does not do much to clarify the issue, as the range of experience is so wide. Two illustrative examples are described in Box 4, the case of Italy in the 1960s and Spain in the 1970s.

40.   These sensitivities are particularly important because unlike Western Europe at the outset of its growth spurt, the CEEC-5 is in the process of renewing its capital stock. It is replacing the stock inherited from the planning era that has largely been outdated by the process of transition itself. Even after ten years of transition, it is unclear how much of this task remains. But to the extent that it is still ongoing, economic growth will likely continue to be associated with—by international standards--relatively high average rates of depreciation of capital and high gross investment rates.

41.   The second uncertainty concerns the path of domestic savings to fund the investment levels required to achieve the CEEC-5's growth potential. A study of the determinants of savings in these countries is reported in Table 6. The key findings are that growth does not

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Box 4. Investment Ratios and Capital Intensity: Italy 1960s; Spain 1970s

In 1960, Italian GDP per capita was a little below that attained by the CEEC-5 in the mid-1990s. During the 1960s, GDP growth in Italy averaged 6 percent, total employment declined marginally, and the share of employment in agriculture fell by 10 percentage points to 20 percent. A similar shift out of agriculture is anticipated in Poland, but equally sizeable intra-sectoral shifts may be in prospect in the other CEEC-5, so the Italian experience may hold lessons for them too.

During the 1960s, the capital to output ratio in Italy was broadly unchanged as was the investment/GDP ratio, which hovered around 25 percent. Thus, rapid growth in Italy was largely driven by total factor productivity, and that did not require either an increase in the capital/GDP ratio or high investment/GDP ratios (Figure 11).

The experience of Spain in the 1970s is cautionary, however. There, growth was more capital intensive with higher investment to GDP ratios and was associated with much higher unemployment.

Economic growth during transition in the more successful CEEC-5 countries has already been largely due to total factor productivity and it has the potential to remain so. Italy's experience suggests that this can be achieved without raising the capital stock/GDP ratio and without further increases in the investment/GDP ratio. Spain's experience suggests that a more difficult road could lie ahead. Whether or not the CEEC-5 will replicate Italy's success remains to be seen, but seems within the bounds of possibility.

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exhibit the normal positive effect on saving rates and that the dependency ratio is positively correlated with private saving rates. In other regards, savings behavior has been comparable with that elsewhere, notably in regard to the effects of relative income and public savings on private savings rates. The key concern arising from this is that, unlike in East Asia, growth may not generate the private savings needed to fund the investment necessary to sustain it. And if those investment needs are substantial, as indicated above, substantial foreign savings will be necessary to finance the CEEC-5's growth. To the extent that those are not forthcoming, domestic savings could come to constitute the binding constraint on CEEC-5 growth prospects. This possibility, and the uncertainties surrounding it, have significant implications for the appropriate evolution of fiscal stance in the CEEC-5.

42.   The third uncertainty is the specific nature of the legal and business environment that will be most conducive to TFP-intensive growth in the CEEC-5. As noted above, the experience of the CEEC-5 already points to the importance of this environment for the nature of growth—and its rates—that will be achieved. As EU accessants, this group have committed themselves to the *acquis communautaire*. But in some areas that may be critical for the successful realization of the potential for TFP growth, the acquis is non-prescriptive or non-binding, including labor market policy and financial market development (See Boxes 5 and 6). Nevertheless, perhaps the key merit of the acquis in this regard is that it will put in place a set of frameworks for economic activity that are familiar to international investors, thereby facilitating their entry and activity in the CEEC-5, and thereby promoting the CEEC-5's economic development.

Box 5. TFP Intensive Growth and the Acquis in Labor Markets

Among the challenges that the CEEC-5 must address are skill mismatches and the associated structural unemployment, rigidities including sometimes excessively centralized wage-setting mechanisms, and high wage taxation, social security contributions, hiring and firing costs, and fringe benefits. Successfully overcoming these challenges will be key to ensuring that the potential for TFP intensive growth is realized.

On labor policy, the acquis requires compliance in equal opportunities, health and safety, a variety of collective labor rights, and coordination (though not harmonization) of social security schemes. According to the most recent assessment of the EU commission, Hungary is the most closely aligned with the acquis, while the Slovak Republic requires the greatest progress.

There are no formal estimates of the costs and benefits of the remaining actions before full compliance with the acquis in the area of labor markets is achieved. But in several areas, the current legislation in place in these economies imposes greater labor market rigidities than compliance with the acquis would require. For example, the current employment legislation in several cases imposes higher layoff costs to employers than the equivalent legislation in the EU, and working time rules are sometimes more strict that EU directives: e.g., in Poland, the weekly limit on hours work is 42 hours (a three-month average), compared with the EU directive of 48 hours. In some other areas, where the acquis will impose additional compliance costs, it is possible that these requirements could encourage TFP intensive growth. Examples here include health and safety requirements and the associated monitoring mechanisms, programs for updating skills and retraining, and the adoption of (generally more demanding) EU standards.

The CEEC-5 will continue to enjoy discretion in their labor market policies, while remaining fully compliant with the acquis. The fact that in some areas the CEEC-5 are already compliant leaves open the possibility that changes to regulations may be necessary to best facilitate growth. And as the examples given above illustrate, even when the acquis is binding, its requirements—if sufficiently flexibly implemented—could be supportive of that growth.

Box 6. TFP Intensive Growth and the Acquis in Financial Markets

Financial markets, through their intermediating and governance functions, will be critical to realizing the CEEC-5's growth potential. The requirements of the acquis in this area, which are largely based on EU-directives, have already largely been met, as have those emanating from the Copenhagen criteria.

In the view of the EU Commission, the CEEC-5 have the necessary basic legislation in place in the area of financial services. Most of the remaining priorities pertain to the "completion" of alignment of legislation and the strengthening and coordination of supervisory institutions.

As concerns requirements for the financial sector emanating from the economic Copenhagen criteria, the priority areas concern financial reform and privatization. The EU's assessment was that these needs were greatest in Slovakia, though privatization of the banking sector was also key in Poland and the Czech Republic. The latter countries were also called upon to improve bankruptcy procedures and streamline their implementation. In general, impressive progress has been made in the introduction of relevant legislation, while progress remains outstanding in the area of enforcement.

The acquis, which is largely based on EU-directives, encompasses both the bank/institution based approach to financial markets typical of continental Europe as well as the more market-based financial systems commonly associated with Anglo-Saxon countries. To this extent, therefore, it is not prescriptive in regard to the nature of financial systems that evolve. The CEEC-5 thus effectively retain the discretion to choose which of these systems to adopt, weighing up the heavily contested arguments for and against each in light of their own circumstances. To date, the financial sectors in the CEEC-5 have been greatly influenced by those of continental Western Europe, with commercial banks playing a major direct role in corporate governance, often simply because financial institutions domiciled in Western Europe have taken large stakes in financial institutions in this group of countries. But while the extent of intermediation remains relatively low, the evolution of effective governance over largely internally-financed corporations may be of greater importance to realization of potential TFP-intensive growth than choices over the nature of financial systems.

Nevertheless, by establishing a framework for financial markets that accords with international best practice and is familiar to international investors, the requirements of the acquis will under gird financial soundness and facilitate foreign investment and thereby encourage growth.

VI. CONCLUSIONS

43. The recent evidence of growth behavior as well as international comparisons suggests that TFP could have a key role to play in growth patterns in the CEEC5 in coming decades. Whether it does so appears to depend considerably on the policy framework put in place, but growth could be rapid with an appropriate framework.

44. Even if the microeconomic policy framework is appropriate, however, there is considerable uncertainty about the design of appropriate macroeconomic frameworks. In large part, this uncertainty arises from the opacity of prospects for capital/output ratios and private savings behavior. In light of both uncertainties, fiscal deficit targets will need to be sufficiently flexible to respond to private savings and investment developments as they occur. Such flexibility, alongside stability in the financial sectors of these countries, will be essential to ensure that sizeable capital inflows, necessary to achieve the CEEC5 growth potential, can be absorbed in a stable macroeconomic environment.

45. On the monetary side, Balassa Samuelson effects need to be considered. Perhaps reflecting the scope for increased productivity in services in the transition context, these effectsmay be fairly small, on the order of 1 percent per annum. However, there is already tentative evidence that the Balassa Samuelson effects can be relatively large, so this remains a further area of uncertainty.
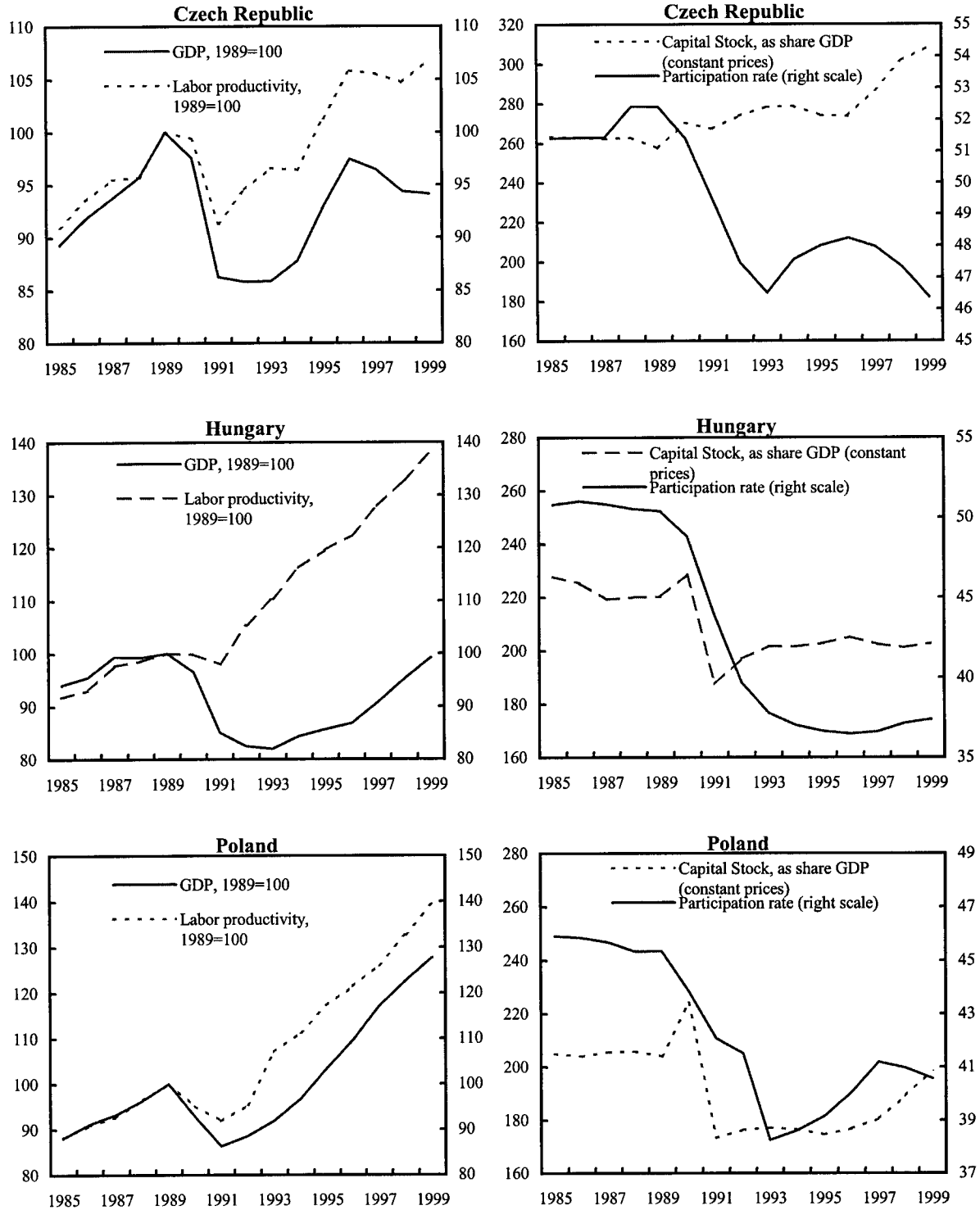
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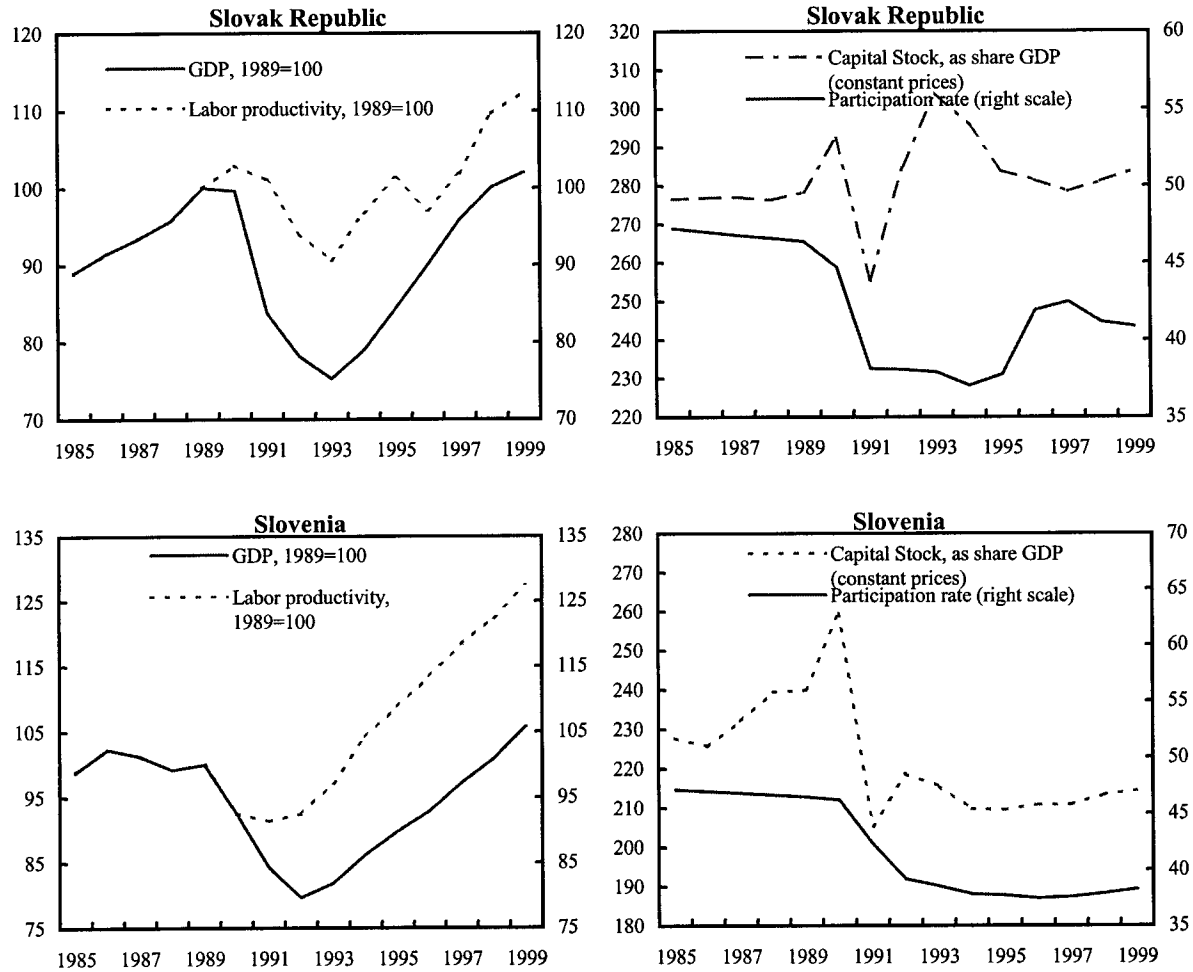
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Figure 1. CEEC-5: Sources of Growth, 1989-99

Czech Republic

- GDP, 1989=100
- Labor productivity, 1989=100

Czech Republic

- Capital Stock, as share GDP (constant prices)
- Participation rate (right scale)

Hungary

- GDP, 1989=100
- Labor productivity, 1989=100

Hungary

- Capital Stock, as share GDP (constant prices)
- Participation rate (right scale)

Poland

- GDP, 1989=100
- Labor productivity, 1989=100

Poland

- Capital Stock, as share GDP (constant prices)
- Participation rate (right scale)

Sources: World Economic Outlook and staff estimates.

Figure 1 (continued). CEEC-5: Sources of Growth, 1989-99

Slovak Republic

- GDP, 1989=100
- Labor productivity, 1989=100

Slovak Republic

- Capital Stock, as share GDP (constant prices)
- Participation rate (right scale)

Slovenia

- GDP, 1989=100
- Labor productivity, 1989=100

Slovenia

- Capital Stock, as share GDP (constant prices)
- Participation rate (right scale)

Sources: World Economic Outlook and staff estimates.

Figure 2. CEEC-5: Investment to GDP ratios, 1985-1999
(in percent (both in current prices))
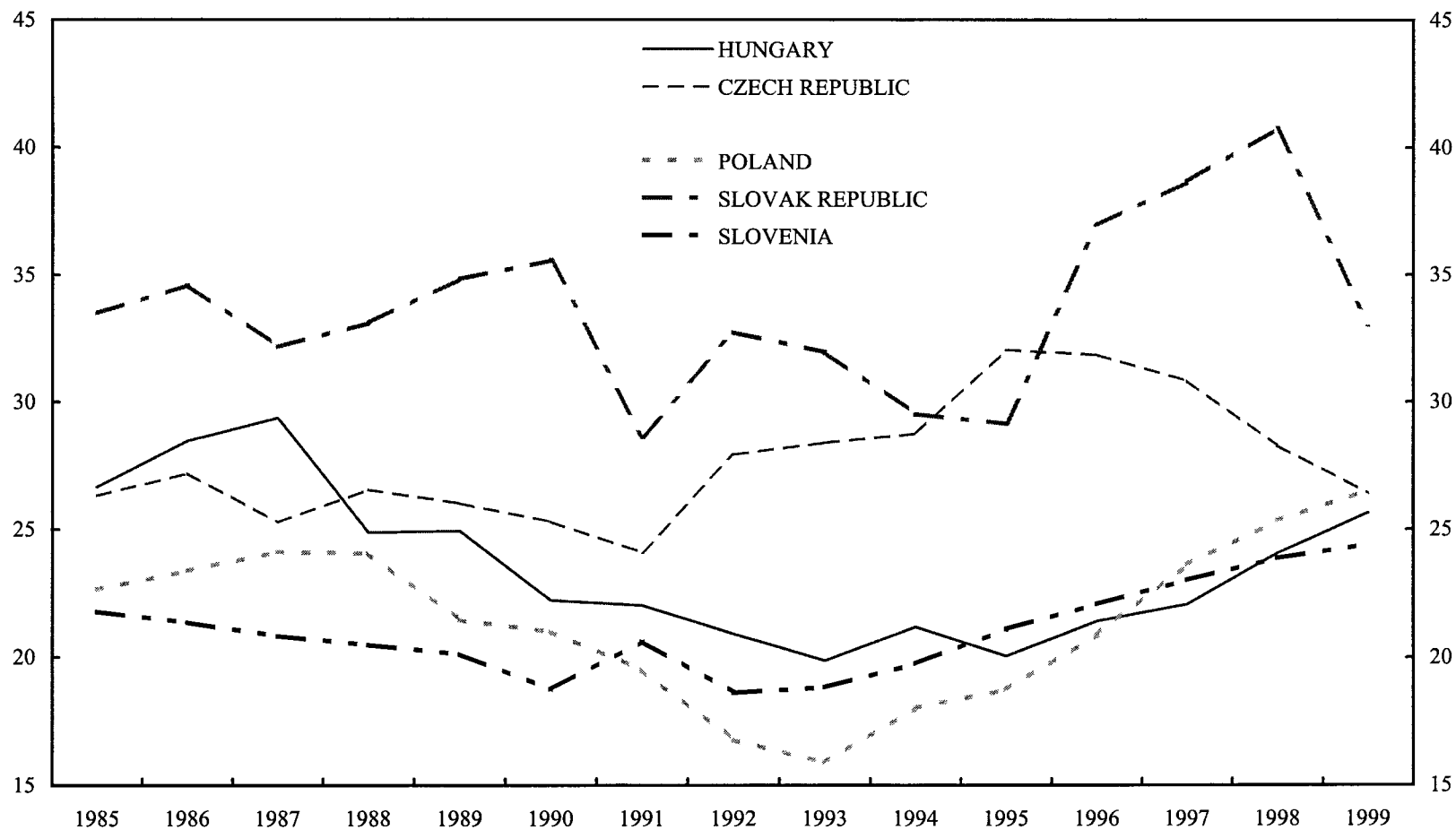
Source: IMF World Economic Outlook.

Figure 3. Ownership concentration and restructuring
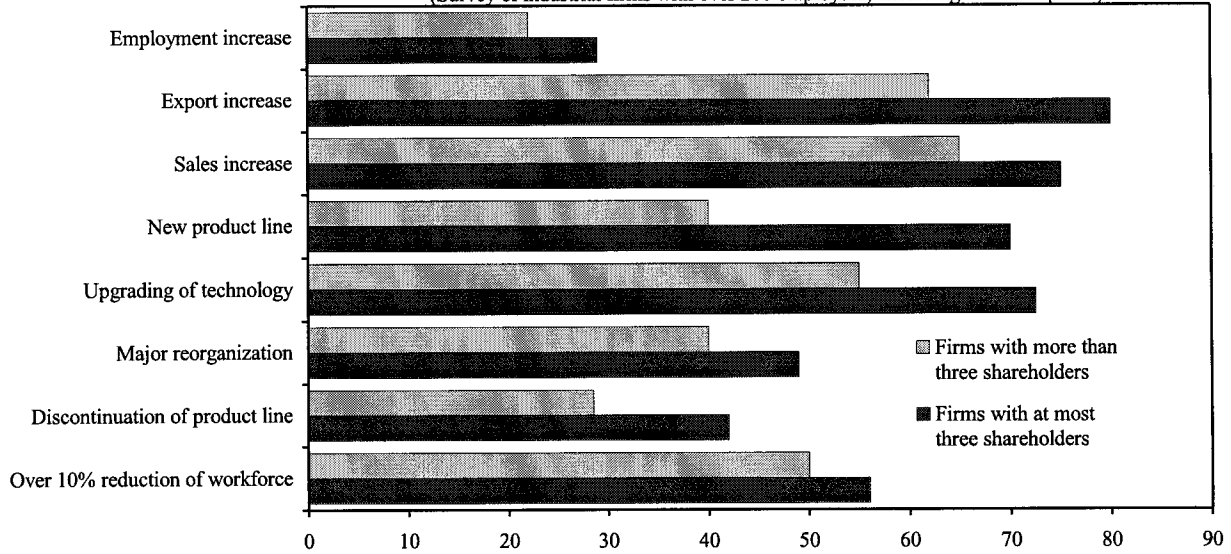(Survey of industrial firms with over 200 employees, excluding new enterprises)
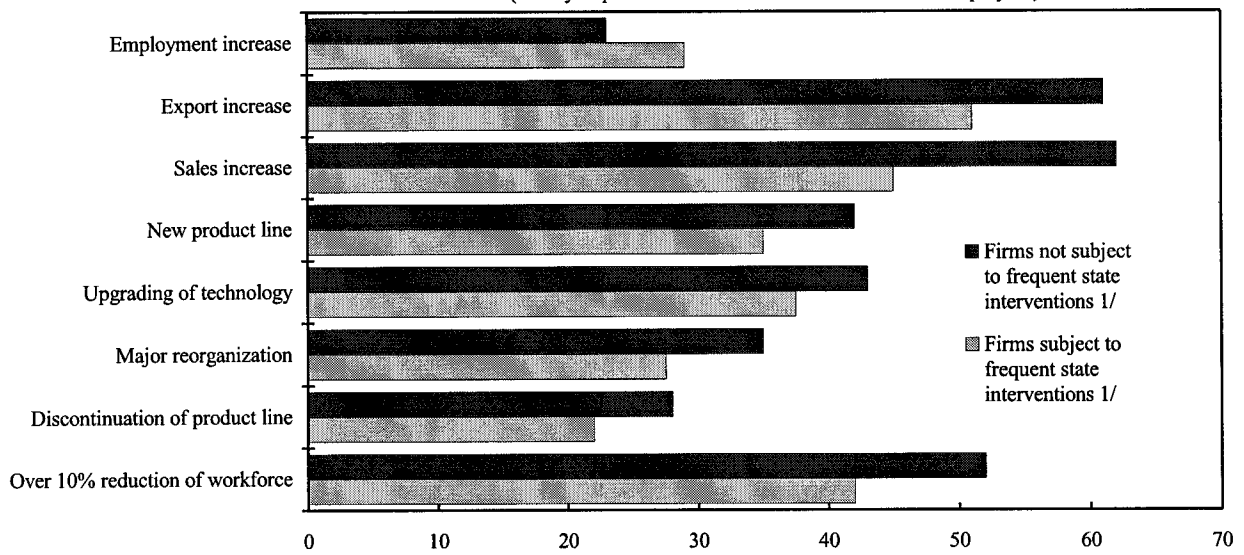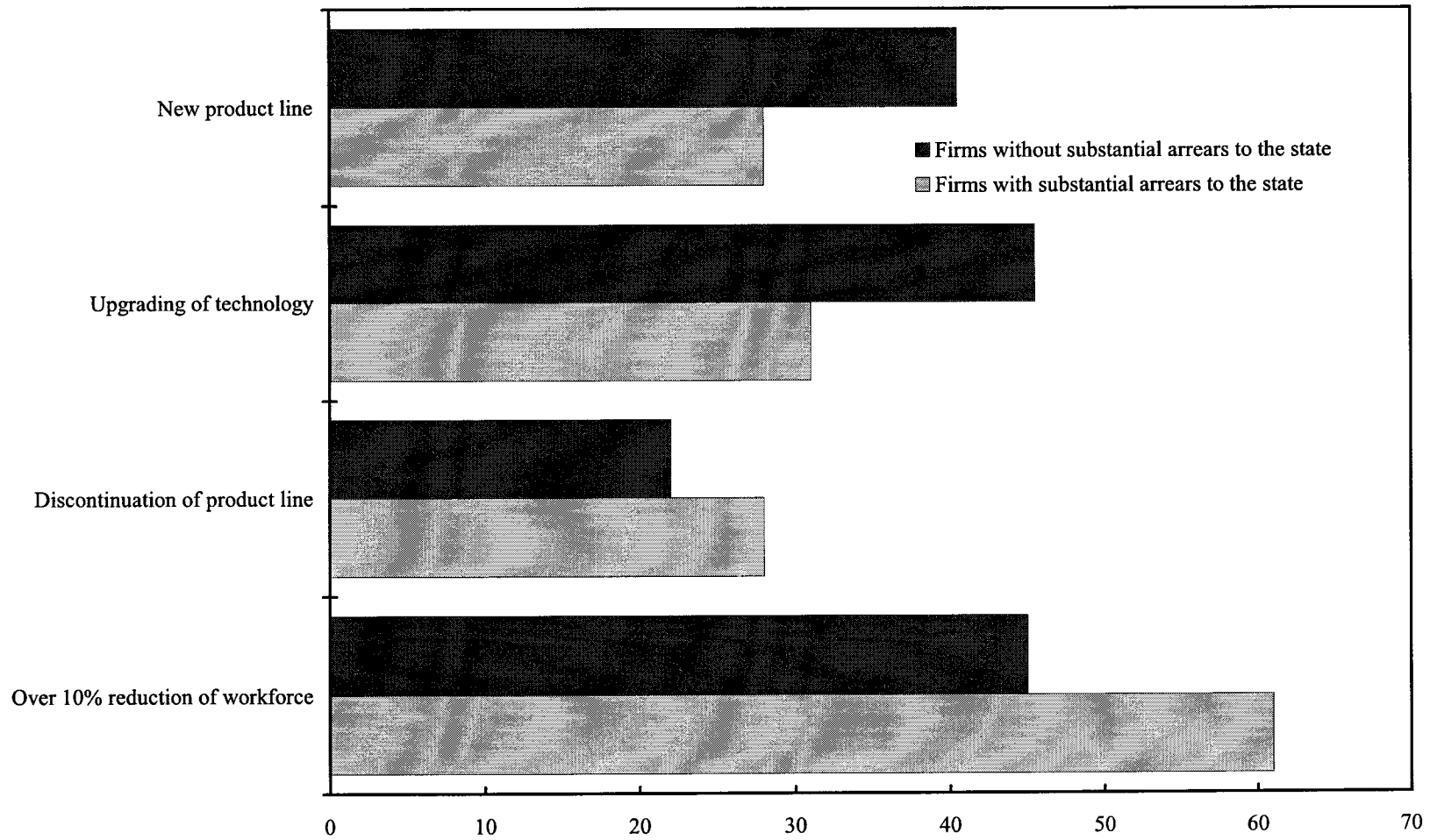

Figure 4: State intervention and restructuring
(Survey of privitized industrial firms with over 200 employees) 1/

Source: EBRD Business Environment and Enterprise Performance Survey
1/ Intervention in the firm's decision-making on pricing, sales and/or investments.

Figure 5. Soft budget constraints and restructuring
(Survey of privitized industrial firms

- Firms without substantial arrears to the state
- Firms with substantial arrears to the state

New product line

Upgrading of technology

Discontinuation of product line

Over 10% reduction of workforce

0   10   20   30   40   50   60   70

Source: EBRD Transtition Report, 1999.

Figure 6. Soft budget constraints in countries grouped by region
(Index of soft budget constraints, in percent) 1/
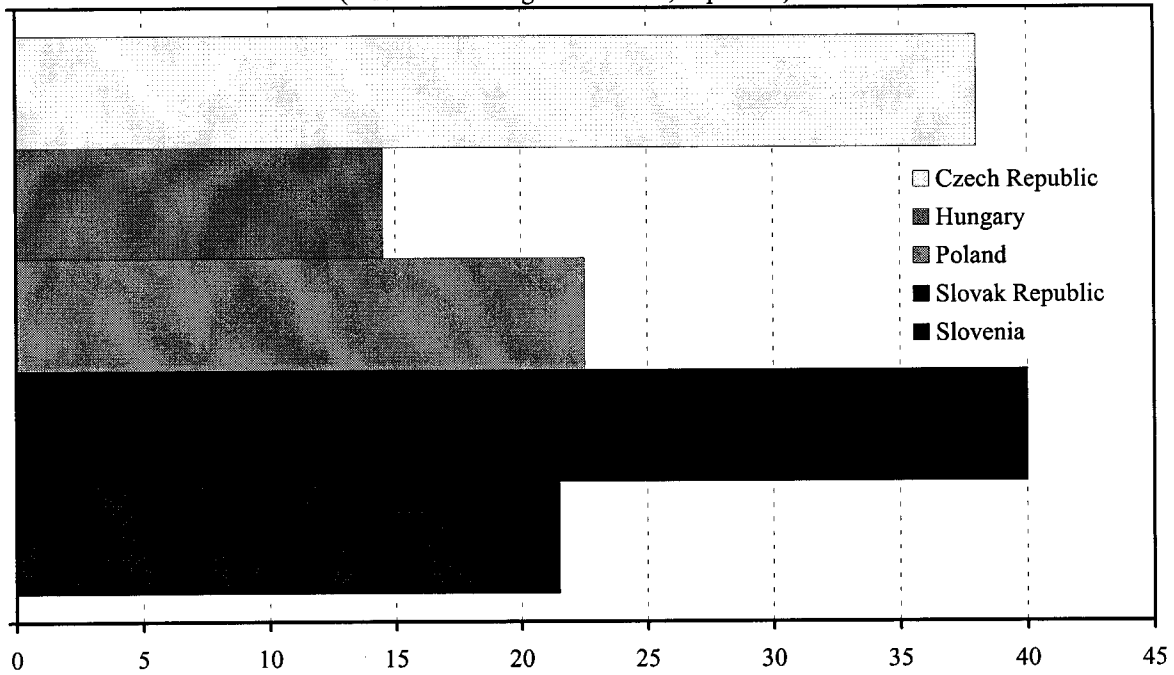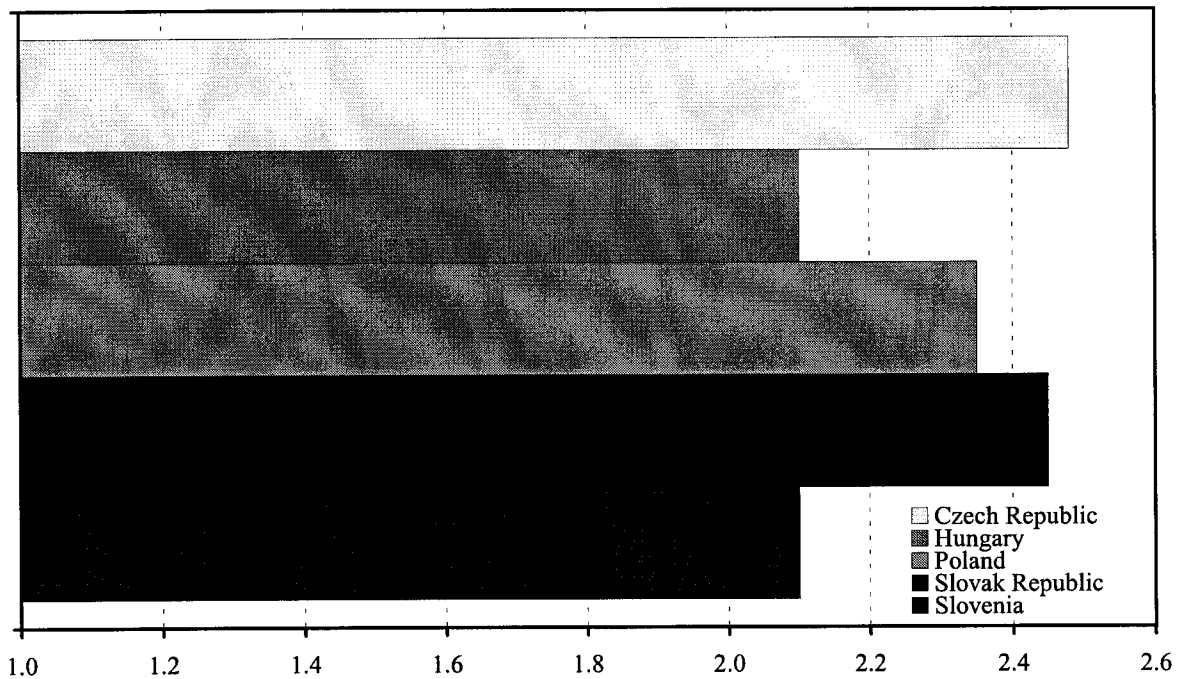

Figure 7. Average investment climate score by region 2/

Source: EBRD Business Environment and Enterprise Performance Survey.
1/ The index of soft budget constraints is the proportion of firms in a country that failed to pay all their taxes. A higher index value therefore means a softer budget constraint.
2/ Index on a scale from 1 (no obstacles) to 4 (major obstacles)

Figure 8. Market selection and desirable expansion
(Market selection index)
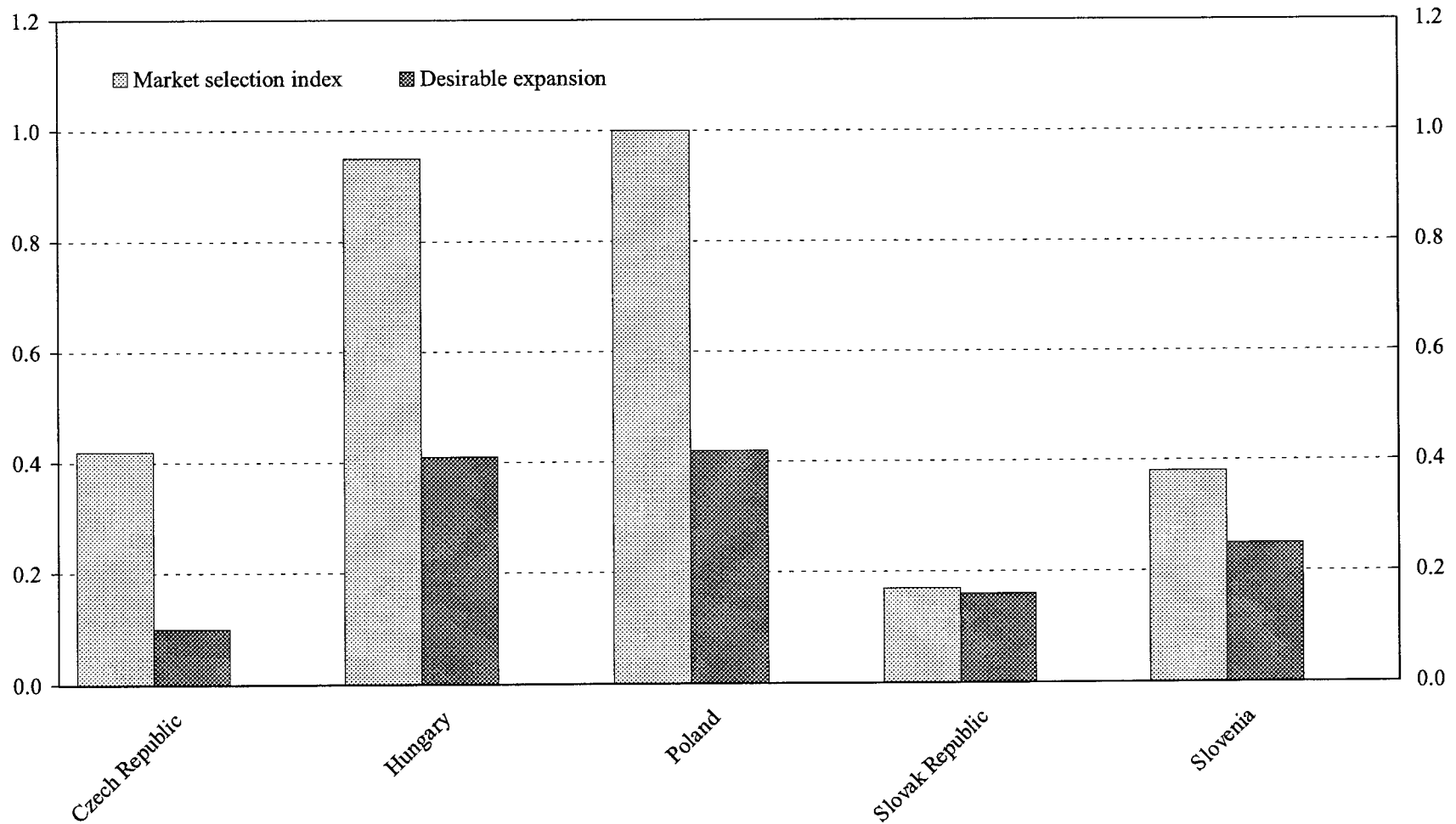
Source: EBRD 1999, Business environment and enterprise performance survey.
The market selection index has two components: desirable expansion and desirable contraction, and is normalized so that countries can be compared with the top performer.

Figure 9. Creditor rights in transition economies and the rest of the world

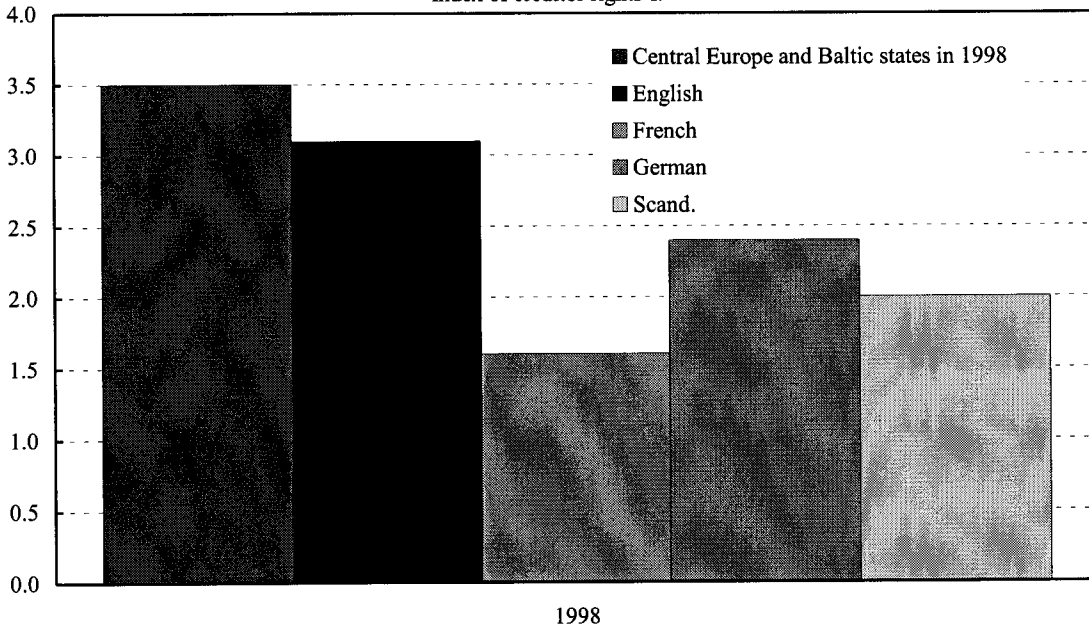Index of creditor rights 1/

- Central Europe and Baltic states in 1998
- English
- French
- German
- Scand.

1998

Figure 10. Shareholder rights in transition economies and the rest of the world

Index of shareholder rights 2/

- Central Europe and Baltic states in 1998
- English
- French
- German
- Scand.

1998
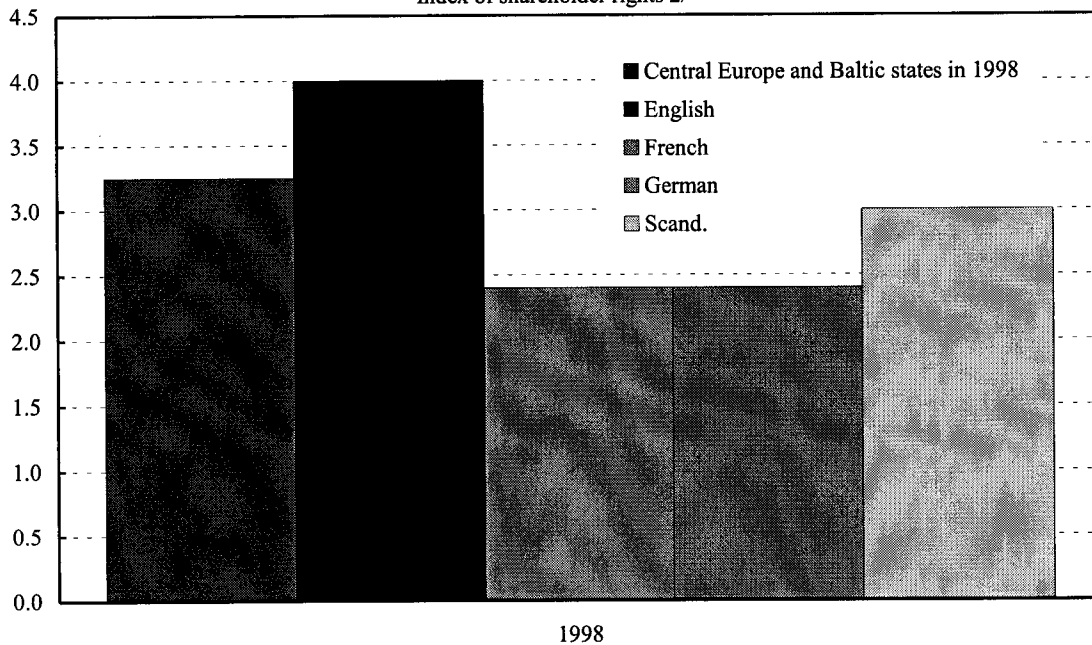
Source: EBRD Transition Report, 1999.

1/ The index of creditor riths has four components: i) no automatic stay on assets, ii) secured creditors first, iii) restrictions on reorganisation, iv) management changes during reorganization. The index can reach a maximum of four points.

2/ The index of shareholders rights is based on seven indicators: i) one share one vote, ii) proxy voting by mail, iii) shares not blocked before meeting, iv) cumulative voting, v) oppressed minority rights, vi) pre-emptive rights to new issues, vii) per cent of shares required to call extraordinary meeting. The index can reach a miximum of seven points.

Figure 11. Italy and Spain: Trends in Investment and the Capital Stock, 1965-85
(in percent)
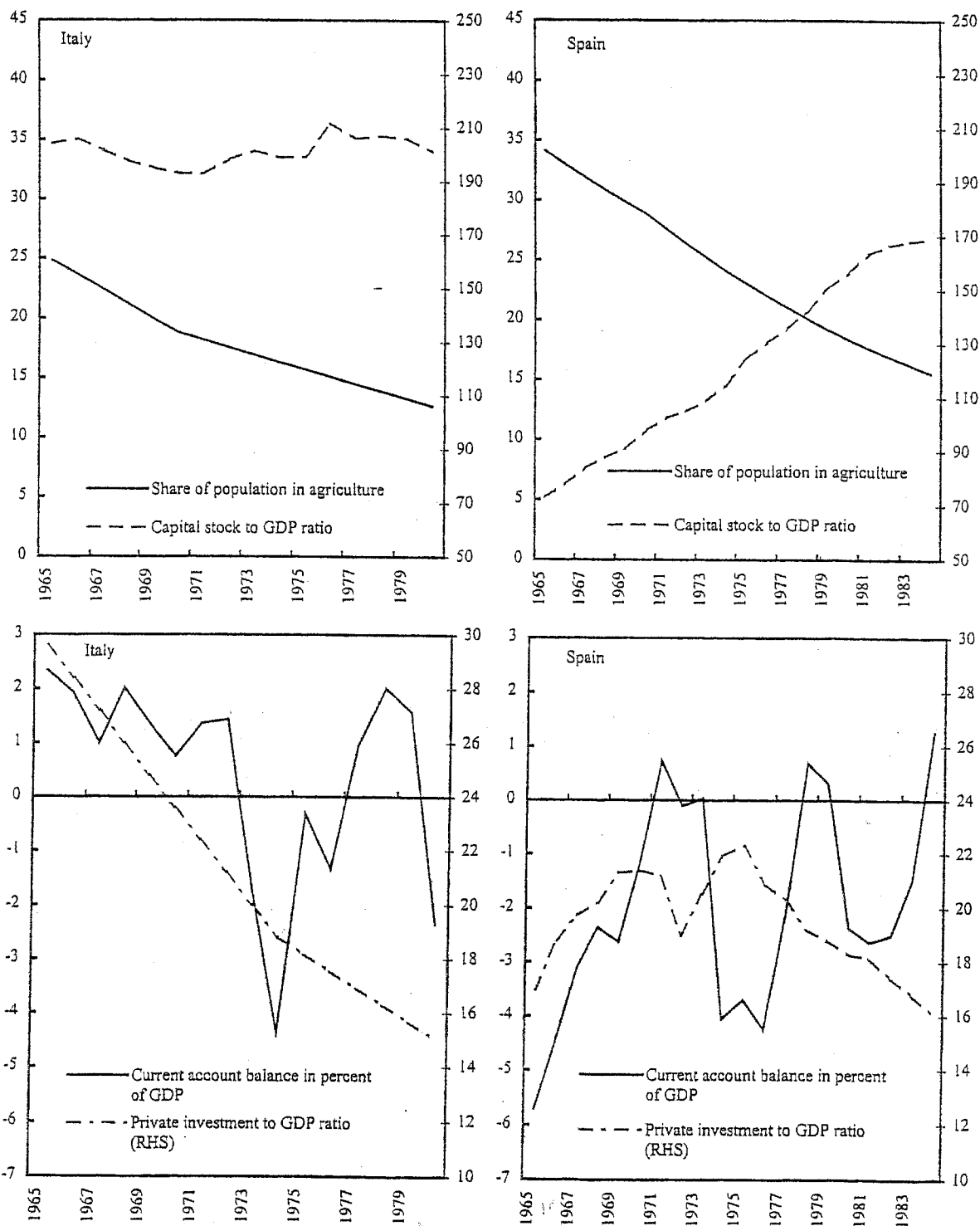
Table 1: Cumulative Output Growth and its Sources 1/
(in percent)

	1989-99	1991-99
CZECH REPUBLIC		
GDP growth	-5.9	9.1
Contribution of		
Employment	-7.7	-4.3
Capital	4.4	9.0
TFP growth	-2.3	4.6
HUNGARY		
GDP growth	-0.8	16.6
Contribution of		
Employment	-18.3	-11.1
Capital	-3.0	9.2
TFP growth	25.2	20.2
POLAND		
GDP growth	27.7	47.9
Contribution of		
Employment	-5.4	-1.6
Capital	8.5	24.3
TFP growth	24.4	20.9
SLOVAK REPUBLIC		
GDP growth	2.0	21.8
Contribution of		
Employment	-6.0	6.2
Capital	1.4	12.4
TFP growth	7.0	2.0
SLOVENIA		
GDP growth	5.8	25.6
Contribution of		
Employment	-11.0	-6.4
Capital	-1.9	10.9
TFP growth	21.2	21.0

Sources: IMF World Economic Outlook and staff estimates.

Notes:
1/ Based on a Cobb-Douglas production funtion, with assumed weights
of capital and labor of 35 and 65 percent.

Table 2. Progress and methods of privatisation of medium-sized and larger enterprises 1/

	EBRD large-scale privatization transition indicator score	Direct sales	Vouchers	MEBO 2/
Czech Republic	4	Secondary	Primary	—
Hungary	4	Primary	—	Secondary
Poland	3+	Primary	—	Secondary
Slovak Republic	4	Primary	Secondary	-
Slovenia	3+	—	Secondary	Primary

Source: EBRD, Transition Report 1999.
1/ Progress in Privatization of medium-sized and large enterprises is measured by the EBRD's transition indicators. A score of 2 indicates that up to 25% of state-owned enterprise assets have been privatized, a score of 3 that up to 50% of these assets have been privatised.
2/ Management-employee buy-out.

Table 3. Legal transition indicators, 1999

	Commercial Laws			Financial Regulations		
	Overall	Extensiveness	Effectiveness	Overall	Extensiveness	Effectiveness
Czech Republic	3	3+	3-	3	3+	2+
Hungary	4-	4	4-	4	4	4
Poland	3+	4	3	4	4	4
Slovak Republic	3	3+	3	3+	4	3+
Slovenia	4	4	4	3+	3+	3+

Source: EBRD, Transition Report 1999.

Table 4. Sources of Growth in Golden Age Europe and Japan, and Recent East Asia

	GDP/person relative to US (current intl. prices)	Capital	Labor	TFP	Output
1950-73	**1950**		(in percent, per year)		
France	46	1.6	0.3	3.1	5.0
Italy	32	1.6	0.2	3.2	5.0
Japan	16	3.1	2.5	3.6	9.2
United Kingdom	59	1.6	0.2	1.2	3.0
West Germany	38	2.2	0.5	3.3	6.0
1960-94	**1960**				
China	5	3.1	2.7	1.7	7.5
Hong Kong	21	2.8	2.1	2.4	7.3
Indonesia	6	2.9	1.9	0.8	5.6
Korea	9	4.3	2.5	1.5	8.3
Malaysia	15	3.4	2.5	0.9	6.8
Philippines	12	2.1	2.1	-0.4	3.8
Singapore	17	4.4	2.2	1.5	8.1
Taiwan Province of China	12	4.1	2.4	2.0	8.5
Thailand	10	3.7	2.0	1.8	7.5
Memo items:					
	1999				
Czech Republic	40				
Hungary	34				
Poland	27				
Slovak Republic	31				
Slovenia	47				

Sources: Crafts (1999).

Income data on Europe and East Asia in 1950 and 1960 are taken from the Penn-World tables, mark 5.6a, income data on transition economies in 1999 are taken from WEO.

Table 5. Projected TFP Growth for Selected Central and Eastern European Countries

	Average years of schooling	Gap	Projected TFP growth	Labor force growth
Czech Republic	9.1	2.5	1.9	-0.4
Hungary	8.9	2.9	2.2	-0.6
Poland	9.5	3.8	3.0	0.2
Slovak Republic	9.1	3.2	2.5	0.4
Slovenia	9.2	2.1	1.7	-0.1
	1950			
France	8.2			
Italy	4.9			
Japan	8.1			
United Kingdom	9.4			
West Germany	8.5			
	1960			
China	1.7			
Hong Kong	5.2			
Indonesia	1.1			
Korea	3.2			
Malaysia	2.3			
Philippines	3.8			
Singapore	3.0			
Taiwan Province of China	3.2			
Thailand	3.5			

Sources:
Average years of schooling for Hungary and Poland are from 2000 World Development Indicators CD-ROM, World Bank, others are estimated from expected years of schooling from the same source.
Gap is the ratio of the US per capita GDP to that of the country concerned in 1999 at current international prices from WEO.
Projected TFP growth is based on the formula from Benhabib and Spiegel (1994), which is .0007*schooling*Gap+.0014*Gap.
Labor force growth is average annual growth rate over 1998-2010, from 2000 World Development Indicators CD-ROM, WB
Data for Western Europe and Japan in 1950 and East Asia in 1960 are taken from Crafts (1999).

Table 6. Panel Regression Results from A Sample of Six Transition Economies, 1992-99 1/

(Dependent variable--private saving as a share of GDP)

| | Fixed Effects | | | |
	General Model	with Heteroskedasticity Adjustment	Restricted Model	with Heteroskedasticity Adjustment
Growth	-0.29	-0.29	-0.29	-0.29
	2.0	*2.3*	*1.9*	*2.1*
PubSav	-0.51	-0.51	-0.51	-0.51
	2.1	*2.3*	*2.1*	*2.2*
Income	2.38	2.38	2.19	2.19
	5.1	*5.2*	*4.8*	*5.3*
DepRatio	1.61	1.61	1.20	1.20
	2.6	*2.5*	*2.1*	*2.2*
Unemploy	-1.10	-1.10	-1.10	-1.10
	3.8	*3.2*	*3.7*	*3.0*
Pcredit/GDP	-0.53	-0.53	-0.55	-0.55
	5.1	*6.4*	*5.2*	*6.0*
Inflation	-0.01	-0.01	-0.01	-0.01
	1.9	*2.3*	*1.9*	*2.2*
TOT	0.15	0.15	---	---
	1.6	*1.8*	---	---
Number of observations	48	48	48	48
R2 adjusted	0.98	0.98	0.97	0.97
Equation Standard Error	2.34	2.34	2.39	2.39

Source: staff calculations.
Note: t-ratios in italics.
1/ CEEC 5 plus Estonia.