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Growth and Recovery in Mongolia During Transition

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Abstract

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This paper studies Mongolia's experience of growth and recovery during the first decade of its transition to a market-based system and compares it with those of other transition economies. Mongolia, like most other transition economies, experienced a painful, initial "transformational recession" before the economy began to recover, with efficiency gains the main source of growth during the early stages of transition. Mongolia's transition process has been relatively smooth compared with other transition economies, probably reflecting the combined effects of some favorable initial conditions, coupled with the early adoption of appropriate adjustment policies and market-oriented reforms.

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I. INTRODUCTION

Mongolia, like its two giant neighbors, China and Russia, was once a socialist economy. From the early 1920s to the late 1980s, Mongolia was closely linked to the Soviet Union, with the Mongolian political and economic systems modeled on those of the latter. Following the collapse of the Soviet Union, however, Mongolia began its transformation from a centrally planned economy to a market-based economy in the early 1990s.

While there is a large literature on the growth experiences of other transition countries, Mongolia has received relatively little attention.² The objective of this paper is to fill this gap by focusing on the following questions: (i) What were Mongolia's sources of growth before and during transition? (ii) How does Mongolia's growth and recovery compare with those of other transition economies? and (iii) What explains differences in Mongolia's performance relative to other transition economies?

The findings of previous studies about transition economies include the following stylized facts.³ First, reforms introduced early in the transition were typically followed by a temporary period of output declines. Second, initial conditions are important factors in determining the speed of recovery. In particular, overindustrialization during the socialist regime may hinder the transitional process. Third, traditional factor inputs appear to have had a limited role in explaining growth over time and across countries for transition economies. In particular, econometric studies have found no strong link between the level of aggregate investment and the strength of recovery from the fall in output recorded in the early years of transition. Therefore, most researchers agree that efficiency gains are the main source of growth during the recovery phase of transition, with the development of good institutions and sound economic policies playing an important supportive role.

The major findings of this paper concur with those of most studies on transition economies. Specifically, while the Mongolian economy suffered great output losses at the outset of its transition, it has subsequently benefited from efficiency gains following its market reforms. In addition, Mongolia's transition process was relatively smooth compared with other transition economies, probably due to the combined effects of its relatively underindustrialized economy prior to the transition, a peaceful and relatively stable social and political environment, and sound economic policies.

The paper is organized as follows: Section II presents a brief background discussion on Mongolia's transition experience. Section III describes the major sources of economic growth in Mongolia since the early 1980s in the context of a basic growth accounting

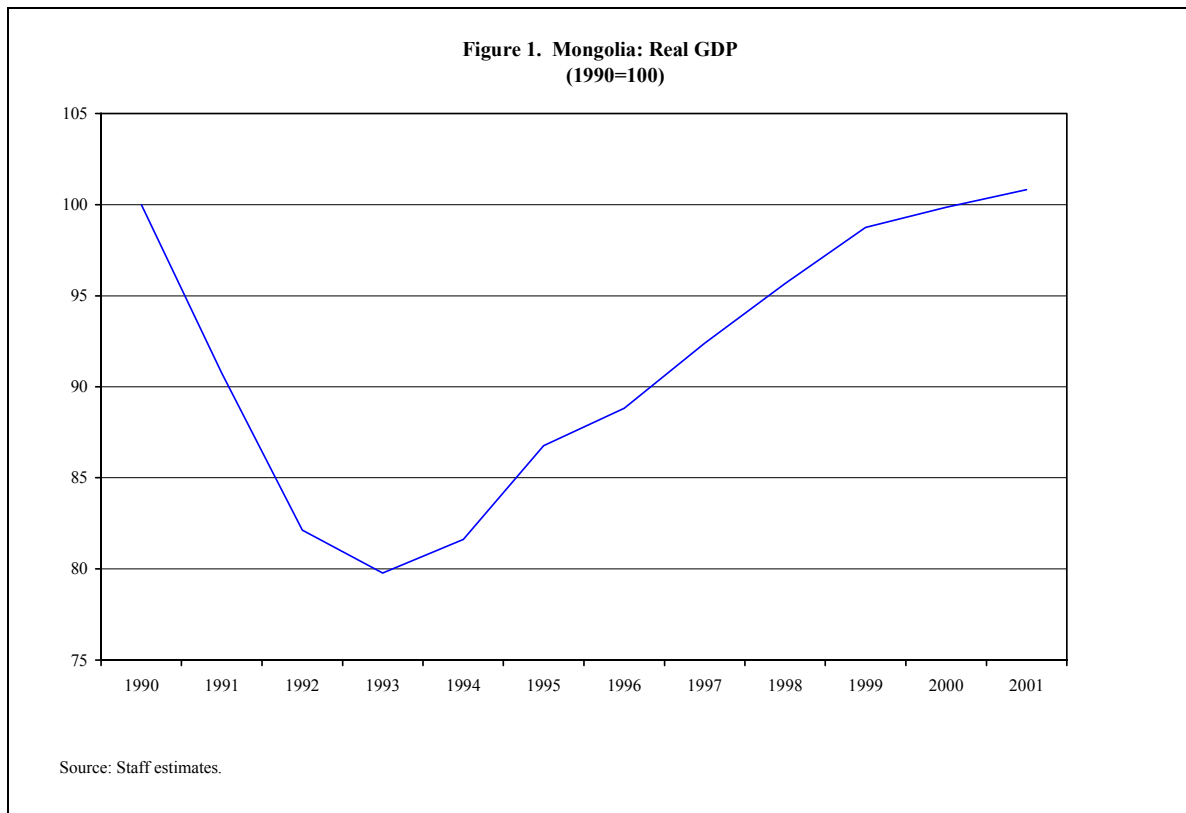
² Among the studies relating to Mongolia's transition experience, two notable examples are Sløk (2000) and Black (2001).

³ For an extensive review of the literature on this issue, see *IMF Staff Papers*, Special Issue, Volume 48.

framework. Section IV discusses Mongolia’s post-transition growth performance relative to other transition countries. The main conclusions along with some caveats are summarized in Section V.

II. AN OVERVIEW OF MONGOLIA’S TRANSITION EXPERIENCE

In the early 1990s, Mongolia embarked on its transition to a market-based system. As indicated in Figure 1, the evolution of real GDP suggests that Mongolia, like many other former socialist economies, experienced a painful “transformational recession” in the first few years during its transition to a market economy before beginning to recover as a result of efficiency gains from market-oriented reforms. Real GDP bottomed out in 1993 and began to recover to positive rates of growth thereafter, and by 2000–01, real GDP had reverted to the level prior to the transition.



As illustrated in Figure 2, Mongolia has traditionally depended heavily on the primary sector, which mainly consists of livestock husbandry and crop production. The primary sector was a principal engine of Mongolia’s quick recovery during the second half of the 1990s, although its share in GDP has been declining since 1999. The tertiary sector, dominated by wholesale and retail trade, as well as transport and communication, was the other main source of growth during the late 1990s, and it has grown so steeply that it now

surpasses agriculture as the largest sector. The importance of the secondary sector, dominated by mining, manufacturing, and construction, was more limited during the 1990s, but has shown signs of revival since 2000.⁴

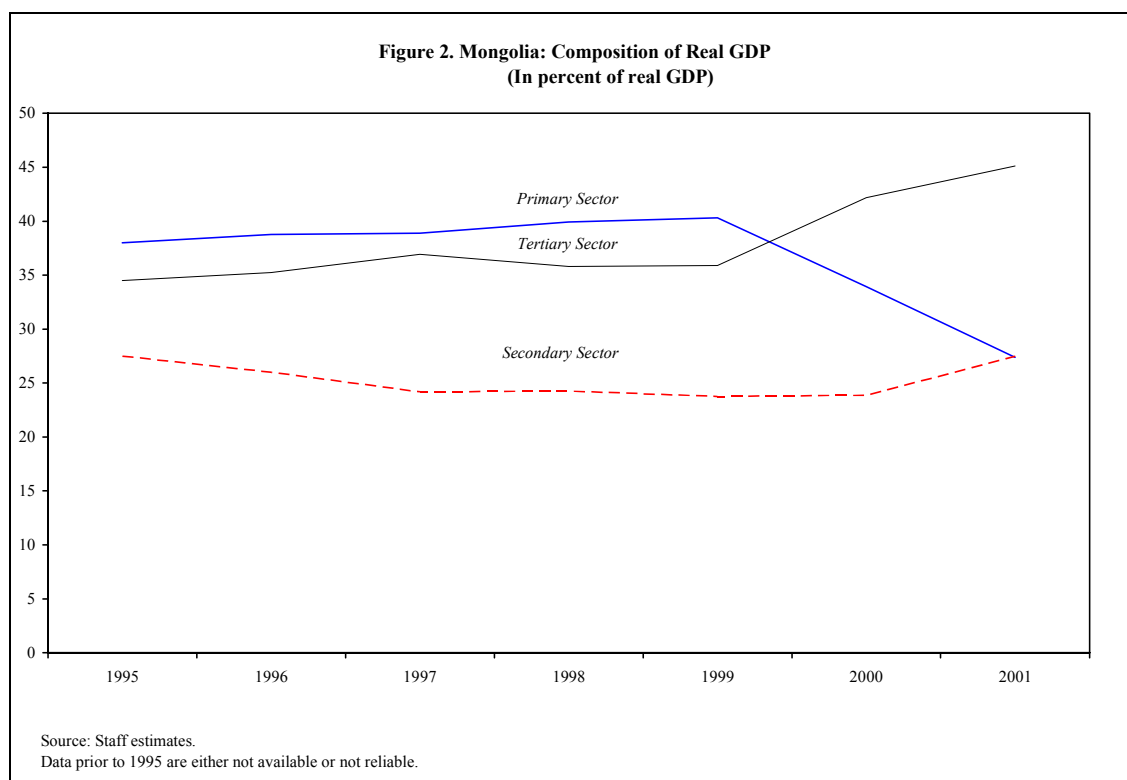
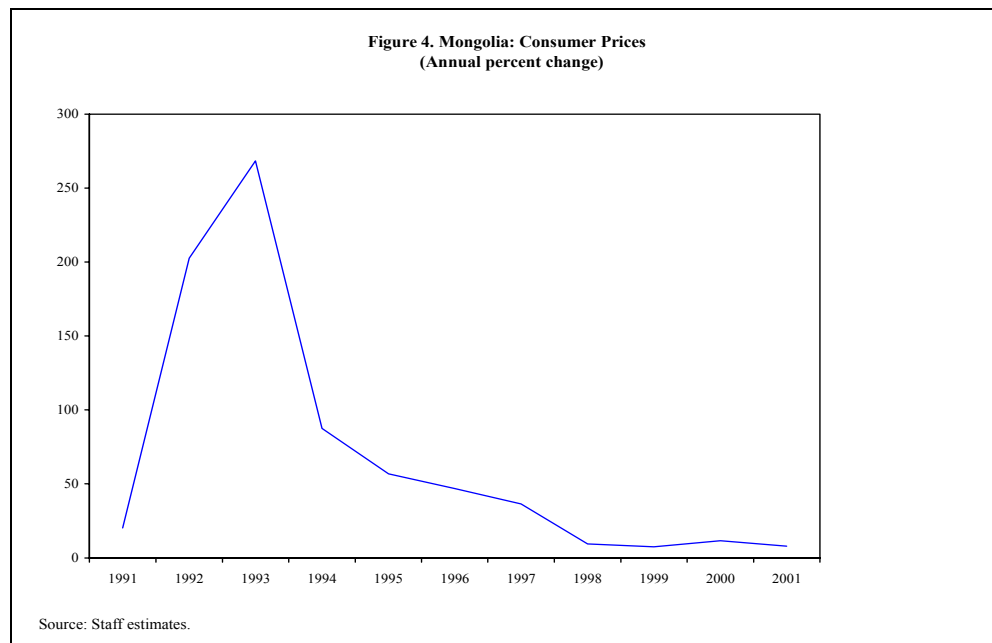
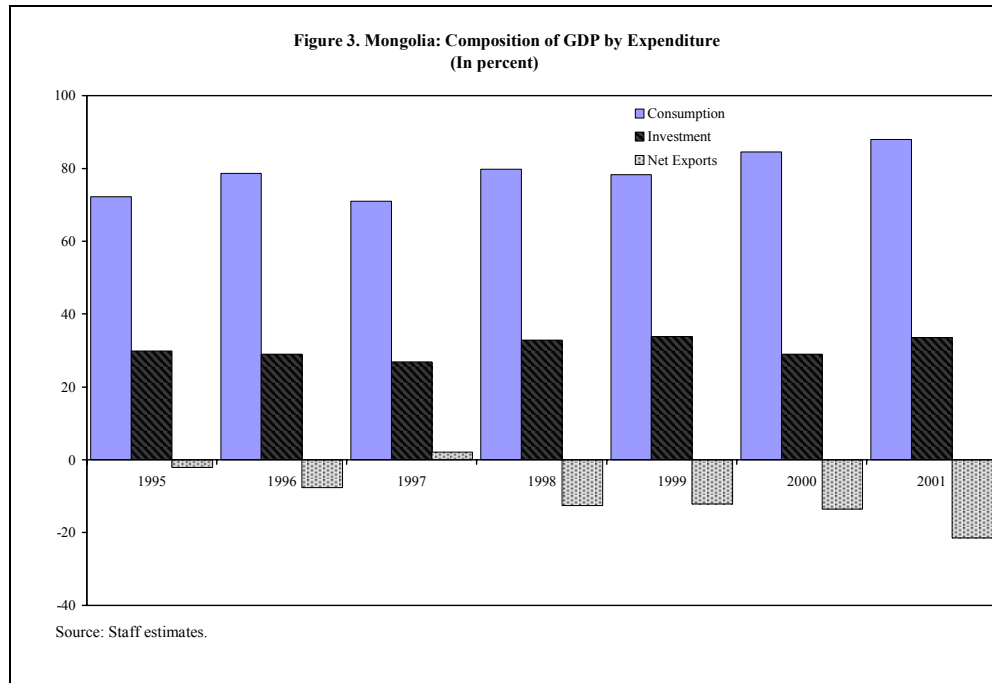


Figure 3 shows that the expenditure composition of Mongolia's GDP since the mid-1990s has been characterized by a relatively stable investment ratio—at about 30 percent of GDP—and a growing share of consumption, which has been accompanied by a widening trade deficit in recent years. Mongolia's heavy dependence on exports of a few key commodities—including copper, gold and cashmere—has made its economy particularly vulnerable to fluctuations in commodity prices and natural disasters. This vulnerability was made evident during 2000–01, when extreme drought followed by unusually harsh winters, together with an outbreak of foot-and-mouth disease, took a heavy toll on the herd stock and depressed GDP growth.

Like many other former socialist economies, Mongolia experienced a surge in inflation in the first few years of transition, followed by steady disinflation in subsequent years. As shown in Figure 4, inflation, measured by the annual percentage change in consumer prices, peaked at more than 250 percent in 1993, and then fell rapidly, reaching the

⁴ For a more detailed discussion of the sectoral composition of Mongolia's growth in recent years, see Chapter II of IMF Country Report No. 02/253.

single-digit range by 2000. A consistent tightening of monetary conditions, coupled with an early liberalization of domestic prices and the establishment of an open exchange and trade system, were instrumental in promoting rapid disinflation.⁵



⁵ For a formal analysis of the role of monetary policy in promoting macroeconomic stabilization during Mongolia's transition, see Sløk (2000).

Fiscal policy also played a supportive role in helping bring about short-term macroeconomic stabilization. While government efforts to ease some of the social costs of transition led to a sharp expansion of public expenditures and wide budget deficits, government borrowing from the domestic banking system was progressively reduced, as the deficits were largely financed through concessional foreign loans. This mode of financing the budget served to ease pressures on the balance of payments and prevented a crowding out of credit to the private sector. At the same time, however, Mongolia's post-1991 public debt rose sharply, reaching the equivalent of 100 percent of GDP by 1999. While the concessional terms on most of this debt have helped to restrain the debt service burden to a manageable level to date, there is also a looming burden of the yet-to-be settled stock of pre-1991 transferable ruble debt to Russia, which was equivalent to about 10 times Mongolia's GDP as of 2001. These developments suggest that a more disciplined fiscal policy will have to be a central part of Mongolia's strategy to ensure enduring macroeconomic stability in the period ahead.

The early introduction of public enterprise reforms helped smooth the labor market's adjustment process during the period of transition. As is illustrated in Appendix Table 1, Mongolia has a sparse population of about 2.4 million. As of 2001, around 58 percent of the population was in the labor force, of which about 62 percent was economically active. Despite the significant adjustment problems of large, inefficient public enterprises, which caused major dislocations in the labor market during the early years of transition, total employment fell by a relatively modest 5½ percent during the early 1990s and recovered steadily thereafter, exceeding its pre-transition level by 1999 (Appendix Table 2). The unemployment rate was estimated to have been restrained to about 4½ percent of the economically active population as of 2001. Although the primary sector accounted for the largest share of the increase in employment since the mid-1990s, the number of workers in the tertiary sector has also increased rapidly in recent years. A key contributing factor to the dynamism of the agricultural and tertiary sectors was the early privatization of herds and of small- and medium-sized enterprises. Thus, while manufacturing suffered a prolonged decline, the former employees of defunct state industries were able to quickly find new opportunities in herding, trading and other services.⁶

III. A GROWTH ACCOUNTING EXERCISE FOR MONGOLIA

Methodology and Data

Following the conventional growth accounting framework, we assume that Mongolia's output performance since the early 1980s can be explained by the following Cobb-Douglas production function:

⁶ For a discussion of Mongolia's experience with public enterprise restructuring and privatization, see Chapter III of IMF Country Report No. 02/253.

$$Y_t = A_t K_t^\alpha (q_t L_t)^{1-\alpha} \quad (1)$$

where Y is real GDP, K is the physical capital stock, q is a human capital index, L is labor input, and A is total factor productivity (TFP).

Taking logarithms and differentiating, we obtain the following growth accounting equation:

$$\frac{dY}{Y} = \frac{dA}{A} + \alpha \frac{dK}{K} + (1-\alpha) \frac{dL}{L} + (1-\alpha) \frac{dq}{q} \quad (2)$$

Equation (2) decomposes the growth rate of output into the growth rates of TFP, physical capital, labor, and human capital.

Physical capital K is calculated by the conventional perpetual inventory method, as discussed in Barro and Sala-i-Martin (2000):

$$K_{t+1} = I_t + (1-\delta)K_t \quad (3)$$

where I is the level of real investment and δ is the rate of depreciation of the existing capital stock. Given estimates of the depreciation rate and the initial capital stock, and a time series for investment, we can calculate the capital stock series recursively using (3). In this study, the depreciation rate is assumed to be 6 percent, which is well within the range of 4–10 percent used in similar studies. Since Mongolia's industrialization began in the early 1960s, 1959 has been selected as the initial year when the capital stock was assumed to be zero.⁷

The time series data used in this study for real GDP, real investment, the capital stock, labor, and human capital between 1980 and 2001 are presented in Appendix Table 2. Data on real GDP and investment in current prices were obtained from the Mongolian National Statistical Office (NSO).⁸ Due to the lack of official data on the expenditure deflators, the investment deflator was approximated based on the following equation:

⁷ The Mongolian economy depended almost exclusively on livestock herding until the early 1960s when the economy began to be industrialized with the assistance of the former Soviet Union. It is likely that most of the capital stock that existed in 1959 would have depreciated fully by 1980. In any case, changing the initial year does not materially alter the main results, as illustrated in the sensitivity analysis below. For more details on the structure of the Mongolian economy prior to the transition, see Economist Intelligence Unit (2001).

⁸ The data on total investment have been compiled by adding together construction, machinery, inventories, and other miscellaneous items.

$$\text{investment deflator} = w * (\text{construction investment deflator}) + (1-w) * (\text{GDP deflator}),$$

with w being the share of construction in total investment. The construction deflator has been derived implicitly from the real and nominal construction data obtained from Mongolia's national accounts statistics. Since there are no data for the nonconstruction investment deflator, the GDP deflator has been used as a proxy.⁹ Labor input has been approximated by total employment, which was obtained from the NSO. Finally, following Lucas (1988), the human capital index is measured by the average number of years of schooling of the Mongolian population aged 15 or above.¹⁰ Data for this variable were obtained from Mongolia's *Living Standards Survey* (1998) and are presented in Table 1. Since only data for two years are available (1989 and 1998), figures for other years were estimated by assuming a constant annual growth rate in the human capital stock.

Table 1. Mongolia: Composition of Population Aged 15 or Above by Educational Status

	Uneducated (0 Year of Schooling)	Primary (4 Years of Schooling)	Incomplete Secondary (8 Years of Schooling)	Complete Secondary (10 Years of Schooling)	Sepecial Education (10 Years of Schooling)	Tertiary (14-15 Years of Schooling)	Average Number of Years of Schooling
	(In Percent)						
1989	9.4	20.5	33.9	18.1	9.6	8.5	7.5
1998	4.2	15.3	32.2	24.5	12.3	11.5	8.5

Sources: Living Standards Survey, 1998; and staff estimates.

The income share of capital, α , is calculated by a regression approach. Specifically, dividing both sides of (1) by qL and then taking logarithms, we obtain:

$$\ln y_t = \ln A_t + \alpha \ln k_t,$$

with, $y_t \equiv \frac{Y_t}{q_t L_t}$ and $k_t \equiv \frac{K_t}{q_t L_t}$. Taking first differences (indicated by a Δ), we obtain the following regression equation which can give us an estimate of α :

⁹ This approach is better than simply using the GDP deflator for total investment, because price indices for construction tend to move differently from other items in the national accounts. Moreover, the quality of existing NSO estimates for the GDP deflator is weak, as elaborated in Chapter II of IMF Country Report No. 02/253.

¹⁰ Given the lack of data on earnings by educational status for Mongolia, the conventional measure of human capital—in which human capital is calculated by summing over the number workers with different educational levels, weighted by their earnings—is not available.

$$\Delta \ln y_t = \gamma + \alpha \Delta \ln k_t + \varepsilon_t \quad (4)$$

where γ is average TFP growth and ε_t is the disturbance term. The regression results are shown Table 2.

Table 2. Mongolia: Regression Results for the Income Share of Capital

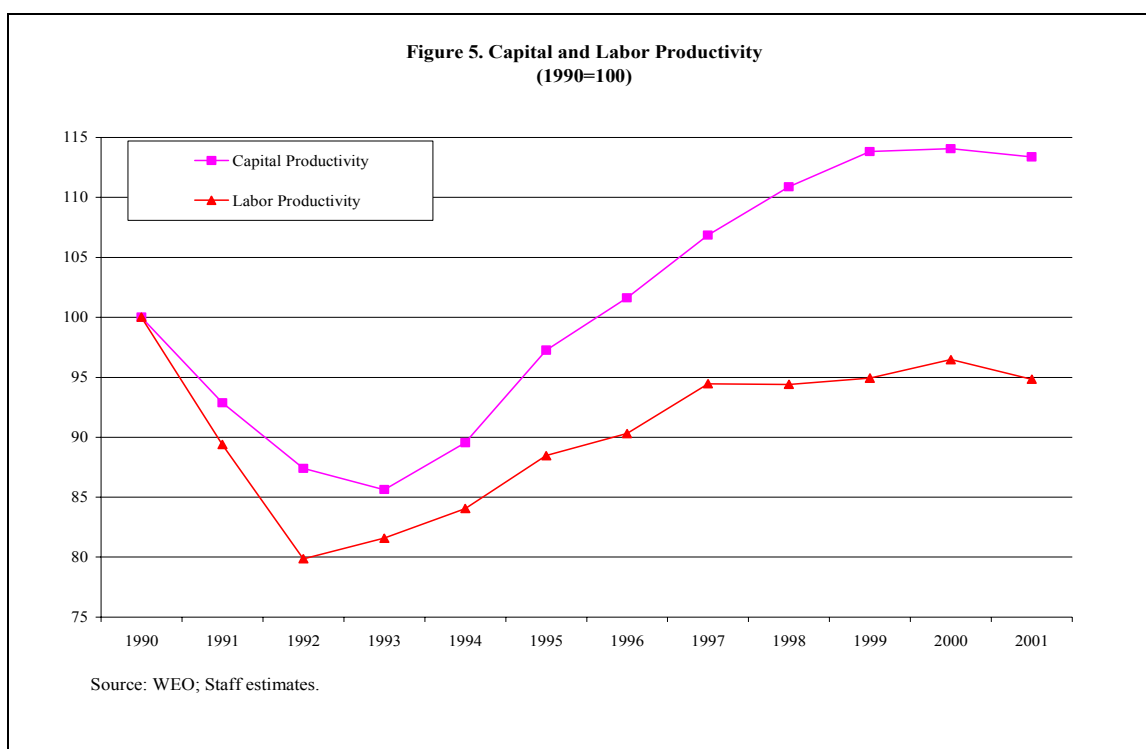
	Coefficients	Standard Error	<i>t</i> Statistics
Intercept	-0.008	0.009	-0.95
α	0.69	0.18	3.77
Number of observations	20 (1980–99)	R-squared	0.43

As discussed below, average TFP growth over the period between 1980 and 2000 is sometimes positive and sometimes negative, which is consistent with an estimated intercept not significantly different from zero. The estimate of α of 0.69 may seem large, but it is not out of line with the findings of other empirical studies. For example, Senhadji (1999), using a similar econometric approach as the one used in this paper, found that the average value of α for his sample of 88 countries was 0.53, with some countries having values as high as 0.91. Similarly, Heytens and Zebregs (2000) estimated that α was equal to 0.63 in China, an Asian transition economy that may share a number of characteristics with Mongolia.

Results

As indicated in Figure 5, both capital and labor productivity since 1990, defined as GDP/K and GDP/L, bottomed out in 1992–93 and improved afterward as a result of efficiency gains from market-oriented reforms. By 1995, capital productivity had started to surpass its 1990 level. Labor productivity as of 2001, however, was still slightly below the level of 1990, possibly reflecting sluggishness in the shedding and reallocation of labor employed in the less productive state-controlled sector of the economy.

Mongolia's sources of growth before and after the transition resemble those in most other transition economies. As is indicated in Table 3, which presents growth accounting estimates based on equation (2), capital accumulation appears to have been the key engine for economic growth before the transition began; however, its role diminished following the launching of market-oriented reforms. Similarly, neither education nor employment appears to have made a considerable contribution to economic growth during the early years of transition. While the growth of factor inputs cannot account for Mongolia's growth performance during the transition, TFP seems to be of paramount importance. In the 1980s, TFP growth was negative, reflecting resource misallocation typical of all planned economies. TFP declined even further at the initial stages of the transition, becoming the primary factor accounting for the collapse in Mongolia's real GDP in the early 1990s. But as stabilization policies took hold and the foundations were laid for the



development of a competitive market economy, TFP turned positive from the mid-1990s. Hence, consistent with the findings of empirical work on other transition economies, efficiency gains appear to have been the main factor accounting for the pick-up of growth in Mongolia as the transition took root.

**Table 3. Mongolia: Growth Accounting
(In percent)**

Year	Annual Average Growth Rate of Output	Annual Average Contributions to Output Growth			
		Capital	Employment	Education	TFP
1980-84	7.11	7.34	0.50	0.43	-1.17
1985-89	5.51	4.98	2.08	0.43	-1.98
1990-94	-4.99	-1.60	-0.24	0.43	-3.58
1995-01	2.54	-0.03	0.42	0.43	1.72

Sensitivity Analysis

Although the above growth accounting exercise is based on arbitrary assumptions about the initial capital stock and its rate of depreciation, sensitivity analysis suggests that the results are robust to different assumptions. Table 4.A shows the results for the growth accounting exercise under a different assumption about the initial capital stock, with an

investment/GDP ratio between 1949–59 that is the same as the average level recorded during the 1970s (38 percent), as opposed to an assumption of a zero capital stock in 1959 in the benchmark scenario. While this probably overstates the initial capital stock by a significant amount, the results in Table 4.A are only slightly different from those in Table 3, and the big picture remains the same. Similarly, changes in the depreciation rate do not alter the main results, as shown in Tables 4.B and 4.C.

Table 4. Mongolia: Growth Accounting Sensitivity Analysis
(Average annual percentage changes)

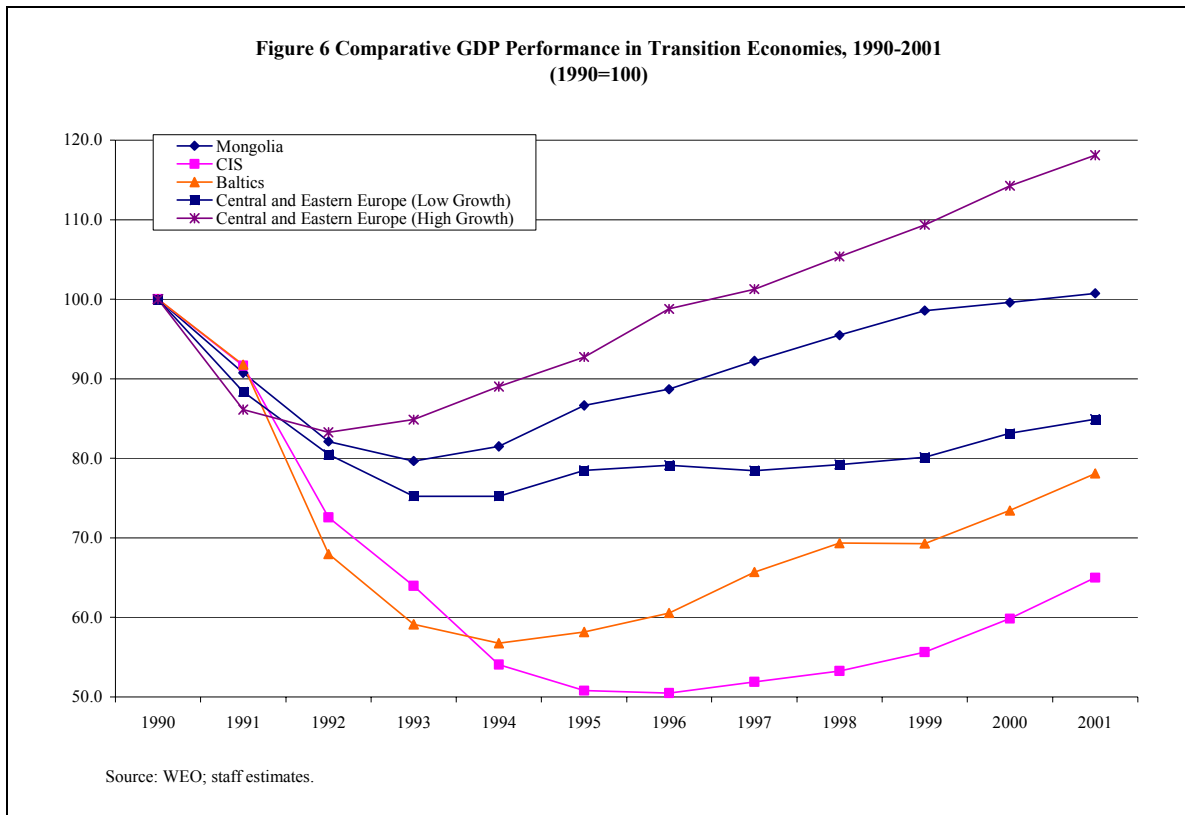
A. Assuming the Investment/GDP Ratio Equals 38 Percent During 1949–59					
Year	Annual Average Growth Rate of Output	Annual Average Contributions to Output Growth			
		Capital	Employment	Education	TFP
1980–1984	7.11	7.19	0.42	0.36	-0.87
1985–1989	5.51	5.08	1.74	0.36	-1.67
1990–1994	-4.99	-1.76	-0.20	0.36	-3.38
1995–2001	2.54	-0.09	0.35	0.36	1.92

B. Assuming a Depreciation Rate of 4 Percent					
Year	Annual Average Growth Rate of Output	Annual Average Contributions to Output Growth			
		Capital	Employment	Education	TFP
1980–1984	7.11	7.97	0.42	0.36	-1.65
1985–1989	5.51	5.62	1.74	0.36	-2.21
1990–1994	-4.99	-0.67	-0.20	0.36	-4.47
1995–2001	2.54	0.48	0.35	0.36	1.34

C. Assuming a Depreciation Rate of 10 Percent					
Year	Annual Average Growth Rate of Output	Annual Average Contributions to Output Growth			
		Capital	Employment	Education	TFP
1980–1984	7.11	6.40	0.63	0.54	-0.47
1985–1989	5.51	4.02	2.61	0.54	-1.67
1990–1994	-4.99	-3.04	-0.30	0.54	-2.19
1995–2001	2.54	-0.50	0.53	0.54	1.97

IV. COMPARISON WITH OTHER TRANSITION ECONOMIES

Compared with other transition economies, Mongolia's adjustment process has been relatively smooth.¹¹ While Mongolia's output recovery was more sluggish than in the best-performing countries in Central and Eastern Europe, its growth performance during the transition, in general, has been better than those of the Baltics, the Commonwealth of Independent States (CIS) except for Uzbekistan, and the poorer performers of Central and Eastern Europe (Figure 6 and Appendix Tables 3 and 4). While the Baltics and the CIS suffered a cumulative output loss averaging 23.8 percent and 34.2 percent, respectively, during 1990–2001, Mongolia's output rose by 0.7 percent during the same period. Moreover, between 1990 and 2001, Mongolia recorded only three years of output decline, compared with four to six years in most of Central and Eastern Europe and the Baltics, and five to eight years in most of the CIS.



¹¹ The growth experiences of East and Southeast Asian transition economies are not included in this paper's comparisons because of their markedly different pattern of transition. While Mongolia, like the formerly socialist economies of Eastern Europe and Central Asia, embarked on its market reforms in the early 1990s as a direct or indirect consequence of the collapse of the Soviet Union, other Asian transition economies such as China and Vietnam began their transitions earlier and implemented their reforms on a much more gradual basis. For example, China began its transformation around 1979, and Vietnam introduced private enterprises and other market reforms beginning in 1986.

Mongolia's relatively fast recovery cannot be easily attributed to geographical, historical, and other noneconomic factors. Despite Mongolia's physical proximity and close historical and cultural ties to the former Soviet Union, its economic performance since the early 1990s has been noticeably stronger than that of CIS countries with similar characteristics. Indeed, quite surprisingly, Mongolia's pattern of growth and recovery resembles more those in the high-growth Central and Eastern European countries, which are very different from Mongolia in terms of geography and history, and have had a somewhat shorter-lived experience under a Soviet-style system of central planning.

A number of favorable initial economic and social factors may partly explain Mongolia's relatively good performance. First, unlike some transition countries that embarked on their transition with a significant degree of overindustrialization, Mongolia launched its market reforms with a relatively rudimentary economic structure. As shown in Appendix Tables 5–6, Mongolia was among the countries with the highest share of the agricultural sector in GDP over the period 1990–2000 and has been the poorest country in terms of PPP-based per capita income.¹² Such a simple economic structure is likely to have reduced the complexity of the market reforms, facilitating price liberalization and early enterprise restructuring.¹³ Second, Mongolia's relatively good performance may also be partly attributed to some favorable noneconomic initial conditions. Unlike some other transition economies seriously disrupted by civil conflicts, blockades, or sanctions such as in Armenia, Azerbaijan, and Tajikistan, Mongolia has enjoyed a peaceful and relatively stable social and political environment from the early days of the transition.

Perhaps most importantly, the early adoption of appropriate adjustment policies and market-based reforms is likely to have been instrumental in promoting sustainable growth. In particular, the Mongolian authorities promptly established an open exchange and trade system at the outset of transition. As shown in Appendix Tables 7 and 8, compared with other transition economies, Mongolia is a fairly open economy, with a high exports-plus-imports-to-GDP ratio and one of the least restrictive trade regimes.¹⁴ Moreover, the authorities made a determined macroeconomic adjustment effort to contain inflation and

¹² For a more general discussion of how initial conditions such as overindustrialization may have affected the pace of growth and recovery in transition countries, see Havrylyshyn *et al.* (1999) and references therein.

¹³ For a more detailed review of the possible factors that may have spurred enterprise restructuring and the formation of new enterprises in transition economies, see Djankov and Murrell (2002) and McMillan and Woodruff (2002).

¹⁴ The strong and positive link between openness to international trade and growth is well-documented in the economics literature. In a recent study of economic performance and trade in the CIS, Odling-Smee (2003) provides considerable evidence suggesting that the relatively low degree of openness of CIS countries has been a barrier to growth in the region.

external imbalances, including by implementing a firm monetary policy coupled with a flexible exchange rate system. This created the conditions for a rapid expansion of trade and investment without threatening short-term macroeconomic stability.¹⁵

V. CONCLUSIONS

This paper has described some of the key stylized facts of Mongolia's growth and recovery during the first decade of its transition to a market-based system, and compared them with those of other transition economies. The major findings are as follows:

- As in most former socialist countries, while capital accumulation appears to have been the primary factor accounting for growth prior to the establishment of a market system, efficiency gains became the main source of growth during the early stages of transition;
- Mongolia, like most other transition economies, experienced a painful, initial “transformational recession” before the economy began to recover;
- Mongolia's adjustment process has been smooth compared with other transition economies and has been less costly in terms of output loss than those of countries of the former Soviet Union that have similar geographical and historical features; and
- While Mongolia's relatively strong output performance can be partly explained by favorable economic and noneconomic initial conditions, the early adoption of appropriate adjustment policies and market-oriented reforms is likely to have played a key role in supporting the prompt recovery of growth.

While the above results are instructive, they need to be interpreted with caution in light of the well-known weaknesses in the quality of national accounts and related data in transition economies.¹⁶ These data weaknesses mean that comparisons of economic performance before and after the transition, and across countries, along the lines described above, may be subject to a large margin of error.

One particularly important general caveat for the results of this paper is that, owing to the serious limitations of GDP statistics for transition economies, the collapse in economic activity in CIS countries during the 1990s may be considerably overstated. To the extent that

¹⁵ Many studies have found that sound macroeconomic policies and structural reforms have played a critical role in promoting growth during the transition process. See, for example, Iradian (2003).

¹⁶ See, for example, Campos and Coricelli (2002) and references therein. For Mongolia, the quality of post-transition national accounts are of particular concern, as elaborated in Chapter II of IMF Country Report No. 02/253.

some particular features of Mongolia's economy, such as the importance of the agricultural sector, have resulted in a more modest overstatement of the fall in output during the early 1990s, the actual differences in cumulative output performance between Mongolia and the CIS countries may be somewhat smaller than suggested in this paper.

Appendix Table 1. Mongolia: Population and Labor Statistics

	1995	1998	1999	2000	2001
(In thousands of people, unless otherwise indicated)					
Primary Sector	354.2	394.2	402.6	393.5	402.4
(percent of total employment)	46.1	49.7	49.5	48.6	48.3
Secondary Sector	137.6	125.4	126.4	114.4	113.7
(percent of total employment)	17.9	15.8	15.5	14.1	13.7
Tertiary Sector	275.8	273.0	284.6	301.1	316.2
(percent of total employment)	35.9	34.4	35.0	37.2	38.0
Total Employment	767.6	792.6	813.6	809.0	832.3
(percent of economically active)	...	...	95.3	95.4	95.4
Unemployed	...	...	39.8	38.6	40.3
(percent of economically active)	...	...	4.7	4.6	4.6
Economically active	...	...	853.4	847.6	872.6
(percent of labor force)	...	...	66.7	61.7	62.2
Labor Force	...	1,256.8	1,279.3	1,374.4	1,402.8
(percent of population)	...	53.3	53.8	57.3	58.2
Population	2,275.0	2,356.1	2,378.3	2,398.0	2,409.0
(In people per sq km)					
Population Density	1.5	1.5	1.5	1.5	1.5
Compared with:					
Canada	3.2	3.3	3.3	3.3	3.4
United States	28.9	30.0	30.4	30.7	31.2
China	129.2	133.2	134.4	135.3	136.8
Japan	344.0	346.8	347.5	348.1	348.8
Bangladesh	922.9	972.3	989.4	1,006.8	1,012.0

Sources: National Statistical Office of Mongolia, World Bank, World Development Indicators Database; WEO; and staff estimates. Data for years not shown are not available.

Appendix Table 2. Mongolia: Estimates of Real GDP and Factor Inputs, 1980–2001

Year	Real			Labor (In thousands of persons)	Human Capital (Average number of years of schooling)
	Real GDP (In billions of togrogs, constant 1995 prices)	Investment	Capital		
1980	376.1	172.8	1,183.8	516.0	6.7
1981	407.4	235.3	1,348.1	518.0	6.7
1982	441.4	250.0	1,517.2	532.2	6.8
1983	466.9	208.7	1,634.9	543.0	6.9
1984	494.9	236.7	1,773.5	550.3	7.0
1985	525.7	259.9	1,927.0	589.5	7.1
1986	575.0	294.1	2,105.5	643.1	7.2
1987	594.8	278.9	2,258.0	665.4	7.3
1988	625.2	275.4	2,398.0	743.3	7.4
1989	651.5	291.8	2,545.9	764.1	7.5
1990	635.1	205.4	2,598.5	783.6	7.6
1991	576.4	97.0	2,539.6	795.7	7.7
1992	521.6	54.8	2,442.0	806.0	7.9
1993	505.9	122.3	2,417.8	765.4	8.0
1994	517.6	92.7	2,365.4	759.8	8.1
1995	550.3	91.5	2,315.0	767.6	8.2
1996	563.2	91.3	2,267.4	769.6	8.3
1997	585.7	111.4	2,242.8	765.1	8.4
1998	606.4	129.5	2,237.7	792.6	8.5
1999	625.9	146.6	2,250.1	813.6	8.7
2000	632.5	153.8	2,268.8	809.0	8.8
2001	639.7	175.9	2,308.6	832.3	8.9

Sources: Data provided by the NSO; and Living Standards Survey, 1998.

Appendix Table 3. GDP Performance in Transition Economies

Index (1990=100)

Country	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Mongolia	102.6	100.0	90.8	82.1	79.7	81.5	86.6	88.7	92.2	95.5	98.6	99.6	100.7
Commonwealth of Independent States (CIS)													
Armenia	102.2	100.0	87.6	41.5	35.7	37.6	40.2	42.6	44.0	47.2	48.8	51.7	56.7
Azerbaijan	113.3	100.0	99.3	76.7	59.0	47.4	41.8	42.3	44.8	49.3	52.9	58.8	64.1
Belarus	102.3	100.0	98.8	89.2	82.9	75.5	67.7	69.6	77.5	83.9	86.8	91.8	95.6
Georgia	117.6	100.0	78.9	43.5	30.7	27.5	28.3	31.2	34.5	35.5	36.6	37.3	39.0
Kazakhstan	102.3	100.0	89.0	84.3	76.5	66.9	61.4	61.7	62.7	61.5	63.2	69.4	78.5
Kyrgyz Republic	102.4	100.0	92.2	79.4	67.1	53.8	50.9	54.5	59.9	61.1	63.3	66.8	70.3
Moldova	102.4	100.0	82.5	53.9	53.3	36.8	36.3	34.2	34.7	32.4	31.3	32.0	34.0
Russia	96.4	100.0	94.5	76.9	66.9	57.9	55.5	53.6	54.1	51.4	54.2	59.1	62.1
Tajikistan	148.3	100.0	92.9	66.1	58.7	46.2	40.4	38.6	39.3	41.3	42.9	46.4	51.2
Turkmenistan	102.3	100.0	95.3	90.2	81.2	67.2	62.3	58.2	51.6	55.2	64.3	75.9	91.4
Ukraine	103.7	100.0	89.4	80.7	69.2	53.3	46.9	42.2	40.9	40.1	40.0	42.3	46.2
Uzbekistan	95.9	100.0	99.5	88.5	86.4	82.8	82.0	83.4	85.4	89.1	92.9	96.5	100.8
Average	107.4	100.0	91.6	72.6	64.0	54.4	51.1	51.0	52.4	54.0	56.4	60.7	65.8
Baltics													
Estonia	102.3	100.0	92.1	72.2	66.2	64.9	67.7	70.4	77.2	80.8	80.3	86.0	90.3
Latvia	102.3	100.0	88.9	57.6	49.0	49.3	48.9	50.5	54.9	57.0	57.6	61.6	66.2
Lithuania	94.8	100.0	94.3	74.2	62.2	56.1	58.0	60.7	65.1	68.4	65.8	68.3	72.3
Average	99.8	100.0	91.8	68.0	59.2	56.8	58.2	60.5	65.7	68.8	67.9	72.0	76.3
Central and Eastern Europe (Negative Growth)													
Bulgaria	110.0	100.0	89.6	81.7	71.8	66.2	69.1	62.6	59.1	61.5	62.9	66.3	68.9
Croatia	108.1	100.0	83.0	73.3	67.4	71.4	76.3	80.8	86.1	88.3	88.0	91.2	95.0
Macedonia, FYR	108.1	100.0	93.8	87.6	81.0	79.6	78.7	79.6	80.8	83.5	87.1	91.0	87.3
Romania	105.9	100.0	87.1	79.4	80.7	83.8	89.9	93.5	87.8	83.6	82.6	84.1	88.6
Average	108.0	100.0	88.4	80.5	75.2	75.3	78.5	79.1	78.5	79.2	80.1	83.2	84.9
Central and Eastern Europe (Positive Growth)													
Albania	111.1	100.0	72.0	66.8	73.2	80.1	79.4	95.2	88.5	95.6	102.6	110.6	117.8
Czech Republic	102.5	100.0	88.4	87.9	88.0	89.9	95.3	99.4	98.6	97.6	98.0	101.2	104.5
Hungary	103.6	100.0	88.1	85.4	84.9	87.4	88.7	89.9	94.0	98.6	102.7	108.1	112.2
Poland	107.7	100.0	93.0	94.9	99.0	104.1	111.2	117.9	125.9	131.9	137.3	142.8	144.3
Slovak Republic	100.4	100.0	84.1	78.5	75.6	79.3	84.6	89.9	95.4	99.3	100.5	102.8	106.1
Slovenia	108.1	100.0	91.1	86.1	88.5	93.3	97.1	100.5	105.1	109.1	114.8	120.1	123.6
Average	105.6	100.0	86.1	83.3	84.9	89.0	92.7	98.8	101.3	105.4	109.3	114.3	118.1

Sources: IMF, WEO; Havrylyshyn and others (1999); and staff estimates.

Appendix Table 4. Growth Performance and Location

	Cumulative Growth between 1990–2001	Number of Years of Decline Before Initial Recovery	Total Number of Years of Decline Between 1990–2001	Cumulative Decline Before Initial Recovery	Cumulative Growth Since Initial Recovery	Average Growth between Initial Recovery and 2001
MONGOLIA	0.7	3.0	3.0	-20.3	26.4	3.0
Commonwealth of Independent States (CIS)						
Armenia	-43.3	3.0	3.0	-64.3	58.8	5.9
Azerbaijan	-35.9	5.0	5.0	-58.2	53.3	7.4
Belarus	-4.4	5.0	5.0	-32.3	41.2	5.9
Georgia	-61.0	4.0	4.0	-72.5	41.5	5.1
Kazakhstan	-21.5	5.0	6.0	-38.6	28.0	4.2
Kyrgyz Republic	-29.7	5.0	5.0	-49.1	38.1	5.5
Moldova	-66.0	6.0	8.0	-65.8	-0.6	-0.1
Russia	-37.9	6.0	7.0	-46.4	15.8	3.0
Tajikistan	-48.8	6.0	6.0	-61.4	32.5	5.8
Turkmenistan	-8.6	7.0	7.0	-48.4	77.2	15.4
Ukraine	-53.8	9.0	9.0	-60.0	15.4	7.4
Uzbekistan	0.8	5.0	5.0	-18.0	22.9	3.5
Average	-34.2	5.5	5.8	-51.3	35.3	5.8
Baltics						
Estonia	-9.7	4.0	5.0	-35.1	39.1	4.8
Latvia	-33.8	3.0	4.0	-51.0	35.1	3.8
Lithuania	-27.7	4.0	5.0	-43.9	28.8	3.7
Average	-23.7	3.7	4.7	-43.3	34.3	4.1
Central and Eastern Europe (High Growth)						
Albania	17.8	2.0	4.0	-33.2	76.3	6.5
Czech Republic	4.5	2.0	4.0	-12.1	18.9	1.9
Hungary	12.2	3.0	3.0	-15.1	32.2	3.5
Poland	44.3	1.0	1.0	-7.0	55.1	4.5
Slovak Republic	6.1	3.0	3.0	-24.4	40.5	4.3
Slovenia	23.6	2.0	2.0	-13.9	43.6	4.1
Average	18.1	2.2	2.8	-17.6	44.4	4.2
Central and Eastern Europe (Low Growth)						
Bulgaria	-31.1	4.0	6.0	-33.8	4.0	0.6
Croatia	-5.0	3.0	4.0	-32.6	40.8	4.4
Macedonia, FYR	-12.7	5.0	6.0	-21.3	10.9	1.7
Romania	-11.4	2.0	5.0	-20.6	11.5	1.2
Average	-15.1	3.5	5.3	-27.0	16.8	2.0

Sources: IMF, WEO; Havrylyshyn and others (1999); and staff estimates.

Appendix Table 5. Growth Performance and Share of Agriculture in GDP

	Agriculture Share in GDP		Cumulative Growth		Total Number of Years of Decline		Cumulative Decline Before Initial Recovery	
	Rank	Average, 1990–2000	between 1990–2001 (rank*)	Number of Years of Decline Before Initial Recovery	Between 1990–2001	Recovery (rank*)	Cumulative Growth Since Initial Recovery (rank*)	
Albania	1	49.1	3	2.0	4.0	12	26	
Georgia	2	39.9	25	4.0	4.0	26	18	
Kyrgyz Republic	3	39.9	17	5.0	5.0	19	15	
Armenia	4	33.6	22	3.0	3.0	24	25	
MONGOLIA	5	33.2	8	3.0	3.0	6	10	
Moldova	6	33.0	26	6.0	8.0	25	11	
Uzbekistan	7	32.8	7	5.0	5.0	5	2	
Tajikistan	8	29.6	23	6.0	6.0	23	4	
Turkmenistan	9	24.7	11	7.0	7.0	18	1	
Azerbaijan	10	24.3	20	5.0	5.0	21	24	
Belarus	11	18.2	9	5.0	5.0	10	23	
Romania	12	18.1	13	2.0	5.0	7	8	
Ukraine	13	18.0	24	9.0	9.0	22	3	
Bulgaria	14	15.3	18	4.0	6.0	13	22	
Kazakhstan	15	14.0	15	5.0	6.0	15	16	
Lithuania	16	13.4	16	4.0	5.0	16	13	
Macedonia, FYR	17	12.9	14	5.0	6.0	8	12	
Latvia	18	11.9	19	3.0	4.0	20	14	
Croatia	19	11.0	10	3.0	4.0	11	21	
Estonia	20	10.9	12	4.0	5.0	14	19	
Russia	21	9.3	21	6.0	7.0	17	7	
Hungary	22	8.6	4	3.0	3.0	4	17	
Poland	23	6.0	1	1.0	1.0	1	9	
Slovak Republic	24	5.5	5	3.0	3.0	9	6	
Czech Republic	25	5.1	6	2.0	4.0	2	20	
Slovenia	26	4.5	2	2.0	2.0	3	5	

Sources: WEO; World Bank, World Development Indicators Database; Havrylyshyn and others (1999); and staff estimates.

* The lower the rank, the better the performance.

Appendix Table 6. Growth Performance and PPP-Based Per Capita Income Level

	Rank	PPP Per Capita GDP (Period Average, 1990–2000)	Cumulative Growth between 1990–2001 (rank*)	Number of Years of Decline Before Initial Recovery	Total Number of Years of Decline Between 1990–2001	Cumulative Decline Before Initial Recovery (rank*)	Cumulative Growth Since Initial Recovery (rank*)
Slovenia	1	13277	2	2.0	2.0	3	5
Czech Republic	2	12336	6	2.0	4.0	2	20
Hungary	3	9716	4	3.0	3.0	4	17
Slovak Republic	4	8864	5	3.0	3.0	9	6
Russia	5	7873	21	6.0	7.0	17	7
Estonia	6	7150	12	4.0	5.0	14	19
Poland	7	7112	1	1.0	1.0	1	9
Turkmenistan	8	6570	11	7.0	7.0	18	1
Lithuania	9	6553	16	4.0	5.0	16	13
Belarus	10	6397	9	5.0	5.0	10	23
Croatia	11	6128	10	3.0	4.0	11	21
Romania	12	6041	13	2.0	5.0	7	8
Latvia	13	5870	19	3.0	4.0	20	14
Kazakhstan	14	5169	15	5.0	6.0	15	16
Bulgaria	15	5011	18	4.0	6.0	13	22
Macedonia, FYR	16	4830	14	5.0	6.0	8	12
Ukraine	17	4682	24	9.0	9.0	22	3
Georgia	18	4621	25	4.0	4.0	26	18
Azerbaijan	19	2856	20	5.0	5.0	21	24
Moldova	20	2791	26	6.0	8.0	25	11
Albania	21	2727	3	2.0	4.0	12	26
Armenia	22	2626	22	3.0	3.0	24	25
Kyrgyz Republic	23	2580	17	5.0	5.0	19	15
Uzbekistan	24	2179	7	5.0	5.0	5	2
Tajikistan	25	1462	23	6.0	6.0	23	4
MONGOLIA	26	1448	8	3.0	3.0	6	10

Sources: WEO; Havrylyshyn and others (1999); and staff estimates.

* The lower the rank, the better the performance.

Appendix Table 7. Growth Performance and Openness

	Openness		Cumulative Growth between 1990–2001 (rank*)	Number of Years of Decline Before Initial Recovery	Total Number of Years of Decline Between 1990–2001	Cumulative		
	Rank	Imports/GDP (=Exports+ Exports/GDP)				Decline Before Initial Recovery (rank*)	Cumulative Growth Since Initial Recovery (rank*)	
								Average, available years during 1990-2001**
Moldova	1	2.10	0.95	26	6.0	8.0	25	11
Estonia	2	1.42	0.68	12	4.0	5.0	14	19
Slovak Republic	3	1.32	0.62	5	3.0	3.0	9	6
Armenia	4	1.31	0.44	22	3.0	3.0	24	25
Tajikistan***	5	1.31	0.62	23	6.0	6.0	23	4
Slovenia	6	1.24	0.63	2	2.0	2.0	3	5
Czech Republic	7	1.15	0.57	6	2.0	4.0	2	20
Belarus	8	1.15	0.55	9	5.0	5.0	10	23
Croatia	9	1.15	0.54	10	3.0	4.0	11	21
MONGOLIA	10	1.14	0.52	8	3.0	3.0	6	10
Latvia	11	1.07	0.50	19	3.0	4.0	20	14
Lithuania	12	1.04	0.49	16	4.0	5.0	16	13
Macedonia, FYR	13	1.00	0.45	14	5.0	6.0	8	12
Ukraine	14	0.99	0.49	24	9.0	9.0	22	3
Bulgaria	15	0.95	0.47	18	4.0	6.0	13	22
Hungary	16	0.87	0.43	4	3.0	3.0	4	17
Kyrgyz Republic	17	0.86	0.39	17	5.0	5.0	19	15
Azerbaijan	18	0.84	0.37	20	5.0	5.0	21	24
Turkmenistan***	19	0.69	0.33	11	7.0	7.0	18	1
Georgia	20	0.64	0.25	25	4.0	4.0	26	18
Kazakhstan***	21	0.63	0.31	15	5.0	6.0	15	16
Albania	22	0.61	0.16	3	2.0	4.0	12	26
Romania	23	0.59	0.26	13	2.0	5.0	7	8
Uzbekistan***	24	0.59	0.30	7	5.0	5.0	5	2
Russia	25	0.57	0.32	21	6.0	7.0	17	7
Poland	26	0.51	0.25	1	1.0	1.0	1	9

Sources: WEO; Havrylyshyn and others (1999); and staff estimates.

* The lower the rank, the better the performance.

** Trade data for most countries are obtained from the WEO database, unless otherwise indicated.

*** Trade data for Kazakhstan, Tajikistan, Turkmenistan, and Uzbekistan are obtained from relevant recent country reports and are limited only to the late 1990s due to the lack of data in the WEO database.

Appendix Table 8. Trade Restrictiveness Ratings, 1997-2001*

Country Name	Average, 1997-2001		
	Nontariff Trade Barrier Rating	Tariff Rating	Overall Rating
Mongolia ^{1/}	1.0	1.0	1.0
Average	Commonwealth of Independent States (CIS)		
	1.8	1.8	4.1
Average	Baltics		
	1.0	1.0	1.0
Average	Central and Eastern Europe (High Growth)		
	1.4	1.9	3.1
Average	Central and Eastern Europe (Low Growth)		
	1.2	2.7	3.3

Source: IMF Trade Policy Information Database (TPID).

* The ratings range between 1 and 10, with 1 corresponding to the least restrictive trade regime.

^{1/} For a more detailed description of Mongolia's trade regime, see Annex to IMF Country Report No. 02/253.

References

- Anderson, James, Young Lee, and Peter Murrell, 2000, "Competition and Privatization Amidst Weak Institutions: Evidence From Mongolia," *Economic Inquiry*, Vol. 38, No. 4 (October), pp. 527–549.
- Barro, Robert J., and Xavier Sala-i-Martin, 2000, *Economic Growth*, (New York: McGraw-Hill).
- Black, Stanley, 2001, "Obstacles to Faster Growth in Transition Economies: The Mongolian Case," IMF Working Paper WP/01/37 (Washington, D.C.: International Monetary Fund).
- Campos, Nauro and Fabrizio Coricelli, 2002, "Growth in Transition: What We Know, What We Don't and What We Should," *Journal of Economic Literature*, Vol. 60, No. 3 (September), pp.793–836.
- Djankov, Simeon, and Peter Murrell, 2002, "Enterprise Restructuring in Transition: A Quantitative Survey," *Journal of Economic Literature*, Vol. 60, No. 3 (September), pp. 739–92.
- Doyle, Peter, Guorong Jiang, and Louis Kuijs, 2002, "Real Convergence to EU Income Levels: Central Europe from 1990 to the Long Term," *Into the EU: Policy Frameworks in Central Europe* (Washington, D.C.: International Monetary Fund).
- Economist Intelligence Unit, 2001, Mongolia Country Profile.
- Havrylyshyn, Oleh, 2001, "Recovery and Growth in Transition: A Decade of Evidence," *IMF Staff Papers (Special Issue)*, Vol 48, pp. 53–87.
- Havrylyshyn, Oleh, Thomas Wolf, Julian Berengaut, Marta Castello-Branco, Ron van Rooden, and Valerie Mercer-Blackman, 1999, "Growth Experience in Transition Countries, 1990–98," IMF Occasional Paper 184 (Washington, D.C.: International Monetary Fund).
- Heytens, Paul and Harm Zebregs, 2000, "How Fast can China Grow?" *People's Republic of China: Selected Issues* (Washington, D.C.: International Monetary Fund).
- International Monetary Fund, 2002, *IMF Country Report No. 02/253* (Washington, D.C.: International Monetary Fund).
- Iradian, Garbis, 2003, "Armenia: The Road to Sustained Rapid Growth, Cross-Country Evidence," IMF Working Paper 03/103 (Washington, D.C.: International Monetary Fund).

- Kalra, Sanjay, and Torsten Sløk, 1999, "Inflation and Growth in Transition: Are the Asian Economies Different?" IMF Working Paper 99/118 (Washington, D.C.: International Monetary Fund).
- Lucas, Robert, 1998, "On the Mechanics of Economic Development," *Journal of Monetary Economics*, Vol. 22 (July), pp. 3–42.
- McMillan, John, and Christopher Woodruff, 2002, "The Central Role of Entrepreneurs in Transition Economies," *Journal of Economic Perspectives*, Vol. 16, No. 3 (Summer), pp. 153–70.
- Mongolian National Statistical Office and UNDP, 1998, *Living Standards Measurement Survey 1998*.
- Odling-Smee, John, 2003, *Economic Performance and Trade in the CIS*, presentation delivered at the International Conference dedicated to the 10th Anniversary of the National Currency of the Kyrgyz Republic, held in Bishkek on May 10, 2003.
- Sarel, Michael, 1997, "Growth and Productivity in ASEAN Countries," IMF Working Paper 97/97 (Washington, D.C.: International Monetary Fund).
- Schneider, Friedrich, and Dominik H. Enste, 2000, "Shadow Economies: Size, Causes and Consequences," *Journal of Economic Literature*, Vol. 38, No. 1 (March), pp. 77–114.
- Senhadji, Abdelhak, 1999, "Sources of Economic Growth: An Extensive Growth Accounting Exercise," *IMF Working Paper 99/77* (Washington, D.C.: International Monetary Fund).
- Sløk, Torsten, 2000, "Monetary Policy in Transition: The Case of Mongolia," IMF Working Paper WP/00/21 (Washington, D.C.: International Monetary Fund).
- Young, Alwyn, "Gold into Base Metals: Productivity Growth in the People's Republic of China During the Reform Period," *NBER Working Paper 7856* (Cambridge, Massachusetts: National Bureau of Economic Research).