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**Output Decline and Recovery in Uzbekistan: Past Performance and Future Prospects<sup>1</sup>**

Prepared by Günther Taube and Jeromin Zettelmeyer

Authorized for distribution by Peter Keller and Eduardo Borensztein

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**Abstract**

What explains Uzbekistan's unusually mild "transformational recession" and its moderate recovery during 1996-97? We examine potential biases in output measurement, the role of "special factors"—including initial production structure, natural resources, and public investment policies—and sectoral output developments. The main findings are (i) Uzbekistan's relatively favorable output record is *not* an artifact of measurement alone; (ii) public investment has had no significant effects on growth; (iii) the mildness of Uzbekistan's transitional recession can be accounted for by its favorable initial production structure and its self-sufficiency in energy; (iv) unless reforms are significantly accelerated, medium-term growth prospects are mediocre.

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Authors' E-mail Address: gtaube@imf.org, jzettelmeyer@imf.org

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## SUMMARY

Between 1991 and 1997, output in Uzbekistan fell less than in any other country of the Baltics, Russia, and the other countries of the former Soviet Union, and growth turned moderately positive in 1996 and 1997. What explains this fact in light of Uzbekistan's economic policies, which emphasized a gradualist approach to reforms and a large continuing role for the state over rapid liberalization and macroeconomic stabilization? As to the future, should the country depart from its gradualist and state-led reform strategy, or is this strategy the key to Uzbekistan's continued success?

To shed light on these issues, we look at evidence from a variety of methodological angles. First, we examine the extent to which output measurement could be yielding misleading results. Second, we use econometric results from Zettelmeyer (1998) to review a number of competing economic explanations, including favorable initial conditions, gradualism, and public investment. Third, we examine sectoral output developments. Fourth, we use the Zettelmeyer (1998) model to simulate medium-term growth under alternative policy assumptions.

The main findings are that (1) Uzbekistan's relatively favorable output record is *not* an artifact of measurement alone; (2) the mildness of Uzbekistan's transitional recession can be largely accounted for by its favorable initial production structure and its self-sufficiency in energy; (3) public investment has had no significant effects on growth; and (4) continuing current policies will lead to much lower-medium term growth rates than an acceleration of structural reforms.

While emphasizing the role of initial conditions, these results do not imply that Uzbekistan's relatively favorable output path was unrelated to policies. One interpretation is that the output decline was mitigated because industrial production could be maintained using subsidies financed through agricultural exports and by ensuring a continued supply of cheap energy, albeit at a high cost to consumers and growth in the medium term.

## I. INTRODUCTION

Uzbekistan's output record since independence has been exceptional when compared to that of most other transition economies. Its decline in official output between 1991 and 1997 was the lowest of any country of the Baltics, Russia, and the other countries of the former Soviet Union (BRO) (Table 1). In addition, Uzbekistan's "transformational recession" (Kornai 1994) was mild not only relative to the BRO average but even relative to the average of the Central European transition economies (Figure 1). This is true regardless of whether output is measured in calendar time or "transition time".<sup>2</sup> Finally, Uzbekistan resumed moderately positive growth during 1996 and 1997, behind some fast reformers such as the

Table 1. Baltics, Russia and Other Countries of the Former Soviet Union:  
Output Paths, 1992-1997

	Output Index (1991 = 100)						Cumul. loss, 1991-1997	Liberalization Index, 1995 2/
	1992	1993	1994	1995	1996	1997		
Armenia	47	41	43	46	49	50	324	0.60
Azerbaijan	78	60	49	44	44	46	279	0.40
Belarus	90	83	73	65	67	74	147	0.50
Estonia	78	72	71	74	77	81	148	0.90
Georgia	55	41	37	37	41	45	343	0.50
Kazakhstan	95	85	74	68	68	70	141	0.60
Kyrgyz Republic	86	73	58	55	58	62	208	0.80
Latvia	65	54	56	56	57	61	252	0.80
Lithuania	80	67	59	61	64	68	202	0.90
Moldova	71	72	49	49	45	46	269	0.70
Russia	86	78	68	66	64	64	175	0.70
Tajikistan	71	63	50	44	31	32	309	0.40
Turkmenistan	95	85	69	64	62	47	179	0.20
Ukraine	90	77	60	52	47	46	228	0.50
<b>Uzbekistan</b>	89	87	83	83	84	86	<b>89</b>	<b>0.50</b>
BRO Average	81	72	62	59	59	60	207	0.62
excl. Uzbekistan	80	71	60	57	57	58	217	0.63

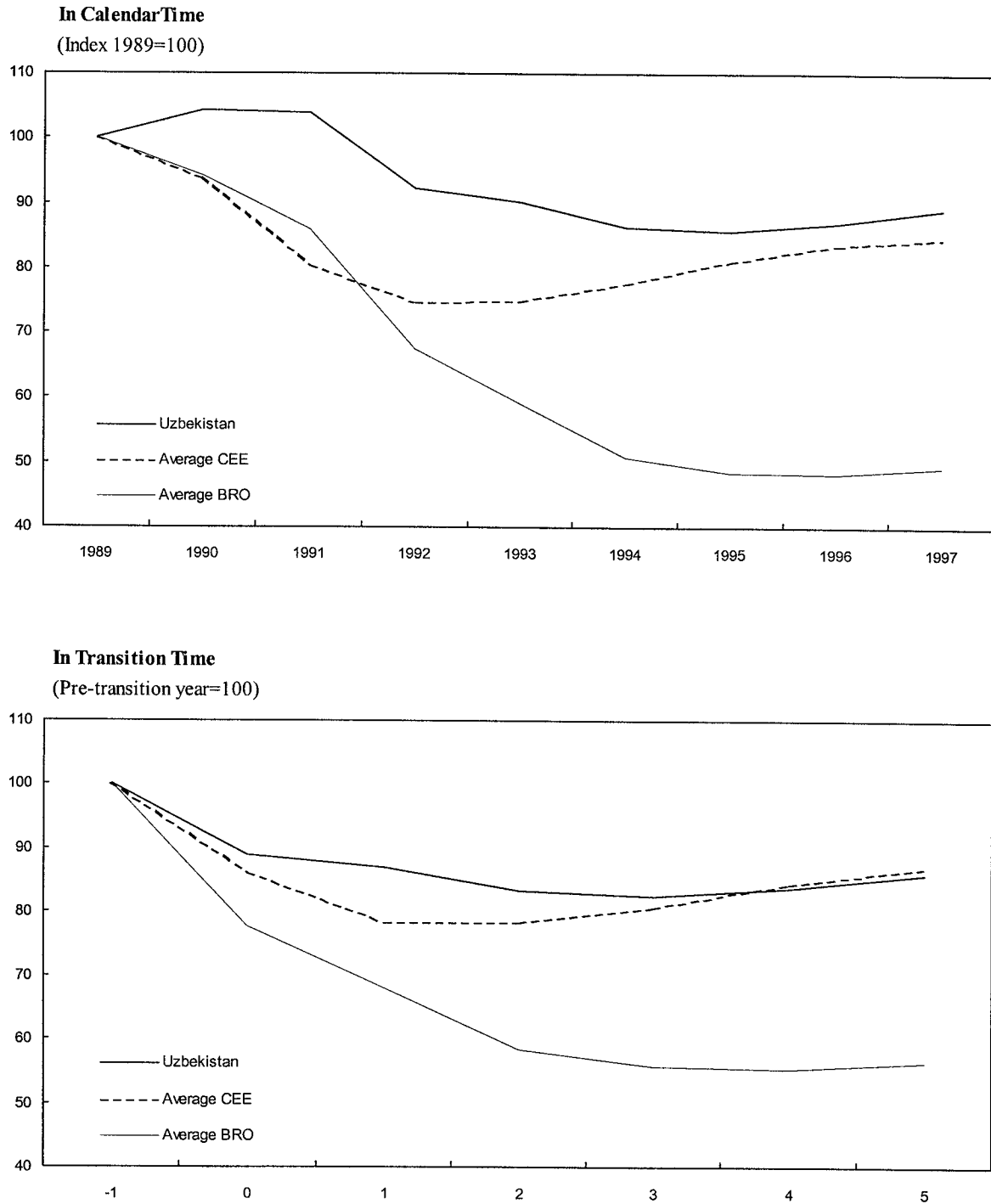
Sources: IMF; de Melo and Gelb (1997).

1/ In percent of 1991 output (sum of differences between 1991 level and levels in 1992 through 1997).

2/ Defined between 0 (no liberalization/structural reform) and 1 (full liberalization).

<sup>2</sup> Transition year zero is defined as the year in which central planning was decisively abandoned (Berg et al, 1998). This is taken to be 1992 for the BRO countries, 1990 for Poland, Hungary and countries on the territory of the former Socialist Federated Republic of Yugoslavia and 1991 for the remaining Eastern European countries.

Figure 1. Uzbekistan and Other Transition Economies: Output Paths



Source: IMF data, authors' calculations.

Baltic countries, the Kyrgyz Republic, and (more recently) Azerbaijan, but ahead of many other BRO countries including Russia and Ukraine, where output stagnated or continued to decline.

Uzbekistan's relative success is particularly striking given the government's hesitancy to engage in rapid market oriented reforms and sustained macroeconomic stabilization, i.e. policies that have been widely credited with contributing towards milder transitional recessions and quicker and stronger recoveries.<sup>3</sup> This raises a number of questions. How can Uzbekistan's exceptional output record be explained in light of its economic policies? Is it sustainable? As to the future, should the country's depart from its traditional gradualist and state-led reform strategy, or is this strategy the key to Uzbekistan's continued success?

The objective of this paper is to shed light on these questions by combining evidence from several methodological angles. We begin by giving some background on Uzbekistan's initial conditions and policy record. This helps us identify a number of alternative explanations for the country's output experience (Section II). In Section III, we first examine whether the observed cross-country differences in output performance could be an artifact of output measurement biases. After ruling out measurement as the main reason for Uzbekistan's relatively good official output record (although not as a contributing factor), we draw on a cross-country regression analysis of aggregate growth by Zettelmeyer (1998) to shed light on the competing explanations suggested in Section II. The results suggest that some of the potential explanatory variables—in particular, variables relating to Uzbekistan's low degree of initial industrialization and its commodity and energy production—do a good job at explaining the mildness of Uzbekistan's overall output decline, but the model is less successful at predicting the *recovery* of aggregate output in 1996 (the last year included in the econometric sample period). We thus move outside the econometric model and attempt to understand the main components of output growth in Uzbekistan, and in particular of recent growth, at the *sectoral* level. Finally, in Section IV we extend the Zettelmeyer (1998) analysis for the purposes of projecting Uzbekistan's growth under alternative policy scenarios in the medium term. Section V summarizes the principal results and concludes.

## II. BACKGROUND

### A. Initial Conditions

Although among the poorer Soviet Republics, Uzbekistan began the transition with relatively favorable initial conditions. It was less deeply entrenched in the former Soviet Union's industrial-military complex than most of the other BRO countries. According to De Melo et al. (1997), it was the least over-industrialized economy of any of the 26 Central and Eastern European and BRO transition countries. Under the Soviet system, Uzbekistan specialized in

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<sup>3</sup>Berg et al. (1998), de Melo et al. (1997), Hernández-Catá (1997), IMF (1998a), Fischer, Sahay, and Vegh (1996a, b), Sachs (1996), Åslund, Boone and Johnson (1996), Selowsky and Martin (1997), Wolf (1997) and World Bank (1996).

cotton cultivation, gold mining, and the exploitation of other natural resources.<sup>4</sup> Together, cotton and gold accounted for more than 30 percent of GDP and 60 percent of total exports in the early transition years. With this output and export composition, Uzbekistan could quickly and relatively easily redirect its main exports to Western markets after its traditional trade and payments arrangements collapsed with the Soviet Union. In addition, while Uzbekistan was not as well-endowed in petroleum and gas reserves as, for example, neighboring Kazakhstan or Turkmenistan, it was able to develop its energy sector to become energy self-sufficient.

In the context of transition, this production structure could have offered important advantages in two respects. First, agricultural and natural resource commodities that could either be sold for hard currency or substituted for hard currency imports allowed Uzbekistan to relax the foreign exchange constraint, and corresponding import constraint, that plagued other economies in the region. Second, self sufficiency (or near self-sufficiency) in energy might have constituted a particular advantage, especially in the early years of transition. Following independence, the centrally planned supplier relationships of the former Soviet Union were not quickly replaced by markets and international trade. Bilateral barter arrangements which some countries put in place in an attempt to maintain Soviet era goods flows proved unreliable and were plagued by non-payment problems, especially in the energy sector. These problems could be bypassed by maintaining an own energy supply.

Uzbekistan was also favored in one other aspect. Unlike a number of other BRO countries (Armenia, Azerbaijan, Georgia, Tajikistan), it did not suffer from additional output shocks due to war or civil strife. It has been estimated that each year in conflict has added 6.5 percentage points of GDP, on average, to the annual decline in output in transition countries since 1989 (World Bank 1996).

## **B. Investment Patterns and Industrialization Policies**

Investment patterns during the transition have reflected the government's strong emphasis on industrialization and import substitution. By contrast, investment in agriculture has been relatively small. IMF estimates suggest that the overall investment rate fluctuated at low levels in the early transition years but rebounded to about 20 percent of GDP in, largely on

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<sup>4</sup>Uzbekistan is well endowed with reserves of natural gas, oil, and coal, and has substantial deposits of gold, silver, copper, lead, zinc, wolfram, uranium, and tungsten. It is the world's fifth largest cotton producer and second largest cotton exporter (about 17 percent of world exports), and among the 10 largest gold producers. Agriculture has always been the key sector of the Uzbek economy, and a significant part of the industrial and services sectors depend on transporting and processing of agricultural commodities. At independence, agriculture's share in GDP was over 30 percent, and the sector's relative importance has remained high despite the Government's efforts to diversify the country's economic base.

account of higher investments financed by the budget and state-owned enterprises.<sup>5</sup> As under the Soviet system, outlays on new investment projects appear to have been given priority over expenditures geared to preserving and modernizing the existing capital stock.<sup>6</sup> A number of large investment projects were initiated by the government, generally in cooperation with foreign investors, in the energy sector and a few technologically advanced industrial subsectors. In addition to oil and gas exploration and exploitation, the government constructed and rehabilitated two refineries in Bukhara and Ferghana and is currently planning a large new oil-chemical complex in Shartan. Other prominent investment projects included gold mining and manufacturing of technologically advanced consumer goods, e.g., automobiles and electronics.<sup>7</sup>

Despite the involvement of foreign enterprises in a number of the large investment projects mentioned above, foreign direct investment remained limited. Cumulative inflows probably did not exceed US\$250 million through 1995, while inflows in 1996-97 are estimated at less than US\$200 million per year, which would be less than both the BRO and the CIS average on a per capita basis.<sup>8</sup> This may be related to the government's restrictive foreign exchange and trade policies and other problems in the business environment (see below).

### C. Structural Policies

Although some progress in structural reforms was made in the early years of the transition, domestic and external liberalization and enterprise restructuring and privatization have remained limited. In the early years, a significant number of prices were liberalized, explicit budgetary subsidies for consumers were abolished or reduced, residential housing was

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<sup>5</sup>Official investment data are very weak and need to be interpreted with caution, in part because they include current expenditures by the budget and state-owned enterprises.

<sup>6</sup>See Gavrilentov and Koen (1994) and Easterly and Fischer (1995) who discuss problems related to this investment approach in the context of the former Soviet Union. With assistance from the World Bank, a public sector investment review was initiated in 1996, which however did not produce useful results because of the unavailability of data.

<sup>7</sup>The government has also financed a number of large construction projects including the restoration of tourist sites, hotels, and several new administrative and representational buildings.

<sup>8</sup> Estimates of foreign direct investment are subject to considerable uncertainty. US\$200 million is equivalent to less than US\$10 per capita for Uzbekistan, compared to a CIS (BRO) average of about US\$ 20 (35) for 1996 and US\$23 (35) for 1997 according to IMF estimates. The EBRD (1998) estimates are much lower; it estimates Uzbekistan's net FDI at only US\$ 50 million for 1996 and US\$ 60 million for 1997. This translates to an average of less than US\$ 3 per capita, as compared to a CIS (BRO) average of about US\$ 26 (57) for 1996 and US\$33 (69) for 1997, according to the EBRD.



transferred to occupants (often at nominal fees), and many small enterprises and retail outlets were privatized. Privatization of medium and large enterprises did not begin until mid-1996, when the government initiated the Privatization Investment Fund (PIF) scheme with support from the World Bank. Some liberalization of the foreign exchange market and external trade was achieved in late 1995 and 1996 in the context of IMF-supported adjustment programs. However, most of these reforms were not sustained and some were reversed in 1997 (see below).

Throughout, the government has maintained control over large parts of the economy. In agriculture, the authorities control the production and marketing of the two most important crops, cotton and wheat. In industry, extensive support has been provided to keep state-owned enterprises afloat, including through budgetary on lending, low energy prices, directed credits at favorable terms, and priority access to foreign exchange at the favorable official exchange rate. Regulation is extensive, especially for small and medium sized enterprises, which also carry a heavy tax burden. Competition has remained limited in many sectors owing to the dominance of large state owned enterprises. "Anti-monopoly" policies have mainly taken the form of extensive price controls. Various restrictions on businesses and individuals have been maintained in the financial sector (e.g., on cash withdrawals and on the number of bank accounts).

Earlier progress in external liberalization was reversed in late 1996, when the Government severely tightened foreign exchange and trade restrictions. This has resulted in a fragmented market for foreign exchange, with several official exchange rates and a curb market premium of around 100 percent. Import tariffs were raised, and an ex-ante import registration scheme was introduced. For a number of important consumer goods (e.g., flour, sugar and vegetable oil) price controls were intensified in mid-1997. The privatization program also suffered some reversals in the second half of 1997.

Uzbekistan's slow pace and (since late 1996) reversals in structural reforms are reflected in international comparisons of the state of transition, "economic freedom", and private sector development. In terms of *average* liberalization over the 1992-1996 period, De Melo et al. (1997) rank Uzbekistan 21st out of 28 transition countries.<sup>9</sup> The EBRD (1997), which compares 25 transition economies according to a set of 8 criteria reflecting progress in specific areas of structural reform as of mid-1997, places Uzbekistan below the median in all 8 categories. In the categories "price liberalization" and "trade and the foreign exchange system" it is ranked 23rd. Within the BRO group, Uzbekistan is ranked below the median in all but one category.<sup>10</sup> Uzbekistan was given the second lowest ranking among all transition countries in the 1997 Freedom House Ranking, and listed as number 146 out of 156 countries

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<sup>9</sup> See also De Melo et al.'s liberalization index for 1995, which is reproduced in Table 1 (last column) for the BRO countries.

<sup>10</sup> The exception is "Securities markets and non-bank financial institutions", where the country is given exactly the median grade.

in the “Index of Economic Freedom” prepared by the Heritage Foundation and the Wall Street Journal. Finally, the private sector share in GDP is estimated to have increased from about 10 percent in 1990 to approximately 30 percent in 1995, but probably remained below 50 percent in 1997, less than most other transition countries at this time.<sup>11</sup>

### III. ELEMENTS OF AN EXPLANATION

The previous section suggests three partly overlapping hypotheses as to why Uzbekistan has done relatively well in managing to avoid a large transitional recession: (i) favorable initial conditions, including absence of initial overindustrialization, production of primary commodities and endowment with energy resources (possibly in combination with certain policies, including the policy of energy self-sufficiency); (ii) a gradualist reform strategy that deliberately avoided “shock therapy” and maintained a large role for the state in industry and agriculture; and (iii) an aggressive public investment program, in particular in areas of production in which the country traditionally lacked technological capability and/or where goods are currently imported.<sup>12</sup> The first of these explanations is the one that has been emphasized by Fund staff in the past. The second explanation has some supporters both in Uzbekistan and outside and can be given a theoretical justification, although it contradicts most (but not all) empirical evidence on determinants of output in transition.<sup>13</sup> The third one, finally, is the preferred explanation of the Uzbek authorities.

The main objective of this section is to present a test of these rival hypotheses and analyze the extent to which they can account for Uzbekistan’s output record. Before doing so, however, we must establish the extent to which this supposedly “exceptional” Uzbek record can be taken for a fact, i.e. we must check whether Uzbekistan’s observed output performance according to Table 1 might be driven by measurement problems.

#### A. The Role of Output Measurement

Measuring output in Uzbekistan has been difficult, in particular in the first few years following independence. Apart from methodological difficulties encountered when switching

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<sup>11</sup> See EBRD (1997). The EBRD has estimated the private sector share in GDP at 45 percent in mid-1997. This estimate is more plausible than the government’s official data which equates non-state ownership with private ownership.

<sup>12</sup> This strategy could be referred to as “import substitution” (see Bruton (1998)), but this is not a term which the Uzbek authorities use or would agree with.

<sup>13</sup> On empirical evidence implicitly or explicitly contradicting gradualism, see the references given in the introduction; for an empirical study supporting gradualism, see Heybey and Murrell (1997). In order to justify gradualism theoretically (at least in some circumstances), it would be possible to invoke Blanchard and Kremer (1997), who emphasize the role of “disorganization” in the output decline.

from the Net Material Product concept to the new System of National Accounts (SNA) and GDP, the statistical authorities had to cope with continued upward biases in reporting by state-owned enterprises (managers had incentives for being seen as meeting ambitious production targets), the effects of high inflation, large changes in relative prices, and the emergence of a private sector activities which could not easily be captured through traditional data collection systems.

However, these problems have affected output measurement in most, if not all transition economies. Arguing that Uzbekistan's relatively favorable measured output path can be partly or wholly attributed to measurement problems requires that Uzbekistan systematically overstated its output figures *relative* to the transition (and BRO) country average. In principle, this could be because (i) there is truly an upward bias in the way Uzbek output is measured, or (ii) output measurement in Uzbekistan merely carries *less* of a *downward* bias than that in other transition countries.

There are reasons to believe that output growth in Uzbekistan might have been substantially overestimated in recent years. Fund technical assistance missions have identified methodological problems in the compilation of the national accounts, including an inconsistent treatment of informal sector activities over time, inappropriate procedures for dealing with the increased share of high-value commodities with low trade margins in organized retail turnover, and the use of the downward biased consumer price index as a deflator for trade activities and subsidies. In addition, there are inconsistencies in growth estimates for specific sectors in 1997. For agriculture, the official growth estimate is based on a sharp increase (22 percent) in real gross production value for "other products," which include fodder and feed crops. However, according to other official and nongovernment sources, production of these crops did not increase in 1997. For the domestic trade sector, the official growth estimate is 17 percent (after 20 percent in 1996); this is implausible against the background of a substantial compression of consumer goods imports during 1997.

However, it is unlikely that these problems alone could explain Uzbekistan's exceptionally mild transitional recession, and in particular the lower output decline during the *early* years. Moreover, the most recent (1997) annual growth estimate shown in Table 1 is already based on IMF estimates which are more conservative than Uzbekistan's official statistics, especially as regards real growth in the services sectors (see Table 5 below).

The second possibility, namely that Uzbekistan's output numbers overstate the true output decline to a lesser degree than those of other transition economies, seems more plausible *ex-ante*. It is well established that official statistics in transition economies tend to underestimate the activity of the newly emerging private sector.<sup>14</sup> The larger the share of the new sectors in

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<sup>14</sup> See Dobozi and Pohl (1995), Kaufmann and Kaliberda (1996) and Bloem, Cotterell, and Gigantes (1996). In the context of specific countries, see Berg (1993) for Poland, Gavrilencov and Koen (1994) for Russia, and de Broeck and Kostial (1998) for Kazakhstan.

total output, the larger the downward bias to GDP measurement.<sup>15</sup> As a result, countries such as Uzbekistan, in which economic policies are geared to preserving—and, indeed, adding—to the official sector, will *ceteris paribus* suffer *smaller* downward biases to output measurement than transition countries where the private sector grows quickly.

This argument has empirical backing from output estimates based on changes in electricity consumption. According to these estimates, Uzbekistan's informal sector's share in GDP remained low compared to that of most other transition economies. Johnson, Kaufmann, and Shleifer (1997) estimate the share of the unofficial economy for Uzbekistan at 9.5 percent for 1994 and 6.5 percent for 1995.<sup>16</sup> By contrast, the (unweighted) average for the BRO economies is 36.2 and 34.4 percent, respectively.<sup>17</sup> Table 2 shows the values of the Kaufmann-Kaliberda output index for 1994 and 1995 for the BRO economies and compares output losses based on this index with those based on the output indices used in Table 1. For 1994, we also show an alternative set of electricity-based estimates due to Dobozi and Pohl (1995).

Table 2 implies that if electricity-based GDP estimates are used to compare Uzbekistan with the other BRO countries, Uzbekistan stands out less than if official GDP data are used. However, even electricity-based output data indicate that Uzbekistan suffered the smallest output decline by both 1994 and 1995 and the smallest cumulative output loss through 1995 of any BRO country. This suggests that measurement problems play some role in explaining Uzbekistan's relatively small output decline according to official data, but that they are not the only—or even the main—explanatory factor. The question is now whether other explanations are capable of narrowing the gap between the actual and “explainable” output

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<sup>15</sup> Let  $Y$  denote total output.  $Y \equiv Y_O + Y_N$ , where  $Y_O$  and  $Y_N$  denotes output in the old and new sectors, respectively. Let  $\tilde{Y}$  denote measured output. Assume  $\tilde{Y} \equiv Y_O + \beta Y_N$ , where  $0 < \beta < 1$ . The percentage bias in output measurement is defined as  $(\tilde{Y} - Y)/Y$ , a negative number if the bias is downward. Substituting the previous definitions,

$$\frac{\tilde{Y} - Y}{Y} = (\beta - 1) \frac{Y_P}{Y}$$

Thus, the bias is greater (more negative) the larger the private sector share,  $Y_P/Y$ .

<sup>16</sup> The estimate for 1995 is consistent with estimates from the Uzbek authorities, who put the share of the unofficial economy at about 6 percent of GDP in 1995 and about 10-12 percent in 1996 and 1997.

<sup>17</sup> The weighted average would be even higher, since the estimated shares for Russia and Ukraine are 40.3 and 45.7 percent for 1994 and 41.6 and 48.9 for 1995, respectively.

paths to a margin which can be reasonably attributed to measurement issues on the basis of Table 2.

Table 2. Official GDP and GDP Estimates Based on Electricity Consumption

	1994 GDP Index (1991=100)			1995 GDP Index (1991=100)		Cumulative Loss 1991-95 4/	
	Official 1/	KK 2/	DP 3/	Official 1/	KK 2/	Official	KK
Armenia	42.9	...	51.9	45.9	...	223	...
Azerbaijan	49.0	71.6	75.5	43.7	70.3	169	97
Belarus	72.9	66.8	71.2	65.3	60.2	88	108
Estonia	70.6	80.9	80.9	73.7	70.8	105	87
Georgia	36.5	43.8	50.4	37.4	43.8	230	173
Kazakhstan	74.0	69.9	74.1	67.9	63.9	79	92
Kyrgyz Republic	58.2	...	...	55.0	...	128	...
Latvia	55.5	66.8	66.8	55.7	66.9	170	121
Lithuania	59.2	56.9	56.9	60.5	53.2	133	154
Moldova	49.4	60.9	66.0	48.7	58.9	159	122
Russia	68.2	78.1	81.1	65.5	76.4	103	66
Tajikistan	49.7	...	...	43.5	...	173	...
Turkmenistan	69.2	...	...	63.5	...	87	...
Ukraine	59.6	72.6	76.4	52.3	68.2	121	83
Uzbekistan	83.2	85.3	87.4	82.5	81.6	59	51

1/ IMF data based on official statistics of country authorities, see Table 1.

2/ Kaufmann-Kaliberda methodology. Source: Johnson, Kaufmann and Shleifer (1997).

3/ Dobozi-Pohl methodology. Source: Dobozi (1995).

4/ See Notes to Table 1.

### B. The Role of "Special Factors"

We now turn to the role of the "special factors" which may have played a role in Uzbekistan and which were summarized at the beginning of this section in the form of competing hypotheses. A natural approach to shed evidence on these hypotheses is to test for the significance of the main variables emphasized by each in the context of a regression model which controls for potentially relevant co-determinants of output or growth (including, in particular, those variables which are stressed by the competing hypotheses).<sup>18</sup> Implementing this approach, however, is not straightforward.

<sup>18</sup> Note that this approach falls somewhat short of constituting a formal test of these hypotheses as the null hypothesis in the context of a significance test is that the variables under scrutiny do not matter, whereas the null we are really interested in rejecting is that they do matter.

- As the number of variables of interest clearly exceeds the number of data points available for Uzbekistan (5 or 6), one needs to work with a panel regression that estimates the effect of these variables on growth on the basis of the experience in many transition economies, not just Uzbekistan.
- In order to control for other potentially relevant co-determinants of growth, one requires a statistical model that not only accounts for the effects of the “special factors” implicit in the hypotheses outlined, but also for the effects of relevant policies and initial conditions other than the “special factors”.

An existing model that incorporates these features is that of Berg, Borensztein, Sahay and Zettelmeyer (1998), who regress growth on macroeconomic and structural policies as well as a standard set of initial conditions using a panel of 26 transition economies. As Zettelmeyer (1998) shows, in spite of its generality, this model is *not* very successful in explaining why Uzbekistan did relatively well. Specifically, it systematically underpredicts Uzbek growth for every year between 1992 and 1996 (the sample period considered) and the sum of absolute residuals over this period is larger for Uzbekistan than for any other country. However, it is also the case that, except for a variable capturing “overindustrialization” and variables controlling for structural reforms, the special factors addressed by the competing hypotheses formulated above are not reflected in this general model.

In response, Zettelmeyer (1998) extends the Berg et al. model by including a number of additional variables that might contribute toward explaining Uzbekistan’s output experience based on the hypotheses formulated above.<sup>19</sup> These include variables measuring the production value of commodities that can be readily exported for hard currency (such as energy, non-ferrous metals and agricultural variables including cotton), a variable capturing the degree of energy self-sufficiency and variables capturing public investment. On the basis of this extended model, two questions are asked: (i) which of the variables implicit in the hypotheses formulated at the beginning of this section matter, and which do not? (ii) to what extent do the surviving hypotheses explain Uzbekistan’s growth performance? In the

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<sup>19</sup>These regressions use the official output data, as output estimates based on electricity consumption seem even more problematic (i) in assuming constant output elasticities of electricity consumption along time; (ii) in making somewhat arbitrary assumptions about the magnitude of this elasticity across countries. As Koen (1995) has pointed out, these are implausible assumptions in the context of transition economies undergoing fundamental structural changes, including drastic changes in relative prices, a large potential for energy savings, and substantial shifts in the structure of production (e.g., strong growth in services sectors). In the context of a panel regression, this is a particularly serious issue as the speed of these changes is likely to vary substantially across countries. While the official data probably exaggerates the differences between Uzbekistan and the other countries, it is thus not clear that differences in the output paths within the remaining set of countries, on which our regression results are based, are more accurately captured by electricity-based consumption estimates than by the official data.

following, we limit ourselves to summarizing the answers to these questions; for technical details see Zettelmeyer (1998).

### **Which “Special Factors” matter?**

The main results from the regressions of Zettelmeyer (1998) are summarized as follows.

- the contribution of the public investment variable is particularly weak. Not only is it insignificant, but with one exception its t-values are consistently lower than those of all other variables, and it exhibits contradictory signs depending on whether it is normalized by GDP or population.
- upon rederiving the basic cross-country model after including the agricultural and natural resource variables listed above, the paper finds (i) a robust and significant positive effect of cotton production (ii) a robust and significant *negative* effect of energy *exports*; (iii) a positive effect of energy self-sufficiency which, however, was significant only in some variations of the model; (iv) insignificant effects of non-ferrous metal production when simultaneously controlling for cotton (but positive and significant effects when not).
- As in Berg et al. (1998), the main variables driving the recovery are indices proxying market oriented reforms. Although the model does not suggest that the speed of reforms matters *per se* (only the levels of the structural reform indices matter in the regression, not how quickly these are realized), this does imply that the faster a market environment is created, the better from the perspective of recovery.

On the basis of these results, one would conclude as follows. First, government investment seems to play a minimal role, if any, in explaining cross-country growth differences in transition economies.<sup>20</sup> Second, as structural reforms are found to be the main engine of recovery, it is hard to make a case for gradualism on the grounds of the above results. Third, a number of the variables capturing commodity production and energy which were discussed in the previous section appear to matter when included in the extended model. The question is now to what extent these variables solve the “Uzbek Growth Puzzle”, and whether the way in which they appear to act can be given a reasonable interpretation based on what was said about these variables in the background section.

### **How well is the Uzbek growth experience explained?**

Table 3 compares fitted and actual growth since 1992 for Uzbekistan and an unweighted average of 14 BRO economies excluding Uzbekistan, based on two variants of the extended

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<sup>20</sup> One important caveat applies, which is that the quality and consistency of public investment measurement across countries is questionable and this might bias the coefficient on public investment towards zero.

(rederived) model presented in Zettelmeyer (1998). The two variants differ in the set of agricultural and natural resource variables (see below), but their ability to “fit” the Uzbek growth path is very similar. As is apparent from the residuals for Uzbekistan, both models still have some difficulty in explaining why Uzbek output declined so little in 1994 and why it began to recover in 1996. However, the models do a satisfactory job in fitting the Uzbek experience in at least three respects. First, some residuals are now positive and others negative; thus, Uzbek growth during transition is no longer systematically underpredicted. Second, the models do at least as well—in fact, slightly better—in fitting the Uzbek path as they do in fitting the path of the average BRO economy. This can be checked by comparing the lines showing the absolute residuals for each transition year in the two panels of Table 3. Third, most of the difference between the Uzbek growth path and that of the average BRO economy is “explained” in Table 3, i.e. it is captured by differences in the fitted values rather than in the residuals.

Table 3. Uzbekistan and BRO Average: Fitted and Actual Growth Paths  
(in percent p.a.)

	1992	1993	1994	1995	1996
<b>Model A</b>					
	Average of BRO Countries excluding Uzbekistan				
Actual Growth	-22.3	-12.9	-13.4	-4.1	-1.0
Fitted Growth	-22.3	-12.7	-12.5	-3.2	-1.1
Residual	0.0	-0.2	-0.9	-0.9	0.2
Average of Absolute Residual	2.3	3.2	4.8	3.1	5.2
	Uzbekistan				
Actual Growth	-11.1	-2.3	-4.2	-0.9	1.6
Fitted Growth	-10.0	-2.2	-8.9	-0.2	-2.2
Residual	-1.1	-0.1	4.7	-0.7	3.8
Absolute Residual	1.1	0.1	4.7	0.7	3.8
<b>Model B</b>					
	Average of BRO Countries excluding Uzbekistan				
Actual Growth	-22.3	-12.9	-13.4	-4.1	-1.0
Fitted Growth	-22.2	-13.2	-12.6	-3.9	-1.4
Residual	-0.1	0.3	-0.8	-0.2	0.4
Average of Absolute Residual	2.3	3.1	4.1	2.9	5.3
	Uzbekistan				
Actual Growth	-11.1	-2.3	-4.2	-0.9	1.6
Fitted Growth	-11.6	-0.6	-8.4	0.2	-1.5
Residual	0.5	-1.7	4.2	-1.1	3.1
Absolute Residual	0.5	1.7	4.2	1.1	3.1

This leads naturally to the question of what drives the differences in the fitted values between Uzbekistan and the BRO average. The answer is given in Table 4, which decomposes the fitted values into the contributions of the main groups of right hand side variables (see Zettelmeyer 1998 for technical details):



Table 4. Contributions of Major Groups of Variables to Fitted Growth  
(in percent p.a.)

	1992	1993	1994	1995	1996
<b>Model A</b>	Average of BRO Countries excluding Uzbekistan				
Macroeconomic Policy	-1.3	2.3	2.2	1.6	1.9
Structural Reforms	9.7	9.0	11.0	13.6	13.6
Initial Conditions	-9.5	-2.8	-7.1	-1.1	1.6
Constant	-19.0	-19.0	-19.0	-19.0	-19.0
War	-3.4	-3.4	-0.8	-0.2	-0.4
New Variables	1.2	1.2	1.3	1.9	1.2
Cotton	0.7	0.7	0.9	1.0	0.4
Energy self-sufficiency	0.5	0.5	0.4	0.8	0.8
	Uzbekistan				
Macroeconomic Policy	-5.8	1.1	0.5	0.8	0.7
Structural Reforms	7.8	3.3	7.7	9.8	10.9
Initial Conditions	0.7	5.9	-5.6	-0.7	-0.9
Constant	-19.0	-19.0	-19.0	-19.0	-19.0
War	0.0	0.0	0.0	0.0	0.0
New Variables	6.4	6.5	7.6	8.9	6.2
Cotton	3.9	3.9	5.0	6.2	4.1
Energy self-sufficiency	2.5	2.6	2.5	2.7	2.1
<b>Model B</b>	Average of BRO Countries excluding Uzbekistan				
Macroeconomic Policy	-1.8	2.1	2.2	1.5	1.7
Structural Reforms	7.1	6.9	7.4	10.2	11.3
Initial Conditions	-15.5	-9.8	-12.3	-6.6	-4.2
Constant	-7.8	-7.8	-7.8	-7.8	-7.8
War	-2.7	-2.7	-0.7	-0.2	-0.3
New Variables	-1.6	-1.9	-1.5	-1.1	-2.1
Cotton	0.8	0.8	1.1	1.3	0.5
non-Cotton Agricultural Commod.	-1.5	-1.9	-1.5	-1.7	-1.9
Energy exports	-0.9	-0.9	-1.0	-0.7	-0.7
	Uzbekistan				
Macroeconomic Policy	-6.8	0.8	0.7	0.8	0.6
Structural Reforms	5.0	2.4	2.3	4.5	6.5
Initial Conditions	-5.8	0.0	-8.9	-3.8	-3.8
Constant	-7.8	-7.8	-7.8	-7.8	-7.8
War	0.0	0.0	0.0	0.0	0.0
New Variables	3.9	4.1	5.3	6.4	3.1
Cotton	4.8	4.8	6.2	7.8	5.2
non-Cotton Agricultural Commod.	-0.9	-0.8	-0.9	-1.3	-1.3
Energy exports	0.0	0.0	0.0	0.0	-0.8

Note first that Table 4 suggests that Uzbekistan's relatively favorable growth performance did not happen because, but rather *in spite of* its macroeconomic and structural policies. On both counts, and particularly in the area of structural reforms, Uzbekistan's policies were worse for growth than in the average BRO economy. Instead, the positive difference in the fitted values of Uzbekistan and the BRO average originates from the variable groups "initial conditions" and "new variables". As regards the former, a further disaggregation of the initial conditions group (not shown) indicates that the differences in initial conditions are mainly due to the variables capturing overindustrialization and share of agriculture. As regards the latter, in Model A cotton—expressed as dollar value per capita—shares the credit with the variable measuring energy self-sufficiency while in Model B most of the favorable impact of the additional variables is concentrated on cotton; energy self-sufficiency was not significant in B. However, the *total* growth advantage imparted by the commodity and energy variables is about the same in both versions: between five and eight growth points relative to the average transition economy, depending on the year.

Zettelmeyer (1998) also addresses an important methodological risk, which is that the new variables, which according to Table 4 impart such a positive effect on Uzbek growth, might not actually be important in themselves, but merely *seem* important because they are effectively proxying something about the favorable Uzbek experience which we still have failed to measure. The most straightforward way to decide whether this could be the case is to re-estimate the model after *excluding* Uzbekistan from the sample and see how this affects the outcome. Zettelmeyer (1998) shows that while the coefficients drop in value, they are, in economic terms, still quite close, and they still do a satisfactory job in fitting the Uzbek experience (out of sample). Moreover, a structural break test testing the equality of the models including and excluding the Uzbek samples does not reject equality. Under these circumstances, it is valid to interpret the results of Table 4 as reflecting the economic impact of the new variables rather than proxying an unmeasured "Uzbekistan effect".

### C. A Sectoral View

We conclude our analysis of output developments in Uzbekistan by examining growth at the sectoral and sub-sectoral level. This serves both as a complement of our previous analysis of aggregate growth, and sheds some light on why growth turned the corner in 1996 and remained moderately positive in 1997.

As indicated above, overall output held up relatively well during the first few years of the transition and the economy resumed growth in late 1995 and during 1996. However, production trends have been very diverse across and within sectors since independence (Table 5 and Figure 2). Output in industry, transport and communication, and construction fell more than overall GDP, while agriculture and, in particular, the trade and services sectors performed relatively better. Within the industrial sector, output declined in a number of traditional subsectors, which however was partly compensated by sharply higher energy production and increases in output for a number of intermediate and final consumer goods.

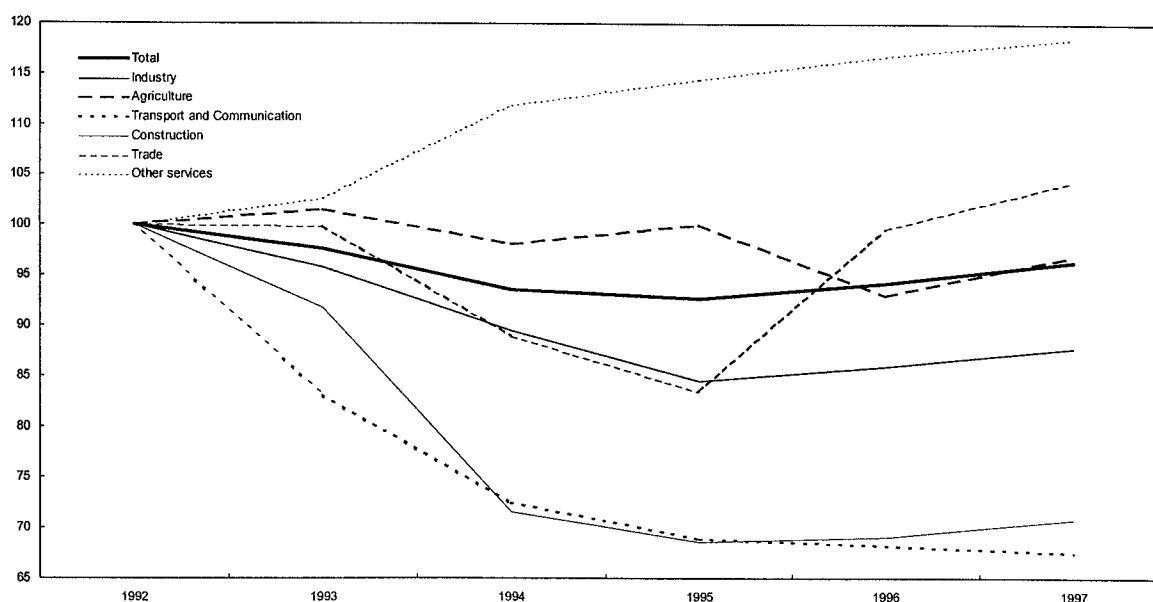
Table 5. Uzbekistan: Real GDP Growth by Sector, 1992-97  
(In percent over previous year, unless otherwise stated)

	1992	1993	1994	1995	1996	1997 (estimates)	
						Staff	Official
Total	-11.1	-2.3	-4.2	-0.9	1.6	2.4	5.2
Agriculture	...	1.5	-3.4	2	-7	4.2	5.8
Industry	...	-4.2	-6.6	-5.6	1.7	2.2	2.2
Transport and communication	...	-17	-12.7	-5	-1	-1	-1
Construction	...	-8.3	-22	-4.1	0.6	2.6	2.6
Trade	...	-0.2	-10.9	-6.2	19.5	4.7	17.1
Other services 1/	...	2.6	9.1	2.3	2	1.6	4.1
Indirect subsidies minus taxes	...	...	-2.5	-0.4	14.1	1.5	8.1
<b>Memorandum Item: Shares of GDP at Market Prices</b>							
Total		100.0	100.0	100.0	100.0	100.0	...
Agriculture		27.9	34.5	28.1	22.4	25.8	...
Industry		22.4	17.0	17.1	17.8	16.5	...
Transport and communication		5.5	5.8	7.3	6.7	6.3	...
Construction		9.0	7.2	7.1	8.2	8.1	...
Trade		6.2	7.5	5.2	7.0	8.2	...
Other services 1/		19.6	19.8	22.1	23.3	23.6	...
Indirect taxes minus subsidies		9.4	8.2	13.1	14.4	11.5	...

Sources: Ministry of Macroeconomics and Statistics; and Fund staff estimates.

1/ Includes the government sector.

Figure 2. Uzbekistan: Real GDP Index by Sector (1992=100)



While this trend is hidden in the aggregated output data, it is clearly borne out by statistics on physical production volumes (Table 6).<sup>21</sup>

Table 6. Uzbekistan: Production of Selected Industrial Products, 1991-97

	Unit	1991	1992	1993	1994	1995	1996	1997
<b>Machinery, raw materials, and intermediate goods</b>								
Paper	'000 tons	20	16	13	8	9	11	8
Cement	'000 tons	6,191	5,935	5,277	4,780	3,419	3,277	3,286
Ferrous metal products	'000 tons	749	604	573	337	322	423	350
Mineral fertilizers	'000 tons	1,660	1,361	1,273	811	943	1,029	954
Plastics and synthetic resins	'000 tons	126	94	53	20	13	11	10
Fibers and chemical thread	'000 tons	49	33	23	13	8	6	7
Compressors	units	11,106	8,123	3,981	1,264	784	828	284
Power transformers	'000 kWh	6,771	4,621	2,590	1,106	780	535	398
Tractors	units	21	19	12	2	4	4	3
Cotton harvesters	units	5,800	2,350	2,155	651	1,121	863	1,049
Cotton sowing machines	units	1,800	1,800	1,350	970	330	470	411
Steel	'000 tons	860	688	611	364	367	466	379
Window glass	'000 m <sup>2</sup>	2,537	3,130	2,807	1,122	2,130	1,499	5,123
Cotton fiber	'000 tons	1,532	1,404	1,258	1,385	1,238	1,164	1,125
<b>Consumer goods</b>								
Refrigerators and freezers	units	211,900	84,300	81,750	19,750	18,600	12,700	35,000
Automobiles	units	--	--	--	800	3,000	25,400	64,900
Television sets	units	1,100	9,200	16,400	51,800	64,900	139,650	268,450
Video recorders	units	2,100	18,900	6,500	23,900	25,300	100,000	140,600
Cotton cloth	'000 tons	392	484	482	480	456	445	425
Tricotage products	million units	95	93	98	96	34	46	50
Synthetic textiles	'000 tons	36	18	16	8	7	3	3
Socks and hosiery	million pairs	103	106	109	107	66	68	62
Shoes	million pairs	45	41	41	28	6	5	5
Soap	'000 tons	16	7	8	9	9	7	4
Detergent	'000 tons	36	18	16	8	7	3	...
Vegetable oil	'000 tons	400	325	291	360	340	232	237
<b>Energy products</b>								
Electricity	bn. kWh	54	51	49	48	47	45	46
Coal	'000 tons	5,948	4,681	3,807	3,845	3,054	2,837	2,946
Natural gas	bn. m <sup>3</sup>	42	43	45	47	49	49	51
Oil and gas condensate	'000 tons	2,831	3,293	3,944	5,517	7,586	7,621	7,891

Source: Ministry of Macroeconomics and Statistics.

<sup>21</sup>For example, output fell dramatically in the case of paper, cement, mineral fertilizer, chemical production, power transformers, tractors, and cotton harvesters.

Industrial output performance in more recent years benefitted substantially from government efforts to promote domestic production of consumer goods in a few industrial sectors. During the past two years, these included, most prominently, manufacturing of television sets, VCRs, and automobiles. At the same time, the government was able to stabilize production in a number of industrial subsectors that continued to be dominated by large state-owned enterprises producing, for example, paper, cement, ferrous metals, and mineral fertilizer. In part, this may have reflected the continuing support through the budget and easy access to directed central bank and commercial bank credit on concessional terms. By contrast, and despite government support, output continued to decline in a number of other industrial sectors, including machinery (e.g., power transformers, tractors, cotton harvesters), raw materials and intermediate goods (e.g., window glass, cotton fiber), and consumer goods (e.g., refrigerators and freezers, cotton cloth, shoes, detergents, and vegetable oil).

In agriculture, cotton production fell while grain output increased, in part as a result of government efforts to shift land to grain production so as to achieve food self-sufficiency. At the same time, there was a decline in livestock production from state owned enterprises, while there was a favorable supply response from the private sector as regards output, and productivity, in livestock products as well as fruits and vegetables. Aggregate agricultural production fell sharply in 1996, mainly as a result of a poor cotton harvest, and partly rebounded in 1997.

As regards services, Uzbekistan's output performance has been fairly similar to other transition countries where the previously repressed services sectors have often been the leading sectors of "new growth" (de Melo et al. 1996, World Bank 1996). The services sector started expanding in late 1995 and 1996, when the macroeconomic situation began to stabilize. Helped by trade liberalization and boosted foreign exchange earnings through favorable world market prices for cotton, imports of investment goods, intermediate products, and consumer goods increased substantially during this phase. As a consequence, domestic wholesale and retail activities thrived, especially in Tashkent. Many small private businesses and shops opened or extended their activities during this phase, including the large number of previously privatized small firms and retail outlets.

In summary, the recovery of aggregate production in 1996 was driven by (i) sharp growth in services, fueled by small scale privatization and trade and foreign exchange liberalization in late 1995, which more than offset a bad cotton harvest; (ii) the government's success in arresting the industrial output decline, in particular in industrial subsectors that continued to be dominated by large state-owned enterprises. The continuing modest growth in 1997, on the other hand, was mainly the result of a partial rebound in agriculture combined with continuing, albeit much slower, growth in services, as consumer goods imports were restrained.

#### **IV. MEDIUM TERM GROWTH PROSPECTS**

Having spent the last section on interpreting Uzbekistan's past growth record from a variety of angles, we now ask how the country's *future* growth performance is likely to be influenced

by alternative sets of economic policies. Our main vehicle is the econometric model used in Section III.B, which seems well-suited to the task in two respects. It did a good overall job at fitting Uzbek growth performance in the past. Given the generality of its right hand-side (in particular, in capturing the structural transformation process—see Zettelmeyer 1998 and Berg et al. 1998) one would thus presume that it might have something useful to say about the future, conditioning on alternative sets of right hand side variables. Moreover, it is easy to use for the purposes of simulating the effects of alternative policies, as these can be translated into assumptions about the paths of structural reform indices, the fiscal deficit and inflation which can be fed directly into the model.

This said, some limitations and caveats apply. First, the model does not contain lagged endogenous variables on the right hand side. This was essential to enable a decomposition of fitted values into the various groups of independent variables (Table 4), however, estimation as a times series model would have led to a better fit and presumably better predictive properties. Second, the model was estimated on a panel covering the first 5-6 years of transition for each country; thus, it would be wrong to use it as a basis for long-term (post-transition) growth projections.<sup>22</sup>

In the case of Uzbekistan, the second caveat applies with less force, as Uzbekistan's slow pace of reforms suggests that it can be usefully modeled as a transition economy over the medium term, which is our concern here. The other caveat implies that caution needs to be exercised when it comes to interpreting the model's predictions. In particular, all projections should be viewed as exercises to check the sensitivity of growth rates to alternative policy assumptions, rather than forecasts. That is, the *level* of projected growth rates should be taken less seriously than the *differences* between levels that are generated by alternative policy scenarios.

#### A. Assumptions

We consider four policy scenarios. The first two assume continuing current policies at first, following by either backtracking in certain areas of market-oriented reforms or more accommodative macroeconomic policies. The others study two variants of accelerated reforms. In the following, we motivate and describe these alternative scenarios in general (qualitative) terms; the corresponding numerical values for the main right hand side variables are given in the Appendix.

**Current policies** in Uzbekistan are characterized by stalled or very slow moving structural reforms and relatively loose credit policies, driven in particular by credit to priority non-government sectors (i.e. specific industries and agriculture), while the government's attention

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<sup>22</sup> One manifestation of this fact is that, as can be seen from the negative constant in Table 4, the model predicts a decline in output unless there is continuing liberalization and structural reform. Obviously, one would not expect this to continue indefinitely once liberalization and reform indices have reached the levels of market economies.

is focused on its public investment program.<sup>23</sup> In the short run, a continuation of these policies implies (1) stagnant structural reforms; (2) stable inflation at moderately high levels, as the government continues its current practice of partly offsetting the monetary impact from loose credit policies by allowing international reserves to decline. In the medium run, however, the scope for acceptable reserve reductions will be exhausted. At this stage, the government has two options. One is to address (or at least suppress) macroeconomic imbalances. In line with current policies, this would take place primarily through administrative measures (scenario “**Current Policies/Reform Reversals**”). The government would attempt to reduce or suppress aggregate demand by extending price controls and the state order system, imposing additional restrictions on imports and access to foreign exchange, and tightening other restrictions on the way firms do business (for example, tightening cash withdrawal restrictions). These reversals show up as a deterioration in all three indices used in Zettelmeyer (1998) (following de Melo et al. 1996) to characterize the state of structural reforms, i.e. as a backtracking in the areas of price liberalization, external liberalization, and private sector conditions. Alternatively, the government could accept a faster expansion in the money supply and consequently higher inflation if the state of regulations and restrictions is left unchanged and credit to priority sectors continues to fuel NDA growth at current rates. This scenario is referred to as “**Current Policies/High Inflation**”. The main difference between two scenarios is thus that the former assumes reversals in market-oriented reforms in 2000, with inflation remaining at current (moderately high) levels, whereas the latter assumes unchanged structural reform indices and accelerating inflation beginning in 2000. Another difference is that we view the high inflation scenario as consistent with (moderate) continuing growth in the share of the private sector in GDP, while policies in the reversal scenario are directly adverse to the private sector and its share is thus assumed to level off after peaking in 1999 (see Table A1 in the Appendix).

The **reform policies** scenarios assume intensified market-oriented reforms beginning in (early) 1999. These include trade liberalization, exchange rate unification and current account convertibility, price liberalization, reforms in the agricultural sector, an acceleration of the privatization program and legal reforms. They would also be accompanied by a curtailment of nominal credit growth, leading to declining inflation from 1999 onwards. Variants (1) and (2) are more and less radical incarnations, respectively, of this idea. “**Reform Policies (1)**” assumes that all structural reform indicators are brought up to levels currently enjoyed by the Baltic countries or the Kyrgyz Republic within 3 or 4 years. “**Reform Policies (2)**” is identical except that the assumed pace of internal liberalization is slower. The private sector share is assumed to grow at the same rate in both cases.

In addition to assumptions regarding the major structural and macroeconomic policy variables, the “reform policies” scenarios assume a moderately rising path of cotton production in response to producer price liberalization (productivity is assumed to rise by around 10 percent over the five year horizon from 1998 to 2003), while the “current policies”

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<sup>23</sup> See IMF (1998b) and IMF (1997) for details on Uzbekistan’s recent macroeconomic policies.

scenarios assume a flat production path. Cotton prices are assumed to rise by 1-2 percent each year. As to energy, both scenarios assume continued energy self sufficiency *and* that Uzbekistan does not become a major energy exporter. All other right hand side variables are assumed unchanged from their 1996 values under both scenarios.

## B. Projections

Medium term projections based on the assumptions of the previous sections and Appendix Table A1 are reproduced in Table 7.

Table 7. Uzbekistan: Growth Projections Under Alternative Policy Scenarios  
(in percent p.a.)

	1998	1999	2000	2001	2002	2003
Model A Current Policies/Reform Reversals	-0.8	0.1	-2.0	-2.7	-1.4	-1.8
Current Policies/High Inflation	-0.8	0.1	0.4	0.4	0.8	0.8
Reform Policies (1)	-0.7	3.6	8.8	8.5	7.4	7.9
Reform Policies (2)	-0.7	0.6	3.0	5.8	7.4	6.0
Model B Current Policies/Reform Reversals	1.8	4.0	2.6	1.3	1.3	1.5
Current Policies/High Inflation	1.8	4.0	4.2	4.3	5.9	5.9
Reform Policies (1)	1.9	2.5	7.7	11.9	12.6	14.2
Reform Policies (2)	1.9	2.5	4.1	6.8	9.9	11.2
<b>Memorandum Item: Reform Scenarios Estimated on Sample Excluding Uzbekistan</b>						
Model A Reform Policies (1)	-3.1	1.1	6.1	5.8	4.7	5.2
Reform Policies (2)	-3.1	-1.8	0.3	3.1	4.6	3.3
Model B Reform Policies (1)	0.6	1.1	6.2	10.4	11.0	12.5
Reform Policies (2)	0.6	1.1	2.6	5.2	8.2	9.5

Notes: For details on policy scenarios underlying projections, see text and Appendix.

For details on models A and B, see Section III.B and Zettelmeyer (1998).

The main results from the table can be summarized as follows.

With only one exception, the two scenarios that unfold from current policies will at best yield mediocre growth in the 0-2 percent range and at worst a continuing decline in the order of -2 percent per year. The exception is the "Current Policies/High Inflation" scenario in conjunction with Model B, which shows fairly high medium term growth rates. The mechanics of this result is that in Model B, structural reforms have strongly opposite effects on the private and public sectors (see Zettelmeyer 1998 for details); thus, a small change in their relative size in favor of the private sector (as assumed in "Current Policies/High Inflation", see Appendix Table) can shift the balance and generate a positive overall effect.



The economic interpretation could be that reasonable medium term growth is conceivable even under current policies *if* (and only if) the private sector continues to grow moderately despite the lack of progress on structural reforms.

Growth rates are much higher under reform policies in *any* scenario. However, the positive effect of structural reforms is typically felt only after a one year lag: in the Appendix Table, the jump in structural reforms is assumed to occur in 1999 under the “active” scenarios, whereas growth begins to take off in 2000 in the reform scenarios.

In short, Table 7 implies that reform policies will generate a medium term (i.e. by 2002/2003) growth differential of *at least* 5 percent per annum, depending on the model used and the scenarios compared. However, there may be a potential source of bias, as follows. Suppose the models’ coefficients on cotton and energy, which are used in both sets of scenarios, capture not just the intrinsic effects of these variables but in addition idiosyncratic elements of the Uzbek experience which we have failed to capture elsewhere in the model (see Section III above and Zettelmeyer (1998)). Suppose further that this idiosyncratic element is related to current Uzbek policies. In this case, it would clearly be incorrect to use these coefficients for the purposes of predicting Uzbek growth in the “reform” policies case. Instead, it would be advisable to use coefficients that are estimated on a sample that *excludes* Uzbekistan, as these coefficients are unrelated to current Uzbek policies by construction. As can be seen from the memorandum item in Table 7, the effect of using these alternative coefficient estimates is to lower medium term projections in the “reform policies” scenario by about 2.7 percent for Model A and about 1.7 percent for Model B. However, the qualitative implications of the previous results remain unchanged.

## V. CONCLUSIONS

The main purpose of this paper was to analyze why Uzbekistan’s output performance has been so much more favorable, according to official data, than that of other transition economies. Four main explanations were evaluated: biases in output measurement, a gradualist approach to reforms, a policy of industrialization through ambitious public investment, and favorable initial conditions—possibly in combination with policies that built on these initial conditions. We also sought to shed light on recent positive growth by examining output at the sectoral level, and examined growth prospects for the medium term. The main findings are as follows.

- Biases in measurement play a role in exaggerating Uzbekistan’s relative favorable output performance, but Uzbekistan’s relative success is *not* an artifact of measurement alone. Even according to output estimates based on electricity consumption, Uzbekistan experienced the mildest “transformational recession” of any BRO country
- A cross-country regression model suggests that Uzbekistan’s favorable output performance did not occur *because*, but *in spite of*, gradualist macroeconomic and structural policies which by themselves would have had detrimental effects on growth

- Attempts to relate public investment to growth in a sample of transition countries including Uzbekistan give insignificant coefficients and conflicting signs
- To a large degree, the mildness of Uzbekistan's transitional recession can be accounted for by a combination of its low degree of initial industrialization, its cotton production, and its self-sufficiency in energy
- Uzbekistan's positive growth in the last two years was driven by growth in services, especially in 1996, and—to a lesser extent—a rebound in agriculture in 1997.

These results suggest that Uzbekistan's relative success has much to do with favorable initial conditions, and that the government's public investment program and gradualist reform strategy were *not* the driving forces of its relatively favorable output performance. This said, it is hard to pin down the role of policies in explaining Uzbekistan's mild transformational recession. While the results indicate that structural and macroeconomic policies would have been detrimental *by themselves* (with the notable exception of the brief period of liberalization during 1995/96), policies and initial conditions cannot be easily unbundled. One interpretation of the results is that Uzbekistan did relatively well in terms of aggregate output decline because it was successful at preventing the collapse of the (relatively small) industrial sectors by combining rigid state control with subsidies that were in large part financed by cotton exports, and by ensuring an uninterrupted supply of cheap energy. In other words, a set of policies which failed elsewhere as they could not be afforded—supporting the industrial sector through both credits and direct subsidies—may have been relatively successful in maintaining production *in combination* with Uzbekistan's favorable initial conditions, albeit at a high cost to consumers and growth in the medium term.

In conclusion, while our results stress the importance of favorable circumstances in explaining Uzbekistan's relative success, Uzbekistan's policies could share credit in two respects. First, Uzbekistan's brief liberalization period from late 1995 to mid 1996 might have generated an environment that allowed the rebound in services that drove positive growth in 1996 and (to a lesser extent) in 1997. Second, economic policies prior to this period, which by themselves would have aggravated the output decline, may have mitigated it in combination with Uzbekistan's initial circumstances. The latter, however does not imply that Uzbekistan's policies were optimal even in those circumstances. Not only did they ignore broader welfare issues such as consumer's choice and environmental degradation, but they failed to set the right incentives even from the narrow perspective of maximizing production, particularly in the agricultural sector. Most importantly, the same model that explains Uzbekistan relatively successful past also suggests that in the absence of continuing market reforms Uzbekistan's *future* growth rates will hover in the range of -2 to +2 percent, while comprehensive external liberalization, price liberalization (including in agriculture) and improvements in the private sector environment could well lead to growth rates in the order of 6-10 percent within three years. As Uzbekistan's international environment normalizes, policies that may have mitigated the output decline in the special initial circumstances of Uzbekistan will almost certainly be harmful from the perspective of medium-term growth.

The following table presents the assumed values of the policy variables in the scenarios described in Section IV.A. The three liberalization proxies LII (“internal liberalization”), LIE (“external liberalization”) and LIP (“private sector entry conditions”) are indices between 0 and 1. For their precise definition, see De Melo et al (1996).

Table A1. Medium Term Assumptions on Paths of Policy Variables and Private Sector Share  
(Units: see notes)

		1997	1998	1999	2000	2001	2002	2003
Current Policies/ Reform Reversals	Inflation	50	40	43	50	50	50	50
	Fiscal Balance	-2.40	-4.00	-4.00	-4.00	-4.00	-4.00	-4.00
	LII	0.60	0.60	0.60	0.50	0.50	0.50	0.50
	LIE	0.40	0.40	0.40	0.30	0.30	0.30	0.30
	LIP	0.50	0.50	0.50	0.40	0.40	0.40	0.40
	PS share	0.45	0.50	0.55	0.50	0.50	0.50	0.50
Current Policies/ High Inflation	Inflation	50	40	43	60	90	110	130
	Fiscal Balance	-2.40	-4.00	-4.00	-4.00	-4.00	-4.00	-4.00
	LII	0.60	0.60	0.60	0.60	0.60	0.60	0.60
	LIE	0.40	0.40	0.40	0.40	0.40	0.40	0.40
	LIP	0.50	0.50	0.50	0.50	0.50	0.50	0.50
	PS share	0.45	0.50	0.55	0.55	0.55	0.60	0.60
Reform Policies (1)	Inflation	50	50	15	10	8	5	5
	Fiscal Balance	-2.40	-3.00	-3.00	-3.00	-3.00	-3.00	-3.00
	LII	0.60	0.60	0.80	0.90	0.90	0.90	0.90
	LIE	0.40	0.40	0.80	0.80	0.90	0.90	0.90
	LIP	0.50	0.50	0.60	0.65	0.70	0.75	0.80
	PS share	0.45	0.50	0.55	0.60	0.65	0.70	0.75
Reform Policies (2)	Inflation	50	50	15	10	8	5	5
	Fiscal Balance	-2.40	-3.00	-3.00	-3.00	-3.00	-3.00	-3.00
	LII	0.60	0.60	0.65	0.70	0.80	0.80	0.80
	LIE	0.40	0.40	0.80	0.80	0.90	0.90	0.90
	LIP	0.50	0.50	0.60	0.65	0.70	0.75	0.80
	PS share	0.45	0.50	0.55	0.60	0.65	0.70	0.75

Notes: Inflation is defined as average inflation, in percent per annum. Fiscal Balance is expressed in percent of GDP. LII, LIE and LIP are indices defined between 0 and 1. “PS share” is the approximate share of private sector activity in GDP, defined between 0 and 1.

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