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The Russian Financial Crisis and its Consequences for Central Asia

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Abstract

This paper reviews the economic conditions in central Asia at the time of the Russian financial crisis of August 1998; the channels by which the crisis was transmitted to the central Asian region; and the policy responses. The paper concludes that, while real exchange rates of central Asian national currencies vis-à-vis the Russian ruble have returned to their pre-crisis levels following the nominal devaluations that ensued, other indicators of external competitiveness, such as unit labor cost indices, suggest the need for further surveillance in this area. Also, it is not yet clear if full exchange rate flexibility has been established in central Asia despite the protracted and costly exits from the nominal exchange rates in place at the time of the crisis. Finally, the debt-to-GDP ratios in central Asia, which grew rapidly between 1998 and 1999 in the context of large exchange rate adjustments, remain a challenge for the Tajik and Kyrgyz authorities, in particular.

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I. INTRODUCTION

As in other regions of the former Soviet Union, the sharp devaluation of the Russian ruble (Figure 1) and the uncertainties for domestic and foreign investors that arose in the context of Russia's financial crisis in August 1998 became a dominant economic concern in Kazakhstan, the Kyrgyz Republic, Tajikistan, Turkmenistan, and Uzbekistan. This paper reviews the prevailing economic conditions in these five central Asian countries at the time of the crisis; the crisis's transmission channels into the central Asian region; and the policy response to the crisis. Lessons from the experience and challenges ahead for the financial authorities in Central Asia are then put forward for consideration.

A conclusion from the paper is that, while positive growth and stronger balance of payments positions have reemerged for the region since mid-1999, the initial policy response to the crisis left much to be desired. For one, as the effects of the Russian crisis became manifest in the last quarter of 1998, the initial policy response by the various monetary authorities in central Asia was to use large portions of their foreign exchange reserves to support de facto exchange rate pegs, which were no longer sustainable. At the same time, in an effort to sustain economic activity and maintain internal balance, fiscal policy was relaxed and central banks tried to keep the growth of monetary aggregates within target levels devised before the outbreak of the crisis. Expenditure switching policies—aimed at reducing imports and increasing exports—were also put in place with the introduction of measures to limit current and capital account transactions in Kazakhstan, Uzbekistan, and Turkmenistan, mainly.

As pressures on foreign exchange markets continued unabated throughout the first quarter of 1999, monetary authorities in Kazakhstan, Tajikistan, and Uzbekistan joined earlier exchange rate liberalization efforts by the central bank of the Kyrgyz Republic, while, at the same time, tightening financial conditions. Turkmenistan has been a singular case, in which the official exchange rate has remained unchanged since 1996, albeit in conjunction with mounting exchange and trade restrictions and a growing spread between the official and the black market exchange rate.

The economic environment, however, was more difficult in early 1999 than it had been in early August 1998 and it continues to pose new challenges to the national authorities. First, while real exchange rates vis-à-vis the Russian ruble have returned to their pre-crisis levels following the nominal devaluations that ensued, other indicators of external competitiveness—such as unit labor cost indices—suggest the need for further monitoring in this area. Also, it is not yet clear if full exchange rate flexibility has been established in central Asia despite the protracted and costly exits from the nominal exchange rate levels in place at the time of the crisis. Moreover, the debt to GDP ratios in central Asia, which grew rapidly between 1998 and 1999 in the context of large exchange rate adjustments, remain a challenge for policymakers in Tajikistan and the Kyrgyz Republic, in particular.

Figure 1: Russian Federation: Nominal and Real Effective Exchange Rate Indices,
Jan 1997 - Jan 2001 [1]
(1995=100)
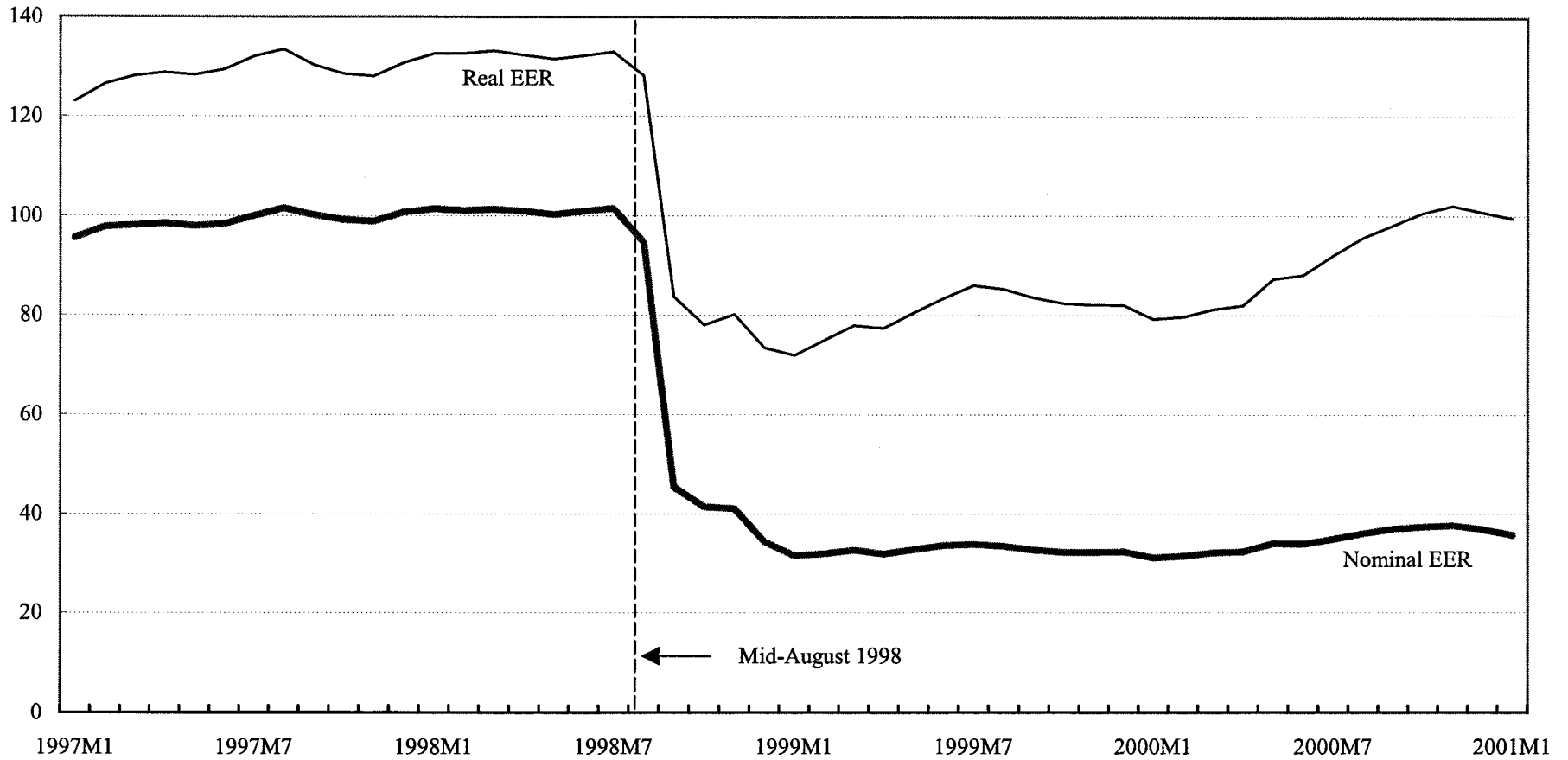
Source: International Monetary Fund; Economic Data Sharing System (EDSS) databank.

1/ The trade weights are the average of 1994-95. The weights were built up from trade flows as reported in the IMF Direction of Trade Statistics.

The structure of the paper is as follows. Section II starts with a brief review of the region's macroeconomic conditions on the eve of the August 1998 crisis. Sections III and IV focus, respectively, on the crisis's transmission channels into the region, and the initial policy response by the central Asian financial authorities to the crisis. Section V goes on to argue that the legacy from the Russian financial crisis has not been insignificant. Section VI summarizes the lessons and conclusions from the analysis.

II. INITIAL CONDITIONS

On the eve of the Russian financial crisis, macroeconomic indicators for central Asia had shown major improvements with respect to 1992–94 (Figure 2). Except for Turkmenistan, data for the region showed that a **recovery of economic activity** was finally underway, reflecting a combination of rapid growth in domestic absorption and international trade. Domestic investment, when significant, was mostly being financed by foreign savings targeting the development of rich energy and mineral resource endowments like those in Kazakhstan and, to a lesser extent, in the Kyrgyz Republic. Private and public consumption were growing rapidly following a recovery of real wages (that started in late 1996) and increases in tax-to-GDP ratios, which provided funding to central and local governments to cover their current expenses.[2] Trade with CIS and nonCIS countries had also recovered from the levels registered after the dissolution of the Soviet Union, although Russia still remained a key trading partner (as regards formal and informal trade) for the central Asian region (Table 1).

Table 1. Central Asia: Composition of Trade, 1995–97

	Kazakhstan	Kyrgyz Republic	Tajikistan	Turkmenistan	Uzbekistan
(Average Share in Percent of Total Exports)					
Exports to Russia	40.3	22.1	10.3	4.2	25.2
Exports to other BRO countries	13.6	47.3	31.4	60.4 1/	20.3
Other export markets	46.1	30.6	58.3	35.4	54.5
(Average Share in Percent of Total Imports)					
Imports from Russia	50.0	25.2	14.4	12.8	28.1
Imports from other BRO countries	15.2	39.2	46.7	36.6 1/	23.8
Other import markets	34.8	35.6	38.9	50.6	48.1

Source: IMF, Direction of Trade Statistics.
1/ Trade with Ukraine; mainly gas exports and barter imports.

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[2] In Uzbekistan, tax-to-GDP ratios remained broadly stable, at around 30 percent of GDP, during the early transition years.

Figure 2. Central Asia: Selected Macroeconomic Indicators, 1992-2000

Real GDP (percentage change)

Inflation Rate (log scale) 1/

Current Account Balance
(in percent of GDP)

External Debt 2/
(in percent of GDP)
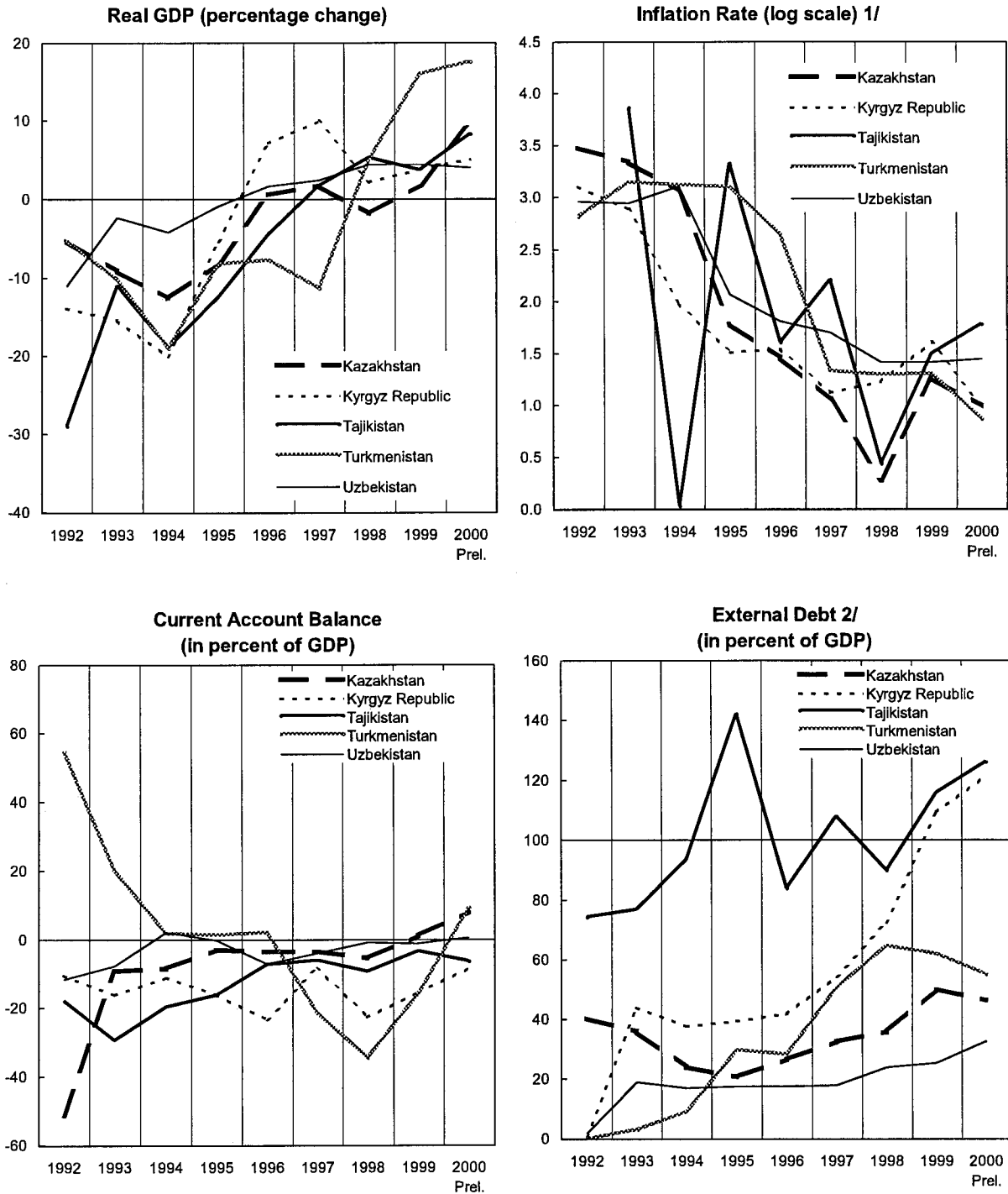
Sources: IMF staff estimates.

1/ End of period inflation; as measured by official price statistics.
2/ For Kyrgyz Republic, excludes Kumtor related debt. Dollar GDP figures estimated using official exchange rates for all central Asian countries.

High—and unstable—**inflation** had been "defeated" (or success in this area was "within reach") according to public speeches and declarations by policymakers and international observers by mid-1997. Three-digit annual inflation rate figures were things of the past in Kazakhstan, the Kyrgyz Republic, Turkmenistan, and Uzbekistan, and the question was how to steer the economy into the single-digit inflation range without undue social costs. In 1997, inflation prospects for Tajikistan were also promising due to a successful launching of the peace agreement and enhanced international assistance to the new Tajik government aimed at establishing macroeconomic stability, reducing fiscal and quasi-fiscal deficits, and continuing Tajikistan's transition to a market-based economy.

Domestic savings, however, did not improve in tandem with macro stabilization and the resumption of economic growth. Indeed, except for Turkmenistan, all other central Asian countries experienced **sizeable current account deficits** during 1992–97.[3] These large external gaps mirrored large, albeit declining, fiscal and quasi-fiscal public sector deficits and, to a lesser extent, the private sector's savings-investment gap.

The cumulative impact of those fiscal deficits led to a rapid **increase in the public sector external debt** of all central Asian countries. By end-1997, the stocks of debt for Tajikistan and the Kyrgyz Republic were equivalent to about 110 percent and 55 percent of GDP, respectively. External debt to GDP ratios for Kazakhstan and Uzbekistan by end-1997 ranged between 18 to 30 percent of GDP, but the debt maturity profile in these two countries pointed to a bunching of debt service payments in 1998/1999. Turkmenistan's debt-to-GDP ratio was also high by mid-1997 (equivalent to 51 percent of GDP), largely reflecting the impact of unpaid gas exports to Ukraine and large public off-budget investment projects in the energy sector.

A summary measure of the positive expectations on central Asia by mid-1998 could be found in the *Euromoney Country Risk Assessments* and the ratings prepared by international credit rating agencies, such as Standard & Poor's, Moody's, and FitchIbeca. Euromoney assessments show that, on average, country rankings for central Asian countries improved continuously between September 1996 and December 1997 (Table 2).[4] In the same vein, credit rating agencies were optimistic about the region and generally maintained their pre-crisis ratings for Kazakhstan and Turkmenistan through end-January 1999. The agencies' limited reassessment of ratings for central Asia contrasted sharply with their repeated downgrading of Russia during the second half of 1998 (Table 3).

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[3] Uzbekistan reported a small current account surplus in 1994.

[4] No *Euromoney* ratings are available for March 1998.

Table 2. Central Asia: Euromoney Country Risk Ranking (1995–1999) 1/2/

	March 1994	March 1995	March 1996	Sept. 1996	March 1997	Sept. 1997	Dec. 1997	Sept. 1998	March 1999	Sept. 1999
Kazakhstan	129	129	111	129	98	84	82	88	78	82
Kyrgyz Republic	135	169	121	156	169	156	145	105	110	115
Tajikistan	144	178	173	173	162	137	129	128	139	142
Turkmenistan	117	147	154	157	146	145	144	166	111	121
Uzbekistan	126	161	114	147	117	93	92	122	127	136
Average Central Asia	**130**	**157**	**135**	**152**	**138**	**123**	**118**	**122**	**113**	**119**
Russia	138	141	100	86	91	79	78	129	161	159
Number of countries in sample	157	187	178	178	180	180	174	174	180	180

Source: Euromoney magazine, various issues.
1/ The higher the number for a country, the higher the country risk.
2/ Computed while taking into account nine risk categories: economic performance; political risk; debt indicators; debt in default or rescheduled; credit ratings; access to bank finance; access to short term credit; to capital markets; discount on forfaiting.

Table 3. International Credit Ratings, November 1996–February 1999
(Long-term rating)

	Kazakhstan			Turkmenistan		Russia		
	Fitch IBCA	Moody's 1/	Standard & Poor's	Fitch IBCA	Moody's	Fitch IBCA	Moody's	Standard & Poor's
1996 November	BB-	Ba3	BB-	B		BB+	Ba2	BB-
1998 January	BB	Ba3	BB-	B	B2	BB+	Ba2**	B+
June	BB	Ba3	BB-	B	B2	BB	B1	B+
July	BB	Ba3	BB-	B	B2	BB-	B1	B+
August	BB	Ba3	BB-	B	B2	B	B2/B3	B-/CCC
September	BB	Ba3	B+	B	B2	CCC	B3	CCC-
October	BB	Ba3**	B+	B	B2	CCC	B3	CCC-
November	BB	Ba3**	B+	B	B2	CCC	B3	CCC-
December	BB	Ba3**	B+	B	B2	CCC	B3	CCC-
1999 January	BB	Ba3**	B+	B-	B2	CCC	B3	CCC-
February	BB-	B1	B+	B-	B2	CCC	B3	SD

Sources: Fitch IBCA; Moody's; Standard & Poor's; and International Monetary Fund, Research Department.
1/ Ba2** and Ba3** refers to "on review for possible downgrade."

III. THE CRISIS'S TRANSMISSION MECHANISM

From the outset, financial and economic analysts[5] identified a number of transmission channels of the Russian financial crisis into central Asia. These channels included: (i) the direct and indirect impact of the Russian crisis on central Asian exports and imports; (ii) a possible loss of market shares of central Asian exporters to Russian enterprises that benefited from the sharp devaluation of the ruble; (iii) reduced external capital flows to central Asia; and (iv) the crisis's potential for accelerating structural reforms in central Asia.

The emphasis on **direct and indirect trade link** suggested that enhanced price competitiveness of the Russian tradable sector stemming from the ruble's devaluation would increase imports of Russian products into the region and reduce central Asian exports to Russia and other CIS countries affected by the crisis.[6] In the event, predictions from the trade link hypothesis were only partially confirmed. Central Asian imports from Russia did not increase as expected. If anything, during the last quarter of 1998, imports from Russia were less than the average for the first three quarters of the year.[7] Possible explanations of this import contraction include the fact that Russian enterprises demanded hard currency payments—rather than barter trade—for their supplies following the crisis's outbreak. Also, some regions in Russia (in the Krasnoyarsk region, for example) reportedly introduced controls to stop their local production from fleeing their districts, while regions in central Asia (mainly in Kazakhstan and Uzbekistan) set up barriers and regulations against imports from Russia to protect the local industries (Westin (1999) and Kaser (1999)). Another reason could be that contraction of exports reduced imported input needs.

The expected slowdown in central Asian exports did take place, however. Exports to Russia fell rapidly in late 1998. Central Asian exports to CIS countries other than Russia also fell sharply, further contributing to a widening gap between actual 1998 exports and projections prepared before the crisis's outbreak (Figure 3). Excluding Turkmenistan, whose export revenue shortfall reflected mainly the suspension of gas exports to Ukraine, the largest export shortfalls in 1998 occurred in Uzbekistan, Tajikistan, and Kazakhstan whose trade links with

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[5] Including, notably, the Economist Intelligence Unit (EIU), PlanEcon; *Kazakhstan Economic Trends,* the US Department of Commerce in its publications on the Newly Independent States, and the *Financial Times* in its commentaries on the Russian financial crisis. See bibliography for specific references.

[6] For example, econometric estimates of export and import demand equations for trade between Russia and Kazakhstan for the period before the crisis suggested that Russia's trade surplus vis-à-vis Kazakhstan would increase significantly in the short-run following the ruble's devaluation (see Perekhodsev (1999)).

[7] The slowdown in central Asian imports from Russia lasted through the first quarter of 1999 according to data published in the IMF Direction of Trade Statistics.

Figure 3. Central Asia: Total Export Revenue Shortfall, 1998-99 1/
(In percent of pre-crisis projections)
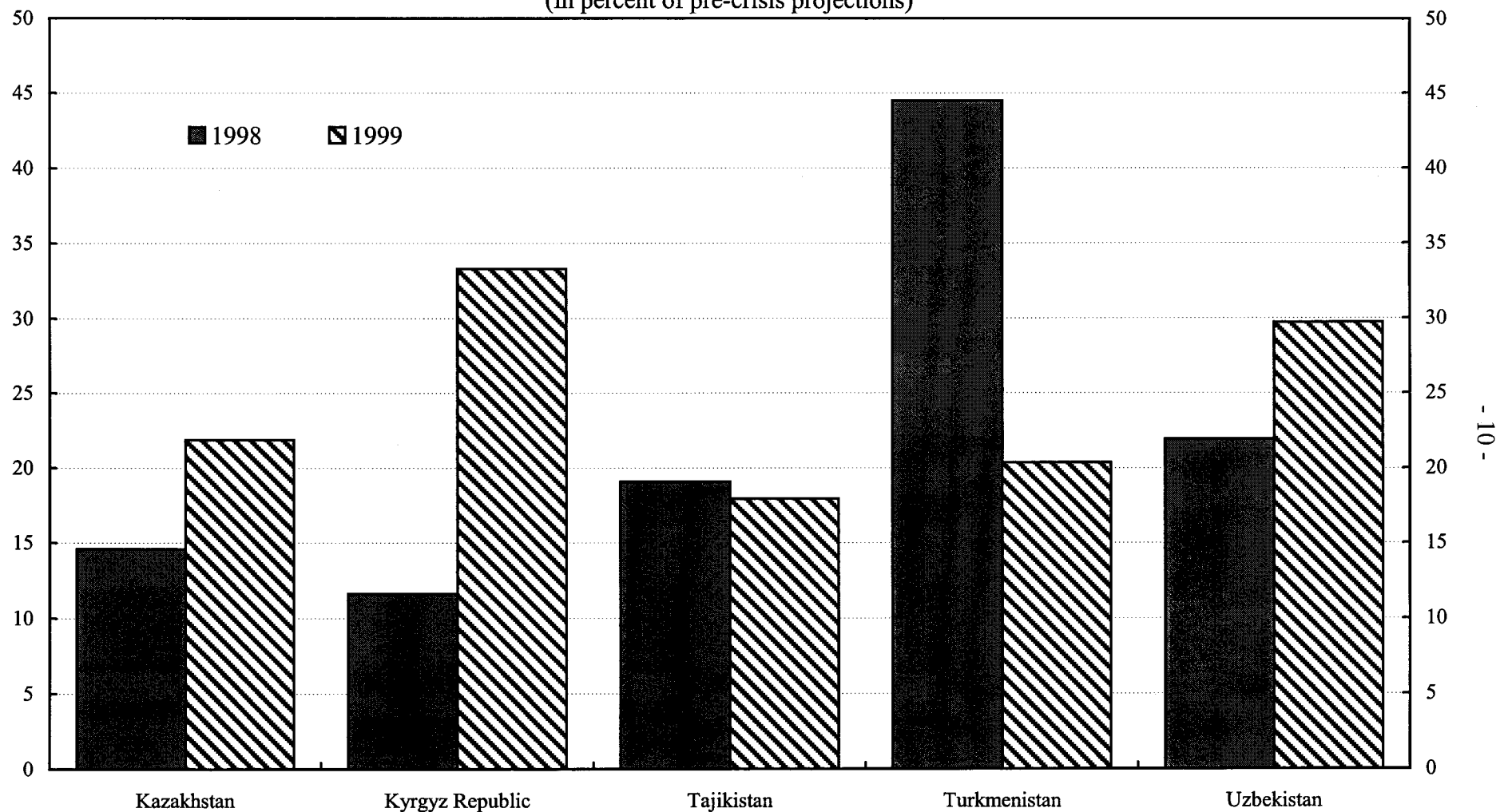
Source: Fund staff estimates.

1/ Actual exports relative to pre-crisis projections prepared by IMF staff.

other CIS countries (including Russia) had remained significant after some seven years of transition.[8] The Kyrgyz Republic had the smallest export shortfall of all countries in the region in 1998, but this situation changed significantly in 1999, as exports of non-energy manufacturing products and gold export proceeds fell due to (i) depressed markets in Russia, and (ii) low prices and production problems in the gold mining sector, respectively.

Another potential transmission channel from the Russian financial crisis included **changes in market shares** of central Asian exporters of raw materials and manufacturing products. In particular, the sharp devaluation of the ruble was viewed as giving a new lease on life to Russian exporters of ferrous and nonferrous metals, machinery and equipment, and light industry products. These risks apparently materialized in late 1998 and early 1999, as Russian enterprises reportedly tried to increase their sales in CIS and nonCIS markets using alleged unfair trading practices. In the United States, for example, dumping claims filed by American steel producers against Russian firms in late 1998 were only resolved in mid-July 1999, when an agreement between the US Department of Commerce and the Russian Ministry of Trade limited Russian hot-rolled steel exports to the United States. The agreement also established minimum prices for hot-rolled steel products and included a number of accords to restrict other Russian steel exports to the United States.

A **reduction of capital inflows** was another anticipated transmission channel of the Russian financial crisis into central Asia. The view was that the Russian financial crisis would limit the availability and/or increase the foreign borrowing cost for all emerging markets, including countries in central Asia. Kazakhstan was considered to be at risk mainly because of the participation of nonresident investors in its domestic treasury bills and equity markets, and, to a lesser extent, because of Kazakhstan's dollar-denominated sovereign (Eurobond) debt.[9] The Kyrgyz Republic was also viewed at risk because of its weak banking sector (with manifested solvency and liquidity problems before the crisis) and the role of portfolio and foreign direct investors in the economy. In addition, Tajikistan's heavy reliance on foreign commercial bank financing of its cotton export industry was also viewed with concern.

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[8] According to Ismalov (1998) and Westin (1999), in mid-1997, about one half of total central Asian exports were still being directed to CIS countries, with Russia remaining a key export market for Uzbek cars and electronics, as well as for Kazakh chemicals, metals, food items, and light industry products.

[9] At the time of the Russian financial crisis, the bulk of Eurobonds issued by the government of Kazakhstan were held by Kazakh pension funds. These funds were established in January 1998 as part of Kazakhstan's pension reform.

In the event, foreign financing dried up in some degree for each of these central Asian countries. The demand for Kazakhstan's eurobonds fell somewhat, resulting in an increase in yields (Figure 4), and international banks reportedly raised the level for approval of any loans to Kazakh entities to the highest levels of their headquarter offices. At the same time, foreign investors—mainly Russian and Kazakh banks—abandoned the market for Kyrgyz government securities, with the share of non-resident holders of treasury bills falling from 18 percent at end-June 1998 to less than 5 percent at end-October 1998. Foreign direct investment also declined in the Kyrgyz Republic due to uncertainty amongst investors about regional economic conditions, as well as the completion of the Kumtor gold project and a slowdown in the privatization program. In Tajikistan, the impact of the Russian financial crisis was less clear-cut, however, as foreign loans for the financing of the annual cotton harvest were disbursed a few months before the crisis's outbreak in mid-August 1998.

Finally, there was the view that the Russian financial crisis could actually be an **opportunity to accelerate structural reform in central Asia**.[10] There were two main reasons for this. First, legislative approval for reforms was considered to be easier to obtain at times of crisis. Second, a further push for reforms was the best signal that political authorities could send to the market under the circumstances. In the event, however, these predictions did not materialize. If anything, the opposite happened, as the average EBRD transition indicators for Kazakhstan and the Kyrgyz Republic worsened between 1998 and 1999, suggesting some backsliding in structural reform in these two countries (Figure 5). The EBRD transition indicator for Uzbekistan also declined between 1997 and 1998, and again between 1998 and 1999, due mainly to a surge of selective price controls and an intensification of import and export restrictions. Within the region, only Tajikistan showed steady improvements in its EBRD transition indicator in the context of post-conflict restructuring of the economy. Between 1997 and 1999, the EBRD transition indicator for Turkmenistan changed little, following some important reforms of the exchange rate system in 1996.

IV. POLICY RESPONSE TO THE CRISIS

The outbreak of the Russian financial crisis brought to the fore the classic dilemma of how to restore internal and external balance in the event of an external shock hitting the economy. On the one hand, the sharp decline in central Asian exports reduced output and aggregate demand at a time when these economies were finally recovering from the disruptions brought about by the dissolution of the Soviet Union. On the other hand, the external current account deficits for all central Asian countries (except Uzbekistan) increased significantly between 1997 and 1998.

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[10] See, for example, Plan Econ (1998 and 1999).

Figure 4. Selected Eurobond Spreads, 1998-2000
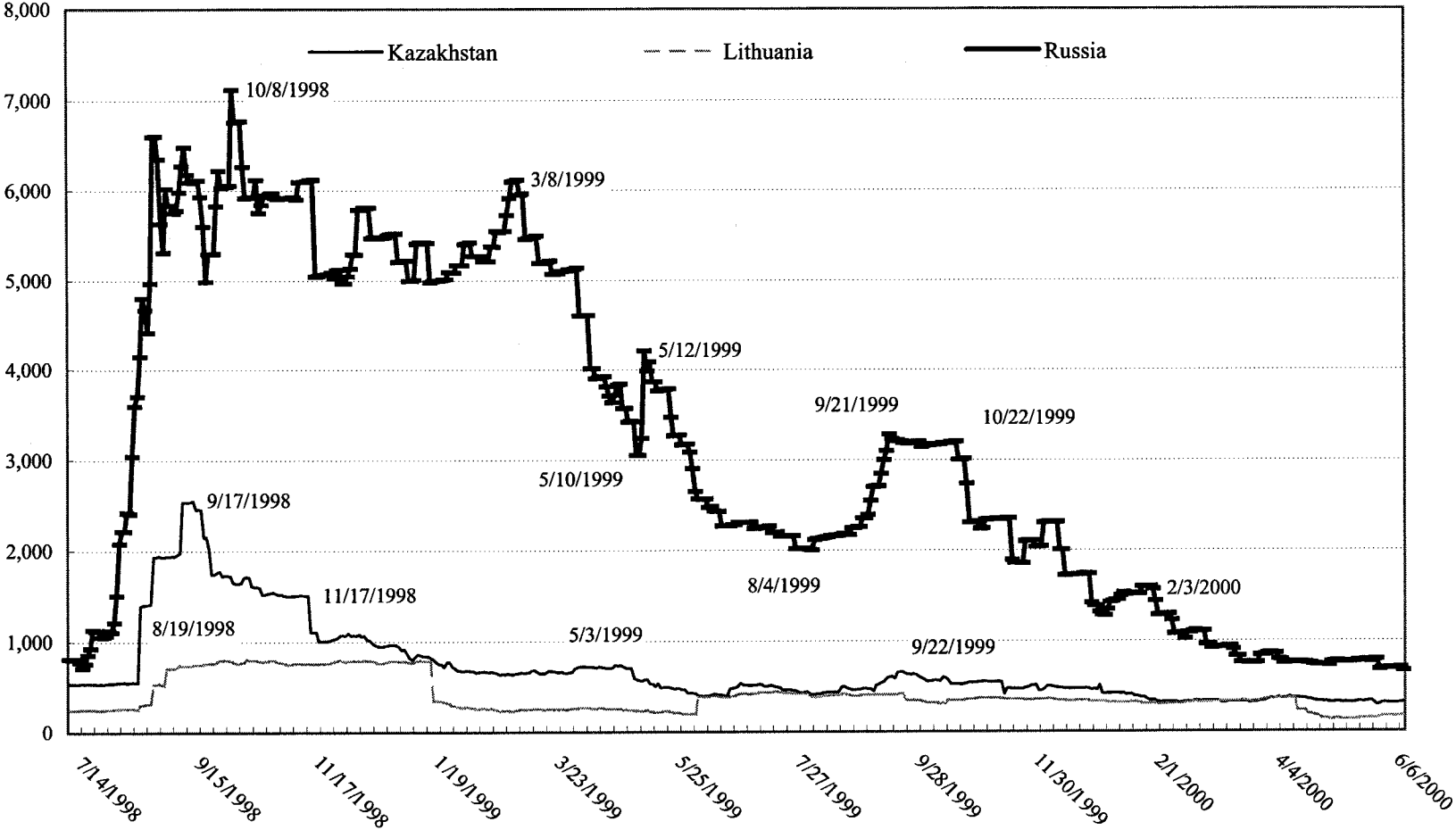
Source: International Monetary Fund, Research Department.

Figure 5. Annual Changes in EBRD Transition Indicators, 1996-99 1/

1996-1997

1997-1998

1998-1999
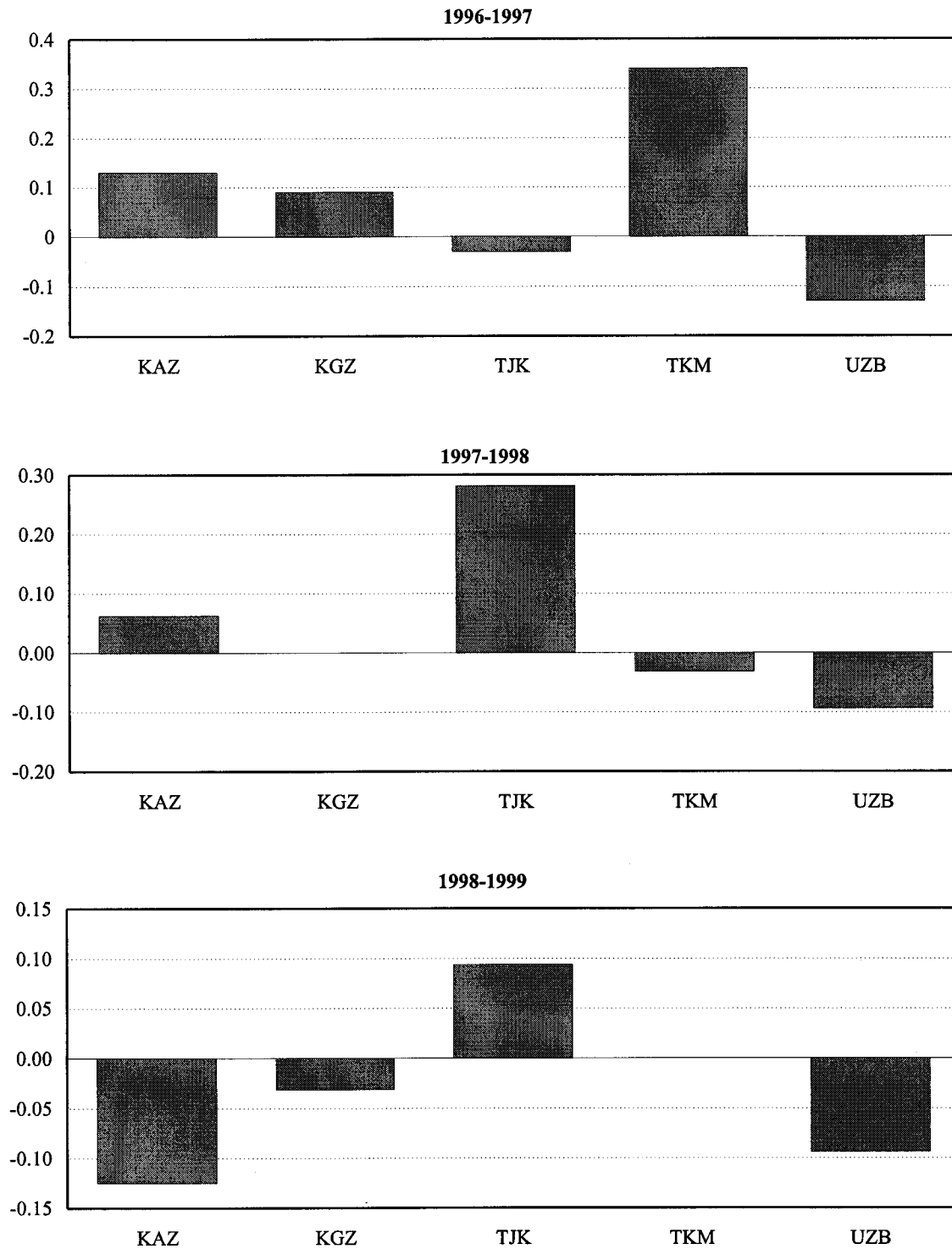
Source: EBRD Transition reports.

1/ A positive number indicates progress with structural reform.

Acronyms: Kazakhstan (KAZ), the Kyrgyz Republic (KGZ), Tajikistan (TJK), Turkmenistan (TKM), and Uzbekistan (UZB).

The record shows that, between September 1998 and March 1999, the financial authorities in central Asia generally used expansionary fiscal and monetary policies to alter the *level* of the economy's total demand (and supply) for goods and services. Also, there was an intensification of trade and exchange controls aimed at changing the *direction* of aggregate demand. The underlying assumption was that these absorption and expenditure-switching policies would be sufficient to restore a degree of internal and external balance, without any major adjustment in nominal exchange rates.

Fiscal deficits increased significantly between the third and fourth quarter of 1998 (Figure 6). In Kazakhstan and the Kyrgyz Republic, fiscal deficits reached a high of about 8–10 percent of GDP, respectively.[11] In the same vein, the government deficit in Tajikistan more than tripled between the first and fourth quarter of 1998. While this policy stance by the Tajik government may have helped stabilize domestic output, it reaccelerated inflation in late 1998/early 1999 and did not help restore the external balance. In Uzbekistan, the increase in the fiscal deficit between 1997 and 1998 was rather modest compared to developments in other central Asian countries.

The stance of monetary policy was also relaxed in central Asia in late 1998. Financial data show negligible changes in central banks' refinance rates and large sterilized foreign exchange intervention, as official international reserves shrank (Figure 7 and Table 4).[12] In principle, central bank credit should have been cut and interest rates increased to tame pressures in foreign exchange markets. In practice, however, this policy was too costly for governments given the risks of aborting the economic recovery that had started in 1995.[13] Higher interest rates would have also had important negative effects on the government's interest bill and on the domestic banks' balance sheets, which were already suffering the strains of the uncertainties and payment difficulties surrounding the crisis in Russia.

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[11] In the Kyrgyz Republic, the increase in the fiscal deficit mirrored large investment outlays connected with the implementation of the government's Public Investment Program (PIP).

[12] The degree of the sterilized intervention could be illustrated by comparing the (actual) composition of the central banks' balance sheet against balance sheet projections prepared before the crisis's outbreak. By end-December 1998, for example, the net domestic assets for the central banks of Kazakhstan, the Kyrgyz Republic, and Tajikistan were, on average, 21 percentage points higher than what it had been projected before the crisis. On the other hand, net international reserves were some 36 percentage points lower than pre-crisis projections.

[13] The erosion of fiscal and monetary institutions as a result of the civil war in Tajikistan may also explain in part the weak policy response of the Tajik authorities in the aftermath of the Russian financial crisis.

Figure 6. Central Asia: Cumulative Fiscal Deficits, 1998-1999 1/
(In percent of GDP)
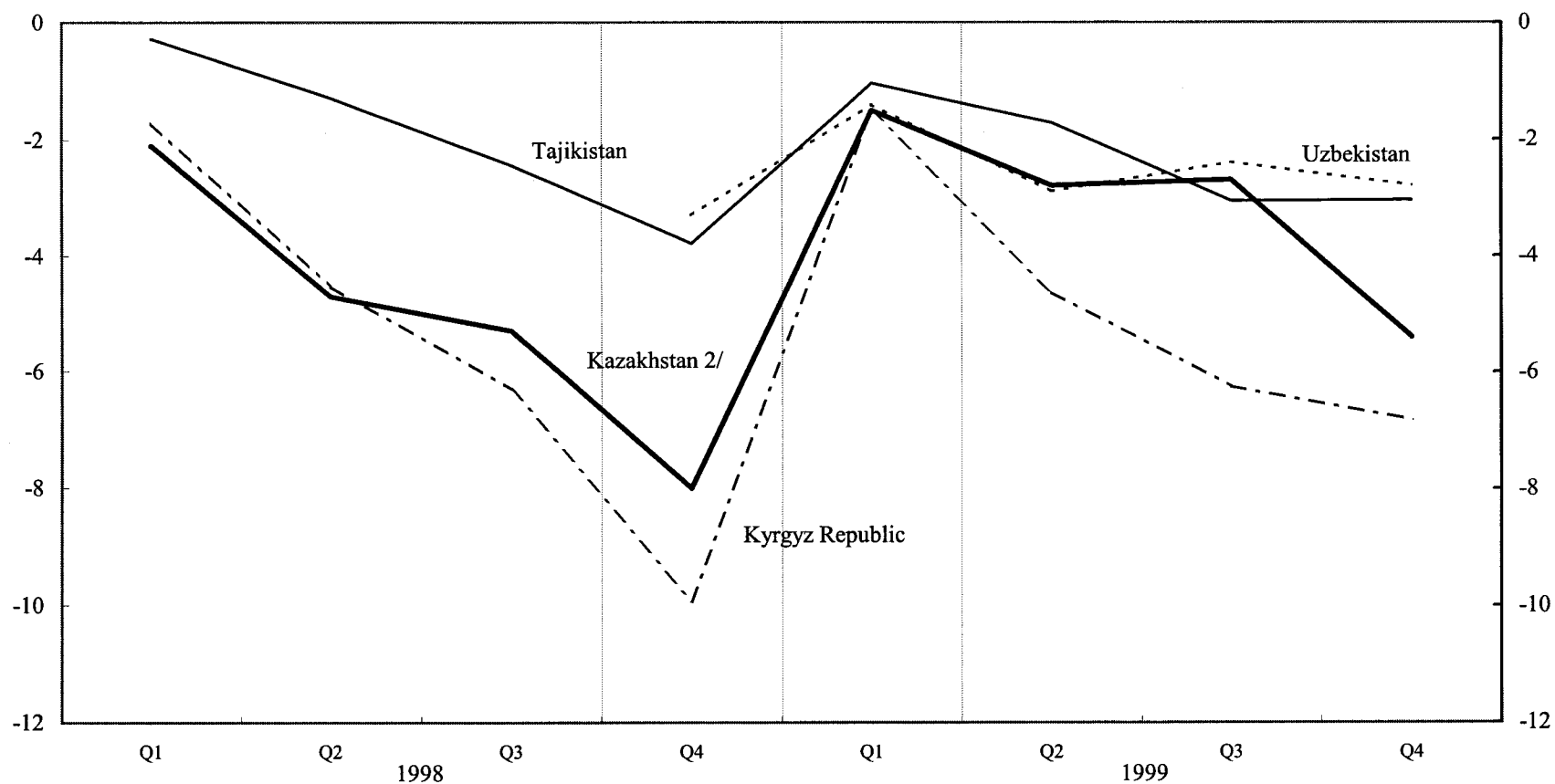
Source: National authorities; and Fund staff estimates.

1/ Refers to accounts of general government; no quarterly data are available for Turkmenistan (1998 and 1999) and Uzbekistan (1998).

2/ Budget deficit excluding privatization receipts.

Figure 7. Central Asia: Central Bank Refinance Rates, January 1998 - July 1999
(Two-month moving average; in percent per annum)

Mid-August 98

Kazakhstan
Kyrgyz Republic
Tajikistan
Turkmenistan
Uzbekistan
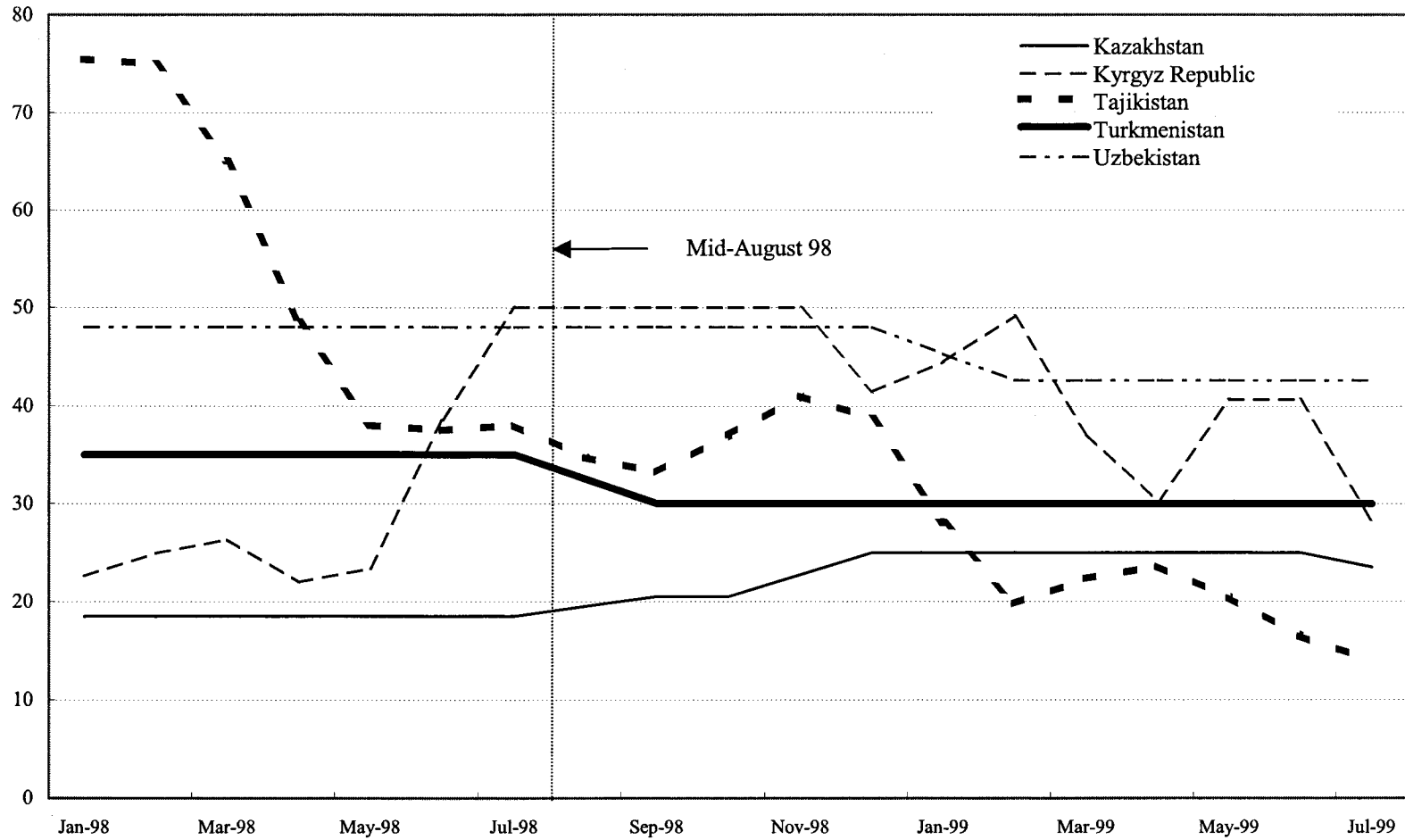
Source: International Monetary Fund.

Table 4. Central Asia: Changes in Central Banks' Balance Sheets, 1998-99
(With Respect to Pre-Crisis Projections; in percentage points)

	1998	1999
Net international reserves 1/		
Kazakhstan	-27.9	39.1
Kyrgyz Republic	-10.1	23.5
Tajikistan	-70.9	-39.9
Turkmenistan	210.7	71.8
Uzbekistan	9.6	18.4
Average all countries 2/	22.3	22.6
Average all countries less TKM and UZB 2/ 3/	**-36.3**	7.6
Net domestic assets 1/		
Kazakhstan	-4.3	4.3
Kyrgyz Republic	1.4	-9.9
Tajikistan	65.9	44.5
Turkmenistan	-86.4	-81.8
Uzbekistan	10.2	-24.6
Average all countries 2/	-2.6	-13.5
Average all countries less TKM and UZB 2/ 3/	**21.0**	12.9
Monetary base		
Kazakhstan	-32.2	43.4
Kyrgyz Republic	-8.7	13.6
Tajikistan	-5.0	4.6
Turkmenistan	124.2	-10.0
Uzbekistan	19.8	-6.2
Average all countries 2/	19.6	9.1
Average all countries less TKM and UZB 2/ 3/	-15.3	20.5

Sources: National authorities; and IMF staff estimates.
1/ Changes in relation to monetary base at the beginning of the period.
2/ Arithmetic average.
3/ Turkmenistan (TKM) and Uzbekistan (UZB).

Expenditure switching policies to restore the external balance were also put in place through an intensification of exchange and capital controls in late 1998/early 1999 (Box 1). From the outset, a range of national authorities in central Asia argued that exchange controls would avoid the inflationary consequences of exchange rate devaluations by focusing on "non-essential" imports and other current account transactions. Capital account controls were viewed to be instrumental in dampening capital flight and limiting the ability of residents and nonresidents to speculate against domestic currencies.

**Box 1. Central Asia: Intensification of Trade and Exchange Restrictions
in late 1998/early 1999 1/**

Kazakhstan

● September 1998: Introduction of a 20 percent value added tax on all personal imports from Russia, Uzbekistan, and the Kyrgyz Republic.

● December 1998: Adoption, by parliament, of law No.337—10, "On Measures to Protect the Domestic Market from Imported Goods." The new law authorized state agencies to impose tariffs and import quotas on imported goods in response to local producers' complains about unfair competition by imports.

● January 1999: Introduction of quantitative restrictions on imports from Russia, including new licensing procedures and bans on imported tobacco and alcoholic beverages.

● February 1999: Introduction of a 200 percent import tariff on imported tobacco and alcoholic beverages from the Kyrgyz Republic and Uzbekistan. Increase in transit fees and restrictions on re-exports from the Kyrgyz Republic to Russia. Introduction of import quotas on cement from the Kyrgyz Republic.

● April 1999: Introduction of new licensing procedures, transit fees, and mandatory deposits on imports from the Kyrgyz Republic and Uzbekistan. The 200 percent import tariff introduced in February 1999 was eliminated.

♦ September 1998: Mandatory reduction of banks' open foreign exchange positions.

♦ April 1999: Introduction of a 50 percent surrender requirement on residents' payments for invisible transactions and current transfers. Introduction of a 1 percent fee on foreign currency purchases by natural persons. Introduction of legislation allowing pension funds to swap their holdings of tenge-denominated government securities into five-year securities denominated in foreign currency. Individuals had the option to exchange their tenge bank deposits into nine-month dollar denominated deposits. Legal entities could exchange up to 30 percent of their tenge deposits into six-month dollar deposits.

Uzbekistan

● April—May 1999: Increases in excise duties on imports from the Kyrgyz Republic. Introduction of stricter passport controls and checkpoints along the Uzbek-Kyrgyz common border.

♦ January 1999: Introduction of a 5 percent tax on all purchases of foreign exchange.

♦ January 1999: Increase in the surrender requirement on decentralized exports from 30 to 50 percent.

Turkmenistan

● 1998/1999: New legislation requiring all export and import contracts be approved by the State Commodity Exchange (COMEX).

♦ December 1998: Closing of the commercial banks' foreign exchange window.

1/ ● Refers to new trade restriction; ♦ refers to new exchange restriction.

The end result of these restrictive polices was probably best summarized by the indices of exchange and capital controls produced by the Fund in the context of the *Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER)* (see Table 5 and Appendix I for methodological issues on these indices).[14] According to the data, by end-1998, central Asian countries had one of the most restrictive trade and exchange systems in the CIS region—as measured by the Fund's index of exchange and capital controls *(ECI)*—although the Kyrgyz Republic was a notable exception in the group. Indeed, the *ECI* for Kyrgyz was even lower (i.e., more liberal) that those indices estimated for Latvia and Lithuania at end-1998.[15] By end-1999, average *ECI* indices for central Asia increased marginally with respect to 1998, largely on account of an intensification of controls (i) on exports and export proceeds, and (ii) on payments for invisibles. This tightening of measures on current account transactions in 1998/99 represented a reversal of trade liberalization measures introduced in Kazakhstan, in particular, during 1997.

While allowing the nominal exchange rate to depreciate could have, in principle, helped restore the external balance in central Asia, this policy was not actively pursued during the early months of the crisis. Rather, a high degree of nominal exchange rate fixity prevailed in late 1998/early 1999, notwithstanding the exchange rate regimes in all five central Asian countries had been classified before the crisis as "more flexible: managed floating" arrangements in the IMF's *AREAER*.[16] In this context, the National Bank of Tajikistan held dollar auctions more frequently and sold large amounts of dollars in the foreign exchange market before devaluing its national currency by some 30 percent (in nominal terms, against the US dollar) by end-1998 (Table 6).[17] In the same vein, Kazakhstan lost large amounts of its gross reserves during the last five months of 1998 before taking steps towards an exchange rate realignment and eventually floating the tenge in April 1999. Intervention by the Kyrgyz Republic's central bank during August–December 1998 was much more limited than in Tajikistan and Kazakhstan, although the som's large and rapid devaluation may be

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[14] See Tamirisa (1999) for one of the earliest publications using these indices for 40 IMF member countries.

[15] Tajikistan had the second most liberal exchange and trade regime in central Asia during 1997–99 according to the data.

[16] See International Monetary Fund (1998), pages 992–998, with summary tabulations of exchange arrangements and regulatory frameworks for current and capital transactions of IMF member countries as of end-1997.

[17] Precise figures of the amount of central bank intervention in central Asia are difficult to obtain. However, Owen (1999) estimated that cumulative net official sales of foreign exchange during August/December 1998 were equivalent to 72 percent of end-July 1998 gross reserves in Tajikistan; 43 percent in Kazakhstan; and 12 percent in the Kyrgyz Republic.

Table 5. BRO Countries: Indices of Exchange and Capital Controls, 1997–1999

Index values range from zero (lowest/most liberal) to 1 (highest, most restrictive)

	Index of exchange and capital controls (ECI)			Index of controls on current payments and transfers (CCI)			Index of capital controls (KCI)		
	1997	**1998**	**1999**	**1997**	**1998**	**1999**	**1997**	**1998**	**1999**
Armenia	0.15	0.09	0.09	0.29	0.12	0.12	0.01	0.06	0.06
Azerbaijan	0.47	0.40	0.33	0.41	0.38	0.29	0.54	0.38	0.36
Belarus	0.50	0.52	0.50	0.45	0.40	0.40	0.56	0.61	0.61
Estonia	0.09	0.05	0.10	0.11	0.04	0.04	0.07	0.06	0.16
Georgia	0.26	0.23	0.21	0.20	0.18	0.28	0.32	0.32	0.14
Kazakhstan	**0.59**	**0.46**	**0.50**	**0.36**	**0.16**	**0.18**	**0.83**	**0.80**	**0.81**
The Kyrgyz Republic	**0.12**	**0.12**	**0.14**	**0.03**	**0.05**	**0.06**	**0.20**	**0.20**	**0.22**
Latvia	0.10	0.15	0.10	0.08	0.05	0.03	0.11	0.26	0.17
Lithuania	0.15	0.15	0.14	0.13	0.11	0.11	0.17	0.17	0.17
Moldova	0.43	0.45	0.50	0.25	0.20	0.20	0.60	0.70	0.80
Russia	0.58	0.56	0.56	0.34	0.28	0.29	0.82	0.83	0.83
Tajikistan	**0.32**	**0.32**	**0.33**	**0.21**	**0.23**	**0.23**	**0.43**	**0.43**	**0.43**
Turkmenistan	**0.53**	**0.54**	**0.54**	**0.44**	**0.44**	**0.45**	**0.63**	**0.62**	**0.62**
Ukraine	0.54	0.56	0.39	0.33	0.07	0.07	0.74	0.76	0.71
Uzbekistan	**0.51**	**0.51**	**0.50**	**0.33**	**0.33**	**0.40**	**0.69**	**0.69**	**0.61**
Memorandum items									
Average Central Asia	0.41	0.39	0.40	0.27	0.24	0.26	0.56	0.55	0.54
Average Central Asia less KGZ 1/	0.49	0.46	0.47	0.34	0.29	0.32	0.64	0.64	0.62
Average BRO countries less Russia & central Asia	0.30	0.29	0.26	0.25	0.17	0.17	0.35	0.37	0.35

Source: IMF, Monetary and Exchange Affairs Department, Exchange Regimes and Market Operations Division. Data are as reported by country authorities. Variables employed to compute index scores are dichotomous, and hence do not represent the degree of restrictiveness of any particular control. Similarly, the indices do not explicitly take into account the monitoring and enforcement of controls. The AREAER database from which the indices are generated does not distinguish controls that are maintained for prudential reasons from other capital controls.

1/ The Kyrgyz Republic (KGZ).

explained by the sizeable fiscal deficit registered during this period. Foreign exchange intervention was negligible in Turkmenistan, but the black market foreign exchange rate fell by more than 70 percent between July 1998 and April 1999. Similarly, the Uzbek central bank severely restricted access to foreign exchange for individuals and enterprises during the second half of 1998 and, as a result, the already large gap between the official exchange rate and the curb market rate widened further in the latter part of 1998 and 1999.

Table 6. Central Asia: Central Bank Intervention and Exchange Rate Depreciation,
July 1998-April 1999

	Central Bank Intervention 1/	Official Exchange Rate Depreciation 2/ (In percent)		
		July 98/ Oct.98	July 98/ Dec.98	July 98/ April 99
Kazakhstan	43	4	7	32
The Kyrgyz Republic	12	21	34	49
Tajikistan	72	14	29	33
Turkmenistan 3/	2	--- (25.3)	--- (55.0)	--- (70.4)
Uzbekistan 3/	NA 4/	7 (37.0)	9 (47.5)	14 (56.0)
Memorandum item:				
Russia	22	61	70	74

Sources: Owen (1999) and authors' estimates.

1/ Cumulative net official sales of foreign exchange, August to December 1998, as a percentage
    of end-July 1998 gross reserves (Owen (1999)).
2/ Dollar per local currency exchange rate.
3/ Numbers in parenthesis indicate exchange rate depreciation in the curb exchange rate market.
4/ Data not available.

V. LEGACY FROM THE CRISIS

By end-April 1999, economic realities had overtaken policymakers' initial reactions to the adverse shock from Russia. By then, nominal exchange rates had depreciated by about 37 percent (with respect to their July 1998 levels) in Kazakhstan and Tajikistan. In the Kyrgyz Republic, the som fell by almost 50 percent with respect to the US dollar during the same period. Moreover, in all of these three countries, the authorities tightened the stance of monetary policy and invigorated their efforts towards fiscal consolidation in the context of

IMF-supported economic programs.[18]

No major policy revisions took place in Turkmenistan and Uzbekistan, however. In Turkmenistan, the gap between the official and the curb market foreign exchange continued to widen throughout 1999, while the stance of fiscal policy remained loose as a result of large deficits of the extrabudgetary funds. In Uzbekistan, a large gap between the official exchange rate(s) and the curb market rate persisted throughout 1999.

The impact of the Russian financial crisis on the external sectors of the central Asian economies, together with the policy response of the authorities in these countries, raises a number of questions about the conduct of economic policy in the region. For example, to what extent are the current exchange rate regimes fundamentally different than those in place at the time of the crisis? Another issue is the extent to which the burden of external debt could become unmanageable for these economies. These two issues are briefly addressed in this section.

Bilateral Exchange Rates and Unit Labor Costs

As noted above, central banks in the region did not initially accept a depreciation of their national currencies. Instead, monetary authorities in central Asia let their nominal exchange rates fall in a protracted manner, after having lost vast amounts of reserves, especially Tajikistan and Kazakhstan.[19]

To date, the impact of the nominal exchange rate depreciations in central Asia has been positive on a number of fronts. First, the *nominal* exchange rate depreciations, accompanied by a tightening of demand management policies, have successfully translated into *real* depreciations, as domestic inflation in these countries gradually started to decline during the second half of 1999 (Figure 8).[20] Second, except for Turkmenistan, which has not adjusted its

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[18] On March 4, 1999, the IMF completed the mid-term review of the first year Enhanced Structural Facility (ESAF) loan to the Kyrgyz Republic. Also, a second annual ESAF loan for Tajikistan was approved by the IMF on July 2, 1999. Intense discussions between the IMF staff and the Kazakh authorities throughout 1999 led to an acceleration of stabilization efforts and structural reform, which culminated with the approval of a three-year credit for Kazakhstan under the Extended Fund Facility (EFF) in December 1999.

[19] Kazakhstan officially switched to a freely floating exchange rate regime in April 1999, while at the same time eliminating most trade restrictions introduced at the outset of the crisis (Box 1). However, some ad hoc trade restrictions (e.g., export bans, new import duties, and delays in scheduled tariff unification efforts) remained in place during the second half of 1999.

[20] In late 2000, a burst in domestic inflation appreciated the Tajik ruble vis-à-vis the Russian ruble.

Figure 8. Central Asia: Bilateral Nominal and Effective Real Exchange Rates
Against the Russian Ruble, 1996-2000 1/
(1995=100)

Kazakhstan

Kyrgyz Republic
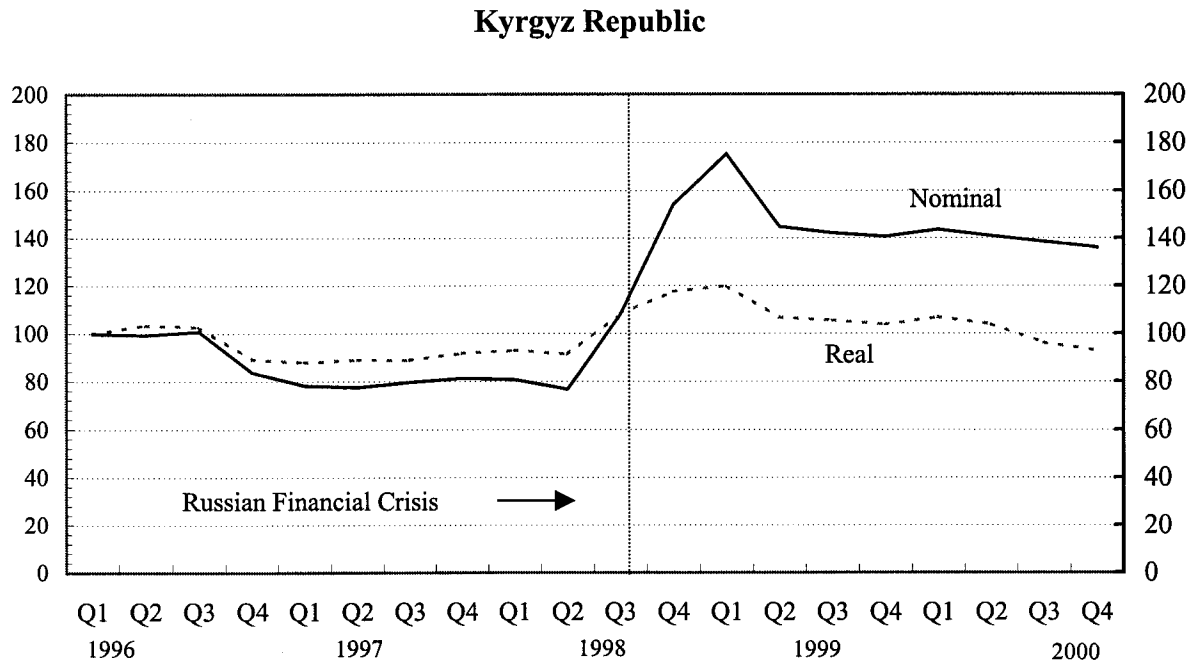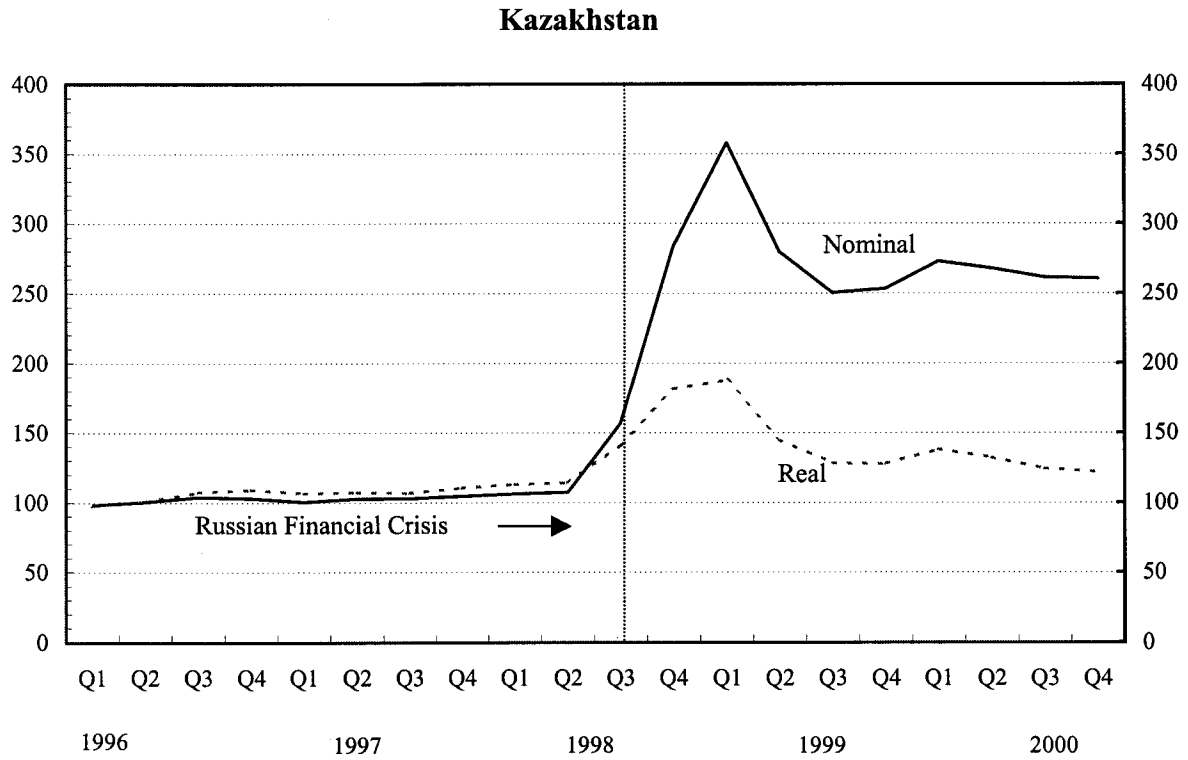
Source: Fund staff estimates.
1/ An increase in the index indicates an appreciation of the exchange rate.

Figure 8. Central Asia: Bilateral Nominal and Effective Real Exchange Rates
Against the Russian Ruble, 1996-2000 (continued)
(1995=100)

Tajikistan

Uzbekistan

Source: Fund staff estimates.

Figure 8. Central Asia: Bilateral Nominal and Effective Real Exchange Rates
Against the Russian Ruble, 1996-2000 (concluded)
(1995=100)

Turkmenistan
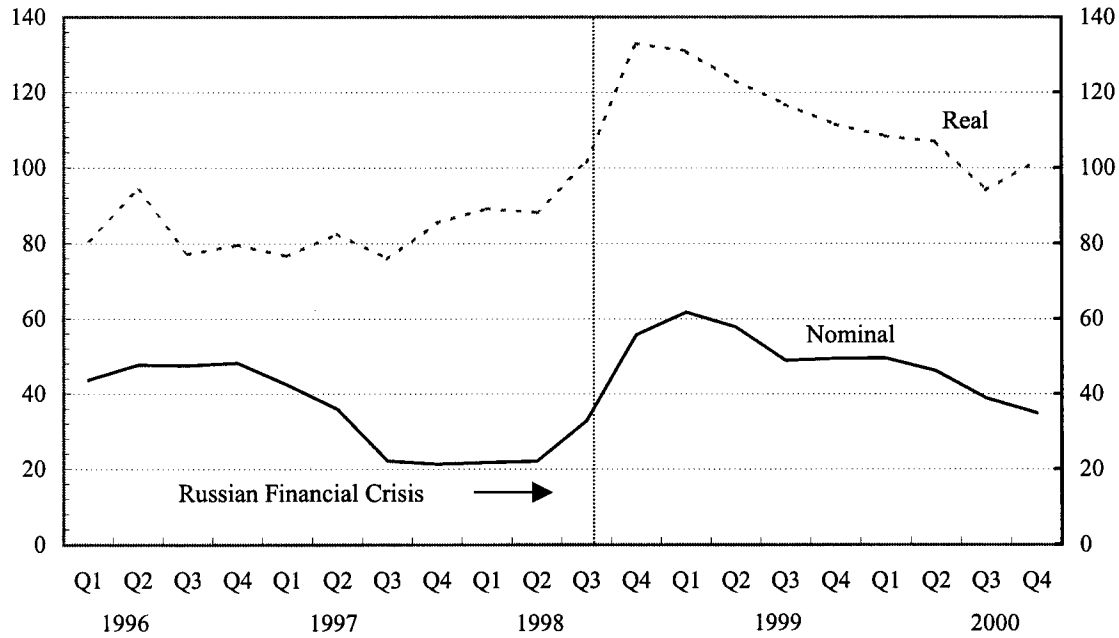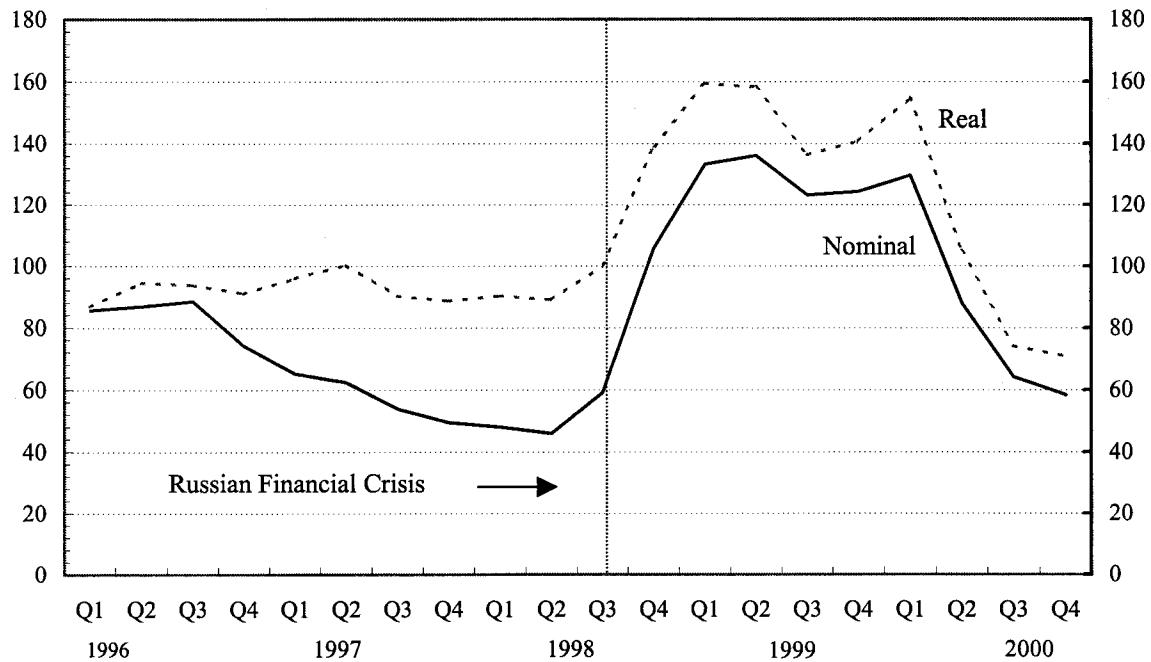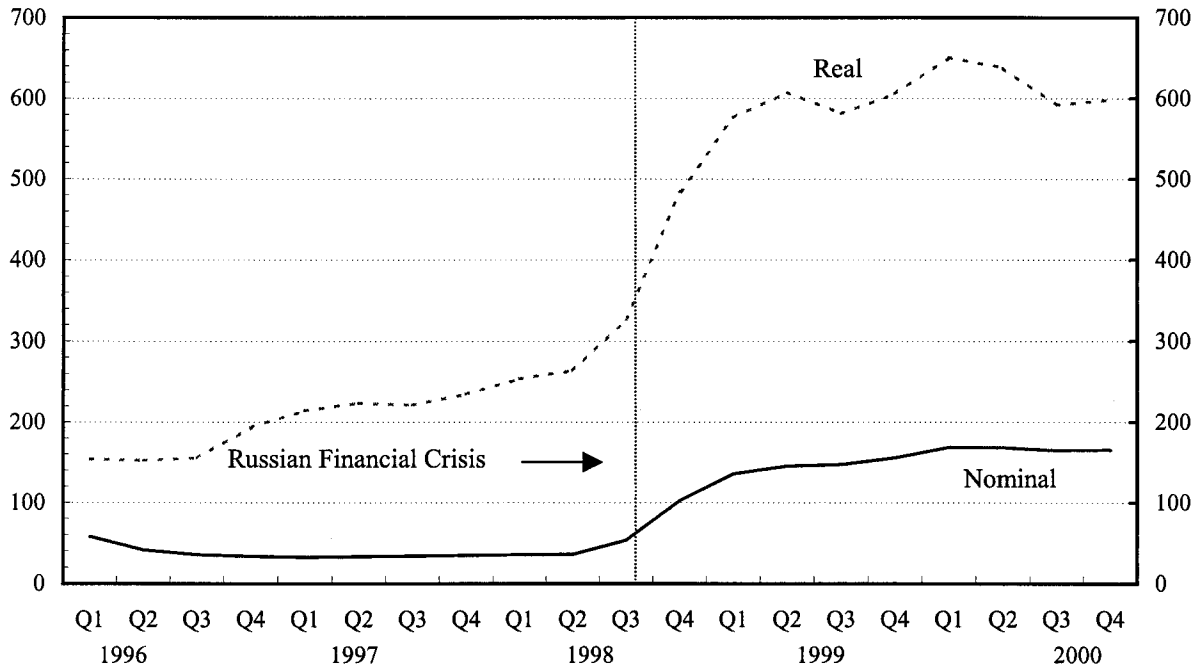

Source: Fund staff estimates.

official exchange rate from the levels in place before August 1998, bilateral real exchange rates between the Russian ruble and the Kazakh tenge, the Kyrgyz som, the Tajik ruble, and the Uzbek sum have roughly returned to their pre-crisis levels (in the second quarter of 1998), pointing to an apparent recovery in export competitiveness in these countries vis-à-vis Russia.[21]

Yet, other price indicators suggest that export competitiveness is probably worse than what is implied by bilateral real exchange rate estimates. In particular, unit labor costs (ULC) in each of the central Asian countries vis-à-vis ULC in Russia increased significantly between 1997 and 1999, and only started to decline in 2000 (Figure 9) against the background of very rapid labor productivity (and real GDP) growth and wage restraint in central Asia.[22] In Kazakhstan, for example, the increase in relative ULC has been accompanied by a decline in foreign direct investment to key non-energy sectors, like ferrous and nonferrous metals, geological exploration, food manufacturing, and services industry, which are important for long-term sustainable growth. While no immediate threat to the performance of non-energy products can be discerned, promoting a diversified export structure will require policies that encourage the growth in labor productivity, but discourage excessive nominal wage growth in the non-energy sector against the background of large capital inflows connected with the energy sector's boom.

A second challenge facing monetary authorities in central Asia is that the 1998/1999 exchange rate devaluations did not lead to the introduction of more flexible exchange rate regimes in the region. Indeed, a high degree of nominal exchange rate stability has persisted in these countries; far greater than one would expect for countries following either an "independent float," like Kazakhstan, or "nominally flexible regimes with no pre-announced path for the exchange rate," like in the case of the Kyrgyz Republic, Tajikistan, and Uzbekistan.[23] In fact, for all five central Asian countries we find that standard deviations of monthly nominal exchange rates for the period May 1999 to October 2000 are far smaller than those computed for the period January 1996 to July 1998 (Table 7).

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[21] A likely understating of inflation in the official price statistics suggests a caveat with the estimation and interpretation of real exchange rates for the Uzbek som.

[22] Due to data limitations, the productivity measures for Russia and central Asia plotted in Figure 9 relate to the whole economy and not only to the traded goods sector. It is generally accepted that the differential productivity growth rates find their origin in the tradable sector and that these differences are small when comparing non-tradable sectors across countries, see, for example, De Grauwe (1996), pages 98–102 on this subject.

[23] These exchange rate regime classifications come from the 2000 IMF's *Annual Report on Exchange Rate Arrangements and Exchange Restrictions*. The report did not include information on the type of exchange rate regime in place in Turkmenistan as of end-1999.

Figure 9. Cental Asia: Relative Dollar Unit Labor Costs with Respect to Russia, 1995-2000 1/
(1995 = 1.0)
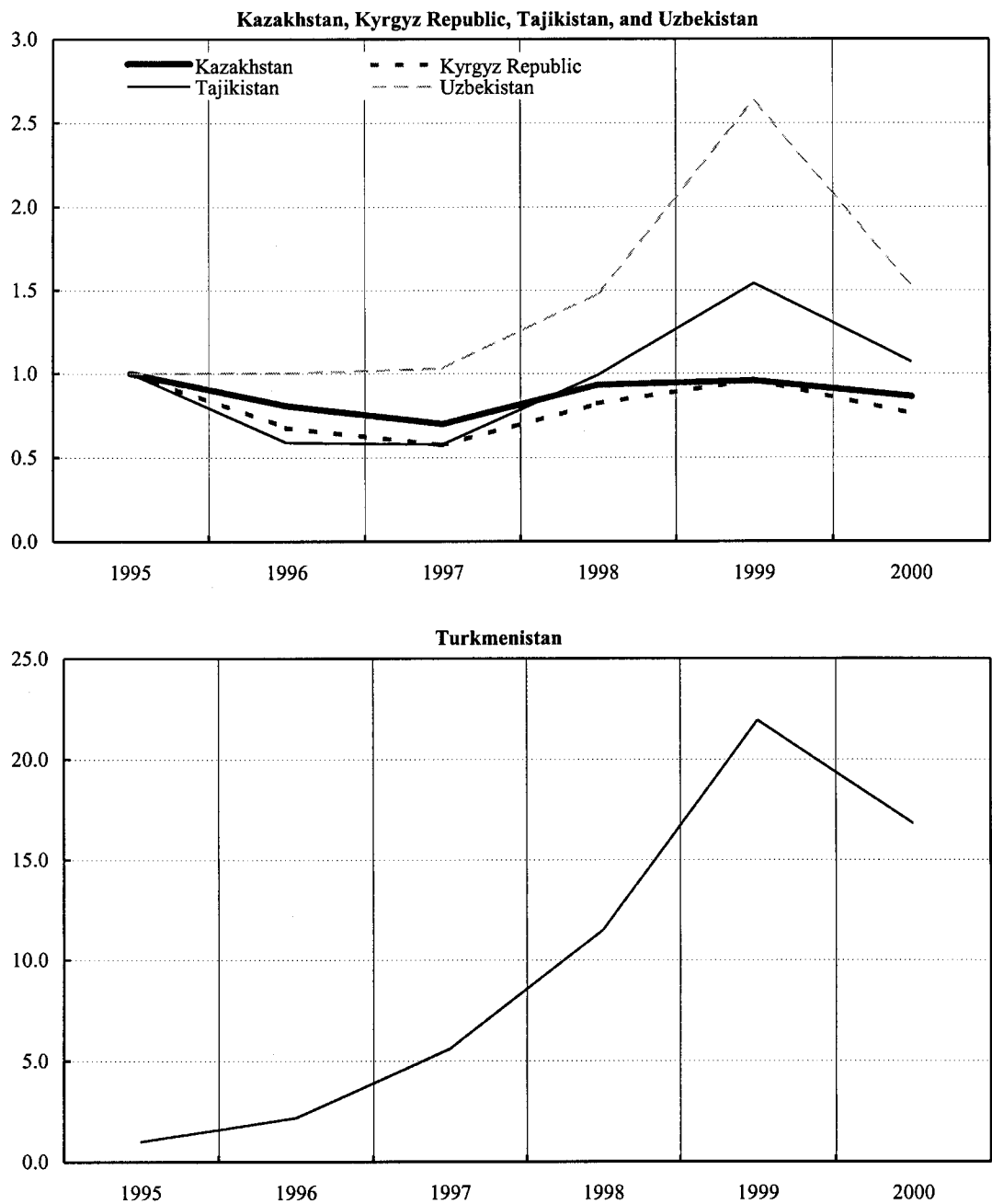
Sources: National authorities; and Fund staff estimates.

1/ Defined as the ratio of unit labor cost in Central Asian countries to unit labor cost in Russia.

Table 7. Central Asia. Descriptive Statistics for Nominal Exchange Rate Data, 1996-2000
(Monthly Data; National Currency per Russian Ruble)

| | Jan.96/July 98 | | Aug.98/April 99 | | May 99/Oct. 00 | |
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Kazakhstan	12.88	0.33	5.21	2.46	5.14	0.19
The Kyrgyz Republic	2.79	0.30	1.60	0.50	1.68	0.03
Tajikistan	87.13	31.78	53.83	21.94	58.92	8.46
Turkmenistan	688.26	131.11	324.76	175.25	194.20	12.24
Uzbekistan	10.60	2.73	6.71	3.28	6.68	2.30

Sources: National authorities; and authors' estimates.

In the same vein, statistical analysis advocated by the "fear of floating" literature[24] also suggests an important degree of post-crisis nominal exchange rate fixity in central Asia. Our estimates for central Asia show that, except for Kazakhstan, the indices of effective exchange rate flexibility (*FLEX*) for the post-crisis period (May 1999 to October 2000) were smaller than those computed for the period January 1996–July 1998 (Table 8). Interestingly, throughout 1996–2000, for all five central Asian countries, the estimated country indices (i) were consistently less than one, suggesting a *de facto* limited exchange rate flexibility according to the literature[25]; and (ii) showed an exchange rate volatility (*ME*) that was lower than the volatility of reserves (*MR*), which seems to suggest that the observed exchange rate stability was due to important intervention by the monetary authorities. A caveat with the estimation and interpretation of the *FLEX* index, however, is that the volatility of reserves could also reflect reserves movements associated with central bank operations other than intervention.

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[24] This literature measures the degree of *de facto* exchange rate flexibility—as opposed to *de jure*—of a given country by an index of effective exchange rate flexibility (*FLEX*), which is the ratio of the average absolute value of the monthly nominal exchange rate depreciation (*ME*) to the average absolute value of the monthly change in official reserves (*MR*). If *MR* is high relative to *ME and FLEX* is close to zero, this analysis would suggest that the monetary authorities are intervening heavily in the foreign exchange market to offset market forces. See Appendix II for basic references on the "fear of floating" literature.

[25] Poirson (2001), working with a sample of 164 IMF member countries for the 12 months to December 1998, calculated FLEX indices that ranged in value from 0 (currency unions and a number of *de jure* and *de facto* pegs) to more than 5 in Japan. Indices for other independent floaters like Australia, Indonesia, and Sudan ranged between 0.974 and 2.446 in Poirson's estimates.

Table 8: Central Asia: Country Scores on the FLEX Index, 1996-2000

| | | Volatility of | |
| | | Exchange Rate Changes | Reserves |
	FLEX	ME	MR 1/
Kazakhstan			
Jan.96-July 98	0.110	0.649	5.890
Aug.98-April 99	0.383	4.421	11.540
May 99-Oct. 00	0.123	1.677	13.610
Kyrgyz Republic			
Jan.96-July 98	0.475	2.443	5.140
Aug.98-April 99	0.718	7.230	10.070
May 99-Oct. 00	0.343	2.529	7.380
Tajikistan			
Jan.96-July 98	0.239	3.870	16.220
Aug.98-April 99	0.400	5.470	13.670
May 99-Oct. 00	0.221	3.850	17.460
Turkmenistan			
Jan.96-July 98	0.262	9.310	35.510
Aug.98-April 99	0.000	0	7.940
May 99-Oct. 00	0.000	0	2.410
Uzbekistan			
Jan.96-July 98	0.729	3.36	4.61
Aug.98-April 99	0.512	1.87	3.65
May 99-Oct. 00	0.725	6.08	8.39

Source: IMF, International Financial Statistics (IFS) and authors' calculations.
1/ External liabilities and government deposits were netted out from
reserves data as recommended in Levy-Yeyati and Sturzenegger (2000).
More precisely, we use line 11 from IFS, net of lines 16c and 16d, and divide
its change by line 14 lagged one month.

The apparent post-crisis nominal exchange rate fixity is at odds with an increasing amount of economic research suggesting that if a country is forced to exit a peg in a crisis, the new exchange rate arrangement should embody more flexibility.[26] The presumption is that the circumstances that gave rise to one disorderly exit could occur again and could be even heightened by ongoing current and capital account liberalization.

External Debt Issues

The unfolding of the Russian financial crisis during late 1998/early 1999 led to a significant increase in external debt-to-GDP ratios in central Asia, especially in the Kyrgyz Republic and Tajikistan. In the Kyrgyz Republic, the external debt-to-GDP ratio rose sharply from 56 percent of GDP in 1997 to 73 percent in 1998 and 110 percent of GDP by end-1999 (see Figure 1). The ratio reached 120 percent of GDP in 2000. In Tajikistan, the debt-to-GDP ratio increased from an average equivalent of about 90 percent of GDP in 1998 to 116 percent in 1999 and 126 percent in 2000. For Turkmenistan and Uzbekistan the burden of their external debt is more difficult to assess due to the overvaluation of these countries' official exchange rates. However, it is clear that valued at curb market foreign exchange rates, dollar GDP figures for these two countries would have shrank and their external debt-to-GDP ratios increased substantially between 1998 and 1999.

In Kazakhstan, the 1999 increase in the debt-to-GDP ratio (from an average equivalent to 33 percent of GDP in 1997/98 to roughly 50 percent in 1999) was not as large as in Tajikistan or the Kyrgyz Republic, and the level and composition of the debt did not become a source of fiscal and/or external vulnerability for the government. For one, Kazakhstan experienced a major terms of trade gain starting the first quarter of 1999, which ultimately translated in (i) very rapid growth of real GDP and energy exports in 2000/01; (ii) reduced financing needs of the general government due to large increases in tax revenue from exports of raw materials; and (iii) a major hike in its central bank's net international reserves position. Moreover, at the end of 1999, the average maturity of Kazakhstan's external debt was about 10 years, thus limiting the debt's refinancing risk.

In Tajikistan and the Kyrgyz Republic, the recorded large increase in the external debt-to-GDP ratio in 1999—from an already very high level in 1998—was mainly due to a rather unfavorable relation between the growth rate of dollar GDP and borrowing costs on foreign financing, while large fiscal deficits prevailed (Table 9). In particular, dollar GDP figures in these two countries shrank due to (i) the underlying exchange rate devaluations that ensued in late 1998/early 1999; (ii) a weak supply-side response to a large program of foreign-assisted investments carried on in the Kyrgyz Republic in 1995/98; and (iii) the negative effect of the

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[26] See, for example, Eichengreen and Masson et. al. (1998), International Monetary Fund (1997), Chapter IV, Collins (1996), and Obstfeld (1995).

Russian crisis on Tajikistan's exports and real GDP growth.[27] At the same time, interest rate costs vary between 3 to 6 percent per year in 1999, while overall fiscal deficits ranged between 3 percent of GDP in Tajikistan to 12 percent of GDP in the Kyrgyz Republic in 1999. All in all, the increase in the debt-to-GDP ratio was the standard result predicted by the literature on debt dynamics, with the relation between key financial parameters (i.e., borrowing interest costs and dollar GDP growth rates) suggesting that the Kyrgyz Republic and Tajikistan were confronting a serious debt problem by end-1999.[28]

Table 9. Central Asia: Indicators of External Debt Dynamics, 1999

	Fiscal balance (In percent of GDP; deficit -)	Interest Rate 1/ (In percentage points)	Growth of Dollar GDP (In percent) 2/	Change in Debt-to-GDP Ratio (in percentage points; increase +, decline -)
Kazakhstan	-5.0	2.6	-28.4	14.3
Kyrgyz Republic	-12.0	6.0	-23.6	36.7
Tajikistan	-3.1	3.0	-19.9	25.0
Turkmenistan	0.9	3.8	24.2	-4.4
Uzbekistan	-2.8	5.5	14.4	1.7

Sources: October 2000 WEO databank, and authors' estimates.

1/ Defined as the ratio of annual interest payments due to total external debt outstanding at the beginning of the year.
2/ Dollar GDP figures estimated using official exchange rates.

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[27] See chapter II in International Monetary Fund (2001a) and appendix I to International Monetary Fund (2001b) for a detailed discussion of the debt problems in Tajikistan and the Kyrgyz Republic.

[28] See Appendix III for a derivation of the classic debt dynamics equation:

$$\Delta d = -p + (i-g)d_{-1}/(1+g) + a$$

where Δd is the change in the debt-to-GDP ratio; p is the government's primary deficit in percent of GDP; i is the nominal interest rate; g is the growth rate of nominal GDP; d_{-1} is the debt-to-GDP ratio at the beginning of the period; and a refers to other items besides the budget deficit affecting indebtedness.

Bringing the debt ratios into a sustainable trajectory over the coming years will be a big challenge for the Tajik and Kyrgyz authorities. First, fiscal consolidation would need to proceed at a brisk pace with a view to generate large primary surpluses in the government accounts. Second, growth rates of dollar GDP would need to be higher than the projected costs of external borrowing. This would entail, inter alia, rapid economic growth and skillful debt management, possibly including debt rescheduling, to lower debt service costs.

VI. Concluding Remarks

The following observations and policy issues emerge from the paper:

•   The Russian financial crisis resulted in a sharp decline in central Asian commodity exports to Russia and other CIS countries; effects through the capital account of central Asian countries were somewhat less important.

•   The Russian financial crisis did not have the immediate effect of accelerating structural reform in central Asia, as some had been originally expected. Rather, EBRD transition indicators deteriorated for all central Asian countries (except Tajikistan) between 1998 and 1999, suggesting some backsliding in earlier structural reform efforts.

•   The initial policy response to the crisis by the financial authorities in Tajikistan and Kazakhstan was to hang on to their pre-crisis nominal exchange rates in the hope of maintaining the recovery in output that had been in evidence before the Russia crisis. Allowing the exchange rates to depreciate was apparently too costly for the authorities and could trigger an inflation spiral. At the same time, the stance of fiscal policy was relaxed and the Kazakh and Tajik central banks engaged in large sterilized intervention to arrest a contraction of monetary aggregates, while new current account and capital account controls were introduced.

•   The initial policy response to the crisis in the Kyrgyz Republic included limited intervention in foreign exchange markets, but the stance of fiscal policy was very expansionary in late 1998, thus contributing to a large and swift devaluation of the som.

•   By end-April 1999, economic realities had overtaken expectations by policymakers about what countries could do to minimize the effects of an adverse external shock like the Russian crisis. By then, nominal exchange rates had been devalued by 50 percent with respect to their July 1998 levels in the Kyrgyz Republic, and by an average of about 37 percent Kazakhstan and Tajikistan. At the same time, in all three countries, the authorities tightened the stance of monetary policy and invigorated their efforts towards fiscal consolidation in the context of IMF-supported financial programs.

•   On the other hand, in Turkmenistan, the gap between the official and the curb market foreign exchange continued to widen, as the authorities ran large fiscal deficits and kept the parity of the manat against the U.S. dollar unchanged from pre-crisis levels in the context of

tight exchange and capital controls. In the same vein, in Uzbekistan, extensive exchange controls and a large gap between the official exchange rate and the curb market rate persisted throughout 1999.

• A number a policy issues remain despite the exchange rate devaluations of late 1998/early 1999. *First*, according to unit labor costs estimates, all central Asian economies may face an export competitiveness problem vis-à-vis Russia, which is still a major trading partner for these countries.

Second, it is not clear whether central Asian countries shifted to more flexible exchange rate arrangements despite the protracted and costly exits that arose in the context of the crisis. Indeed, a preliminary analysis of exchange rate variability suggests that it is an open question whether the authorities in central Asia moved to more flexible exchange rate regimes following the September 1998 events. This apparent post-crisis exchange rate fixity is at odds with international experience suggesting that countries are likely to find it advantageous to move toward regimes of greater exchange rate flexibility over time, especially in a context of high capital mobility and growing export diversification. However, reaching a firm conclusion on the existing degree of exchange rate flexibility in central Asia may require further analysis in this area, as there is not clear-cut methodology to differentiate between reserves movements due to intervention (aimed at reducing exchange rate volatility) and other central bank operations, when assessing countries' exchange rate regimes.

Third, an evaluation of average interest rates on external borrowing and growth rates of dollar GDP suggests that the Kyrgyz Republic and Tajikistan were caught in a vicious external debt dynamics by end-1999. Growing out of this external debt problem will require, inter alia, a tightening of demand management policies, rapid growth of exports and real GDP, and skillful debt management on the part of the Tajik and Kyrgyz authorities to lower the debt service interest costs.

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Indices of Exchange and Capital Controls

The tabular presentation of the IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions* identifies 142 individual types of exchange and capital control. These are aggregated hierarchically into 16 categories; these categories are aggregated into indices, that measure the extent of exchange and capital controls. The index of controls on current payments and transfers includes exchange controls pertaining to the exchange arrangement, arrangements for payments and receipts, resident and nonresident accounts, import payments, and export proceeds. The index of capital controls encompasses controls on capital and money market securities, derivatives, credit operations, foreign direct investment, real estate transactions; provisions specific to commercial banks, other credit institutions and institutional investors; and surrender and repatriation requirements. The index of exchange and capital controls covers controls on current payments and transfers and capital movements.

The presence of control i in country j is reflected in a dummy variable D_{ij}, which is assigned a value of 1 when the individual type of control is in place and 0 otherwise, according to the conventions described below. The index of controls in category k (denoted by CI_{kj}) is defined as the actual number of controls normalized by the total feasible number of controls in the category (N_k), as follows:

$$CI_{kj} = \frac{1}{N_k} \sum_{N_1}^{N_k} D_{ij} \tag{1}$$

The indices of controls on current payments and transfers and capital controls (CCI_j and KCI_j, respectively) are the averages of indices for the respective categories:

$$CCI_j = \frac{1}{N_{CCI}} \sum_1^{N_{CCI}} CI_{kj} \tag{2}$$

$$KCI_j = \frac{1}{N_{KCI}} \sum_1^{N_{CCI}} CI_{kj} \tag{3}$$

where N_{CCI} and N_{KCI} denote the number of categories in CCI and KCI, respectively. The overall index of exchange and capital controls (ECI_j) is the average of CCI_j and KCI_j.

$$ECI_j = \frac{1}{2}\left(CCI_j + KCI_j\right) \tag{4}$$

Conventions for assigning values of the dummy variables D_{ij} are as follows. The value of 1 corresponds to prohibitions, quantitative limits, approval and registration requirements, restrictions on investors' opportunity set (for example, the type and maturity of securities), as well as the transactions infeasible due to the absence of the respective markets. The value of 0 is assigned for measures for statistical purposes, administrative verification, optional official cover of forward operations, liberal granting of licenses, and the lack of access to the formal market for foreign exchange transactions.

Index of Effective Exchange Rate Flexibility

Following the approach pioneered by Holden, Holden and Suss (1979), and more recently advocated in the "fear of floating" literature (see, for example, Levy Yeyati and Sturzenegger (2000)), we measure the degree of *de facto* exchange rate flexibility of country i (FLEX) as the ratio of the average exchange rate volatility (*ME*) to the average variations in reserves (*MR*), both in absolute value, with changes in reserves normalized by the monetary base in the previous month, in order to proxy for the monetary impact of these changes. Both averages are calculated for three different periods: pre-Russian crisis (January 96–July 98); the crisis period (August 98–April 99); and post-Russian crisis (May 99–October 00).

According to the literature, the rationale for using FLEX as an indicator of *de facto* exchange rate flexibility is that if *MR* is high relative to *ME* (and therefore FLEX is comparatively small) the monetary authorities are intervening heavily in the foreign exchange market to offset market forces. FLEX assumes values ranging from zero to infinity, with the limits being defined by a perfectly pegged policy at the one end (*ME*=0) and a completely intervention-free policy at the other (*MR*=0). An average for the period of analysis is used to eliminate the effect of short run fluctuations in either reserves or exchange rates, that do not accurately reflect longer run exchange rate policies. For country i and for *n* observations:

$$FLEX = \frac{ME}{MR} = \frac{\sum_{0}^{n} \left| E_{t-k} - E_{t-k-1} \right| / E_{t-k-1}}{\sum_{0}^{n} \left| R_{t-k} - R_{t-k-1} \right| \Big/ H_{t-k-1}}$$

where $E_{t,k}$ = nominal exchange rate in month t, R_t = net international reserves in month t, and H_t = monetary base in month t.

Public Debt Arithmetic

The change in public debt can be expressed in the following form:

$$\Delta D = (I-P) + A \qquad (1)$$

Where I is interest payments; P is the primary surplus; and A is other items besides the budget deficit that affect indebtedness, e.g., privatization receipts, devaluation losses, issuance of bonds for recapitalizing banks.

Equation (1) is useful in helping to identify the key determinants of the change in nominal debt; however, to facilitate an analysis of debt dynamics and the sustainability of debt, it is useful to rewrite (1) in terms of ratios to GDP. Dividing both sides of (1) by Y, the nominal GDP, and defining:

$$I = iD_{-1}; \text{ and} \qquad (2a)$$

$$Y = (1+g)Y_{-1} \qquad (2b)$$

Where i is the nominal interest rate and g is the growth rate of nominal GDP, we obtain:

$$D/Y - D_{-1}/(1+g)Y_{-1} = iD_{-1}/(1+g)Y_{-1} - P/Y + A/Y \qquad (3)$$

(3) can be rewritten as:

$$\Delta d = -p + (i-g)d_{-1}/(1+g) + a \qquad (4)$$

where $d=D/Y$, $p=P/Y$, $d_{-1}=D_{-1}/Y_{-1}$, and $a=A/Y$