

## **Russian Federation: Selected Issues**

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RUSSIAN FEDERATION

**Selected Issues**

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August 10, 2004

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## I. PRIVATE CAPITAL FLOWS TO RUSSIA IN PERSPECTIVE<sup>1</sup>

1. **This chapter reviews trends in private capital flows to Russia in recent years by decomposing the flows into its subcomponents.** While the balance of payments data present trends in capital flows in an aggregated form, the focus in this chapter is on private capital flows from a sources perspective, putting the various subcategories of flows within the broader context of overall emerging market financing,

2. **The main finding of this chapter is that there has been a significant shift in private market financing to Russia since 2002.** First, Russia became a net lender to the international banking system, as a complement to the prolonged period of large current account surpluses. Second, the nonbank corporate sector in Russia began to have better access to both bank and nonbank sources of external finance, with improving investor perceptions and a favorable external environment. This pattern began in late 2001, while interest rate sensitive borrowing by Russian banks showed an upturn later, around mid-2002. Syndicated loan and bond financing, after resuming in relatively modest amounts in early 2000, showed a significant upturn from late 2001, in a pattern broadly consistent with overall emerging market financing. The relatively lackluster performance of equity issuances and foreign direct investment (FDI) has been an outcome of both global and local factors. Structural reforms that improve access to international equity financing and FDI would diversify the funding base for the corporate sector and improve the overall liabilities in their balance sheets.

3. **The remainder of this chapter is organized as follows.** It begins by looking at the role of international bank lending into the Russian economy, which comprises the largest category of capital flows between Russia and the rest of the world. This is followed by a review of trends in international bond issuances, which are increasingly becoming a sizable source of financing for Russian non-sovereign entities. The relatively modest role of syndicated lending and the narrow focus of international equity issuances round out the discussion of international capital market access by Russian entities. The chapter concludes by offering an overview of recent developments as well as drawing out implications for further integration with international capital markets.

### A. Recent Trends

4. **After several years of large but declining private capital outflows<sup>2</sup>, the year 2003 was the first year when net private outflows declined to negligible amounts.** As Table 1

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<sup>1</sup> This chapter was prepared by Subir Lall.

<sup>2</sup> Private capital flows are defined in the balance of payments as the sum of “private sector capital” and “errors and omissions.”

shows, the main factors underlying this development were the sharp increases in commercial bank borrowing from overseas (\$10.3 billion) and in borrowing by the nonbank corporate sector (“corporations”) in international markets (\$12 billion). Portfolio investment registered a modest outflow (-\$0.8 billion), while net foreign direct investment continued to be negative (-\$3 billion). Capital flight is believed to comprise a major proportion of unclassified capital outflows, including substitution from domestic to foreign currencies by households and possibly enterprises. Trade credit is also a sizable component of “other private capital,” the bulk of which tends to be between international banks and their domestic counterparts.

Table 1. Russian Federation: Capital Account Developments, 2000-03  
(In billions of U.S. dollars, unless otherwise indicated)

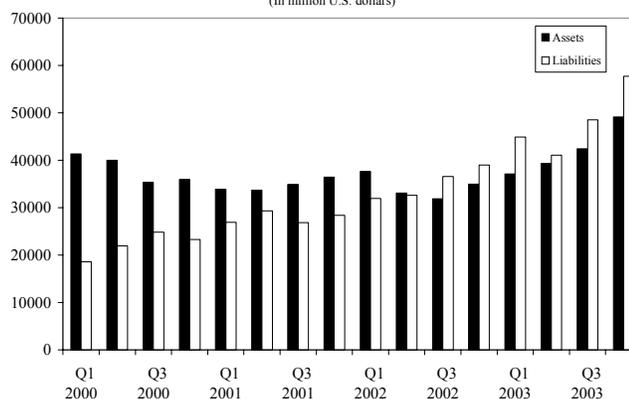
	2000	2001	2002	2003
Capital and financial and account	-21.8	-13.9	-10.9	-0.6
Capital transfers	-0.3	-0.5	-0.5	-1.0
Federal capital	-4.3	-6.8	-6.6	-4.4
Budgetary	-5.4	-5.2	-4.9	-7.4
Disbursements	1.1	0.6	0.9	0.8
Amortization	-6.6	-5.8	-5.7	-8.2
Non-budgetary	1.1	-1.6	-1.8	3.0
Local Governments	-0.8	-0.2	-0.5	-0.2
Private sector capital	-16.3	-6.4	-3.3	5.0
Direct investment	-0.4	-0.2	-1.2	-3.0
Portfolio investment (net)	-0.2	0.6	2.0	-0.8
Commercial banks	-2.1	1.0	2.2	10.3
Corporations	-1.0	0.4	8.3	12.0
Other private capital	-12.7	-8.2	-14.7	-13.4
Errors and omissions, net	-9.2	-10.2	-7.5	-5.2

Sources: Russian authorities; and Fund staff estimates. Data are presented on a due basis.

## B. International Bank Lending

5. **International bank data from the Bank for International Settlements (BIS) show that Russia has become a net lender to the international banking system since 2002** (Figure 1). The total position of BIS reporting banks vis-à-vis Russia was marked by an increase of liabilities of international banks since the beginning of the period under review, with assets showing a consistent increase only since the second half of 2002. Since that time, net international liabilities of banks vis-à-vis Russia turned positive. This is consistent with the long and sustained period of sizable current account surpluses in Russia and reduction in external debt ratios.

Figure 1. Russian Federation: External Position of BIS Reporting Banks vis-à-vis Russia, 2000-03  
(In million U.S. dollars)

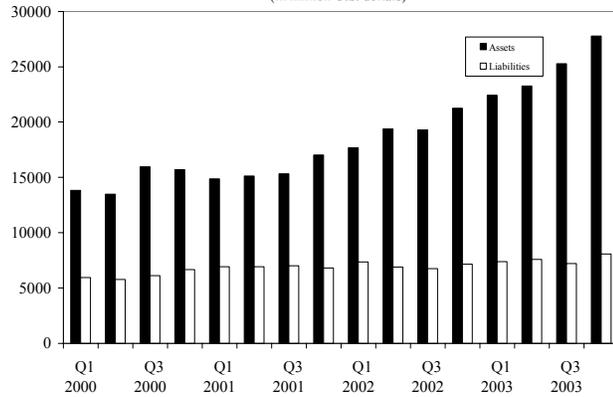


Source: Bank of International Settlements (BIS).

6. **While the overall picture highlights Russia’s role as net lender to the international banking system, the composition of this aggregate position differs markedly between banks and nonbank corporates** (Figure 2). International banks have been net lenders to the nonbank corporate sector in Russia, and this development has been amplified markedly since early 2002. The small size of the domestic banking system, coupled

with the improved access to international borrowing in terms of both volumes and pricing, for larger corporates since 2002, has been a key driver in allowing domestic corporates to diversify their sources of funding on attractive terms. While the nonbank sector's placement of funds with international banks has been broadly stable at around \$6–8 billion, the international banks' asset position vis-à-vis the nonbank sector has doubled from around \$14 billion to \$28 billion. Based on this measure, international banks have lent some \$12 billion in net terms to the nonbank sector in Russia over the period 2000–03.

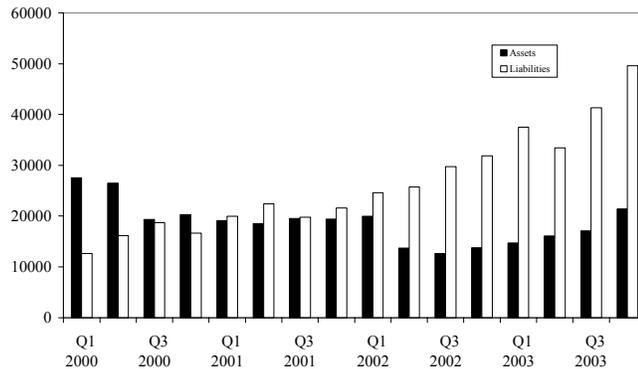
Figure 2. Russian Federation: BIS Banks' Position vis-à-vis Nonbank Sector, 2000-03  
(In million U.S. dollars)



Source: Bank of International Settlements (BIS).

**7. The picture regarding the Russian banking system is starkly different in comparison** (Figure 3). Here, international banks have gone from being net lenders to being net borrowers from early 2001 onwards. Russian banks' net lending to the international banking system has increased from \$1 billion at the beginning of 2001 to \$28 billion by end-2003. Much of this lending is believed to be in the form of interbank deposits placed by Russian

Figure 3. Russian Federation: BIS Banks' Position vis-à-vis Banking Sector, 2000-03  
(In millions of U.S. dollars)

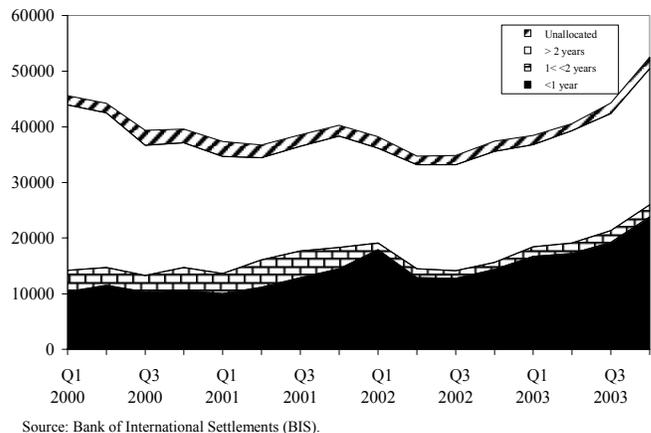


Source: Bank of International Settlements (BIS).

banks with BIS banks and trade credit by Russian exporters, which take the form of lending by Russian-based banks of exporters with the importing countries' banks. The apparent discrepancy between this picture and the balance of payments data on commercial bank's net borrowing can in part be explained by the fact that trade credit (recorded in the balance of payments under "other private capital") has increased in recent years (in net terms an outflow of \$9.7 billion in 2000–03). The increase in lending by international banks to Russian banks since mid-2002 (the "assets" of international banks) coincides with the period of fairly predictable exchange rates, which allowed Russian banks to participate in the carry trade by borrowing at attractive rates overseas with little perceived exchange rate risk. The increase in Russian banks' deposits overseas appears to have been driven more by client needs for providing trade credit and depositing the proceeds of current account surpluses.

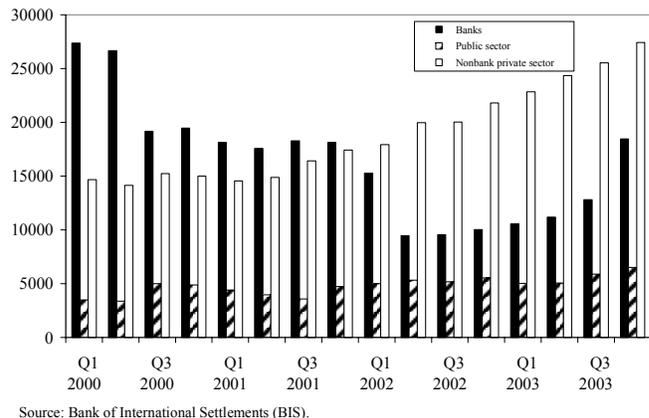
8. **Finally, a look at the consolidated data gives a more detailed picture of the composition of international bank flows to Russia** (Figure 4).<sup>3</sup> Looking at the claims of the foreign banks towards Russian entities, the proportion of short term exposure of foreign banks towards Russia has increased notably since the second half of 2002, coinciding with an upturn in foreign borrowing by Russian banks in the carry trade. Discussions with market participants suggest that the bulk of the increase in short term lending to Russia is related to the increase in borrowing by Russian banks, which would be consistent with the short-term nature of the carry trade, while the nonbank sector appears to be able to access funding at longer maturities for working capital and investment needs. This suggests that any change in the lending environment such as increases in global interest rates or rises in global risk aversion, affecting short term borrowing disproportionately, would likely see a reduction in foreign borrowing by Russian banks.

Figure 4. Russian Federation: BIS Banks' Consolidated Claims by Maturity, 2000-03  
(In million U.S. dollars)



9. **The perception that interest rate sensitive borrowing is more driven by Russian banks than by corporates is reinforced by the data on consolidated claims by sector** (Figure 5). These data suggest that the upward trend in corporate borrowing began in 2001, after ratings upgrades by the major agencies, while the banks' carry trade only started to increase from 2002 onwards, when U.S. policy rates had stabilized after the sharp cuts of 2001 and long-term rates had declined to near-record lows.

Figure 5. Russian Federation: BIS Banks' Consolidated Claims by Sector, 2000-03  
(In million U.S. dollars)



10. **In sum, this section reviewed the role of bank financing in private capital flows to Russia.** While the Russian banking system has been a net lender to the international banking system, the corporate sector has begun to increase its borrowing from abroad

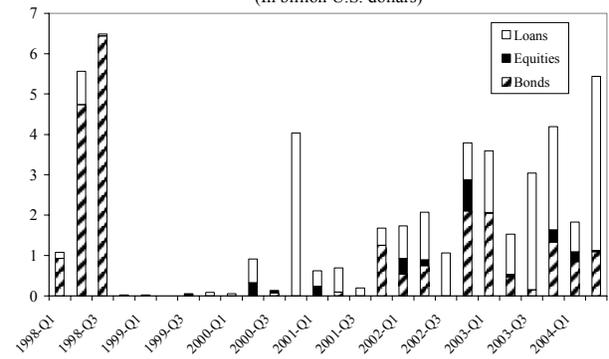
<sup>3</sup> Unlike the preceding international banking statistics which are based on location, and conform more closely to balance of payments definitions, consolidated statistics look at exposures by ownership, therefore, including local branches and subsidiaries of foreign banks as part of the foreign banks' overall claims position.

financed by banks. The recent upward trend in borrowing appears to have begun in earnest in late 2001, with creditor perceptions of Russia appearing to show what may be a fundamental positive shift around that time. The low interest rates in global financial markets became entrenched in 2002, allowing Russian banks to access interest rate sensitive flows as the ruble exchange rate became more predictable.

### C. International Issuances of Bonds, Loans and Equities

11. **Nonbanking flows from international markets to Russian entities have primarily taken the form of syndicated lending and bond issuances** (Figure 6). While bonds, particularly by the public sector, were prominent before the 1998 crisis, the recovery of market access since 2000 has shifted the balance of borrowing toward syndicated loans. Nevertheless, bonds outstanding have continued to grow, with public sector issuances declining and the private sector and the financial sector increasing their share of total issuances.

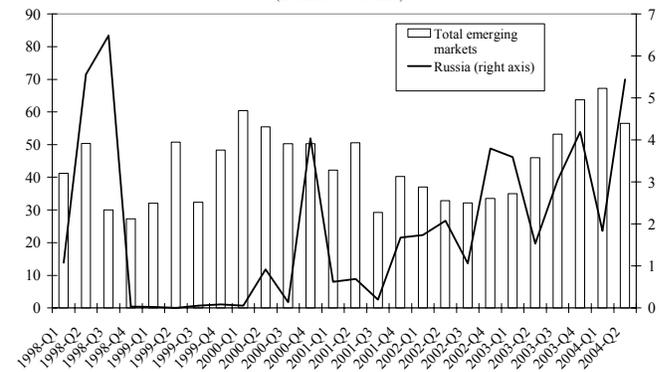
Figure 6: Russian Federation: Gross International Issuances of Bonds, Equity and Loans, 1998-2004  
(In billion U.S. dollars)



Sources: Capital Data and Fund staff calculations.

12. **The pattern of issuances has been broadly consistent with overall flows to emerging markets** (Figure 7). However, in terms of Russian borrowing from international markets, the proportions remain small, suggesting that there is little risk of saturation of the markets at the aggregate level.

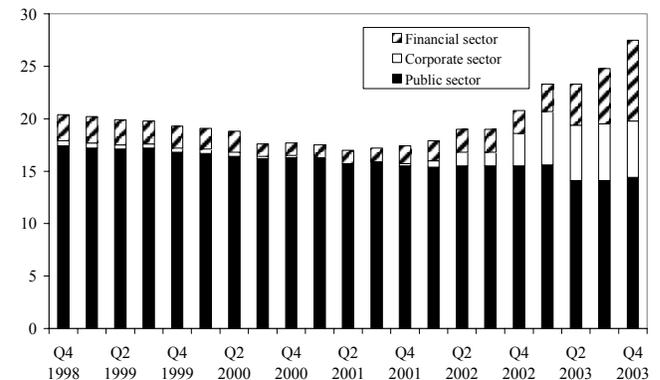
Figure 7: Gross Bond, Equity and Loan Issuance: Russia vs Emerging Markets, 1998-2004  
(In billion U.S. dollars)



Sources: Capital Data and Fund staff calculations.

13. **While the outstanding stock of government bonds has been declining, the stock of bonds issued by financial institutions and the corporate sector has been rising** (Figure 8). Taking advantage of improved investor perceptions towards Russia, as well as the improved outlook for emerging market bonds in general, Russian private entities began accessing international bond markets in earnest from late 2001 onwards, around the same time that bank flows began to show large

Figure 8: Russian Federation: International Bonds Outstanding by Sector, 1998-2003  
(In billions of U.S. dollars)



Sources: Bank of International Settlements (BIS) and Fund staff calculations.

increases. While the stock of government bonds declined from 85 percent at the beginning of 1999 to 52 percent by end-2003, that of the corporate sector grew from 2 percent to 20 percent over the same period. The proportion of bonds issued by financial institutions declined from 12 percent to 6.8 percent by end-2002, and increased to 28 percent by end-2003.

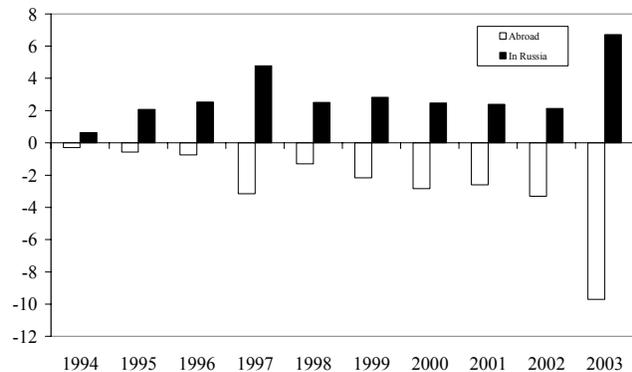
14. **Russian access to the syndicated loan market has been growing sharply, while Russian access to the international equity market has been relatively small.** On the one hand, issuance of syndicated loans to Russia grew rapidly, and picked up to unprecedented levels in the first half of 2004. However, their generally floating rate structure makes them vulnerable to rising interest rates in mature markets. As a result, the potential debt servicing costs of this could rise substantially. On the other hand, Russian access to the international equity market has been relatively small in contrast with other flows. Equity placements have been even smaller and sporadic, reflecting in part the concentration of ownership for the big Russian firms that potentially could access international capital markets. While syndicated loans have been overwhelmingly concentrated in the energy sector, followed by mining and some activity in the financial sector, international equity issuances have been distributed in relatively small amounts among the telecom, healthcare, aerospace, energy, consulting and banking sectors.

#### D. Foreign Direct Investment

15. **Based on balance of payments data, net FDI into Russia has turned negative, with FDI abroad rising, while FDI from overseas remained at relatively low levels**

(Figure 9). To some extent, the outward FDI reflects Russian entities booking investments into offshore fully - investments back in some part. Furthermore, some FDI investments, such as the landmark deal between BP and TNK in 2003 was recorded offshore and did not show up in balance of payments data. The huge energy sector surpluses have also obviated the need for FDI into the oil sector, and have given the oil companies the resources to fund acquisitions abroad, especially in the CIS. Finally, continued concerns about corporate governance are also reflected in low rates of inward FDI.

Figure 9: Russian Federation: Foreign Direct Investment, 1994-2003  
(In billion U.S. dollars)



Sources: Central Bank of Russia and Fund staff estimates.

#### E. Conclusions

16. **Since 2002, Russia has enjoyed increased capital inflows and greater capital market access.** First, there has been an increase in overall borrowing, ranging from bilateral

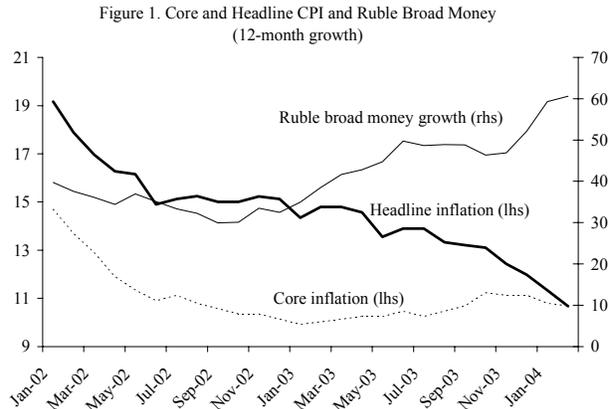
bank loans to bonds, syndicated lending, and some equity issuances. This diversification is a welcome development, given the limited extent to which the private sector can borrow at attractive rates from the domestic banking system and the ruble bond market. Moreover, accessing international markets requires the borrowers to meet international standards for reporting and disclosure, which can be expected to contribute to the improvement of the overall corporate governance environment. Second, the upgrading of Russia by the major rating agencies in 2001 and improved perceptions of country creditworthiness appears to have enhanced access by Russian corporates to international markets since late 2001. Third, with the subsequent decline in global interest rates to near-historic lows in 2002, the increase in short-term borrowing, particularly by banks engaging in the carry trade, has added to the overall trend..

17. **Two areas that have notably lagged in this broader trend have been equity issuances and FDI.** With the bursting of the global equity bubble in 2000, conditions for equity issuance remained subdued until late 2003 across all emerging markets. But with improvements in recent quarters, the scope for greater equity issuance by emerging markets has improved. However, both equity issuances and FDI are affected much more than international debt flows by perceptions of corporate governance, protection of minority shareholders, and a stable and predictable domestic legal framework. This suggests that structural reform efforts in these areas, besides improving the overall business environment, would also allow corporates to diversify their funding sources with a better balance between equity and debt financing. Within debt financing, better access to bond markets would also allow for longer-term fixed rate financing that corporates would need, particularly for infrastructure and long-term capital investments.

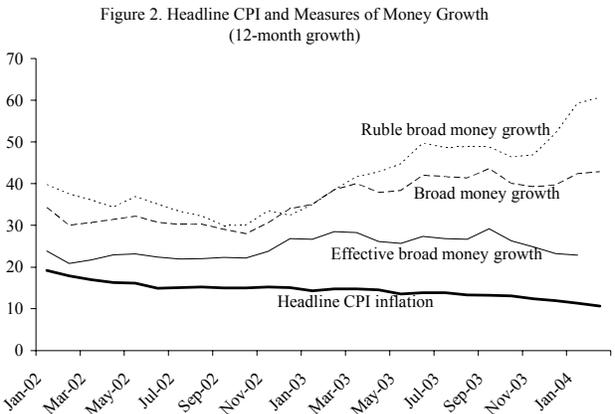
## II. INFLATION, MONEY DEMAND, AND DE-DOLLARIZATION IN RUSSIA<sup>4</sup>

### A. Introduction

1. **During 2003, Russia experienced rapid ruble money growth, while inflation remained lower than expected.** Ruble broad money growth almost doubled, from 32 percent at end-2002 to 61 percent at end-2003, while headline inflation declined from 15 percent at end-2002 to 12 percent at end-2003 (Figure 1). Part of the decline in headline inflation was due to slowing administered price growth, as indicated by the fact that core inflation increased slightly in 2003. Nevertheless, even the rise in core inflation appears relatively modest compared with the rapid pace of money growth. This “missing inflation puzzle,” which has recently appeared in other transition economies as well, calls for a better understanding of the determinants of money growth and inflation.



2. **In this chapter, we show that the “missing inflation puzzle” is explained in part by de-dollarization.** Since the early 1990s, foreign currency, mainly the U.S. dollar, has generally served all standard money functions in Russia.<sup>5</sup> It is only natural, therefore, to include foreign cash holdings outside the banking system in the definition of money. While data on foreign cash holdings are typically unavailable for most countries, this chapter presents an estimate of foreign cash in circulation in



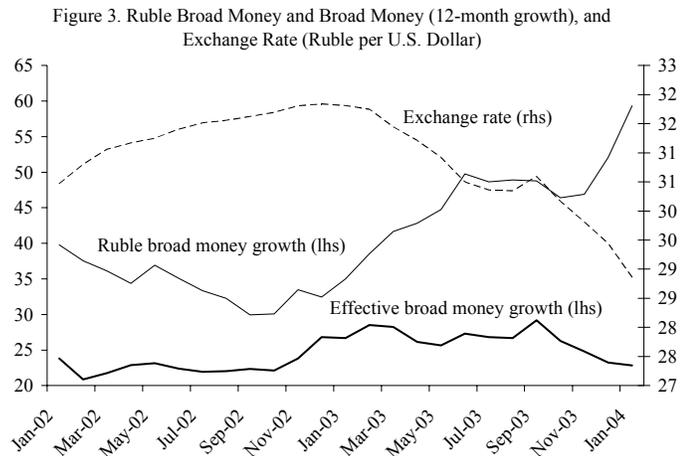
<sup>4</sup> This chapter was prepared by Franziska Ohnsorge and Nienke Oomes. For useful comments and suggestions, the authors are indebted to Olena Bilan, Gooheon Kwon, Bogdan Lissovlik, Sergei Nikolaenko, David Owen, Antonio Spilimbergo, Poul Thomson, Anna Vdovichenko, and seminar participants at the IMF, the Central Bank of Russia, and the UACES conference on “Monetary Policy in Selected CIS Countries.”

<sup>5</sup> That is, foreign currency has been used in Russia as unit of account, store of value, as well as a means of payment. While foreign currency is not legal tender in Russia, the U.S. dollar and, increasingly, the euro have been de facto accepted means of payment, in particular for large purchases such as real estate and cars.

Russia. Although the exact amount of foreign cash in circulation is subject to considerable uncertainty (see Appendix I), both our estimate and official sources suggest that a reversal in currency substitution, or de-dollarization, took place in 2003: that is, ruble money growth was partly the result of a decline in foreign cash holdings.<sup>6</sup> As a result, the growth in what we call *effective broad money* (broad money plus foreign cash holdings) was much less rapid than the growth of narrower monetary aggregates (Figure 2), taking away most of the missing inflation puzzle.

### 3. De-dollarization in 2003 appears to have been related to expected ruble appreciation.

From early 2003 until early 2004, the ruble appreciated against the dollar in a predictable way. The resulting negative expected return on dollar holdings outside the banking system, combined with strengthened confidence in banks, gave an incentive to substitute dollar cash for ruble deposits and, to a lesser extent, for ruble cash and euro cash. This may explain why ruble broad money growth began to increase at about the same time as the ruble started to appreciate. (Figure 3)



4. Previous studies of money demand in Russia, which did not include an estimate of foreign cash holdings, have found it difficult to find a stable money demand function. Banerji (2002) estimates a demand function for ruble broad money in Russia for the period June 1995–March 2001 and finds that VAR tests for the presence of a single cointegrating vector, which is one measure of money demand stability, “did not yield sensible or robust results.”<sup>7</sup> Choudhry (1998) estimates money demand in Russia for the earlier hyperinflation period January 1992–September 1994, and also fails to find evidence for a stationary long-run relationship between real ruble money balances (ruble broad money and ruble currency) and inflation.<sup>8</sup> Bahmani-Oskooee and Barry (2000) obtain a stationary relationship for the

<sup>6</sup> The Central Bank of Russia (CBR) confirms that de-dollarization has taken place in 2003. It estimates that the stock of foreign cash holdings outside the banking system fell from \$38.8 billion on January 1, 2003 to \$33.2 billion on January 1, 2004 (Bulletin of Banking Statistics, Table 1.9).

<sup>7</sup> Banerji (2002), footnote 6.

<sup>8</sup> However, Choudhry (1998) does find evidence for a stationary relationship between real money balances, the inflation rate, and the rate of nominal ruble/U.S. dollar depreciation, which he interprets as evidence of currency substitution.

period January 1991–June 1997, but, nevertheless, find evidence for instability of real ruble broad money demand in Russia. Studying a similar period, January 1992–July 1998, Nikolić (2000) finds that the relationship between broad money and inflation is “unstable and sensitive to changes taking place in the new economic and institutional environment” (p. 131).

5. **In this chapter, we show that including foreign cash holdings in the definition of money improves the stability of the money demand function.** For the period April 1996–January 2004, we find that monetary aggregates that exclude foreign cash holdings are significantly negatively dependent on the nominal bilateral U.S. dollar depreciation rate, confirming that the U.S. dollar has been an important substitute for ruble broad money. It is perhaps not surprising, therefore, that the demand for effective broad money, which includes foreign cash holdings, does not significantly depend on depreciation, because it is unaffected by currency substitution. Additional indications that the effective broad money demand function is stable is that it exhibits the smallest standard errors, constant parameter estimates, and the strongest evidence for uniqueness of its cointegrating vector.

6. **The construction of a broader, more stable, monetary aggregate can also help to better understand, and possibly predict, inflation.** Using a standard approach for estimating a “long-run” inflation equation, we find that, over our sample period, inflation depends for roughly 50 percent on nominal effective depreciation, for 40 percent on unit labor costs, and for 10 percent on utility prices. Deviations from this long-run relationship can be quite persistent, i.e., they can take up to 12 months to be corrected. As expected, the short-run dynamics of inflation seem to depend importantly on effective broad money: an excess supply of effective broad money does appear to be inflationary (while the excess supply of narrower monetary aggregates does not), and changes in effective broad money growth have the strongest and most persistent effect on short-run inflation.

7. **Our results should be interpreted with some caution, since they depend crucially on the accuracy of the data and the appropriateness of the econometric approach.** First, our estimate of foreign currency in circulation is subject to considerable uncertainty (Appendix I). Second, the strength of the short-term impact of effective broad money on inflation may be overestimated because of valuation effects (Appendix II). Third, our “long-run” cointegration results should be treated cautiously because of the relatively short time series and our ensuing choice to use monthly data and dummies for the August 1998 crisis, which may not have been sufficient to entirely remove the structural break in our series. Finally, while our methodology follows that of several other studies in the literature, the robustness of our approach needs to be tested in further research, using other data sources, additional variables, and different econometric specifications.

8. **The results of this study may be relevant for other dollarized transition economies.** As Table 1 shows, a number of transition economies, mostly former Soviet Union republics, have recently experienced rapid money growth as well, while inflation has remained relatively low. In addition, several recent studies on inflation in transition economies have found a weak link between inflation and the growth of monetary aggregates that exclude foreign cash holdings.<sup>9</sup> It may, therefore, be useful to study whether de-dollarization has played a role in these transition economies as well.

Table 1. Selected Transition Economies: Money Growth and Inflation, (average annual percent growth)

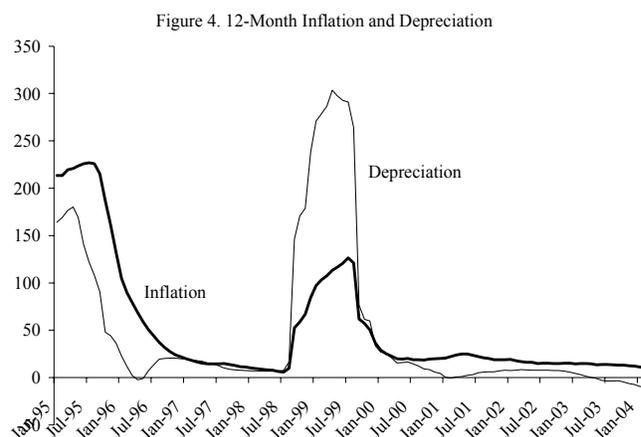
	Inflation	M2 1/	Broad money
Azerbaijan	2.2	28.0	30.0
Belarus	28.4	71.1	56.8
Bulgaria	2.3	20.3	16.8
Kazakhstan	6.4	55.1	29.2
Kyrgyz Republic	2.7	33.5	33.4
Russia	13.7	51.6	39.7
Ukraine	5.2	43.5	47.2

Source: International Financial Statistics.

1/ Defined as currency outside banks, demand deposits, time and savings deposits, and foreign currency deposits at deposit money banks.

### B. Russia's Inflation Experience During the Past Decade

9. **Slowing ruble depreciation contributed significantly to the disinflation of 1995–96.** In 1995, the authorities began implementing tight monetary and fiscal policies that contributed to a decline of 12-month inflation from over 200 percent at end-1994 to 22 percent at end-1996. Disinflation efforts were supported by a favorable external environment. However, short-term capital inflows and official debt relief exerted upward pressure on the exchange rate. By attempting to stem a ruble appreciation with unsterilized foreign exchange interventions, the CBR slowed the disinflation process somewhat. To discourage speculation for ruble appreciation, an exchange rate band was introduced from July 1995, which helped stabilize exchange rate and inflation expectations further. (Figure 4)



<sup>9</sup> For Ukraine, Lissovlik (2003) finds no evidence for a significant long-run relationship between money and inflation between February 1996 and September 2002. For the Slovak Republic, Kuijs (2002) finds no direct impact of excess broad money on short-run inflation during the period March 1993–December 2000. For Georgia, Maliszewski (2003) finds that the effect of exchange rates on inflation is somewhat higher than that of money aggregates for the period January 1996 to February 2003.

10. **In late 1997, weak fiscal and external fundamentals, combined with contagion effects from the Asian crisis, created pressures for ruble depreciation, which eventually led to the August 1998 financial crisis.** A reversal of capital inflows coincided with falling oil prices, which reduced GDP growth and the current account surplus. On top of this, underlying fiscal weaknesses led to surging interest rates.<sup>10</sup> Eventually, in August 1998,

the authorities announced a unilateral moratorium on debt payments and widened the trading band of the ruble, implying a de facto devaluation. In September 1998, the exchange rate depreciated by 103 percent, the immediate effect of which was a surge in monthly inflation from 3.7 percent in August to 38 percent in September 1998, and an increase in 12-month inflation from 5.6 percent in July 1998 to 126 percent by July 1999.

11. **Since 1999, the authorities have pursued a relatively unambitious disinflation path, reducing inflation by 2–3 percent per year.** A favorable external environment, in particular a recovery of oil and metals prices and ensuing current account surpluses, as well as resumed capital inflows from 2001, allowed the CBR to accumulate reserves. Since 2000, the CBR has been fighting pressures for ruble appreciation through largely unsterilized foreign exchange purchases. As a result, monetary aggregates have been growing rapidly, and further disinflation has proven difficult.

12. **Effective broad money has grown broadly in line with inflation and exchange rate developments.** As Figure 6 shows, effective broad money growth accelerated sharply during (and partly anticipating) the 1998 crisis,<sup>11</sup> and decelerated again as inflation came down. While this is mostly a reflection of the revaluation of dollar-denominated

Figure 5. Industrial Output (12-month percent change) and Urals Oil Price (U.S. dollars per barrel)

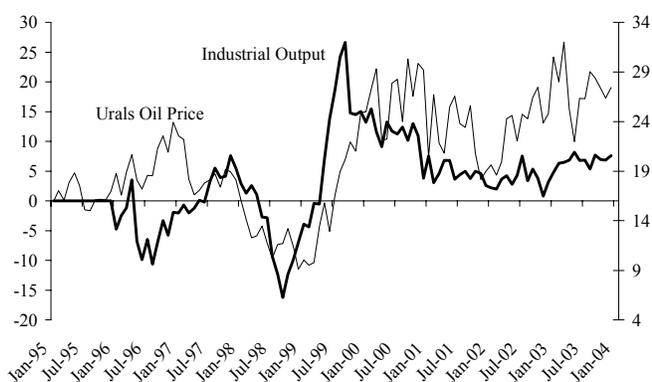
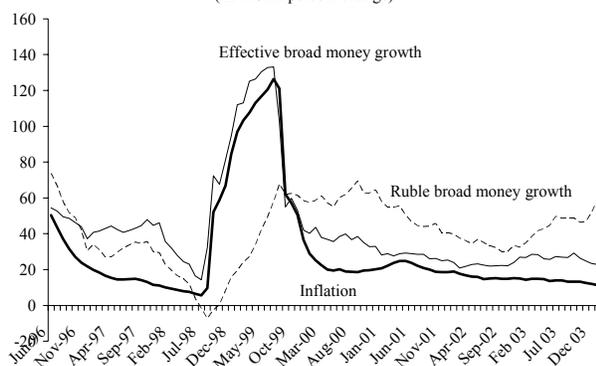


Figure 6. Growth in Monetary Aggregates and Inflation (12-month percent change)



<sup>10</sup> For more discussion on the causes of the 1998 crisis, which is beyond the scope of this chapter, see, e.g., Buchs (1999), Desai (2000), and Kharas, Pinto, and Ulatov (2001).

<sup>11</sup> The drop in all monetary aggregates in mid-1998 partly reflects a collapse of the payment system in the immediate aftermath of the crisis.

assets during ruble depreciations and appreciations, more detailed calculations in Appendix II show that it also reflects a volume effect. Moreover, as we argue in Appendix II, the fact that changes in the exchange rate affect effective broad money may make it a more useful measure for explaining, and possibly predicting, inflation.

### C. Analytical Framework

13. **We model the determinants of inflation in Russia by combining two main theories: the markup theory of inflation and the monetary theory of inflation.** The markup theory of inflation goes back to Duesenberry (1950), while the monetary theory of inflation is typically associated with Friedman and Schwartz (1963). The markup theory has often been used as a framework for estimating the long-run determinants of inflation, while the monetary theory is mostly used to model short-run inflation dynamics.

14. **According to the markup theory of inflation, the long-run domestic price level is a markup over total unit costs.** Following De Brouwer and Ericsson (1998), we can write:

$$P = \mu \cdot ULC^\alpha P_{im}^\beta P_{ut}^\gamma,$$

where  $P$  is the consumer price index,  $\mu$  is the markup,  $ULC$  is the unit labor cost (average wage cost per unit of output),  $P_{im}$  measures the price of imported inputs, and  $P_{ut}$  is an index of utility prices, including energy and electricity. The elasticities of the CPI with respect to each input price are denoted by  $\alpha$ ,  $\beta$ , and  $\gamma$ , respectively, and are hypothesized to be positive and constant. Moreover, it is typically assumed that  $P$  is linearly homogenous (that is, raising the cost of each input by  $x$  percent should lead to an increase in consumer prices by  $x$  percent), which generates the testable hypothesis  $\alpha + \beta + \gamma = 1$ . The term  $\mu - 1$ , then, equals the percentage markup of consumer prices over production costs. Similar markup models of inflation have been used, among others, by Lissovolik (2003) for Ukraine, by Kuijs (2002) for the Slovak Republic, and by Sekine (2001) for Japan.

15. **According to the monetary theory of inflation, inflation is driven by excess money supply.** Several studies have suggested that, in the years following price liberalization in 1992, inflation in Russia had mainly monetary roots, in that ruble money growth appeared to be strongly correlated with inflation.<sup>12</sup> This suggests that, during the hyperinflation period of the early 1990s, money demand growth was negligible compared with money supply

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<sup>12</sup> Studies based on Russian data from the early 1990s (surveyed in Pesonen and Korhonen, 1999) find a strong effect of ruble broad money growth on inflation with a relatively short lag of up to four months. They also find some evidence that the lag length extended and weakened from 1994 onward as disinflation progressed and velocity became less predictable. Nikolić (2000) finds no stable linear relationship between ruble broad money or overall broad money (including foreign currency deposits) and inflation for the period 1994–98, suggesting that inflation in the second half of the 1990s was no longer a monetary phenomenon.

growth. In principle, however, inflationary pressures are naturally expected to arise only when money supply exceeds money demand.

16. **We employ a two-stage estimation method that allows us to take into account both theories of inflation.** In the first stage, we estimate a long-run markup equation for inflation without taking into account excess money supply (since excess money should equal zero in the long run) and we separately estimate a long-run equation for money demand, using the Johansen cointegration approach in both cases. In the second stage, we then combine the two long-run relationships in one equation that takes into account deviations from the long-run equations (i.e., the equilibrium correction terms), so as to determine the short-run dynamics of inflation.<sup>13</sup>

#### D. Long-Run Inflation

17. **To estimate a long-run inflation equation for Russia, we calculate unit labor costs using industrial wage, employment, and output data, we measure import price growth by nominal effective exchange rate depreciation, and we estimate the growth in utility costs by the growth of the “paid services” component of the CPI.**<sup>14</sup> Unit labor cost are calculated as the industrial wage bill (i.e., industrial wages times industrial employment) divided by real industrial output.<sup>15</sup> The nominal effective exchange rate is a trade-weighted average of exchange rates, and, therefore, is a better proxy for import prices than bilateral exchange rates.<sup>16</sup> The “paid services” component of the CPI include public transportation, housing, telephone subscription, electricity, water, sewage, and gas.<sup>17</sup> Although this approach has been used in the literature, the difficulty of it is that services inflation is a subset of CPI inflation, which would lead to perfect collinearity if the weight of services in the CPI was

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<sup>13</sup> Such a two-stage approach is commonly used for developing countries with time series data that are of limited length and that tend to be subject to significant measurement errors (e.g., Kuijs, 2002; Sacerdoti and Xiao, 2001; Williams and Adedeji, 2004). While it would obviously be preferable to estimate the two long-run equations simultaneously from one VAR, this tends to be very difficult with short time series data of limited quality that are subject to structural breaks. The advantage of separately estimating two VARs, each of which has a unique cointegrating vector, is that it is easier to find estimates close to theoretical priors. Kuijs (2002, p. 9) argues that this economic advantage outweighs the technical drawback of having a (statistically) less efficient procedure.

<sup>14</sup> A similar variable is used in the long-run inflation equations estimated by Kuijs (2002) for the Slovak Republic, and by Lissovlik (2003) for Ukraine.

<sup>15</sup> Since monthly industrial employment data for Russia are only available from January 1998, we used overall employment growth as a proxy for industrial employment growth for the earlier period.

<sup>16</sup> We do not multiply the nominal effective exchange rate by foreign price levels because, during the sample period, inflation in the trading partner countries (most importantly, the EU) was low and stable compared to Russian inflation.

<sup>17</sup> These data are taken from Goskomstat, the state statistical committee, which publishes time series on only three subcomponents of the CPI: foodstuffs, non-food goods, and paid services.

constant over time, which it is not. A preferable approach is to use core inflation as the dependent variable, but Russian data on core inflation are only available from January 1999.

18. **We can write the long-run equation for inflation as a loglinear function of unit labor costs, depreciation, and utility prices:**

$$p = \ln(\mu) + \alpha \cdot ulc + \beta \cdot neer + \gamma \cdot p_{ut},$$

where  $p$  denotes the logarithm of the CPI index,  $neer$  denotes the logarithm of the nominal effective exchange rate index,  $ulc$  the logarithm of the unit labor cost index, and  $p_{ut}$  the logarithm of the price index for paid services (utilities). In order to test for cointegration between these variables, it is necessary for all variables to be I(1), i.e., nonstationary in levels but stationary in differences. However, standard unit root tests, reported in Appendix III, cannot reject (at the 1 percent level) the hypothesis that all variables are nonstationary in differences, not even when we use 12-month differences to reduce seasonal effects.<sup>18</sup> However, monthly changes in the year-on-year growth rates are found to be stationary. Although unit root tests have weak power in short time series, we consider these results sufficiently reliable to estimate the following cointegration vector:

$$\Delta p = \alpha \cdot \Delta ulc + \beta \cdot \Delta neer + \gamma \cdot \Delta p_{ut},$$

where the  $\Delta$  signs refer to 12-month differences. That is, we assume that inflation depends for  $\alpha$  percent on unit labor cost growth, for  $\beta$  percent on the nominal effective depreciation rate, and for  $\gamma$  percent on utility price inflation.

19. **Cointegration tests generally confirm the hypothesis of a unique cointegrating vector for the period April 1996–January 2004.** As Appendix IV shows, the null hypothesis of no cointegration ( $r = 0$ ) is strongly rejected, while the null hypothesis that there is at most one cointegration test ( $r \leq 1$ ) cannot be rejected by three out of four cointegration tests (and for the fourth test only at the 5 percent level). Again, the caveat of the weak power of cointegration test in short time series has to be kept in mind when interpreting the results of the tests.

20. **The estimated cointegration relationship, normalized for inflation, suggests that long-run inflation depends for roughly 50 percent on nominal effective depreciation, for roughly 40 percent on unit labor cost growth, and for roughly 10 percent on increases**

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<sup>18</sup> It is possible that our failure to reject the null hypothesis that inflation is nonstationary is due to the low power of Dickey-Fuller unit root tests for relatively small samples with structural breaks. However, it is not unusual for inflation to be nonstationary. For example, the inflation rate is often included as an opportunity cost in cointegrating vectors for money demand, which is a valid procedure only if inflation is I(1). Evidence of nonstationary inflation is also reported by Celasun and Goswami (2002) for Iran, and by Budina, Maliszewski, De Menil, and Turlea (2004) for Romania.

**in utility prices.** The estimate of the pass-through effect from nominal effective depreciation is relatively precise and robust, and close to the 0.5–0.6 pass-through estimate found by Stavrev (2003) for the nominal ruble-U.S. dollar depreciation rate.<sup>19</sup> Without imposing the restriction that the coefficients should add up to unity, the coefficient on utility price growth is larger, and the coefficient on ULC is smaller (Table 2). However, when we reestimate the equation imposing the linear homogeneity hypothesis ( $\alpha+\beta+\gamma=1$ ), a formal likelihood-ratio test shows that this hypothesis cannot be rejected at the 5 percent level (Table 2). We, therefore, take the restricted long-run inflation equation to be the more economically meaningful one.

21. **The cointegration test suggests that the estimated coefficients of the (restricted) long-run inflation equation are stable over time.** Figure 9 shows the recursive estimates and 95 percent confidence intervals for nominal effective depreciation and unit labor cost growth (the growth in utility prices is a residual), allowing us to observe how the coefficients change as the equation is reestimated after sequentially adding new monthly observations, starting from January 2000. The coefficient on depreciation is stable at about 0.5. There is some indication that inflation did not significantly depend on unit labor cost growth before 2001, but the fact that the early estimates are not significantly different from zero may be owing to the short sample. As Appendix V shows, the coefficients, especially the coefficient on nominal effective depreciation, appear broadly robust to the choice of lag length (using two instead of three lags), the measure of unit labor costs (using industrial wage growth gives similar results) and the measure of import price growth (using the bilateral depreciation rate against the U.S. dollar gives similar results as using nominal effective depreciation).

### E. Long-Run Money Demand

22. **We estimate long-run money demand using a standard specification that is consistent with a range of monetary theories:**

$$\frac{M^d}{P} = f(Y, \bar{R}),$$

where  $M^d$  is the demand for a particular monetary aggregate,  $P$  is the consumer price index,  $Y$  is a scale variable measuring the real level of economic activity, and  $\bar{R}$  is a vector representing the rates of return on alternative assets (i.e., the opportunity costs of holding

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<sup>19</sup> Reestimating the equation with the bilateral rate instead of the nominal effective rate gives a very similar estimate, most likely because the nominal effective exchange rate for Russia puts a large weight on the bilateral U.S. dollar rate.

money). To measure  $Y$ , we use monthly data on industrial production as a proxy for monthly GDP.<sup>20</sup>

23. **To measure the rate of return on alternative assets, we use two different opportunity costs.** The first opportunity cost is the nominal ruble deposit rate, which is a weighted average of interest rates on deposits with different maturities. While it is more common to use the T-bill rate, we could not use this for our sample period because of

**Table 2. Estimated Long-Run Cointegration Equation for Inflation, 1996:4-2004:1 1/**

		Unit labor cost growth	Nominal effective depreciation	Utility price growth	Sum of coefficients
Unrestricted	Coefficient 2/	0.253 **	0.477 **	0.457 **	1.187
	Standard error	0.097	0.019	0.140	
Restricted	Coefficient 2/	0.397 **	0.494 **	0.109 3/	1.000
	Standard error	0.103	0.020	...	

LR test of restriction:  $\chi^2(1) = 3.0548$  [0.0805]

1/ The underlying VAR includes three lags, a constant, a trend, and four dummies: for the disinflation period in early 1996, the 1998 crisis, the August 1999 recovery from the exchange rate overshooting in August 98, and October 2000 (for 4/96 to 7/96, 8/98 to 9/98, 8/99, 10/00).

2/ \*\* denotes significance at the 1 percent level.

3/ The coefficient on utility price growth is a residual.

lack of data.<sup>21</sup> We apply this interest rate to monetary aggregates that also include deposits because we expect the cash component of monetary aggregates to dominate in Russian data. The second opportunity cost is the (expected) nominal ruble-dollar depreciation rate, that is, the rate of return on holding U.S. dollars.<sup>22</sup> While the inflation rate could also be considered

<sup>20</sup> Monthly estimates of GDP are not available for Russia. If we were to use quarterly data on GDP for the period 1996:II–2003:IV, we would have only 35 data points, which is too few to generate any statistically reliable results.

<sup>21</sup> The T-bill (GKO) market in Russia collapsed when the government defaulted on its T-bills in August 1998. While it was reinstated in June 2000, the market has been thin since then, hence the T-bill rate is unlikely to have played a major role in determining money demand.

<sup>22</sup> Both Choudhry (1998) and Banerji (2002) find that real ruble money demand depends negatively on the rate of RUR/USD depreciation, while Buch (1998) finds that it depends negatively on the *level* of the nominal RUR/USD exchange rate (and not on the current of future depreciation rate). The significance of the

(continued...)

as an opportunity cost, i.e., the return on holding goods, the high correlation between inflation and depreciation in Russia prevented us from including both in the money demand equation at the same time.<sup>23</sup> Hence, we chose to include only the depreciation rate because the depreciation rate may have been a more important opportunity cost than the inflation rate because (1) the depreciation rate is easier to monitor by the population than the inflation rate, and (2) anecdotal evidence suggests that U.S. dollars have been a more important alternative asset than durable goods.<sup>24</sup>

**24. While money supply can temporarily exceed money demand, or vice versa, it is assumed that prices in Russia are sufficiently flexible so as to ensure money market equilibrium in the long run.** Setting  $M^d = M^s = M$ , and using lower cases for logarithms, we can thus write the long-run money demand function in log-linear form:

$$m - p = \beta_0 + \beta_1 y + \beta_2 i + \beta_3 e,$$

where  $i$  is the 12-month nominal ruble deposit rate, and  $e$  is the 12-month nominal ruble-U.S. dollar depreciation rate. Since each variable is nonstationary in levels, and stationary in (one-month) differences (see Appendix III), we can estimate a cointegrating relationship between the four variables.<sup>25</sup> The residual of this long-run relationship shows the difference between money supply and money demand, i.e., the monetary policy stance.

**25. In order to determine which monetary aggregate provides the most stable money demand function, we estimate  $M^d$  by five different aggregates: ruble currency in**

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depreciation rate is interpreted by Choudhry (1998) as evidence for currency substitution, and by Banerji (2002) as evidence that the depreciation rate is used as a proxy for future interest rates or for convertibility risk following a crisis. Buch (1998) interprets the significance of the level of the exchange rate as evidence that the current exchange rate is taken as an indicator of future depreciation, which seems somewhat unrealistic.

<sup>23</sup> We estimated separate money demand equations with inflation instead of depreciation, and found that including inflation into any of the money demand equations removed the significance of deposit rates and/or industrial output. Additionally, the effect of inflation alone on effective broad money was insignificant. We interpreted this as evidence that inflation was capturing both depreciation and interest rate effects, rather than opportunity cost representing the return on durable goods.

<sup>24</sup> Real estate has only recently started to be used as an alternative asset, and only by a small fraction of the population.

<sup>25</sup> Using actual depreciation as a measure of expected depreciation in a cointegrating relationship can be justified if agents' forecast errors are stationary. Under rational expectations the forecast errors are always stationary, while under backward-looking expectations the forecast errors are stationary when the process being forecast is nonstationary in levels, which is the case here (Taylor, 1991; Choudhry, 1998). We estimated our equations using both rational expectations (perfect foresight) and backward-looking expectations, and the results did not change significantly.

**circulation, ruble narrow money, ruble broad money, broad money, and effective broad money.** Following Feige (2002), we define effective broad money (EBM) as the sum of ruble currency in circulation outside the banking system (RCC), ruble demand deposits (RDD), ruble time and savings deposits (RTD), foreign currency deposits (FCD) and, most importantly, an estimate of foreign currency in circulation (FCC). Our five monetary aggregates are defined as follows:

Ruble Currency in Circulation	= RCC
Ruble Narrow Money (RNM)	= RCC+RDD
Ruble Broad Money (RBM)	= RCC+RDD+RTD
Broad Money (BM)	= RCC+RDD+RTD+FCD
Effective Broad Money (EBM)	= RCC+RDD+RTD+FCC

26. **Cointegration tests suggest that the money demand function for effective broad money is the most stable.** Although cointegration tests have weak power in short time series, there is evidence for a unique cointegrating vector for effective broad money, but the hypothesis of no cointegration can generally not be confidently rejected for the two narrowest monetary aggregates, as Appendix IV shows. However, since there is at least some evidence for a unique cointegration vector for all monetary aggregates (although for ruble narrow money only for one of the cointegration tests, and only at the 5 percent level), we do estimate long-run cointegration equations for all five definitions of money.

27. **The estimated coefficients of the long-run money demand equations have the anticipated signs and are similar in most respects.** As Table 3 shows, the coefficient estimate for industrial output, which measures the transactions demand for money, is significant in all money equations and often not significantly different from unity, consistent with the quantity theory of money. The coefficient estimate on the deposit rate, which serves as a general opportunity cost for holding money, is between -0.006 and -0.01, and is highly significant in all cases except for ruble broad money.<sup>26</sup> Since the deposit rate is measured in percentage points, this means a semi-elasticity of -0.6 percent to -1, meaning that an increase in the deposit rate by 1 percentage point leads to a decrease in money demand by 0.6 to 1 percent. The significance of the coefficients is broadly robust to the use of two lags (instead of three) and the inclusion of other variables (e.g., barter and the three-month U.S. treasury bill as an additional measure of opportunity cost).

28. **All measures of money demand that exclude foreign currency in circulation are strongly negatively dependent on the nominal depreciation rate, suggesting that foreign**

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<sup>26</sup> This is an intuitive result, since ruble broad money consists in part of ruble cash, the demand for which depends negatively on the ruble deposit rate, and in part of ruble deposits, the demand for which depends positively on the deposit rate. For the broader measures of money (BM and EBM), ruble deposits constitute a relatively small fraction, hence the aggregate behavior is dominated by components that depend negatively on the ruble deposit rate.

**Table 3. Estimated Long-Run Money Demand Equations, 1996:4 - 2004:1** 1/

		Industrial Production	Deposit rate	Depreciation
Ruble Currency in Circulation	Coefficient	2.0866 **	-0.009 **	-0.005 **
	Standard error	0.587	0.004	0.002
Ruble Narrow Money	Coefficient	1.319 **	-0.010 **	-0.004 **
	Standard error	0.414	0.003	0.001
Ruble Broad Money	Coefficient	3.159 **	-0.004	-0.004 **
	Standard error	0.689	0.005	0.002
Broad Money	Coefficient	1.853 **	-0.006 **	-0.003 **
	Standard error	0.326	0.002	0.001
Effective Broad Money	Coefficient	1.216 **	-0.008 **	0.001
	Standard error	0.126	0.001	0.000

1/ The underlying VAR includes three lags, a constant, seasonal dummies, a dummy for August-September 1998, and a dummy for August-September 1999.

2/ \*\* denotes significance at the 1 percent level, and \* denotes significance at the 5 percent level.

**cash has been an important substitute for domestic money and possibly even for foreign currency deposits.**<sup>27</sup> For almost all measures of money demand, the semi-elasticity with respect to depreciation is estimated at approximately 0.4 percent, which implies that an increase in the depreciation rate by 1 percentage point leads to a decrease in money demand by 0.4 percent. For ruble broad money, e.g., this implies that about one sixth of the growth in real ruble broad money in 2003 was accounted for by the ruble appreciation.<sup>28</sup> While broad money appears to be somewhat less sensitive to the depreciation rate with a semi-elasticity of 0.3 percent, this semi-elasticity is not significantly different from 0.4. Effective broad money demand, which includes foreign cash holdings, does not significantly depend on the depreciation rate, as predicted.

**29. The equation for ruble broad money, which is one of the most commonly used measures, is also the most unstable.** One indication for this is that the coefficient estimates for the ruble broad money demand equation are the least precise (i.e., have the largest

<sup>27</sup> Since the deposit rate gives the annual return on deposits, we also used the annual depreciation rate (i.e., the 12-month growth in the exchange rate), so as to allow for easier comparison of the coefficient estimates for both returns.

<sup>28</sup> Real ruble broad money grew by 30.6 percent during 2003, compared to a turnaround from nominal ruble depreciation of 5.6 percent in 2002 to ruble appreciation of 7.8 percent in 2003. The predicted growth in real ruble broad money from this turnaround in ruble appreciation is 5.4 percent (i.e.  $0.4 \times (7.8 + 5.6)$ ), or about one sixth of the actual real ruble broad money growth in 2003.

standard errors). In fact, the coefficient on the deposit rate is insignificant, and the recursive estimates of the coefficient on output increase significantly over time (Figure 12).

30. **Recursive estimates of the long-run money demand coefficients confirm that effective broad money constitutes the most stable money demand function.** As Figures 10–14 show, the coefficients for ruble currency in circulation, ruble narrow money, and ruble broad money suggest that the effect of industrial output has become stronger over time (i.e., the transactions demand for money has increased), but the standard errors are sufficiently large that the effect is barely or not at all significantly different from zero for most of the period observed. The coefficient estimates for the effective broad money equation are not only the most precisely estimated, i.e., they have the narrowest confidence intervals, but they are also the most stable in the sense that the confidence intervals do not widen over time. This suggests that the confidence intervals for the other monetary aggregates have widened because of changes in foreign cash holdings, to which effective broad money is immune.

## F. Short-Run Inflation Dynamics

31. **To study the short-run dynamics of inflation, we combine the long-run inflation equation and the long-run money demand equation in an equilibrium correction model.** Since we found inflation and its long-run determinants to be I(1), we need to estimate the short-run equation in differences for OLS to be valid.<sup>29</sup> An equilibrium correction model for the change in inflation is thus described by the lagged differences of its explanatory variables, an equilibrium correction term for inflation, and an equilibrium correction term for money. In addition, we add the lagged values of changes in money growth itself as possible determinants of short-run inflation. This gives the following equation:

$$\begin{aligned} \Delta\Delta p_t = & b_0 + b_1\Delta\Delta p_{t-1} + b_2\Delta\Delta p_{t-2} + b_3\Delta\Delta ulc_{t-1} + b_4\Delta\Delta ulc_{t-2} + b_5\Delta\Delta near_{t-1} + b_6\Delta\Delta near_{t-2} \\ & + b_7\Delta\Delta p_{ut,t-1} + b_8\Delta\Delta p_{ut,t-2} + b_9EC\Delta p_{t-1} + b_{10}ECm_{t-1} + \sum_{i=1}^6 b_{10+i}\Delta\Delta m_{t-i}, \end{aligned}$$

where  $EC\Delta p_{t-1}$  indicates the equilibrium correction term (EC) for inflation (i.e., deviations from the long-run inflation equation), and  $ECm_{t-1}$  indicates the equilibrium correction term for a given monetary aggregate (i.e., deviations from long-run money market equilibrium). The coefficient  $b_9$  thus captures the short-run “correction” of inflation to temporary deviations from the long-run equilibrium in the goods market (where prices are determined), while the coefficient  $b_{10}$  captures the short-run correction of inflation in response to temporary deviations from the long-run equilibrium in the money market. In addition, by

<sup>29</sup> Similar equilibrium correction models for the change in inflation are estimated by Celasun and Goswami (2002) for Iran, and by Budina and others (2004) for Romania. While differencing implies a loss of information, the advantage is that this makes our equation immune to structural breaks, which is a desirable property for a forecasting model (Hendry, 2003).

including the terms  $\sum_{i=1}^6 b_{10+i} \Delta \Delta m_{t-i}$ , we allow for a possible direct effect of an acceleration in money growth on the acceleration in inflation.<sup>30</sup>

32. **The estimated equilibrium correction model suggests that the best model of short-run inflation is obtained when using effective broad money (EBM) as a monetary aggregate.** Looking at the goodness-of-fit indicators in Table 4, the EBM equation has the lowest sigma, the highest R-squared, the maximum log-likelihood, and the smallest residual sum of squares (RSS). Looking at the residual tests, the EBM equation has the highest p-values, which implies that the EBM equation gives us the most certainty that the residuals are distributed normally and do not exhibit any significant autocorrelation or heteroskedasticity.

33. **The estimation results also suggest that, in the short run, inflation does not significantly respond to excess supply of monetary aggregates that exclude foreign currency in circulation, but does significantly respond to excess supply of effective broad money.** As Table 4 shows, the coefficient on lagged excess money (ECm\_1) is insignificant in all cases, except for effective broad money. This may reflect the instability of the long-run equilibrium relationships for monetary aggregates that exclude foreign currency. The estimated coefficient for ECm\_1 in the EBM model suggests that excess money supply of one percent translates into a 3.7 percent acceleration in inflation (e.g., if inflation was initially 10 percent, it will be 10.37 percent the next month).

34. **In addition, the results suggest that changes in EBM growth have the strongest and most persistent effect on short-run inflation.** This is perhaps not surprising, given that the high correlation between EBM growth and inflation is driven by valuation effects (see Appendix II). However, it is interesting to note that an acceleration in EBM growth still has a significant effect even after correcting for the impact of exchange rate changes on inflation. While for most monetary aggregates, the effect of an acceleration in money growth occurs mainly after three months,<sup>31</sup> EBM growth continues to affect inflation even after four and five months, implying that its effect is more persistent. The total size of the impact is also largest for EBM, and equals 0.259, suggesting that the total effect of a one-percent acceleration in effective broad money growth is an acceleration of inflation by approximately ¼ percent.

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<sup>30</sup> Adding this term makes our model essentially a differenced version of the equilibrium correction model estimated by Lissovolik (2003).

<sup>31</sup> The lag lengths of three to five months for the transmission of money to inflation in Russia are consistent with the lag lengths found by Nikolić (2000).

Perhaps intuitively, the second largest effect comes from ruble currency in circulation, with a total impact of 0.144, which is a bit more than half the impact of EBM.<sup>32</sup>

35. **Finally, the estimates suggest that the speed of adjustment of inflation to its long-run equilibrium is about 6–12 months.** As shown in Table 4, the coefficient on the lagged equilibrium correction term for inflation ( $EC\Delta p_{-1}$ ) varies from -0.169 to -0.085, depending on which monetary aggregate is used. (In the EBM equation, the coefficient equals -0.085 and is only significant at the 12 percent level). This means that, if inflation exceeds its long-run equilibrium by 1 percentage point, e.g., because of a temporary shock, 8.5 percent to 17 percent of this deviation is adjusted for every month, so that it takes about 6 to 12 months for inflation to return to its long-run equilibrium. Assuming that the EBM equation best describes the short-run inflation dynamics in Russia, this suggests that shocks to inflation are very persistent.

## G. Conclusion

36. **Russia, like several other transition economies, has recently experienced rapid domestic money growth without any accompanying rise in inflation.** In this chapter, an estimate of foreign cash holdings outside the banking system was used to show that this apparent puzzle can be explained in part by de-dollarization, i.e., a reversal of currency substitution. More generally, our results suggest that inflation and money demand in dollarized economies cannot be well understood without taking into account foreign cash holdings.

37. **We first estimated a long-run inflation equation, using a markup model where inflation is a weighted average of increases in unit input costs.** We found that, in the long run, inflation depends for roughly 50 percent on nominal effective depreciation, for 40 percent on unit labor costs, and for 10 percent on utility prices. We also tested the restriction that the marginal effects of input cost inflation add up to unity, and could not reject the hypothesis that the inflation equation is indeed linearly homogenous, as suggested by theory. The large pass-through from depreciation to inflation suggests that further nominal appreciation may help to reduce inflation.

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<sup>32</sup> This result is similar to that of Nikolić (2000), who finds that broader monetary aggregates generally bear a closer relation to inflation than narrower aggregates in Russia. However, the broadest monetary aggregate used by Nikolić is broad money, which includes foreign currency deposits, but does not include an estimate of foreign cash holdings. The results are also similar to Kuijs (2002), who finds no direct impact of excess money on short-run inflation in the Slovak Republic, from which he concludes that the effect of monetary policy on inflation will have to come via the direct determinants of the price level.

**Table 4. Estimated Short-Run Inflation Equation, 1997:1-2004:1 1/**

	RCC	NRM	RBM	BM	EBM
$\Delta\Delta p_{-1}$	-0.186	-0.085	-0.112	-0.456 **	-0.544 ***
$\Delta\Delta p_{-2}$	0.219	0.323 *	0.341 *	0.425 **	0.354 **
Constant	0.047	0.096	0.055	-0.024	0.033
$\Delta\Delta neer_{-1}$	0.350 ***	0.396 ***	0.379 ***	0.281 ***	0.165 ***
$\Delta\Delta neer_{-2}$	-0.024	0.027	0.034	-0.012	-0.007
$\Delta\Delta p_{ut_{-1}}$	0.257	0.452 **	0.390 *	0.485 ***	0.394 ***
$\Delta\Delta p_{ut_{-2}}$	0.155	0.031	0.039	0.030	0.038
$\Delta\Delta ulc_{-1}$	0.044	0.085 *	0.088 *	0.000	0.008
$\Delta\Delta ulc_{-2}$	0.118 ***	0.124 ***	0.148 ***	0.057	-0.002
$EC\Delta p_{-1}$	-0.168 **	-0.150 *	-0.138 *	-0.120 *	-0.085
$ECm_{-1}$	0.719	0.976	0.214	0.373	3.709 *
$\Delta\Delta m_{-1}$	-0.004	0.006	0.010	0.020	0.056
$\Delta\Delta m_{-2}$	-0.074	-0.104 *	-0.063	-0.290 ***	-0.259 ***
$\Delta\Delta m_{-3}$	0.140 **	0.098	0.172 *	0.285 ***	0.155 ***
$\Delta\Delta m_{-4}$	0.065	-0.063	-0.135	0.000	0.223 ***
$\Delta\Delta m_{-5}$	0.047	0.033	0.068	0.077	0.087 **
$\Delta\Delta m_{-6}$	-0.031	-0.069	-0.138 *	-0.026	-0.005
total effect of $\Delta\Delta m$	0.144	-0.101	-0.085	0.067	0.255
No. of observations	85	85	85	85	85
No. of parameters	22	22	22	22	22
Sigma	1.56	1.59	1.59	1.34	1.13
$R^2$	0.94	0.94	0.94	0.95	0.97
Log-likelihood	-145.85	-147.30	-147.27	-132.49	-118.61
RSS	153.93	159.28	159.18	112.42	81.09
F(21,63)	45.36 ***	43.73 ***	43.76 ***	63.21 ***	88.79 ***
DW	1.71	1.92	1.86	2.26	1.92
AR 1-6 test (F-test)	1.2804 [0.2809]	0.9664 [0.4562]	1.0073 [0.4297]	0.7251 [0.6312]	0.1468 [0.9890]
ARCH 1-6 test (F-test)	0.3172 [0.9251]	0.5052 [0.8015]	0.8189 [0.5605]	1.4599 [0.2107]	0.0510 [0.9994]
Normality test ( $\chi^2$ -test)	1.0478 [0.5922]	0.5667 [0.7532]	0.7612 [0.6834]	1.9630 [0.3748]	0.6862 [0.7096]
Heterosk. test (F-test)	1.6978 [0.0840]	2.1618 [0.0232]	1.4817 [0.1527]	1.0677 [0.4390]	1.1125 [0.3959]
RESET test (F-test)	0.2385 [0.6270]	0.7149 [0.4011]	0.6209 [0.4337]	0.0443 [0.8339]	0.0224 [0.8815]

1/ Regressions include dummies for 8-9/98, 1/99, 8-9/99, 1/00, and 2/00.

\*\*\* indicates significance at the 1-percent level, \*\* at the 5-percent level, and \* at the 10-percent level.

38. **We then estimated a set of long-run money demand equations for Russia using five different monetary aggregates, ranging from ruble currency in circulation to effective broad money, where the latter includes both foreign currency deposits and an estimate of foreign currency in circulation.** We found that all measures of money demand that exclude foreign currency in circulation are strongly negatively dependent on the nominal depreciation rate, suggesting that foreign currency has been an important substitute for domestic money. The long-run depreciation semi-elasticity of ruble broad money demand was estimated at 0.4, implying that the appreciation of 2003 contributed about 5½ percentage points to the 30½ percent growth in real money demand. Moreover, we found that the money demand function for effective broad money, which includes foreign currency in circulation, was by far the most stable one, and that money demand may appear to be unstable when foreign cash holdings are not taken into account.

39. **Finally, we estimated an equilibrium correction model for inflation in order to determine how the short-term dynamics of inflation are affected by deviations from the long-run inflation and long-run money demand equations.** We found that the speed of adjustment of inflation to its long-run equilibrium is slow, and varies from 6 to 12 months. Inflation appears not to significantly respond to excess supply of monetary aggregates that exclude foreign cash holdings, but does seem to respond significantly to excess supply of effective broad money. In particular, we estimate that, for each percent by which effective broad money supply exceeds its demand, inflation accelerates by 3.7 percent.

40. **Our estimates should be interpreted with some caution.** First, our estimate of foreign cash holdings is subject to considerable uncertainty, and should be further compared with other estimates (Appendix I). Second, our finding of a significant short-term impact of effective broad money on inflation is partly due to valuation effects (Appendix II). Third, it may be difficult to interpret our estimated cointegrating vectors as true “long run” equations, given the short time series and the structural break around August 1998, which may not have been entirely accounted for by crisis dummies.

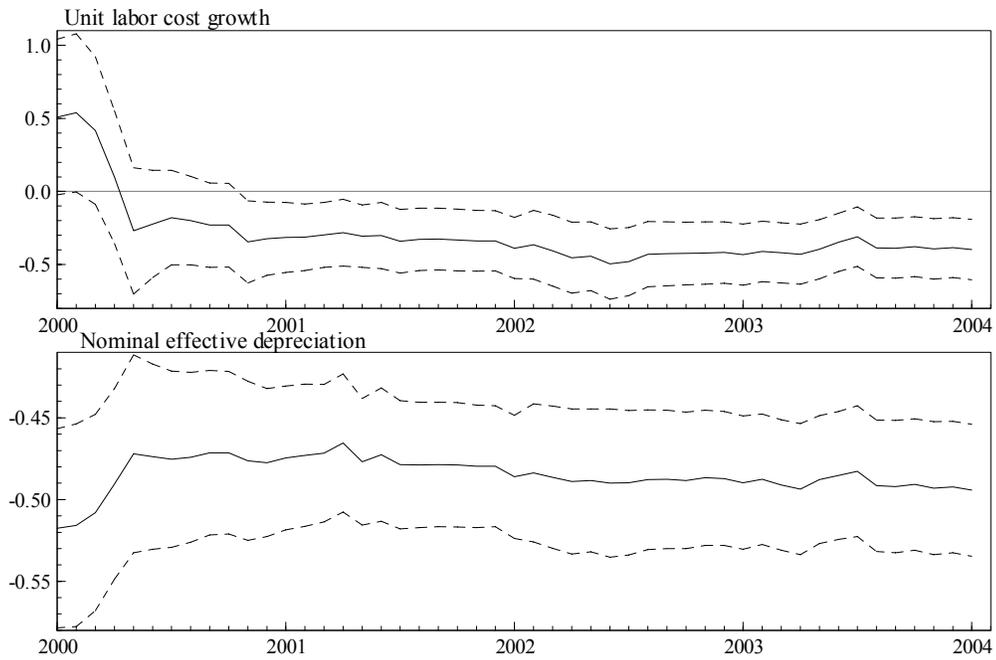
41. **Our estimated inflation and money demand equations can be further improved.** For example, our unit labor cost estimates may need to be corrected for informal sector wages; Granger causality or weak exogeneity tests could be conducted to test for the direction of causality between wages and prices; and the possible collinearity between CPI and services inflation could be avoided by using alternative measures of inflation (e.g., core or goods inflation), and other measures of utility costs (e.g., electricity tariffs). Possible ways to improve the money demand functions are to enhance the modeling of exchange rate expectations, for example by including a ratchet variable to account for hysteresis (see Oomes, 2003), and to include measures of financial innovation and confidence in the banking system among money demand determinants.

42. **We have several other suggestions for further research.** Among other things, it would be useful to conduct an in-depth estimation of separate demand functions for each of the four components of effective broad money demand (ruble currency, foreign currency,

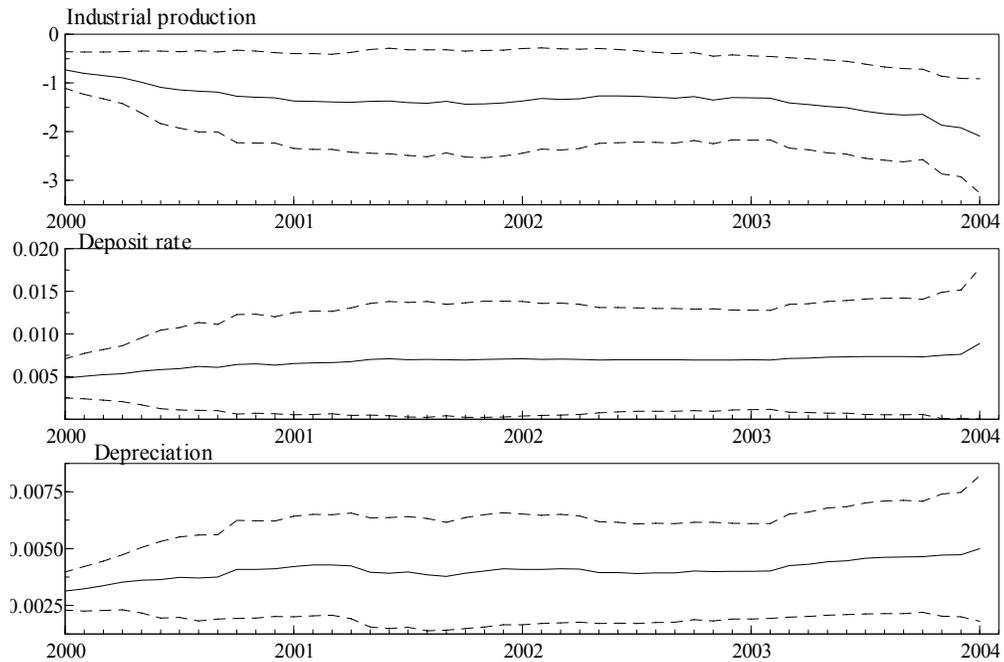
ruble deposits, and foreign currency deposits), and study what determines the switches between these components, taking into account the relative returns on each component separately. In addition, the model could be extended by estimating additional long-run relationships for interest rates and exchange rates (where, ideally, all long-run relationships would need to be estimated simultaneously in a VAR). Finally, the usefulness of the model should be tested by constructing out-of-sample projections.

43. **Keeping in mind these caveats, we conclude that estimates of foreign-cash holdings can help us to better understand the relationship between money growth and inflation.** Rapid growth of domestic money, as was recently observed in Russia as well as many other transition economies, need not be inflationary to the extent that it reflects de-dollarization and general monetization. Conversely, squeezing the domestic money supply does not necessarily reduce inflation in the presence of currency substitution.

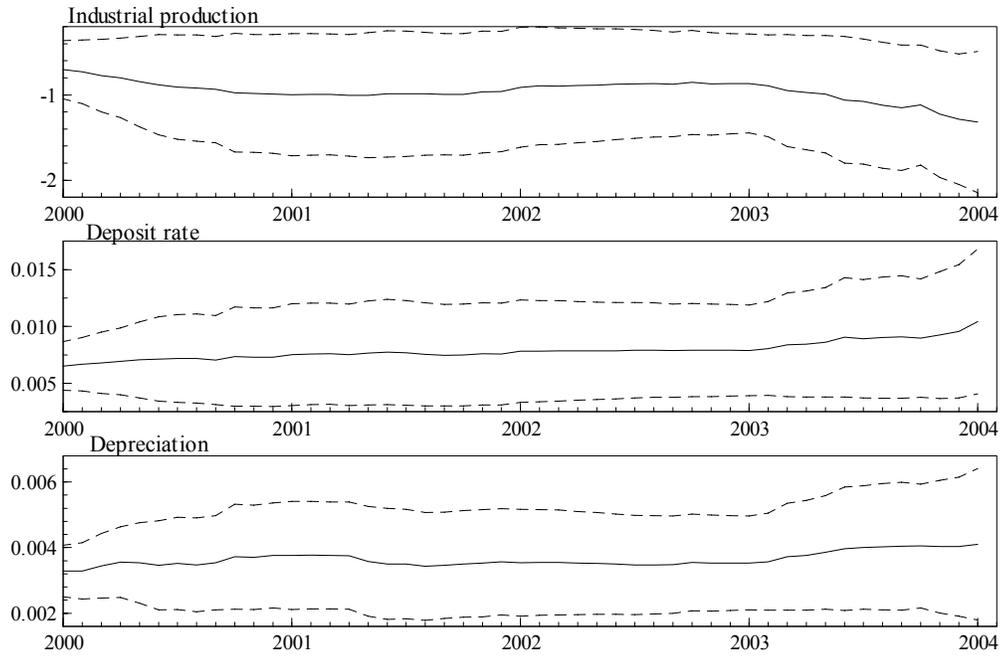
**Figure 9. Recursive Estimates of Long-Run Coefficients on Inflation**  
(Including 95 percent confidence intervals)



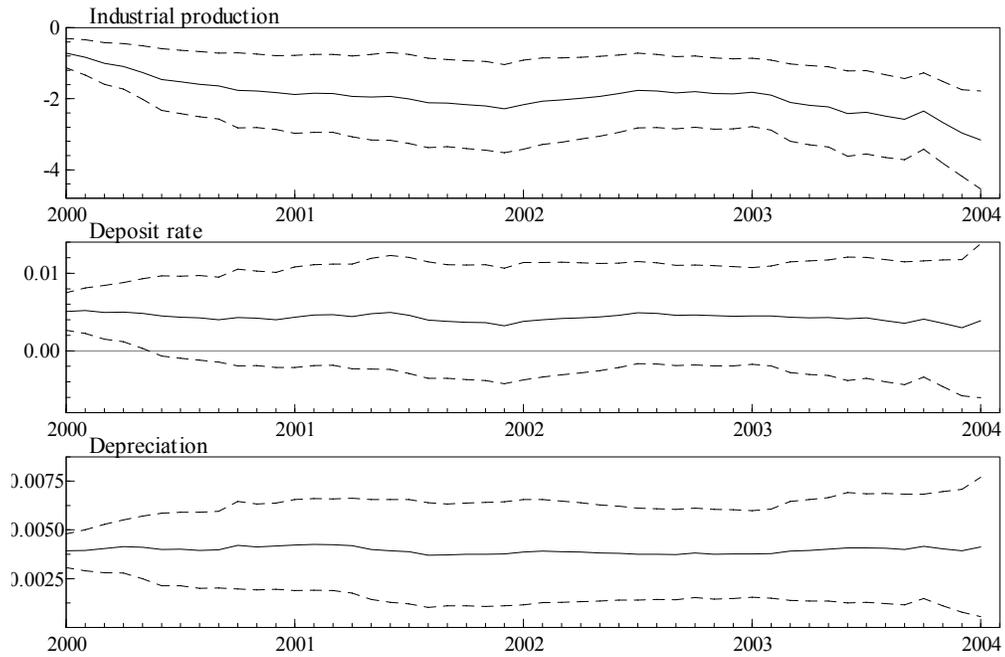
**Figure 10. Recursive Estimates of Long-Run Demand for Ruble Currency in Circulation**  
(Including 95 percent confidence intervals)



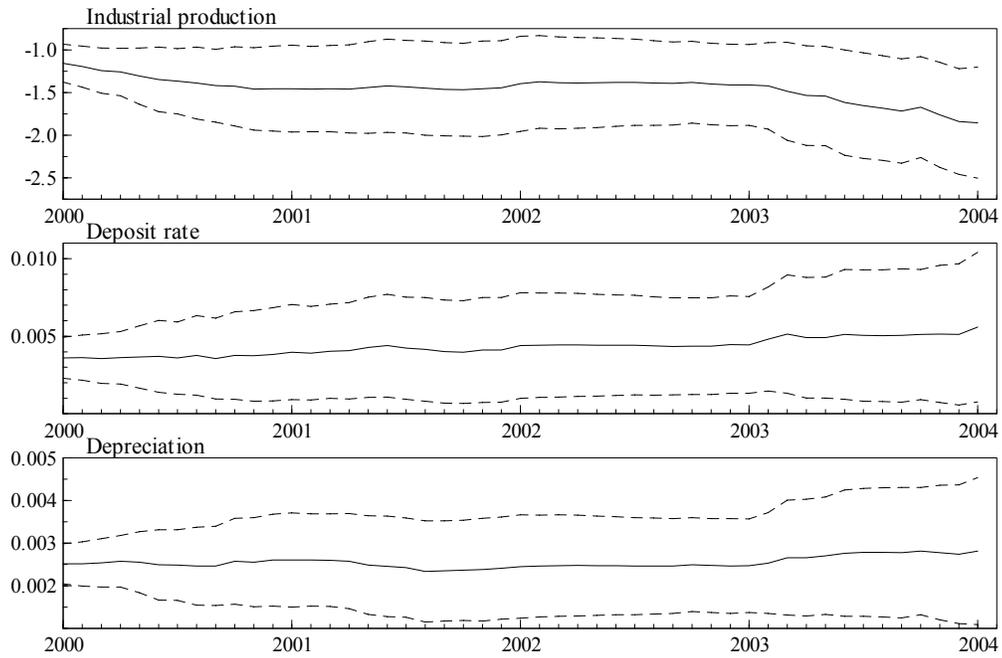
**Figure 11. Recursive Estimates of Long-Run Demand for Ruble Narrow Money**  
(Including 95 percent confidence intervals)



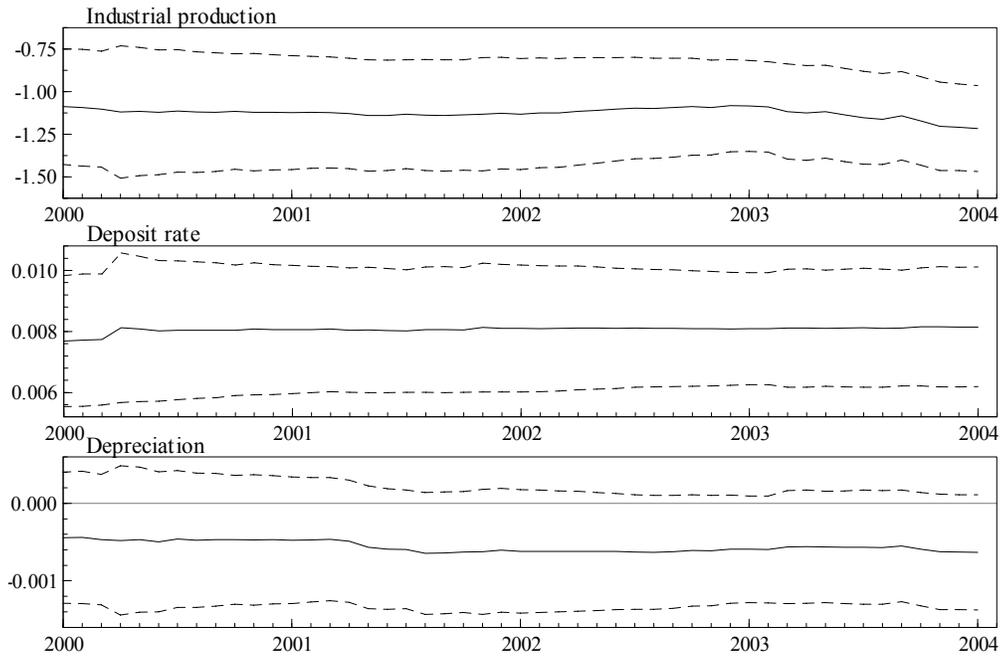
**Figure 12. Recursive Estimates of Long-Run Demand for Ruble Broad Money**  
(Including 95 percent confidence intervals)



**Figure 13. Recursive Estimates of Long-Run Demand for Broad Money**  
(Including 95 percent confidence intervals)



**Figure 14. Recursive Estimates of Long-Run Demand for Effective Broad Money**  
(Including 95 percent confidence intervals)



### **Estimating Foreign Currency in Circulation in Russia**

- 1. Our estimate of foreign currency in circulation is based on estimates by the Central Bank of Russia (CBR) of net foreign currency sales by authorized banks' exchange offices, and net withdrawals from foreign currency deposits.**<sup>33</sup> The Bureau of Economic Analysis (BEA) in Moscow has further adjusted these estimates for outflows of foreign currency related to travel and shuttle trade. Estimates of the latter used to be published by the CBR until 1999, and are since then based on balance of payments (BOP) data.<sup>34</sup>
- 2. Because of data limitations, several assumptions need to be made to arrive at an estimate of foreign currency in circulation.** First, the CBR and BOP data provide only a flow estimate of changes in foreign cash holdings, and need to be combined with an initial stock assumption to arrive at a stock estimate. The stock assumption made by the BEA, which we adopt, is that foreign cash holdings before December 1991 were zero.<sup>35</sup> Second, since several CBR and BOP data series were not available for the years prior to 1996, the estimates for those earlier years are based on a number of ad hoc assumptions. In particular, monthly estimates of net foreign currency sales before 1996 are assumed to equal 1/12 of their annual estimates, and estimates of shuttle trade imports prior to 1996 are based on the difference between new and old imports data published by Goskomstat, where the revised imports data include an estimate of unregistered imports. Finally, estimates of travel expenditures are based on the assumption that such expenditures were negligible in 1991 and then grew at a constant rate until their first available BOP estimate in 1994.
- 3. Comparing our BEA estimate with other estimates suggests that the BEA may underestimate the stock of foreign cash holdings.** An alternative time series on foreign cash holdings in Russia is based on net flows of U.S. dollars from the U.S. to Russia, as reported in the Currency and Monetary Instrument Reports (CMIRs) collected by the U.S. Customs Service. This CMIR estimate is described in detail in Oomes (2003), but is only available through November 1998, at which time U.S. dollar holdings were estimated at \$63 billion. Another alternative point estimate can be obtained from a survey conducted by Rimashevskaya (1998) and financed by the CBR, which found that foreign cash holdings in Russia in October 1996 amounted to \$56 billion. The CMIR estimate for that period was \$43 billion while the CBR estimate was only \$8 billion. However, a problem with this survey

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<sup>33</sup> These data are published in the CBR's *Bulletin of Banking Statistics*, tables 3.2.7 and 3.2.8.

<sup>34</sup> Shuttle trade is estimated by the category "other corrections for imports" and travel expenditure by the category "travel services" in the Balance of Payments.

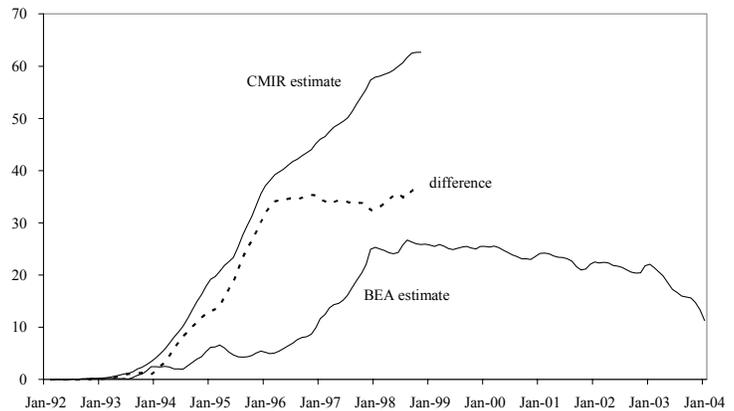
<sup>35</sup> While we acknowledge that some foreign currency was in circulation before this period, e.g., because of repatriation of foreign earnings, these amounts were likely quite small compared and are, therefore, treated as negligible.

is that the majority of all foreign cash holdings were attributed to the richest two percent of the population, which were not part of the survey, but were interviewed separately. A more recent survey, conducted by American Express, estimated foreign cash holdings in Russia at end-2002 at \$13.5 billion, while the CBR estimates them at \$39 billion for the same period.<sup>36</sup>

**4. While there is thus considerable uncertainty about the stock of foreign cash holdings, there is less uncertainty about their flows.**

Figure 7 plots both the BEA and the CMIR estimate. Interestingly, this figure shows that, for the period April 1996 (the start of our sample period) to November 1998 (the last observation for the CMIR data), the difference between the two estimates is almost constant, at around \$35 billion. When we added this amount to our BEA estimate and re-estimated our regressions, the results did not change significantly.

Figure 7. Estimates of Foreign Cash Holdings in Russia  
(In billions of U.S. dollars)



<sup>36</sup> This survey is described by Semenov (2003). A problem with the American Express survey, however, is that averages were taken over families, rather than individuals. Sergei Nikolaenko of the Bureau of Economic Analysis estimates that, when individuals are taken into account, the American Express survey estimate increases to \$18 billion.

### The Contribution of Valuation Effects to Effective Broad Money Growth

1. **Changes in effective broad money (EBM) are partly due to valuation effects arising from exchange rate movements.** For example, the ruble value of dollar-denominated assets automatically increased following the August 1998 crisis, when the ruble depreciated against the U.S. dollar, and automatically decreased in 2003, when the ruble appreciated against the U.S. dollar. To assess the importance of this valuation effect, we first note that

$$EBM_t = RBM_t + E_t(FCD_t^{\$} + FCC_t^{\$})$$

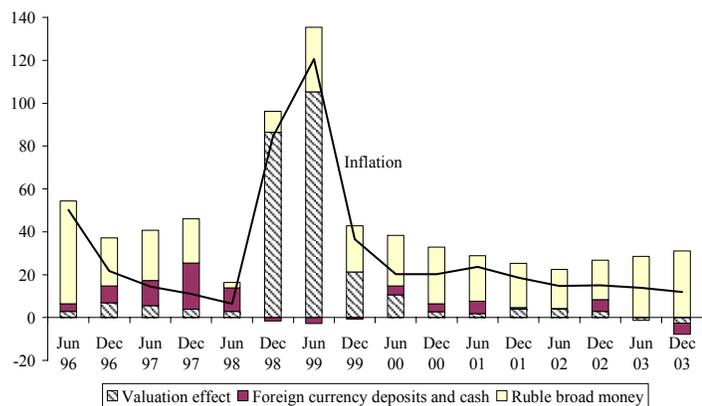
where  $RBM$  denotes ruble broad money,  $E_t$  is the ruble/dollar exchange rate, and  $FCD_t^{\$}$  and  $FCC_t^{\$}$  denote the U.S. dollar value of foreign currency deposits and foreign currency in circulation, respectively. We can then decompose the change in EBM as follows:

$$\begin{aligned} EBM_t - EBM_{t-1} &= (RBM_t - RBM_{t-1}) + E_t(FCD_t^{\$} + FCC_t^{\$}) - E_{t-1}(FCD_{t-1}^{\$} + FCC_{t-1}^{\$}) \\ &= (RBM_t - RBM_{t-1}) + (E_t - E_{t-1})(FCD_t^{\$} + FCC_t^{\$}) + E_{t-1}((FCD_t^{\$} + FCC_t^{\$}) - (FCD_{t-1}^{\$} + FCC_{t-1}^{\$})) \end{aligned}$$

The first term is the contribution of ruble broad money growth, the second term is the contribution of exchange rate changes (i.e., the valuation effect), and the third term is the contribution of changes in the volume of foreign currency assets (i.e., the volume effect).

2. **Using the above decomposition, we find that valuation effects dominated in the year following the August 1998 crisis, but not at other times.** As Figure 8 shows, the correlation between effective broad money growth and inflation in the four quarters following the 1998 crisis was driven largely by the valuation effect of the fourfold ruble depreciation, which significantly increased the value of foreign cash holdings. Before and after the crisis, however, the volume effect was often larger than the valuation effect, and both have generally been dominated by changes in ruble broad money. During 2003, the nominal appreciation of the ruble against the U.S. dollar encouraged a decline in foreign currency deposits and cash holdings and, therefore, had a negative contribution to effective broad money growth.

Figure 8. Inflation and Contributions to Effective Broad Money Growth (12-month change in percent of beginning-of-period effective broad money)



3. **While valuation effects have been important, there are two reasons why EBM at actual, rather than constant, exchange rates may be the correct measure to use when considering the effect of excess money on inflation.** First, even when effective broad money increases purely because of a sudden depreciation, this valuation effect constitutes inflationary excess money supply in the short run if it is not offset by an increase in money demand (and similarly, a sudden appreciation implies excess money demand, which can be disinflationary). Failing to take into account foreign cash holdings would underestimate this pass-through effect of depreciation on inflation. Second, it is possible that a short-run valuation effect can become a longer-run volume effect. In fact, there is evidence of “dollarization hysteresis” in Russia (Oomes, 2003), implying that increases in foreign currency-denominated assets owing to depreciation are typically not reversed subsequently. For example, while the increase in the value of foreign assets following the August 1998 crisis was initially due to a valuation effect, the fact that this “unintended” rise was not quickly reversed suggests that it became in fact an “intended” increase, e.g., because of inflation, further expected depreciation, or network externalities.<sup>37</sup>

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<sup>37</sup> The direct effect of the surge in 12-month depreciation from 7 percent in June 1998 to 238 percent in December 1998 on 12-month inflation would be expected to reflect increased import prices (about 1/3 of the consumption basket). The surge in 12-month inflation to 84 percent in December 1998 from 6 percent in June 1998 is broadly consistent with a pass-through of one-third of the depreciation into inflation via import prices. If money holdings after the depreciation had exceeded the equilibrium demand for money and had been unwound through increased consumption, inflationary pressures beyond the direct pass-through via import prices would likely have been stronger.

**Unit Root Tests**

Unit Root Tests for Regression Variables, 1996:4-2004:1

	Dickey-Fuller test (no lagged differences)	Augmented Dickey-Fuller test (3 lagged differences)	
	t-statistic	rho	t-statistic
log(RCC)-p	0.143	1.0136	0.4937
log(RNM)-p	0.11	1.0018	0.07328
log(RBM)-p	0.9482	1.0087	0.4288
log(BM)-p	1.321	1.0098	0.6826
log(EBM)-p	-1.602	0.97618	-1.895
ip	-1.52	0.98302	-0.4126
$\Delta e$	-1.313	0.92813	-2.473
$\Delta neer$	-1.579	0.9144	-2.681
$\Delta p$	-1.796	0.92768	-2.833
IRDEP	-2.069	0.94567	-2.134
$\Delta ulc\_ind$	-3.018*	0.85755	-3.205*
$\Delta p\_ut$	-8.407**	0.95903	-2.791
$\Delta \log(RCC)-\Delta p$	-11.66**	0.10195	-4.047**
$\Delta \log(RNM)-\Delta p$	-10.18**	0.1474	-3.931**
$\Delta \log(RBM)-\Delta p$	-8.384**	0.3826	-3.349*
$\Delta \log(BM)-\Delta p$	-8.675**	0.39316	-3.380*
$\Delta \log(EBM)-\Delta p$	-11.83**	-0.11021	-4.320**
$\Delta \Delta e$	-7.401**	0.44339	-3.572**
$\Delta \Delta p$	-6.661**	0.58823	-3.163*
$\Delta \Delta neer$	-7.496**	0.41973	-3.559**
$\Delta IRDEP$	-11.41**	0.093988	-4.938**
$\Delta \Delta ulc\_ind$	-12.83**	-0.51056	-5.154**
$\Delta \Delta p\_ut$	-4.942**	0.76544	-3.903**

1/ Results for Augmented Dickey-Fuller tests using one or two lags were qualitatively similar to those for three lags and are therefore not reported. Critical values are -2.89 at the 5 percent level and -3.5 at the 1 percent level. \*\* (\*) denotes rejection of the null hypothesis of a unit root at the 1 percent level (5 percent level).

## Cointegration Tests

Cointegration Tests for Long-Run Inflation and Money Demand, 1996:4-2004:1 1/

<u>Inflation</u>								
rank	$\lambda_{\text{trace}}$	prob	$\lambda'_{\text{trace}}$	prob	$\lambda_{\text{max}}$	prob	$\lambda'_{\text{max}}$	prob
r=0	74.39	[0.004]**	35.86	[0.013]*	64.90	[0.039]*	31.28	[0.060]
r ≤ 1	38.54	[0.128]	26.83	[0.033]*	33.62	[0.311]	23.41	[0.101]
r ≤ 2	11.70	[0.829]	11.70	[0.456]	10.21	[0.909]	10.21	[0.605]
r ≤ 3	0.00	[1.000]	0.00	[1.000]	0.00	[1.000]	0.00	[1.000]
<u>Effective Broad Money</u>								
rank	$\lambda_{\text{trace}}$	prob	$\lambda'_{\text{trace}}$	prob	$\lambda_{\text{max}}$	prob	$\lambda'_{\text{max}}$	prob
r=0	61.39	[0.001]**	44.73	[0.000]**	53.55	[0.012]*	39.02	[0.001]**
r ≤ 1	16.66	[0.672]	10.67	[0.687]	14.54	[0.811]	9.31	[0.805]
r ≤ 2	5.99	[0.700]	5.48	[0.683]	5.23	[0.784]	4.78	[0.768]
r ≤ 3	0.51	[0.475]	0.51	[0.475]	0.44	[0.505]	0.44	[0.505]
<u>Effective Broad Money at Fixed Accounting Exchange Rate</u>								
rank	$\lambda_{\text{trace}}$	prob	$\lambda'_{\text{trace}}$	prob	$\lambda_{\text{max}}$	prob	$\lambda'_{\text{max}}$	prob
r=0	62.67	[0.001]**	33.93	[0.005]**	54.67	[0.009]**	29.60	[0.024]*
r ≤ 1	28.74	[0.067]	23.00	[0.025]*	25.07	[0.164]	20.06	[0.069]
r ≤ 2	5.74	[0.728]	5.64	[0.663]	5.01	[0.806]	4.92	[0.751]
r ≤ 3	0.10	[0.757]	0.10	[0.757]	0.08	[0.773]	0.08	[0.773]
<u>Broad Money</u>								
rank	$\lambda_{\text{trace}}$	prob	$\lambda'_{\text{trace}}$	prob	$\lambda_{\text{max}}$	prob	$\lambda'_{\text{max}}$	prob
r=0	49.64	[0.032]*	31.47	[0.012]*	43.30	[0.125]	27.45	[0.049]*
r ≤ 1	18.18	[0.563]	14.37	[0.349]	15.86	[0.728]	12.53	[0.510]
r ≤ 2	3.81	[0.911]	3.51	[0.898]	3.32	[0.943]	3.06	[0.932]
r ≤ 3	0.30	[0.584]	0.30	[0.584]	0.26	[0.609]	0.26	[0.609]
<u>Ruble Broad Money</u>								
rank	$\lambda_{\text{trace}}$	prob	$\lambda'_{\text{trace}}$	prob	$\lambda_{\text{max}}$	prob	$\lambda'_{\text{max}}$	prob
r=0	53.37	[0.013]*	33.25	[0.006]**	46.56	[0.064]	29.00	[0.029]*
r ≤ 1	20.12	[0.425]	17.48	[0.155]	17.55	[0.608]	15.25	[0.283]
r ≤ 2	2.64	[0.974]	2.33	[0.972]	2.30	[0.984]	2.04	[0.983]
r ≤ 3	0.31	[0.579]	0.31	[0.579]	0.27	[0.605]	0.27	[0.605]
<u>Ruble Narrow Money</u>								
rank	$\lambda_{\text{trace}}$	prob	$\lambda'_{\text{trace}}$	prob	$\lambda_{\text{max}}$	prob	$\lambda'_{\text{max}}$	prob
r=0	41.05	[0.188]	29.51	[0.025]*	35.81	[0.411]	25.74	[0.083]
r ≤ 1	11.54	[0.942]	8.86	[0.839]	10.07	[0.975]	7.73	[0.910]
r ≤ 2	2.67	[0.973]	1.91	[0.986]	2.33	[0.983]	1.67	[0.992]
r ≤ 3	0.76	[0.382]	0.76	[0.382]	0.67	[0.414]	0.67	[0.414]
<u>Ruble Currency in Circulation</u>								
rank	$\lambda_{\text{trace}}$	prob	$\lambda'_{\text{trace}}$	prob	$\lambda_{\text{max}}$	prob	$\lambda'_{\text{max}}$	prob
r=0	46.43	[0.066]	32.92	[0.007]**	40.51	[0.207]	28.72	[0.032]*
r ≤ 1	13.51	[0.866]	9.24	[0.811]	11.78	[0.935]	8.06	[0.892]
r ≤ 2	4.27	[0.875]	2.68	[0.955]	3.73	[0.917]	2.34	[0.972]
r ≤ 3	1.59	[0.208]	1.59	[0.208]	1.38	[0.239]	1.38	[0.239]

1/ The statistics  $\lambda_{\text{trace}}$  and  $\lambda_{\text{max}}$  are Johansen's trace eigenvalue and maximal eigenvalue statistics. The statistics  $\lambda'_{\text{trace}}$  and  $\lambda'_{\text{max}}$  incorporate a degrees-of-freedom correction. The null hypotheses are whether the cointegration rank  $r$  equals zero (no cointegration), is less than or equal to one (at most one cointegration vector), etc. \*\* (\*) denotes significance at the 1 (5) percent level.

### Selected Robustness Checks

Robustness Tests for Estimated Long-Run Cointegration Equation for Inflation, 1/

		Unit labor cost growth	Nominal effective depreciation	Utility price growth	Other included variables	Sum of coefficients
I. Baseline regression, using sample 1996:4 to 2004:1 with three lags						
Restricted	Coefficient 2/	0.397 **	0.494 **	0.109 2/	...	1.000
	Standard error	0.103	0.020	...	...	
LR test of restrictions: $\chi^2(1) = 3.0548$ [0.0805]						
II Sample 1996:4 to 2004:1 with two lags						
Restricted	Coefficient 2/	0.148 *	0.481 **	0.371 2/	...	1.000
	Standard error	0.077	0.016	...	...	
LR test of restrictions: $\chi^2(1) = 4.4173$ [0.0356]						
III. Using industrial wage growth instead of industrial unit labor cost growth, sample 1996:4 to 2004:1 with three lags						
Restricted	Coefficient 2/	0.464 **	0.490 **	0.046 2/	...	1.000
	Standard error	0.079	0.017	...	...	
LR test of restrictions: $\chi^2(1) = 6.7472$ [0.0094]						
IV. Using industrial wage growth instead of industrial unit labor cost growth, sample 1996:4 to 2004:1 with three lags						
Unrestricted	Coefficient 2/	0.431 **	0.484 **	0.254 2/	...	1.169
	Standard error	0.065	0.014	0.084	...	
V. Using industrial wage growth instead of industrial unit labor cost growth and depreciation against the U.S. dollar instead of nominal effective depreciation, sample 1996:4 to 2004:1 with three lags						
Unrestricted	Coefficient 2/	0.677 **	0.502 **	-0.200	...	0.980
	Standard error	0.118	0.026	0.155	...	

1/ The underlying VAR includes three lags and four dummies for the disinflation period in early 1996, the 1998 crisis, the August 1999 recovery from the exchange rate overshooting in August 98 and October 2000 (i.e. dummies for 4/96 to 7/96, 8/98 to 9/98, 8/99, 10/00). \*\* denotes significance at the 1 percent level. \* denotes significance at the 5 percent level.

3/ The coefficient on utility price growth is estimated as a residual.

Robustness of Estimated Long-Run Effective Broad Money and Ruble Broad Money Demand Equations, 1/

	Industrial Production	Deposit rate	Depreciation	Other included variables
I. Effective broad money demand, sample 1996:4 to 2004:1 with two lags				
Coefficient	-1.104 **	-0.008 **	0.000	
Standard error	0.130	0.000	0.000	
LR test of restrictions: $\chi^2(1) = 0.83676$ [0.6581]				
II. Using inflation instead of depreciation in effective broad money demand, sample 1996:4 to 2004:1 with three lags				
Coefficient	-1.240 **	0.001	...	Inflation 0.000
Standard error	0.108	0.001	...	0.001
III. Including inflation in effective broad money demand, sample 1996:4 to 2004:1 with three lags				
Coefficient	0.229	-0.033 **	-0.008 **	Inflation 0.021 **
Standard error	0.337	0.004	0.002	0.004
IV. Including Urals oil price in effective broad money demand, sample 1996:4 to 2004:1 with three lags				
Coefficient	1.000	-0.009 **	0.001	Urals oil price 0.103 *
Standard error	...	0.001	0.000	0.059
LR test of restrictions: $\chi^2(1) = 2.6566$ [0.1031]				
V. Including 3-month US treasury bill rate in effective broad money demand, sample 1996:4 to 2004:1 with three lags				
Coefficient	1.645 **	-0.008 **	0.001	US t-bill rate 0.027 **
Standard error	0.202	0.001	0.000	0.011
VI. Including barter in effective broad money demand, sample 1996:4 to 2003:12 with three lags				
Coefficient	2.455 **	-0.006 **	0.001	Barter 0.009 **
Standard error	0.381	0.001	0.000	0.003
VII. Including barter in ruble broad money demand, sample 1996:4 to 2003:12 with three lags				
Coefficient	3.931 **	-0.004 **	-0.002	Barter 0.016 **
Standard error	0.928	0.003	0.001	0.007
VIII. Including barter into demand for currency in circulation, sample 1996:4 to 2003:12 with three lags				
Coefficient	3.781 **	-0.005 **	-0.001	Barter 0.016 **
Standard error	0.919	0.003	0.001	0.007

1/ The underlying VAR includes three lags, a constant, seasonal dummies, a dummy for September 1998, and a dummy for September 1999.

2/ \*\* denotes significance at the 1 percent level, and \* denotes significance at the 5 percent level.

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### III. THE RUSSIAN BANKING SYSTEM: RECENT DEVELOPMENTS<sup>38</sup>

*Banks' performance has benefited from the strong macroeconomic environment, but credit and liquidity risks are increasing as balance sheets expand rapidly. While the CBR has made progress in implementing FSAP recommendations to strengthen supervision, significant structural weaknesses remain, and the weak framework for bank resolution has hampered efforts to address problems forcefully. Recent steps to tighten supervision triggered some turmoil in the banking sector in early July, which was calmed by prompt actions by the authorities. The subsequent rapid approval by the Duma of a strengthened bank bankruptcy law in late July suggests a growing recognition that banking reforms need to be accelerated while the macroeconomic environment remains favorable.*

#### A. Background

##### 1. Russian banks continued to benefit from the strong macroeconomic environment in 2003.

Strong and prolonged growth in GDP and real incomes, in combination with increased economic and political stability and generally sound economic management, led to rapid deposit growth. Deposits increased by 2 percent of GDP during 2003, largely reflecting growth in ruble time deposits as the gradual ruble appreciation during most of 2003 encouraged a reversal of foreign currency substitution. Rapid deposit growth, as well as foreign borrowing, financed a credit boom. As a result, credit to the economy expanded by 46 percent, to 22 percent of GDP. Banking system assets grew to 42 percent of GDP.<sup>39</sup>

Russia: The Size of the Banking System  
(End of period, in percent of GDP)

	2001	2002	2003
Banking system assets	35.3	38.3	42.2
Deposits	17.2	19.2	21.2
<i>Of which:</i> Ruble time deposits	4.6	5.7	7.8
Credit to the economy	16.7	18.7	22.4
Memorandum items:			
Banking system assets in Hungary	...	...	67
Banking system assets in Poland	...	...	52
Banking system assets in Czech Republic	...	...	93

Sources: CBR; *IFS statistics*; and Fund staff estimates.

##### 2. Several financial soundness indicators improved on the back of the strong macroeconomy, although rapid growth in banks' balance sheets introduced some risks (Table 1).

Based on Russian Accounting Standards (RAS), banks continued to show improved profitability and asset quality.<sup>40</sup> Bank capital increased by 40 percent as the Central Bank of Russia made efforts to enforce capital requirements. During the 12 months ended

<sup>38</sup> Prepared by Pamela Madrid, Franziska Ohnsorge, and Leslie Teo.

<sup>39</sup> These trends continued during the first five months of 2004 but may have been interrupted in May–July after the closing of a mid-sized bank sparked interbank and depositor nervousness, culminating in a deposit run on two large private domestic banks (see below).

<sup>40</sup> Russian Accounting Standards are subject to several weaknesses discussed in paragraph 12.

December 2003, foreign exchange risks declined as banks narrowed their net open positions in foreign exchange to reduce losses from the persistent ruble appreciation. The strong external environment was reflected in banks' loan portfolios. Access to international capital markets for the resource-extracting export industry encouraged a diversification of loan portfolios away from industry and trade. Strong growth in domestic demand, however, fueled a boom in retail and mortgage lending, albeit from a small base.

Table 1. Russia: Financial Soundness Indicators 1/  
(In percent)

Indicator	1998	1999	2000	2001	2002	2003	Q1 2004
<i>Capital</i>							
Regulatory capital to risk-weighted assets	11.5	18.1	19.0	20.3	19.1	19.1	18.7
Regulatory Tier I capital to risk-weighted assets	11.8	16.4	16.5	16.7	15.8	14.5	13.8
<i>Asset quality</i>							
Nonperforming loans to total gross loans	17.3	13.4	7.7	6.2	5.6	5.0	5.0
<i>Sectoral exposures</i>							
Sectoral distribution of loans to total loans							
Industry	29.6	34.1	39.9	40.1	36.7	33.3	32.3
Agriculture	1.0	1.2	1.4	1.8	2.2	2.4	2.8
Construction	7.7	7.1	5.7	4.2	4.4	4.4	4.2
Trade and public dining	17.5	16.7	17.6	19.6	21.6	20.6	20.3
Transport and communications	3.7	4.9	4.9	4.5	4.6	5.1	5.2
Others	34.4	30.3	25	22.5	22.4	22.7	22.7
Individuals	6.0	5.7	5.5	7.3	8.0	11.5	12.6
Regions							
Russia	35.3	31.7	26	37.9	41.1	54.2	47.2
U.K.	7.5	15.5	16.2	13.5	23.4	9.0	14.4
US	12.7	15.4	17.4	18.9	6.2	8.2	8.3
Germany	7.4	4.8	8.0	6.0	5.9	2.4	5.3
Austria	16.9	8.1	6.7	6.4	5.7	6.8	4.3
France	1.2	3.3	3.4	2.7	1.5	1.6	3.2
Italy	0.8	3.4	4.4	2.4	1.6	1.0	2.8
Others	18.1	17.8	17.9	12.2	14.5	16.8	14.4
<i>Profitability</i>							
Return on assets	-3.5	-0.3	0.9	2.4	2.6	2.6	...
Return on equity	-28.6	-4.0	8.0	19.4	18.0	17.8	...
<i>Liquidity</i>							
Liquid assets to total assets	35.3	39.1	41.3	40.8	39.1	36.1	34.3
Liquid assets to short-term liabilities	70.0	82.4	82.9	87.4	90.6	90.4	90.9
<i>Market risk</i>							
Net open position in foreign exchange to capital	...	...	42.9	22.6	18.5	8.4	7.7
<i>Other FSIs</i>							
Loan loss reserves to total gross loans	7.4	9.9	7.9	6.7	6.3	5.9	5.9
Large exposures to capital	450.2	275.7	249.4	216.1	228.6	241.0	233.6
Interest rate risk to capital	...	...	2.4	4.0	6.9	9.9	12.6
Net open position in equities to capital	...	...	1.0	5.6	11.7	12.4	17.2

Source: Central Bank of Russia.

1/ Credit and depository institutions.

**3. The banking system remains dominated by state-controlled banks, although Sberbank's share has been declining.** Four of the top five banks by assets are state-owned<sup>41</sup> or state-controlled banks. As of end-2003, these banks constitute 37 percent of banking system assets and credit to the economy, 50 percent of deposits, and 68 percent of household deposits. With increasing competition from other banks, however, Sberbank's dominance of the banking system has been declining. In the 12 months ended May 2004, its share of household deposits declined by 6 percentage points to 61 percent and its share of credit to the economy declined by 1½ percentage points to 26¼ percent. The 32 fully foreign-owned banks usually target high-income and large corporate clients. The 1,200 private Russian banks are mostly small and fragmented. Almost three-fourths of them have capital below EUR 5 million, and one-third have capital below EUR 1 million. Only about 15 of them are large enough to have shares of 1–5 percent of system assets or deposits. Many of the smaller banks are regional banks or providers of niche services, including the facilitation of illegal activities.

Russia: Structure of the Banking System, End-2003  
(In percent of total; unless otherwise indicated)

	Sberbank	Top 4 state banks 1/	Top 5 banks 2/	Top 30 banks
Assets	27	37	41	64
Credit to the economy	28	37	40	...
Deposits	42	50	53	74
<i>Of which:</i> Household deposits	63	68	71	81
Memorandum items:				
Number of banks	1,329			
<i>Of which:</i> state-owned	6			
fully foreign-owned	32			

Sources: CBR; and Fund staff estimates.

1/ Includes Sberbank and VTB as well as state-controlled Gazprombank (owned by Gazprom Group) and Bank of Moscow (63 percent owned by Moscow government).

2/ In addition, includes Alfabank.

## B. Risks to the Banking System

**4. There are signs that the rapid growth in bank balance sheets has increased some risks** (Table 1). Competition is increasingly resulting in declining net interest margins. In 2003, trading gains related to the boom in stock and bond market prices masked weaknesses in the underlying profitability of many banks. Such trading gains, which accounted for one-third of revenues in 2003, are unlikely to be sustainable. Especially among the 30 largest banks, growth in capital did not keep up with asset growth. These pressures have encouraged many banks to enter new markets and target new clients.

<sup>41</sup> State-owned banks are Sberbank, Vneshtorgbank (VTB) and the specialized banks VEB, Russian Agricultural Bank, Russian Bank of Development, and Roseximbank.

**5. Stress tests show that credit risks to the banking system have increased.**

The CBR conducts regular stress tests of the 200 largest banks, based on a similar, but somewhat less conservative methodology than that used by the Financial Sector Assessment Program (Box 1).<sup>42</sup> For end-2003, the CBR found that a shock like the 1998 crisis would entail losses from credit risk of about 4 percent of GDP. While the estimates are not fully comparable due to different methodologies, this is higher than the estimate in the FSAP of 3.4 percent for end-2001 data. Applying the FSAP methodology to end-2002 data, staff estimated losses of 4½ percent of GDP for the 38 largest banks.

	Total loss (in percent of GDP)	Coverage	
		Number of banks	In percent of assets
FSAP (end-2001 data)			
Version 1	3.4	64	75
Version 2	3.7	64	75
Staff update for Article IV 2004 (end-2002 data)			
Version 2	4.4	38	70
CBR (end-2003 data)			
Modified version 1	4.0	200	88

Sources: CBR; FSAP; and Fund staff estimates.

1/ See box 1 for a description of the methodology of versions 1 and 2.

**6. With rapid deposit growth financing a credit boom, liquidity risk has increased, although overall liquidity is high by international standards.**

The share of total assets that are liquid has declined as the loan portfolio has expanded, resulting in lower coverage of deposits and short-term funding. Liquidity stress tests, based on aggregate maturity gaps, show an increased exposure to liquidity risks, as the negative asset gap at one month or less has increased. Aggregate numbers, however, mask large variations among banks, and liquidity risks may be concentrated in a small number of banks. Circumvention of prudential requirements on liquidity could also mean that exposures are larger than reported in banks' balance sheets.

	2002	2003
Average 1/	42.3	33.6
Average for top 3 banks 2/	58.4	...
Median 1/	32.1	36.9
Average for global peers 3/	29.5	30.1
Average for transition peers 4/	23.3	22.7

Source: Bankscope.

1/ For 2002, based on 38 banks and for 2003 based on 12 banks for which data based on IFRS were available.

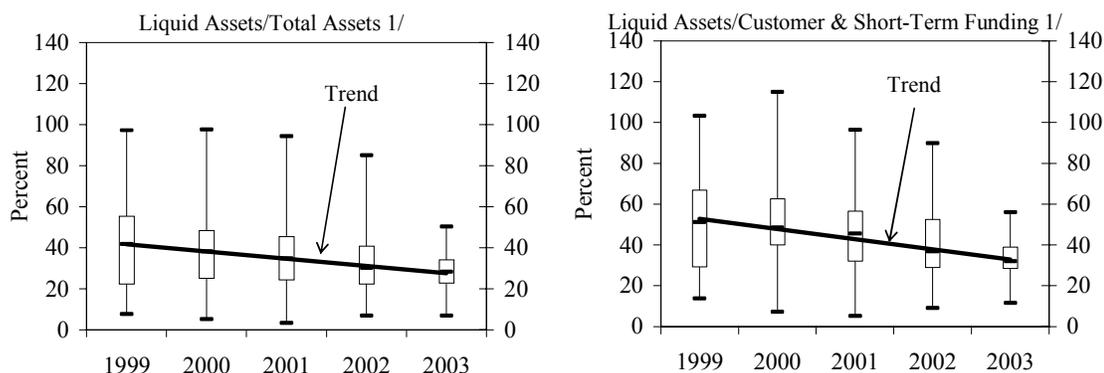
2/ Sberbank, VTB, Gazprombank.

3/ Sample of 15 large North American and European banks.

4/ Sample of 22 banks in 2002 and a subset of 18 in 2003 from the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, and Slovakia.

	2002	2003
In percent of GDP	-3.4	-4.2
In percent of banking system assets	-8.8	-9.9

<sup>42</sup> An FSAP report was completed in August 2003, based on FSAP missions in April and September 2002.



1/ The box around the median shows values for the second and the third quartile. The top and bottom bars show maximum and minimum values.

7. **The CBR estimates that market and interest rate risks increased somewhat during 2003.** Booming stock and bond markets encouraged banks to raise their exposure to these assets. Nevertheless, risks stemming from equity exposure remain small, and the CBR estimates that even the most extreme stress test would not lead to losses exceeding 5 percent of capital. The credit boom has also increased interest rate risk, but such a risk is likely to remain small, given the still-limited exposure.

8. **Many Russian banks may lack the capacity to accurately price and manage their risks.** A number of private banks have been engaged in building business according to best market practices and have invested heavily in risk management systems. Many banks, however, still have poor corporate governance and weak accounting and audit practices that hinder effective risk management.

9. **The macroeconomic risks arising from the banking system are likely manageable in the current strong fiscal and external environment, given the low level of monetization of the economy.** With a projected federal government surplus of 3 percent of GDP in 2004, the budget could absorb the loss from a large shock to the banking system, comparable to the stress test estimates of 4–4½ percent of GDP, without running an immediate risk of a fiscal crisis. International reserves amounting to more than 83 percent of bank deposits and 57 percent of total broad money would be available to buffer effects of a deposit run on the exchange rate.

### C. Structural Weaknesses of the Banking System

10. **Banks' balance sheets are highly concentrated, although many banks have made efforts to reduce concentrations and entered new markets.** Large loan exposures increased during 2003 to 241 percent of capital. For the highest rated banks, Standard & Poor's estimates that the ten largest loans average about 40 percent of total loans and almost

### **Box 1. Methodology of Stress Tests**

#### **Credit risk stress test**

**The credit risk stress test of the FSAP was based on the end-2001 accounts of 64 banks, representing 75 percent of banking system assets.** The stress test used financial statements based on International Financial Reporting Standards, if available, or according to RAS converted into IFRS-comparable accounts. The FSAP team used two versions of the test to assess losses under a macro-style stress scenario similar to the 1998 historical shock. One version used each bank's peak in its nonperforming loan ratio in the nine months after the initial August 1998 shock and assumed that a large macroeconomic shock would lead to similar nonperforming loan ratios for each bank as during the 1998 crisis. This is the version of the stress test discussed in the Financial System Stability Assessment (FSSA) (IMF Country Report No. 03/147). A second version assumed that a large macroeconomic shock would lead to nonperforming loan ratios for all banks of 20 percent (equivalent to one standard deviation above the observed mean for the 12 largest banks audited by banking supervisors in fall 1998). This version was based on the approach used by staff during the 2001 Article IV mission and was useful in comparing how projected losses had evolved. Under both versions, fixed assets were assumed to lose 30 percent of their value and off-balance-sheet items were converted into loan equivalents and correspondingly shocked in the same way as loans and securities. The first version of the stress test yielded an estimated loss from a large macroeconomic shock of 3.4 percent of GDP, the second an estimated loss of 3.7 percent of GDP.

**The staff's update for the 2004 Article IV consultation was based on the end-2002 accounts of 38 banks, representing 70 percent of banking system assets.** It used the financial statements according to IFRS and followed the second version of the FSAP stress test. Corresponding data are not yet available for end-2003.

**The CBR's stress test was based on the end-2003 accounts of 200 banks, representing about 88 percent of banking system assets.** The test used financial statements based on IFRS accounts for the 16 largest banks and based on RAS accounts for other banks. The CBR generally followed the first version of the FSAP stress test with the important exception of the treatment of loan loss reserves. The FSAP stress test exercise assumed that true nonperforming loans before the shock were the full amount of loan loss reserves. The CBR assumed that the true nonperforming loans before the shock were as reported by banks and loan loss reserves were available to absorb part of the losses.

**The estimates of losses are constrained by data quality and based on a static snapshot.** Substantial underreporting of nonperforming loans in the unaudited data used in the staff update may lead to an underestimation of actual credit risk. Additionally, although the shock was modeled using sectoral-average data during the 1998 crisis, a bank-by-bank approach would have been preferable but was not possible due to data constraints. Bearing in mind these caveats, we believe that the estimates adequately reflect qualitative trends.

#### **Liquidity stress test**

**The liquidity stress test uses the consolidated banking system balance sheet based on RAS accounts for end-2002 and end-2003.** It is assumed that 30 percent of total deposits are withdrawn within one month and that a 30 percent "haircut" is applied to government securities that could be sold to increase liquidity.

**The results of the stress test are conditioned by the assumptions and constrained by the quality of the underlying data.** In particular, schemes to circumvent prudential requirements may lead to an underestimation of liquidity risk. Bearing in mind these caveats, we consider the methodology acceptable for showing trends between end-2002 and end-2003.

150 percent of total equity.<sup>43</sup> As before, many of the large loan exposures are to related parties, often concentrated in one industry. The FSAP calculated that sectoral concentration and related lending can lead to additional losses in case of default (about 1.4 percent of GDP in addition to the losses reported above). Liability concentration is also significant as many banks are part of industrial-financial groups.<sup>44</sup> Of the 13 private Russian banks among the top 20 banks, 12 are related to industrial-financial groups in the resource-extracting sector and the remaining 1 to a industrial-financial group in the IT and telecommunications sector. Nevertheless, many banks reduced their balance sheet concentrations during 2003, as banks' profits from their traditional lending were squeezed by increased corporate access to international capital markets, abundant liquidity, and falling interest margins. To broaden their client base, several banks entered mortgage lending (Box 2), consumer lending, and lending to small and medium-sized enterprises. Interest margins in these markets are often still wide as they are just beginning to develop.

11. **Circumvention of prudential requirements is common.** Lending through nominee companies is used to formally comply with prudential norms on large exposures and can overinflate capital. A 2003 CBR study found that 20 percent of a sample of 638 banks reported overinflated capital. Triangles of indirect lending to final borrowers through other banks are used to formally meet exposure limits to single borrowers, as well as liquidity requirements.

12. **Poor governance and weak accounting and auditing rules complicate the CBR's assessment of banks' activities and enforcement of prudential norms.** Poor corporate governance and inadequate auditing result in uneven quality of banks' financial statements. Up-to-date financial statements are available only according to RAS, which tend to overestimate capital and assets and impose less stringent definitions for capital ownership and connected-party transactions. About 200 banks publish financial statements compliant with International Financial Reporting Standards (IFRS), but usually with significant lags and only on an annual basis. Given the rapidly changing nature of the environment, such lags make it difficult to form a timely and accurate assessment of the system.

13. **Weak bank bankruptcy legislation and legal procedures have made it difficult to liquidate banks.** While the CBR has the authority to revoke bank licenses, this does not always result in bank liquidation. As a result, a number of "phantom banks" that have lost their licenses have yet to be liquidated. Court suspension orders often delay the start of the liquidation process. When a case does proceed to court, it is often held up because of

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<sup>43</sup> Standard & Poor's, *Bank Industry Risk Analysis: Russian Federation*, June 2004.

<sup>44</sup> These risks were demonstrated by the bankruptcy of a seemingly healthy bank in early 2003, after the withdrawal of deposits by a large shareholder.

## Box 2. The Mortgage Market

**The Russian mortgage market is a compromise between the European and U.S. models.** Any bank (currently about 20, mainly in the Moscow region) may issue mortgage loans to house buyers and may refinance them by issuing mortgage-backed securities (MBS), provided it complies with additional prudential requirements. The stringency of these additional prudential requirements is designed to discourage general commercial banks from issuing MBS and to encourage the creation of specialized “mortgage banks.” For long-term financing, MBS may be issued by mortgage or commercial banks directly or through special-purpose vehicles that bundle mortgage loans. The State Mortgage Agency, created in 1997, was intended to play a similar role, bundling and refinancing mortgage loans extended by state-owned regional mortgage agencies.

**While mortgage lending has grown rapidly, it is still small and often unattractive to both borrowers and lenders.** Residential mortgage lending is about 1 percent and construction lending about 4 percent of banks’ loan portfolios. There are a number of reasons for the small size of the mortgage market:

- Borrowers are discouraged by high interest rates (averaging a fixed 10–20 percent for a typical ten-year foreign currency loan); the need to declare salaries; and the need to declare true taxable housing values with collateral registration.
- Lenders are still forced to rely largely on household deposits and capital for long-term funding because of the still incomplete legislation regarding mortgage-backed securities. Additionally, regional mortgage agencies provide loans that are fully guaranteed by regional governments, at less than half the market interest rate. These agencies are also subject to significantly weaker prudential requirements. Moreover, mortgage legislation is still unclear. A law on mortgage lending was passed in 1998 and a law on MBS was passed in November 2003, but the priority of claims is unclear in case of a conflict between the law on mortgage lending and the civil code. The judicial process for mortgage collateral seizure is long and costly. Only in Moscow is there a reasonably comprehensive and up-to-date real estate registry to prevent the fraudulent sale of property and to protect bona fide purchasers of real estate and those financing such purchases. Despite these difficulties, however, the experience of several mortgage banks suggests that default rates were almost zero, even during the 1998 crisis.
- On the supply side, the development of new housing is constrained by poorly functioning land markets; opaque systems for issuing building permits; monopolistic local construction markets; and inadequate provision of utilities.

**MBS are not likely to become widely used in the near future.** The cost of issuing such securities requires large volumes of mortgage loans and makes the MBS unattractive to most banks. MBS issuance by private mortgage banks is further hindered by stringent prudential regulation similar to that on commercial banks. The State Mortgage Agency suffers from capacity constraints and poor governance and has so far not been able to develop a marketable MBS.

**The authorities are aware that legislative, supervisory, and institutional measures are required to strengthen the mortgage market.** The housing supply constraints need to be removed to ensure that increased mortgage lending does not simply fuel price increases. The authorities have developed for consideration by the Duma a large package of legislative amendments that addresses many of the legislative weaknesses. At end-July 2004, the Duma passed several elements of the package, in particular those relating to taxation. The amended legislation needs to be supported by the courts to streamline the foreclosure process. Also, the establishment of effective credit bureaus would help banks manage risks and strengthen prudential supervision. In addition, the distorting interest subsidies of regional mortgage agencies need to be replaced by more efficient down-payment subsidies for low-income households; the State Real Estate Title Registry should be modernized, computerized, and updated; and legal obstacles to mortgage registration need to be removed.

congestion in the judicial system. Liquidation itself, which is done by a court-appointed liquidator (i.e., judicial liquidation), has a mixed record: there are often complaints about the professionalism of liquidators, and, in the past, amicable settlements have watered down the priority rights of household depositors, resulting in smaller payouts.<sup>45</sup> As a result, the liquidation process has proved highly ineffective, slow, and costly.

14. **Reflecting these weaknesses, Russian banks are generally rated “speculative” and considered riskier than their transition country peers** (Appendix I). While short-term prospects are usually assessed positively, given buoyant macroeconomic conditions, the significant structural risks constrain ratings.

#### **D. Prudential Regulation and Supervision**

15. **In June 2004, the government adopted a banking sector strategy for 2004–07 designed to address many of the weaknesses identified in the FSAP and highlighted above.** Bank resolution processes are to be improved through tightened legislation. Bank supervision is to be shifted toward risk-based supervision and strengthened through increased use of qualitative judgment by supervisors; expanded supervision on a consolidated basis; tightened procedures for connected lending; enforcement of definitions of bank capital; and stricter fit-and-proper criteria for bank owners and managers. A key element of the authorities’ banking sector strategy is the introduction of deposit insurance to level the playing field for state and private banks and to leverage stronger bank supervision. The scheme will come into effect on January 1, 2005. By April 2005, the CBR plans to complete reviews of all 1,140 banks that have applied for entry into the deposit insurance scheme and to make monthly announcements of accepted banks as the work progresses. The FSAP cautioned that this staggered admission may create risks of destabilizing runs on fundamentally sound banks. In response to the run on two large private sector banks in early July, interim deposit insurance was extended to all banks (see below). Noticeably absent, however, is an explicit strategy for the state-owned banks, especially Sberbank, whose deposits are still fully guaranteed by the state or the CBR.<sup>46</sup> A review of Sberbank’s role is not planned until it becomes a full member of the deposit insurance scheme in 2007.

16. **The authorities have already taken steps to strengthen regulation and supervision.** First, the CBR has substantially strengthened prudential regulation to increase the transparency of banks’ capital and ownership and to address weaknesses identified in the FSAP. Second, the CBR, together with the ministry of finance, is more rigorously enforcing anti-money-laundering and counter-terrorist-financing (AML/CFT) rules. Third, enrollment

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<sup>45</sup> A 2001 amendment to the law on bank bankruptcy allows for expedited payment (at the outset of proceedings) to retail depositors.

<sup>46</sup> At end-July 2004, the Duma passed amendments to the deposit insurance law removing the state guarantee of new Sberbank deposits after October 1, 2004. Those deposits remain guaranteed by the CBR.

in the deposit insurance system is guided by strict checks of strengthened prudential requirements for applicants: any bank that has not been accepted into the insurance scheme by end-September 2005 will have its license to take household deposits revoked.

**17. The CBR has introduced new regulations to increase the transparency of banks' capital and ownership in line with the FSAP's recommendation to tighten the definition of capital and strengthen fit-and-proper requirements for bank owners and managers:**

- In February 2003, the CBR issued instructions that introduced the notion of "improper" assets that inflate capital fictitiously. The new regulation allows the CBR to audit and impose sanctions on banks that are suspected of showing inflated capital.
- In July 2003, amendments to the law on banks and banking were approved that tightened fit-and-proper requirements for bank owners, including net asset adequacy and liquidity ratios.<sup>47</sup> New owners of banks are required to undergo an assessment of their eligibility as bank owners based on these requirements.
- Effective February 2004, the CBR strengthened the requirements for establishing loan loss provisions, moving them toward IFRS.

**18. The CBR has taken several initiatives to further improve the transparency of financial statements, which also help address problems of nontransparent corporate ownership structures:**

- In 2003, the CBR tightened supervision of transactions with offshore banks. New regulations prohibit transactions with most banks in countries identified as high risk because of their legal and governance environment.
- Effective April 2004, the CBR introduced revised prudential requirements allowing for motivated judgment by CBR supervisors, one of the major recommendations in the FSAP, and reducing incentives for window dressing. Banks are required to comply with prudential standards on a daily basis, and noncompliance has been redefined as noncompliance over 5 business days in any 30-day period. This is expected to reduce room for end-month window dressing. Off-balance-sheet items need to be fully reported to reduce incentives for schemes to evade risk assessments.
- The CBR has taken steps to move toward IFRS accounting for financial statements, as recommended in the FSAP. New regulations require banks, from October 2004 onwards, to report their accounts for monitoring purposes (and from 2006 onwards for supervision purposes) according to RAS converted into IFRS format. From end-

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<sup>47</sup> Previously, the only grounds for refusal of bank ownership were criminal convictions.

2004 onward, banks' accounts will have to be audited. A move to full IFRS accounting and auditing for banks is not anticipated in the near term because of capacity constraints on banks and the auditing profession. Whether the revised accounting standards improve the transparency of financial statements will depend on banks' willingness to comply with the general principles underlying IFRS accounting, as well as on the professionalism and independence of auditors.

19. **To accelerate bank resolution procedures, the CBR revised merger and acquisition regulations in July 2003, and the Duma passed amendments to the bank bankruptcy law in July 2004.** Registration procedures for bank mergers were shortened from six to four months and for bank acquisitions from six to three months. Several administrative requirements for mergers and acquisitions were removed. At end-July 2004, the Duma passed amendments to the bank bankruptcy legislation to move liquidation toward an administrative process (i.e., liquidation by the deposit insurance agency); these amendments could accelerate bank resolution and were supported by the FSAP. The amendments also strengthen the personal liability of bank owners and managers and simplify bank bankruptcy procedures.

20. **Strengthening the banking system will be particularly important in light of the new foreign exchange law.** From mid-2005 onwards, domestic banks will face competition from foreign banks, as depositors will be allowed to open deposits in foreign banks. The new foreign exchange law also removes administrative barriers to capital flows, such as permit requirements, but instead allows the CBR to impose unremunerated reserve requirements on capital flows. The CBR has indicated that moderate reserve requirements on a broad range of capital in- and outflows will be imposed in August 2004. To administer reserve requirements and monitor capital flows, an elaborate system of special accounts will be introduced which may impose considerable administrative cost.

#### **E. Recent Events in the Banking Sector**

21. **Efforts to address long-term underlying weaknesses recently triggered some turmoil in the banking system.** On May 12, 2004, the CBR withdrew the license of Sodbusinessbank, a midsized bank, for violations of anti-money-laundering legislation. Rumors that other banks might be affected led to the closure of interbank credit lines to all but the largest banks and a spike in interbank interest rates. In early June, Credittrust, a bank thought to have the same owner as Sodbusinessbank, defaulted on a bond payment, suspended operations, and opted for voluntary liquidation.

22. **Throughout June, tight interbank market conditions affected small and medium-sized banks despite steps by the CBR to boost liquidity.** In mid-June, the CBR cut the required reserve ratio on corporate and foreign currency deposits by 2 percentage points to 7 percent; expanded the list of collateral eligible for transactions with the CBR; and reduced the refinance rate by 1 percentage point to 13 percent. Nevertheless, four small banks suspended operations in the second half of June, and one small bank's license was withdrawn

for violation of anti-money-laundering legislation. Additionally, a midsized bank restricted deposit withdrawals.

23. **Rumors in early July about problems at larger banks undermined depositor confidence and culminated in the suspension of operations at one bank and a deposit run on another.** On July 6, Gutabank, the 22<sup>nd</sup>-largest bank, suspended operations after it had lost deposits equivalent to one third of its balance sheet. This was followed by a two-day run on Alfabank, the largest private bank, after several of its ATM machines ran out of funds. Alfabank's owners provided \$800 million to support the bank, and Alfabank imposed a 10 percent fee on early deposit withdrawals to stem the run.

24. **The authorities acted promptly to calm depositors.** The CBR brokered a takeover of Gutabank by state-owned Vneshtorgbank (VTB), the second-largest bank, financed with a \$700 million CBR loan to VTB. The CBR also reduced reserve requirements further to 3½ percent effective July 7 (a liquidity injection of 8½ percent of base money), and on July 10, the Duma passed a law introducing interim deposit insurance for all banks. The additional deposit insurance, which is effective from August 2004 to end-2006, has broadly the same coverage of household deposits as the main deposit insurance law approved in December 2003; however, it is financed and administered by the CBR rather than the deposit insurance agency. The review process of all banks for entry into the main deposit insurance scheme will be completed as previously planned and, as banks qualify, they will be transferred into the main deposit insurance scheme. Banks that do not qualify will lose their license to attract new retail deposits by end-September 2005, but their existing deposits will be insured by the interim deposit insurance scheme.

25. **These measures have been successful in calming the situation.** By July 9, the run on Alfabank had subsided, and, by July 17, the penalty on early withdrawals had been lifted. On July 19, VTB paid Rub 1 million (about \$35,000) for Gutabank, including for some of the industrial assets of Gutabank's parent group, and, ten days later, Gutabank was fully operational again. The CBR has since withdrawn four small banks' licenses without repercussions in the interbank markets or among depositors.

## F. Conclusions

26. **The main conclusions are the following:**

- Banks' performance has benefited from the strong macroeconomic environment. Credit and liquidity risks are increasing as balance sheets expand rapidly, but they remain manageable, given Russia's low level of monetization and strong fiscal and external positions.
- Despite progress in implementing FSAP recommendations to strengthen prudential regulation and supervision, significant structural weaknesses remain. These include highly concentrated balance sheets; substantial, albeit declining, connected lending;

frequent circumvention of prudential norms; poor governance; and weak accounting practices. The system remains dominated by state-owned banks, especially Sberbank.

- Efforts by the CBR to strengthen enforcement of prudential regulations have been hampered by a weak framework for bank resolution, notably, until very recently, an inadequate bank bankruptcy law and an unpredictable judicial system.
- The authorities' banking sector strategy is designed to address many of these weaknesses. A key element is the introduction of household deposit insurance to level the playing field for Sberbank and other banks, and leverage stronger enforcement of prudential standards. However, no strategic review of Sberbank's role is envisaged in the near term.
- Recent turmoil in the banking sector highlights the fragility of confidence, and reflects the sector's continuing structural weaknesses. Further nervousness is likely as the CBR continues to strengthen supervision. The strong macroeconomic environment provides an important opportunity to do this while macroeconomic and systemic risks are still manageable.
- While the CBR's recent measures were effective in calming the situation, more effective bank resolution processes, improved crisis management tools, and a clear and consistent public communications strategy are needed to minimize the impact of individual banks' problems on confidence in the sector as a whole. The Duma's recent approval of a strengthened bank bankruptcy law is an important step in this direction.

## Larger Russian Banks' Ratings as of July 26, 2004

Bank	Country	Long-Term Ratings		
		Fitch	Moody's 1/	S & P 2/
Alfa Bank	Russia	B+	Ba2	B
ABH Financial Limited	Russia	B+	...	...
Absolut Bank	Russia	B-	...	...
Ak Bars Bank	Russia	B-	...	...
B.I.N. Bank	Russia	CCC+	...	...
Bank Avangard	Russia	B-	...	...
Bank Evrofinance-Morsnarbank	Russia	B	...	...
Bank Menatep St Petersburg	Russia	CCC+	WR	WR
Bank Zenit	Russia	B-	B1	...
CentroCredit Bank	Russia	CCC+	...	...
Financial Corporation NIKoil	Russia	B	...	...
Gazprombank	Russia	...	Ba2	B+
Industry & Construction Bank, St Petersburg (ICB)	Russia	B	...	...
International Industrial Bank	Russia	B	B1	B-
International Moscow Bank	Russia	BB-	...	B+
MDM Bank	Russia	B+	Ba2	B
Moscow Bank for Reconstruction and Development	Russia	B-	...	...
Moscow Municipal Bank-Bank of Moscow	Russia	BB	Ba2	...
NIKoil IBG Bank	Russia	B	B1	...
NOMOS Bank	Russia	B	B1	...
National Reserve Bank	Russia	CCC+	...	...
Orgresbank	Russia	B-	...	...
Probusinessbank	Russia	B-	...	...
Promsvyazbank	Russia	B	B1	B-
Renaissance Capital Holdings Limited	Russia	B	...	...
Rosbank	Russia	B-	B1	B-
Sberbank-Savings Bank of Russian Federation	Russia	BB+	Ba1	...
Ural-Siberian Bank	Russia	B	...	B-
Uraltransbank	Russia	B-	...	...
Vnesheconombank	Russia	BB+	B1	...
Vneshtorgbank	Russia	BB+	Ba1	BB+
United Bulgarian Bank	Bulgaria	BB+	...	BB
Belarusbank	Belarus	CCC	...	...
Belpromstroibank	Belarus	CCC	...	...
Ceskoslovenska Obchodni Bank	Czech Republic	A+	A1	BBB
Komerčni banka	Czech Republic	A	A1	BBB
Hansapank	Estonia	A	A1	...
Central European International Bank	Hungary	A	A2	BBBpi
Kereskedelmi es Hitelbank	Hungary	A+	A1	BBBpi
AB Bankas NORD/LB Lietuva	Lithuania	BBB+	...	...
Bankas Snoras	Lithuania	BB-	...	...
Latvijas Ekonomiska Komerčbanka	Latvia	B+	A2	...
BRE Bank SA	Poland	BBB+	A3	Bbpi
BRE Leasing SP	Poland	BBB+	...	...
Bank Ochrony Srodowiska	Poland	BBB-	...	...
Bank Pekao	Poland	A	...	...
Bank Zachodni WBK S.A.	Poland	A	A2	BBBpi
ING Bank Slaski	Poland	A	A2	...
Kredyt Bank	Poland	A	A2	BBpi
IndustrialBank	Ukraine	CCC	...	...
JSC The State Export-Import Bank of Ukraine (Ukreximbank)	Ukraine	B+	B2	...
Ukrsibbank	Ukraine	B-	B2	...

Sources: FitchRatings; Moody's Ratings Direct; and Standard & Poor's Bank Ratings Guide.

1/ Foreign long-term deposit ratings for Gazprombank, NIKoil IBG Bank, Rosbank, NOMOS Bank, Sberbank, Vneshtorgbank, and MDM Bank.

2/ Long-term local issuer credit.

#### IV. KEY FISCAL MEASURES FOR 2005: AN ASSESSMENT<sup>48</sup>

- *The most important fiscal measure for 2005 is a tax cut, entailing a reduction in the effective social tax rate by 5–6 percentage points. As a result, the general government is likely to lose revenues by nearly 1¼ percent of GDP. Offsetting revenue measures are limited to hikes in oil taxes, designed to raise substantial revenues only at very high oil prices. Social benefit reform, aiming at eliminating unfunded benefit entitlements, is another major element of the 2005 budget.*
- *While these measures are positive steps in principle, their timing might not be optimal. Absent further offsetting measures, they are likely to add fiscal stimulus to the already buoyant economy, increase vulnerability of the budget to oil prices, and limit the scope for fiscal easing in the next economic downturn. In addition, the cutback of the funded pension system, associated with the tax cut, is a regrettable reversal of pension reform.*
- *Given sizeable budget surpluses in recent years, low public debt, and a very high level of international reserves, the fiscal measures do not appear to jeopardize long-term fiscal sustainability. They would, however, reduce room for maneuver in the future, given potentially large resource needs for important reforms and better social services. Additional spending pressure could also arise from large unfunded pension obligations and contingent liabilities associated with the recent introduction of deposit insurance.*

##### A. Introduction

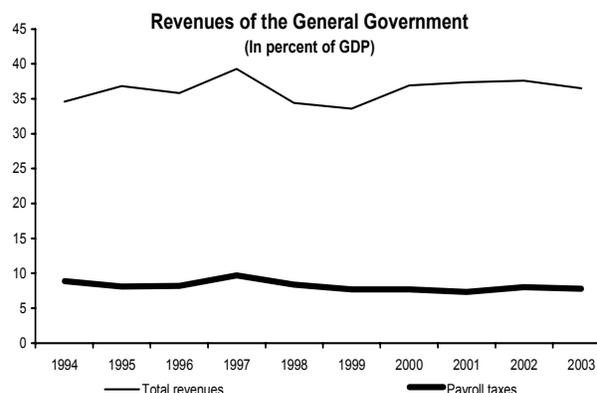
1. **The government has adopted several important fiscal measures for 2005.** They include a reduction in the social tax rate, hikes in oil taxes, and reform of social benefits. The tax cut is the most important among them in terms of the scale. The measure is also important qualitatively, with the tax cut package entailing modifications of pension reform and, more broadly, hikes in oil taxes. This chapter describes key elements of the tax cut package, discusses its economic and policy background, assesses its fiscal implications, and discusses policy issues arising from the social tax cut, the oil tax increases, and the social benefit reform.

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<sup>48</sup> Prepared by Goohoon Kwon.

## B. Key Elements of the Tax Cut Package

2. **The social tax is the single largest tax of the general government.** It amounts to nearly 8 percent of GDP and finances the bulk of social expenditures administered by state social extrabudgetary funds, including the state pension fund. The tax is also one of the most stable taxes, based almost entirely on wage bills. The tax rate was already reduced in 2001 from a flat rate of 39.5 percent to regressive rates with an average effective rate of about 30 percent and a top rate of 35.6 percent. However, the social tax is still widely seen as overly burdensome. Many claim, and Fund staff agree, that the high social tax rate hampers the growth of small and medium-sized businesses, impedes investment, and leads to tax evasion and hidden activities.



3. **There have been three main competing proposals for the tax cut, differentiated by the scale and modality of the cut.** The first, which passed its first reading in parliament last year, envisages a reduction in the effective rate by about 8 percentage points. The second, approved in principle by the previous government late last year, is to decrease the effective rate by about 5–6 percentage points. A third, more recent, version called for a more drastic cut—a reduction in the effective rate by as much as 10 percentage points. The radical approach, based on an assertion that the tax base could be expanded only by a very large tax cut, has received broad public support, in part bolstered by sustained budget surpluses and rising international reserves.

Table 1. **Marginal Social Tax Rates for Employers\***  
(In percent of annual wage bills)

Wage brackets (in rubles)	Current Law	Parliament Version	Radical Version	Final Version	New Law
Below 30,000	35.6	30	32**	26	26
30,000-50,000	35.6	30	19.5	26	26
50,000-100,000	35.6	15	19.5	26	26
100,000-280,000	20	15	19.5	26	26
280,000-300,000	20	15	19.5	26	10
300,000-600,000	10	15	12	10	10
Over 600,000	2	5	2	2	2
<u>Memorandum item:</u>					
Average effective rate	30	22-23	20-21***	24-25	24-25

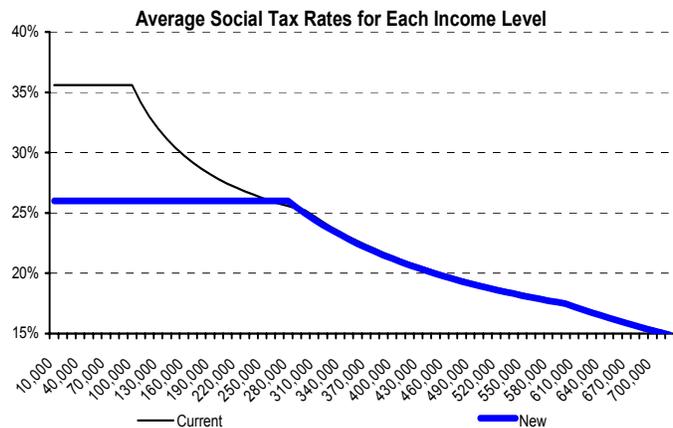
\*Standard rates. Preferential rates are applied to individual entrepreneurs, lawyers, agricultural workers, and qualified small businesses. \*\*Or fixed at Rub9600.

\*\*\*Including mandatory pension contributions of 2-4 percentage points to be paid by employees to their own individual retirement accounts. These contributions are currently paid by employers as part of the unified social tax.

4. **Eventually, the new government, formed after the March presidential election, endorsed the most modest version, entailing a reduction in the effective rate by 5-6 percentage points.** The State Duma passed the bill in late June and the president signed it into law in late July. Details of the changes are as follows:<sup>49</sup>

<sup>49</sup> See Box in Annex for a summary of the current social security system and planned changes.

- **The standard top rate of 35.6 percent will be cut to 26 percent.** In detail, the social tax collected by the federal government will be cut from 14 percent to 6 percent; mandatory contributions to the social insurance fund will be cut from 4 percent to 3.2 percent; and those to the medical insurance fund from 3.6 percent to 2.8 percent. In contrast, total mandatory contributions to the state pension system, including the pay-as-you-go part and the funded part, will remain unchanged at 14 percent.
- **Preferential rates for small businesses and certain occupations will be mostly preserved.** This will be achieved by reducing the preferential rates largely in proportion to the cut in the standard rates. Specifically, the basic preferential rate for small businesses will drop from 13.2 percent to 10 percent, for agricultural producers from 26.1 percent to 20 percent and for lawyers from 10.6 percent to 8 percent. These preferential rates will remain much lower than the new standard top rate of 26 percent, although absolute differences in the rates will be narrowed.
- **The average tax rate will decline sharply for most employees.** The average tax rate will fall for wage brackets below an annual average wage of Rub 280,000, or about \$800 per month, while those above the threshold will remain largely the same. Given that the national average wage is currently well below Rub 100,000 per annum, most employees are expected to be in the top bracket, for which the tax rate is set to drop the most, by 9.6 percentage points.
- **The funded pension system will lose a substantial portion of pension contributions in order to finance the pay-as-you-go system.** The enacted tax cut bill effectively discharges  $\frac{1}{3}$ – $\frac{1}{2}$  of qualified employees from the defined contribution system (or the funded system). Their contributions to the defined contribution system, estimated at around  $\frac{1}{4}$  percent of GDP, will instead be transferred to the defined benefit system and used to finance part of the gap caused by the tax cut. This means that middle-aged employees, who have been accumulating contributions to the funded pension system since 2002, will be no longer allowed to continue tax-deductible pension saving. This is a sharp reversal of an ambitious pension reform, which was launched in late 2001 with the aim to develop financial markets and ensure long-term financial viability of the public pension system.



### C. Economic and Policy Background

5. **The social tax cut, while justifiable in principle, needs to be assessed against the economic and policy background.** The government accelerated tax reform in mid-2000 as one of its top priorities. The reform entailed streamlining tax rules, reducing or eliminating exemptions, cutting and unifying tax rates, and centralizing revenues to the federal government (Box 1 and IMF 2002). One of the core commitments of the government was to reduce the tax burden by 1 percent of GDP per year, starting from 2004 and sustained for the next two to three years. As part of the committed reform, the standard rate of the value-added tax (VAT) was cut from 20 percent to 18 percent in 2004. Also, the sales tax, a major local tax, was eliminated in 2004.

#### Box 1. Key Tax Reform Measures

President Putin, after winning the presidential election in early 2000, introduced sweeping tax reforms in mid-2000. The objectives were to make the tax system fairer, simpler, more stable, more predictable, and more efficient.

Specific reform measures included:

- Elimination of turnover taxes including housing tax (2001), tax on fuel sales (2001), road fund tax (2003) and sales tax (2004);
- Reduction of the standard social tax rate from 39.5 percent to 35.6 percent, and the top personal income tax rate from 35 percent to 13 percent (2001), the profit tax rate from 35 percent to 24 percent (2002), and the standard VAT rate from 20 percent to 18 percent (2004);
- Introduction of a low, flat income tax rate of 13 percent (2001); introduction of a mineral extraction tax (2002), of which rate is linked to world oil prices; introduction of a simplified tax system for small businesses (2003) and agriculture (2004); and
- Removal of domestic tax havens (2004) and reduction of a variety of exemptions and tax privileges.

6. **As intended, tax reform led to a considerable decline in non-oil taxes.** Non-oil taxes collected by the general government dropped by about 1 percent of GDP in 2003 compared to the pre-reform year of 2000, breaking a trend of steady non-oil tax collections in the post-crisis period. Non-oil

**Table 2. Tax Performance Before and After Tax Reform**  
(Changes within periods in percentage points of GDP)

	Crisis 1998*	Post-crisis (1999-03)	Pre-reform (1999-00)	Post-reform (2001-03)
General gov't tax revenue	-6.3	2.2	3.3	-1.2
Oil taxes	-2.4	3.3	3.4	-0.1
Non-oil taxes	-3.9	-1.1	-0.1	-1.1
Federal gov't tax revenue**	-3.2	5.8	4.9	0.9
Oil taxes	-0.9	3.7	2.3	1.4
Non-oil taxes	-2.3	2.1	2.6	-0.5
<u>Memorandum item:</u>				
General gov't total revenue	-6.0	3.3	3.6	-0.3
of which: federal revenue	-3.0	6.4	5.2	1.2

Source: Ministry of Finance and author's estimates

\*Excluding end-year non-cash revenues and offset, estimated at 1 percent of GDP.

\*\*Excluding the unified social tax.

taxes declined less at the federal level as a result of the centralization of tax revenues. Non-tax revenues however increased, reflecting buoyant property incomes.

7. **The true size of tax losses was masked by high oil prices.** Despite tax cuts, oil tax collections remained largely unchanged relative to GDP between 2000 and 2003. This mainly reflects high oil prices and changes in the oil tax regime, which made oil taxes more progressive with respect to oil prices (Kwon 2003). A surge in oil production and oil exports after the crisis also contributed to the strong performance of oil taxes.

#### **D. Fiscal Implications of the Tax Cut Package**

8. **The tax cut package has several fiscal implications.** This section discusses budgetary costs of the tax cut and assesses its possible compliance effects. This section also discusses their implications for the vulnerability of the budget to oil prices.

##### **The impact cost of the tax cut**

9. **The tax cut is likely to cost the budget of the general government nearly 1¼ percent of GDP in 2005.** This impact cost estimate is consistent with the government's initial estimate of some Ruble 280 billion, or slightly over 1½ percent of GDP. The staff's estimate is slightly lower than the government's estimate as it takes into account an expansion of other tax bases because of the tax cut, notably profit tax and personal income tax.

10. **Compensatory revenue measures are limited to hikes in oil taxes,** designed to raise substantial revenues only at very high oil prices. The government estimates that the hikes will add revenue by some ½ percent of GDP at Urals oil prices over \$30 per barrel but very little at prices around \$20 per barrel. Some gains are expected in personal property tax, tax on dividends and unified tax on mixed incomes, but they are likely to be minor. These changes will increase the sensitivity of the budget to oil prices from an already high level, as discussed further at the end of this section.

11. **Explicit expenditure measures are so far confined to modest savings in health and pension expenditures,** totaling about ¼ percent of GDP. Specifically, the social insurance fund will save about 0.1 percent of GDP by shifting its financial responsibility for the first several days of sick leave to employers.<sup>50</sup> A similar saving scheme is being considered for the medical insurance funds, although no concrete schemes have been agreed yet.<sup>51</sup> The state pension fund could reduce pension expenditures by slowing down the

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<sup>50</sup> This saving measure is in line with recommendations of a TA mission on public expenditures in 2000.

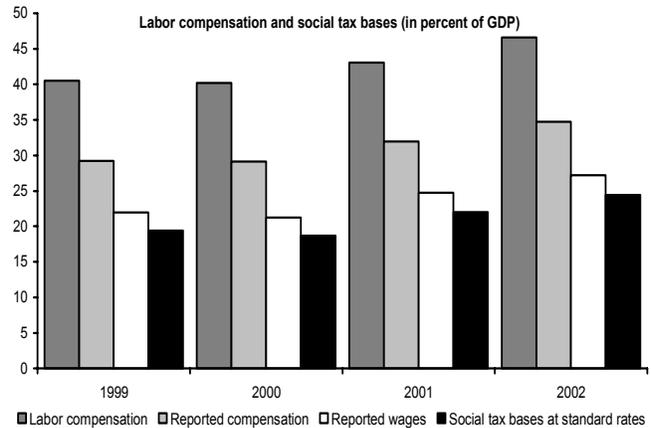
<sup>51</sup> It is doubtful whether, without an overhaul of the state medical insurance system, a significant saving could be achieved in the medical insurance funds, which most local experts claim already run a large deficit, with the gap covered by private payment and de-capitalization. A recent reform initiative advanced by a government working  
(continued...)

indexation of pension payments, but the sustainability of this approach is doubtful, given the already low level of pension benefits.

**Assessment of possible compliance effects of the tax cut**

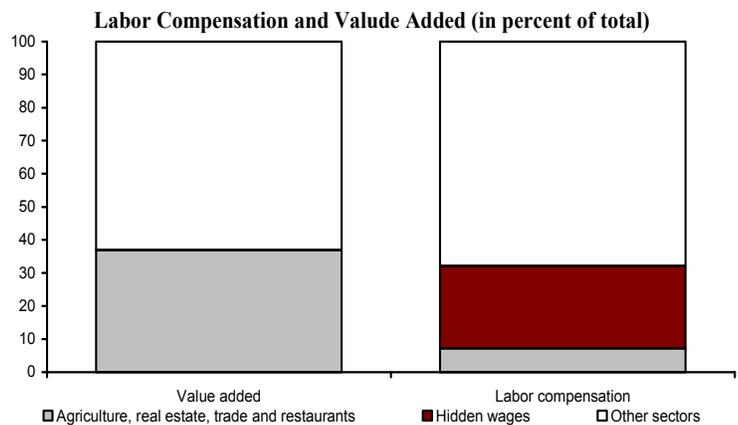
**12. Proponents of the tax cut argue that revenue losses are overstated as the tax cut will lead to a large and rapid improvement in tax compliance.** There is little doubt that

so-called hidden wages are substantial—they account for a quarter of total labor compensation accrued in the economy according to the State Statistical Agency. Indeed, there is little evidence of massive tax evasion in the declared part of labor compensation, typically taking the forms of excessive deductions and fraudulent claims for preferential rates; the state pension fund reports that over 90 percent of reported wages are charged at standard rates with less than 10 percent at preferential rates. Thus, a significant increase in the tax base would be impossible without reduction in the so-called shadow economy.



**13. There is, however, considerable uncertainty about the scope for rapid improvement in tax compliance since hidden wages are mostly in sectors where tax administration is traditionally very difficult.**

Detailed national account data show that slightly more than 1/3 of total value added in the economy was produced in 2002 by agriculture, real estate businesses, trade, and restaurants, where wages are inherently mixed with other incomes and practically often non-taxable. In contrast, wages reportedly paid by these four sectors were much less than one tenth of total labor compensation



group proposes that 1.5–2 percentage points of the unified social tax rate should be shifted to the private insurance system to promote competition and improve quality of medical services, with the resulting gap to be financed by the federal budget. Critics argue that this scheme will only worsen the viability of the state medical insurance system by transferring wealthy and healthy contributors to the private insurance scheme—the so-called adverse selection problem.

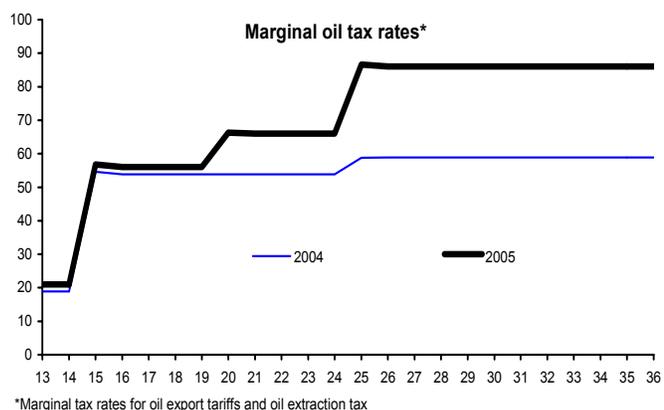
in the economy, which includes official estimates of hidden wages. The large discrepancy between the sectoral value added and the sectoral wage contributions suggests that a significant portion of hidden wages are in these four sectors since, otherwise, employees in these sectors would have received wages equivalent merely to one tenth of the total value produced by these sectors—a share clearly out of line with the national average of 50 percent and the conventional range of 50–70 percent in other economies.

14. **Moreover, experience with previous tax cuts suggests that revenue losses are only partially and gradually compensated by increases in tax bases.** Surely, collections of personal income tax improved substantially almost immediately after the introduction of a low flat income tax in 2001. Based on a panel data regression, Sinel'nikov-Murylev and others (2003) attributed the improvement mostly to a positive impact of the tax cut. However, experience with other tax cuts—notably profit tax and VAT—suggests that this was most likely an exception, explained largely by a boost in disposable income associated with public wage hikes and simultaneous cuts in other taxes sharing common tax bases (Gurvich and others, 2003).

15. **A case in point is previous experiments with the social tax regime.** Already in 2002, individual entrepreneurs, a potentially large untapped tax base, became eligible for preferential rates, which are less than half the standard rates. But there has been little improvement in collection since the change. Similarly, a comparable preferential regime was granted to agricultural workers in 2004, without any positive impact as yet. Furthermore, weak VAT performance after the recent tax cut and emerging evidence of large-scale refund fraud suggest that tax cuts are unlikely to be self-financing unless combined with strengthened tax administration. In this regard, the outlook for quick improvement in compliance is not good, particularly because tax administration remains weak and the new tax structure will preserve highly preferential rates.

### Vulnerability of the budget to oil prices

16. **The share of oil revenues in the budget has steadily increased since the 1998 crisis.** Its share in the revenues of the general government soared from less than a fifth in 1998 to a quarter in 2003. The share in federal revenues rose even more sharply, from a quarter to 40 percent, as more oil taxes were shifted to the federal government. As noted above, these developments reflect changes in the tax regime, high oil prices, and relatively strong growth in oil output and exports, which in combination more than tripled the sensitivity of federal revenues to oil prices compared to the pre-crisis level.



17. **The planned replacement of the social tax with oil taxes will further magnify the sensitivity of the budget to oil prices.** At Urals oil prices higher than \$25 per barrel, the new oil tax regime will increase the combined marginal tax rate for the two major oil taxes, including the oil export tariff and oil extraction tax, from 59 percent to 86 percent. This sharp increase will lift the oil price sensitivity of federal revenues—at the top price range of over \$25 per barrel, a one dollar decline in oil prices is estimated to reduce general government revenues by about 0.41 percent of GDP, compared to some 0.37 percent of GDP in 2004.

18. **The oil stabilization fund, put in place this year, will certainly help to mitigate the vulnerability of the budget but, in its current form, would not be sufficient to limit downside risks.** In an attempt to reduce oil dependency of the budget, the government introduced a law on an oil stabilization fund in 2003 and created the fund in January 2004. The fund is set to accumulate the oil revenues that can be attributed to Urals oil prices in excess of \$20 per barrel. The fund's resources can be invested only in high-quality foreign securities, with investment incomes retained within the fund. The resources are allowed to be withdrawn to fill financing gaps when oil prices fall below the benchmark price of \$20 per barrel. A critical drawback in this arrangement is that these rules work only until the fund reaches a cap of Ruble 500 billion (about \$17 billion or 2¾ percent of GDP). If the fund accumulates resources beyond the ceiling, the government could use the excess oil revenues to increase expenditures, regardless of the level of oil prices.

## E. Policy Issues

### Political economy considerations

19. **There could be a case for a tax cut from the viewpoint of political economy.** Experience of many commodity exporting countries suggests that the accumulation of windfall revenues tends to increase political pressures to spend them and often ends up with wasteful expenditures (Talvi and Vegh, 2000; Tornell and Lane, 1999; Gelb 1988). In such a case, a tax cut could be supported as a better alternative to wasteful spending on the ground that money left with the private sector is usually utilized more efficiently.

20. **A risk in this strategy is that expenditures could still increase with or without tax cuts.** Such a risk has been amply demonstrated by a recent decision of the government to increase expenditures by about ¾ percent of GDP, which together with the tax cut would cost the 2005 budget about 2 percent of GDP. The extra spending could be justified as it is expected to help marshal critical political support for eliminating unfunded social benefits (Box 2). A concern, however, is that there might be other equally justifiable expenditure needs in the near future, given the challenging agenda of major structural reforms, including energy reform and civil service reform. Experience of other countries also illustrates a considerable risk of spending hikes following or in tandem with tax cuts (Stockman 1986, for example).

### **Box 2. Reform of Unfunded Expenditure Mandates**

One of the biggest challenges in intergovernmental fiscal relations in Russia is the so-called “unfunded mandates”—social benefit obligations imposed by federal laws on subnational governments without any identified source of financing. In practice, the bulk of these benefits have simply been not available in most regions because of the lack of funding. Only a fraction of them have been provided to limited beneficiaries in certain regions at budgetary expense or, more commonly, through cross-subsidies or de-capitalization of benefit providers. Correspondingly, the federal government has regularly suspended most of enabling laws through annual budgets, accounting for about  $\frac{2}{3}$  of the unfunded mandates, but this practice has been increasingly challenged in the constitutional court. Unsuspended unfunded mandates have been left to the discretion of subnational governments, which reportedly finance only a fraction of them.

The precise amounts of total unfunded mandates are hard to estimate due to legal ambiguities. An added complication is difficulties in pricing the social entitlements, most of which are Soviet-era remnants of in-kind benefits in transportation, communication, health care, and public utilities. The ministry of finance estimates the amounts roughly at about 15 percent of GDP, subject to a wide margin of error, which is equivalent to the size of consolidated regional budgets.

The government has recently embarked on a sweeping social benefit reform, aiming to resolve the issue of the unfunded mandates. The measures, which require parliamentary approval, include the delineation of funding responsibilities among different layers of governments; the elimination of most of statutory—yet unaffordable—commitments; the assurance of a sufficient funding of the remaining benefits and their monetization; and the assignment of full authority to subnational governments in determining the size and scope of social benefits for certain categories of beneficiaries. According to the plan, the federal government will be solely responsible for 14 categories of beneficiaries totaling about 13 million while subnational governments will need to take care of some 21 million people, including Soviet-era political victims and certain types of veterans.

This is a welcome step in principle. The unfunded mandates are highly distortionary, non-transparent, and simply unaffordable. Payment in monetary form, which will be standard for federally-funded benefits according to the plan, will also help improve efficiency and ensure transparency of social spending. It is nonetheless unclear whether the monetization of in-kind benefits will be sufficiently well-targeted and whether subnational governments will have adequate resources and the political will to eliminate the unfunded mandates under their jurisdiction.

#### **Short-term stimulus effect**

21. **On balance, the tax cut and social benefit reform are likely to add fiscal stimulus to an already buoyant economy, and so add to inflationary pressures.** Signs of macroeconomic tensions include tightening labor markets, emerging capacity constraints, entrenched core inflation at a double-digit level and a recent acceleration in real ruble appreciation. The output response to fiscal stimulus in this environment would likely be minimal, if not negative, consistent with empirical studies on the short run fiscal multiplier (Hemming and others, 2002).

22. **Empirical evidence suggests that an increase in oil taxes owing to high oil prices will not mitigate the inflationary effect of the tax cut and social benefit reform.** A variety of regressions applied to quarterly data between 1995–2003 show that a fall in the overall fiscal balance, a conventional indicator of fiscal stimulus, does not show any significant, meaningful relationship with inflation or output growth. In contrast, strong and stable links are identified between inflation, in particular that of non-tradable goods, and increases in the non-oil deficit, measured as the difference between expenditures and non-oil revenues. These empirical findings indicate that a main fiscal driver in aggregate demand is government spending and taxes net of windfall oil revenues (see annex tables for typical results). These outcomes are largely preserved in dynamic settings including vector autoregression and error correction models, although their significances depend on the number of lags and the choice of exogenous variables. These findings on fiscal stimulus and inflation are broadly supported by outcomes of separate regressions taking government spending as an exogenous variable. They show that the impact of government spending on inflation outweighs that on output by as much as three times. Its inflationary effect is both strong and stable, particularly with respect to non-tradable goods.

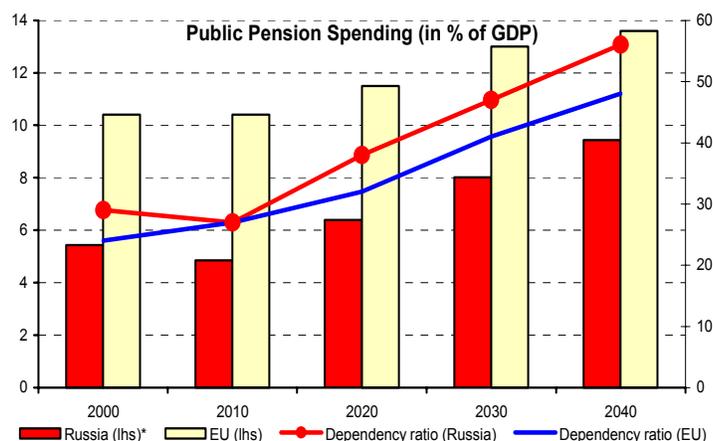
#### **Long-term fiscal sustainability**

23. Given sizeable budget surpluses in recent years, low public debt, and a very high level of international reserves, the tax cut does not appear to jeopardize the long-term fiscal sustainability. **The stimulus measures in the 2005 budget would nonetheless reduce room for maneuver in the future, given that pressures on limited public resources are set to remain high.** In particular, the tax cut would weaken the already tenuous long-term solvency of the state pension system, which is expected to deteriorate progressively in the next two decades due to aging baby-boomers and declining labor forces as discussed below.

24. **The demographic outlook in Russia is highly unfavorable, even relative to EU countries, which face serious fiscal challenges due to adverse demographic profiles.** In Russia, the share of the population over 60, the retirement age for men, is projected to surge from the current rate of 30 percent of the working age population to 40 percent by 2020 and then further to some 60 percent by 2040. This escalating trend in the old-age dependency ratio is steeper than in most EU countries, where a comparable dependency ratio is to rise, on average, from about 25 percent in 2000 to some 50 percent in 2040 (EPC 2001). Among EU countries, only Italy is comparable to Russia in the steepness of its trajectory.

25. **The social tax cut aggravates the solvency of the already fragile state pension system.** In an earlier study by the World Bank (2002), public pension expenditures are projected to rise sharply in the long term, by as much as 4 percentage points of GDP from 2002 to 2040. This is based on a baseline scenario, assuming no changes in pension policies

and tax rates, no deterioration in the replacement rates—the portion of wages covered by pension payments—and steadily increasing wage bills relative to GDP. The Pension Fund projects that the recent tax cut will aggravate the financial viability of the state pension system, putting the Pension Fund in an underlying deficit of about 1½ percent of GDP in the short and medium-term, even assuming a steadily declining replacement ratio. This projection is broadly consistent with preliminary estimates done by the World Bank (2004).



26. Other warning signals of potentially large future spending needs include low public wages and the existence of unfunded benefit commitments in the subnational governments. Another important source of contingent liabilities is a weak yet rapidly expanding banking sector, with household deposits now under a state guarantee.

### Long-term growth implications

27. **The long-term growth implications of the tax cut are ambiguous.** Economic literature suggests that the growth implications of tax cuts depend on the reactions of the private sector and the nature and extent of compensatory measures. A self-financed tax cut, if it happens, would certainly be positive for growth, as the costs of business would be reduced without causing revenue losses. Also, empirical growth literature suggests that a tax cut combined with offsetting spending reduction could be positive to growth to the extent that the spending cuts do not adversely affect the quality of public services (Barro 2002). A strong case could be made in Russia in this regard since the cut in the social tax, which is widely seen as overly burdensome, would reduce distortions in the labor market and promote small and medium-sized businesses. However, in an equally, if not more, likely scenario of sustained revenue losses and associated deficits, growth would be negatively affected as deficits would crowd out private investment and reduce national saving. In sum, empirical studies on economic growth demonstrate that a tax cut alone, without supporting structural measures, would hardly contribute to sustained economic growth (Tanzi and Zee, 1997)

## F. Conclusions

28. **The reduction in the social tax rate and the social benefits reform, two key elements of the 2005 budget, are in principle positive measures.** The social tax cut, the single most important fiscal measure for 2005 reduces distortions in the labor market and promotes small and medium-sized businesses. The ambitious social benefit reform is a

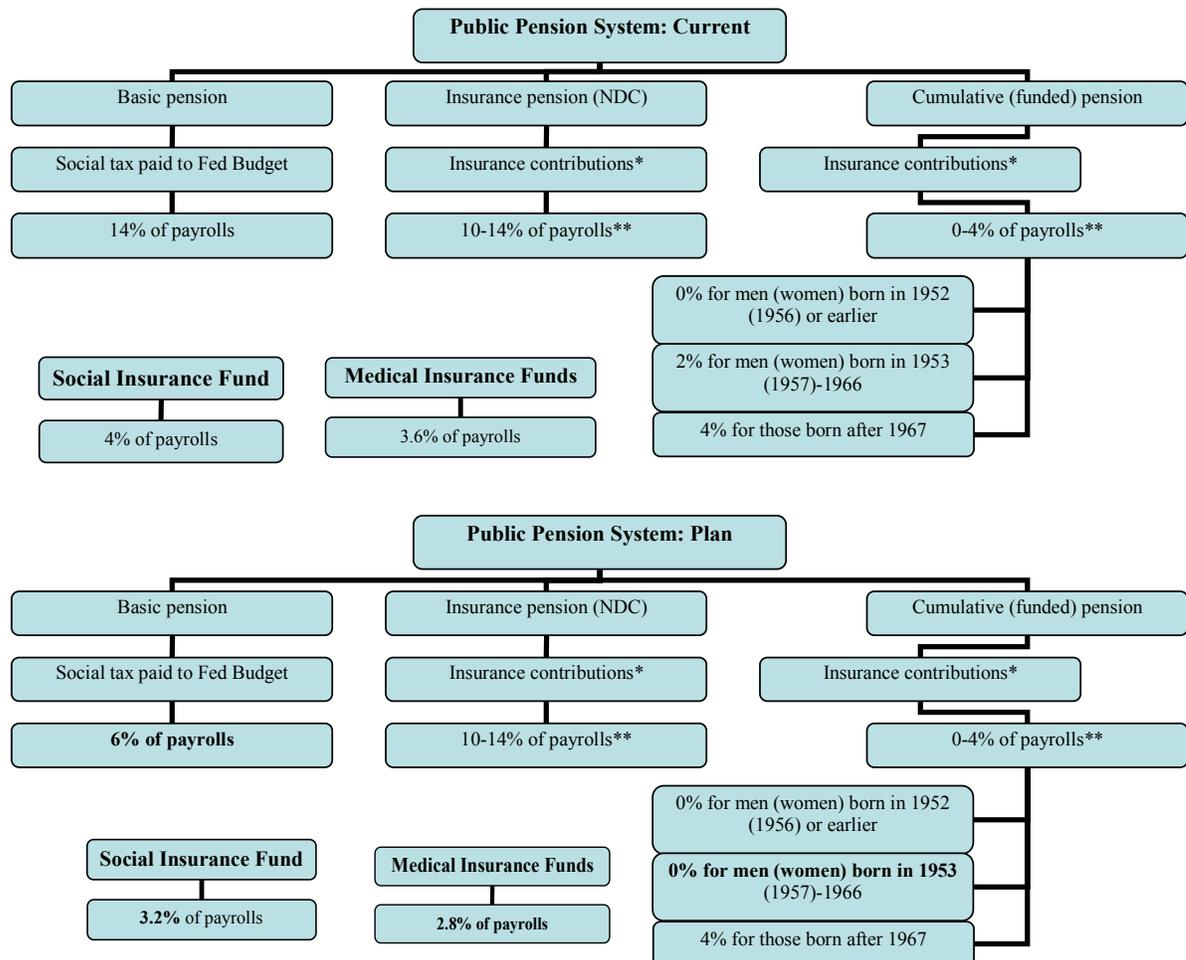
welcome effort to eliminate large unfunded expenditure mandates and to improve the efficiency and transparency of social spending.

29. **However, the timing of the tax cut and social benefit reform might not be optimal.** If not accompanied by offsetting tax or expenditure measures, they are likely to add fiscal stimulus to the already buoyant economy, to increase the vulnerability of the budget to oil prices, and to limit the scope for fiscal stimulus in the next economic downturn. The planned increase in oil taxes will not mitigate the inflationary effect of the stimulus measures. Another shortcoming is the cutback of the funded pension system, which reverses hard-won gains made in pension reform. Moreover, although these expansionary fiscal measures do not appear to jeopardize long-term fiscal sustainability, they would reduce room for fiscal maneuver in the future, given the need to mobilize additional resources for important reforms and better social services. Finally, additional spending pressure could arise from large unfunded pension obligations and contingent liabilities associated with the recent introduction of deposit insurance.

### Social Security System in Russia

**The current system of social security is provided mainly by three extrabudgetary funds, the pension fund, medical insurance fund, and the social insurance fund.** The pension fund is the biggest, spending around 5-6 percent of GDP per year. The old pay-as-you-go pension system was replaced by a mixed system in 2002, consisting of a flat basic pension, a notionally defined contribution scheme (NDC), and a fully funded scheme. The standard contribution rate has been set at 28 percent, with half of the contribution used for basic pensions and the remainder split between the NDC and the fully-funded scheme. Both the basic pension and NDC schemes are pay-as-you-go systems, although the NDC has certain elements of a funded system (World Bank 2002).

**The social tax cut entails further changes in the social security system, substantially weakening the fully-funded part.** Contributions for old employees will continue to be fully transferred to the pay-as-you-go part. However, those for middle aged employees, currently split between the NDC and the fully funded part, will be wholly shifted to the NDC part. For young employees, the contributions will remain unchanged for 2005–07 as opposed to a planned increase of one percentage point for the fully-funded part at the expense of NDC part.



\*Deductible to the social tax. These are commonly called the social tax, but strictly speaking not a tax.

\*\*Varying by ages but the sum of insurance contributions to NDC and the funded pension should be 14 percent.

## Selected Empirical Evidence of Fiscal Impulse to Output and Inflation

### Table 3: Inflation Indicators and Non-oil Budget Deficits

Dependent Variable: **Changes in Real Effective Exchange Rate**

White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
<b>Changes in real non-oil deficits</b>	<b>0.045010</b>	<b>0.019180</b>	<b>2.346752</b>	<b>0.0262</b>
Lagged dependent variable (-1)	0.163564	0.121365	1.347701	0.1886
Lagged dependent variable (-2)	-0.186957	0.068287	-2.737815	0.0106
DUMMY98Q3	-0.050354	0.026192	-1.922488	0.0648
Changes in unit labor costs	0.377818	0.144637	2.612187	0.0143
R-squared	0.733009	Mean dependent var		0.002113
Adjusted R-squared	0.694868	S.D. dependent var		0.079502
S.E. of regression	0.043916	Akaike info criterion		-3.274353
Sum squared resid	0.054001	Schwarz criterion		-3.047609
Log likelihood	59.02682	Durbin-Watson stat		2.460086

Dependent Variable: **Inflation differentials between services and food**

Method: Least Squares

Sample(adjusted): 1995:3 2003:4

White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
<b>Changes in real non-oil deficits</b>	<b>0.031714</b>	<b>0.009946</b>	<b>3.188565</b>	<b>0.0034</b>
Changes in oil prices	0.080769	0.026624	3.033668	0.0051
Lagged inflation differential (-1)	0.487295	0.099931	4.876297	0.0000
Changes in unit labor costs	0.334502	0.072348	4.623527	0.0001
DUMMY98Q3	-0.039997	0.014646	-2.730915	0.0106
R-squared	0.914151	Mean dependent var		0.020803
Adjusted R-squared	0.902310	S.D. dependent var		0.079662
S.E. of regression	0.024899	Akaike info criterion		-4.412963
Sum squared resid	0.017978	Schwarz criterion		-4.188498
Log likelihood	80.02037	Durbin-Watson stat		1.545959

**Table 4: Inflation Indicators and Government Consumption**Dependent Variable: **Inflation measured by the GDP deflator**

Method: Least Squares

Sample(adjusted): 1995:4 2003:4

White Heteroskedasticity-Consistent Standard Errors &amp; Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.022816	0.006053	3.769371	0.0009
<b>Growth in real gov't consumption</b>	<b>0.503510</b>	<b>0.229339</b>	<b>2.195488</b>	<b>0.0376</b>
Changes in oil prices	0.066831	0.019319	3.459414	0.0020
Changes in exchange rates	0.233859	0.056896	4.110266	0.0004
Lagged inflation (-1)	0.134541	0.105314	1.277522	0.2132
Lagged inflation (-2)	0.207690	0.075591	2.747549	0.0110
DUMMY98Q3	-0.054988	0.009563	-5.749825	0.0000
Changes in unit labor costs	-0.047170	0.059946	-0.786876	0.4388
R-squared	0.880253	Mean dependent var		0.058833
Adjusted R-squared	0.846724	S.D. dependent var		0.045470
S.E. of regression	0.017802	Akaike info criterion		-5.011806
Sum squared residual	0.007923	Schwarz criterion		-4.649016
Log likelihood	90.69479	F-statistic		26.25332
Durbin-Watson stat	2.299017	Prob(F-statistic)		0.000000

Dependent Variable: **Inflation differentials between services and food**

White Heteroskedasticity-Consistent Standard Errors &amp; Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.012531	0.005489	2.283094	0.0316
<b>Growth in real gov't consumption</b>	<b>0.452865</b>	<b>0.137799</b>	<b>3.286427</b>	<b>0.0031</b>
Changes in oil prices	0.064568	0.018859	3.423793	0.0022
Changes in exchange rates	-0.191214	0.046911	-4.076083	0.0004
Lagged inflation differential (-1)	0.373333	0.073363	5.088860	0.0000
Lagged inflation differential (-2)	-0.099071	0.054750	-1.809508	0.0829
Lagged inflation differential (-3)	0.101030	0.035045	2.882819	0.0082
Changes in unit labor costs	0.264280	0.059935	4.409450	0.0002
R-squared	0.957436	Mean dependent var		0.014438
Adjusted R-squared	0.945021	S.D. dependent var		0.077739
S.E. of regression	0.018228	Akaike info criterion		-4.959398
Sum squared residual	0.007974	Schwarz criterion		-4.592964
Log likelihood	87.35038	F-statistic		77.12178
Durbin-Watson stat	1.498685	Prob(F-statistic)		0.000000

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## V. RUSSIA'S REGIONS: INCOME VOLATILITY, LABOR MOBILITY AND FISCAL POLICY<sup>52</sup>

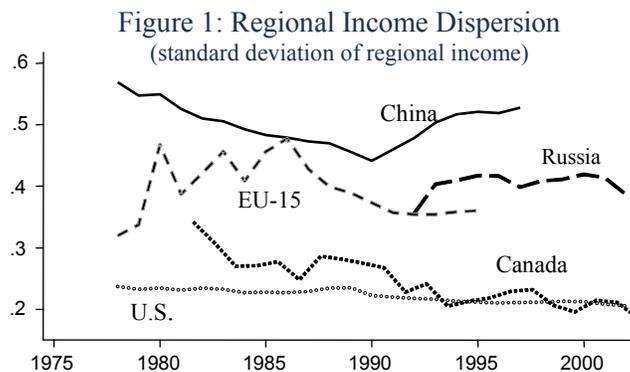
*Russia's regions are heavily exposed to regional income shocks because of an uneven distribution of natural resources and a Soviet legacy of distorted regional specialization. Also, Russia has a limited mobility of labor and lacks fiscal instruments in regions. We assess how these features influence the magnitude and persistence of regional income shocks, through a panel vector auto-regression, drawing on extensive regional data of the last decade. We find that labor mobility associated with regional shocks is far lower than in the U.S. yet higher than in the EU-15, and that regional expenditures tend to expand in booms and contract in recessions. We discuss institutional factors behind these outcomes and conclude with policy implications.*

### A. Introduction

#### 1. **Russia's regions differ very much from each other in their economic environment.**

The sheer size of the Russian territory, the largest in the world, spanning 11 time zones, provides a unique and crucial backdrop for regional diversity. Natural resources are distributed highly unevenly across the territory. Moreover, the industrial structures of the regions still carry the Soviet legacy—political and military considerations often overrode economic rationales in building factories, towns and infrastructure across the vast territory (Hill and Gaddy, 2003).

2. **This diversity in geography, natural resource endowment, and pattern of industrialization has led to huge income disparities across regions.** Figure 1 illustrates the income disparity across regions in Canada, China, the EU-15, Russia, and the U.S., defined as the standard deviation of regional income per capita.<sup>53</sup> This figure



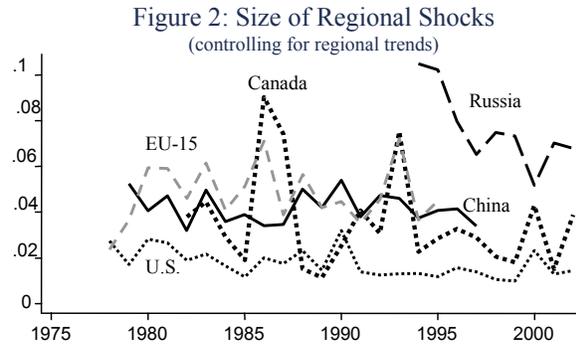
<sup>52</sup> Prepared by Goohoon Kwon and Antonio Spilimbergo.

<sup>53</sup> Regions within each country or economic area are defined as the largest sub-national administrative unit. They correspond to 89 regions for Russia, 51 States and the District of Columbia in the US, 11 provinces for Canada, 30 provinces for China, and 178 regions for the 15 countries of the European Union (EU-15). Data for Russia, the U.S., Canada, and China comes from the respective domestic statistical agencies; data for the European Union comes from Eurostat. Economic and social indicators for Russia's regions are mostly from the State Statistical Services. Regional real output data for the early 1990s are staff's estimates based on sectoral data of the State Statistical Services and the ministry of economy and trade. The primary source of regional fiscal data is the

(continued...)

shows that Russia has one of the largest regional disparities, second only to China. Moreover, Russia and China, unlike advanced economies, show no convergence in regional incomes over time.

3. **More importantly, the heterogeneity across regions has also increased the volatility of regional incomes, exposing regions to very large idiosyncratic economic shocks.** Figure 2 shows that regional income shocks in Russia, measured by the standard deviation of detrended regional growth, are about three times bigger than in the U.S., Canada, China and the EU-15. The size of the shocks has declined sharply from the early period of market economy reform but is still persistently high.<sup>54</sup>



4. The large magnitude of regional shocks in Russia highlights the importance of shock-absorption mechanisms in Russia's regions, including labor mobility and fiscal policy. In this chapter, we assess how labor forces react to regional income shocks, we analyze how fiscal policy affects the level and volatility of regional incomes, and we discuss their policy implications. We start by analyzing regional income shocks in Russia and their consequences for labor markets in comparison with those in the U.S. and the EU-15, and discuss their economic implications. We proceed with investigating whether regional fiscal policies and federal transfers to regions have helped mitigate regional shocks, and discuss the institutional factors behind the results. In the concluding section, we discuss the policy implications of these findings.

## B. Tale of Three Adjustment Mechanisms

5. **An economy can deal with regional shocks in a variety of ways.** First, the government can help to absorb the income effects of negative regional shocks on households through budgetary transfers and expenditure programs. Second, depending on the mobility of labor, people can move away from stagnating regions and into booming regions. The mobility

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ministry of finance. We use the NUTS2 classification of Eurostat to define European regions; note that using the NUTS1 classification we would have much less regions and less regional disparity. While some of these regions have a very limited number of inhabitants, the findings on disparity and shocks are confirmed if regions with less of a million inhabitants are excluded from the sample.

<sup>54</sup> Russian regional shocks remain large even using alternative definitions of shocks, such as the coefficient of variation or regional income growth in excess of region-specific income growth trends. The terms "regional shocks" and "local shocks" are used interchangeably in this chapter, unless noted otherwise.

of labor depends on many institutional and economic factors, including moving costs, housing markets, and regulations, which are in part determined by historical and geographic factors.

6. **In this section, we examine the extent to which labor reacts to regional income shocks.** For that purpose, we perform panel vector auto-regressions (VAR) for Russia, the U.S. and the EU-15. The panel VAR comprises an equation for income per capita at the regional level and an equation for regional population.<sup>55</sup> Each variable contains three lags. In addition, we add a dummy for each region  $i$  and a dummy for each year  $t$  in order to control for fixed effects and national business cycles. The specification is as follows:

$$\ln(\text{income})_{it} = \sum_{j=1}^3 \alpha_{1j} \ln(\text{income})_{it-j} + \sum_{j=1}^3 \beta_{1j} \ln(\text{population})_{it-j} + \text{year dummies} + \text{regional dummies} + \varepsilon_{1it}$$
$$\ln(\text{population})_{it} = \sum_{j=1}^3 \alpha_{2j} \ln(\text{income})_{it-j} + \sum_{j=1}^3 \beta_{2j} \ln(\text{population})_{it-j} + \text{year dummies} + \text{regional dummies} + \varepsilon_{2it}$$

7. **Figures 3 and 4 show how regional incomes and regional populations interact with each other when there is a positive regional income shock.**<sup>56</sup> Figure 3 shows the annual evolution of regional incomes in the EU-15, Russia and the U.S. after a positive shock to regional incomes in year zero. The size of the shock is equivalent to one standard deviation of regional income growth. Similarly, Figure 4 shows the reactions of regional population to a positive income shock, as characterized by the panel VAR.

8. **Figures 3 and 4 reveal several interesting facts:**

- The size of the standard income shock is much larger in Russia than in Europe and the U.S.;
- The shocks in Russia are far less persistent than in regions of other countries, in the sense that they essentially disappear after four years; and
- Regional populations react to a regional economic shock more mildly in Russia and Europe than in the U.S. In the U.S., the number of regional residents increases by 0.4 percent in about five years in response to a surprise income increase of about 2 percent. In Russia, regional populations do not grow at all, even with a surge in

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<sup>55</sup> In this chapter, variables for income and population are expressed in logarithms, unless otherwise noted.

<sup>56</sup> The identification is based on a Cholesky decomposition in which the order is income followed by population. The 90 percent confidence intervals are shown.

Figure 3. Annual Evolution of Regional Incomes  
(orthogonalized impulse response functions to a positive income shock;  
grey area represents 90-percent confidence interval)

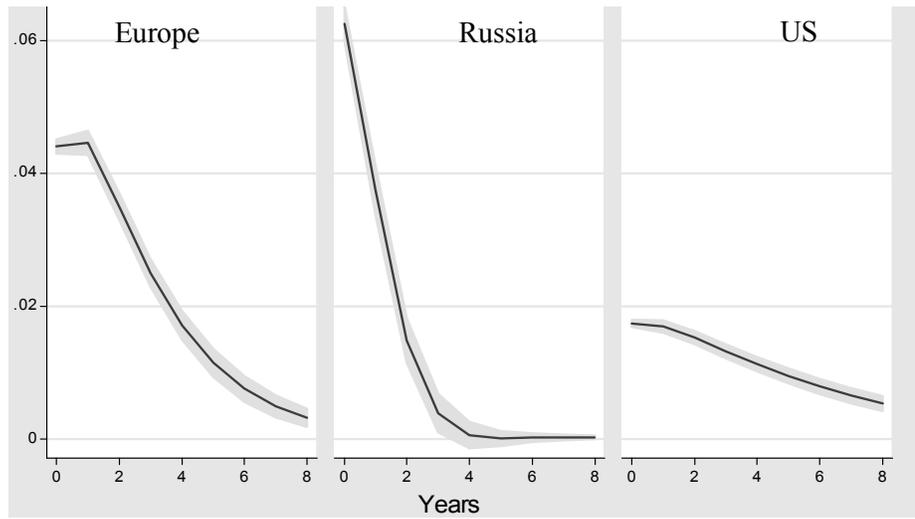
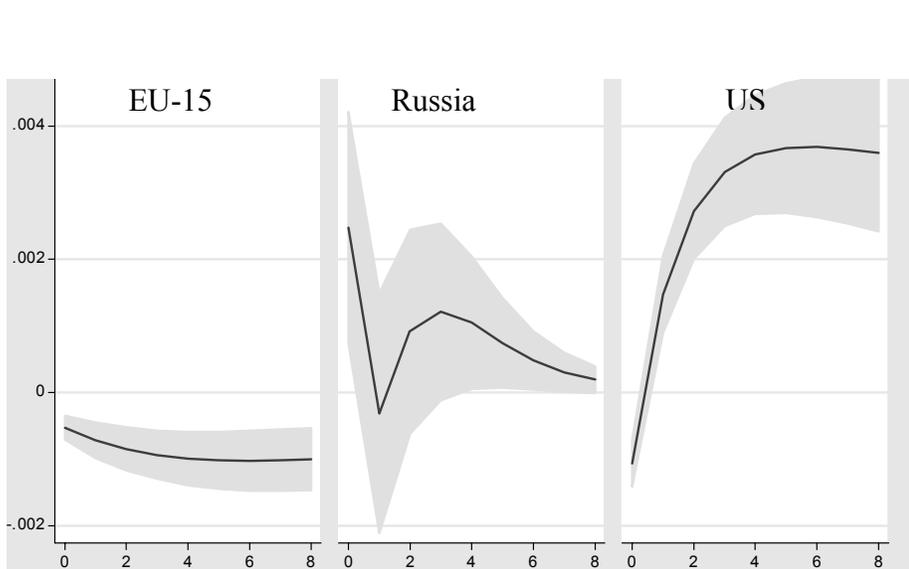


Figure 4. Annual Evolution of Regional Populations  
(orthogonalized impulse response functions to a positive income shock;  
grey area represents 90-percent confidence interval)



regional income of 8 percent. In Europe, the response is even slightly negative, but this is not economically meaningful.

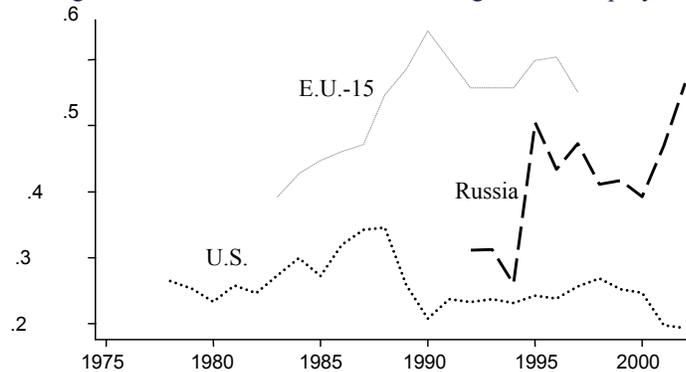
9. **This analysis illustrates three different types of adjustment to shocks:**

- (i) **The U.S. type.** Labor is highly mobile. Even with relatively modest regional income shocks, the population moves rapidly to other regions;<sup>57</sup>
- (ii) **The European type.** Labor mobility is sluggish. Even in the presence of large and persistent shocks, people hardly move. This is explained partly by rigid labor markets and partly by fiscal policy (Mauro, Prasad, and Spilimbergo, 1999). As a primary remedy to regional shocks, several European countries have fiscal transfer programs to poor regions. In addition, the European Union provides structural funds to relatively poor regions within the Union; and
- (iii) **The Russian type.** Russian regions face very large, but relatively short-lived, shocks. The population responds in the first year, but there is no lasting movement.

10. **The consequences of the different adjustment mechanisms are evident in the labor markets.**

If labor does not move despite negative local shocks, local unemployment increases above the national average. The coefficients of variation of regional unemployment rates would thus likely be higher in countries with lower labor mobility than in those with

Figure 5: Coefficient of Variation of Regional Unemployment Rates



higher labor mobility. Indeed, Figure 5 shows that Russia's and Europe's variations in regional unemployment rates are significantly higher than in the U.S. Moreover, recent economic growth in Russia seems to have increased regional income disparities, reducing unemployment more in booming regions than in stagnating regions. This finding is consistent with Andrienko and Guriev (2003), who argue that labor mobility in Russia is severely constrained because of underdeveloped housing markets, a host of regional regulations inhibiting movements of labor, and high search and moving costs. They report that, as a result, internal migration in Russia is

<sup>57</sup> The U.S. type of adjustment has been documented by Blanchard and Katz (1992), while Decressin and Fatás (1995) have documented the European type of adjustment.

merely 2 percent of the total population, which is significantly lower than in most OECD countries.

### C. Fiscal Impact of Regional Income Shocks

11. **Given the size of regional shocks and the lack of labor mobility, an examination of whether regions have used fiscal policy to cushion the blow of income shocks is of interest.** In this section, we analyze the impact of regional income shocks on regional expenditures by using an extensive regional fiscal database covering the period 1992 to 2002. In particular, we are interested in whether regional expenditures tend to expand in booms and contract in recessions (i.e., whether regional fiscal policy is procyclical).

12. **The analysis of the effect of income shocks on fiscal variables is complicated by two econometric problems: simultaneity bias and the possibility of frequent structural breaks.** The first problem occurs because fiscal policy is not only affected by income but also affects income. This simultaneity bias makes the interpretation of any regression of fiscal variables on income difficult and problematic. The second problem of frequent structural breaks is potentially serious in Russia, which went through sweeping structural changes during the past decade of economic reforms. Such changes would make it problematic to explain the regional dynamics with a single panel regression that constrains the parameters to be constant over time.

13. **As regards the first problem of simultaneity bias, various authors have adopted different identification strategies to deal with it.** For instance, Blanchard and Perotti (2002) relied on high frequency data to identify the effects of fiscal spending on income. Poterba (1994) constructed an ad-hoc measure of fiscal shocks based on the state forecast of fiscal revenues. Another possible solution is the use of instrumental variables.

14. **Using all the available information on the industrial structure of Russia's regions and the panel structure of our data, we utilize an alternative strategy to deal with simultaneity bias, by identifying an explicit source of the shocks to the regions.** We construct two shock variables, an oil shock and an industrial shock, which are meant to reflect the peculiarities of Russia's regions as discussed in the introduction. The oil shock variable is defined as:

$$(\text{oil shock})_{it} = (\text{oil share in regional income})_{it-1} * (\text{oil price})_t,$$

where the oil share variable refers to the share of regional income coming from the hydrocarbon sector in year t-1.<sup>58</sup> In this construction, regions specializing in the energy sector will have a positive shock when oil prices are high. Similarly, the industrial shock variable is

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<sup>58</sup> We use the lagged value of the income composition to avoid the problem that nominal income could grow mechanically when the oil sector expands.

defined as the share of regional income originating from the manufacturing sector in year  $t-1$  multiplied by the real exchange rate. The real exchange rate is meant to capture competition from foreign companies—a rise in the real exchange rate creates a negative shock to regions, engaged in the production of tradable goods. Both shock variables are exogenous to the fiscal policy of any region, given that they depend on the industrial structure of the previous year, the real exchange rate, and the price of oil.

15. **We run two types of panel regressions to test whether these shock variables have any significant effects on regional growth.** The results are reported in Table 1. A regression allowing for fixed effects, which capture unobserved region-specific factors, confirms that they are significantly correlated with local shocks with the expected signs. We get the same results when we introduce dynamic effects by including lagged dependent variables.<sup>59</sup>

Table 1. Regional Growth and Regional Shocks

	Fixed effects	Arellano-Bond
Oil Shock $t$	1.64 ***	
Industrial shock $t$	-0.11 **	
Difference in gdp growth $t,1$		-0.04
Difference in oil shock $t$		2.28 ***
Difference in industrial shock $t$		0.23 ***
Constant	2.85	1.98 ***
Number of observations	760	608
Number of regions	76	76

\*\*  $p < .05$ ; \*\*\*  $p < .01$

16. **As regards the second problem of structural breaks, the economic literature on Russian reforms indicates that the issue warrants special attention.** The sources of regional revenues and the patterns of expenditures have varied greatly over time because of frequent changes in the de jure and de facto institutional arrangements over the past decade (Lavrov and others, 2000, Martinez-Vazquez and Boex, 2000). In particular, the fiscal effects of oil and industrial shocks are likely to have changed. For this reason, it is problematic to proceed with a panel regression that constrains the parameters to be constant over time. In addition, the span of time under analysis is too short for standard time series techniques.

17. **We address this problem by running several cross-section regressions for every year under analysis.** Having identified two exogenous shock variables, we proceed with a reduced form regression as follows:

$$\left( \frac{\text{fiscal surplus}}{\text{income}} \right)_i = \text{constant} + \alpha (\text{oil shock})_i + \beta (\text{industrial shock})_i$$

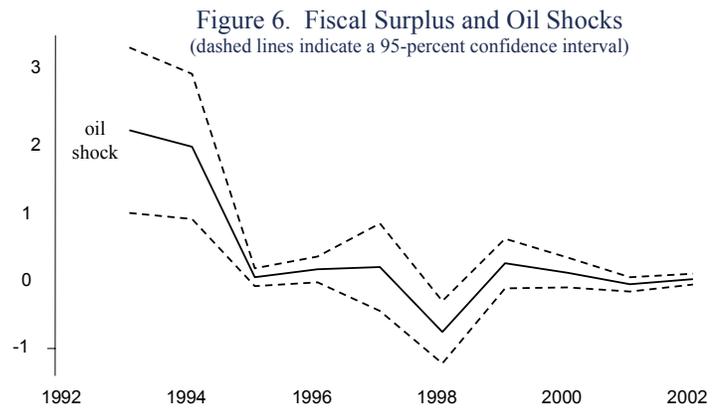
where  $i$  refers to region  $i$ . The construction of the shock variables is explained above. This specification is used in ten cross-section regressions—one for each year.

<sup>59</sup> In the second panel regression, we use the Arellano-Bond methodology, which avoids problem of inconsistency in dynamic panels with fixed effects (Arellano and Bond, 1991).

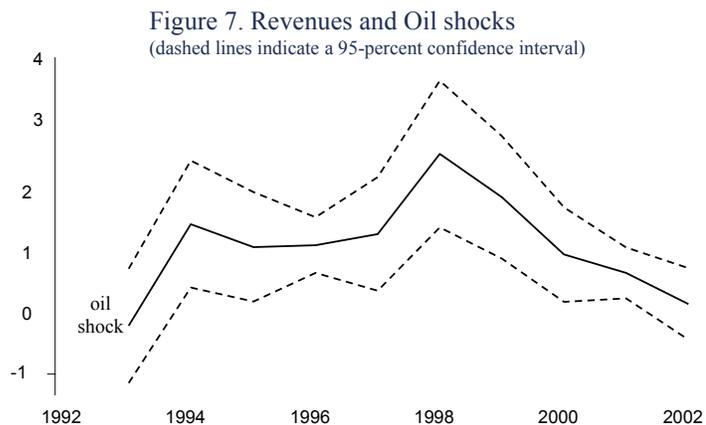
18. **We test the cyclical behavior of regional fiscal surpluses as follows.** Suppose that regional governments run a countercyclical fiscal policy. Then, the coefficient  $\alpha$  should be positive because the fiscal surplus of oil-rich regions should increase at higher oil prices as the extra revenues are saved, while the surplus of non-oil regions should be largely unchanged or could even modestly increase because of spillover effects. Similarly, the coefficient  $\beta$  should be negative under a countercyclical policy, because this implies that the fiscal surplus of a highly industrialized region should decline when the ruble strengthens in real terms.

19. **The regression outcomes strongly suggest that regions have not been pursuing a countercyclical fiscal policy.**

Figure 6 reports the coefficients  $\alpha$  for the years 1993 to 2002; in the same graph we report the two standard deviation band. Except for the first two years, and for the crisis year of 1998, the coefficient  $\alpha$  is never significantly different from zero, indicating that regions have not conducted a countercyclical fiscal policy with respect to oil shocks. A similar pattern is observed in the fiscal reaction to the industrial shocks.



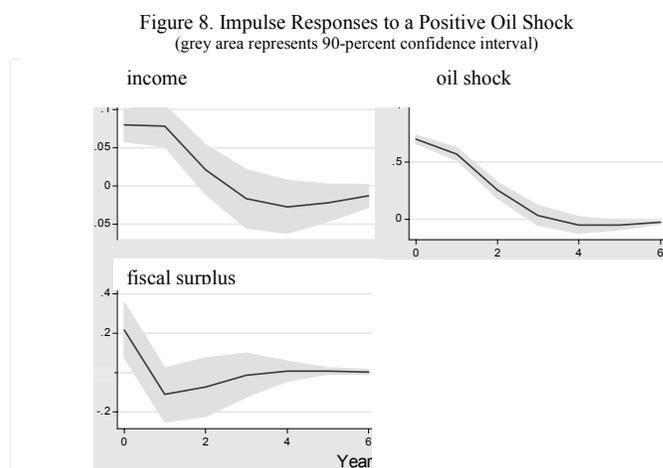
20. **The primary impact of oil prices on regional expenditures comes from the revenue side.** We ran the same regression as above, this time using regions' own revenues as a dependent variable. The results show that regions' own revenues are highly sensitive to oil prices (Figure 7).<sup>60</sup> The value 1 in the regression coefficient indicates that additional revenues from a one-dollar rise in oil prices in a region where the oil sector



<sup>60</sup> Region's own revenues are defined as total revenues minus federal cash transfers. Non-cash settlements between the federal government and regional governments, which were often substantial in the pre-crisis period, have not been deducted in the calculation of regions' own revenues since they are in essence an accounting reflection of earmarked federal expenditures of highly uncertain value.

accounts for a quarter of total regional income, was more than half of a percentage point of regional income in 1998 and more than  $\frac{1}{4}$  of a percentage point in 2000. Regional governments were able to capture a relatively large share of oil revenues up to 1998. Consistent with other studies, however, we find that the federal government has progressively taken away oil revenues since 1998. This effect measures both the direct and indirect effect of an oil boom and so it is not directly comparable with a study at the national level focusing only on the direct effect of oil prices (Kwon, 2003).

21. **We also looked at the response of regions to an oil shock in a dynamic form.** In order to capture the dynamic adjustment to an oil shock, we estimate a structural panel VAR comprising oil shock, income, and fiscal surplus. We allow for two annual lags and for regional dummies. It is a structural VAR because we do not allow any feedback from the other variables to the oil shock.<sup>61</sup> The ordering of the variables (oil shock, income,



fiscal surplus) assumes that fiscal policy has no contemporaneous impact on income, although it could affect it with a lag. The corresponding impulse response functions are shown in Figure 8. A typical oil shock has an immediate effect on both income and fiscal surplus. However, already in the second year after the shock, the fiscal surplus disappears, while the effect on income is more persistent. These results indicate that regional governments that benefited from oil-driven booms, especially before 2000, have used fiscal revenues to finance local expenditure, with a negligible net effect of oil prices on the local surplus. This is consistent with an unreported finding that local expenditure tracks local revenues very closely.

22. **Our finding that regional governments use procyclical fiscal policy is consistent with the institutional setup.** In Russia, most regions have limited discretion in the formulation and conduct of fiscal policy (Lavrov, Litwack, and Sutherland, 2001; and OECD, 2001). Their tax autonomy is lacking and their borrowing authority is severely constrained. Mandates, mostly imposed by the federal government, exceed available resources in most regions by a wide margin, with the gap only partly covered by federal transfers.<sup>62</sup> An

<sup>61</sup> Note that our previous analysis has shown that there are important structural breaks in the sample. Moreover, the data allows only 10 years of analysis. The results of this section are subject to these caveats.

<sup>62</sup> For details, see Chapter IV, “Key Fiscal Issues for 2005: An Assessment.”

implication is that regions do not have sufficient incentives to improve their fiscal situation—they risk losing federal assistance or being burdened with extra expenditure responsibilities (Zhuravskaya 1998, Martinez-Vazquez and Boex, 2000, Litwack 2002). As a result, expenditures are driven primarily by the availability of revenues, with regions usually spending windfall revenues in booms rather than saving them. A corollary is that spending is cut in recessions.

**23. The ongoing sweeping reform of intergovernmental fiscal relations may help to make regional fiscal policy more countercyclical.** The reform aims to allow more fiscal autonomy to sub-national governments while maintaining or even strengthening accountability policy. Substantial progress has been made so far. Two main governing laws were passed into law in late 2003. Also, amendments to the tax and budget codes are expected to be enacted in 2004, in accordance with the new principles of strengthened fiscal autonomy of local self-governments (See Box 1 for details).

#### **Box 1. Reform of Intergovernmental Fiscal Relations**

One of the top priorities under the Putin presidency is reform of intergovernmental fiscal relations. The reform plan was prepared in late 2002 by the Presidential Commission headed by Mr. Kozak, then Deputy Head of Presidential Administration and currently Minister of Cabinet Administration. The blueprint became law in late 2003 when parliament passed two governing laws including the Law on General Principles in the Organization of Local Self-Government (No. 121-FZ) and the Amendment to the Law on General Principles in the Organization of Judiciary and Executive Bodies of Government Bodies of Subjects of the Russian Federation (No. 95-FZ).

In essence, the reform aims to promote the fiscal autonomy of sub-national governments while preserving policy accountability. The laws, for example, grant more autonomy to municipal governments including full discretion in setting wages of local public employees while allowing regional governments to take over local administration in the case of fiscal insolvency of local governments. The laws also create a fourth level of government within municipalities in order to streamline expenditure assignments.

The government has also prepared amendments to the Budget Code and the Tax Code in accordance with the new principles of local self-government. The bills, expected to be enacted in 2004 and implemented gradually, envisage:

- Streamlining of expenditure authority among different levels of government;
- Formulation of rules and procedures for spending assignment;
- Clarification of tax-sharing arrangements among federal, regional, municipal and sub-municipal or settlement levels;
- Clarification of rules and procedures for temporary takeover of local administration by regional governments; and
- Formulation of rules and procedures for financial transfers between lower levels of government.

#### **D. The Role of Central Governments in Absorbing Regional Shocks**

24. **One instrument available to central governments to mitigate the effect of regional shocks is social benefit entitlements.** These entitlements, such as unemployment benefits and means-tested minimum benefit programs, automatically rise in recessions and fall in booms. In the U.S., for example, unemployment-sensitive programs, such as unemployment compensation and food subsidies, represent the bulk of cyclical components of public spending. These cyclical expenditures are usually substantial in advanced economies; on labor market programs alone, OECD countries spend over 2 percent of GDP on average, although the sensitivity of such expenditures to business cycles differ by countries and the nature of programs.

25. **However, in Russia, these expenditure-based stabilizers have an insignificant impact, if any, on regional economies.** First, unemployment benefits are de facto discretionary spending rather than mandatory, largely predetermined by the availability of revenues. Second, the total benefit spending is small, less than a third of one percent of GDP, much lower than in OECD countries and even lower than in advanced transition economies (World Bank, 2002). It is thus not surprising that registered unemployment is estimated at less than 15 percent of total unemployment. Third, other social benefit programs are even less sensitive to regional business cycles since such benefits, often paid in kind, are usually based on age, occupation, and other special criteria (in particular, disability) rather than income levels.

26. **Other instruments with which central governments can smooth regional shocks include tax arrangements and federal transfers.** For instance, in the U.S., state governments have independent taxing power and do impose their own taxes and set the rates. Personal income tax, one of the most common and important state taxes, provides an automatic stabilizing force as citizens of states experiencing a downturn pay less income taxes. In the European Union, explicit transfers from Brussels provide some stabilizing effects in the long run.

27. **However, not much stabilizing power is provided by the tax system in Russia.** The corporate income tax and personal income tax, major sources of regional revenues, are federal taxes, of which rates, bases, and sharing rules are governed by the federal authorities. Moreover, tax competition among regional governments, especially over corporate incomes, has constrained the potential stabilizing force of income taxes by discouraging regional governments from collecting more income taxes in booms. Capital gains and property income taxes, which are highly cyclical in nature, are negligible, given underdeveloped real estate markets and inadequate tax administration. Oil taxes, the most cyclical ones, are assigned mainly to the federal budget.

28. **These institutional arrangements leave federal transfers as potentially the most effective instrument for absorbing regional shocks.** In fact, the federal government has provided a substantial amount of financial assistance to regions since 1994, based on a formula, although other channels of assistance were often used as well, exceeding the formula-

based channel in some years (Trounin, 2001). However, it is doubtful that federal transfers, in their current form, could play an important role in reducing the volatility of regional economies. The formula, despite the merits of transparency and fiscal discipline, is based on notional tax capacity and expenditure needs, which in turn reflect historical data with considerable lags and unrealistic statutory norms. A more fundamental challenge is posed by the gap-filling nature of federal transfers and the annual adjustment process, both of which discourage regions from intensifying tax effort.

**29. There are three main economic reasons why a central government may wish to provide transfers to sub-national authorities:**

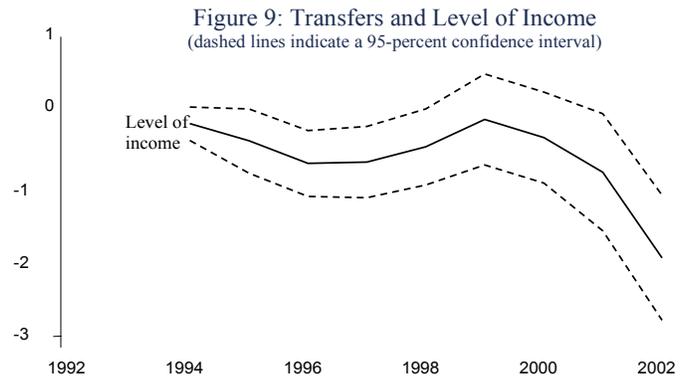
- **Equalization transfers.** If there is a substantial gap in per capita incomes between regions, the central authority may consider financing structural funds to help the development of the less-rich regions. An example of these equalization transfers are the Structural Funds in the European Union;
- **Insurance transfers.** If a region experiences a temporary shock, such as a natural disaster or the closure of an important industry, the central government could decide to compensate this region as a form of “insurance.” Examples of such transfers are the emergency federal funds in the U.S. These transfers are equivalent to an insurance policy for local authorities and administered by the central government; and
- **Permanent transfers.** If there is a discrepancy between local expenditure mandates and local financing, the central government could cover the gap with transfers. These transfers are present even in the absence of regional shocks or regional income disparities. An example of these transfers are the bloc grants given by the federal U.S. government to U.S. states in order to allow them to fulfill their mandated social expenditure after the welfare reform in 1996.

**30. In order to investigate the determinants of transfer policy in Russia, we estimate the following specification:**

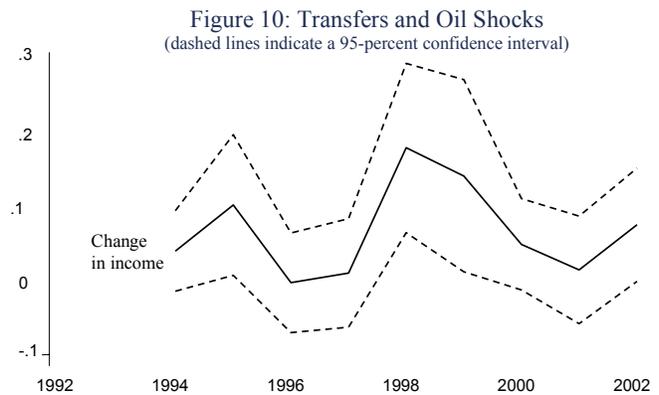
$$\left( \frac{\text{net transfers}}{\text{income}} \right)_i = \text{constant} + \alpha \ln(\text{income per capita})_i + \beta \ln(\text{oil shock})_i + \gamma (\text{net revenues per capita})_i$$

The parameter  $\alpha$  is meant to capture the extent of the equalization transfers. Poor regions should receive more transfers in order to finance local investment projects. The parameter  $\beta$  should capture the insurance transfers; a region experiencing a negative oil shock should receive more transfers. Finally, the parameter  $\gamma$  is meant to capture the third reason for transfers; regions with less revenues to cover their expenditure obligations should receive more transfers. This last coefficient is only a very rough approximation of the last reason for transfers, given that it supposes that expenditure mandates per capita are the same across regions. As before, we estimate several cross-sectional regressions.

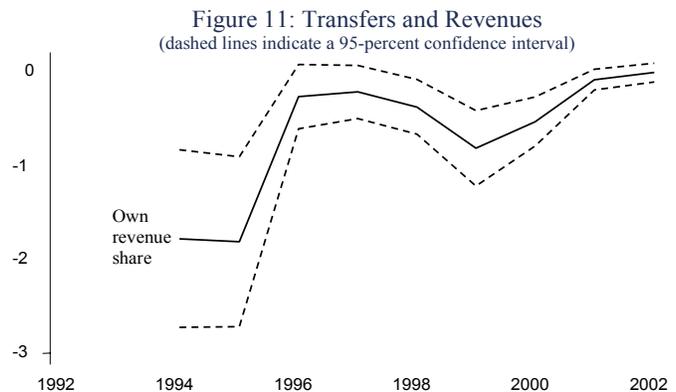
31. **Figure 9 plots the estimated parameter  $\alpha$  for each year.** It shows that the sensitivity of regional transfers to regional income per capita has increased, that is, poorer regions have been receiving proportionally more transfers over time. It is notable that the equalization effects captured in  $\alpha$  are becoming stronger in the later period. This is consistent with the improvement in the operation of the Fund for Financial Support of the Regions (FFSR) after the 1998 crisis (Martinez-Vazquez and Boex, 2000).



32. **Figure 10 shows the results for parameter  $\beta$ .** If there is an insurance motivation to transfers, this coefficient should be significantly negative. However, if, for political economy reasons, oil-rich regions with more bargaining power receive additional transfers during oil booms, then the coefficient should be positive. Figure 10 does not provide firm evidence for either explanation. If anything, transfers seem positively correlated to oil shocks in periods in which the central government was weak, such as 1998.



33. **Finally, Figure 11 illustrates the coefficient  $\gamma$  over time.** The coefficient  $\gamma$  is almost always significantly negative, indicating that regions with less revenues are receiving more transfers even controlling for the level of income and oil shocks.



## E. Conclusions

34. **This chapter has shown empirical evidence that Russia's regions are much more heavily exposed to regional income shocks than the U.S. and EU-15 countries.** This finding reflects the uneven distribution of natural resources across Russian regions, combined with a Soviet legacy of distorted regional specialization. We also find that labor mobility associated with regional shocks is much lower in Russia than in the U.S., stressing the importance of fiscal policy in Russia in dealing with recessionary or overheating pressures in regions.

35. **Despite the central importance of fiscal policy in absorbing regional shocks, our panel data study suggests that fiscal policy in Russia has been largely procyclical at the regional level.** In particular, our regression outcomes, relying on an extensive regional dataset, indicate that regional revenues and expenditures are highly correlated with oil shocks, although the relationship is unstable over time because of changes in oil taxes. Federal transfers do not seem to play much of a role in the shock absorption with the size of the transfers not being explained well by economic factors. An obvious policy implication is that a neutral fiscal stance could be attained at the general government level only if the federal government's fiscal policy is sufficiently countercyclical so as to offset the procyclical fiscal policy in regions.

36. **This evidence of regional procyclical policy reflects, in our view, an underdeveloped tax system, the lack of countercyclical welfare spending, and rigid inter-governmental fiscal arrangements** in which sub-national governments have little discretion and little incentive to react to regional shocks. In addition, a weak and fragmented banking system—a large number of small banks, underdeveloped inter-bank markets, and the virtual absence of loan syndication—intensifies rather than attenuates the vulnerability of regions, although the financial sector issue is beyond the scope of our study.

37. The strength of economic recovery since the 1998 crisis, together with evidence of low labor mobility and high volatility in regional incomes, suggests that **more attention should be given to the need of an adequate shock-absorption instrument at the regional level.** The lack of autonomy in sub-national fiscal policy was probably fully justified for earlier years, when fiscal sustainability and anti-inflation policy were top policy priorities. In those years, “soft-budget constraints” of sub-national governments were also a legitimate concern. However, given the current strong economic situation, shifting the focus from crisis management to macroeconomic stability would be a welcome change. The ongoing sweeping reform of intergovernmental fiscal relations, which intends to promote regional fiscal autonomy while preserving accountability, is a step in the right direction in this regard.

38. **Finally, our study shows the importance of removing the obstacles to labor mobility.** Presently, labor mobility is very limited due to a system of regulation and housing subsidies. While the provision of some social security net may be desirable, heavy intervention in the housing markets can delay adjustment processes. A reform of the housing subsidies not only would save some public expenditure but also would promote more efficient labor markets.

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