Russia's Transition Toward the World Economy:
Is the Market Mechanism Working?

by

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Abstract

By the end of 1993, the unified and freely convertible ruble on current account represented a major step in Russia's foreign exchange management. The monetarist model of this paper (which gives a robust estimate of the real exchange rate) suggests that the impact of the gap between available cash supply and cash demand (in the next month) on the real ruble-dollar exchange rate (for the period beginning July 1992 and ending in December 1994) was small. Perhaps this parametric value reflects the restrictions on foreign exchange transactions, and the intervention of the Central Bank of Russia (CBR) in the Moscow Interbank Currency Exchange (MICEX) which determines the exchange rate.

In contrast to the unification and current account convertibility of the ruble, progress during 1992-94 in the foreign trading arrangements was halting. Export trading was hobbled by export quotas, licensing and passport surveillance. There were no quantitative restrictions on import activity which nevertheless was subjected to steadily rising import tariffs (evidently calculated to counter the impact of the appreciating real ruble). The estimates of the trade equations suggest that the real exchange rate had no impact, ceteris paribus, on export performance but it influenced import flows. The changing pattern of Russia's trade, in terms of (export-import) commodity composition and orientation, has to be judged in the context of the asymmetrical impact of the exchange rate on that pattern.
The literature on the various aspects of Russia's transition to an open market economy is substantial. In fact, no aspect of the process has been left outside the scope of scholarly inquiries or the watchful scrutiny of governmental and multinational agencies. In particular, the impact of the uncontrolled inflation on the exchange rate, the continuously changing trade and foreign exchange arrangements, the structure and orientation of Russia's trade with the post-Soviet states and the rest of the world—and more—has been analyzed thoroughly by Easterly and da Cunha (1994), Drebentsov (1994), Illarionov (1994), Konovalov (1994), Kuznetsov (1994), Lucke (1994), Panich (1994), Rogovski (1994), Sarafanov (1994), and Sutela (1994), and in Economic Bulletin for Europe (1994, hereafter Bulletin), and Economic Survey of Europe in 1994-1995 (1995, hereafter Survey). From this perspective, there is little to add to the existing material on Russia's trade and financial interaction with the outside world as it moves toward a stable market economy.

The focus of this paper is different. It starts from the available information on and policy changes in the exchange rate, foreign trade and institutional arrangements (section I), describes Russia's foreign trade performance with regard to its pattern and orientation (in section II); and then develops a model (in section III) for estimating the ruble-dollar real exchange rate. Import demand, export supply, and net export equations in which the observed real exchange rate (with a lag) is used are also presented in section III.

The estimates (in section IV) of the monetarist model of the exchange rate adjustment indicate that the real exchange rate was not very sensitive with respect to the gap between the available real cash balances (in a given month) and the demand for real cash in the next month during 1992-94: the estimated elasticity is 0.15. The trade equations (in section IV) suggest that
during the period, the exchange rate had no role in the emerging pattern of Russia's exports to the non-FSU (former Soviet Union) countries but that imports were influenced by the exchange rate. In particular, the export control and licensing arrangements with respect to Russia's major exports seemed to have influenced its export performance. On the other hand, imports increased with a steadily appreciating real exchange rate despite rising but low average tariffs on imports.

While the results need to be improved, they represent the very first attempt to construct a (monetarist) model of exchange rate determination for Russia and to analyze the role of the exchange rate in Russia's foreign trade performance.

I. The Exchange Rate, Foreign Trade, and Institutional Arrangements

Three factors are relevant for analyzing Russia's interaction with the world economy beginning 1992.

The first relates to the policy makers' efforts to dismantle the remnants of the multiple exchange rates (which were inherited from the Soviet days) and manage an exchange rate policy that can effectively promote export competitiveness and contribute to inflation control. The second is the emerging regime of import and export policies that govern Russia's foreign trade. The institutional arrangements under which the Soviet Foreign Trade Organizations (FTOs) were increasingly replaced by private exporters and importers constitute the final feature.

The Exchange Rate Regime

A variety of exchange rates prevailed in early 1992.¹

Arrangements with Regard to Current Account Transactions

Among the major rates were those at which exporters were required to sell foreign exchange earnings and importers could acquire critical items such as food and medicines for
centralized imports of the state. From January to June 1992, exporters could legally keep half of their foreign exchange earnings and had to sell 40 percent to a Republican Hard Currency Fund of the government at the rate of 55 rubles to the dollar and the remaining 10 percent to the Central Bank of Russia (CBR) at an "official" rate that fluctuated between 120 rubles and 200 rubles to the dollar (Bulletin, p. 78). Importers, on the other hand, were reimbursed by the government at varying rates for the foreign exchange they spent for essential imports on the government account that were subsequently sold to final users at less than their import price. (Details of the scheme are given below.) Clearly, this arrangement penalized exporters and subsidized imports of critical items.

Foreign exchange auctions, which appeared in Moscow in early 1991, provided alternative dollar sources for importers and sales outlets for exporters. The Moscow Interbank Currency Exchange (MICEX) began trading the dollar once a week on January 8, 1991. Initially, a few banks participated with small offerings and the CBR operated with substantial intervention. The resulting interbank exchange rate, hardly a market rate of exchange, was influenced by enterprises' limited access to the auctions, CBR restrictions, and CBR intervention in the auctions.

Despite these limitations, the proliferating currency exchanges opened alternatives for exporters and importers. Having carried out the mandatory surrender at a less than favorable rate, exporters could sell their remaining holdings on the MICEX, or spend them on imports, or deposit them, as required by law, in their resident bank accounts. Importers could buy foreign exchange at the market rate from the MICEX, or at a subsidized rate from the government for importing essential items.
A major change in these arrangements was introduced by the government of Acting Prime Minister Yegor Gaidar when, on July 1, 1992, it enacted measures to unify the exchange rate for current account transactions. Furthermore, the exchange rate of the ruble in terms of the dollar was allowed to vary and followed the quotations, twice a week, of the MICEX.

A critical implication of a flexible exchange rate for the exchange rate adjustment model (which is specified in section III) is that the exchange rate is influenced by policy-driven decisions with regard to the level of money supply in the economy. Since the observed exchange rate is thus endogenously determined, it is used with a lag as an instrumental variable for estimating the export supply and import demand equations for Russia (see section IV).

While the new arrangements marked the first step toward a unified and market exchange rate, the 50 percent surrender of export earnings continued. Exporters were required to sell 20 percent of their foreign exchange in the market through authorized commercial banks and 30 percent to the CBR (and not to the government) at the market rate (and not at the unfavorable fixed rate of 55 rubles to a dollar). (Furthermore, the export transactions were subject to export quotas and licensing, as will be discussed below.)

Progress toward a unified exchange rate, however, was absent from importing activity. Organizations that imported critical items—including food products, medicines, industrial raw materials and machinery—at MICEX rates of exchange sold them to domestic traders or final users (of the machinery, for example) who paid these organizations in foreign exchange (or the equivalent amount in rubles)—the amounts were 20 to 80 percent less than the prices at which they were imported from abroad. The importing organizations were reimbursed in foreign exchange from the off-budget, hard currency fund of the government. The subsidization of
imported items at varying rates implied the use of multiple exchange rates.

Changes occurred on all fronts in 1993 and continued in 1994. Beginning June 1, 1993, MICEX auctioned currencies five days a week, thus providing daily quotations of the ruble-dollar exchange rate. The CBR's reference exchange rate, which is currently published twice a week, is based on the closing rates of the Tuesday and Thursday MICEX auctions and comes into effect the following day. From July 1, exporters were required to surrender half their export earnings directly to the market through their banks. Despite this compulsory surrender requirement, the repatriation of foreign exchange earnings continued to be a major concern of policy makers. With a view to closing the gap between the declared value of an export contract to the customs authorities and the export earnings deposited in commercial bank accounts, the CBR and the Customs Committee introduced a passport system requiring exporters to record details of export transactions (from January 1, 1994, for "strategically important exports" [hereafter strategic exports] and from March 1, 1994, for all exports). Finally, the exchange rate coefficients applicable to imports were abolished in December 1993.

Thus, a flexible, current account convertible, and unified exchange rate was in place in Russia at the start of 1994. The managed float and the subsequent crawling corridor regimes have operated under a limited current account convertibility of the ruble in which exporters have been required to convert foreign exchange into rubles. However, capital account transactions for residents and nonresidents, individuals and corporate entities have continued to be restricted. (These arrangements were in place until the end of 1995 but were evidently to be brought under gradual and selective relaxation in 1996.)

Arrangements with Regard to Capital Account Transactions
Let us consider residents first. Citizens were allowed to open foreign exchange accounts and deposit foreign exchange (which they could buy from authorized foreign exchange bureaus operating in large cities) in resident banks. They could also buy foreign exchange from such banks for legitimate transactions, such as repaying a foreign debt. Bona fide documents were necessary for the purpose. A person could take out any amount of foreign banknotes upon presenting a certificate from an authorized bank to the customs authorities about the origin of the funds. Residents traveling abroad could take out a maximum of half a million rubles in banknotes. (The amount was raised from time to time.) Russian citizens were allowed foreign bank accounts only during their stay abroad. Otherwise, they must get permission from the CBR for the purpose.

Resident corporate entities—enterprises, for example—needed to acquire a license and approval from the CBR in order to borrow abroad. An additional license from the Ministry of Finance was necessary if the foreign loan required a guarantee from a state agency. Enterprises were not allowed to keep accounts in foreign banks, including branches of Russian banks, without CBR authorization.

Finally, Russian commercial banks that had a general foreign exchange license did not require a license to borrow abroad, maintain a foreign account, or import and export foreign currency, banknotes, bonds, and securities. These banks also could carry out all these transactions for other authorized banks.

Detailed rules existed also for foreign exchange transactions by nonresidents. Nonresident individuals were allowed to take out rubles purchased in Russia with foreign exchange. They also could freely convert their income into foreign exchange.
Restrictions abounded with respect to corporate nonresidents. They could take out foreign exchange in their possession that they brought in. If they earned foreign exchange from service activities, such as consulting or provision of shipping and insurance, they could transfer the earnings abroad after having converted half of the hard currency into rubles (which they might keep in their "T" accounts in an authorized Russian bank. In other words, foreign exchange earnings of nonresident suppliers of invisible items on current account were subject to the surrender requirement, just as the earnings of resident exporters were.) Beginning September 1, 1994, corporate nonresidents were allowed to use their "I" accounts with Russian banks freely for buying and selling foreign exchange for investment activity. However, foreign investment itself was restricted in Russia (besides being deterred by legal uncertainties and a chaotic securities market): foreigners could not own a bank; they needed a license for owning and exploiting Russia's natural resource; they could not own land.

The limited foreign exchange activity by residents and nonresidents, individual and corporate, in a world of Hobson's choice on capital account transactions suggests that the ruble was not freely convertible beyond current account transactions. Since capital could not move freely in and out of Russia, the equilibrating impact (on the exchange rate) of real interest rate differentials, by inducing the flow of funds in desirable directions, can be assumed to be absent. In other words, the real interest rate differential does not feature in the money demand equation in our model for estimating the exchange rate. (Following the familiar Cagan formulation, however, the expected rate of inflation is introduced in the money demand equation.)

Finally, which currency was used by Russia for trade payments and for debt settlement (including rescheduling and accumulation of arrears) depended on the group of countries under
consideration. (These practices also continue to the present day.)

A useful distinction emerged in this context between Russia's dealings with the FSU and the non-FSU countries. All transactions with non-FSU countries (except those covered by special agreements with the former CMEA and with developing countries) were conducted in freely convertible currencies (such as the dollar). Trade payments and debt settlements by private traders and trading organizations among FSU countries were conducted in freely convertible currencies, or rubles, or the national currency of the state in question. The correspondent accounts of authorized banks were used for the purpose. The central banks of the FSU states, including the CBR, also maintained correspondent accounts that were used to carry out bilateral, intergovernmental transactions; these accounts were not to be used to settle balances multilaterally. Foreign trade payments were settled with members of the former CMEA on the basis of contractual agreements; the major exception was oil and energy exports by Russia on centralized government account (to be explained below), which had to be paid for by the importer in hard currency.

The Foreign Trade Regime

A major challenge facing Russia's policy makers with respect to foreign trade arrangements was to shed the restrictive features of the Soviet planned economy. Another was to narrow the gap separating the trading arrangements between non-FSU and FSU countries, which differed at the start.

**Non-FSU Export Arrangements**

The regime of Russia's main exports from early 1992 to end of 1994 was marked by quotas, licenses and export taxes that were gradually relaxed during the period. Moreover,
strategic goods could be exported only by special exporters.\textsuperscript{10}

\textit{Export quotas.} Export quotas prevailed on several commodity groups (including fuels, ferrous and nonferrous metals, basic chemicals) in 1992; the arrangements under which they operated became elaborate and bureaucratized as the year advanced. The new scheme, which came into force on January 1, 1993, laid down the methods of working out and enforcing four types of subquotas.

The Ministry of Economy predicted non-FSU exports of each strategic commodity by calculating its domestic production at the start of the year and subtracting from it domestic consumption and the claims of the FSU states, based on their needs and current agreements.

In the next step, export subquotas were allocated to four groups.

The first claimant was the Ministry of Finance, which needed adequate foreign exchange to meet its hard currency obligations and finance imports of essential items under the Centralized Import Scheme. Under the Centralized Export Scheme of subquota allocation, the ministry received the foreign exchange from licensed exporters who bought the items from the domestic market and exported them on its behalf. These special exporters received a fee of 5 to 7 percent of the export proceeds.\textsuperscript{11} The special exporter licenses were auctioned to bidders who offered to pay the amount of foreign exchange (guaranteed by an authorized commercial bank) to the ministry in advance.

The next set of subquotas was auctioned to enterprises that needed foreign exchange for importing high-tech items.

Joint ventures received automatic subquotas up to the full amount of their projected production levels.
Finally, some regions, such as Tatarstan, received export subquotas based on agreements with the federal government.

The regime of restrictive export quotas came under severe pressure in 1993 as the ruble appreciated in real terms via-a-vis the dollar. In fact, it was no longer necessary to maintain export quotas in order to protect domestic consumption because the appreciating ruble reduced the relative competitiveness of export sales (at given foreign prices) in relation to domestic sales. As a result, export quotas on a number of commodities such as timber, fertilizers, coal and meat products were removed in June and November 1993. From January 1, 1994, twelve commodity groups, including oil and oil products, gas, electric energy, some ferrous metals, and food products, were retained on the quota list. The presidential decree of May 23, 1994 announced the abolition of all export quotas and licenses, but in a later reversal, they were retained to the end of the year for crude oil and petroleum products, and for aluminum and textiles to restrict their sales in the European Common Market (Bulletin, p. 76).

In any case, centralized export subquotas continued to diminish over time: they accounted for 33 percent of total exports in 1992, 30 percent in 1993, and only 15 percent in the first half of 1994 (Bulletin, p.77). Oil export quotas, and oil export subquotas under the centralized export scheme continued to be a contentious issue between the Russian policy makers and the IMF. As argued immediately below, the centralized export subquotas provided an implicit export tax (in dollars, measured approximately as the difference between the higher foreign price and the lower domestic price) to the federal budget. By early 1996, Russia's oil prices were approximately 70 percent of world prices and oil shipments were effectively constrained by pipeline allocations rather than by quotas.
Non-FSU export taxes. These export taxes, which were introduced on January 1, 1992, changed frequently over the years in their rates and coverage of commodities. As domestic supply prices continued to move up (because of rising costs and production shortfalls), the profit margin from export sales at a given nominal exchange rate and world price declined; the real appreciation of the ruble cut further into the earnings. As a result, the export taxes were reduced steadily on all commodities except crude oil, for which it was 30 ECU per metric ton on September 1, 1994, compared with 26 ECU on January 1, 1992. For the same period, it went down (per ton) from 24 ECU to 5 ECU on natural gas, 51 ECU to 30 ECU on diesel fuel, 30 ECU to 3 ECU on nitrogenous fertilizers, 45 ECU to 8 ECU on timber, 215 ECU to 12 ECU on stainless steel, 500 ECU to 10 ECU on aluminum, and 2,000 ECU to 640 ECU on nickel (Bulletin, p. 75, Table 3.3.9).12

The centralized exports on government account were exempt from explicit export taxes. They were, however, subject to an implicit export tax because the federal budget automatically earned the difference (excluding special exporters’ commission and transport costs) between the foreign price and the domestic price of oil (which was regulated and had moved to 70 percent of the world price toward the end of 1995 from about 40 percent a year earlier). The IMF’s recommendation that the authorities remove the remaining energy export quotas and switch from an export tax to an excise tax on energy products in 1996 was calculated to stimulate exports and slash wasteful domestic consumption.

To sum up, the Russian export trade regime edged forward from early 1992 to less extensive export quotas, lower export tariffs, and fewer taxed items. Did this imply that market incentives of sorts were beginning to operate in Russia’s export performance? Not really. Export
quotas on major items comprising 70 percent of exports continued through 1993; quotas on oil and oil products, constituting about half of exports, continued until the end of the period under consideration. Their exports were determined by the residual amounts left after domestic consumption and claims of partner countries (covered by special agreements) were met. The rest of the exports, where price incentives could play a role, were constrained by market disruptions and rising domestic costs that could not be fully offset by the declining export taxes in view of the constraints of given foreign prices and an appreciating ruble. The exportable surpluses that emerged from declining outputs after (declining) domestic use was met were sold abroad. It was as though the supply-constrained Soviet regime of residually planned exports, untouched by foreign demand and the real exchange rate, was still in place. This conundrum is explored via the export supply equation with respect to non-FSU markets in Section IV.

**Non-FSU Import Trade Regime**

By contrast, the import trade regime, though marked by higher and more diversified tariffs across commodities, created incentives for domestic demand and relative prices to operate. Russia's import trade arrangements continued to be free from quotas and licenses throughout the period. Moreover, there were no import duties between January and July 1, 1992, because all import tariff levies of the former Soviet Union were abolished on January 15. Subsequently, the tariff rates were differentiated by commodity groups and by source.

For example, the basic rate of 5 percent of July 1, 1992 was raised to 15 percent on September 1, 1992. Nonessential items such as alcohol, cars, and TVs were subjected to rates varying from 15 to 25 percent. There were no duties on food and medicines.

A new tariff scheme came into force on July 1993: food, medicines, medical equipment,
children's clothes, and other "socially important" items were exempt from duties.\textsuperscript{14} "For other
goods, the basic tax rate varied from 5 per cent (intermediate goods, metals, transport equipment)
to 15 per cent (capital goods, consumer durables). The highest rate applied to strong alcoholic
drinks (100 per cent)" (Bulletin, p. 75). The simple average tariff resulting from these
arrangements was 8.1 percent.

At the same time, the tariff schedule was differentiated by import source. The basic rate
(5 percent) applied to countries (their number increased over time) with most-favored-nation
status; half the basic rate applied to imports from developing countries and twice the rate to the
remaining countries.

Increasing protectionist pressures appeared from the agricultural sector and some
industries at the start of 1994 as the ruble continued to appreciate in real terms. The new schedule
of levies with seventeen bands, which came into force on July 1, 1994, had an average duty rate
of 12.5 percent. Food products, which were previously duty free, were taxed at the rate of 15 to
20 percent. The rates were raised on a range of manufactured and investment goods.

Finally, imported consumer goods--among them hard liquors, cars, furs, leather goods--
were subjected to excise taxes and a value added tax (VAT) of 20 percent beginning February 1,
1993.

In effect, the policy makers sought to counter or weaken the impact of the appreciating
ruble on imports by successive hikes and selective differentiation of import tariffs. Protectionist
pressures continued throughout 1995 and escalated on the eve of the December 1995 elections
for the Russian Duma and later on the eve of the Russian presidential elections of June 1996. The
devaluationary shifts in the crawling corridor of the ruble were calculated to counter these
demands. The possibility of a connection, ceteris paribus, between the real exchange rate and real imports is explored in the import demand equation of section IV.

Trade Arrangements with FSU States

How did the arrangements of export quotas, licensing, and taxes, and of import tariffs that prevailed in Russia's trade with non-FSU countries differ from those which emerged in Russian-FSU trade?

By early 1993 the export regimes, marked by export quotas, licensing, and tariffs, resembled those which prevailed with non-FSU countries; imports were exempt from tariffs (but were subject to VAT and excise taxes). Russia had trade agreements with the Central Asian republics and Kazakhstan, and with Azerbaijan and Armenia, that specified these features; similar agreements were signed with Ukraine in February 1994 and with Georgia in May 1994.

Institutional Arrangements

The elaborate system of export quotas and licensing was operated by several ministries. The Ministry of Economy calculated the production and consumption (including the needs of FSU states that were covered by special agreements), and the potential exportable surpluses to non-FSU destinations of the strategic commodities that were subject to quotas and licensing. The centralized export subquotas of these items were worked out jointly by the Finance and Economy ministries. Quotas for nonenergy products were auctioned by the Ministry of Foreign Economic Relations. Export subquotas, which were auctioned to enterprises so that they could earn foreign exchange to import technologies and know-how, were issued by the Operational Issues Committee of the government.

The special exporters who implemented the quotas of strategic commodities were
registered by the Ministry of Foreign Economic Relations, which eliminated former participants on grounds of bad performance and invited fresh blood to energize the scheme. The situation was ripe for distribution of largess in return for bribes. The number of special exporters declined to 497 on August 1, 1994, from 800 at the end of 1993. As of July 1, 1994, quotas and licenses were replaced by registration of export contracts with the Ministry of Foreign Economic Relations. The special exporters were to be abolished as of January 1, 1995. As late as March 1995, that decision had not been implemented. It was difficult to get rid of the system of top-heavy and selective decision-making in which ministry bureaucrats, managerial elites, and trade groups participated to their mutual benefit. The arrangements lacked market incentives and promoted corruption.

II The Results

The regime of the unified ruble exchange rate, which was made convertible for current account transactions and was allowed to fluctuate in terms of the dollar, influenced the ruble's nominal and real value. As already noted, the policy-makers' "exogenous" decision to incur budget deficits and finance them via borrowing from the CBR and currency emission contributed to the exchange rate movements by aggravating domestic inflation. The exchange rate was thus influenced by the overpowering macroeconomic outcomes of budgetary (and monetary) policies. The purpose of the monetarist model of section III is to measure the impact of the adjustment of money demand to the exogenous money supply on the ruble-dollar exchange rate. In fact, the model is formulated with the real (rather than the nominal) exchange rate, with a view to assessing ex post the impact of the monetary imbalance on the exchange rate during 1992-94 rather than designed as a policy exercise.
At the same time, the substantial production declines in the economy (especially in the export industries, including oil) and the structural output shifts influenced the overall non-FSU and FSU trade balances and the direction and composition of Russia's foreign trade. Thus, the evolving export and import trade regimes (described earlier) contributed to the changes in the external trade balance and its structure in the midst of turmoil in the domestic economy. It is difficult to incorporate fully these disturbances in the export supply and import demand equations of Section III. For example, the declining domestic production and consumption of oil and other export commodities (among them minerals and metals) generated different amounts of exportable surpluses for the period under consideration. However, appropriate monthly measures of domestic supply constraints are hard to construct.

The ruble-dollar exchange rate, both nominal and real, took the full brunt of the policy makers' domestic macroeconomic agenda. These exchange rate movements are discussed immediately below followed by an analysis of Russia's non-FSU trade balance and its changing trade structure and orientation.

The Ruble-Dollar Exchange Rate

The connection between the monthly ruble-dollar exchange rate, the money supply, and the price level (here measured in terms of the Russian consumer price index, CPI) is explored in Easterly and da Cunha (1994). The high correlation between the nominal exchange rate and the money supply (appropriately lagged) suggests a monetary model of the ruble-dollar exchange rate determination. The data of the nominal exchange rate, the ruble money supply, and the Russian CPI are therefore used in section III to estimate a ruble-dollar exchange rate model, the first such attempt incorporating the familiar Cagan (1956) specification of money demand. The
significant feature of the monthly nominal and real exchange rates is that the nominal exchange rate, defined as rubles per dollar, depreciated throughout the period (Appendix Table 1) whereas the real exchange rate depreciated from June to November 1992 and appreciated thereafter until the end of 1994 (Appendix Table 2).

Thus, the nominal value of the ruble in MICEX depreciated rapidly from July 1992 to December 1994 (with the trend continuing in 1995), having declined to 3,402.5 rubles per dollar in December 1994 from 143.3 rubles per dollar in July 1992 (ER in Appendix Table 1). The CBR intervention in MICEX, which was calculated to balance the goal of export and import-substitute competitiveness with inflation control, nevertheless resulted in a real appreciation of the ruble because inflation differential at home and abroad ran ahead of the rate of nominal devaluation: the real exchange rate of the ruble (RER in Appendix Table 2) of 55.74 rubles per dollar in December 1994 was eight percent of its value in January 1992. The rate of real appreciation moderated somewhat in 1995 as the monthly inflation rate declined. Indeed, the CBR switched from a regime of managed float to that of crawling band and tilted the band toward a devaluationary mode from July 1, 1995. The July-December band of 4,300-4,800 rubles to the dollar was lifted to 4,800-5,100 rubles to the dollar on the eve of the elections for the Russian Duma on December 19. With inflation evidently under control (running at 2.2 percent in April 1996), the band was raised again to 5,000-5,600 rubles to the dollar on July 1 and was targeted to reach 5,500-6,100 rubles to the dollar on December 31.

We turn next to the important issues in Russia's trade performance. They are its trade balances with the non-FSU and FSU trading partners, and the changing composition and orientation of its trade.
Russia's non-FSU exports declined from $71.1 billion in 1990 to $44.3 billion in 1993, an average annual decline of 21 percent (Bulletin, p. 70). However they climbed by 16.1 percent in 1994 and an estimated 25 percent in 1995 (EBRD, 1996, p. 42). Imports also declined sharply, at an annual average rate of 11 percent from 1990 to 1993 (Bulletin, p. 70), but picked up by 12.7 percent in 1994 and an estimated 12.5 percent in 1995 (EBRD, 1996, p. 42). As a result, the net trade balance turned from a negative $10.6 billion in 1990 to positive levels thereafter.

Trade balance with the FSU states also registered a sharp positive increase, from 6.7 billion rubles in 1990 to 5.2 trillion rubles in 1993, the positive balances continuing in 1994 and 1995.

It is, however, difficult to aggregate these two balances and arrive at a definite picture of Russia's overall trade balance with the outside world. This exercise presents insurmountable conceptual problems that are discussed below.

*Conceptual Problems of Aggregating non-FSU and FSU Trade Data.*

Four conceptual issues arise in working up a consolidated account of Russia's balance of payments position with the outside world.

The first issue is whether Russia can settle its net overall debtor position with the non-FSU group by using its net creditor position with the FSU trading partners. The net non-FSU debtor situation was sustained through 1992-94 by measures undertaken by official and private creditors rather than by the flow of private investment. (Foreign direct investment from January 1991 to October 1995 was estimated at a disappointing $4.9 billion. See *Wall Street Journal*, April 30, 1996, p. A13.) In fact, this support, which was estimated at $59 billion in 1992 and
1993, consisted of $27 billion in bilateral and multilateral official loans, $15 billion in debt relief, and $17 billion in debt rescheduling. Similar measures have continued to date: the $10.2 billion, three-year IMF credit agreement approved in March 1996, was followed by a rescheduling over a period of twenty-five years of more than $40 billion official debt by the Paris Club of sovereign creditors in April 1996. At the same time, the London Club of commercial creditors rescheduled $32.5 billion of commercial credits. The restructuring of the official and commercial debt opened up opportunities for Russia to begin borrowing in international markets. By contrast, the net debtor position of the FSU states with Russia was increasingly reflected in accumulated arrears of interstate and interenterprise liabilities owed to Russia. These were settled with credits from the Russian budget (CBR credits to FSU partners were discontinued in July 1993), settlement of some debts (with the Baltic States) in hard currency, and trade agreements allowing rescheduling of debts, and future barter deals.

Russia, however, could not be regarded as borrowing from one group and lending to another because these debt instruments were not viewed as exchangeable by financial markets; even if they were, Russian financial institutions were not sufficiently developed to carry out such a swap.

A similar "nonequivalence" problem arose with respect to goods sold by Russia (with the exception of energy products) to the FSU states. They could not be sold freely at world prices in non-FSU countries because of poor quality and lack of servicing with respect to manufactured items.

Third, the conversion of ruble earnings on items sold by Russia to FSU states into dollars was problematic because of daily shifts in the nominal ruble-dollar exchange rate. The averaging
method would seriously influence the estimates.

Finally, the prices charged by Russia until the end of 1993 for energy products sold to FSU states were lower. It was not clear if Russia charged lower prices with a view to giving assistance to FSU states. In that case, Russia's trade account in oil could be valued at market prices with a capital account entry registering the aid.

In view of these problems, no attempt is made here to aggregate Russia's trade balances with the two groups of trading partners. In any case, monthly data on foreign trade with FSU states are not available.

Clearly, the aggregate non-FSU exports and imports conceal critical shifts in Russia's commodity trade: the destinations of exports and the origins of imports. This information is not available on a monthly basis and is briefly described below on the basis of annual features.

*Geographical and Commodity Structure of Russian Trade*

The most significant change in Russia's non-FSU trade took place with regard to the sources of imports and the destinations of exports. The most dramatic shift occurred in trade with the former CMEA countries: their share in Russia's total exports dropped from 43 percent in 1990 to 14 percent in January-August 1994. Their share in Russia's imports dropped from 44 percent in 1990 to 8 percent in the first half of 1994 (*Bulletin*, p. 70). The share of the OECD countries in Russia's declining exports and imports increased: they took 67 percent of Russia's total exports in the first eight months of 1994, compared with 36 percent in 1990. Similarly, their share in Russia's imports went from 40 percent in 1990 to 69 percent in January-August 1994. The developing countries' share in Russia's exports was stable at 12-14 percent, but their contribution to Russian imports rose from 10 percent in 1990 to 17 percent in 1994.
Russia thus had managed to forge new trade ties with the developed and developing market economies and loosened these with its former CMEA trade partners.

The commodity composition of Russian trade showed a high concentration of crude oil, natural gas, and petroleum products in exports (46 percent of exports in January-June 1994); in fact, ten commodities accounted for 74 percent of Russia's exports. Thus, exports failed to diversify toward manufactured goods. By contrast, the commodity composition of imports registered a shift away from machinery (which dropped from 44 percent in 1990 to 30 percent in the first eight months of 1994) and toward consumer goods and food items (Bulletin, p. 73).

Russia's trade structure with the non-FSU countries thus changed significantly in commodity composition and orientation. Moreover, this trade was carried out in hard currency under a unified, convertible, and flexible exchange rate; the export quotas and licenses were progressively relaxed, although the passport system, beginning January 1, 1994, put exporters under surveillance. At the same time, import tariff rates were progressively raised and became more diversified.

The critical question to address in the context of these developments is whether the emerging changes in Russia's trade pattern proceeded under market-type incentives. In particular, was the trade performance with the non-FSU countries a response to the real exchange rate and certain other variables, such as the growth of real GDP (which, ceteris paribus, could be expected to influence import demand) or exportable surpluses of oil (which, given the foreign demand, could spill into exports)?

These questions are rigorously examined via the models presented below, beginning with the model for estimating the real ruble-dollar exchange rate.
III The Models

The Exchange Rate Model

Following Cagan (1956), the demand for cash balances is defined as follows:

\[ L_t = kP_t y_t \eta e^{-\alpha \pi^* t} \mu_t \]

where \( L_t \) represents demand for nominal ruble cash balances in (month) \( t \), \( P_t \) is the price level (defined as the consumer price index, CPI) in \( t \), \( y_t \) is real output or GDP in \( t \), \( \pi^* t \) is the expected rate of inflation in \( t \), and \( \mu_t \) is the error term.

We emphasize several features of the equation. First, the demand for cash balances rises, ceteris paribus, in proportion to the price level suggesting the absence of money illusion. Next, the demand relates positively to \( y \) taken by itself reflecting the need to finance more transactions as \( y \) rises. Third, the demand declines, ceteris paribus, with respect to the expected rate of inflation because the opportunity cost of holding cash rises if inflation is expected to go up. This feature of \( \pi^* \) representing the opportunity cost of holding ruble cash in Russia during 1992-94 is appropriate because inflation far exceeded the nominal rate of interest due to interest rate ceilings. Finally, \( \eta \) is the income elasticity of demand for money and \( \alpha \pi^* \) is the absolute value of the elasticity with respect to the expected rate of inflation.

The demand for real money balances is derived from (1) below:

\[ \frac{L_t}{P_t} = ky_t \eta e^{-\alpha \pi^* t} \mu_t \]

The expected rate of inflation \( \pi^* t \) is estimated on the basis of a two-period, backward...
adjustment process as follows:

\[(3) \quad \pi_t^* = a + b \pi_{t-1} + c \pi_{t-2} + \text{error term}\]

Here, b and c are estimated as weights to the observed inflation rates \(\pi_{t-1}\) and \(\pi_{t-2}\) in t-1 and t-2 with a view to deriving the expected inflation rate \(\pi_t^*\) in t. The estimated, expected inflation rate series is presented in Appendix Table 1.

The long-run demand for real cash balances in the (natural) log formulation is given as

\[(4) \quad \ln \left( \frac{\text{L}_t}{\text{P}_t} \right) = \ln k + \eta \ln y_t - \alpha \pi_t^* + \mu_t\]

In the short run, however, the actual real supply of money may not correspond to the real demand because of lags in adjustment. The net excess supply of real balances can in turn influence the exchange rate because individuals, banks and enterprises can convert them into foreign exchange. (Net excess supply implies excess supply of cash if it is positive, and excess demand for cash if it is negative.)

Let us assume that any net excess supply of real balances gets reflected in the real exchange rate, i.e. the market for real balances clears through variations in the real exchange rate.

First, define the real ruble exchange rate as

\[(5) \quad \varepsilon_t = \frac{E_t P_t^*}{P_t}\]
where $E_t$ is the nominal exchange rate of the ruble per dollar in $t$, and $P_t^*$ is the U.S. consumer price index in $t$.

Next, define the net excess supply of real cash balances as

$$z_t = \ln\left(\frac{M_t}{P_t}\right) - \ln\left(\frac{L_{t+1}}{P_{t+1}}\right)$$

This definition implies that the real money supply relevant for period $t+1$ is determined at the end of period $t$.

Finally, assume that the demand for foreign exchange in $t$ depends on the traders' expectation of the net excess supply of real ruble balances in period $t+1$. With the equilibrium exchange rate defined as $e^*$, and the difference $\ln e_t - \ln e_t^*$ as $x_t$, we can write

$$x_t = \lambda z_t$$

$\lambda$ in this equation will have to be different from zero in order for the exchange rate to reflect disequilibrium in the market for real balances. Eliminating $\ln e^*$ by differencing, one gets

$$x_t - x_{t-1} = \ln e_t - \ln e_{t-1} = \lambda (z_t - z_{t-1})$$

Now assume that the monetary authorities aim at reducing the net excess supply of real balances asymptotically to zero. They adjust real balances as follows:

$$z_t - z_{t-1} = -\mu z_{t-1}$$
or

(10) \[ z_t = (1 - \mu)z_{t-1} \quad \text{where} \quad 0 \leq \mu \leq 1 \]

This adaptive adjustment process converges asymptotically to equilibrium implying zero net excess supply of real cash.

Substituting (6) and (9) in (8), and setting \( \theta = \lambda \mu \), we get:

(11) \[ \ln e_t - \ln e_{t-1} = \theta \left[ \ln \left( \frac{M_{t-1}}{P_{t-1}} \right) - \ln \left( \frac{L_t}{P_t} \right) \right] + \text{error term} \]

where \( \theta \) is the speed with which the net excess supply of real cash gets reflected into a change in the real exchange rate. The speed with which the demand for real cash adjusts to the available supply implies three possibilities with regard to the exchange rate adjustment. The exchange rate may adjust instantaneously to its equilibrium value; or it may fail to adjust from its previous level; or it may adjust with a delay. The parametric constraints and interaction between \( \lambda, \mu \) and \( \theta \) relevant for the three possibilities are specified below.

Let us consider the instantaneous adjustment of \( e_t \) to \( e^* \). The real exchange rate deviates from its equilibrium value in (7) only if there is disequilibrium in the market for real balances. Therefore, the real exchange rate is \( e^* \) if the latter is in equilibrium, i.e. if \( z_t = 0 \). Now if \( \mu = 1 \), \( z_t = 0 \) regardless of \( z_{t-1} \). This implies that any disequilibrium in the market for real balances is removed in one period (in effect instantaneously) by real money stock adjustment. Therefore, via (7), \( e_t = e^* \), so that there is instantaneous adjustment in the real exchange rate, regardless of the value of \( \lambda \) or, equivalently of \( \theta \), since \( \lambda = -\theta \mu \).

Next, we turn to the case of lack of adjustment in the real exchange rate. \( \mu = 0 \) implies that
Therefore, from (10), any disequilibrium in the market for real balances persists forever. This, in turn, means, via (7), that the real exchange rate will deviate from its equilibrium value forever. Thus, there is no adjustment in the real exchange rate.

Finally, we consider the case of delayed adjustments in the exchange rate. Let $0 < \mu < 1$; this means $z_t > 0$ asymptotically. Let us assume that a positive, net excess supply of real money, i.e. $z_t > 0$, leads to a rise in $P_t$. If the foreign price level $P_t^*$ is assumed to remain unchanged, and the rate of devaluation in the nominal exchange rate $E_t$ lags behind the domestic rate of inflation (as has been the case in Russia), equation (5) would imply a reduction in $e_t$ below its equilibrium level. Thus, $x_t < 0$, if $z_t > 0$ so that $\lambda < 0$. Therefore, $\theta > 0$, if $\mu > 0$ because $\theta = -\lambda \mu$. This means that the real exchange rate moves to its equilibrium value, not instantaneously, but asymptotically, as $z_t$ goes to zero. This is the case of delayed adjustment in the real exchange rate.

It is clear that $\mu$ rather than $\lambda$ determines the nature of adjustment. Because $\lambda \neq 0$ by assumption, $\theta = -\lambda \mu$ can be zero only if $\mu = 0$. With $\mu = 0$ and hence $\theta = 0$, there is no adjustment in the market for real balances and the real exchange rate regardless of $\lambda$. On the other hand, if $\mu = 1$, any disequilibrium in the market for real balances is instantaneously eliminated so that the real exchange rate also jumps to its equilibrium value, again regardless of $\lambda$. This is the case of instantaneous adjustment in the markets for the exchange rate and cash balances. Finally, if $0 < \mu < 1$, a disequilibrium in the market for real balances is eliminated only asymptotically, i.e. in the long run. Until it is eliminated, the real exchange rate will also deviate from its equilibrium value regardless of $\lambda$. Thus, there is delayed adjustment in both markets.

Why is the model specified in terms of the real exchange rate and cash balances? For the
period under consideration, Russia had a floating exchange rate managed by the CBR. This implied that the money supply was exogenously determined by the policies of the authorities, and the purchase (or sale) of dollars in exchange for rubles by individuals and enterprises resulted in a depreciation (or appreciation) of the ruble. These transactions influenced their real cash balances because of the policy-induced change in the price level.

Finally, (12) below for estimating the real exchange rate is derived by substituting (3) and (4) in (11) and stated as:

\[(12) \quad \ln e_t - \ln e_{t-1} = \alpha + \beta \ln (M_{t-1}/P_{t-1}) + \gamma \ln (y_t) + \delta \ln (\pi_t^v) + \text{error term}\]

where \(\alpha, \beta, \gamma, \) and \(\delta\) are the transformed parameters. \(\gamma\) is expected to be <0 and \(\delta<0\). The equation is estimated with the variables stated in Appendix Table 1. The series of \(\ln e\), predicted from equation (12) without the constant term is presented in Appendix Table 2, and graphed in Figure 1 along with the observed real exchange rate, both defined in log.

The Import Demand, Export Supply, and Net Export Trade Models

The observed real exchange rate is used for analyzing Russia's foreign trade performance via three relationships.

At the outset, a few general observations that are relevant in formulating these models, which are based on the monthly import and export data from July 1992 to December 1994, are in order. These data are presented in Appendix Table 2 and in Figure 2.

A dominant feature of Russia's trade performance on exports (valued FOB) and imports (valued CIF), both in dollars, with non-FSU countries is the systematic peaks and valleys in exports and imports in January and July. The unification of the exchange rate in July 1992, the
launching of the elaborate export quotas and licenses in January 1993, the import tariff hikes in July 1993 and July 1994, the start of the passport system for exporters in January 1994 and the abolition of the import subsidies in December 1993 -- all seem to be reflected in the sharp discontinuity in the export and import series in those months. Evidently January and July are critical months for changes in the export and import regime in Russia.

It is impossible to incorporate all these features, via appropriate dummies, in the trade equations. Also, the real exchange rate appreciated decisively beginning May 1993. There was also a sharp decline in the trade series in January 1994. Therefore, the estimates of the import demand and export supply equations are based on data from May 1993 (the earlier observations were omitted) and on the use of a dummy from January 1994, representing (the shift in the intercept caused by) the sharp decline in exports and imports in that month.

It is also assumed that Russia's exports are constrained by domestic supply rather than world demand. Monthly oil production is used as a proxy representing supply difficulties. An ideal explanatory variable representing supplies of oil and some major items (such as metals and precious stones, which contributed 20 and 23 percent of total exports in 1992 and 1993, Bulletin, p. 72) cannot be constructed. The estimated parameter with respect to oil production in the export supply equation was, however, statistically not significant and was omitted in the final round. Similarly, real GDP which remained more or less constant throughout the period (see Figure 3) was removed from the import demand equation.

Finally, the dollar exports are converted into real values through dividing them by a reconstructed monthly international commodity price index. The price indices of commodities and of fuels (Appendix Table 1) are aggregated by applying weights of 0.45 to the fuel price
index and of 0.55 to the commodity price index. (The aggregated price index is stated in Appendix Table 1). Russia's exports of fuels were, on average, 45 percent of its total exports during 1992-94. The dollar imports are converted into real magnitudes by dividing them by the CPI of industrial countries (also presented in Appendix Table 1). This choice is dictated by the increasing share, reaching 69 percent in January-August 1994, of developed market economies in Russian imports (Bulletin, p. 70). The export and import series, both in real terms, and the real net trade balance (exports minus imports) derived from them are presented in Appendix Table 2.

IV. The Equations and Interpretation of the Estimates

The import demand, export supply, and net export equations are as follows:

(13)  
\[ \ln(\text{real imp}) = \alpha_1 + \beta_1 \ln(\text{real ER}) + \gamma_1 \ln(\text{real GDP}) + \gamma_1 DV_{94} + w_t \]

(14)  
\[ \ln(\text{real exp}) = \alpha_2 + \beta_2 \ln(\text{real ER}) + \gamma_2 DV_{94} + \eta_t \]

(15)  
\[ \ln(\text{real NX}) = \alpha_3 + \beta_3 \ln(\text{real ER}) + \gamma_3 DV_{94} + u_t \]

The estimates of equations (3), and (12) to (15) are presented in Tables 1 to 5.

The estimate of \( \beta \), the adjustment parameter of equation 12, is low at 0.15, suggesting a small impact of the gap between real cash supply and real cash demand (in the next month) on the real ruble-dollar exchange rate. This result is not surprising. Foreign exchange transactions in Russia
(which are officially accounted for) continue to be confined to current account activity although by September 1994, dollars sold in the MICEX (which determines the exchange rate) had reached 81.8 percent of registered exports for that month (Bulletin, p. 79). More to the point, the CBR intervenes in the MICEX in order to regulate its movement: the real exchange rate is allowed to appreciate within limits so that the tradable sector of the economy is not hurt excessively.

The estimates of the foreign trade equations, if they are to be believed, have parametric values suggesting that the real exchange rate did not influence export performance but did have an impact on import flows. The estimated parameter in the export equation (Table 4) is statistically significant but has the wrong sign; it is statistically significant in the import demand equation (Table 3) with the correct negative sign. The parameter linking import demand to real GDP was statistically not significant. Therefore, it was dropped from the equation. (Note that the log of real GDP in Figure 3 is more or less constant for the period under consideration.)

The conclusion that the real exchange rate had no impact on export performance carries over in the estimate of the relationship between the real exchange rate and the net positive trade balance defined by real net exports (Table 5). The system of extensive quotas and licensing of exports during the period, supplemented by the passport system for exporters during 1994—rather than the appreciating real ruble—seems to have curtailed exports. As a result, it is difficult to establish a connection between the real exchange rate and the net trade balance. (The sign of the estimated parameter, which is statistically not significant, is "perverse.")

V. Conclusions

The unified and convertible ruble on current account represented a major step in Russia's foreign exchange management. The monetarist model adopted here (which gives a robust estimate
of the real exchange rate) suggests that the impact of the gap between cash supply and cash demand (in the next month) on the real ruble-dollar exchange rate (for the period beginning July 1992) was small. Perhaps this parametric value reflects the restrictions on foreign exchange transactions and the intervention of the CBR in the MICEX.

In contrast to the unification and current account convertibility of the ruble, progress during 1992-94 in the foreign trading arrangements was halting. Export trading was hobbled by export quotas, licensing, and passport surveillance. There were no quantitative restrictions on import activity, which nevertheless was subjected to steadily rising import tariffs (evidently calculated to counter the impact of the appreciating real ruble). The estimates of the trade equations suggest that the real exchange rate had no impact, ceteris paribus, on export performance, but it influenced import flows. The changing pattern of Russia's trade, in terms of both (export-import) commodity composition and orientation, has to be judged in the context of the asymmetrical impact of the exchange rate on that pattern.
Figure 1 Predicted and Actual Log of the Real Exchange Rate

Source: Appendix Table 2
Notes for Figure 2

July 1, 1992: A unified (except for imports), flexible, and convertible ruble for current account transactions was introduced.

January 1, 1993: Export quotas were made elaborate and bureaucratized.

July 1, 1993: Import tariffs with the basic rate varying from 5 to 15 percent were introduced.

December 31, 1993: Multiple exchange rates applicable to imports were abolished.

July 1, 1994: A new import tariff schedule with a higher average rate of 12.5 percent and wider range was introduced.

September 1, 1994: Export taxes were reduced on a number of commodities.

January 1, 1994: The list of commodity groups subject to export quotas was trimmed.

January 1, 1994: A passport system requiring exporters to record details of export transactions was launched.

The monthly export (f.o.b.) and import data (c.i.f.) from July 1992 to October 1994 (used in the estimates) are in billion current dollars. These are reported by Goskomstat (the State Committee on Statistics) in dollars on the basis of information supplied by trading enterprises to Goskomstat's regional offices. Goskomstat's methods conform to international standards for classifying and valuing goods.

The coverage of the reporting enterprises worsened as the trading activity became decentralized especially with regard to imports. In 1994, the collection of trade statistics was transferred to the Customs Committee which supplied the information on imports to Goskomstat. Some cross-border trading activity escaped the coverage of the Customs Committee too.

There are also problems of comparing the trade data from year to year. Exports may occasionally include gold and arms sales and some services; imports sporadically include some services and items financed with humanitarian aid.

The adjustments in the yearly data, carried out on the basis of partner country data and reports provided by representatives of the Ministry for Foreign Economic Relations, suggest underreporting in the Goskomstat export and import data although the relative underreporting is smaller for export than for import statistics. Details of the data collection problems and such adjustments are in Bulletin, p. 69.
### Appendix Table 1
Monthly Monetary and Financial Data

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Sources: CPI: Consumer price index is from Statisticheskoe obozrenie, 1994, no. 1, 2; Finansovaya
izvestiya, 6-12 August 1993, no. 40; and various issues of Kommersant. INF: Inflation rate is calculated as
100x(CPI-CPI[-1])/CPI[-1]; ESTINF: Estimated inflation rate is calculated using the regression results in Table 7.2; RM2: Ruble money supply (M2) is from Goskomstat; ER: The nominal exchange rate is from Goskomstat;
USCPI: U.S. consumer price index is from the International Financial Statistics of the IMF (July 1992=100);
WOILP: World oil price index is from the International Financial Statistics of the IMF (July 1992=100);
WCOMP: World commodity price index (excl. petroleum) is from International Financial Statistics of the IMF
(July 1992=100); WOILP: World oil price index is from the International Financial Statistics of the IMF (July
1992=100); EXPRICE: Export price index is computed as .45xWOILP+.55xWCOMP (July 1992=100); WCPI:
World consumer price index is from International Financial Statistics of the IMF (July 1992=100).
### Appendix Table 2
Monthly Export, Import and Exchange Rate Data

<table>
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<tr>
<th>Date</th>
<th>EXP (million dollars)</th>
<th>IMP (million dollars)</th>
<th>REAL EXP (in July-1992)</th>
<th>REAL IMP (in July-1992)</th>
<th>RER (rubles/$)</th>
<th>ln (RER)</th>
<th>eln (RER)</th>
<th>REAL NX (REAL EXP-REAL IMP) (in July-1992)</th>
<th>(million dollars)</th>
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Sources: Trade data are from Statisticheskoe obozrenie, 1994, no. 1; Sotsial'no-ekonomicheskoe polozhenie Rossii, yanvar'-oktyabr' 1994 (Moscow: Goskomstat, 1994), p. 55; REALEXP: Real exports are computed as X/EXPRICE; REALIMP: Real imports are computed as IMP/WCPI; RER: Real ruble/U.S. dollar exchange rate is computed as ERxUSCPI/CPI; In(RER): Log of the real exchange rate is computed as log of RER; eln(RER): Predicted log of real exchange rate is computed from equation 12.
Table 3
The Log-Linear Real Exchange Rate Equation

\[ \ln e_t - \ln e_{t-1} = \alpha + \beta \ln(M_{t-1}/P_{t-1}) + \gamma \ln(y_t) + \delta \ln(\pi_t') + \text{error term} \]

<table>
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<th>Parameter</th>
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<th>t-Ratio</th>
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<td>(\beta)</td>
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<td>(\gamma)</td>
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<td>(\delta)</td>
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<td></td>
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<td>Durbin-Watson statistic</td>
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<td></td>
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Notes: The data underlying the equation are stated in Table 7.1. The equation was estimated with positive signs of parameters on the right hand side. Estimates of the equation without the constant term \(\alpha\) are stated in parentheses. The constant term \(\alpha\), and the parameter \(\gamma\) with respect to \(\ln\text{GDP}\) are poorly estimated. \(\ln e_t\), in Figure 7.1 and Table 7.2, is predicted by using the bracketed estimates without the constant term.
Table 4
Estimate of the Relationship Between Inflation, Lagged Inflation, and Double-Lagged Inflation

\[ \pi_t^* = a + b\pi_{t-1} + c\pi_{t-2} + \text{error term} \]

<table>
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<th>Parameter</th>
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<td>c</td>
<td>-0.0105</td>
<td>-0.4278</td>
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</tbody>
</table>

R^2                  | 0.6225
Adjusted R^2          | 0.5981
Durbin-Watson statistic | 1.9001
Number of observations | 34
**Table 5**  
Estimate of Import Demand Equation

\[
\ln(\text{real imp}) = \alpha_i + \beta_i \ln(\text{real ER}_{i,t}) + \gamma_i \text{DV}_{94,t} + \omega_t
\]

<table>
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<th>Parameter</th>
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<td>(\gamma_i)</td>
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</table>

- \(R^2 = 0.6914\)
- Adjusted \(R^2 = 0.6202\)
- Durbin-Watson statistic = 1.8445
- Number of observations = 17

**Notes:** \(\text{DV}_{94} = 1\) if year \(\geq 94\); otherwise \(\text{DV}_{94} = 0\); first-order autocorrelation was corrected using the Cochrane-Orcutt method.
Table 6
Estimate of Export Supply Equation

\[ \ln(\text{real exp}) = \alpha_2 + \beta_2 \ln(\text{real ER}_t) + \gamma_2 \text{DV}_{94} + \eta_t \]

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</table>

\[
\begin{align*}
\text{R}^2 & = 0.5759 \\
\text{Adjusted R}^2 & = 0.4781 \\
\text{Durbin-Watson statistic} & = 1.8678 \\
\text{Number of observations} & = 17
\end{align*}
\]

*Notes:* DV94=1 if year \( \geq 94 \); otherwise DV94=0; first-order autocorrelation was corrected using the Cochrane-Orcutt method.
Table 7
Estimate of the Relationship Between Net Real Exports and Lagged Real Exchange Rate

\[ \ln(\text{real NX}) = \alpha_3 + \beta_3 \ln(\text{real ER}_{t-1}) + \gamma_3 \text{DV94} + u_t \]

<table>
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</table>

| R²          | 0.4775          |
| Adjusted R² | 0.3569          |
| Durbin-Watson statistic | 2.0280 |
| Number of observations | 17               |

Notes: DV94=1 if year \( \geq 94 \); otherwise DV94=0; first-order autocorrelation was corrected using the Cochrane-Orcutt method.
Notes
Thanks are due to Eugene Beaulieu and Devashish Mitra for research assistance, to Michael Connolly for insightful suggestions, and to Vladimir Mikhalev for putting together some of the information used in the paper. An earlier version of the paper was presented in July 1995 before a Russian Finance Ministry research group organized by Jochen Wermuth.

1. These are discussed in Sutela (1994, p. 13).

2. Foreign exchange may be earned from merchandise exports or services, just as it may be spent for importing goods or services or both. Thus, current account activities such as shipping and insurance were not distinguished from merchandise trade in the arrangements.

3. MICEX, which was formed as a joint stock company by the CBR, Russian banks, and enterprises, took over the currency trading of the Soviet Vneshekonombank by April 1991 and soon expanded its activity. It traded dollars on a daily basis beginning September 20, 1993; by the end of 1993, it had 139 member banks, none of which were foreign. Over time, more currencies were included in its activity.

   MICEX was soon followed by several currency exchanges formed by banks, among them the St. Petersburg Currency Exchange, the Urals Interbank Currency Exchange in Yekaterinberg, the Siberian Interbank Currency Exchange in Novosibirsk, the Asian-Pacific Ocean Interbank Currency Exchange in Vladivostok, and the Rostov Interbank Currency Exchange in Rostov-on-Don. The frequency of auctions and the number of currencies traded increased over time. However, the regional markets remained segmented because the local credit markets were underdeveloped and domestic settlements were slow.

   The CBR intervenes in each market with dollars, with a view to keeping the regional dollar-ruble exchange rates in line with the MICEX rate.

4. The CBR administers exchange control regulations and monitors the foreign currency transactions of authorized commercial banks. The repatriation of the foreign exchange based on the surrender requirements, which continued into early 1996, is enforced by authorized commercial banks.

5. The CBR currently issues three types of licenses to Russian commercial banks. An internal license allows a bank to deal in foreign exchange transactions, such as opening a foreign exchange bureau inside Russia and opening a correspondent account abroad in banks of the former Soviet Union (such as Moscow Narodny). A limited license allows a bank to open up to six correspondent accounts and deal in up to six currencies. A general license allows a bank to carry out all foreign exchange transactions, including portfolio investments.

6. Nonresident corporate entities at present can operate accounts with authorized Russian banks for servicing their export-import activities (the "T" accounts) or for financing their investment activities including purchase of stocks of Russian privatized companies (the "I" accounts). Foreign banks also can operate correspondent accounts in Russia.

7. This is not to minimize the critical need for the emergence of a positive real interest rate in
Russia, which began in 1994.

8. Non-FSU countries include the OECD market economies, the (former) CMEA, and developing countries.

9. On July 25, 1993, the CBR, under the stewardship of Viktor Gerashchenko, demonetized all pre-January 1993 ruble notes. The substantial ruble surplus, that the CBR held with the FSU central banks, was subsequently revalued via agreements among the banks. Following the Russian currency reform, all post-Soviet states introduced their own currencies as plans by Armenia, Belarus, Kazakhstan, Tajikistan, and Uzbekistan to form a monetary union with Russia did not succeed.

10. Barring exceptions noted below, all strategic commodities were subject to quotas and licensing. The list of strategic items included all energy and petrochemical products, electric energy, nonferrous metals, alkaline metals and alkaline earths, cellulose, hard and soft wheat, soybeans and sunflower seeds, unmethylated ethyl alcohol, fish and caviar, timber, nitric and phosphoric fertilizers, and uncut diamonds. Of these, nitric and phosphoric fertilizers and diamonds were not subject to quotas and licenses.

   Strategic goods constituted up to 70 percent of Russia's exports.

11. These excluded transport costs. The special exporters were also exempted from paying export taxes on a portion of their noncentralized export subquotas.

12. Export taxes were specific rather than ad valorem because tariff revenues were difficult to calculate with constantly changing domestic prices and exchange rates (Bulletin, p. 75).

13. In fact, there were frequent complaints that Russia was dumping aluminum, nickel, and fertilizers in world markets.

14. More items were subsequently exempted from import duties, including imports of gas- and oil-extracting equipment, some imports by joint ventures, and centralized imports. Centralized imports not only were duty free but also were sold to final users at varying rates of subsidies that were finally abolished in December 1993.

15. Items, that were exported on the basis of intergovernmental agreements, were exempted from export taxes.

16. This appreciation was necessary in view of the fact that in January 1992, the nominal value of the ruble was far too low in relation to the ruble/purchasing power parity estimate, the latter based on the composition of Russian GDP. In fact, "at the exchange rate of January 1992, the entire GDP of Russia in 1992 would come to less than $20 billion, while the value of oil output alone was more than $50 billion in that year" (Bulletin, 1994, p. 80).

17. Despite formidable problems, these trade balances are aggregated at a market exchange rate in the Bulletin (p. 71) revealing exports of $264.7 billion in 1991, which declined to 57.7 billion
in 1993, and imports of $209.8 billion, which fell sharply to $17.1 billion! Estimates based on purchasing power parity are also provided there.

18. In April 1996, Russia's total liabilities of $120 billion to $130 billion in outstanding interest and principal payments consisted of $90 billion owed to governments and the rest to commercial bank creditors (Wall Street Journal, April 29, 1996, p. 118).

Debt relief (in contrast to debt rescheduling) consists of a lowering of outstanding debt via write-offs or of interest charges or both. Debt rescheduling involves stretching repayment schedules, capitalizing unpaid interest payments, and allowing a grace period that did not feature in the original contract. For example, the massive $40 billion debt restructuring agreement with the Paris Club of official creditors in April 1996 offered Russia a six-year grace period on principal payments (Wall Street Journal, April 30, 1996, p. A7).

19. The debt repayment obligations to sovereign creditors in 1996 amounted to $8 billion. Instead, Russia will pay between $2 billion and $3 billion (Financial Times, April 20, 1996, p. 2).
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