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1

The Emergence of Open Inflation and Stabilization Efforts in Postcommunist Russia

Introduction

By the beginning of the last decade of the twentieth century it had become clear that the task of mending the system of central planning was beyond even the resourceful and mighty Soviet Union. Substantial overhauls in 1957, 1965 and 1975, as well as piecemeal reforms between 1985 and 1989, failed adequately to address the chronic inefficiencies of the system. In the face of the rapid deterioration of the economy after the dissolution of the Soviet Union and the breakdown of overall authority, the newly installed Russian government embarked on a programme of radical economic reforms at the end of 1991. Russia's leap into market reforms began on 2 January 1992. The cornerstones of this endeavour resembled the Polish reforms¹ launched two years earlier and included a general decontrol of prices and trade, stabilization of the domestic currency and privatization.²

Perhaps the least successful aspect of the Russian reformers' endeavours was their failure to regain macroeconomic stability, and high and volatile inflation characterized the economy throughout the 1990s. Price rises are usually analyzed within the framework of the classic quantity equation. However in the theoretical analysis of the determinants of inflation an appealing new strand of research emphasizes the role of fiscal policy. Proponents of this approach (Cochrane, 1998; Canzoneri *et al.*, 1998; Sims, 1994; Woodford, 1994) hold the view that there can be two regimes for price determination: the so-called 'monetary dominant regime' and the 'fiscal policy regime'. In the former the price level is determined by the quantity equation. Thus monetary policy *de facto* determines the price level while fiscal policy is said to 'remain reactive' (Komulainen and Pirtilä, 2000). In the latter regime the price level is

determined by the government's intertemporal budget constraint. In other words, if future surpluses are likely to fall short of financing the debt, prices must be adjusted upwards, thereby reducing the real value of government debt. Hence in this regime fiscal policy determines the price level and monetary policy is reactive. That is, when there are changes in the price level the money supply is adjusted to bring the money demand equation into balance.

This chapter considers the emergence of inflation in postcommunist Russia from the viewpoint of these regimes and their interaction. The chapter stops short of empirically determining the dominant regime because the lack of reliable data on the budget deficit would render the results unreliable, given the short time series, and because empirical studies (for example Komulainen and Pirttilä, 2000) have already rejected fiscal dominance as an explanation of inflation in postcommunist Russia. This is not to say that fiscal deficit does not matter for inflation. On the contrary, as the traditional macroeconomics literature suggests and as Komulainen and Pirttilä (2000) have found, it is the inflationary method of financing the deficit rather than the deficit *per se* that affects the price level.

The following section discusses the monetary roots of inflation following the liberalization of prices. The third section briefly describes the new fiscal theory of price level, provides an overview of the related literature and applies the theory to postcommunist Russia. The fourth section presents a theoretical framework for analyzing the interaction between monetary and fiscal policies, and the fifth analyzes Russia's fiscal stance during transition and the repercussions of this on monetary policy. The final section summarizes the findings.

The monetary roots of inflation in postcommunist Russia

Price liberalization and the emergence of open inflation

Russia's market reforms began on 2 January 1992 with the liberalization of prices. However this measure was not only tardy but also far too timid, with serious economic, intellectual, social and political consequences (Åslund, 1995). One of most serious consequences was sustained high inflation. Although views on the causes of inflation differ there is a consensus among economists about the detrimental effects that inflation has on domestic economies.³ In transitional economies, high inflation distorts relative prices, discourages investment, inhibits growth (Fisher *et al.*, 1996), generates uncertainty about key prices,

encourages unproductive activities aimed only at hedging against inflation, fosters a general climate of uncertainty and lack of trust in government policies, and hurts the most deprived groups in society (Hernández de Catá, 1995). The failure of successive Russian governments to control inflation has been a focal point of the academic literature on systemic transformation.⁴ Hence since an analysis of macroeconomic stabilization is crucial to understanding of Russia's economic transition we pay particular attention to this topic.

The announcement of the sweeping liberalization of previously controlled prices is often regarded as the beginning of shock therapy in Russia. The chief purpose of liberalizing prices was to eliminate the excessive demand for artificially low priced goods and the consequent queues. Although a sizable monetary overhang had prevailed in the Soviet economy since the introduction of currency reform in 1961 it had become particularly acute in 1991. In that year the monetary authorities had created as much as 137.5 billion rubles, more than the total of 133.8 billion printed between 1961 and 1990 (*Ekonomika i Zhizn*, vol. 10, 1992). Another reason for price liberalization was to alter production to suit consumers' preferences rather than state prescriptions. About 80 per cent of producer prices and approximately 90 per cent of consumer prices became free in value terms (Åslund, 1995). However price controls remained on food and energy, which resulted in huge subsidies to these sectors and contributed to the continuing budget deficit.

Contrary to the prediction by various institutions including the Russian government and the International Monetary Fund, prices rose in January 1992 by as much as 245 per cent.⁵ The failure of these institution to envisage the size of the price jump upon liberalization can be explained by inappropriate use of models of the demand for financial assets and reliance on the velocity of savings rather than that of cash, because the former proved to be much more variable than the latter (Gros and Steinherr, 1995). In any event the elimination of monetary overhang should not have caused inflation *per se* since inflation is by definition a continuous increase in the price level. Thus a one-off jump in prices should not have caused inflation. As it happened price rises in Russia attained double digits each month in 1992 and 1993, except in August 1992 (Nikolić, 2001).

There is considerable evidence that the price rises after liberalization were due to increases in the money supply.⁶ More precisely the inflation rate followed variations in the growth of the broad money supply four months earlier (Figure 1.1). As the growth of M2 in 1992–94 is a reasonably good proxy for the rise in prices (Table 1.1 and Figure 1.2), inflation appeared to be a monetary phenomenon in the early years of transition.⁷

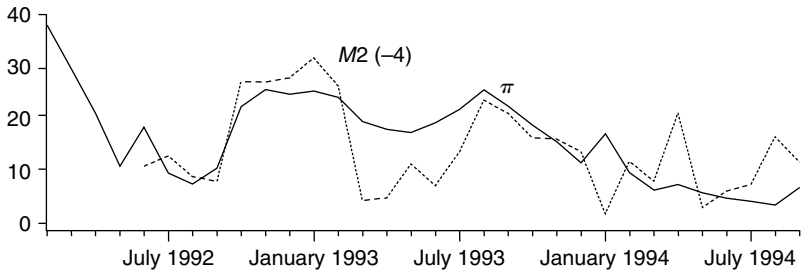


Figure 1.1 Lagged monetary growth ($M2$) and inflation (π), Russia, 1992–94 (%)
Source: Nikolić (2000a).

Table 1.1 OLS estimates of the distributed lag model of inflation, Russia, February 1992 to September 1994

Variable	Coefficient	Std error	t-statistic	Probability
$\Delta M2$	0.025028	0.099480	0.251587	0.8056
$\Delta M2_{(-1)}$	0.328145	0.094653	3.466824	0.0047
$\Delta M2_{(-2)}$	0.180520	0.117613	1.534870	0.1508
$\Delta M2_{(-3)}$	0.212921	0.117796	1.807534	0.0958
$\Delta M2_{(-4)}$	0.257276	0.084087	3.059635	0.0099
$\Delta M2_{(-5)}$	0.211170	0.100409	2.103103	0.0572
$\Delta M2_{(-6)}$	0.250186	0.090307	2.770400	0.0169
$\Delta M2_{(-7)}$	0.038532	0.083230	0.462960	0.6517
$\Delta M2_{(-8)}$	-0.018118	0.081146	-0.223274	0.8271
D_1	3.668939	2.114631	1.735026	0.1083
D_6	-0.651321	1.919754	-0.339273	0.7403
R^2	0.706866	Mean dependent variable		-0.650348
Adjusted R^2	0.462587	Standard deviation of dependent variable		3.029836
Standard error of regression	2.221126	Akaike information criterion		4.739840
Sum squared residuals	59.20080	Schwarz criterion		5.282902
Log likelihood	-43.50815	F-statistic		2.893686
Durbin-Watson statistic	1.666928	Probability (F-statistic)		0.042489

Note: D_1 and D_6 are seasonal dummies, denoting seasonal variations in January and June, respectively.

Source: Nikolić (2000a).

If inflation was indeed a consequence of the growth of the money supply, the obvious question is what drove this growth? The answer can be found in an analysis of the balance sheet of the Central Bank of Russia (CBR). The accounting identities of the CBR imply that (1) an increase in net domestic assets (ΔNDA) and net international reserves

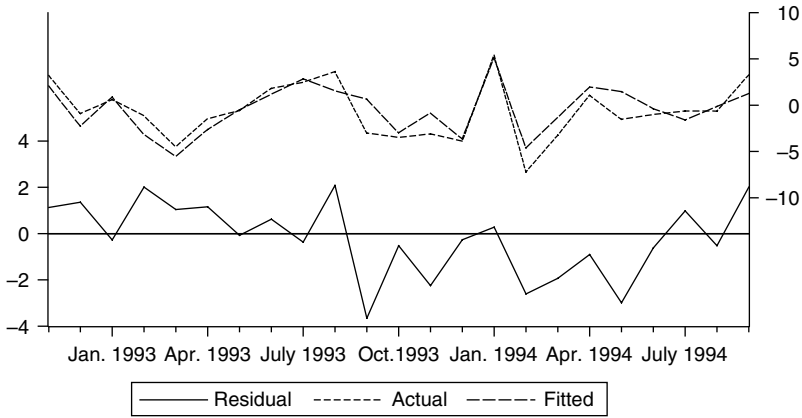


Figure 1.2 Fit of the distributed lag model of inflation, Russia, 1992–94
 Source: Nikolić (2000a).

(ΔNIR) were fundamental determinants of base monetary growth (ΔMB); and (2) base monetary growth, often referred as high-powered money, was the fundamental determinant of broad monetary growth ($\Delta M2$), which in turn was a fundamental determinant of inflation (π), as stated above and elaborated in the next chapter. CBR activities thus drive inflation. However there are two complicatory factors.

The first complication is related to a change in the monetary base. An increase in net international reserves and domestic credits does not necessarily imply a one for one increase in the monetary base. The difference lies in a non-credit component of net domestic assets: other items net (OIN). The latter includes all other unclassified assets of the CBR and its net worth. More specifically,

$$\Delta MB = \Delta NIR + \Delta NDA \tag{1.1}$$

$$\Delta NDA = \Delta NCD + \Delta OIN \tag{1.2}$$

$$\begin{aligned} \Delta NCD &= \Delta NCG + \Delta NCB + \Delta NFSR \\ &= \Delta MB - \Delta NIR - \Delta OIN \end{aligned} \tag{1.3}$$

where ΔNCG , ΔNCB and $\Delta NFSR$ are variations in the CBR's net credits to the central government, commercial banks and former Soviet republics respectively.

The second complication arises from the relationship between base money and broad money, which depends on the currency in circulation (C), deposits (D) and commercial banks' reserves (R).⁸ If there is a change

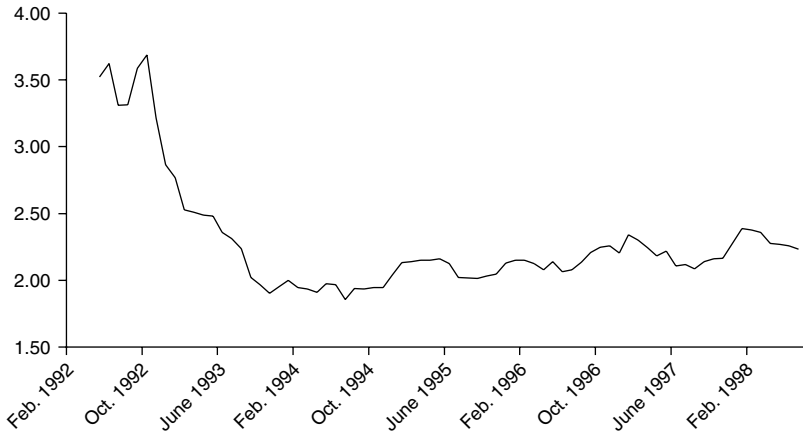


Figure 1.3 Money multiplier, Russia, 1992–94

Source: Calculations based on data in *Russian Economic Trends* (Russian European Centre for Economic Policy, 1993–99).

in the ratio of broad money to base money, referred to as the ‘money multiplier’, base monetary growth and broad monetary growth will diverge. Typically, in periods of loose monetary policy the money multiplier falls, and *vice versa*. As Figure 1.3 shows, after a brief period of volatility at the beginning of 1992 the money multiplier fell dramatically between October 1992 and October 1993. Needless to say this coincided with a period of a rapid credit expansion by the CBR. Additional reasons for the changes in the money multiplier during the first years of transition were changes in interest rates, the reserve requirement and fluctuations in the sizable excess reserves held by commercial banks, which in turn reflected, or at least in part, the inefficiency of the payment system in Russia.⁹ Following a period of relative stability, the money multiplier began to rise at the end of 1994 and in general continued its upward trend during the rest of the period under consideration. During this time monetary policy was relatively tight, prices were stable and the efficiency of the payment system improved.

CBR credits

Whatever the complications arising from changes in the money base and the money multiplier, and from the relationship between broad money and inflation, it is clear that credits issued by the CBR were the main cause of the growth of the money supply. Table 1.2 provides details of the credit issued in 1992–95.

Table 1.2 CBR credits flows, 1992–95 (percentage of GDP)

	<i>Commercial banks</i>	<i>CIS states</i>	<i>Government (Ministry of Finance)</i>	<i>Other</i> ¹	<i>Total</i>	<i>GDP</i> ²
1992	15.0	8.7	13.5	-0.5	36.6	18,063
1st quarter ³	8.3	3.1	0.0	0.8	12.2	1,832
2nd quarter	10.2	10.3	12.7	0.5	33.7	2,703
3rd quarter	14.1	16.7	15.0	0.3	46.0	5,042
4th quarter	18.5	4.6	15.7	-1.6	37.2	8,486
1993	3.6	1.6	8.7	0.7	14.6	161,700
1st quarter	7.9	6.1	9.3	4.3	27.5	13,200
2nd quarter	6.9	4.2	6.7	-1.0	16.7	22,000
3rd quarter	5.4	1.7	5.6	-0.4	12.3	48,500
4th quarter	0.9	0.0	5.3	0.5	6.8	78,000
1994	1.8	-0.7	7.7	0.1	8.9	630,000
1st quarter	2.0	0.1	6.7	1.4	10.1	85,700
2nd quarter	2.2	0.3	10.9	-1.0	12.4	116,800
3rd quarter	1.7	-2.5	9.0	2.8	11.1	183,500
4th quarter	1.6	0.0	5.5	-1.9	5.3	244,000
1995						
1st quarter	2.0	0.0	1.4	0.0	3.3	252,000
2nd quarter	-0.6	0.0	-0.1	-0.1	-7.0	354,000

Notes:

1. CBR credits to enterprises, to other (non-federal) forms of government and to extra-budgetary funds.
2. Rubles bn, current prices.
3. Average monthly increase in flow of credits relative to December 1991.

Sources: Calculations based on data in *Russian Economic Trends* (RECEP, 1995) and Granville (1995).

Net credit to the government

The first type of credit, net credit to the government, was used to finance the budget deficit. In normal circumstances there are three ways to finance a budget deficit: money creation, internal debt or bonds and external debt. The undeveloped domestic financial market and the low credibility of the ruble prevented the government from financing its deficit by bond creation in the early stages of the reform, and this, combined with the non-arrival of pledged international assistance, left the government with no option but to increase the money supply.¹⁰ Table 1.3 shows the size of the budget deficit in the period 1992–98

Monetization of the budget deficit was mainly achieved by varying the monetary base, which amounted to an implicit taxation. The two most common measures used to evaluate the real value of the revenues

Table 1.3 Russian budget deficit, 1992–98 (percentage of GDP)

1992	1993	1994	1995	1996	1997	1998
-18.9	-7.3	-10.4	-6	-8.9	-7.6	-8

Source: EBRD (2000).

that a government can obtain by money creation are seigniorage (*SE*) and inflation tax (*IT*). Seigniorage is usually defined as:

$$SE = \frac{\Delta M}{GDP} \quad (1.4)$$

where *M* is an aggregate of money supply such as currency in circulation (*C*), base money (*MB*) or broad money (*M2*), and *GDP* is gross national product.¹¹

Conversely inflation tax is imposed on holders of monetary wealth and can be defined as follows:

$$IT = \frac{M\pi}{GDP} \quad (1.5)$$

$$IT = \frac{(C\pi + D(\pi - i))}{GDP} \quad (1.6)$$

where π , *D* and *i* represent the inflation rate, ruble deposits and interest rate respectively.¹² As Table 1.4 shows, both seigniorage and inflation tax amounted to a significant proportion of GDP, particularly during the first two years after liberalization.

The trouble with monetary financing from the government's point of view was that economic agents opted to hedge against tax on their monetary wealth. They did so mainly by converting rubles into foreign currency, US dollars in particular. Hence the tax base (*MB/GDP*) as a proportion of GDP (in this case base money, *MB*) shrank, as shown in Table 1.4.¹³ If the government had continued to maintain a constant level of monetary financing inflation would have accelerated. In other words if the tax base had shrunk further, taxes would have had to be increased in order to maintain the same level of monetary financing. An additional consequence of low monetization was that it made the economy very sensitive to capital flows. An annual capital flight of several billion US dollars, or more than a third of the entire stock of ruble *M2* valued in US dollars, could have caused serious macroeconomic problems and threatened the entire financial system. Thus the government faced a stark choice: to find a non-monetary way of financing the

Table 1.4 Seigniorage and inflation tax on monetary aggregates, Russia, 1991–98

	π (end of year)	π annual average	GDP (rubles tril)	C (rubles bn)	MB (rubles bn)	M2 (rubles bn)	MB/GDP (%)	SEC (%GDP)	SEMB (%GDP)	SEM2 (%GDP)	ITMB (%GDP)	ITM2 (%GDP)
1991	161.0	97.2	1.4	191	182	958	13.00					
1992	2,506.1	1,526.0	19.0	1,678	2,235	6,400	11.76	7.83	10.81	28.64	14.2	52.8
1993	840.0	875.0	171.5	13,278	16,691	32,601	9.73	6.76	8.43	15.28	11.0	24.0
1994	204.4	311.4	610.7	35,698	48,000	97,800	7.86	3.67	5.13	10.68	6.5	12.7
1995	128.6	197.7	1,585.0	80,800	103,800	220,800	6.55	2.85	3.52	7.76	3.6	7.5
1996	21.8	47.8	2,200.0	103,800	130,900	288,300	5.95	1.05	1.23	3.07	1.0	2.3
1997	10.9	14.7	2,602.0	130,400	164,500	374,100	6.32	1.02	1.29	3.30	0.6	1.3
1998	84.5	27.8	2,685.0	187,800	210,400	448,300	7.84	2.14	1.71	2.76	4.6	9.7

Notes: π = inflation rate; GDP = gross domestic product; C = cash in circulation; MB = monetary base; M2 = ruble broad money; SE = seigniorage; IT = inflation tax; derived from the monthly figures of economic aggregates (RET, 1993–99) according to the formula $IT = (M^* \pi / GDP) \times 100$. Unlike in Layard and Richter (1994), therefore, interest receipts from deposits are not accounted for.

Sources: Calculations based on EBRD (2000); RECEP (1993–99).

budget deficit if the latter could not be slashed, or to let inflation accelerate. From May 1993 the government issued various securities to help finance the deficit. These securities covered 1.5 per cent, 10 per cent, and 40 per cent of the budget deficit in 1993, 1994 and 1995 respectively (Granville, 1995). External financing also helped to reduce the deficit, although this was considerably less than had been pledged (Nikolić, 2002). In early 1995 the CBR was prohibited from financing the budget deficit as this was essential to the stabilization of the economy in the short to medium term.

Net credit to commercial banks

Net credit to commercial banks, in addition to providing liquidity to banks through the refinance rate, were also channelled to enterprises as a non-budgetary subsidy. These credits were allocated according to political bargaining rather than market considerations (Granville, 1995). In the dispute between the government and the Duma over jurisdiction of the CBR the Duma had gained the upper hand. The Duma's reasons for increasing the issuance of credits by the CBR to enterprises via commercial banks were to maintain employment and help ailing industries and agriculture. These credits included military conversion subsidies and working capital credits (*ibid.*). Clearly macroeconomic stabilization was not high on the CBR's list of priorities during this period.

CBR credit to commercial banks amounted to 15 per cent and 3.6 per cent of GDP in 1992 and 1993 respectively (Table 1.2). Most of these credits were earmarked for ailing enterprises and agriculture. Since the credits were issued via commercial banks the responsibility for their repayment lay with the banks. However no action was taken until at least 1994 against a bank or a firm that could not reimburse its loan (*ibid.*). Moreover since the real interest rates on the credits were negative, enterprise credits amounted to grants. In November 1993 positive real interest rates were introduced and banks started to refuse to channel the credits.

As commercial banks were slow to forward the funds to enterprises they built up huge excess reserves (RECEP, 1995). For example their excess reserves were about four times more than the required reserves in 1992 and double the required reserves in 1993 (Granville, 1995). This puzzling phenomenon can be partly explained by the inefficiency of the financial system, the large credit risk and the opportunity the banks had to delay channelling the credit in order to buy foreign assets that would yield considerable gains in the short term given the high inflation rate. It is very likely that the inflation tax imposed by the government on the

non-interest bearing funds was passed on to deposit holders in the form of lower saving rates.

Net credit to former Soviet republics

Both cash and non-cash credits were provided to 'near abroad' former Soviet republics to enable them to continue trading with Russian enterprises. The cash credits were intended to minimize the severance of links between enterprises in these states, thus constraining trade shocks and falls in output. In addition to cash credits, many non-Russian enterprises were able to obtain unauthorized credits ('non-cash' rubles) from the CBR via national central banks. The dual money system, characterized on the one hand by an unlimited supply of non-cash credits and on the other by a hard constraint on the delivery of cash, was particularly costly to Russia in the first year of transition. In 1992 CBR credits to other former Soviet republics amounted to at least 8.5 per cent of Russian GDP if the delivery of cash is excluded, and 11.6 per cent otherwise (Granville, 1997). The substantial increase in the money supply inevitably resulted in higher prices and hampered the stabilization efforts. The destabilizing effects of the ruble zone prevailed until November 1993. In July that year the CBR had suddenly withdrawn pre-1993 ruble notes and this, together with the collapse of negotiations between Russia and Kazakhstan in November 1993, effectively sealed the fate of the old ruble area.

The fiscal theory of price level and its application to Russia

The prevailing view in the classic macroeconomics literature is that inflation has monetary determinants such as the money supply and the exchange rate. In contrast, at the heart of the new fiscal theory of price level is the notion that the price level must adjust to equilibrate the real value of nominal government debt with the present value of surpluses (Komulainen and Pirttilä 2000). However the quantity theory and fiscal theory of price determination are not mutually exclusive but are differing strands of the same theory (Cochrane, 2000). The origins of the new fiscal theory can be found in the work of Sargent and Wallace (1986) and their notion of interaction between monetary and fiscal policies. The theory was further developed and formalized by Woodroff (1994), Sims (1994), Burnside *et al.* (1998) and Canzoneri *et al.* (1998).

Unsurprisingly the new theory has attracted considerable criticism. The critics charge that since the theory rules out the possibility of

government default the model leads to overdetermination of the price level in the fiscal regime (Buiter, 1999). It is also argued that the model is misspecified since it assumes that the government's intertemporal budget constraint needs to be satisfied only in equilibrium (Buiter, 2002). Similarly Cochrane (1998) argues that if a government violates the present budget constraint the model cannot be empirically tested since prices will react and the off-equilibrium price sequence will remain hidden.

Despite these criticisms the new fiscal theory has found application in transition economies since most of them have experienced persistent budget deficits and high inflation. Among the theoretical papers on the subject it is worth mentioning the work of Begg and Wyplosz (1999), who have used the theory to show the necessity of prudential stabilization in efforts in Central and East European countries that wish to join the European Union. According to Fakin and de Crombrughe (1997), after their dramatic shift away from subsidies in the early years of transition the countries of Central Europe still show signs of unsuccessful fiscal adjustment, insufficient deficit reduction and loose expenditure policy.

Although fiscal issues were usually overshadowed by monetary ones in transition economies, interest in fiscal policy intensified in the wake of the Russian financial crisis in August 1998. A large number of authors have stressed the importance of controlling the fiscal deficit to achieve price stability (see for example Barbone and Marchetti, 1995; Budina and van Wijnbergen, 1997; Buiter, 1997; Fakin and de Crombrughe, 1997; Coricelli *et al.*, 1998; Cottareli and Boyle, 1999; Dabrowski, 1999). Because of its consistently high level of inflation during transition prior to the financial crisis, the perils of the unsustainable Russian budget deficit were emphasized by Cheasty and Davis (1996), Lopez-Claros and Alexashenko (1998) and Sinel'nikov-Murilev and Trofimov (1998), among others. In the wake of the crisis there was little doubt among researchers that the cause of the country's financial meltdown was its poor fiscal performance coupled with a number of internal and external factors (Nikolić, 2000a; Desai, 2000; Sutela, 2000; Kharas *et al.*, 2001).

However there is little empirical evidence that inflation in Russia was due to its fiscal deficit. Using vector-autoregressive models Komulainen and Pirtilä (2000) analyzed whether fiscal deficits had caused inflation in Romania, Bulgaria and Russia. While there was some evidence that the fiscal deficit had increased inflation in Bulgaria, they rejected the null hypothesis that fiscal deficit was significant determinant of

inflation in both Romania and Russia. According to the authors this finding did not support the presence of fiscally dominant regimes in these countries. Rather the price levels in Russia and Romania were determined in monetarily dominant regimes by the quantity theory of money. This is not to say that fiscal policy does not matter. On the contrary it does, as traditional macroeconomics would suggest. Komulainen and Pirtilä's findings simply underline the notion that the inflationary method of financing the deficit, rather than the deficit itself, affects the price level.

Frameworks for analyzing the impact of monetary and fiscal policies on macroeconomic stabilization

Predictably the expansionary monetary policy of the CBR was not conducive to macroeconomic stabilization. Unlike in other transition economies, the mainly half-hearted stabilization programmes, implemented in Russia in 1991–94 had a very little success. Indeed the mid 1995 stabilization effort culminated in the severe financial crisis of August 1998. It has become conventional wisdom that these programmes failed because they were not supported by structural and institutional reforms (Gavrilencov and Kuboniwa, 1997). In the absence of such reforms most of the macroeconomic problems arose from the fiscal side. Subsequently monetary policy was used as an adjustment tool. It follows that in order for a stabilization programme to succeed, fiscal and monetary policies should be interrelated and coordinated. The interaction between these policies can be analyzed using the Sargent and Wallace (1976, 1986) framework.

Fiscal and monetary framework

In Sargent and Wallace's (1976, 1986) framework the interaction between policy makers (the monetary and fiscal authorities) and the public (private agents) is endogenized. The fiscal authority takes decisions on public expenditure and tax rates, while the monetary authority decides about the composition of government debt. They do so by maximizing their objective function subject to the constraints imposed by the behaviour of the public. Meanwhile the public decides about consumption, investment and employment and is assumed to pay the imposed taxes.

The rational expectations hypothesis (Muth, 1961) postulates that future rates of inflation are conditioned by agents' perceptions of long-term monetary and fiscal policies. The agents are expected to change their

'strategy of rules' whenever there is a regime change in government policies (Sargent and Wallace, 1976). Private agents limit government action and determine the government's budget constraint by choosing how much and what combination of the elements of government debt to hold. Hence monetary and fiscal policies must be coordinated because the government faces a budget constraint. It follows that there is no purely monetary cure for inflation.

The budget constraint is thus becomes pivotal to the analysis of inflation stabilization in Sargent and Wallace's framework. The government's budget constraint (Sargent and Wallace, 1976, 1986) is represented by:

$$G_t - T_t = \frac{(H_t - H_{t-1})}{\pi_t} + (B_t - B_{t-1}) - r_{t-1}B_{t-1} \quad (1.7)$$

where G_t is real government expenditure at time t , T_t represents real taxes net of transfers (apart from interest payments on government debt) at time t , H_t is a stock of base money at time t , π_t is the price level at time t , B_t is the real value of a one-period government bond issued at t and paid off at $(t + 1)$ and r is the net real rate of interest.

Equation 1.7 specifies that a real primary or non-interest budget deficit ($D_t = G_t - T_t$) at time t , can be financed by increasing the monetary base and/or issuing to the public an interest-bearing debt. Following Keynesian tradition, this framework assumes that the public is willing to hold interest-bearing government debt on the same terms as private debt. The upper bound (\bar{B}) of the public's willingness to accumulate real interest-bearing government debt (B_t) is assumed to be constrained by the total wealth in the country. In practice (\bar{B}) is often far lower than the total wealth.

Similarly the public's willingness to accumulate the other government debt – the stock of base money – is determined by Cagan's (1956) function of demand for money. This describes the demand for real base money as a decreasing function of the expected rate of inflation, as follows:

$$\frac{H_t}{\pi_t} = \alpha_1 - \alpha_2 E_t \left[\frac{\pi_{t+1}}{\pi_t} \right] \quad \alpha_1 > \alpha_2 \geq 0 \quad (1.8)$$

where $E_t^{[1]}$ is the value of ^[1] expected to prevail by the public as of time t . When solving Equation 1.8, π_t can be expressed solely in terms of the expected future value of H_t :

$$\pi = \frac{1}{\alpha_1} \sum_{j=0}^{\infty} \left(\frac{\alpha_2}{\alpha_1} \right)^j E_t H_{t+j} \quad (1.9)$$

The price level at time t is determined by the interaction between the public's preference for holding high-powered money (parameters α_1 and α_2) and the expected path of high-powered money now and in the indefinite future. It follows that the government deficit can influence the price level solely through the effects on the expected path of high-powered money. As pointed out by Sargent (1993) this is the crux of the monetarist supposition that inflation is always a monetary phenomenon.

However the government deficit and the path of high-powered money are not necessarily rigidly linked because the government can cover its deficit by interest-bearing government debt, or at least temporarily and to a point, as shown in Equation 1.7. Hence under the Sargent's system (Equations 1.7 and 1.9) the inflationary consequences of the government deficit depend on the government's strategy for servicing its debt (*ibid.*).

There are two alternative debt-servicing strategies: a strict Ricardian regime, and the Friedman (1989) rule. The former regime is not inflationary, or at least not initially, but the latter is. In the strict Ricardian regime the government always finances its entire deficit (surplus) by issuing (retiring) interest-bearing government debt. Sargent (1993) shows that this kind of regime has no effect on the price level as long as the deficit is of a temporary nature, since it is not permitted to affect the level of base money. In contrast, according to the Friedman (1989) rule deficits are always entirely financed by issuing additional base money. Subsequently the time path of government deficits affects the time path of the price level via an increase in the money supply, as shown in Equation 1.7 (Sargent, 1993).

There are a number of combinations of the above regimes that can be used. For example Bryant and Wallace (1980) and Sargent and Wallace (1986) have described debt-servicing regimes that are intermediate between Ricardo's and Friedman's. In these regimes, issuing high-powered money will affect the price path sooner or later. The time lag of the effects depend on the parameters α_1 and α_2 in Equations 1.8 and 1.9 (Sargent, 1993).

The idea that monetary and fiscal policies are interrelated and must be coordinated is further developed by Sargent and Wallace (1986). Their extended analysis is based on the premise that in the absence of fiscal authority help, fighting current inflation by means of tight monetary policy will lead to higher inflation in the future. According to Sargent and Wallace, fiscal correction is the necessary and sufficient condition for stabilization.

The limits of monetary policy are further illustrated by Sargent and Wallace's 'unpleasant monetarist arithmetic' (*ibid.*). The authors argue

that financing the debt by money and debt, thus shifting towards tight monetary policy, will lead to an increase in government debt in the future. That increase will be caused by an increase in government's interest burden. Given that there is a limit on the public's willingness to absorb the debt, the government will find it difficult to sell its debt to the public except at falling prices, which will in turn increase expenditure. In order to avoid insolvency the government will have to resort to inflationary money creation to finance its deficit. Thus the public's perception that the government is unable to meet the intertemporal budget constraint will cause an increase in the inflation rate above the level initially expected by the agents. In other words inflation will only occur if the present value of the government debt is not equal to the present value of all the government surpluses expected in the future.

The only way to avoid inflation is to ensure that the fiscal programme meets the intertemporal budget constraint and is accepted as credible evidence that inflation will not be used to finance the budget. Should long-term government policies violate the budget constraint a higher inflation rate will inevitably follow, as in the rational expectations model. In sum, Sargent and Wallace's 'unpleasant arithmetic' postulates that the central bank will be prevented from successfully fighting inflation if the fiscal authority persists in running a net-of-interest budget deficit.

Open economy framework

The analysis so far has concentrated on a closed economy. In an open economy the government budget constraint (Equation 1.7) is also determined by international economic transactions. These include financial and real resources transfers between trading nations. Thus the government budget constraint for a small open economy becomes:

$$G_t - T_t = \frac{(H_t - H_{t-1})}{\pi_t} + (B_t - B_{t-1}) + r_{t-1}B_{t-1} + e_t(B_t^* - B_{t-1}^*) + r_{t-1}^*e_tB_{t-1}^* - e_t(R_t^* - R_{t-1}^*) \quad (1.10)$$

This can be rearranged as

$$D_t + r_{t-1}B_{t-1} + r_{t-1}^*e_tB_{t-1}^* = \frac{\Delta H_t}{\pi_t} + \Delta B_t + e_t\Delta(B_t^* - R_t^*) \quad (1.11)$$

where $D_t = G_t - T_t$ is the real government primary or non-interest budget deficit as described above, e_t is the real exchange rate at time t , B_t^* is foreign public debt at time t , R_t^* is the foreign currency reserve at

time t , and r_t^* is the interest rate on foreign debt at time t . Hence Equation 1.11 states that the excess of real government spending, G , at time t , and domestic debt, rB , plus foreign debt service, $r^*B_t^*$, over real tax receipts, T , must be financed by one of four means: printing money, running down the foreign currency and/or gold reserves, or selling public debt to the domestic sector or the foreign sector. Running down the foreign currency reserves, if these are sizable, will only bring temporary relief. Moreover it will adversely affect the exchange rate. Similarly borrowing from the public or from abroad may induce domestic spending, which will in turn affect the budget deficit.

Interaction of fiscal and monetary policies during transition

Budget distortions in the late years of communism

The budgetary problems and fiscal crises that have plagued Russia's economic transformation have their roots in the late years of communism. The failure of central planning partly reflected the state's inefficiency in balancing its budget. Among the important factors behind the mounting budget distortions at the end of 1980s were the fall in the world prices of raw materials, growing military expenditure due to the arms race and the war in Afghanistan, unfavourable economic policy decisions in the mid 1980s (for example the attempt at new industrialization and the anti-alcohol campaign which sharply reduced budget revenues), and a series of large-scale disasters (for example Chernobyl and the earthquake in Armenia). The deterioration of state finances, as manifested in falling revenues and increased expenditure, is shown in Table 1.5.

Table 1.5 Budget balance, USSR, 1985–90 (rubles bn)

	1985	1986	1987	1988	1989 (estimated)	1990
State budget revenue	367.7	366.0	360.1	378.9	398.8	429.9
State budget expenditure	386.0	415.6	429.3	459.5	479.8	489.9
Balance	- 18.3	- 49.6	- 69.2	- 80.6	- 81.0	- 60.0
Balance as a percentage of GDP	- 2.4	- 6.2	- 8.4	- 9.2	- 8.8	- 6.2

Source: Robinson (2001).

Russia's fiscal performance during transition

The Russian reformers intended to tackle the budget deficit in the first stage of the reforms. President Yeltsin was confident that the deficit could be slashed and announced that 'in 1992 [it] should be almost non-existent or minimal' (*Sovetskaya Rossiya*, 29 October 1991).

In the event the reformers proved overly optimistic and the results fell far short of expectations. As Table 1.3 has shown, the budget deficit persisted and marred the government's efforts to stabilize the economy throughout the transition period. The main problem with the expenditure side of the state budget was the government's inability to stop subsidy payments being made by local authorities and the CBR (Robinson, 2001). Conversely tax collection was weak. According to official data, the tax revenues of Russia's enlarged budget (including the consolidated revenues of the federal and regional budgets and the extrabudgetary funds) fell from over 44 per cent of GDP in 1992 to less than 30 per cent in 1996 (RECEP, 1997). The situation improved slightly in 1997 as a result of the payment of tax arrears by several large enterprises, most notably Gasprom. The key factors in the deteriorating revenue performance were as follows (*ibid.*):

- A decline in output and profits.
- A shrinkage of the tax base due to tax exemptions, tax deferrals and other tax concessions.
- Statutory tax rates were reduced under the profit tax and VAT reforms, so that the excess wage tax was eliminated and export tariffs were phased out.
- A deterioration in tax discipline, a sharp increase in tax arrears,¹⁴ and tax evasion.¹⁵
- A large share of tax revenues was received in kind, which made fiscal policy less flexible.

The government's fiscal position was further undermined by the maintenance of the outdated and opaque tax code. The 1991 Law on the Principles of The Tax System was eventually replaced by a new tax code, but only its first general part was implemented and then not until the beginning of 1999.

The inadequate budget revenues in 1992 and 1993 severely undermined the the government's stabilization effort. More importantly for the reform process, the government's poor fiscal record had an adverse effect on the reformist parties in the parliamentary election of December

1993, and eventually the prime minister and finance minister were forced out. According to one Russian newspaper the shortfall in tax collection in 1993 amounted to 30 per cent (*Rossiiskie vesti*, 5 March 1994), and by the autumn 1994 it had risen to as much as 50 per cent (*Segodnya*, 27 September 1994). This dramatic decline in revenues could not be offset sufficiently by slashing expenditure, so the ballooning budget deficit exerted unbearable pressure on the exchange rate, which was slipping away from the CBR's control. With reserves running low the CBR was unable to prevent what has been dubbed Black Tuesday (11 October 1994), when the ruble – US dollar exchange rate fell by 28 per cent, jumping from R3,000 to almost R4,000 per dollar in one day (RECEP, 1994).

Black Tuesday brought home the depth of the reform's failures in respect of budget financing over the previous three years and it was realized that the days when the CBR could issue large credits without causing high inflation were over. As a consequence in 1995 the CBR was barred from financing the budget deficit.

In the new policy environment the government drew on domestic debt and borrowing from abroad. Short-term treasury bills Gosudarstvennye Kratkosrochnye Obligatsiis (GKO) and fixed coupon bonds Obligatsii Federal'nykh Zaemovs (OFZs) had been introduced in 1993, but they only took off in the aftermath of Black Tuesday as a result of a rise in the CBR's discount rate. By 1996 the stock of GKO and OFZs amounted to about 11 per cent of GDP (RECEP, 1993–99), causing a major concern for the monetary authorities. The interest rate on these securities rose to over 100 per cent in the same year and the state's domestic debt tripled (*Izvestiya*, 15 October 1997). By the autumn of 1996 commercial banks no longer had sufficient liquidity to finance the government debt market since the stock of GKO and OFZs exceeded the total stock of ruble deposits in the banking system (EBRD, 1998). In order to gain control over the growing deficit the government had to find new pool of funds at a lower cost of borrowing. Given the liquidity problem in the Russian banking sector the government's only option was to seek external sources of deficit financing in order to roll over debt repayments into fresh bond issues and expand the debt market at a lower cost (Robinson, 2001). As a consequence the GKO market was opened to foreigners in 1996. The demand for GKO peaked in 1997, when foreign investors acquired US\$19.7 billion, or about 34 per cent of the entire stock of GKO and OFZs (*ibid.*). The high demand for these securities lowered the interest rate on government debt to less than 10 per cent in the summer of 1997 (*ibid.*). Most of the foreign money invested in 1996

and 1997 was in short-term debt that matured in less than a year. Maintaining investors' confidence was therefore crucial to the roll-over into new GKO issues of matured debt.

Investors were aware that the accumulating deficits would push up the government's debt servicing costs in the future and therefore increase the size of future deficits. As the government's finances, and thus the exchange rate target, were viewed as unsustainable the currency risk premium rose, resulting in upward pressure on interest rates (Nikolić, 2000a).¹⁶ This in turn led to an increase in future debt servicing costs and so thus increased future expected budget deficits. This spiral was exacerbated by the adverse effects of the higher interest rates on growth, the dwindling foreign exchange reserves and the less than credible government policies, all of which eventually led the country into a variant of the debt trap (*ibid.*).

The dire state of the government's finances and the economy as a whole was further undermined by additional external and internal factors (*ibid.*). The most important of the external factors, prompted by the 1997 Asian crisis, was the growing reluctance of international capital investors to invest in countries such as Russia, which was plagued by macroeconomic and structural weaknesses, particularly overdependence on short-term capital inflows (RECEP, 1998). Another adverse external factor was the fall in oil and other commodity prices. Among the domestic factors the most important were the excessively large budget deficit and the unsustainable build-up of ruble-denominated debt. These were due to poor tax collection, unproductive government expenditure, the small and weak domestic capital market, the weak and inefficient banking system, poor corporate governance and the continued accumulation of payment arrears (*ibid.*). The failure of policy makers to address these issues in the relatively favourable investment climate of 1997 led in August 1998 to Russia's worst financial crisis in its transition period and contributed to global financial turbulence. The ruble was effectively devalued and left floating and the government defaulted on its GKOs (Nikolić, 2000a).¹⁷

Empirical indicators of the government's non-interest budget constraint

Using a simplified version of Sargent and Wallace's (1976, 1986) framework we shall estimate the budget constraint faced by the Russian government between 1992 and 1998, excluding the interest accruing on the government's domestic and foreign debt. The reason for this exclusion is that reliable data on the build-up of interest on government debts are

Table 1.6 Simple empirical assessment of the non-interest budget constraint, Russia, 1991–98

	<i>GDP</i> (rubles bn)	<i>D</i> _{<i>t</i>} [*] (rubles bn)	<i>D</i> _{<i>t</i>} (% GDP)	ΔH_t (rubles bn)	ΔB_t (rubles bn)	ΔR_t^* (\$ bn)	ΔB_t^* (\$ bn)	<i>e</i> _{<i>t</i>} (rubles/\$)
1991	1,400	–	–	–	–	8.200	–	169.2
1992	19,000	4,929.47	25.94	2,053	–	0.744	10.60	414.5
1993	171,500	38,710.52	22.57	14,456	207.63	4.354	33.30	1,247.0
1994	610,700	71,829.47	11.76	31,309	12,532.37	–1.869	9.80	3,550.0
1995	1,585,000	69,331.03	4.37	55,800	60,975.70	10.386	–1.20	4,640.0
1996	2,200,000	228,479.41	10.39	27,100	163,393.10	–2.841	4.60	5,570.0
1997	2,602,000	176,541.81	6.78	33,600	147,767.20	1.936	1.10	5,974.0
1998	2,685,000	900,879.59	33.55	45,900	2,176.51	–5.305	57.60	21,140.0

* Calculated by averaging end of period exchange rate.

Sources: EBRD (1999); RECEP (1993–99); IMF (1999); Nikolić (2002); and author’s calculations.

not available. Hence Equation 1.11 is simplified as follows:

$$Dt = \frac{\Delta H}{\pi_t} + \Delta B_t + e_t \Delta(B_t^* - R^*_t) \tag{1.12}$$

Equation 1.12 states that the real government deficit, *D*, at time *t* must be financed by one of four means: printing money, ΔH_t , running down international currency (and/or gold) reserves, $e_t \Delta(B_t^* - R^*_t)$, selling public debt to the domestic sector, ΔB_t , or selling public debt to the foreign sector, ΔB_t^* .

As Table 1.6 shows, the non-interest nominal budget deficit was very significant in 1992–98. The money supply was the principal means of financing the deficit in 1992–95, and although monetization of the deficit continued in the subsequent years domestic borrowing took over as the principal source of funds. In 1996–98 domestic borrowing was about twice as large as the increase in base money. In 1998 alone, even though the government could not borrow after its default in August that year, the increase in domestic borrowing amounted to 14.4 per cent of GDP, a similar increase to that in the previous year. Thus even from the limited evidence presented in Table 1.6 it is clear that the financing of the government deficit was following an unsustainable path. International financial investors could clearly see that the government’s finances were in disorder and that the government would default on its obligations sooner or later.

Conclusion

Our analysis of macroeconomic instability in postcommunist Russia has revealed the necessity of coordinating fiscal and monetary policies, in that

the monetary authority cannot successfully fight inflation if the fiscal authority persists in running a net-of-interest budget deficit. Needless to say controlling inflation is even more difficult if the monetary authority subordinates macroeconomic stability to other socioeconomic aims.

Although Russia does not have a fiscally dominant economic regime, its continuing inability to balance the budget has resulted in monetization of the deficit. In the early years after price liberalization the budget deficit was mainly financed by money creation, but in the following years domestic borrowing exceeded the level of money creation. This eventually became unsustainable, leading the economy into financial crisis in August 1998. Both periods were characterized by a lack of macroeconomic stability.

Both the theoretical framework presented in this chapter and the simple empirical analysis demonstrate the need for fiscal correction. In this framework fiscal correction is the necessary and sufficient condition for stabilization. This is not to say that the Russian fiscal regime has dominated the monetary one. Rather we wish to stress that it was monetization of the deficit, rather than the deficit itself, that has affected the price level in postcommunist Russia.

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