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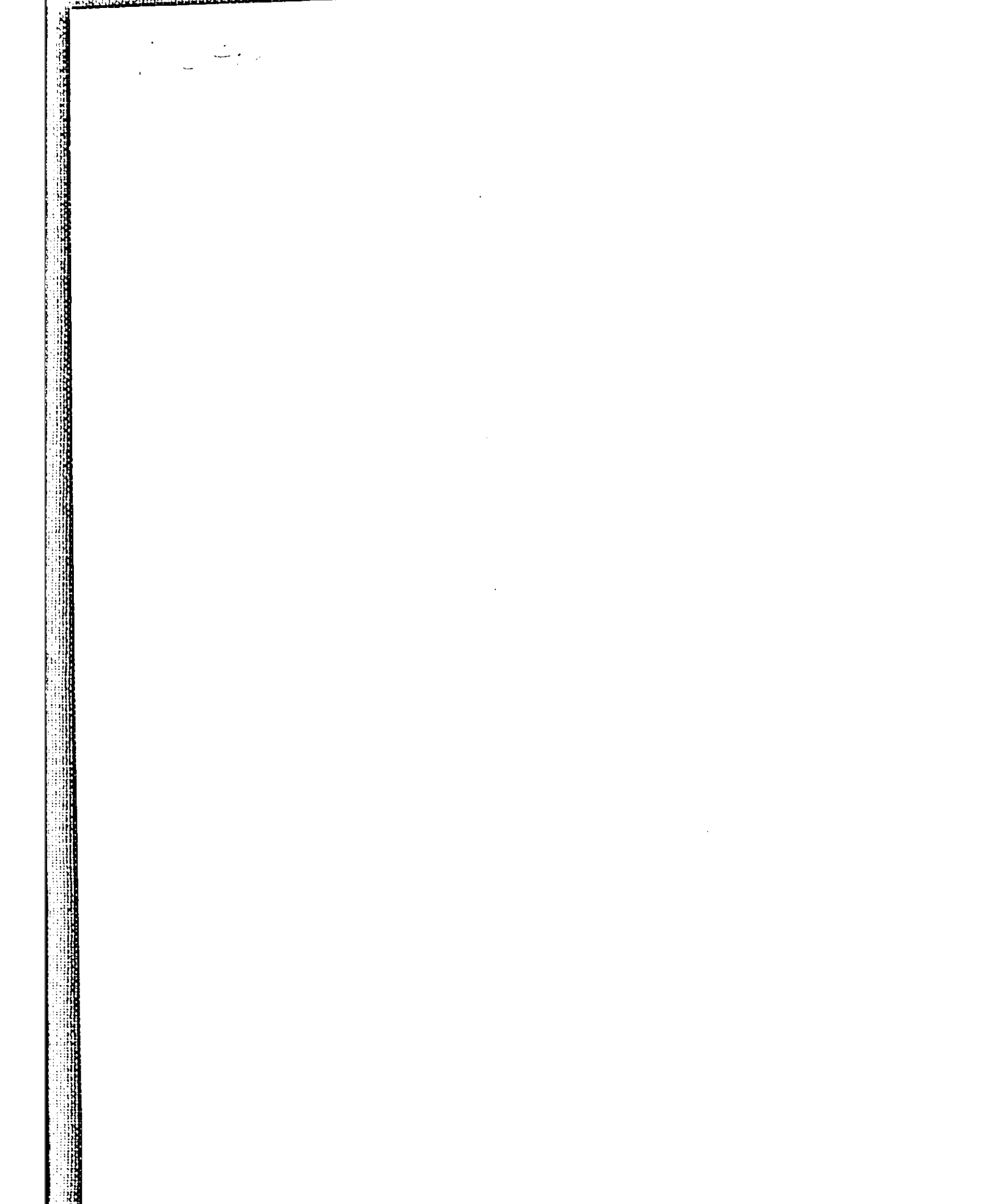# Ending High Inflation:
the Case of Russia versus Poland
and the CSFR

Brigitte Granville

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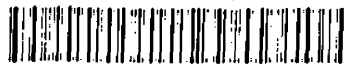the Degree of Doctor of the European University Institute

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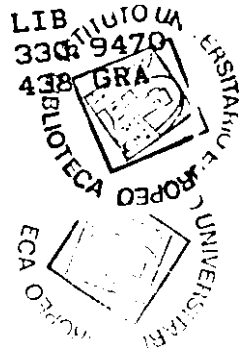**EUROPEAN UNIVERSITY INSTITUTE**
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Ending High Inflation:
the Case of Russia versus Poland
and the CSFR

Brigitte Granville

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LIST OF ABBREVIATIONS

APR	Annual Percentage Rate
CB	Central Bank
CBR	Central Bank of Russia
CIS	Commonwealth of Independent States
CMEA	Council for Mutual Economic Assistance
CPC	Commission for Credit Policy
CPE	Centrally Planned Economy
CPI	Consumer Price Index
CSFR	Czech and Slovak Federal Republic
ECE	Economic Commission for Europe
EDF	Export Development Fund
ESS	Equalization Settlements System
FDI	Foreign Direct Investment
FSE	Former Soviet Economy
FSR	Former Soviet Republics
FSU	Federalni Statisticky Urad
FSU	Former Soviet Union
FTO	Foreign Trade Organisations
FTM	Foreign Trade Multiplier
GOSKOMSTAT	Russian State Statistical Committee
GUS	Glouny Urzad Statystyczny.
IBEC	International Bank for Economic Cooperation
IEA	Inter-Enterprise Arrears
IED	Inter-Enterprise Debt
IER	Internal Exchange Rate
IMF	International Monetary Fund.
Krs	Korunys (CSFR Krowns)
ME	Market Economy
MFO	Mez-Filialny oborot: Interbranch Settlement System
MIC	Militaro-Industrial Complex
MICEX	Moscow Interbank Currency Exchange
ML	Market Loss Effect
MNB	Moscow Narodny Bank
NBP	National Bank of Poland
NMP	Net Material Product
NSRZ	New Syle Rouble Zone
PPI	Producer Price Index
PPP	Purchasing Power Parity
Rbs	Russian Rouble
RKT	Regional Clearing Centres
RSFSR	The Russian Soviet Federated Socialist Republic
RPI	Retail Price Index
SBA	Stand-By-Agreement
SOE	State-owned Enterprises
STF	Structural Transformation Facility
TIP	Tax Incentive Plan
TOT	Terms of Trade Effect
TR	Transferable Rouble
VEB	Vneshekonombank
Zl	Polish Zloty

INTRODUCTION

This dissertation analyses the efficacy of stabilisation policies in the early period of transition to the market[1], marshalling evidence from the experience of three countries - the Russian Federation, Poland and the Czech and Slovak Federal Republic (CSFR)[2]. The Russian experience is the central focus, whilst evidence drawn from Poland and the former CSFR allows more rigorous testing of the central analytical conclusions.

What can such a study add to the arsenal of economics? The nature of the Russian inflation and stabilisation remains a theoretically and empirically disputed question, with critical policy implications. Thus the systematic, analytically-based account of this, underpinned by econometric evidence - which is to be found in Part III - could be considered a contribution on its own. Clearly this account is also one more opportunity for empirical examination of fundamental theories on the nature of inflation and the impact of alternate stabilisation measures, still much disputed in the literature.

A key conclusion of this part of the work has been that inflation in Russia was mainly a monetary phenomenon, and that the expansion of the money supply has been driven by the size of quasi-fiscal expenditures and the way they were financed. The reader will find standard modelling of the Russian case.

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[1] Economies in transition are defined here as former centrally-planned economies which undertake certain liberalising measures in order to become market economies. The key measures are quasi total price liberalisation, liberalisation of foreign trade, introduction of convertibility, and privatisation of enterprises.

[2] The former Czechoslovakia was formally renamed the Czech and Slovak Federal Republic in April 1990 under pressure from the Slovaks who had their own republic since 1969. Indeed the 1918 Pittsburgh Agreement established the "Czecho-Slovak Republic". On 1 January 1993 the country divided into two separate states.

In reality, of course, such work is never straightforward. The first hurdle in the Russian case was, of course, the data. Gratifyingly, other major studies of the Russian economy (e.g. OECD, Survey of the Russian Economy, 1995) now use these series, citing Granville, *Monetary Report*, 1993 - present.

Part III should not, though read on its own, theoretically and empirically. The stabilisation experiences of transition countries turn out to have common features with all stabilisation, but, also and more importantly, features specific to their unique historical and institutional circumstances. This dissertation is thus unavoidably more ambitious and complex than the examination of the Russian experience in Part III.

In Part I, which incorporates a review of the literature, the monetary legacy of the previous centrally-planned system is analysed carefully. I later show that this is essential to the understanding of the difficulties encountered in controlling inflation in economies in transition, more particularly in Russia. In this foundation, or theoretical section, it is also appropriate to discuss the relative merits of exchange-rate versus money-based stabilisation programmes.

Part II then reviews the same issues in a comparative empirical study of the experience of Poland and the CSFR during their first year of reforms (respectively, 1990 and 1991). Poland had a very high inflation rate, a result, I explain, of its high budget deficit. Due to substantial foreign financing and a full macro-stabilisation programme, the Polish inflation rate dropped swiftly. The CSFR case is important for quite a different reason. It illustrates the situation of a low inherited budget deficit and scant inflationary pressure. Hence the inflation problem was confined to a one-month price jump. This one month jump is critical to understanding a phenomenon of considerable (negative) influence at the outset of reform, in all three countries: the monetary overhang. In this section we may also

observe the results of the facts that both countries adopted the exchange rate as the nominal anchor.

Thus Part I and Part II provide the essential theoretical and empirical underpinning for the analysis of the central Russian case, developed in Part III. Part III provides my demonstration that the persistence of high inflation in Russia in the early stages of transition was due to its failures to control the size of its budget financing, and to the lack (particularly in 1992 and 1993) of alternative means of financing the budget deficit.

PART I first reviews the literature on the legacy of central planning, and on the relative merits of exchange-rate versus money-based stabilisation programmes.

Russia embarked on a money-based stabilisation programme, in contrast with the exchange-rate anchor chosen in Poland and the CSFR. As I lay out in Part I, the literature favours the use of an exchange rate anchor. The less favourable Russian experience might seem simply to be the confirmation of this. As I explain in Part III, the constraints in Russia meant that this option was then not open. Part III also addresses the effect on inflation and considers the results of quantitative and formal investigations into the inflation tax.

The conclusion summarises the key findings of this work. The work has been undertaken with the evident understanding that there is much in dispute, and that nothing as complex as these events can be considered "settled". There is always another aspect, another view. These are, however, findings, with a rather solid foundation, developed in detail in this dissertation.

THEORETICAL CONSIDERATIONS:

INHERITED CONSTRAINTS ON MONETARY STABILISATION, CONVERTIBILITY AND THE EXCHANGE RATE AS MONETARY ANCHOR

This part, incorporating a review of the literature, analyses the aspects of the monetary system inherited from central planning which hindered attempts to control inflation in economies in transition. The banking system responded passively to the planning authorities which promoted heavy industrial production. This is elucidated in (Chapter I). Chapter II concludes that thorough-going price liberalisation was indispensable both to absorb excess demand and to reduce government subsidies in the interests of budget management. Because of the soft budget constraint faced by the state enterprises and the inherited absence of a distinction between monetary and fiscal policies - ending inflation in transitional economies required that credit expansion be controlled and efficient financial intermediation be developed (Chapter III). Other measures include the use of the exchange rate as a nominal anchor and the introduction of current account convertibility at the very beginning of the reform programme (Chapter IV).

CHAPTER I

THE PRE-REFORM MONETARY SYSTEM

The role of money in a socialist economy was limited[1] and passive[2]. Production was planned in physical terms, and financial flows were consequently regulated by the Plan. The Ministry of Finance was in charge of the State budget and of the State Bank, a monobank, which handled financial operations.

Financial flows were divided between the consumption and the production sphere[3], in other words between households and enterprises. In each sphere or circuit, money responded passively to the directives of the plan. As Lane (1992) puts it:

"Enterprise revenues and expenditures are constrained by planned input allocations and output targets, while household expenditures are constrained by the availability of consumer goods. Money flows between the two sectors are associated with wage payments and consumers' payments for goods and services, but these are also specified in the plan."[4]

These two monetary circuits, or spheres, functioned as follows:

The Consumption Sphere

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[1] Mises (1920), p. 77: "Money could never fill in a socialist state the role it fills in a competitive society in determining the value of production-goods. Calculations in terms of money will be impossible."

[2] Ericson (1991), p. 11: "By the logic of the traditional system, money exists only to passively facilitate planned economic activity, and should not have an independent influence over production or allocation decisions."

[3] See Nuti (1986), Birman and Clarke (1985), Fallenbuchl (1980) for a full discussion of the two monetary circuits.

[4] Lane (1992), pp. 825-26.

- Households received their wage payments in cash and the only alternative financial asset was deposits in the state savings bank which were re-deposited in the state bank available for the government to use.

- Money was used as means of payment, but there were two parallel markets for consumer goods (especially foodstuffs), with separate price structures: there were state shops and a farm market[5].

The Production Sphere

- Firms received credits according to their production and investment plan financed from budgetary transfers. Enterprise profits were transferred to the government to support the budget. Enterprise losses were covered by government subsidies. The State Bank provided the government with additional credits necessary to make up for any overall shortfall in enterprise profits. This system came to be known as the 'soft budget constraint[6] and inherent in its logic was the need to achieve quantitative targets under the plan[7]. The managers and workforce in such regimes were disciplined only by the quantitative production target.

- Money was merely a unit of account used by companies. The price of production goods was centrally determined at the outset of each five-year plan.

These two spheres, production and consumption, were kept separate by institutional restrictions imposed on goods passing from one to the other. Consumers could not use money - cash - to purchase production goods from companies, nor could companies use

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[5] The farm market was present in the three countries under study but was more developped in Poland.

[6] The term is due to Kornai (1980), (1986).

[7] Hardy (1992), p. 310: "If enterprises are required to meet quantitative targets and prices are administered, it is necessary to let the budget constraint soften and to regard the financial system as little more than an accounting device."

cash to purchase from each other. Instead, inter-company payments were made by means of drafts drawn on company deposits in the State Bank. Thus two monetary circuits - cash and non-cash - coexisted.

With all productive activities run by the state and the division of the monetary system into the consumption and the production circuits and the consequent lack of a commercial banking system (at least until the end of the 1980s) the banking system lent money under order from the plan and not on the basis of market considerations. The interest rate was also administratively decided.

The system supposedly assured price stability, through the planning of both financial and physical flows. Imported inflation was controlled through the use of a system of price equalisation subsidies or taxes to break the link between foreign and domestic prices.[8] A very complicated system of exchange rates was designed for the purpose of isolating the domestic economy from external shocks[9].

In reality, however, price increases were almost always part of the system, often in the forms of hidden and/or repressed inflation (Nuti, 1986). Mises (1920)[10] argued with regard to prices that rational allocation of resources is only possible if competitive markets generate prices for the allocation of factors of production, and if there are competitive processes capable of ensuring the interdependence of those prices with the prices of consumer goods. If these methods of price formation are replaced by arbitrary decisions by central authorities or by the managers of monopoly groups, then considerations of marginal productivity will be ignored, and the rational allocation of resources will become

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[8] See Commander and Coricelli (1990c).

[9] See Granville (1990).

[10] Mises (1920), p. 81: "When there is no free market, there is no pricing mechanism; without a pricing mechanism, there is no economic calculation."

impossible. In the command economy, prices had no relationship to value and were able to reflect central priorities only in the most aggregate terms. Some theoretical accounts of central planning contended that equilibrium prices in a socialist economy were easier to establish since the Central Planning Board possessed better information than any private entrepreneur could ever have (Lange, 1937)[11]. This was unrealistic in practice, however. How could so many prices be maintained administratively close to their economic value?

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[11] See Richter (1991) for a full analysis of the debate between Lange and von Mises.

CHAPTER II

ADMINISTERED PRICES, PARTIAL REFORMS, MONETARY OVERHANG AND PRICE LIBERALISATION

Partial reforms aimed at reviving growth were introduced at the end of the 1960s in Poland[1] and in Russia at the end of the 1980s. These reforms introduced two kinds of distortions into the command-economy regime.

1/ A dual price regime

The partial liberalisation of prices led to a system where administered prices and market prices cohabited. This typically confronted the planner with a situation where the difference between two prices for the same commodity caused shortages to emerge on the state market, leaving the planner with the choice of either increasing controlled prices or providing more subsidies (whether at consumer or producer level or both). More subsidies tended to mean larger budget deficits, hence larger credit expansion and more inflation in the longer run. This was the sequence of events which seems to have resulted from attempts to hold down final goods prices while simultaneously seeking relief for the state budget by allowing increases in the controlled prices of intermediate products.

2/ The monetary overhang

Management of state enterprises was decentralised before the imposition of financial discipline and proper accountability. The result was that workers and managers awarded

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[1] See Allen (1976), Granville (1990).

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themselves large wage increases[2]. Because administered prices under central planning were kept low while wages were increased, excess demand for consumer goods developed. And in the absence of financial or other assets, forced savings were held in money. The excess of actual money holdings (both by households and enterprises) over the desired amount is usually referred to in the literature as "monetary overhang"[3].

The controversy on the existence of the monetary overhang or repressed inflation, analysed by Nuti (1986) for the period before 1985, has not entirely been resolved[4]. The debate ranges from the view of Hinds (1990) that monetary overhang is inevitable:

"The use of pricing as a mechanism to distribute consumption is at the root of the existence of excessive wages and the creation of a monetary overhang so common in socialist countries."[5]

to that of Cochrane and Ickes (1991), (1991a) who argue that in the presence of a black market, a monetary overhang is impossible[6].

"consumers face an operational margin: hold money or spend it on goods in the second economy"[7]

Both views can be qualified. Regarding the nature and extent of monetary overhang:

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[2] Commander and Coricelli (1990b), p. 17: "In principle, wages were determined [...] with reference to a centralised wage norm with some further adjustment for plant-level productivity growth."

[3] See Cottarelli and Blejer (1992).

[4] See Portes (1974) and. Chang (1994).

[5] Hinds (1990), p. 4.

[6] This is also the views of Grossman (1977) and Hartwig (1983) reviewed by Nuti (1986), p. 64 who denied the existence of involuntary liquid assets in presence of a secondary market.

[7] Cochrane and Ickes (1991), p. 102.

1/ The monetary overhang was usually partly invested in stocks of goods. The supply of goods in official shops were limited, but other markets existed such as farm markets and markets for second-hand goods.

2/ The black market was not generalised, neither for all goods nor in all places.

3/ The availability of financial instruments was not as limited as implied by Cottarelli and Blejer (1992). Holdings of foreign currency, often, strictly speaking, illegal were large in all three countries under study (Poland, CSFR, FSU).

Even the existence of a monetary overhang may be difficult to identify. Queues are not a sufficient condition for its existence because:

1/ Queuing may not be rational.

2/ Queuing may reflect excess demand for specific goods rather than generalised excess demand for goods in general.

3/ Queuing may reflect the inefficiency of distributive services[8] rather than excess demand at official prices.

Despite the difficulty of measurement and the debate about its existence, there is quite a consensus now that the monetary overhang developed in the mid and late 80s[9] in the Soviet Union and Poland with the practice of deficit financing, which itself owed a good deal to the relaxation of money wage levels while prices remained severely controlled.

A monetary overhang can be eliminated by the absorption of excess balances by whatever means (reduction of the money supply stock, rise in the price level, privatisation)[10]. When economies in transition freed prices - both internal and external (i.e. devaluing or floating

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[8] Turcan (1977) quoted in Nuti (1986), p. 18.

[9] See Cotarelli and Blejer (1992), p.258.

[10] See Calvo and Frenkel (1991).

the currency), this put an end to the monetary overhang as the general price level rose to the market equilibrium. In practice we will see that this meant higher levels of inflation, especially during the first month of price liberalisation, than expected by Poland, the CSFR and Russia in their respective stabilisation programmes; in principle only on a once-over basis, but with the dangerous potential of breaking out into a continuing rapid spiral if the budget deficit (including extra-budgetary government sector outlays) was not adequately controlled.

CHAPTER III

MONETARY STABILITY

This chapter studies monetary stability in economies in transition and more specifically the relationship between the money supply, the budget deficit and inflation.

In a Soviet type economy, the maintenance of monetary equilibrium (or market stabilisation as described by Nuti, 1986) did not involve monetary means. It was rather understood as follows:

> "once money incomes in the state sector have been fixed, market stabilisation, understood as the restoration of a single market-clearing price will take one or a combination of three policies which do not involve monetary means: (i) price rises, (ii) taxation of wealth (not income tax because, if after-tax income could have been lowered, money incomes would have been fixed at a lower level), (iii) supply rises."[1]

Without entering into discussion of Nuti's argument that "the path to market clearing and to stabilisation is more complex than the simplistic pitching of an equilibrium price level"[2], the fact remains that for the countries under review the choice in the 80s was to have either hidden and repressed inflation or open inflation, not to have no inflation. Nuti puts forward a powerful argument for preferring open inflation to the persistent excess demand implied by hidden and repressed inflation:

> "If socialism, through a combination of bad luck and ill judgment, has failed to deliver price stability it is better to recognise it than to ignore this failure or treat it as a passing phenomenon. The persistence of excess demand, indeed the elevation of shortage to a systemic failure, leads to a prima facie case for suspecting that it is maintained primarily because it conceals the privileges of the elite through exclusive access to luxuries and necessities at abnormally low prices, while market-clearing prices would reveal and

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[1] Nuti (1986), p. 71.

[2] ibid., p. 75.

quantify privileges, as its maintenance would require drastically more unequal incomes and wealth." [3]

Stabilisation of the price level requires that growth of the money supply be brought under control. This in turn requires appropriate means of limiting both the monetary base (the central bank's monetary liabilities) and the lending activities of commercial banks. A principal source of monetary base growth in many countries is the financing - directly or indirectly - of the government sector's budget deficit. As noted earlier, Sargent and Wallace (1981) showed that persistence of a budget deficit beyond certain limits will ultimately make monetary financing unavoidable. Consequently any price stabilisation programme must put major emphasis on curbing budget deficits. But this alone is not sufficient. One additional problem which arises in transition economies particularly is that of quasi-fiscal activities of the central bank.

These are financing activities that are not purely monetary in nature and which in many market economies will be undertaken by the government and not by the central bank. [4] The form typically taken by these quasi-fiscal expenditures is the provision of subsidised credit [5], most of the time directly from the central bank.

In a classic Central Planned Economy (CPE), it was impossible to distinguish between budget financing and credit financing, with both banks and enterprises being wholly state owned. Enterprises would receive subsidies either from the government budget or from

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[3] Nuti (1986), p. 76.

[4] Robinson and Stella (1988), p. 21.

[5] See the useful definition of Wattleworth (1988), p. 60: "the subsidy element of a loan is the difference between the present value of its disbursements and the present value of its service payments, discounted at the market rate of interest. The grant element is defined as the value of the subsidy or grant as a percentage of the present value of its disbursements. According to these definitions, therefore, a loan made at the market rate of interest carries a subsidy value and grant element of zero, while a pure grant has a subsidy element of 100 percent."

the state bank in the form of subsidised credits. These credits were designated 'directed credits' or centralised credits because they come from the centre.

At the time of the introduction of a two-tier banking system, non-governmental loans were treated as credits and transferred to the new commercial banks. The 'directed' credits were still determined either by the central bank or the government but were now channeled through commercial banks. No market consideration was involved, and the interest rates at which these loans were granted were heavily subsidised[6], the difference between the subsidised rate and the official rate being paid by the government to the central bank. In fact, there was no expectation that the credits would be repaid[7]. The demand for these, as a result, was very high. They were usually directed to agriculture, or to sectors of industry in need of working capital. They represented a production subsidy to enterprises.

In the dominant socialised sectors of the economy it was difficult to redeploy workers. The situation had come about partly as a result of repressive population-control policies (denying free movement between cities without a residence permit); partly because of the political power of trade unions and party cells in factories and workers' councils; and partly as a result of the shortage of housing at current (near-zero) prices. The absence of unemployment insurance indicates the extent to which labour immobility was considered a part of the system. Aside from its impact on production costs and efficiency, the immobility of the labour market had longer-term effects. Individuals had no incentive to continue training and to seek better jobs. As a result, flexibility was restricted and

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[6] Fry and Nuti (1992), p. 31: "Interest rates charged on state enterprise working capital and paid out on deposits were symbolic."

[7] Hardy and Lahiri (1992), p. 780: "The losses on accounts of quasi-fiscal operations, such as subsidised selective credit operations or valuation losses chalked up to exchange rate movements, were rolled over for years and listed in the books as assets under "other items, net.""

opportunities for innovation lost. From the point of view of monetary stability, the important point is the one made by Brown, Ickes and Ryterman (1993):

"When labour is highly immobile, entire cities and towns are open to potentially large unemployment shocks if the dominant local industry experiences a downturn. Under these conditions, workers in these firms are likely to pressure their local governments to intervene and try to find them subsidies, undermining the process of micro-adjustment."[8]

This also undermined the process of macro-adjustment in the sense that firms are in a strong position to lobby for either more credits (quasi-subsidies from the Central Bank) or subsidies from the government, obstructing on both counts any attempt to limit the increase of the money supply.

In these conditions, reducing inflation required the creation of the political and institutional framework necessary for effective control over concessional lending by the Central Bank to state enterprises. As a first step, any such concessional (element in) lending needed to be explicitly recorded as a budgetary outlay. One could then hope to avoid falling into the error described by Tanzi (1993):

"If the government raised taxes on state enterprises' profits at the same time as the banking system extended cheap or soft loans to these enterprises, the budget deficit would fall without reducing monetary expansion. This implies that focusing on the budget deficit may lead observers and policy makers to miss the underlying cause of monetary expansion and could lead to the apparently anomalous situation (experienced by Poland and especially Yugoslavia) of high inflation with the budget in surplus."[9]

Also relevant here is the point identified by Wattleworth (1988):

"Because interest paid and received both appear above the line in the unified cash budget, the annual cost of these subsidies is reflected in the observed fiscal balances but is nowhere identified overtly. But because these subsidies are spread over the entire lifetime of the loans, their total magnitude is easily overlooked and usually grossly underestimated, and they

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[8] Brown, Ickes and Ryterman (1993), p. 33.

[9] Tanzi (1993), p. 700.

contribute to the creation of long-term structural deficits that restrict the short term flexibility of fiscal policy."[10]

III.1 Monetary policy

Figure I.3.1 shows striking correlation between the money supply and inflation growth in Poland, the CSFR and Russia in 19^^-1992. Relatively low rates of money growth as in the CSFR in 1991 were matched by a correspondingly low rate of inflation, while Russia in 1992 experienced a high rate of money growth and a high rate of inflation.

Figure I.3.1: Average monthly inflation rate and monetary growth in the first year of price liberalisation for Poland in 1990, the CSFR in 1991 and Russia in 1992
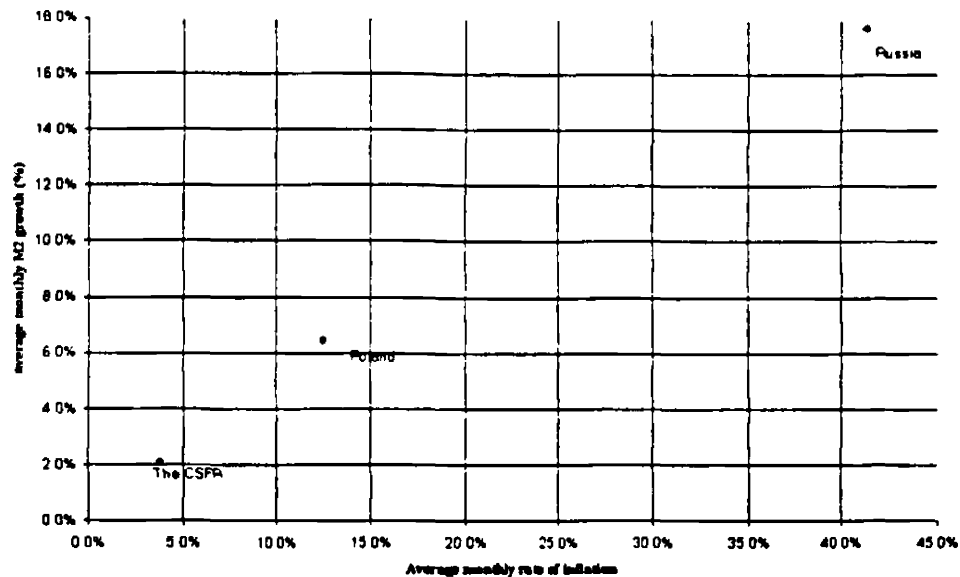
Source: data from OECD (1993), Short Term Statistics and Short Term Economic Indicators and Granville, *Monetary Report*.

The relationship between monetary growth and inflation - or monetary growth and increases in nominal national income - is affected by changes in the velocity of money. Rising velocity is indeed a frequent consequence of rapid inflation as the public seeks to rid itself of a rapidly depreciating asset. This reduces the seignorage that the government

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[10] Wattleworth (1988), p. 57.

can obtain through creation of central bank money[11]. At the same time the availability of alternative assets influences the dynamics of inflation through increased velocity or partial demonetisation of the local currency. But wide variations in the velocity of money are, to some extent, inherent in the reform process. Price liberalisation plus rapid development of the banking and credit system tend to cause marked changes in payments habits and hence in the velocity of money.

If velocity is assumed constant, the relationship between the money supply and inflation is straightforward:

(1) $M = (1/V) \cdot P \cdot Q$

This is one way to calculate the level of the money supply which would be consistent with the stabilisation programme inflation target for each period (so long as velocity and real GDP have been appropriately forecast).

The Central Bank directly determines the level of the Monetary Base (MB), which equals reserves of the commercial banks plus (local) currency on circulation. The relation between the Monetary Base and the money supply - M - depends chiefly on the reserve requirement ratio, the amount of excess reserves held by commercial banks at the Central Bank and interest rates. As we shall elaborate in the case study of Russia in PART III, for any given forecast of the money multiplier, the level of the monetary base consistent with a given M2 target can be calculated as follows:

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[11] Dornbusch, Sturzenegger and Wolf (1990), p. 27: "Since M1 will become a diminishingly small fraction of the money stock, and since the remainder carries interest rates that match inflation, money holdings are practically indexed. Thus far from being in a situation where there is a substantial seigniorage, the debt effectively becomes interest-bearing money and inflation is self-perpetuating unless the budget is balanced or the debt is frozen".

$$(2)\ \Delta MB = \Delta NIR + \Delta NCG + \Delta GCB + \Delta NCFSR + \Delta OIN$$

where Δ is the change over the target period of the variable; NIR is net international reserves; NCG is the stock of net credit to government i.e. accumulated monetary financing of budget deficits; GCB is gross credit outstanding to commercial banks (from the central bank), such credits being part of the quasi-fiscal deficit; NCFSR is outstanding net credit to former Soviet Republics from the central bank. This source of monetary expansion is special to Russia and is analysed in Granville (1994). OIN ("Other Items Net") is a residual including all remaining items of the balance sheet of the central bank, such as retained earnings, fixed assets etc. Since the profits of the Central Bank count as a liability, increases in retained earnings lead to a decline in OIN.

Equation (2) shows how operations of the Central Bank affect the monetary base. For example, purchases of foreign currency for local currency (intervention in the foreign exchange market) raise the monetary base. Sales of foreign exchange for local currency reduce it.

When the Central Bank grants a credit to the government, the funds are initially deposited at the Central Bank. According to the categorisation above, this has no immediate impact on the monetary base, since the net credit to the government (gross credits minus deposits of the government at the Central Bank) will be unchanged. But once the government spends part of these deposits (by transferring them to a commercial bank), net credit to the government rises, and so does the monetary base. Central Bank lending to the commercial banks means a rise both in the Central Bank's assets and in its liabilities which constitute the monetary base (in the form of an increase in excess reserves of the commercial banks).

This leaves us with the following relation between domestic credits (CE) and the monetary base:

(3) $\Delta CE = \Delta NCG + \Delta GCB + \Delta GCFSR = \Delta MB - \Delta NIR - \Delta OIN$

III.2 - Money Growth, Inflation and the Budget

The relation between the budget deficit, money creation and inflation can be stated as follows:

Assuming a steady state with GDP constant, the rate of money creation equals the rate of inflation:

(1) $\Delta M/M = \Delta P/P$

and

(2) $D = d(Y)$

where D is the budget deficit, d is the ratio of the deficit to GDP, Y is the level of nominal GDP

Deficits can be financed by borrowing from the Central Bank, from domestic residents (bond-financing) or from abroad:

(3) $D = \Delta M + \Delta B + \Delta F$

where ΔM is net money creation, ΔB is the change in domestic debt (bonds outstanding), and ΔF is the change in external debt outstanding.

When deficits are financed by bond issues or from abroad, this avoids at least in the short term an increase in the money stock. But in the initial stage of transition direct lending to the government from the central bank is commonly the only available means of deficit financing, either for technical reasons (absence of domestic bond market infrastucture) or because of high inflation (which makes government debt unsellable)[12]. Even if the government pays a market interest rate, this will not in itself discourage borrowing from the central bank, since the latter's profits are usually transferred to the government[13]. Making the interest on central bank credit similar to that paid on bonds nevertheless has had an important educative function in economies in transition, where bond financing was new and where governments were often resistant to this form of deficit financing on grounds of expense.

Financing by foreign borrowing is also non-inflationary in the short term. International interest rates, however are liable to be high and thus to threaten the country with insolvency, in the sense of a situation where debt service cannot be covered by new borrowing because the country has lost its credit-worthiness on the international market. In this case, either the country has to run a trade surplus with which to service the debt or else to finance the purchase of foreign exchange by money creation. The only other alternative is to default on the external debt service as happened in Poland, at the beginning of the 1980s[14].

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[12] Dornbusch, Sturzenegger and Wolf (1990), p. 47: "In a situation of extreme inflation, neither external nor internal debt financing of the government is available. Current inflation taxes, negative real interest rates on assets, and payment arrears finance the government."

[13] see Robinson and Stella (1988).

[14] Dornbusch, Sturzenegger and Wolf (1990), p.33: "High inflation appears to go hand-in-hand with debt service problems. In countries where debt service causes an extreme inflation, reduction or abandonment of debt service, or of reparations in the case of 1920s, is pivotal to stabilisation: it slows money creation, thus eliminating a driving force of high inflation."

Combining the three equations above and the definitions for d, f, and b, which are the respective ratios of budget deficit, external borrowing and bond borrowing as a percentage of GDP, the equation for inflation becomes:

(4) $\Delta P/P = (d-f-b)\ V$

V being defined as $V = GDP/M$

Equation (4) suggests that inflation can be kept under control even in the presence of quite a high budget deficit if financed externally or by bond borrowing. On the other hand, the equation also reminds us that the higher the monetary velocity (V) the higher the inflation rate, even if the budget deficit as a percentage of GDP remains constant and quite low.

CHAPTER IV

EXCHANGE RATE POLICY AND CONVERTIBILITY

In the heyday of Communist economic planning, trade was conducted in physical terms not in monetary terms. Import and export decisions for a commodity were based on the notion of material balance. If the balance was in surplus, the item was exported, and if the balance was in deficit, the item was imported if possible. The objective of the system was to insulate the economy from external shocks and as such the exchange rate was intended to have no influence on the domestic price level.

The official exchange rate started to play a role in the context of economic reforms aimed at giving more autonomy to firms[1], in Poland in the early 1980s and in the Soviet Union and Czechoslovakia some years later. The exchange rate system at the time comprised numerous different exchange rates and thousands of conversion coefficients. For instance, in the Soviet Union in 1989, there were about 6000 different coefficients, used to convert the foreign currency earnings of exports and payments for imports onto the rouble accounts of Soviet enterprises. The coefficients were differentiated by product traded and by country with which trade took place.

As these countries started to embark on market reforms, the operational question was how to find an appropriate exchange rate regime to help create a well functioning price system and to facilitate progress towards price stability.

IV.1 - The Exchange Rate As a Monetary Anchor

Bruno (1990) pointed out that the price level remains indeterminate

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[1] See Wolf (1990), p. 3.

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"unless one nominal variable (e.g. the money stock or the nominal wage or, in an open economy, the nominal exchange rate) is fixed. The latter lies at the heart of the concept of a 'nominal anchor'".[2]

Reviewing the responses to various cases of hyper-inflation, Bruno observed that exchange rate targets have generally been more effective than quantity-of-money targets in achieving a reduction in inflation. This point is made still more emphatically by Vegh (1992)[3]. His examination of various hyper inflation cases from the post World War I European hyperinflations[4] to the Bolivian hyper-inflation (April 1984-September 1985) leads him to conclude that, following exchange-rate stabilisation, inflation is stopped almost immediately.[5]

The choice between exchange-rate versus money based stabilisation programme rests on the following arguments:

1. inflation is reduced depending on strength of the link between the benchmark used and the price level that is the exchange rate link to the price level or the money link to the price level.

2. if money demand and velocity are unstable, the effectiveness of money as an anchor is reduced. The exchange rate anchors the price level through its impact on tradeable prices.

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[2] Bruno (1990), p. 7.

[3] Vegh (1992), p. 636: "The evidence clearly suggests that in hyper inflationary situations, price stability can be the immediate result of using the exchange rate as the nominal anchor".

[4] Austria (October 1921-August 1922), Germany (August 1922-November 1923), Hungary (March 1923-February 1924), Poland (January 1923-January 1924), and Russia (December 1921-January 1924).Ibid., p. 634:

[5] Ibid., p. 637: "during hyper inflation virtually all prices are indexed to the dollar or, which amounts to the same thing, quoted in dollars, hence stabilising the exchange rate is tantamount to achieving price stability."

3. Exchange-rate based stabilisation is not effective in reducing inflation if at the same time budgetary measures are not taken. Vegh (1992) attributes failures mainly to the lack of fiscal adjustment.

4. Exchange rate based stabilisation uses simpler tools than money-based programme. When the Central Bank pegs the exchange rate by selling (buying) foreign exchange it reduces (increases) base money and therefore the money stock. However, access to foreign exchange reserves (either generated by trade surpluses or borrowed) sufficient to maintain the peg and to give confidence are necessary.

5. As pointed out by Dornbusch, Sturzenegger and Wolf (1990):"a fixed exchange rate is an attractive option in that it establishes an immediate focal point for co-ordinating price expectations and price setting.[6]" However failure (that is, the need to devalue and abandon the exchange rate peg) entails a speculative attack on the domestic currency with both a loss in foreign official reserves and a loss of credibility for the government.

The relative effectiveness of exchange-rate and money-based stabilisation strategies are corroborated by the experience of Poland, the former CSFR and Russia: this will be elaborated in PARTS II and III.

IV.2 - The Initial Level of the Exchange Rate

Having helped to halt inflation, both fiscal policy and the exchange rate each have a crucial role to play in the promotion of "internal and external balance" under market conditions. The object is to arrive at a sustainable current-account balance in conjunction with a reasonable ("full") level of aggregate employment. Fiscal and monetary policies are used to influence aggregate domestic expenditure (and saving), while the exchange rate can serve to secure an appropriate level of traded-goods prices relative to non-traded.

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[6] Dornbusch, Sturzenegger and Wolf (1990), p.57.

The question of the initial level at which the exchange rate is fixed is essentially a question of judgement[7]. Neither Purchasing Power Parity nor its derivative, the "fundamental equilibrium exchange rate", are readily applicable in the wake of such distorted prices. The construction of a price index, the choice of base year and the adaptation of the index to changes in technology and other sources of bias[8] all raise major difficulties. The black market is often taken as a kind of indicator even though the black market exchange rate is never at the 'right' level, tending to undershoot or overshoot the post-reform equilibrium exchange rate[9]. Another indicator is the wage level in dollars. But even with the assistance of several indicators, the correct level of the exchange rate remains one of the most difficult questions. The risks of getting it seriously wrong may be summarised as follows:

- on the one hand, undervaluation recreates inflationary pressures, while domestic firms initially enjoy an excessive level of protection from imports.

- on the other hand, overvaluation leads to domestic firms being faced with excessively strong foreign competition and possibly going bankrupt en masse (if the authorities do not set tariff barriers as a way of limiting imports). If large-scale bankruptcies are avoided, the reduced profitability of the traded-goods sector may nonetheless create problems for the government budget, and tax revenues are highly dependent on corporate profits.

If the authorities are confident that they have chosen an appropriate figure for the exchange rate, markets may not immediately be convinced. This is where foreign assistance can contribute, by making available sufficient foreign exchange to bridge any current-account deficit and to allow the adjusting country to hold reserves sufficient to defend a realistic long-term exchange rate.

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[7] Williamson (1991), p.45.

[8] See Camen and Genberg (1987, pp. 5-6).

[9] Goldberg (1992), p. 5

However if prices continue to increase rapidly after the exchange rate is fixed, overvaluation will sooner or later develop, creating expectations of renewed devaluation. Unfortunately there is evidence[10] that after a failed attempt at stabilisation based on a fixed exchange rate, the rate of inflation tends to be higher than before the attempted stabilisation. On this van Wijnbergen, (1991) comments:

"This ultimately inflationary effect of tight credit policies under an unsustainable fixed exchange rate regime is related to the Sargent-Wallace result of high inflation in response to temporary tight money policies in a closed economy context."[11].

To avoid this situation, Dornbusch, Sturzenegger and Wolf (1990) advocate shifting to a crawling peg exchange rate even though this may create additional difficulties for price stabilisation:

"Exchange rates should be fixed at the outset, but soon after should switch to a crawling peg in order to maintain the real exchange rate. This measure increases inflationary pressures in the economy and therefore shifts more weight to the budget as the central stabilising force. Overvaluation notwithstanding, to advocate a fixed exchange rate, with the idea that the resulting recession would teach price setters a lesson, is risky. It may fail on political grounds."[12]

Transition economies cannot in practice afford to dispense with the exchange rate as a nominal anchor altogether and opt for a floating exchange rate regime. This is both because their control of the nominal money stock is insufficiently reliable and because of the lack of capital markets allowing them to absorb shocks through changes in assets positions.

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[10] See Bruno (1990), Vegh (1992).

[11] van Wijnbergen, (1991), p. 91.

[12] Dornbusch, Sturzenegger and Wolf (1990), p. 58. See also Williamson (1991), p.44 who notes that a crawling peg means that "macroeconomic policy needs to provide an alternative nominal anchor."

IV.3 – CONVERTIBILITY

Inconvertibility is natural in a centrally planned economy (CPE), since the planning model requires the central authorities to retain a monopoly over stocks and flows of foreign exchange. In such a context, the link between domestic and international prices - the exchange rate - has a purely accounting function. Inconvertibility isolates domestic agents from world prices, or at least prevents the price system from transmitting relevant information. Export and import flows are selected not in the light of the exchange rates but according to the plan.

The practical means by which the currency of a Soviet type economy was made inconvertible were:

1. preventing participation by nonauthorized bodies in currency auctions and foreign exchange markets;

2. preventing foreigners who acquired domestic currency claims from converting them into other currencies;

3. preventing the purchase and export of valuable goods without official consent[13].

As early as 1911, Irving Fisher wrote:

"In the absence of other safeguards, non-convertibility is a constant temptation to commit abuses, and this fact alone is enough to cause mistrust among businessmen and discourage long-term contracts and ventures. Non-convertible currency almost always turns out to be a curse for the country that uses it."

Even when the State decrees legal inconvertibility, it may be unable to prevent people from carrying out convertible transactions. The experience of CPEs was that even in the presence of formal inconvertibility, a black market in foreign currency always tended to emerge.

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[13] see Rosefielde and Pfouts (1990), p. 1382.

The introduction of some degree of convertibility at the initial stage of reforms is important both to reduce the monopolised market structure and also, perhaps more significantly,

"as a signal to enterprises and the public that this reform is different from those in the past, and as an instrument to improve the mobility of resources between net exporters and net importers."[14]

The question is, what degree of convertibility is indispensable from the start, and how quickly should countries in transition move towards full convertibility - which means total absence of exchange restrictions for both residents and non-residents holders of the currency upon capital as well as current account transactions.

Major Western industrial countries nowadays have fully convertible currencies, but this was by no means the case throughout the post-war period. The IMF's Article VIII requires adherents to maintain currency convertibility (especially external convertibility - that is for non-residents) only on current account transactions. In this connection, Williamson argues powerfully that

"The substance of current account convertibility could be denied de facto if an abolition of exchange controls were accompanied by an intensification of trade restrictions. It is the joint product of exchange controls and trade restrictions that determines how fully a country's goods market is integrated into the world market."[15]

As it happens, Article VIII convertibility has been assumed to be compatible with a whole range of tariffs and other restrictions on international trade, including at least temporary limits on the amounts of foreign exchange which residents are permitted to buy for purposes of tourism. All such restrictions signify retentions of some measure of quantity

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[14] Gomulka (1990), p. 129.

[15] As emphasised by Williamson (1991), pp. 20-21:

rationing for a country's citizens in relation to traded services on goods, and in principle should be phased out at the earliest practicable moment in order to allow full scope for the price mechanism in international terms.

Apart from this, two major factors bearing on the choice of convertibility strategy in the transition are:

1. the extent to which exchange controls are actually enforceable and

2. the relation between exchange controls and the choice of exchange-rate regime, i.e. how retention of (some) exchange controls may affect the pursuit of exchange-rate stability.

PART II

COMPARATIVE STUDY OF TWO STABILISATION EPISODES: POLAND IN 1990 AND THE CZECH AND SLOVAK FEDERAL REPUBLIC (CSFR) IN 1991

Here I compare the experiences of Poland and the CSFR[1] in the first stage of their respective reform programmes. The treatment is not intended to be exhaustive. The conclusions drawn are mainly designed to throw light on the central case of Russia, which will be examined in some depth in Part III. Chapter I reviews the economic legacy of the previous system. The chosen instruments for the macro stabilisation programme - tight monetary and fiscal policy aimed at a sustainable budget balance - are summarised in Chapter II. Poland and the CSFR both chose an exchange-rate based stabilisation and introduced internal convertibility (Chapter III).

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[1] The process of divergence between the Czech and the Slovak republic which occurred in the beginning of 1992 is not studied here. The reader should refer to Bulii (1992) and Begg (1991).

CHAPTER I

THE PRE-REFORM BACKGROUND

By the outbreak of the Second World War, Czechoslovakia had become an important industrial country, ranking 10th in terms of income per head. That is, on the same level as Austria[2]. The Second World War cost the country one third of its territory, but by no means the degree of destruction experienced in, e.g. Poland.

In the CSFR, the first attempts at reform took place in the second half of the 1950s and 1960s, but orthodox central planning remained the dominant factor until 1986. Various measures were taken after 1986, inspired by Perestroika in the Soviet Union and by reform attempts in Poland and Hungary. But these 'Communist' reforms had relatively little impact by comparison with the Polish ones.

In Poland, unlike the CSFR, the economic reform process was ongoing during the whole of the 1980s, and associated with the Solidarity movement. The so-called "price manoeuvre", introduced in February 1988[3], included subsidy cuts and price increases in an attempt to align controlled and free prices. But the increase in prices in a context of loosened control of state enterprises led to a 25 percent increase in average real wages between 1987 and 1989.[4]

CSFR enterprises were particularly large. In 1989, the average number of employees in state-owned firms was over 2000. There were also many fewer small firms than in

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[2] OECD (1991), p. 10.

[3] See Lane (1992), p. 835.

[4] Sachs, 1993b, p. 36.

Poland. An attempt to correct this was made in the Enterprise Act of 1988[5], which permitted the breaking up of several large enterprises into smaller joint-stock companies.

In Poland, the private sector had always survived in agriculture; and it expanded into other sectors during the 1980s. The CSFR private sector produced less than 0.5% of non-agricultural output, and even including the informal sector, the figure was no more than 2%[6]. More than 90 per cent of the workforce was employed in the state and co-operative sector.

In the CSFR, the budget deficit averaged 1% of GDP between 1985 and 1990. In Poland, it was estimated to be about 7.3% of GDP[7], and this was probably an underestimate because of the omission of the subsidies required to finance low interest rates on bank loans[8]. The World Bank estimated that these subsidies amounted to 10 per cent of GDP in 1988[9]. A serious attempt to tackle the problem of negative real interest rates was made in the context of the price-incomes adjustment of 1988. Nominal rates were raised sufficiently for banking authorities to talk for the first time of 'realistic' levels. This increase was quickly overtaken, however, by rapidly mounting inflation, and during 1989 real interest rates were increasingly negative. By August 1989, the monthly inflation rate had reached almost 40 percent. In October 1989, it was over 50 percent[10]. A significant reduction of the budget deficit depended on the successful removal of subsidies. Meanwhile tax receipts declined and enterprises were unable to make payments because of the rise in domestic wage costs. Moreover the limited scope for domestic

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[5] OECD (1991), p. 11.

[6] ibid.

[7] Berg and Sachs (1992), p. 128.

[8] Brainard (1990), p. 8.

[9] See Nuti (1990).

[10] See Granville (1990).

government borrowing owing to negative real interest rates made the authorities heavily reliant on printing money.

In both countries the collapse of the CMEA contributed significantly to the decline in output. The CSFR was somewhat more vulnerable than Poland. In 1989, 45% of Polish exports went to the CMEA zone, compared with 54% of CSFR exports.

Poland had an external debt equivalent to about 59% of GDP in 1989. The CSFR on the other hand inherited a relatively small external debt (about 15% of GDP in 1989)[11], as the Communist regime had serviced its debt regularly and on time. In convertible currencies, Poland's external debt amounted to 476% of exports of goods and services at the end of 1989, and the CSFR's to 109% (Table II.1.1). But current account deficits in the previous few years meant that CSFR debt service burden was increasing.

Table II.1.1. Poland and the CSFR:
External Debt Ratios -1989

	External Debt	Total Debt Service	External Debt %GDP	External Debt %Export	Debt Service %Export
	(Bn$)	(Bn$)			
CSFR	7.90	1.40	14.90	108.70	18.80
Poland	41.50	3.90	58.80	475.80	44.50

Source: Institute of International Finance

I.1 - Monetary Overhang

In Poland, the monetary overhang at the end of 1989 stemmed in part from relaxed monetary policy, with real interest rates negative and the banking system financing

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[11] These figures are the ones reported by the Institute of International Finance. They are subject to a margin of error depending on the exchange rate and GDP measure used at the time. The essential point is that the external debt of the CSFR was almost insignificant compared to the Polish one.

subsidies to consumers and to industry; but it was much enhanced by the budget deficit, and by an accompanying sharp rise in real wages during 1987-1989 (Sachs, 1993b).

As emphasised in Part I, the estimation of monetary overhang must take account of the alternative assets which were available in a CPE, and especially in Poland. Lane (1992) shows that household money holdings in the period 1979-88 were in fact able to adjust rapidly and that the black market cleared the money market. In 1988 legal holdings of foreign exchange deposits (calculated using the black market exchange rate) accounted for 40% of household money and quasi-money[12]. In December 1989 they represented 69.3% of the money supply[13].

Bruno (1992) used the ratio of money to gross domestic product (M2/GDP) as a measure of the monetary overhang, assuming the norm to be around 0.4[14]. He found figures of 0.9 for Poland in 1989 and 0.7 for the CSFR in 1990.

I.2 - Price Liberalisation

In Poland, quite a large proportion of prices had been liberalised in the 1980s before the launch of the stabilisation programme of January 1990. During 1989, the lowest rate of monthly price increase was 6.1% in June and the highest 54.8% in October. Food prices were deregulated in August, wages however were ahead of prices. The real wage in

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[12] Lane (1992), p.826. See ibid., p. 836: "Foreign currency deposits by Polish residents originally required a declaration of the source of the funds (for example, royalties, copyright, gift from non-residents); then, beginning in April 1985, a new form of account was introduced, which could be freely credited with convertible currency without a declaration of source, but funds in these accounts could not be transferred or used to finance travel abroad. In July 1988 the two types of accounts were consolidated, and the restrictions on the use of funds abolished. Meanwhile, the state savings bank issued deposit certificates in US dollars, which beginning in November 1987, it undertook to convert into zlotys at close to the parallel exchange rate; and effective June 16, 1988, it agreed to buy or sell these certificates in exchange for zlotys."

[13] Calvo and Coricelli (1992), p. 180.

[14] Bruno (1992), p. 748.

August 1989 was 44.8% higher than in August 1988[15], thereby dragging up inflation in subsequent months to absorb the excess purchasing power. Most prices were freed at the start of the stabilisation programme. Market shortages were substantially eliminated within a few weeks[16].

In the CSFR, there was very little change in the price system until a complete reform programme was agreed on 24 May 1990. The first price reform came on 1 January 1990 with the introduction of a mixed system of central regulation and contract prices which exhibited the defects explained in Part I. The liberalisation of relative prices began in earnest on 9 July 1990 with the retail food price reform. The year-on-year increase in retail prices for 1990 averaged 13%, with a 22% increase between December 1989 and December 1990. The increase in consumer prices was "primarily due to the replacement in July of consumer subsidies amounting to 3-4% of GDP (the so-called negative turnover tax) by direct cash payments to the population"[17]. From 1970 to 1990 the consumer price index rose by 1% per year. [18] Hidden inflation not recorded by the official price index has been estimated at about 2.5% per annum. Reform in the CSFR thus involved minimising the inflationary pressures caused by the liberalisation of prices, but not having to bring the price level under control from a position of hyper-inflation. From January 1991, prices were liberalised for items covering 85% of GDP. Controls were maintained only on public utilities (water, electricity, gas, health care), foodstuffs, chemical and metal intermediate goods. In addition, guaranteed minimum prices were set to ensure supply of wheat, potatoes, rye, and milk. The amount of GDP subject to price

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[15] Blanchard and Layard (1990), Table 1, p. 28.

[16] Prices which were still controlled in 1990 included in particular fuels, both petroleum products and coal, and services in the non-traded sector. The Polish authorities decided to raise coal prices by 400 per cent for industrial users and by 600 percent for households in January 1990. This left Polish prices still below world levels.

[17] OECD (1991), p. 24.

[18] OECD (1991), p.23.

regulation was further reduced to 10% in June and to 5-6% (comparable to OECD countries) in October[19].

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[19] Ibid., p. 23.

CHAPTER II

MONETARY STABILITY

Monetary stability in Poland and the CSFR was pursued through a direct tightening of credits, the introduction of positive real interest rate and a balanced budget. Additionally, there was a wage restraint policy, designed to counteract the collusion between managers and workers which had led to excessive wage increases, and which could throw the stabilisation programmes off course. In both countries the initial (two-three months) adjustment of the price level was considerably greater than projected. But thereafter the inflation rate was rapidly reduced. The 1990 Polish programme brought the monthly rate down to 3.6-5.9 percent in the second half of 1990 and to an average of around 2 percent per month in the second half of 1991. In the CSFR, under the 1991 programme, the monthly rate converged well under 1 percent from mid-1991 onwards. (Table II.II.1).

Table II.II.1 - Poland and CSFR - Monthly Consumer Price Changes (in %)

	Poland	Poland	Poland	CSFR	CSFR
	1989	1990	1991	1991	1992
January	11.1	79.6	12.7	25.8	1
February	7.9	23.8	6.7	7	0.5
March	8.1	4.3	4.5	4.7	0.4
April	9.8	7.5	2.7	2	0.5
May	7.2	4.6	2.7	1.9	0.4
June	6.1	3.4	4.9\a	1.8	0.3
July	9.5	3.6	0.1	-0.1	0.8
August	39.5	1.8	0.6	0.1	0.6
September	34.4	4.6	4.3	0.3	1.8
October	54.8	5.7	3.2	-0.1	2
November	22.4	4.9	3.2	1.6	2
December	17.7	5.9	3.1	1.2	0.8

a. Reflects an increase in energy prices.
Source: IMF, *International Financial Statistics, various issues.*
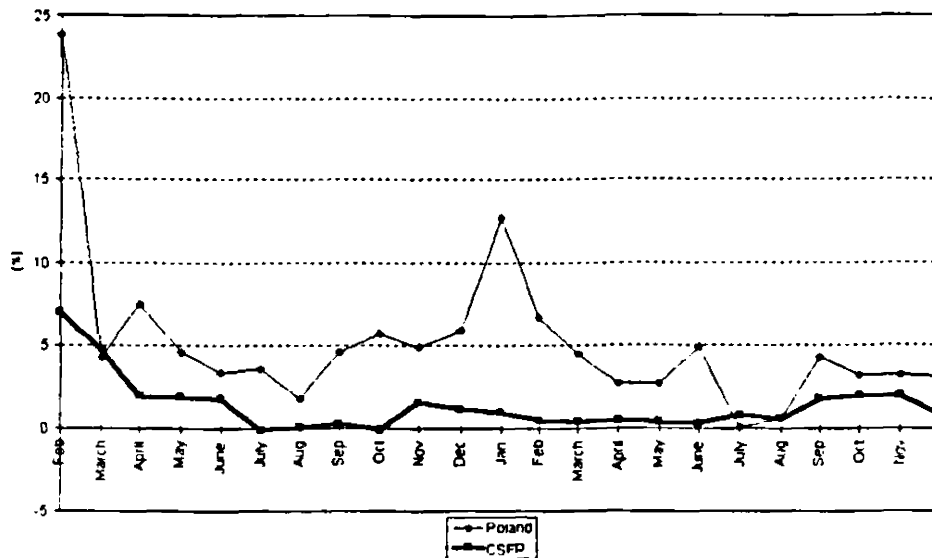
Source: Table II.II.1

II.1 - Monetary Policy

The rudimentary existing banking system prevented the effective use of interest rates, reserve requirements and open market policies to influence the liquidity of the system. Consequently direct control of credit was maintained. Neither in Poland nor in the CSFR was there a money market or a capital market, and the sole methods of saving were bank deposits and a few securities. In spite of various banking reforms, effective controls on banking liquidity remained difficult: The National Bank of Poland (NBP) was given independent status and responsibility for guaranteeing domestic monetary stability. Nine local banks were set up during the first six months of 1990, and there was a pilot privatisation of one of these[1]. "Ceilings on net domestic assets (NDA) of the banking system were imposed, allowing for a nominal growth of 22% in 1990 Q1 and a growth of about 50% for the year as a whole."[2]

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[1] Calvo and Coricelli (1992), p. 178.

[2] ibid., p.181.

In the CSFR, too the absence of a proper banking system complicated monetary policy. The one-tier banking system was maintained until the end of 1989. And only in 1990 were licenses for commercial activity allocated to three banks. CSFR monetary policy was relaxed after the first quarter (Table II.II.2) and the targets were raised during the summer.

Table II.II. 2 - CSFR: Monetary Survey, 1990 - 1991.

In bn of koruny (end of period)

	Dec	March	June	Sep	Dec
Net Foreign Assets	-9.2	-19.1	-16.2	-0.8	18.5
Domestic Credit	640.2	656	667.3	695.6	755.7
Claims on Central Government. ·	54.2	37	4.4	-10	50.5
Claims on Non financial-Public Enterprise	536	567.8	611.3	642.6	644.6
Claims on Private Sector	50	51.2	51.6	53.1	60.6
Money	291.15	278.86	287.65	317.06	371.4
Quasi Money	259.5	271.1	293.5	299.4	326.3
Net Other Items	80.35	86.94	71.95	78.34	76.46

Source: IMF, International Financial Statistics, August 1993

In both countries quantitative limits on credits were combined with a sharp increase in the central bank's refinance rate - the rate charged on loans from the central bank to the commercial banks (Figure II.II.2).

Figure II.II.2:Real Refinance Rates (deflated by the CPI) - Poland - 1990 and the CSFR - 1991
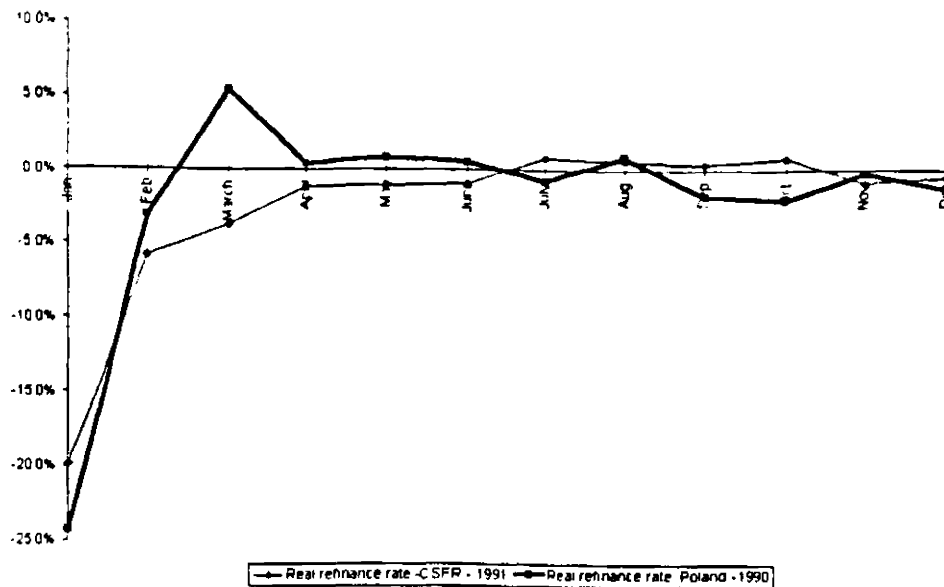
Source: calculated from OECD (1992), Short Term Economic Statistics, Central and Eastern Europe

And in both cases the fact that price rises in the initial months of the programme were considerably larger than expected served to tighten the policy stance automatically, in so far as nominal targets were maintained or not proportionally relaxed (Bruno, 1992)[3]

II.2 - Budget Policy

As regards fiscal policy, in Poland, the General Government budget in 1990 was in surplus by about 3.5% of GDP (Tables II.II.3 and II.II.5), while in the CSFR in 1991 there was a deficit of 1.9% of GDP in 1991 (Tables II.II.4 and II.II.5).

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[3] Bruno (1992), p.761: "When prices rise by more than was planned while money, credit and wages are kept within their specified nominal ceilings, the obvious result is a considerably larger than expected reduction in real money and credit as well as in real wages."

**Table II.II.3 - Poland: Fiscal Indicators
(in % of GDP).**

	1989	1990	1991
State budget revenue	30.8	37.4	26.5
Expenditure	36.9	36.7	33
Balance	-6.1	0.7	-6.5
General Gov.balance	-7.4	3.5	-6.2

Source: IMF(1992a).

**Table II.II.4 - CSFR: Fiscal Indicators
(in % of GDP)**

	1989	1990	1991	1991(a)
	Actual	Actual	Actual	Planned(d)
State Budget and local authorities(b)				
Revenue	59.8	56	47.68	48.26
Expenditure(c)	60.7	55.7	49.58	47.44
Overall Government balance(b)	-0.9	0.3	-1.9	0.8

a. programme
b. composed of the federation, the two republics and the local authorities.
c. excluding take-over of export credits from the state bank.
d. calculated with a GDP of 978 bn Kcs.

Source: National Statistics in GUS, FSU, KSH Bulletin (1992) and ECE (1992)

**Table II.II.5 - Poland and CSFR - Fiscal Indicators
(in % of GDP).**

	Poland 1990	*CSFR* 1991
State budget revenue/a	37.4	47.68
Expenditure	36.7	49.58
Balance	0.7	
General Gov.balance/b	3.5	-1.9

a. The State budget is the budget of the central government.
b. The General Government includes central government, local authorities and extra-budgetary funds.

Source: IMF (1992a) and ECE (1992).

Four elements help to explain the Polish surplus:

1. The first was the government's determined attack on subsidies. Subsidies to agriculture

   alone represent nearly 5 percent of GDP in 1989. They were substantially cut, as were

subsidies to industry including coal-mining. Altogether total subsidies were reduced from 12.9% of GDP in 1989 to 8.2% in 1990 and 4.8% in 1991.[4] In addition, there were reductions in military and internal security outlays.

2. The second factor was that tax revenue exceeded expectations because of higher than expected price increases and lower than expected wage increases, which together generated higher turnover and profits tax[5] receipts. At the same time, almost all income tax reliefs were abolished and sales tax was increased to 20%.

3. Thirdly the budgetary burden of external debt service was relatively light during this period because the Polish authorities secured a debt rescheduling from the Paris Club of official creditors. An interim agreement in March 1989 postponed all debt service payments for a year, and in March 1991 the Paris Club agreed a package that resulted in an overall reduction of 50% in the net present value of the debt.

4. Finally as noted by Tanzi (1993), quasi-fiscal expenditures were off budget. In other words, the consolidated fiscal balance was less favourable than the official budget figure.

In the case of the CSFR, the targeted budget surplus was 0.8% of GDP for 1991. For the first six months of 1991, the budget appeared to be heading for a much larger surplus of 5-6 percent of GDP. The authorities reacted by substantially increasing expenditures (from the planned 47.4% of GDP to 49.5%) and decreasing revenues (from the planned 48.26% of GDP to 47.68%)[6] (Table II.II.4). This easing turned out to be premature. The budget for 1991 ended up with a deficit equal to 1.9% of GDP.

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[4] Berg and Sachs (1992), p. 128.

[5] Calvo and Coricelli (1992), p.186: "Profits were boosted at the beginning of 1990 by capital gains on the revaluation of inventories and on sales of dollars. This amounts to a one-time tax on inventories and enterprises' foreign denominated deposits."

[6] OECD (1991), p. 36.

II.3. - Incomes Policy

In Poland and in the CSFR, incomes policy had two components: a wage norm based on partial indexation to the CPI; and an excess wage tax.

II.3.1 - The Wage Norm

Under the Polish reform programme, only a low degree of wage indexation to prices was allowed: 30% in January 1990, 20% in the subsequent three months and 60% thereafter (with a brief increase in July 1990 to 100%). Indexation started from a notional December 1989 wage base (which was somewhat below actual wages) and the process was forward-looking - i.e. based on forecast inflation rather than actual (Table II.II.6). The programme envisaged for 1990 Q1 a 75% increase in prices and for the rest of the year an increase of 1-2% a month, giving an increase for the year December 1989- December 1990 of about 100%; the actual annual inflation rate over this period, however, amounted to 249%.

In 1990 (but not in 1991) firms were able to choose between the total wage bill or the average wage as the base for the norm. Since many firms were actually reducing employment, they chose the wage bill as the base thereby allowing wages per head to rise at a rate above the norm (see explanation below)[7].

In the CSFR, the same principle was applied with the important difference that wage ceilings were reviewed quarterly. The degree of wage indexation was the following: if the rate of increase of the annual price level was between 10% and 35%, wages indexation to prices was 60%, rising to 90% if prices increased over 35%.

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[7] Blanchard and Layard (1991), p. 4.

II.3.2 - The Excess Wage Tax

In both countries indexation was backed by a punitive tax on excessive wage increases. In Poland, it was called the *popiwek*. A tax of 200-500% was to be applied to all wage increases of more than 3% above the allowed wage growth limit. The one exception to this rule was made for companies which were shedding labour. This intensified the tendency noted above for enterprises to combine labour-force reductions with above-norm wage rises for the workers retained. During the first year of the reform programme, moreover, the tax applied equally to both public and private sectors, so hindering the formation of an efficient labour market as the private sector was unable to use higher wages to attract labour.

In the CSFR, the excess wage tax was levied on state enterprises at a rate of 200% of the excess amount if the actual wage bill exceeded the ceiling by more than 2% but less than 4%, and rising to 750% on wage increases of more than 4% above the norm. The tax was assessed and collected at the end of each quarter in 1991 on any excess wages during that quarter.

Apart from the other weaknesses noted above, the way in which the wage norm was calculated and applied in the Polish case made the whole procedure of doubtful value in the fight against inflation. The January 1990 wage norm was obtained by multiplying the December 1989 indexation base of Zl 593,323 by the maximum allowable rate of growth of wages. Since the actual rate of inflation in January was 79.6% and the indexation coefficient was .3, the maximum allowable rate of growth of the wage fund was 23.9 % (Table II.II.6).

Table II.II.6 - Poland: Average Nominal Wage Increases and Indexation - 1990
(monthly % change)

	Nominal Wage(1)		CPI	CPI	Indexat.	Max rate of growth	Max rate of growth
	%change monthly	zlotys	actual	forecast	Coeff	of wage per worker(2)	of wage per worker(3)
1989							
Dec		593323	17.7				
1990							
jan	4.2%	618000	79.6	45	0.3	23.9	13.5
Feb	5.5%	652000	23.8	23	0.2	4.8	4.6
March	10.4%	720000	4.3	٠	0.2	0.9	1.2
April	2.5%	738000	7.5	6	0.2	1.5	1.2
May	8.7%	802000	4.6	2.5	0.6	2.8	1.5
June	5.6%	847000	3.4	3	0.6	2.0	1.8
July	14.4%	969000	3.6	5.5	1	3.6	5.5
Aug	5.9%	1026000	1.8	3	0.6	1.1	1.8
Sep	8.8%	1116000	4.6	4.5	0.6	2.8	2.7
Oct	13.7%	1269000	5.7	4	0.6	3.4	2.4
Nov	12.8%	1431000	4.9	4.3	0.6	2.9	2.58
Dec	1.6%	1454000	5.9	3	0.6	3.5	1.8

1. Excluding bonuses
2. Maximum rate of growth of wage per worker indexed on actual CPI.
3. Maximum rate of growth of wage per worker indexed on forecast CPI.

Source: GUS and Calvo and Coricelli (1992), Table 6, p.191.

Adjusting for the change in aggregate employment this gave a norm for January of Zl 740,000. While the norm was thus set on the basis of the ex-post inflation rate, enterprises had to anticipate the inflation rate in order to predict the norm for the coming month. A 45% rate of inflation was forecast for January, so the expected increase in the wage norm was 13.5%, giving a wage of Zl 678,000. As it turned out, enterprises paid on average wages of Zl 618,000. Thus the ex-post unused norm was Zl 122,000 (Zl 740,000 minus Zl 618,000) and the unused norm based on the forecast was Zl 60,000. The ex post January norm, in turn served as the base in February calculations.

Calvo and Coricelli (1992) pointed out that

"Only after June did firms begin to use up some of the reserves accumulated in previous months. Beginning in October 1990 average wages exceeded the ceilings and

enterprises paid large excessive-wage taxes. At the end of 1990 this type of tax accounted for almost one-half of income taxes."[8]

In other words, while at the beginning of 1990 the yield from the popiwek was insignificant, by the end of the year it was a major source of revenue. This delayed outcome was not reassuring either. It suggests that monopolistic sectors passed both the increase in wages and the taxes paid to the Treasury through to higher prices.[9]

However under the rules of the scheme any cumulative unutilised limit on wage increases could be used in succeeding months and tax became payable on excess wage increases only after this unused accumulation had been exhausted. Any net underuse or overuse of wage limits remaining at the year end was cancelled, and the new year started with a clean state[10]. This scheme had several unfortunate effects. First, it meant that wage moderation early in the year could not set the standard for subsequent months - on the contrary, it facilitated bigger rises in subsequent months. Secondly, as the year end 1990 approached there was a positive incentive for workers to seek bigger increases to use up the remaining margins before they were cancelled. Thirdly, liability to and payment of excess wage tax was also delayed until the latter part of the year - until the fourth quarter, in fact, in 1990.

The Polish experience with wage controls illustrates how difficult it is to control inflation in this way partly because of the level of initial distortion in relative prices and wages in economies in transition. Wage policies for both Poland and the CSFR were only a complement to the stabilisation programme, the major tool being the exchange rate as studied in the next chapter.

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[8] Calvo and Coricelli (1992), p. 192.

[9] Coricelli and Revenga (1991).

[10] Blanchard and Layard (1991), p. 4.

CHAPTER III

CONVERTIBILITY AND EXCHANGE RATE POLICY

In January 1990, Poland introduced internal current account convertibility of the zloty by allowing residents to acquire foreign exchange, and also carried out a major devaluation of the currency[1]. The purpose was to confront the manufacturing sector - not yet privatised - with international competition on terms designed to produce a constructive response.

The example of Poland was decisive for other former communist countries. In the CSFR, internal convertibility was introduced on 1 January 1991, again limited to the current account and applied to domestic registered businesses. Private individuals had restricted access to foreign exchange: they were allowed a certain amount each year at the current exchange rate[2].

III.1 - The Exchange Rate Anchor And Its Initial Level

In Poland, a nominal exchange rate target was favoured. This meant that the central bank was committed to buy and sell foreign exchange at a pegged price. Nuti (1990a) described the purpose as follows:

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[1] Piotrowski (1990), p. 11: "The present foreign exchange regime, in force since 1 January 1990 is based on the so-called internal convertibility of the national currency in convertible currencies. (Internal convertibility means current account convertibility for residents). This regime was established under the Foreign Exchange Law of 15 February 1989 (published by the Journal of Laws N.6.89, item 33) amended by the law of 28 December 1989 (published in the Journal of Laws N.74.89, item 441)."

[2] For 1991, the exchange rate was fixed at 5,000 krs (US $178.5). See Hrncir and Klacek (1991), p. 42

"The idea is that in an open market economy, a commitment to maintain a fixed rate of exchange after devaluation made credible by the backing of a stabilisation loan, is bound to bring the rate of domestic inflation down to the international level."[3]

The level of reserves at the beginning of the Polish programme was low. A number of OECD countries agreed to provide a stabilisation fund of US$ 1 bn to defend the exchange rate. This provided a back-up supply of reserves, but it was to be drawn down only as a last resort. The black market rate was used as a benchmark for the initial exchange rate level; but while the Polish black market rate was Zl 7,454 to the dollar in December 1989, the chosen rate at the beginning of the reform programme on 1 January 1990 was Zl 9,500 to the dollar representing a sharp depreciation in real terms[4]. The arguments for this "over" depreciation were that it was easier to defend and more especially would give an initial boost to export competitiveness in the context of a much liberalised trading regime (see below). It was thought not to have an inflationary effect, since it would do no more than regularise the existing use of the free exchange market and hard currency for domestic transactions. Thereafter to prevent significant depletion of reserves, the real exchange rate was to be kept in line with increases in labour costs, thereby preserving competitiveness without relaxing the brake on inflation. Nothing specific happened to suggest that the initial rate was inappropriate (Figure II.III.1). The free market rate did not move significantly away from the fixed rate, and it did not require to be defended by drawing either on the IMF facility or on the stabilisation fund of US$ 1 bn.

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[3] Nuti (1990a), p. 9.

[4] Berg and Sachs (1992), p. 133: "at the time of the "big-bang" the government began with an overshooting "devaluation" in which the nominal exchange rate was devalued to a level above the prevailing parallel market exchange rate. At the outset, the real exchange rate therefore depreciated sharply."

Figure II.III.1: Poland -Official and Parallel Market Exchange Rate, January 1989 -December 1990
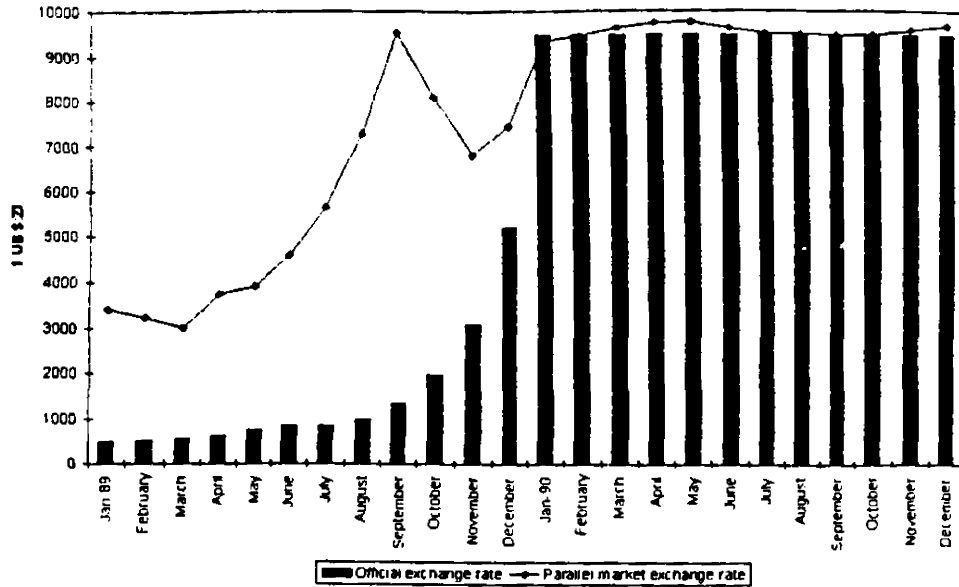
Source: Table S.II.III.1, Statistical appendix

Indeed, foreign exchange reserves grew substantially by about US$2.2 bn in the course of 1990 (Figure II.III.2).

Figure II.III.2 Poland -Total reserves excluding gold (millions of US dollars)
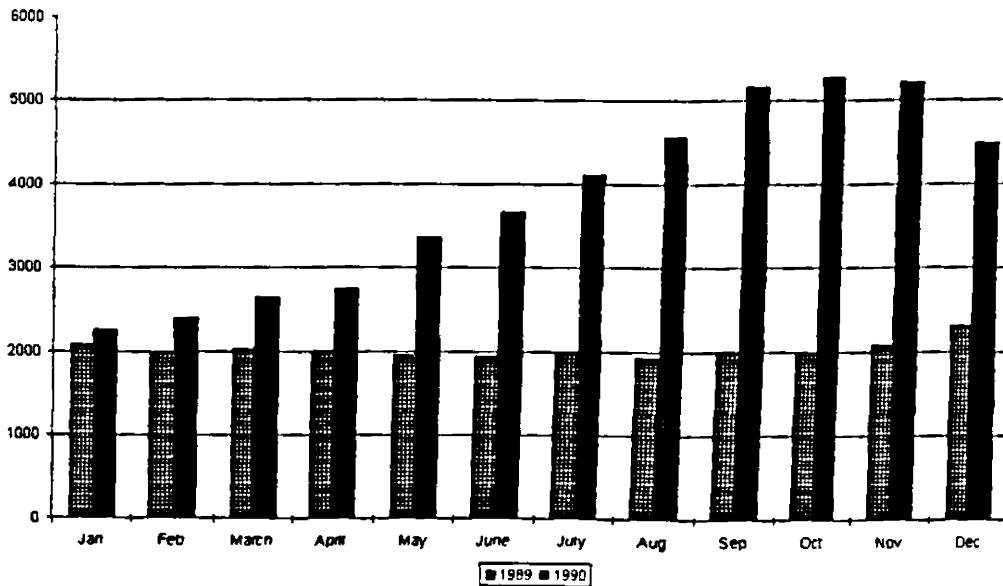
Source: Table S.II.III.2, Statistical appendix

This partly reflected the enterprise sector selling dollar balances as high real interest rates in zlotys encouraged transfers from foreign exchange to zloty accounts. Since companies were not allowed to switch zloties back into dollars (except for the purpose of importing), the inward transfer was largely permanent. Households, by contrast, were allowed to change zloties in both directions, and they did not reduce their foreign currency holdings, on the contrary (Table II.III.1)

Table II.III.1 - Poland: Foreign Currency Deposits in US$bn. January-August 1990.

	Households	*Enterprises*	*Total*
1990			
Jan.	4.8	1.5	6.3
Feb.	4.9	1.2	6.1
March	5	1	6
April	5.1	0.9	6
May	5.2	0.8	6
June	5.2	0.9	5.9
July	5.4	0.7	6.1
Aug.	5.5	0.6	6.1

Source: National Bank of Poland (converted at 9500 zl/1$).

The increase in foreign exchange reserves also reflected the unexpectedly large surplus of the balance of payments during the first 6 months of 1990. The hard currency current account in this period was in surplus by some US$ 3 bn, excluding debt service obligations. This was made up of a US$ 2 bn surplus on the trade account (US$700 m surplus in the whole of 1989) and US$ 1 bn on services and factor income from abroad (Table S.II.III.3, Statistical appendix). The inflow of workers' remittances from abroad in particular increased substantially.

The volume of merchandise imports in the first six months of 1990 compared with the same period in 1989 fell by 30% from hard currency areas and 36% from CMEA. Exports to hard currency areas rose by 14%, but fell by 7.5% to CMEA. These were

substantial volume effects. They may have been partly driven by response to the doubling of import prices in January. The fall in real incomes plus the rundown of inventories of goods built up during the months of incipient hyper inflation also played a part.

In any case, this trade performance occurred against a background of far-reaching progress towards liberalised trade in Poland.

At the beginning of 1990, all quantitative restrictions on imports from the hard-currency area were lifted, and a unified customs tariff for investment and consumer goods was introduced, with temporary surcharges for certain consumer goods. Moreover, the number of export commodities subject to quota was halved and the regulations governing participation in foreign trade were greatly simplified. Export controls were maintained only on those goods in short supply on the domestic market, or, as in the case of steel, textiles and shoes, subject to import restrictions in countries like the USA and EC members. Export quotas remained on 19 products in all[5].

The fact that both the trade surplus and the rate of inflation were higher than expected may have been in part a consequence of the "over" depreciation of the zloty compared to the black market rate for the following reasons:

1. The level of protection has an impact on the profitability of domestic firms and the price level. However besides the disappearance of quantitative restrictions, nominal protection fell as a result of the reform programme. In the first half of 1990 import tariffs were around 10% on inputs and 20% on finished consumer goods, (an average 10% tariff might imply effective protection on consumer goods of one third or more depending on the level of valued added in the production of consumer goods). It seems that this was not very different overall from the average tariff level in 1989.[6] In

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[5] See Granville and Rollo (1990).

[6] Piotrowski (1990), p. 14.

January 1990, however, and in July of the same year tariffs on a number of inputs were suspended - ostensibly to reduce inflationary pressures but in reality to increase profits. This significantly reduced the average tariff rate. In addition to import duties, all sales (imports and domestic) in Poland were subject to a turnover tax at a standard rate of 20% (Table II.III.2). But this was higher for a number of consumer goods. These higher rates were further differentiated by whether the importer was a corporate body or an individual.

Table II.III.2 - Poland: Higher Rates of Turnover Tax, 1990.

	Corporate Bodies (%)	Imports by individuals (%)
Standard Rate	20	20
Alcohol. beverages	25-95	800
Cigarettes	50	100
Cars	50	na
Luxury goods (jewellery)	25	na
Colour TV	40	25
Video recorders	40	25
Hi-fi record Players	30	25

Source: Piotrowski (1990), p. 20.

These higher rates applied equally to imports and domestic production so they did not add to the protection afforded by the tariff system.

2. The hypothesis of imperfect competition contributing to the apparent survivability of firms and the continuing high rate of price increase does not hold (the existence of monopolies cannot in itself be a sufficient explanation of persistent inflation). Although Poland could boast some very large firms, the evidence is that the structure of industry by itself was not easily consistent with a hypothesis of monopoly. Schaffer (1990) shows that the concentration of the top 500 state-owned firms in Poland was not exceptionally high. Only 22 firms had market shares above 30%. Oligopolistic collusion is easier to support given both the structure and the history of close collaboration among managers and trade unions through the *nomenklatura* system. However faced with collapsing demand, which must intensify the incentives for

member of cartels to cheat, there would be some expectation that price wars and industrial restructuring would emerge.

Therefore, the initial level of the exchange rate is a much more plausible cause of the increased market power of firms. Foreign visitors to Poland in 1990 found prices of the tourist basket of consumption to be, in foreign currency terms, very low indeed. Similarly, nominal monthly earnings in June 1990 translated at around US$98 (Table II.III.3) or less than US$5 per day[7].

Table II.III.3 - Poland: Average Monthly Wages in Industry, 1987-1991

	Nominal (zlotys)	Real (a)	Dollar(b) (market)	Dollar (c) (official)
Jun-87	30,722	917	na	119.91
Jun-88	50,661	969	32.68	118.37
Jun-89	130,454	1,304	28.24	153.65
Jun-90	946,822	822	98.38	99.67
Jun-91	1,713,300	945	149.48	150.4

a. Deflated using the CPI
b. Wage in dollars using the market (parallel) exchange rate.
c. Wage in dollars using the official exchange rate.

Source: Table 11, Berg and Sachs (1992), p.139. (Nominal Wage Index and Consumer Price Index from GUS monthly statistical bulletin, various issues. Exchange Rate data from *International Financial Statistics* of the IMF).

This view is shared by critics such as Williamson (1992b) who advocated that it would have been preferable to devalue less sharply, introducing more anti-inflationary competitive pressure from abroad. Specific firms and sectors could have been defended by some limited and temporary protection measures. In reality, however, such discussion is somewhat hypothetical in the case of Poland, since the hyper inflation and impending economic collapse of late 1989 left practically no room for such refined policy

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[7] Belka, Krajewska, Krajewski and Santos (1993), p. 43 however remark: "sales of some foreign consumer products such as textiles and consumer electronics grew from the very onset of transition, due both to unsatisfied demand for these products in the past (very high black-market exchange rates) and the existing network of PEWEX shops carrying these items."

manoeuvre. And unfortunately it is much easier to decide the optimal level of the exchange rate ex-post rather than ex-ante. Also, the nominal exchange rate was maintained until May 1991 while monthly inflation rates reached 8% on average in 1990 and 6% for the first five months of 1991, as such competitiveness of the domestic sector was quickly eroded.

In the CSFR, different exchange rates (summarised in Table S.II.III.4, Statistical appendix) were maintained until January 1991 when the rate was unified and pegged to a basket of five currencies [8] in order to provide an anchor for domestic prices. The different rates discussed at the time varied from 16 kcs/US$ 1 to 35 Kcs/US$ 1[9]. The rate adopted at the beginning of January 1991 was 28 Kcs/US$, a 16% devaluation compared to the October 1990 commercial rate (column 1, Table S.II.III.4). This was a compromise, since it was accompanied by the introduction of a surcharge on imported consumer goods and foodstuffs. The surcharge was 20% until 1 May 1991 when it was reduced to 18% and subsequently on 1 June to 15% . In practice, the import surcharge was also levied on some producer goods. Otherwise, tariff protection was low, on average 4.7%.

In the CSFR, as in Poland in 1990, the nominal exchange rate varied very little from its initial value. But domestic inflation was much lower than in Poland, and this preserved the competitiveness of the export sector. For 1991, the current account was projected to be in deficit of US$ 2.5 bn, with finance coming from official balance of payments support and capital market borrowing. IMF credit amounted to US$ 1.8 bn and EC to US$ 670 m and a the restructuring loan from the IBRD to US$ 500m.. In the event, the 1991 trade deficit turned out to be only US$ 0.5 bn, which allowed the CSFR to use the

[8] According to Hrncir and Klacek (1991), p. 48, those of Austria, Great Britain, Germany, the United States and Switzerland. But the respective weights and composition of the basket change every year according to the direction and amounts of exports and imports.

[9] See Hrncir and Klacek (1991), p. 47.

external financing of US$ 2.7 bn to build up reserves[10] (Table S.II.III.6, Statistical appendix).

The initial programmes carried through in Poland and the CSFR had much in common. Differences of emphasis and detail can mostly be traced to differences in the starting position of the two countries outlined at the beginning of this part. Both programmes succeeded in their principal aim of achieving decisive progress in these countries' transformation into fully fledged market economies. The key points in each case were: price liberalisation; macro stabilisation anchored by a pegged nominal exchange rate; and rapid establishment of current account convertibility.

It cannot be claimed that the programmes were faultless:

1. In the Polish case, we have already noted evidence (or criticism) that the initial devaluation may have been too large. The exchange rate stance and the wages policy gave Polish firms considerable room for manoeuvre during 1990 and inhibited substantial adjustment on the supply side. The wage policy and initial exchange rate devaluation may explain why the inflation rate stabilised at a level higher than in the CSFR.

2. In the case of the CSFR, Williamson (1992b) has regretted the over-restrictive fiscal stance which placed an unnecessarily harsh squeeze on demand, and aggravated the fall in output.

The similarity of the two programmes allows them to be taken as a single basis of comparison with the analogous programme launched by the Russian Government in January 1992. We shall note in particular how Poland and the CSFR both employed the exchange rate as a nominal anchor, while making their currencies convertible from the

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[10] OECD (1991), p. 34.

outset. Also, both countries benefited, unlike Russia, from a favourable political environment for pursuing radical macroeconomic reform policies. In addition, both enjoyed from the outset the support of an IMF agreement and a stabilisation fund to defend the exchange rate. As we shall see, these external elements were absent in the Russian case.

STATISTICAL APPENDIX to PART II

Table S.II.III.1 - Poland: Commercial Exchange Rates monthly averages, 1988 - 1991, (Zlotys per US$)

Month	Official Exchange Rate	Paraliel Market Exchange Rate
Jan-88	315.8	1350
February	382.4	1415
March	385.7	1415
April	397.7	1420
May	407.5	1450
June	429.8	1550
July	449.7	1670
August	456.5	2300
September	469.6	2270
October	482.2	2480
November	491	3050
December	498.7	3380
Jan-89	505.8	3410
February	525.9	3240
March	566.2	3010
April	631.3	3745
May	746.2	3920
June	848.7	4590
July	836.2	5660
August	988	7290
September	1339.5	9540
October	1970.3	8100
November	3076.7	6820
December	5235.5	7454
Jan-90	9500	9344
February	9500	9460
March	9500	9624
April	9500	9750
May	9500	9764
June	9500	9624
July	9500	9513
August	9500	9502
September	9500	9490
October	9500	9489
November	9500	9590
December	9500	9690
Jan-91	9500	9460
February	9500	9499
March	9500	9453
April	9500	9438
May	10290	10312
June	11498	11498

Source: GUS Monthly Statistical Bulletin, Various Issues.

Table S.II.III.2 - Poland: Official Foreign Exchange Reserves (excluding Gold), SUsmillions.

	1989	1990
Jan	2080.4	2259.2
Feb	2004.7	2393
March	2030	2647.3
April	2009.9	2749.6
May	1961.1	3362.8
June	1948	3667.5
July	1969.8	4120.1
Aug	1934.4	4568.4
Sep	2011.1	5162.9
Oct	1976.7	5287.4
Nov	2079.7	5225.9
Dec	2314.2	4491.3

Source: OECD (1992), *Short-Term Economic Statistics, Central and Eastern Europe*, Table 10.4, p.313.

Table S.II.III.3 - Poland: Trade Balance and Hard Currency Account (before Debt Service)(SUS millions)

	1989	Jan-Mar 1990	Jan-June 1990
Convertible Currency Area			
(BOP basis)			
Exports (US $ value)	7575	2084.5	4723
Imports (US $ value)	-7335	1307.2	2753
Trade Balance			
Volume change from same period previous year	240	777.3	1970
Exports		8.10%	13.70%
Imports		-19.50%	-29.70%
Net non-factor services	-228		-155.00
Transfers	1232		990
of which:			
private	1144		796
Current Account (excl. debt interest)	1244		2805
Rouble area			
(customs basis)			
Exports (TR value)		2542.9	5475.4
Imports (TR value)		1572.2	2988.5
Balance			
Volume Changes		970.7	2486.9
same period previous year			
Exports		-13.20%	-7.80%
Imports		-25.40%	-36.40%

Source: GUS (April and July 1990) and National Bank of Poland.

Table S.II.III.4 - CSFR: Exchange Rates 1989-1991(end of period) (Krs per $US)

	Commercial(1)	Non commercial(2)	Auction(3)	Parallel(4)	Tourist(5)
1989	14.29	9.26	114.35	43.48	-
1990					
Jan-April(7)	16.6	16.6	40.0 - 134.0	38.83	30.69
Jan-08	17	17			38
Oct-15	24	24			30
Dec-13	23.48	23.48		38.83	31.36
Dec-28	28	28	28		
1991					
Jan (8)	27.44				

1. Up to December 1988, the commercial exchange rate equalled the official rate multiplied by the coefficient for commercial payments. On 1 January 1989, the official exchange rate was replaced by two rates for convertible currencies (commercial and non-commercial). These two rates were unified on 8 January 1990.

2. Until December 1988, the non-commercial rate equalled the official rate multiplied by the coefficient for non-commercial payments.

3. The first auction took place on 30 August 1989. Monthly foreign exchange auctions were held thereafter on a pragmatic basis. On 1 January 1990, it was introduced as a transitional scheme; the last auction took place in December 1990. See Hrncir (1990), p.17 for the difficulties entailed by such a system.

4. Source: Schweizerischer Bankverein.

5. On 8 January 1990, a new tourist rate was established which applied to tourist transactions and conversions into local currency from foreign currency deposits.

6. From January 1991, the commercial and tourist rates were unified. The exchange rate was set daily using the market value.

7. Trade with CMEA countries is conducted in convertible currencies at the exchange rate fixed on 1 January 1991.

Source: Official data.

Table S.II.III.5 - Poland and The CSFR: Exchange Rates and Consumer Price Inflation (CPI) (per month) - 1990-1992

	CSFR Exchange Rate Krs/US$	Poland Exchange Rate Zl/US$	Poland % CPI	CSFR % CPI
	1991	1990	1990	1991
Jan	27.44	9500	79.6	23.8
Feb	27.84	9500	23.8	7
march	30.15	9500	4.3	4.7
Apr	30.76	9500	7.5	2
May	30.08	9500	4.6	1.9
June	31.03	9500	3.4	1.8
July	30.5	9500	3.6	-0.1
Aug	30.42	9500	1.8	0.1
Sep	29.85	9500	4.6	0.3
Oct	29.85	9500	5.7	-0.1
Nov	29.01	9500	4.9	1.6
Dec	27.84	9500	5.9	1.2
	1992	1991	1991	1992
Jan	28.64	9500	12.7	1
Feb	28.95	9500	6.7	0.5
March	29.03	9500	4.5	0.4
April	29.1	9500	2.7	0.5
May	28.9	11105	2.7	0.4
June	27.89	11458	4.9	0.3
July	27.56	11301	0.1	0.8
Aug		11270	0.6	0.6
Sep		11096	4.3	1.8
Oct		11203	3.2	2
Nov		11154	3.2	2
Dec		10957	3.1	0.8

Source: National Statistics (GSU, FSU, NBP)

Table S.II.III.6 - Poland and CSFR: Balance of Payments - 1990-1991, (in millions of US dollars).

	CSFR 1990 I - IV	CSFR 1991 I - IV	CSFR 1992 I - III	Poland 1990 I - IV	Poland 1991 I - IV	Poland 1992 I - III
Current Account						
in Convertible Currency	-1104.5	356.5	895.3	716	-1359	275
in Non Convertible Currency	-205.9	590.6	-	425	130	1
Trade Balance						
in Convertible Currency	-785.3	-447.4	-441.4	2214	51	1019
in Non Convertible.Currency	-713.7	371.5	-238.2	413	102	-29
International Tourism						
in Convertible Currency	-70.8	445.4	380	-	-	-
in Non Convertible Currency	-87.3	4.6	-	-	-	-
Income Balance						
in Convertible Currency	-316.1	-65.4	58.3	-3329	-2863	-3563
in Non Convertible Currency	56.4	87.3	-	11	17	27
International Reserves /a						
minus Gold	1102	1234		4492	3633	

a. Data include only official reserves of the State Bank of Czechoslovakia, not comparable with the data for 1990.

Source: GUS, FSU, KSH, Bulletin 1992/4, Table 2.23, p. 16, Prague, December 1992.

PART III

RUSSIA

In 1992, Russia embarked on a stabilisation programme similar in principle to the one of Poland and the former CSFR. But while we saw in Part II that both Poland and the former CSFR relied on an exchange rate based stabilisation programme, the lack of access to foreign exchange persuaded Russia to use a money based anchor.

The first chapter analyses the legacy both economic and political bequeathed to Russia by the former regime. Chapter II studies the price liberalisation started on 2 January 1992 and argues that price liberalisation did not go far enough, especially in failing to liberalise energy prices. Chapter III explains the mechanisms linking money growth and inflation and the factors that undermined the use of money as an anchor for stabilising inflation as the lack of instruments of monetary control and the unstability of the velocity of money. The expansion of the money supply was driven by the size of quasi-fiscal expenditures and the way they were financed (Chapter IV). Chapter V analyses the role of the exchange rate from 1992 to July 1995. It will be shown that Russia choice of a money based programme stabilisation was the only option at the time. Chapter VI attempts to show the significance of ending high inflation.

CHAPTER I

POLITICAL AND ECONOMIC LEGACY - 1980-1991

The Soviet planned economy was . . :blished in its definitive form in the 1930s. It was founded on the objective of rapid industrialisation by redirecting the factors of production from agriculture to industry. Private ownership was illegal, as was any economic activity not foreseen by the state plan. The emphasis was put on physical flows leaving little role for prices. The central bank, which after the revolution of 1917 was only re-established in 1921 (and at the time was subordinated to the Department of Finance), was both "banker to the government and lender to the enterprise sector"[1]. Financial flows were divided between firms and households according to the credit and the cash plan. This dichotomy led to two forms of means of payment - cash and non-cash, cash for households and non-cash for enterprises. Credit allocation and the holding of deposits, as regards both enterprises and households, were likewise centralised under the control of the Gosbank (i.e. the state mono-bank). Monetary and fiscal policies were subordinated to central plans which were executed by state enterprises supervised by sectoral branch ministries (representing 90% of production)[2].

In the early post-war period, the system appeared to generate rapid growth (Figure III.I.1); Later, however, the scholarly consensus is summarised by the conclusion of Easterly and Fischer (1994):

"Soviet growth over 1960-1989 was the worst in the world after we control for investment and human capital."[3]

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[1] IMF (1992b), p. 3.

[2] IMF (1992), p. 3.

[3] Easterly and Fisher (1994), abstract.

Figure III.1.1. USSR - Grwoth of Net Material Product (NMP), Annual average growth
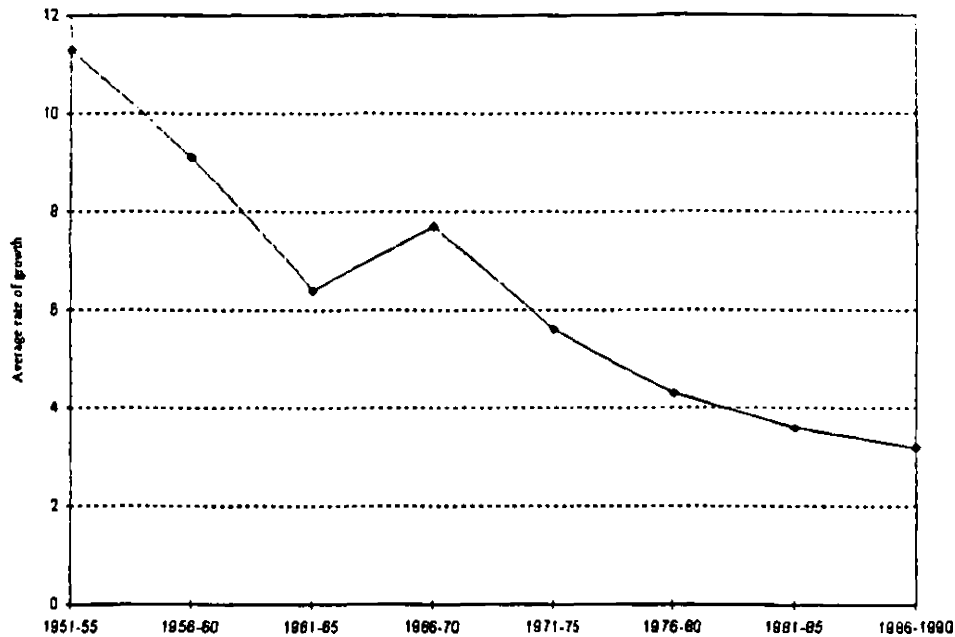
Source: Narkhoz (various years) quoted in Smith (1993), Table 2.1, p. 30.

Various reforms aimed at reviving growth revealed themselves to be more costly than beneficial. The sequence was as follows:

1. In 1985 the USSR embarked on an 'acceleration policy' similar to that pursue in Poland in the 80s. Aimed mainly at the ageing machine tool sector, it consisted of a series of ad hoc reforms designated 'campaigns'[4]. These 'campaigns' included promotion of investment, quality control, accountability of the bureaucracy; and the anti-alcohol drive. The anti-alcohol policy alone is said to have cost R 10 billion in foregone lost budget receipts [5]. This period of "campaigns" lasted until 1988.

2. In 1988 the main reform was the introduction of the law on State Enterprises[6] which gave them a measure of freedom over production and sales decisions. Workers were

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[4] The IMF et al. (1990), p. 3.

[5] Zhukov (1993), p. 3.

[6] The IMF et al. (1990), p. 4: This law "replaced traditional mandatory output targets for enterprises with so-called state orders (namely centrally directed orders to firms to deliver

allowed to create so-called private co-operatives[7] and to lease capital from their enterprises; these quasi-private organisations accounted for 5% of employment by the end of 1990.[8] However, while state enterprises had more freedom over their output, the centre sought to retain its powers by maintaining regulation over most prices.[9] The result was to move resources to the private sector where prices were not controlled. This intensified shortages in the state sector and contributed to the fall of 'measured' output (Murphy et al., 1992). At the same time reform of the banking system was attempted with the introduction of a two-tier system. Three specialised state banks were created to channel credits to enterprises in the agriculture, industry and "social investment" sectors (e.g. housing). The 1988 law on co-operatives permitted the creation of co-operative banks servicing the newly created co-operatives not serviced by the State banks. The Gosbank (the State Bank) remained untouched. No market disciplines were attached to credit allocation (which was direct) and interest rates remained low (and were themselves frequently reduced in various types of concessional lending). Thus managers effectively acquired freedom to increase wages financed with soft loans from the banking system and subsidies from the state budget. From 1988 to 1990, nominal wages grew faster than the retail price index (RPI). In 1990, average real wages as measured were 27% above their 1987 level (Table III.I.1). Since, however, many consumer goods were in short supply or unavailable, the change in measured real wages was not a meaningful indicator of living standards.

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specified quantities of goods). The law also permitted firms some latitude to negotiate with each other, and granted them greater autonomy in the allocation of their internally generated funds, in particular, in the payment of wages and bonuses."

[7] The IMF et al. (1990), p. 4: "Encouragement of private economic activity was limited to small numbers of joint ventures with foreign participation and a grudging acceptance, beginning in 1988, of so-called co-operatives, which were, however, subject to various restrictions and sporadic campaigns of harassment."

[8] Murphy et al. (1992), p. 889.

[9] The IMF et al. (1990), p. 4: "From 1988, enterprises were allowed to negotiate "contract" prices for so-called new products, but these were still subject to official surveillance and, in any event, covered only a fraction of enterprise production."

Table III.I.1 - Russia: Average Nominal and Real Wages - 1987-1990
(period average, Rbs).

	Nominal Wage % change	Nominal Wage Rbs/m	Real Wage/a % change	Real Wage w/p	RPI/b
1987		216		100	1.6
1988	9%	235	9%	108.58	0.2
1989	10%	259	8%	116.86	2.4
1990	15%	297	9%	126.9	5.6

a. The real wage is defined as the nominal wage in Rbs deflated by the Retail Price index (RPI): W/P
b. State stores and consumer co-operatives index through 1989, consolidated RPI for 1990.

Source: Goskomstat and Koen and Phillips (1993), Table 6, p. 37.

At the same time, before 1991, inflation was low as measured by the RPI (Table III.I.2), thanks to continuing price controls. The RPI measured the price in the official market and took into account only the state retail trade.

Table III.I.2 - USSR: Yearly inflation rates, 1985-1991 (annual % change)

	1985	1986	1987	1988	1989	1990	1991
Wholesale industrial prices					1.2	3.9	138.1
Retail prices						5.6	90.4
Food	0.1	0.6	2.1	0.4	0.7	4.9	112.7
Acoholic beverages	6.2	24.7	15.4			1.9	28.6
Non-food products	-0.9	-0.9	-1.1		3.1	6.5	100.7
Retail prices in:							
State and cooperate trade	0.5	2.2	1.6	0.2	2.4	5.2	89.5
Cooperative trade	1.2	3.4	2.4	0.6	0.5	14.1	111.7
Collective farms	5.2	1.1	3.7	2.5	7.4	34.3	132.1

Source: IMF, Economic Review, Russian Federation, April 1992, p.63.

The result was a monetary overhang estimated to be equal to about nine months' earnings of the entire state sector workforce[10]. A black market flourished with prices higher by "up to five hundred percent"[11].

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[10] Linz (1990), p. 12: "it was estimated at 170 billion roubles, an amount approximately equal to nine months'earnings of the entire state sector work force; an amount more than equal to the retail trade turnover in a single year."

[11] Ibid., p. 1.

3. The problem of the monetary overhang was supposedly resolved by the Pavlov reform on 22 January 1991 (named after the Prime Minister of the USSR who introduced it): by removing large denomination rouble notes (50 and 100 rouble notes), about Rbs 4 bn were confiscated (3% of the rouble money supply). The measure had almost no effect, apart from exciting popular discontent at the attempted arbitrary confiscation, because in practice virtually all holdings ended up by being converted into smaller denomination rouble notes. The move was intended to be a populist one, based on the general belief that large bank notes were earned illegally: but it turned out to be deeply unpopular as it alarmed and penalised many pensioners and other ordinary people who had built up large savings in these high denomination notes.

4. An increase in producer and agricultural prices at the beginning of January 1991 was designed to raise incentives; however, since retail prices were not changed until April 1991, the first effect of this reform was to increase the subsidy bill.

5. In April 1991 administered retail prices were increased by 60%. The official policy was to compensate the population for 85% of the expected increase in prices and to index household deposits (as of March 1991) by 40%. The overall effect on the budget turned out to be negative. And while retail prices remained more or less stable after the April 1991 reform, wages rose again, and by December 1991 statistical real wages were twice their 1987 level[12].

The budget deficit had started to go out of control in 1986 due partly to the fall of world oil prices and to the increase in investment expenditures authorised under the

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[12] Koen and Phillips (1993), p. 15: "the national average wage rose 30 percent in the third quarter of 1991, reversing the recent real adjustment. In the final quarter of the year, retail price inflation accelerated to 16 percent, but was again outpaced by a 64 per cent surge in the average wage (73 per cent in industry). By December 1991, statistical real wages were more than twice their 1987 levels. (This extreme outcome can be only partially explained by the seasonal bonus payments to wage earners in December)."

"acceleration" policy. During 1985-89, the deficit in fact rose from about 2 percent to 9-10 percent of GNP[13].

During the 1980s, the budget deficit was financed through loans from international markets and governments (keeping monetary financing of the deficit to low levels). This raised the external debt from US\$ 20 bn in 1985 to US\$ 67 bn at the end of 1991. Sachs (1994b)[14] noted that in order to help maintain creditworthiness the sale of gold reserves was kept secret.

In 1991, the 'notional' budget deficit reached a peak of 16.5% of GDP due to the increase of state subsidies to support administratively controlled prices, the decline in measured output (Table III.I.3), the lack of tax discipline consequent on the break-up of the USSR in particular, the loss of revenue payments from the Republics. "The 'notional' deficit for 1991 consists of the actual outcome of the fiscal operations of the Russian general government, including the take-over of fiscal responsibilities of the former union government, together with the imputed revenues and expenditures that would have been effected by the Russian government had the take-over of union functions agreed to for November-December 1991 actually covered all of 1991."[15]

However, the existence of a large monetary overhang allowed a much higher level of monetary financing by the Russian government than in a market economy where consumers can more readily escape inflation tax by diversifying their portfolio assets. Assuming real output constant, the inflation tax is defined as being equal to πm where π is the inflation rate and m is the real money base: in other words, the real money base is the

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[13] Lin (1993), p. 369. These figures are similar to McKinnon (1991) estimates, p. 62: "from 1.8% of GNP in 1985 to an estimated 9.9% in 1989."

[14] Sachs (1994b), p. 22.

[15] IMF (1993b), p. 59.

tax base and the rate of inflation is the tax rate. In a market economy citizens are taxed only on their desired monetary holdings: but in the case of the Soviet Union in the second half of 1980s large monetary holdings could not be avoided. In 1991, households paid 12% of GDP to the government through excess monetary holding[16]. This is very high by any standards. In cases of hyper inflation (Russia after the First World War, Poland, Hungary and Germany in the 1920s), the inflation tax was 10-15% of GNP. The fact that the monetary overhang 'helped' the financing of the budget deficit in 1991 to such an extent partly explains why the country was not driven to hyper-inflation in the Cagan (1956) sense of the term - more than 50 percent per month.

Table III.I.3 - Russia: 1989 - 1995, GDP and NMP

	1989	1990	1991	1992	1993	1994	1995
NMP bn of Rbs	412.7	444.6	1071.8	15493.1	131480	420199.6	
Real NMP as % change of previous year	1.9	-4	-10.50	-16.20	-9.8	-15	
GDP in current prices bn of Rbs official data	573.1	644	1399	19000	171500	630100	1659000
GDP growth rates in % change of previous year official				-5	-14.5	-8.7	-12.6	-4
deflator in % change of previous year official				2.3	15.9	9.9	4.2	

Source: kratkosrochnie ekonomicheskie pokazateli. February 1996. Goskomstat and *Russia in figures*, 1995, Goskomstat.

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[16] The World Bank (1992), p. 11.

CHAPTER II

PRICE LIBERALISATION

Price liberalisation in Russia started on 2 January 1992. Most but not all items were freed from price controls. The initial jump in prices was very large. Producer prices rose in January by 382%[1] and consumer prices by 296%[2], very much more than in Poland and the CSFR in the first month of their respective reform programmes (Table III.II.1).

Table III.II.1 - Cross Countries: comparison of monthly rates of CPI (compared to previous month) in the first, sixth and twelfth months after the beginning of price liberalisation(in %)

	Beginning of Price Liberalisation	1st month	6th month	12th month
Poland	1st January 1990	79.6	3.4	5.9
CSFR	1st January 1991	25.8	1.8	1.2
Russia	2 nd January 1992	296	13.9	25.1

Source: Economic Commission for Europe (1992), Table 3.4.2, p. 93 and Goskomstat.

In the case of Poland, the difference can be explained by the fact that 50% of Polish prices had already been liberalised in 1989 while, as we have seen, the April 1991 Soviet price "reform" was merely an adjustment of administered prices. In general two further factors may be cited as influential in the Russian case:

1. The monetary overhang, as seen in chapter I, was large[3] and

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[1] This is calculated with a Sauerbeck price index. See Lequiller and Zieschang (1994).

[2] The urban price change was 296% while the so-called hybrid CPI showed 245%. See Koen (1994), Granville and Shapiro (1994) and appendix on data.

[3] World Bank (1992), p. 13: "At the end of 1990, the overhang of unwanted asset holdings for households was estimated to imply a 50% price increase in the event of price liberalisation. At the end of 1991 the "asset overhang" (defined as income rising faster than the supply of consumer goods) of households would have implied a price increase of 143 percent."

2. The government's announcement that prices would rise by three to five times may have had an effect on expectations[4].

In the first (January 1992) wave of measures, price regulation was maintained for energy resources (fuels, electricity), basic foodstuffs, stones and precious metals, and public transport. Fixed prices for basic fuels such as oil, oil products and coal were raised by approximately 400%; coking coal prices by 700%. The share of oil, gas and coal products allowed to be sold at free prices was increased. In the oil and gas sectors it amounted to 40 percent by early May 1992.[5]. In foodstuffs, a limited number of goods were still regulated: bread, milk, sugar, vegetable oil, salt, vodka and baby food. Also, the state distribution sector remained subject to a ceiling on its mark-up ratio (usually 25% but up to 45% in the far north sub-polar regions (known as 'Northern Territories').

Those first days of price liberalisation saw bare shelves and high prices. After two weeks, however, there was growing evidence that market forces were beginning to operate, albeit in the absence of the privatisation of retail trade, which was due to start in the second quarter of 1992 (Granville, 1992)[6]. Prices for some foodstuffs (meat, vegetable oil, butter, eggs) began to fall back (Table III.II.2).

Table III.II.2 - Russia: Free food prices (in Rbs per kilo or litre) (21/01/92 - 10/03/92).

	21/01/92	25/02/92	10/03/92
Beef	83.9	69.48	52.08
Pork	82.69	73.93 -	
Vegetable oil	29.85	23.31	19.46
Butter	114.34	82.76	88.5
10 eggs	17.39	14.86 -	

Source: March 1992, Delovoi Mir (Business World) quoted in Granville (1992)

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[4] Koen and Phillips (1993), p. 6.

[5] ibid, p. 4.

[6] Granville (1992) pp. 3-4

After some two months, the remaining regulated prices were again associated with shortages of the products concerned. Maintenance of these regulated prices required, especially with high inflation, continuing large subsidies. As these subsidies were not forthcoming, the products in question began to disappear from the market, while supplies of freely priced products were plentiful - milk, for instance, disappeared while yoghurt and cheese remained widely available. Also, the price ceilings retained for several food items were exceeded in many cities from February 1992 onwards, with, for instance, 39 cities reporting vegetable oil sales above the price limit on 11 February (out of 130 cities sampled)[7]. Consequently the federal government decided to free the remaining controlled prices on food products, although some local authorities elected to keep them (Table III.II.3).

Table III.II.3 - Russia: Controls on Food Prices, Mid 1992

Product	Percentage of cities in which price remained controlled
Milk	44
Kefir	36
Fat cottage cheese	29
Rye bread	30
Mixed rye-wheat bread	28
Grade 1 and 2 wheat bread	32
Top quality wheat bread	10
Sugar	30
Salt	17
Meat products	11
Butter	6
Vegetable oil	14

a. Sample of 132 cities.

Source: Goskomstat quoted in Koen and Phillips (1993), Table 9, p.41.

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[7] Figures taken from a study carried out by the author (for the Delegation of the EC Commission in Moscow) during the first month of price liberalisation.

March-April 1992 thus saw the lifting of the remaining price controls on foodstuffs (including central controls on retail bread prices)[8], leaving administered prices only for rents, utilities, public transport and energy, and wholesale state grain purchases.

The third stage of price liberalisation was supposed to cover energy prices but the timing and scope of fuel price liberalisation remained highly controversial. It was feared that energy price liberalisation would not only cause a sharp increase in inflation but also reduce the production of food and consumer goods. Worries about the effect of fuel price liberalisation on the harvest (hence on the price of bread) were paramount. So instead of full liberalisation, on 18 May 1992, the Government raised the wholesale price of crude oil from Rbs 350 per tonne to Rbs 2,200 per tonne. This was about US$20 at the exchange rate on 20 May 1992 (Rbs 113: US$1); the world price was about US$120. At the same time the right of producers to sell a proportion of their production at a price exceeding the administrative ceiling was abolished.

It has been argued that, it was a mistake to maintain energy price controls because this meant huge subsidies to the energy sector and foregone tax revenue[9]. This swelled the budget deficit and consequential increases in the volume of money. Higher energy prices would have decreased the budget deficit and therefore reduced the need for monetary financing. The result would have been lower inflation with the exception of a one-month jump in the overall price level.

The absence of any persistent connection between energy price formation and inflation is illustrated by Figure III.II.1 which compares the path of oil prices and general inflation

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[8] Koen and Phillips (1993), p. 4: "On 7 March 1992, a Federal Government order allowed local authorities to abolish limits imposed on the prices of bread, milk, kefir, skim yogurt, sugar, salt, vegetable oil and matches."

[9] Lipton and Sachs (1992), p. 22.

(three months moving average). For instance, in May 1992, the price of oil grew by about 70%; while the rate of inflation decreased and was relatively stable between May 1992 and August 1992 (i.e. about 10% per month) due to the relatively low monetary growth in the early months of 1992.

Figure III.II 1 Inflation and Variation of oil prices (3 months moving average), February 1992-March 1995
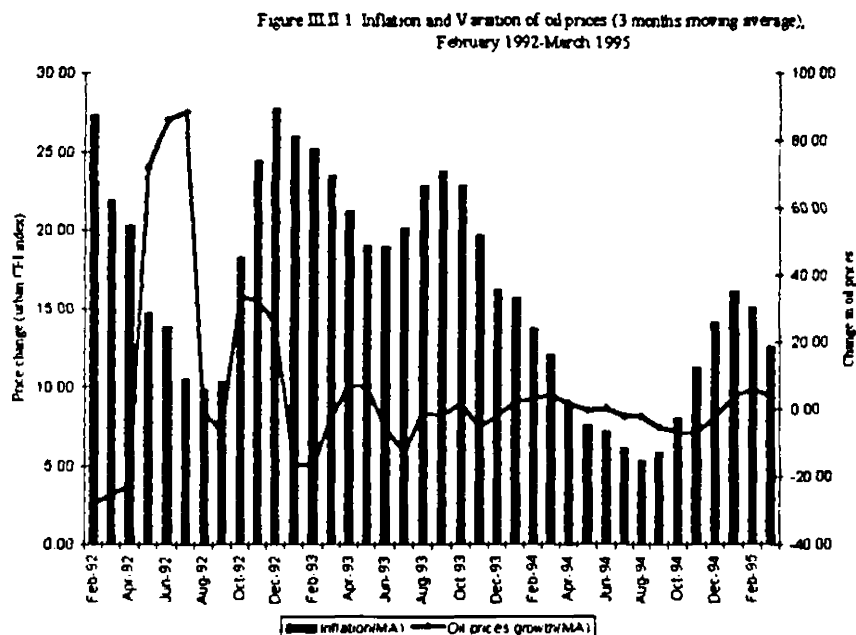
Source: calculated with data from Goskomstat.

As an econometric test, monthly inflation (INF) was regressed on real oil price inflation (ROILPRGR) with different lags of one, two, three and four months for the period from June 1992 to March 1995.

(1) INF = C(1) + C(2)*ROILPRGR + C(3)*ROILPRGR(-1) + C(4)*ROILPRGR(-2) + C(5)*ROILPRGR(-3) + C(6)*ROILPRGR(-4)

Substituting for the coefficients we obtained:

(2) INF = 15.662279 + 0.082518321*ROILPRGR - 0.0026881492*ROILPRGR(-1) -

    (11.234)   (1.303)   (-0.096)

    - 0.017428022*ROILPRGR(-2) - 0.0091360028*ROILPRGR(-3) +

    (-0.626)   (-0.331)

      + 0.0092520941*ROILPRGR(-4)

    (0.338)

$R^2 = 0.10$

In no case was the relationship statistically significant as shown by the t-statistics in parenthesis.

After the price liberalisation of 1992, the federal government continued to maintain various price controls, either directly, as for public utilities, or else via profit margins (limited to a fixed percentage of production costs)[10] and via export quotas on oil and oil products. The freeing of the oil price would have had a beneficial impact on the budget position. Tax revenues would have been increased both because export taxes were calculated according to the per ton price of crude oil on the domestic market and because oil company profits would have been higher.

The consequences for the budget of these price controls being maintained were serious. If the level of the initial price jump in Russia was largely influenced by the existence of a monetary overhang, the subsequent high inflation rates month-by-month were due to the fiscal and quasi fiscal expenditures and the way they were financed. Inflation stayed so high after the initial jump not because of price liberalisation but because monetary policy was loose. And one of the reasons for that monetary laxity was the effect on the budget

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[10] See Delpla (1993) for a detailed study on profit margins.

deficit of subsidies arising from the remaining price controls. We shall return to this whole area in Chapter IV.

CHAPTER III

MONEY USED AS AN ANCHOR

We examined in Part I, Chapter III, the relationship between money and prices in transition economies. This chapter examines the causes of monetary expansion by analysing the respective shares of net international reserves and net domestic assets in the monetary base. It goes on to show statistically that inflation in 'transition' Russia has been primarily a monetary phenomenon. However the instability of velocity of money and the lack of monetary instruments undermined the use of money as an anchor for stabilising inflation.

III.1 - The link between CBR Credits and Money Growth

An expansion of CBR credit leads to an expansion of the monetary base (Central Bank liabilities). However, since the monetary base is composed of net international reserves as well as net domestic assets, the increase in CBR credits is not perfectly matched by the increase in the monetary base. Second, an increase in the monetary base leads to an expanded increase in the money supply through the money multiplier characteristic of a fractional reserve banking system. Table III.III.1 presents in schematic form the balance sheet of the Central Bank of Russia.

Table III.III.1 Balance sheet of the Central Bank of Russia

Assets	Liabilities
NIR: Net International Reserves	MB: Monetary Base
GIR:Gross International Reserves	Cash Issued
- GIL: Gross International Liabilities:	+ Required Reserves of the commercial banks
	+ Excess Reserves of the commercial banks
NDA: Net Domestic Assets	
NCG: Net Credit to Government*	
+GCB: Gross Credit to Commercial Banks	
+NCFSR: Net Credit to Former Soviet Republics	
+OIN: Other Items Net	
Total Assets	Total Liabilities

* Net credit to government = credits to government minus government deposits

The Central Bank directly determines the level of the monetary base (MB) or reserve money. This is defined as the sum of currency outside banks plus banks' cash and deposits at the CBR. It can be defined in a narrow sense as the sum of currency outside banks and minimum reserve requirements of commercial banks or in a broader sense, to include excess reserves of the banks.

Variation in base money reflects changes in the asset side of the balance sheet, which is composed of net international reserves (NIR)[1], net credit to the government (NCG), credits to commercial banks either gross or net (GCB or NCB) depending on the chosen definition of the monetary base (as explained below), credits to former Soviet republics (NCFSR) and other items net (OIN) which are mainly the profit of the CBR.

In a word, expansion of the monetary base is defined by the following identity:

(1) $\Delta MB = \Delta NIR + \Delta NCG + \Delta GCB + \Delta NCFSR + \Delta OIN$

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[1] Net international reserves include gold from both central bank and government, net central bank and net government foreign exchange. See appendix on data.

An overall surplus (deficit) in the balance of payments adds to (subtracts from) net international reserves of the monetary authorities and, given domestic credit and other items net, increases (decreases) base money. Similarly, when the Central Bank brings about a ceteris paribus increase (decrease) of its assets by buying (selling) government securities or making (calling in) loans to (from) commercial banks, the increase (decrease) in these assets is accompanied by an increase (decrease) in base money.

Domestic credits, the change in net domestic assets, is calculated as:

$$(2)\ \Delta CE = \Delta NCG + \Delta GCB + \Delta NCFSR$$
$$= \Delta MB - \Delta NIR - \Delta OIN$$

This shows that the growth of the money supply through the money multiplier depends on three types of Central Bank credits:

(i) ΔNCG: **Net credit to the government** i.e. the monetary financing of the budget deficit. This will be studied with credits to commercial banks in Chapter IV.

(ii) ΔGCB: **Gross credits to commercial banks.** In 1993, the IMF advised the CBR to change its methodology and to count net credits to the banks (that is gross credits minus excess reserves) rather than gross. These credits were not merely designed to provide liquidity to banks through the refinance rate; they also included subsidised credits funded by the budget and the Central Bank and channelled through commercial banks to state enterprises.

(iii) $\Delta NCFSR$: **Net Credit to Former Soviet Republics (FSRs)**[2]. In 1992 and 1993, the CBR provided both non-cash and cash credits to the countries of the 'near-abroad' to

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[2] see Granville (1994) for a comprehensive account of the cost of the Rouble zone for Russia's stabilisation attempt. The conflict between the Ministry of Finance and the Central Bank is described here in much detail, as well as the ambiguous role that the IMF

allow their enterprises to continue trading with Russian enterprises. The credits financed these countries' imports from Russia and thus had much the same effect as direct subsidies to Russian industries, the main difference being that with pure subsidies the products may not even be sold but simply pile up at the factory. At the same time FSRs' central banks were themselves able to issue rouble credits to be spent in Russia, thus further contributing to the growth of Russia's money supply and inflation. While the Ministry of Finance managed to regulate non-cash credit in July 1992, cash transfers remained beyond its control. In 1993, since transfers in cash were not regulated, and because the Central Bank (constitutionally subordinate to, and politically protected by the Supreme Soviet) was opposed to the governmental policy of ending the rouble zone, the CBR saw the opportunity to make transfers in cash, in the form of pre-1993 banknotes i.e. without the Russian flag. The use of cash was however abruptly stopped in July 1993 with the removal from circulation of the pre-1993 roubles. (Granville, 1994, Popov, 1994).

The relative importance of changes in Russia's net international reserves and in net domestic assets in relation to narrowly defined monetary base (i.e. currency plus banks' required reserves) in the years 1992-94 is shown in Figure III.III.1.

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played in the negotiations by asking Russia on one hand to stick to strict monetary target and in the other hand to finance the rouble zone, which cost Russia in 1992 6% of GDP.

Figure II II 1 Quarterly changes in net international reserves and net domestic assets in relation to monetary base at the beginning of the quarter
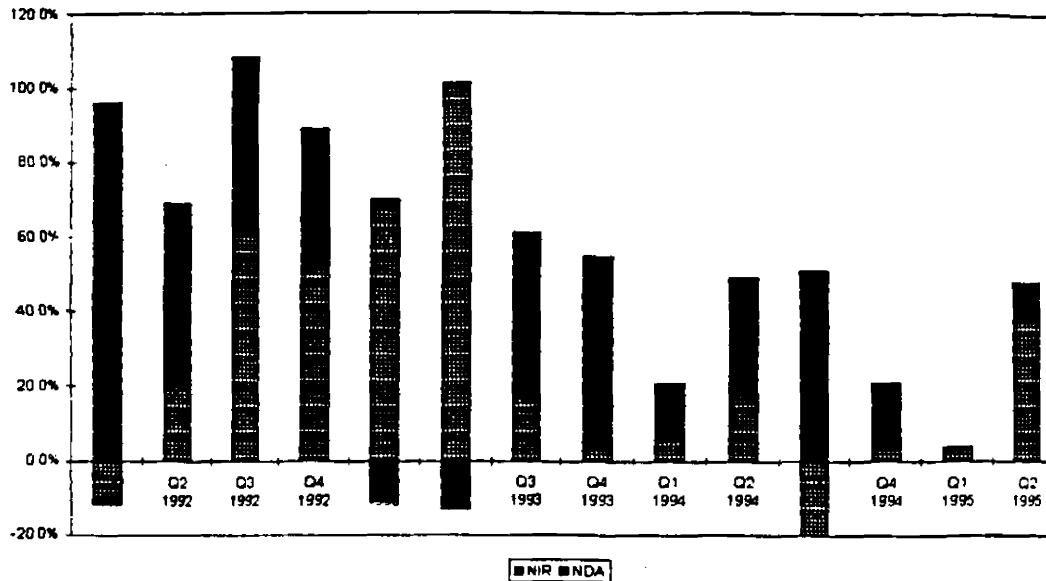
Source: calculated from IMF (October 1995) data, Tables 24 and 25, pp. 24-25

The average monthly growth of NIR was 17% in 1992, 18% in 1993 and negative in 1994 with -10%, reflecting the large intervention by the monetary authorities to support the rouble. In the first half of 1993 NIR were dominant in monetary base growth. A large monetisation of foreign assets reflected the trade surplus, and at the same time commercial banks responded to the credit tightening by moving some of their excess reserves onto the market. This slowed down in the second half of 1993. From then to the end of 1994, Central Bank credit to the government was the main factor in monetary expansion. In the first half of 1995, net international reserves were again dominant.

Net domestic assets grew monthly on average by 23% in 1992, 55% in 1993 and 15% in 1994. Net credit to the enlarged government grew at a monthly average rate of 14% in 1992, 42% in 1993 and 13% in 1994, while gross credits to commercial banks grew respectively at monthly average rates of 29%, 10% and 7%.

Total CBR credit flows per quarter as a percent of GDP accelerated sharply in the second quarter of 1992. They declined substantially in the third quarter of 1993 and first quarter of 1994 before picking up again in the third quarter of 1994 (Table III.III.2).

Table III.III.2 - Russia: Total Quarterly Flows of CBR Credit as a % of quarterly GDP, end of quarter, 1992-1995

Quarter	Total/g	Budget/a	GCB/b	NCB/c	FSR/d	GDP/e
1992						
Q1	6.0%	-6.1%	9.9%	7.3%	2.2%	1831.9
Q2	43.8%	25.2%	8.6%	-3.7%	10.0%	2733
Q3	26.8%	9.7%	14.5%	-1.2%	2.6%	4900
Q4	19.9%	-3.8%	18.3%	10.1%	5.4%	8600
Year	27.4%	6.6%	15.7%	4.5%	5.0%	18064.9
1993						
Q1	17.8%	3.9%	7.9%	2.2%	6.0%	13200
Q2	3.6%	-4.7%	6.9%	6.6%	1.5%	22000
Q3	17.8%	11.4%	5.4%	2.3%	1.0%	48500
Q4	7.2%	6.5%	0.9%	-0.8%	-0.1%	78600
Year	13.8%	7.0%	5.4%	1.9%	1.5%	162300
1994						
Q1	8.8%	6.9%	1.9%	0.9%	0.0%	91800
Q2	9.7%	7.8%	2.0%	1.1%	-0.1%	133200
Q3	13.9%	11.9%	2.0%	0.5%	-0.1%	159600
Q4	7.9%	8.5%	-0.6%	-2.1%	0.0%	226400
Year	13.7%	10.9%	2.4%	0.2%	0.4%	611000
1995						
Q1	2.3%	0.4%	1.9%	2.3%	0.0%	255100
Q2	1.3%	3.2%	-1.9%	-3.9%	0.0%	360500

a. budget means net credit to enlarged government which includes federal and local government, and extra budgetary funds.
b. GCB means gross credits to commercial banks including excess reserves credits. The monetary base should therefore be calculated in its broad definition including excess reserves deposits at the central bank.
c. NCB means net credit to commercial banks which means excluding excess reserves credits and at this time the monetary base should be calculated without excess reserves.
d. FSR means credit to former Soviet republics
e. Bn Rbs, revised in 1995.
g. Total = Budget+GCB+FSR

Source: calculated with data from CBR.

The money multiplier (k) is defined as the ratio of the money supply (M2) to the monetary base (MB):

(3) k = M2/MB

where M2 is defined as currency outside banks plus rouble deposits (i.e. demand deposits plus time and saving deposits); and MB is the monetary base equal to minimum required reserves plus excess reserves of the commercial banks and total currency issued by the central bank (this is shown in the liability side of the CBR balance sheet in Table III.III.1, p.79); The multiplier will tend to fall (rise) whenever the Central Bank raises (lowers) the banks' minimum reserve requirements and whenever commercial banks raise (lower) their excess reserves.

Two multipliers k1 and k2 are represented in Figure III. III. 1, corresponding to the narrow (MB1) and broad (MB2) (including excess reserves) definition of the monetary base.

Figure III III 1 Money multipliers
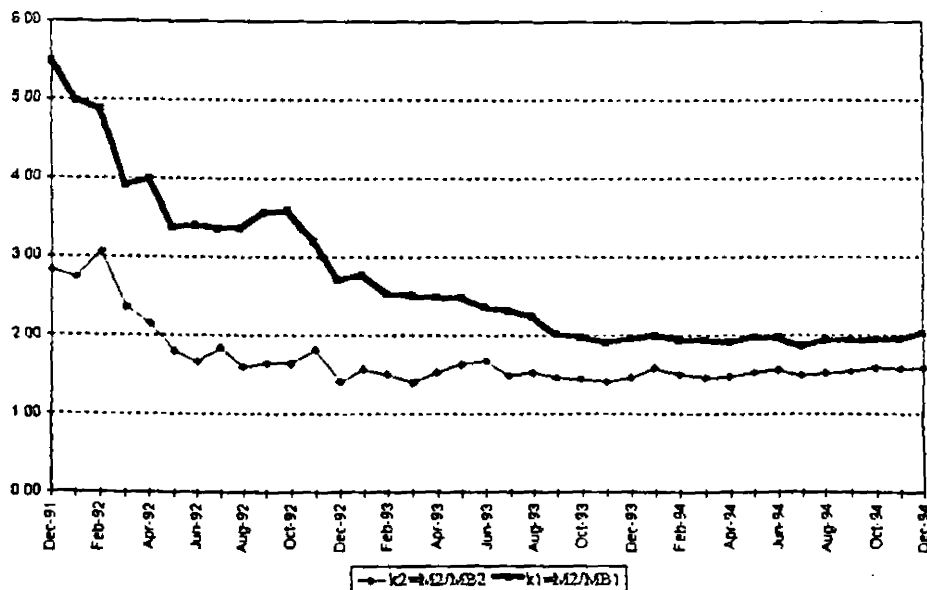
Source: Table S.III.III.8, statistical appendix

k1 and k2 fell sharply at the start of 1992 when minimum reserve requirements were raised and have fluctuated moderately since then.

A - Minimum reserve requirements

The increase in minimum reserve requirements at the beginning of 1992 was from 2% to 15% on short time deposits (term less than one year) and 10% on longer term deposits. In April 1992, the requirements were raised to 20% and 15% for short and long term deposits respectively[3]. But these rather high requirements were in practice not enforced. The actual minimum required reserve deposit ratio at the end of December 1992 amounted to no more than 11%. This implies a difference of 6.5 percentage points between the 17.5% average required and the actual 11% reserved. (Table S.III.III.9. statistical appendix). There is no one obvious explanations for the difference between minimum reserve requirement imposed by law and the actual minimum reserves held by banks. Various hypotheses may be advanced:

1. The method of calculation of minimum reserve requirements permitted a certain amount of manipulation. Banks were allowed to choose the deposit base on which reserve requirements were calculated. Two different methods were available: 1/ the average of the balances at the end of consecutive 5 day periods each month; 2/the average on daily balances for all days in the month. In addition, all banks were required to provide deposit balances on the first day of the month. Provision of deposit balances relating to the 16th day of the month was optional. This method allows for two or more banks to collude in shifting deposits in order to obtain a more favourable (lower) reserve requirement[4]. The fact that the calculation took place only once a month gave added opportunity for collusion between banks. This method of calculation was eventually changed in 1995.

2. There was no required minimum reserve on centralised credits, which means that 30-50% of banks' reserves were not covered.

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[3] In May 1995, minimum reserve requirements were changed as follows: on deposits up to 30 days, 20%; between 30 and 90 days, 14%;, over 90 days 10%.

[4] IMF (1995), p. 202.

B - Excess reserves

By contrast with compulsory minimum reserve requirements, the level of excess reserves held by commercial banks was high[5]. This was especially surprising given that excess reserves are deposited by commercial banks at the Central bank on a non-interest bearing account; they are voluntary and can be withdrawn at any time. These excess reserves were in part due to the inefficiency of the inter-bank payment system effected through the CBR inter branch clearing system.[6]

The high level of excess reserves (Figure III.III.2) in either nominal or real terms through 1992 and 1993 created a risk of a new acceleration of the money supply even in the absence of increased credits. In August 1993, for example, compulsory reserves (that is minimum reserve requirements) stood at Rbs 1615.1 bn while funds held in CBR correspondent accounts amounted to Rbs 4407 bn (that is excess reserves) (Table III.III.9, statistical appendix). If all the banks with excess reserves had decided to use them at the same time to expand credit, the money supply could have increased by 4 times.

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[5] See Granville (1995) for a discussion on excess reserves.

[6] The IMF (1993b), p. 26.

Figure III III 2 Money multiplier and excess reserves ratio -December 1991 -December 1994
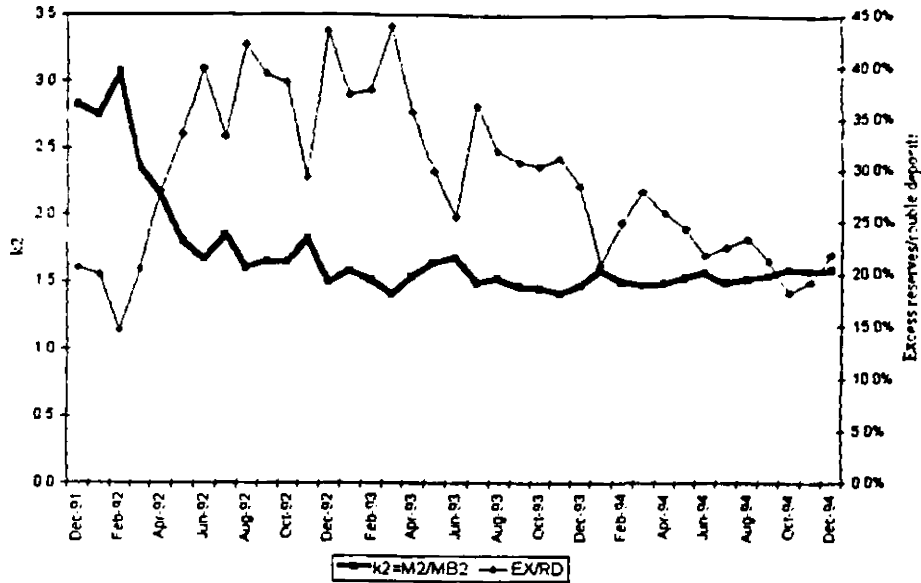
Sources: Tables S.III.III.8 and S.III.III.9, statistical appendix

III.2 - The link between money Growth and inflation

On the basis of a standard Fisher equation, the behaviour of inflation is described as
follows:

(4) $\dot{P} = \dot{M} + \dot{V} - \dot{Y}$

where P is the consumer price index, M is M2 the rouble money supply, V is the M2
velocity and Y is the real GDP, (.) over indicates that it is the rate of change.

The relation in Russia between the money supply and prices was empirically tested. A one
and four-month lag was observed between the rate of growth of M2 and of prices. Some
of the monthly jumps in the consumer price inflation curve correspond to the progressive
liberalisation of administrative prices of energy, utilities, public transport and food
products, and also to price increases of the same utilities which generally occurred each
year at the beginning of January (Figure III.III.3).

Figure II III 3 Russia - Inflation and Rbs M2 Growth, lagged one month and 4 months, 3 months moving average
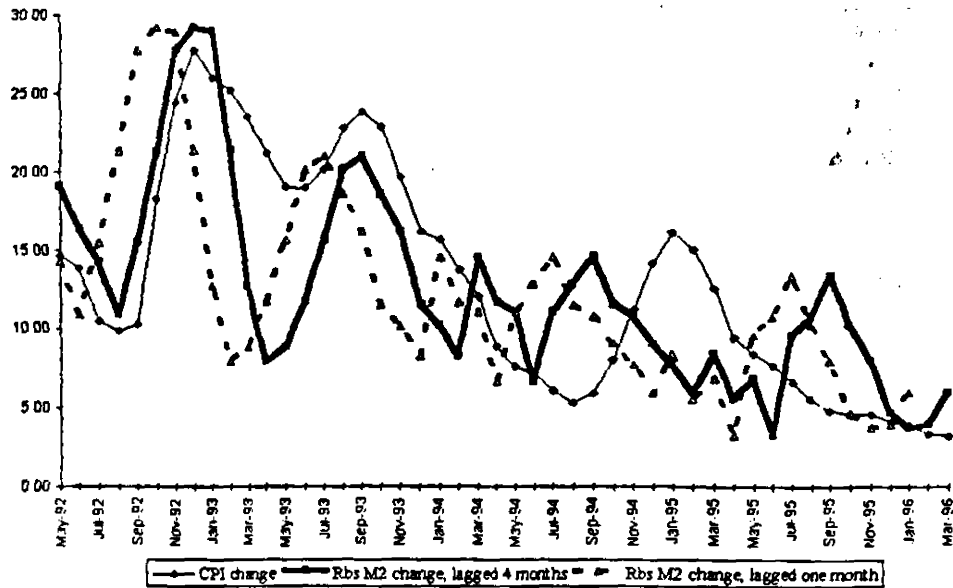
Source: calculated with data from Table S.III.III.1, Statistical appendix.

In order to test the relation between the inflation rate and the money supply, I first run a cointegration test. I used the Johansen tests in *Econometric Views*[7] which determined the number of cointegrating equations. I was however unable to reach any conclusive results. I could not reject no cointegration at 5 % significance level.. I suggest that I had too small a sample of observations to run successfully a cointegration test. I then tested for the stationarity of the two time series, the inflation rate and the money supply. I used the augmented Dickey Fuller test (ADF) which revealed that the data were non stationary, I therefore differenced the money supply and the inflation series. Table III.III.4 shows the result of a regression of the first difference of the logarithm of the inflation rate (DLINFPLUS) and the second difference of the logarithm of the money supply (DLM2,2) in 1992-1996 with lags covering six months. 34% of inflation is explained by the regression. The one-month and four-months lagged coefficients on M2 are statistically significant as indicated by their respective t-ratios of 3.1 and 2.4.

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[7] I used EVIEWS (1995, Version 2.0) as a software to run all regressions. EVIEWS was programmed by D.M.Lillien, R.Startz, S.Ellsworth, J.Noh, R.Engle. It was documented by R.E.Hall, D.M.Lilien, G.Sueyoshi, R.Engle, J.Johnston, S.Ellsworth.

Table III.III.4 Money growth and consumer price changes: OLS, sample period August 1992 - June 1996

D(LINFPLUS) = C(1) + C(2)*D(LM2,2) + C(3)*D(LM2(-1),2) + C(4)*D(LM2(-2),2) + C(5)*D(LM2(-3),2) + C(6)*D(LM2(-4),2) + C(7)*D(LM2(-5),2) + C(8)*D(LM2(-6),2)

LS // Dependent Variable is D(LINFPLUS)
Sample(adjusted): 1992:09 1996:06
Included observations: 46 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.001643	0.004209	0.390356	0.6985
D(LM2,2)	0.047437	0.077025	0.61587	0.5417
D(LM2(-1),2)	0.28602	0.091098	3.139711	0.0033
D(LM2(-2),2)	0.136064	0.080045	1.69984	0.0973
D(LM2(-3),2)	0.187045	0.074787	2.501056	0.0168
D(LM2(-4),2)	0.245884	0.07199	3.415514	0.0015
D(LM2(-5),2)	0.15104	0.081745	1.847694	0.0724
D(LM2(-6),2)	0.147966	0.075465	1.960716	0.0573

R-squared	0.345899	Mean dependent var		-0.001534
Adjusted R-squared	0.225407	S.D. dependent var		0.031015
S.E. of regression	0.027297	Akaike info criterion		-7.045204
Sum squared resid	0.028314	Schwarz criterion		-6.727179
Log likelihood	104.7685	F-statistic		2.870715
Durbin-Watson stat	1.590455	Prob(F-statistic)		0.016547

D(LINFPLUS)=first difference of the logarithm of (1+INF/100) with INF being the inflation rate; D(LM2,2)=second differences in the logarithm of M2.
The Breusch-Godfrey serial correlation LM test[8] did not deduced any autocorrelation of order 1 and 2 at 5% level of significance.

Re-running the regression with only the one-month and four month lag on second difference of in M2 (Table III.III.5), we obtain the following equation

(5)   D(LINFPLUS)   =   -0.0021180056   +   0.11724612*D(LM2(-1),2)   +

0.12337698*D(LM2(-4),2)

---

[8] Eviews, User's guide, 1995, p.184: "The serial correlation LM test is an alternative test for general serial correlation. It uses the Breusch-Godfrey large sample test for autocorrelated disturbances. It is applicable whether the disturbances follow an AR(p) or MA(p) process, where p can be specified at any positive order. It is also applicable whether or not lagged values of the dependent variable appear among the regressors."

This suggests that a one percentage point increase in money growth is associated with 0.1 extra percentage point of inflation the following month, and another 0.1 four months later.

Table III.III.5 Money growth and consumer price changes: OLS, sample period August 1992 - July 1996

D(LINFPLUS) = C(1) + C(2)*D(LM2(-1),2) + C(3)*D(LM2(-4),2)

LS // Dependent Variable is D(LINFPLUS)				
Sample(adjusted): 1992:07 1996:07				
Included observations: 49 after adjusting endpoints				

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.002118	0.00426	-0.4972	0.6214
D(LM2(-1),2)	0.117246	0.058342	2.00965	0.0504
D(LM2(-4),2)	0.123377	0.058341	2.114758	0.0399
R-squared	0.132806	Mean dependent var		-0.002514
Adjusted R-squared	0.095102	S.D. dependent var		0.031323
S.E. of regression	0.029796	Akaike info criterion		-6.967487
Sum squared resid	0.040839	Schwarz criterion		-6.851661
Log likelihood	104.1755	F-statistic		3.522316
Durbin-Watson stat	1.522338	Prob(F-statistic)		0.037729

a. The Breusch-Godfrey serial correlation LM test deduced the absence of autocorrelation of order 1 and 2 at 5% level of significance.

The lack of evidence of contemporaneous correlation between money and price movements reflects the lagged response of inflation to changes in the monetary expansion. Changes in the rate of monetary expansion result first in short term fluctuations in real money balances and velocity, and only subsequently in the rate of inflation. But making allowance for lags in the response of inflation to money growth results in a relatively good fit. (Figure III.III.4).

Figure III.III.4 Inflation and M2 forecasts, 1 and 4 months later
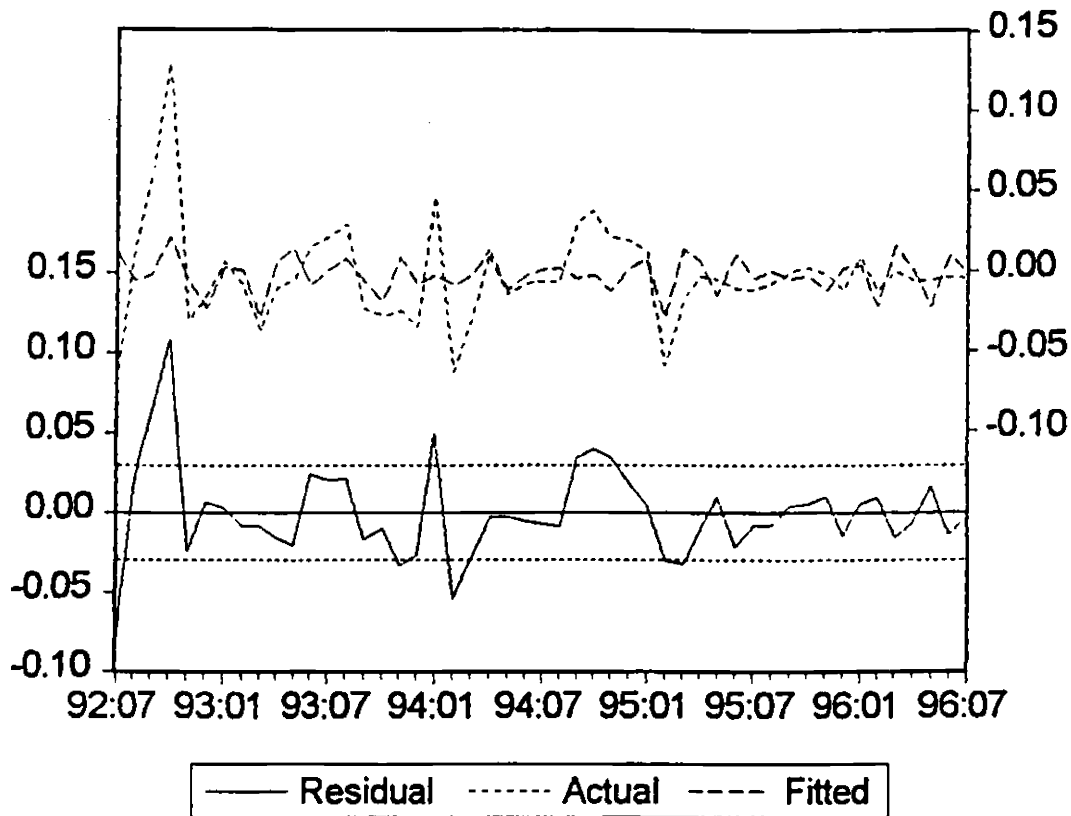
Some of the divergence can be associated either with changes in velocity or changes in real output.

In order to test if changes in output were significant, I regressed the residual (RESID2) of the inflation regression (equation 5) on the first difference of the logarithm of real GDP (DLRGDP). I did not find any statistical evidence (t-statistics in parenthesis).(The Breusch-Godfrey serial correlation LM test deduced the absence of autocorrelation of order 1 and 2 at 5% level of significance).

(6) RESID2 = 0.00015677332 + 0.019578371*D(LRGDP)

$$(0.04) \qquad (0.45)$$

R-squared	0.004760
Adjusted R-squared	-0.016876
S.E. of regression	0.029721
Sum squared resid	0.040634
Log likelihood	101.6754
Durbin-Watson stat	1.498403

I then regressed the residual of equation (5) on the first difference of the logarithm of the nominal interest rate (using T-bills yields as a proxy - TBRET, calculated here as TBRET/100 +1 and noted TBRET PLUS). From equation (7), we see that nominal interest rates are statistically significant at the 10% level (The Breusch-Godfrey serial correlation LM test deduced the absence of autocorrelation of order 1 and 2 at 5% level of significance).

(7) RESID2 = -0.0013974151 + 0.37165414*D(LTBRETPLUS)

$$(-0.4) \qquad (1.95)$$

R-squared	0.095566
Adjusted R-squared	0.070443
S.E. of regression	0.021323
Sum squared resid	0.016368
Log likelihood	93.33061
Durbin-Watson stat	1.809049

Increases in velocity and declining real balances seem to explain the divergence between the rate of inflation and the monetary expansion. This assumption is further tested in the following section.

III.3 Velocity and demand for money

Velocity of money is defined as the ratio of GDP to the money supply or the inverse of the ratio of M2 to GDP. An increase/decrease in monetary velocity while real GDP is constant means that cumulative price increases are greater/smaller than cumulative increases in the money supply (M2 here). The higher the velocity, the higher is inflation (given nominal money growth and real GDP).

From 1992 to 1996[9], the behaviour of the velocity of money both for Rouble M2 and for M2 including foreign deposits (our data stopped in 1994) was not stable (Figure III.III.5). Such variability may be explained by the money demand function itself, changes in interest rates and inflation expectations.

Figure III.III.5 Rb M2 and Broad M2 (including foreign deposits) velocity
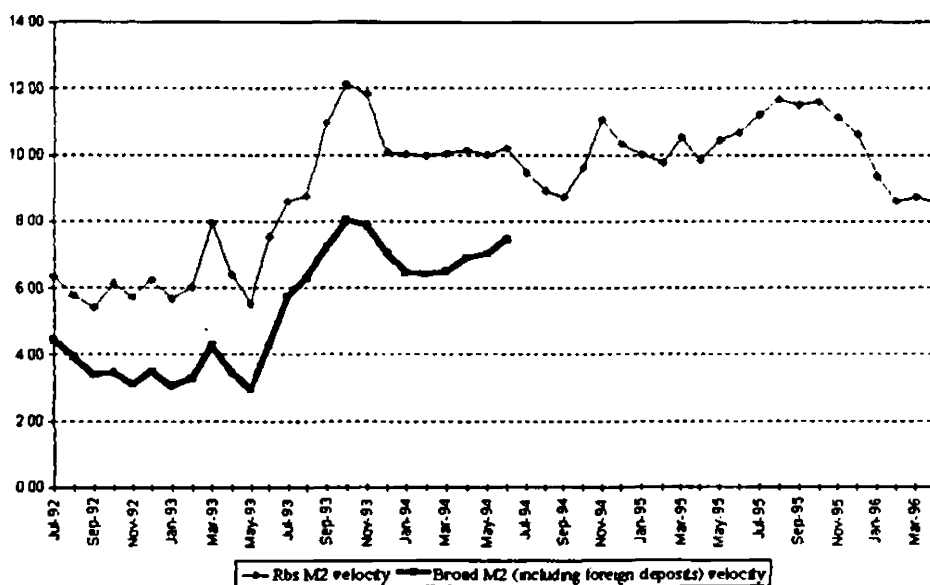
Source: Table S.III.III.2, Statistical Appendix.

The observed relationship between real money balances and nominal interest rates seems to support the role of money demand shifts in explaining inflation and velocity movements. In Figure III.III.6 we plot movements of the real money stock together with

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[9] The behaviour of velocity is studied from July 1992 to June 1996 because the exchange rate was only unified in July 1992.

those of the nominal interbank interest rate Assuming a lag of three months between the amount of real balances available in the economy and the nominal interbank interest rate (i at time t+3), it appears that changes in real balances have been accompanied by inverse movements in the rate of return of monetary assets

Figure III.III.6 Real money balances and nominal interbank interest rates lagged 3 months
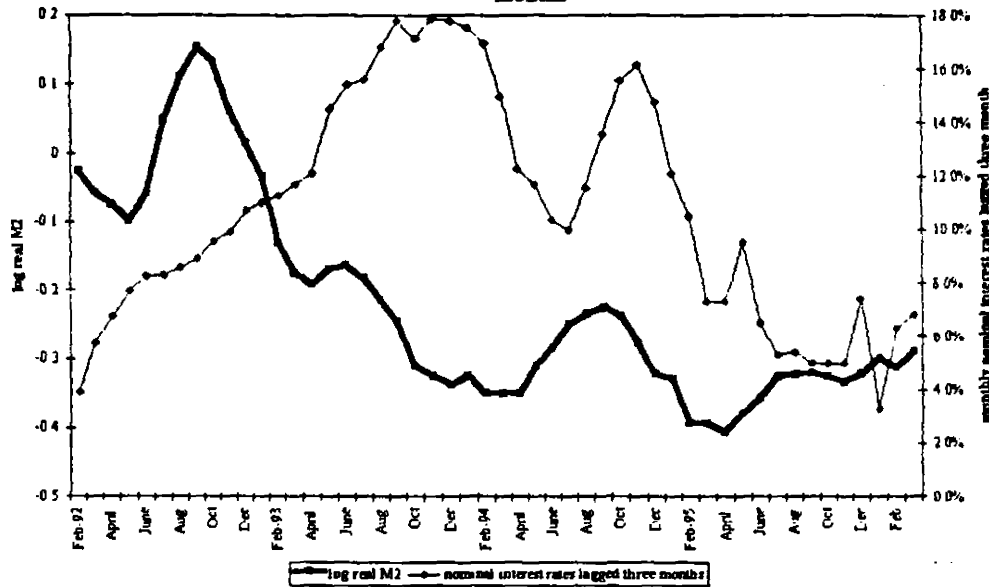
Source: calculated with data from Granville, Monetary Report, various issues

I check this observation by doing a simple correlation of the nominal interbank interest rate and real money balances (Figure III.III.7) (first difference of the logarithms). The coefficient of correlation was negative in the case of nominal interest rates so the relation between nominal interest rates and real balances was confirmed.

Figure III.III.7 Correlation between nominal (interbank) interest rates and real money balances, June 1992 - June 1996
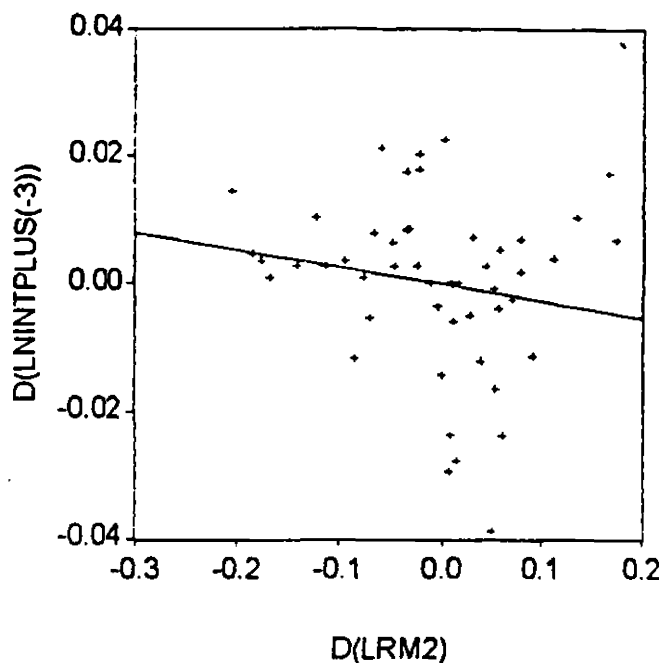
coefficient of correlation = -0.17

Rbs M2 is composed of currency in circulation and rouble deposits. Rouble deposits as a share of GDP varied widely over the period (Figure III.III.8) while currency outside banks stayed relatively constant suggesting that people needed broadly the same amount of currency for transactions. This leaves the question of the behaviour of foreign exchange deposits. There are reported residents' foreign exchange deposits, excluding the deposits in the Vneshekonombank that were "frozen" in late 1991[10].

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[10] IMF (1995), p.31.

Figure III.III.8: Components of broad money as a percent of yearly average GDP
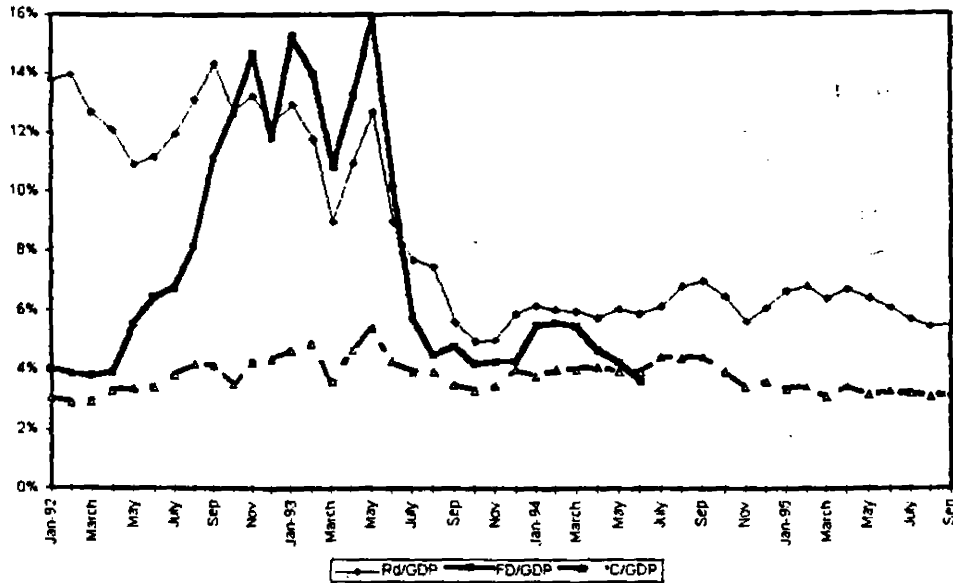
RD: Rouble Deposits, FD: Foreign Deposits, C: Currency.

Source: calculated with data from Table S.III.III.3, Statistical appendix.

Foreign exchange deposits grew markedly during 1992, rising from 19% of total broad money in January 1992 to 43% in June 1993. The increase in the first half of 1993 was mainly due to the depreciation of the rouble against the dollar during 1992 and 1993. Even if these deposits were not evenly distributed, their magnitude suggests that a large proportion of firms held such deposits presumably as a hedge against inflation and rouble depreciation. The proportion of foreign exchange deposits in broad money (Rbs M2 + foreign exchange deposits) had declined to 27%. in June 1994 (Figure III.III.9)

Figure III.III.9 Composition of money holdings. 1992-1994
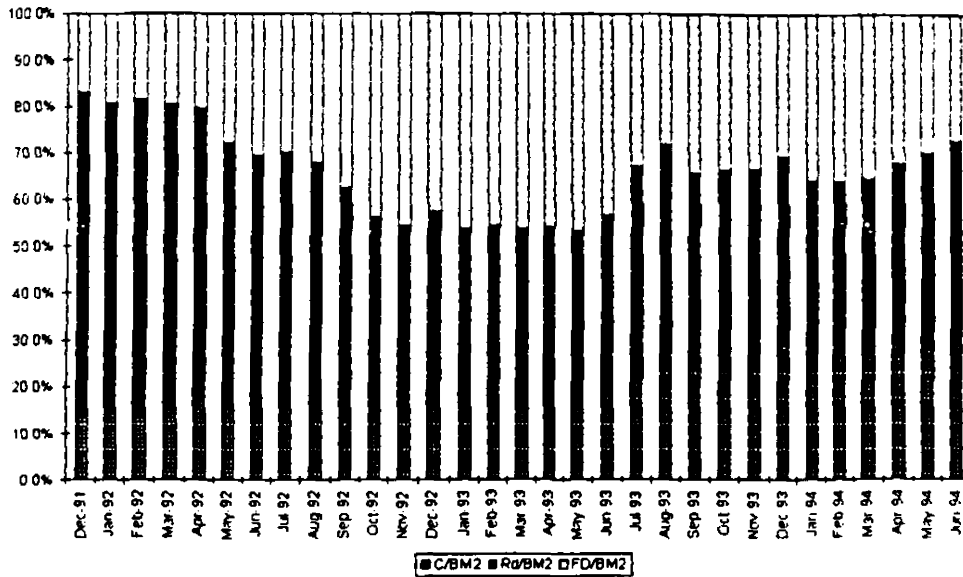
Source: calculated with data from Table S.III.III.3, Statistical appendix;

The standard specification used in the analysis of money demand is the following:

$$(8) \, D\ln\left(\frac{M}{P}\right) = \alpha\left[\ln\left(\frac{M}{P}\right)^{D} - \ln\left(\frac{M}{P}\right)_{-1}\right]$$

$$(9) \, \ln\left(\frac{M}{P}\right)^{D} = \ln k + \beta_1 \ln y + \beta_2 \ln(1 + i_{GKO}(-1)) + \beta_3 D\ln(E^e(-1)) + \beta_4 D\ln p^e$$

$D = d / dt$ and expected signs are $0 < \alpha \leq 1; \beta_1 > 0; \beta_2, \beta_3, \beta_4 < 0$

where M is the money stock, p is the price level, i_{GKO} is a short term nominal interest rate on T-bills yields, y is the GDP, p^e is the expected price level and E^e is the expected return to foreign monetary assets (proxied by the rate of nominal exchange rate depreciation). Equation (8) reflects our assumption of slow adjustment to desired real money stock. Equation (9) specifies economic agents' desired real money stock based on the current number of transactions, the previous period opportunity costs of holding money and inflation expectations.

Like the return on goods and services, expected inflation is also typically included in estimated money demand functions as an opportunity cost argument. However this term was highly variable in Russia and should in principle be included as a specific argument of empirical money demand equation. But if we assume expectations to be static, the current inflation is used as proxy for the expected future inflation rate as in a random walk (RW) equation.

(9) $D\ln p^e = D\ln p_{-1} + \varepsilon$

These are referred as RW price expectations in the money demand results reported below. However, inflation rate series do not, in general random walks, imply the existence of information in the residuals of the random walk model which could improve agents' forecasting of future inflation. Consequently an alternative naive model of price expectations may be formulated in terms of forecasts from autoregressive (AR) equations for the rate of inflation in the general form:

(10)
$$D\ln p^e = const + \varphi_1 D\ln p_{-1} + \varphi_2 D\ln p_{-2} + \varphi_3 D\ln p_{-3} + \varphi_4 D\ln p_{-4} + \varphi_5 D\ln p_{-5} + \varepsilon$$

Also one more variant of autoregressive (AR*) expectations is considered on the assumption that people take into account money growth lagged up to 6 months as well as the previous month's inflation.

(11)
$$D\ln p^e = const + \varphi_1 D\ln p_{-1} + \lambda_1 D\ln M2 + \lambda_2 D\ln M2_{-1} + \lambda_3 D\ln M2_{-2} +$$
$$\lambda_4 D\ln M2_{-3} + \lambda_5 D\ln M2_{-4} + \lambda_6 D\ln M2_{-5} + \lambda_7 D\ln M2_{-6} + \varepsilon$$

The estimated results are shown below. The one period forecasts from the estimated equations were used as an alternative to the random walk measure of expected inflation and are referred to as AR Price Expectations in the money demand results are reported below. The OLS estimates for the real money equation presented here are those implied

by equation (8) and (9) applied to M2 as a definition of money for both the AR and the RW price expectations.

The real money demand equation is estimated first with inflation expectations as a separate input for RW and AR expectations (Tables III.III.6 et III.III.7). First difference series are used since all of them are non-stationary. As said above, T-bills yields are used as proxy for the short term nominal interest rate.

Table III.III.6 Real money demand, Random Walk Expectations

$D(LRM2) = C(1) + C(2)*D(LRGDP) + C(3)*D(LTBRETPLUS(-1)) + C(4)*D(LER(-1)) + C(5)*D(LINFPLUS(-1)) + C(6)*D(LRM2(-1))$

LS // Dependent Variable is D(LRM2)
Sample(adjusted): 1993:07 1996:06
Included observations: 36 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.003507	0.012505	-0.280438	0.7811
D(LRGDP)	0.437246	0.135083	3.236872	0.0029
D(LTBRETPLUS(-1))	-1.147364	0.577531	-1.986673	0.0562
D(LER(-1))	-0.057047	0.166833	-0.34194	0.7348
D(LINFPLUS(-1))	-0.485976	0.443752	-1.095151	0.2822
D(LRM2(-1))	0.094362	0.157749	0.598174	0.5542
R-squared	0.398588	Mean dependent var		-0.00954
Adjusted R-squared	0.298352	S.D. dependent var		0.069996
S.E. of regression	0.058632	Akaike info criterion		-5.521937
Sum squared resid	0.103131	Schwarz criterion		-5.258017
Log likelihood	54.31307	F-statistic		3.976514
Durbin-Watson stat	2.018206	Prob(F-statistic)		0.006928

The absence of autocorrelation of order 1 and 2 were deduced at 5% level of significance using the Breusch-Godfrey serial correlation LM test.
RGDP = real GDP; TBRETPLUS (-1) = $(1+i_{oKo})$ lagged one month; ER(-1) = average nominal exchange rate lagged one month; INFPLUS (-1) = $1+\pi$ lagged one month; RM2 (-1)= Real M2 lagged one month

Table III.III.7 Real Money demand, Autoregressive price expectations(AR)

$D(LRM2) = C(1) + C(2)*D(LRGDP) + C(3)*D(LTBRETPLUS(-1)) - C(4)*D(LER(-1)) + C(5)*D(LINFPLUF) + C(6)*D(LRM2(-1))$

LS // Dependent Variable is D(LRM2)
Sample(adjusted): 1993:07 1996:06
Included observations: 36 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.002659	0.01258	-0.211343	0.834
D(LRGDP)	0.440763	0.136188	3.236443	0.0029
D(LTBRETPLUS(-1))	-1.209099	0.576295	-2.098054	0.0444
D(LER(-1))	-0.053914	0.168424	-0.320111	0.7511
D(LINFPLUF)	-0.33414	0.411558	-0.811888	0.4233
D(LRM2(-1))	0.110413	0.157569	0.700728	0.4889
R-squared	0.387991	Mean dependent var		-0.00954
Adjusted R-squared	0.28599	S.D. dependent var		0.069996
S.E. of regression	0.059146	Akaike info criterion		-5.504471
Sum squared resid	0.104949	Schwarz criterion		-5.240551
Log likelihood	53.99869	F-statistic		3.803778
Durbin-Watson stat	1.980476	Prob(F-statistic)		0.0087

Table III.III.8 Real Money demand, Autoregressive price expectations(AR*)

$D(LRM2) = C(1) + C(2)*D(LRGDP) + C(3)*D(LTBRETPLUS(-1)) + C(4)*D(LER(-1)) + C(5)*D(LINFPLUF1) + C(6)*D(LRM2(-1))$

LS // Dependent Variable is D(LRM2)
Sample(adjusted): 1993:07 1996:06
Included observations: 36 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.007334	0.011474	-0.639203	0.5275
D(LRGDP)	0.433719	0.123483	3.512386	0.0014
D(LTBRETPLUS(-1))	-1.068616	0.522818	-2.043953	0.0498
D(LER(-1))	-0.011501	0.153741	-0.074808	0.9409
D(LINFPLUF1)	-1.344279	0.499762	-2.68984	0.0116
D(LRM2(-1))	0.270438	0.150684	1.794734	0.0828
R-squared	0.496077	Mean dependent var		-0.00954
Adjusted R-squared	0.41209	S.D. dependent var		0.069996
S.E. of regression	0.05367	Akaike info criterion		-5.698795
Sum squared resid	0.086414	Schwarz criterion		-5.434875
Log likelihood	57.49652	F-statistic		5.906589
Durbin-Watson stat	2.100134	Prob(F-statistic)		0.000648

The results are close for RW and AR specifications but quite different for AR*. Both the estimation of real GDP growth and the impact of T-bill returns on the growth of real money balances are robust over the three specifications. For all three specifications, the negative effect of increases in T-bill returns on real money balances is shown as statistically significant. In the first two specifications, the chosen proxy for inflation expectations is insignificant. By contrast, in the AR* specification, the inflation expectations proxy is significant at the 5% level.

The bulk of stability tests (Chow breakpoint and Chow forecast Tests, recursive estimation test) show all three specifications as fairly stable.

To summarise, Russia inflation is demonstrated here to have been primarily determined by monetary expansion but also by money velocity which depends, according to the money demand equation, on real GDP, T-bill yields, and inflation expectations using three different proxies and some other factors included in the disturbance term (as for instance expectations not reflected in the chosen interest rate proxy).

THE CAUSES OF INFLATION

FISCAL AND QUASI FISCAL EXPENDITURES

To understand better the inflationary pressures in the Russian economy during the first years of transition, it is important to look more closely at monetary financing of government-sector deficits. While a polemic developed between Professor Sachs and the International Monetary Fund (IMF) on the importance of upfront external financing of the budget deficit, measured fiscal expenditures and external government obligations have accounted for a relatively low proportion of money creation. Inflation in Russia has been caused much more by subsidies or transfers to the enterprise sector, designated here as quasi-fiscal expenditures.

IV.1 - Measuring the budget deficit: a problem of definition

The budget deficit in Russia can be defined either as the cash deficit of the enlarged government sector or as the cash deficit of the consolidated state budget. If defined as the enlarged government deficit - that is, taking into account import subsidies and the statistical discrepancy - the deficit amounted in 1992 to 18.8% of GDP. The cash deficit of the consolidated budget comprising federal and local governments amounted to 11.1% of GDP (Table III.IV.1).

Looking at the consolidated budget, Professor Jeffrey Sachs argued that stabilisation would have been within reach 1992 if financial aid had been delivered[1]. The IMF for its part focused on the enlarged definition and maintained that Russia was far from fiscal balance in the first half of 1992 and therefore Western aid should not be delivered. The argument centred on the import subsidies: were they a source of inflationary pressures or not?

Table III.IV.1 - Enlarged Government Deficits (% of GDP)

	1991	1992	1993	1994(preliminary)
1.Enlarged government balance(a)	-16.5	-20.5	-8.5	-10
2. Consolidated state balance		-11.1	-6.7	
of which				
- federal government balance		-12.5	-7.3	-10.4
- local government balance (b)		1.3	0.6	
3. Extra-budgetary funds balance(b)		2.5	0.6	
4. Unbudgeted federal import subsidies		11.9	2.3	0
5. Statistical discrepancy and float		-1.7	-0.6	
6. TOTAL FINANCING(1-5)		-18.8	-7.9	
Nominal GDP (in trn of Rbs)		18.1	162.3	630

a. Enlarged government deficit (2+3-4) defined as federal and local governments, plus extra-budgetary funds, plus unbudgeted import subsidies; average of quarterly ratios to GDP. For 1991, annual budget deficit (concept defined in IMF, 1992) over annual GDP. Data based on information from the Ministry of Finance, i.e. not taking account of float and statistical discrepancy.
b. unconsolidated revenues and expenditures (inclusive of transfers).

Source: IMF (1995), Table 23, p. 84 .

Import subsidies (abolished in 1994) were financed externally by tied credits - that is, Western bilateral export credits - and as such were not inflationary in the short term. As Sachs (1994b) emphasises

'this kind of import subsidisation [...] did not, of course, lead directly to monetary financing, since the 'enlarged deficit' was exactly matched by the foreign credit in 1992.[2]

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[1] Sachs, (1994b, 1994c)

[2] Sachs (1994b), p. 25.

This explains the relatively low domestic CBR financing compared with the size of the budget deficit if import subsidies are included (Tables III.IV.1 and III.IV.2). The extrabudgetary funds were usually in surplus, so not relevant from the standpoint of inflationary financing.

Table III.IV.2- Financing of the enlarged government (% of GDP)

	1992	1993	1994:QII
Total Financing	18.8	7.9	10
1.Domestic financing	6.7	5.5	9.7
Domestic bank financing	5.6	5	9.6
Monetary authorities	...	6.2	8.6
2. Foreign financing (i+ii)	12.1	2.6	0.2
i -. Foreign disbursements	12.7	2.7	0.9
Tied credits	11.6	2.7	0.7
untied credits	0.6	0.4	0.15
ii - Principal payments, cash	-1.1	-0.2	-0.6
Nominal GDP (Rtm)	18.1	162.3	128.4

Source: IMF (1995), Table 27, p. 88.

Even if Sachs was right to argue that the measured budget deficit was overstated by the IMF, one can contest his view that stabilisation was achievable in 1992. The reason has to be found in the so-called 'directed credits'[3].

Directed credits were used for two purposes:

-1/to provide liquidity to the banking system

-2/to support specific enterprises, sectors and regions in Russia and in the Former Soviet Republics (FSR). Because state enterprises undertook a large part of social expenditures (housing, kindergartens, medical care etc.) and unemployment insurance, this gave them the potential weight to obtain credits at subsidised interest rates[4]. Since these credits were directly funded by the Central Bank of Russia (CBR), they were

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[3] Defined in Part I, Chapter III.

[4] Boycko and Shleifer, 1994.

highly inflationary. But they did not appear in the budget. Both the budget deficit and the directed credit programmes were financed - at least in 1992 - by money creation. This confusion of fiscal and monetary policy made the system of transfer to enterprises complex and non transparent[5].

A principal justification offered for enterprise support was to keep the level of employment stable. As pointed out by various authors[6], it would have been cheaper - because more effectively directed - to have financed direct provision of welfare benefits to workers. Directed credits were allocated following requests from enterprises to the Supreme Soviet, the government and even in some cases directly to the CBR[7]. The commercial banks were left as little more than the passive instruments of such decisions - reminiscent of their position under the old-command-administrative system. The credits themselves were rarely reimbursed[8].

As for supplying liquidity to the banks, faster change in the commercial banking system would have been promoted by introducing a straight discount window. Instead, credit auctions were only introduced in February 1994 and even then represented a small share of refinancing to banks. (Lombard credits auctions began as late as April 1996).

As shown in Table III.IV.3, Central Bank credits to enterprises fell into two categories:

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[5] World Bank and IMF(1993), Freinkman (1994).

[6] Easterly and Vieira da Cunha (1993), Sachs (1993).

[7] Freinkman (1994), p. 7: "the CBR itself initiated special subsidised directed credit programs in 1992 (about 30% of total CBR directed credits), which were targeted at expanding working capital of enterprises and reducing the burden of the arrears crisis."

[8] Hansson (1991), p. 22 quoting the Wall Street Journal Europe (6 June 1991) states that: "In 1990, the Soviet government wrote off Rbs 93 bn of bad loans to the agricultural sector alone."

Table III.IV.3 - Russia: Breakdown for 1992 of total CBR credits in bn of Rbs (Rbn) and % of GDP.

	1992 in Rbn	% ratio to 1992 GDP	1993 in Rbn	% ratio to 1993 GDP
Total CBR credits a	5703	31.6%	24790	15.3%
Total GDP (yearly) in Rbn	18064		162301	
Budget	1189	6.6%	11276	6.9%
Enterprises of which:	3608	20.0%	11111	6.8%
via commercial banks	2804	15.5%	8150	5.0%
Agriculture and Roskleboprodukt	1300	7.2%	3616	2.2%
Energy	400	2.2%	193	0.1%
Northern Territories	300	1.7%	2134	1.3%
Industry	500	2.8%	466	0.3%
Other	304	1.7%	421	0.3%
Regions with urgent needs			1320	0.8%
via Ministry of Finance	804	4.5%	2961	1.8%
Working capital	600	3.3%		
Investment	105	0.6%	700	0.4%
Military conversion b	77	0.4%		
Roskhleboprodukt	22	0.1%	1566	1.0%
Other budget loans			695	0.4%
Other Republics	906	5.0%	2403	1.5%

a. The ratio of CBR directed credit over the total stock of CBR gross credit to banks amounted to 99% in 1992 and in 1993.
b. In 1993, conversion credits for military-industrial enterprises classified as subsidies in fiscal accounts.

Source: calculated from CBR data, Ministry of Finance and IMF (1995), Table 35, p. 96.

1.   The first kind were channelled through commercial banks. They amounted to Rbs 2,804 bn or 15.5% of GDP in 1992 and to Rbs 8,150 bn or 5% of GDP in 1993. They were directed or "centralised" credits in the sense that through its regional branches the Central Bank informed the commercial banks (usually former state banks specialised in the sector chosen for the credit) which state enterprises were to receive the credit and at what interest rate. The credits were concentrated on the agriculture[9] and energy sectors. Most of these credits were to compensate for

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[9] Amelina, Galbi and Uspenskii (1993) show that the volume of grain credits from the CBR in 1992 was equivalent to about Rbs 620 bn or 3.4% of GDP, which was about half the credits issued to the agricultural sector in 1992.

the price controls which stayed in force in those sectors - agriculture, fuel, energy and other raw materials. For instance, bakery enterprises were subsidised for any producer price above Rbs 12/kg. The sizeable energy subsidy represented, broadly speaking, the difference between the value of potential energy exports restricted through quotas and domestic prices of primary energy sources[10].

2. The second type of Central Bank directed credits to enterprises were those delivered via the Ministry of Finance. These amounted to Rbs 804 bn or 4.5% of GDP in 1992 and to 1.8% of GDP in 1993 (Table III.IV.3). Such credits were allocated off-budget to enterprises. They enabled the Ministry of Finance to borrow a greater amount from the CBR than the ceiling imposed by the Supreme Soviet, since special credit lines had been secured for these operations separate from the overall credit ceiling (IMF, 1993).[11] These credits included:

- Military conversion: subsidies to the Military-Industrial Complex (MIC) used to maintain employment in a sector that would otherwise have been left crippled by the collapse of state defence procurement orders. Civilian products represented only some 44 % of the output of the MIC enterprises in 1988. Rbs 77 bn were allocated during 1992[12].

- Working capital credits: the origin of this subsidy lay in the central planning system, when enterprises automatically obtained working capital from the budget[13]. During the second half of 1992, the government faced an increasing number of complaints from firms claiming that they could not borrow from commercial banks, the interest rate being too high (although it was negative in real terms) and the term too short (usually 3 months or less). The government agreed to extend working capital loans through the Central Bank. These loans were

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[10] World Bank and IMF (1993), p. 7.

[11] IMF (1993b), p. 15.

[12] Gavrilenkov and Koen (1994), p. 11.

[13] Cochrane and Ickes (1994), p. 20.

usually for two years at subsidised interest rates. The sum allocated – Rbs 600 bn – was meant to restore the 1992 real value of working capital[14].

By the end of 1992, credits to state enterprises allocated either by the Central Bank or by the government amounted to almost 20% of GDP; while another 25% of GDP had been allocated in explicit subsidies through the budget (Table III.IV.4). Financial transfer to state enterprises thus amounted for 1992 to 45% of GDP. In 1993 and 1994, directed credits programmes were decreased, mostly in the areas of social expenditures and unemployment insurance.

Table III.IV.4 - Russia: Explicit Subsidies to State Enterprises in 1992, in bn of Rbs (Rbn), end of period.

	Value	Percent of GDP
Explicit Subsidies	4454	24.7%
Agriculture	308	1.7%
Coal	180	1.0%
Local Budgets	585	3.2%
Other	30	0.2%
Interest Rates	630	3.5%
of which on		
CBR credits	495	2.7%
Government Credits	135	0.7%
Centralised imports	2721	15.1%

Source: IMF (1993b), Table A1, p. 139.

The problem of credits was not confined to their size. They were, in addition, allocated largely at concessional interest rates substantially below the CBR refinance rate (which was itself negative in real terms), the difference being paid by the federal budget. For instance at the beginning of 1993, agricultural credits were allocated at an annual rate of 25% (+3% commission for the commercial bank) while the refinance rate stood at an annual 100% (30 March 1993). The subsidy covered the 75% difference, being supplied

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[14] Sachs (1993), p. 3.

by the Federal budget at the end of the fiscal year. Total subsidies on interest rates - vis-à-vis CBR credit and vis-à-vis government credits- amounted to 3.5% of GDP in 1992 (Table III.IV.4).

Theoretically, the responsibility for these credits and their repayment lay with the commercial banks which became the distributing intermediaries. The credits were provided for one year, although on average commercial credits were granted for no more than 3 months. Firms supposedly had an incentive to repay them in order to get more funds. But the negative interest rates effectively meant that directed credits amounted to grants. And no action at least until the end of 1994 was taken against a bank or a firm which failed to reimburse such a loan. Banks for their part showed no reluctance to handle such credits, especially because banks usually did not immediately channel the money to the earmarked firm[15].

On 1 October 1993, subsidised credits were cancelled and in November 1993 real interest rates started to be positive. These measures supplied the essential - and until then absent - preconditions for a successful stabilisation.

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[15] Freinkman (1994), p. 10: "Three groups of banks are participating in such programs:a/former state specialised banks (Promstroi and Rosselkhoz) are main channel banks for a wide set of enterprises. b/sectoral banks (e.g Neftekhim, Gasstroi, Electro,etc.) founded by enterprises in particular sub sectors of industry and being under the control of enterprise associations and concerns, which emerged in place of former line ministries. c/some new commercial banks founded by truly private sector (e.g.Menatep), which established strong links to the government and are the most successful in extracting various privileges."

CHAPTER V

THE EXCHANGE RATE

This chapter discusses the issue of the exchange rate regime in relation to attempts to achieve price stability in Russia. It concentrates in particular on the relative merits of exchange rate based stabilisation as illustrated by Poland and the former CSFR versus money based stabilisation (that is, the targeting of money and credit growth in conjunction with a degree of exchange rate flexibility) as illustrated by Russia. Although we saw in Part I that many studies have concluded in the literature is in favour of stabilisation programmes using the exchange rate as an anchor, this chapter will argue that in the Russian case, a money based programme was in 1992 the only option.

The first section reviews the exchange rate system before the unification of the exchange rate which took place in July 1992. The second section will examine the exchange rate regime adopted at that point. The third section studies the link between the exchange rate and the inflation rate. The fourth section shows why it would have been difficult in 1992 to adopt a fixed exchange rate regime.

V.1 - Towards the unification of the exchange rate: 1989-July 1992

Liberalisation of the exchange system began in the late 80s when enterprises were first permitted to retain foreign exchange for the purpose of importing, and to trade without the intermediation of the Foreign Trade Organisations.

In 1989, the Vneshekonombank (VEB) monopoly in currency transactions was abolished, and currency auctions were introduced[1]. On 22 July 1990 internal trade in foreign currencies was legalised, and in November 1990 a commercial exchange rate replaced the official exchange rate for most transactions. The commercial rate was fixed in terms of a basket of currencies and set at a lev. about 65 percent below the official exchange rate[2]. The system of auctions dating from November 1989 ended on 9 April 1991 with the creation of the Moscow Currency Exchange (MICEX) which operated through inter-bank transactions in foreign exchange. The MICEX was established as a joint stock company, with first 25 banks and later 32 Russian banks (including the CBR as a member) plus the association of Russian banks and the Moscow government. At the time, a small number of banks (about 12) participated in the trading sessions. The previous system, by which currency transactions took place with fixed exchange coefficients according to goods and regions, was simplified[3].

On 2 January 1992, a dual exchange rate system for current account operators was officially introduced - comprising the market rate and a special commercial rate. Up to the unification of the exchange rate in July 1992 numerous different exchange rates remained in force (Table III.V.1).

- The special exchange rate (Rbs 55 to $US 1) applied to the 40% surrender requirement on the proceeds from exports of raw materials[4] (and their products) and services (transport, freight, financial and tourism). This revenue was to be used to service foreign debt, to stabilise the rouble market rate and to purchase necessary imports;

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[1] Goldberg (1992), p. 3.

[2] Koen and Meyermans (1994), p. 2.

[3] See Goldberg (1992), p. 6 for a detailed description of this previous system.

[4] Regulations covering foreign currency export earnings were set out in a presidential decree of 30 December 1991.

Table III.V.1 Exchange rate developments, December 1991–March 1992 (Rbs per US$)

	Special commercial rate	Quasi market rate	Market exchange rates		
			Interbank market[a]	Russian exchange bank[b]	Tourist exchange rate[c]
December 1991					
1–6	1.7		110	132	
7–14	1.7		170	172	101
15–21	1.7		170	144	115
22–31	1.7		169	144	108
January 1992					
2–6	55	110	150	144	109
7–14	55	110	180	178	114
15–21	55	110	230	120	116
22–31	55	110	230		120
February 1992					
1–6	55	110	225		126
7–14	55	110	210		117
15–21	55	100	170		99
22–29	55	90			
March 1992					
1–6	55	90	140		
7–14	55	90	140		
15–21	55	90	161		
22–31	55	100	160		

a. The inter-enterprise exchange rates recorded by the banks were market-determined rates but were difficult to interpret because of side payments which imply that the exchange rate did not reflect the price of the transaction.
b. During an 'open auction' (i.e. an auction in which the Russian Exchange Bank was the only seller) held on 7 January the average exchange rate was R146 per US dollar. The exchange rates quoted in this table refer to the so-called 'closed auctions' where all legal persons (both residents and non-residents) could participate as buyers and sellers of foreign exchange. The auctions were discontinued from the fourth week of January 1992.
c. Average mid-point of buying and selling rates in Moscow as published by 'Commersant'.

Source: IMF (1992), Table 26, p. 79.

- The quasi market rate applied to the 10% surrender imposed on all exports. The decree of 30 December 1991 also provided for the mandatory sale at the market rate of 10% of

all export earnings into a hard currency stabilisation fund, to be used to maintain the rouble's market rate. This meant those exporters (mainly of raw materials) already obliged to sell 40% of their hard currency earnings to the government at the special exchange rate of Rbs 55:$1, had to sell a further 10% at the then market exchange rate. The remaining foreign exchange could be used by the exporter either to finance its own imports or to sell on the exchange market;

- The tourist rate: was set in late October 1989 at a level 90% below the official rate[5]. In December 1991, Gosbank abolished the fixed but adjustable tourist exchange rate which was Rbs 47:US$ 1. Until February 1992, it was basically a market rate;

- The exchange rate fixed at the Russian Exchange Bank reflected the exchange rate decided between firms for transactions taking place through the banks;

- The inter bank rate set weekly, was continued in January 1992 under the organisation of MICEX. Auctions were held twice a week. Until January 1993 (when a weekly DM auction was introduced) it offered spot trading in dollars only;

- The exchange rate for centralised import operations - Rbs 5.4:$1. Centralised imports were mainly of grains, medicines and some other essential consumer and producer goods;

- The exchange rate used for tax payments of Russian citizens with incomes in hard currency: Rbs 10:1$.

During the first months of 1992, the volume of transactions on the inter-bank market for foreign exchange was relatively small (Figure III.V.1). This was partly because of the small number of participants, but mainly because firms received huge centralised credits at negative real interest rates (see above Chapter IV), so had no need to convert the 50% of their foreign earnings not subject to obligatory conversion; and such conversion was unattractive, given the low interest rate on rouble deposits. However, from this modest beginning in the early months of 1992, transactions on the MICEX

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[5] McKinnon (1991), p. 64.

developed quite rapidly. By the end of 1993 the number of member banks had reached

139. At the end of 1994, transactions amounted to about 20% of all exchange

transactions (about US$ 500m/day), the rest being directly traded between banks.[6]

Figure III.V.1 Gross Volume traded on the MICEX (monthly totals in millions of US
dollars
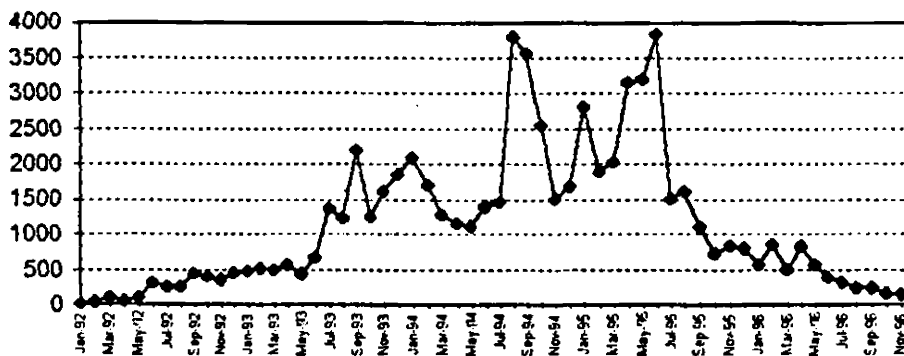
Source: Table S.III.V.1, Statistical appendix.

On 1 July 1992 the CBR introduced a unified floating exchange rate at Rbs 125.26

(which reflected the average in trading on MICEX on that day) to the dollar, cancelling

the special commercial rate (R 55:$1) and the quasi market rate. The exchange rate was

initially determined twice a week (Tuesday and Thursday) by trading on the MICEX[7] and

was used as the official exchange rate by the Central Bank. The new exchange rate

applied to the state budget's revenue and expenditure accounts, to all kinds of state

accounting with enterprises and households, and for book keeping and taxation purposes.

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[6] IMF, (1995), p. 228. See also Koen and Meyermans (1994), p. 6: Also "a credit auction house
specialising in small-scale transactions - the Moscow Interbank Financial House (IFH), with
80 member banks - commenced operations in November 1992, supplying bid and offer US.
dollar/rouble and DM/rouble rates on a daily electronic information system facilitating direct
dealing among members."

[7] During 1992 and 1993, five other exchange markets (St Petersburg, Yekaterinburg,
Novosibirsk, Vladivostok and Rostov) were established. The exchange market in Vladivostok
for instance was created in March 1993. The CBR intervened in order to prevent the exchange
rates deviating unduly from the Moscow rate.

From June 1993 the exchange rate was quoted 5 times a week. Current account convertibility for residents was formally introduced in November 1992[8]. Apart from central import subsidies[9], there was therefore a single rouble exchange rate referred to by the CBR as applying to the "Rouble of the Russian Federation" rather than the rouble. This denoted Russia's assertion of the right to control monetary policy in the rouble zone (Granville, 1994).

Another reform linked to the unification of the exchange rate initiated by the CBR was to require exporters in the period 1 July - 1 October 1992 to sell 30% of their hard currency earnings to the CBR's currency reserve at a rate quoted by the CBR, and permitting exporters to sell a further 20% freely on the Inter bank market. This greatly enhanced exports since exporters were no longer subject to the surrender requirement at an appreciated exchange rate. However, they were still taxed in the sense that the CBR converted the dollars at the rate of exchange on the day of transaction and sometimes quite a long time passed before the CBR paid over the roubles to the enterprise. In July 1993, the regulation was changed and firms were allowed to sell directly (through commercial banks) 50% of their exports earnings (within 14 days of repatriation) on the MICEX at the spot rate. The requirement to repatriate all export earnings immediately upon receipt remained until the introduction of external convertibility for current transactions on 1 July 1996. Other reforms were implemented in 1993 [10]. These included the authorisation (April 1993) for banks to hold general licences to freely import and export foreign currency bank notes, treasury notes, coins and securities; the introduction of a limit on open foreign exchange positions of commercial banks (28 May 1993); authorisation for non-residents to open rouble accounts in Russian banks and to sell hard currency on the MICEX (15 July 1993); and authorisation for non-residents to buy hard currency on the MICEX (1 September 1993);

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[8] IMF, (1993b), p. 35.

[9] IMF (1993b), p. 35: "A special budgetary exchange rate of 20% of the inter bank market rate continued to apply to centralised imports until August 15 1992. The CBR also continued to calculate the official exchange rate of the former Gosbank for valuation of external claims of the former USSR."

[10] A comprehensive account is given in Koen and Meyermans (1994), pp. 2-4.

V.2 - The different exchange rate periods

Various exchange rate behaviour can be distinguished since January 1992.

During the first months of 1992, expectations were high that an exchange stabilisation fund of the Polish type would be ~ ~ble for Russia. A fixed exchange rate regime was discussed and was expected to be adopted with the nominal exchange rate pegged to the dollar. In the first months of reform the nominal exchange rate appreciated substantially (the rouble/dollar rate decreased from Rbs 213.4 in January 1992 to Rbs 126 in June 1992) (Figures III.V.2 and 4) also as a result of an increase in the CBR refinance rate (Figure III.V.3) as well as CBR interventions.

Figure III.V.2 Nominal exchange rates - First half of 1992
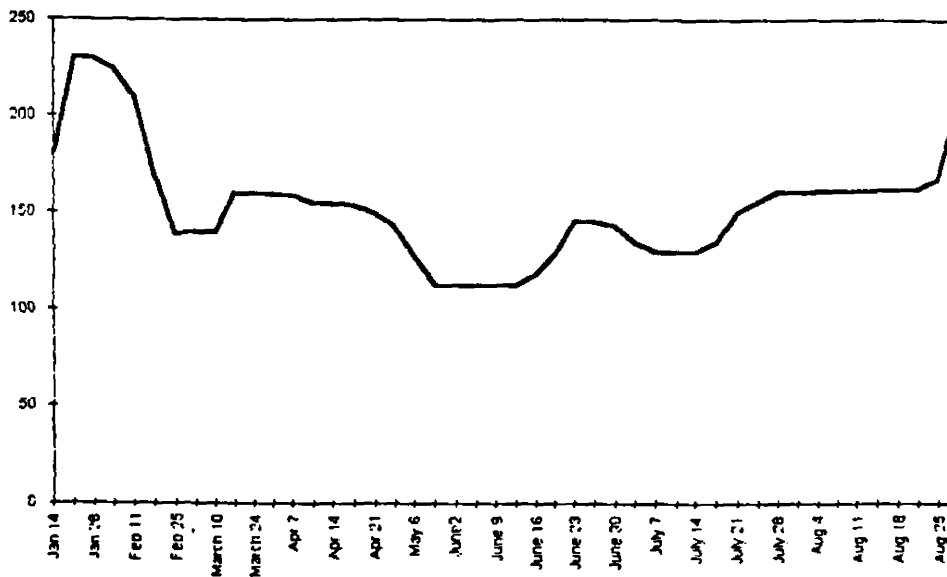
Source: Data from MICEX.

Figure III.V.3 The inflation rate, the nominal interbank interest rate and the nominal refinance rate. February 1992 to July 1992
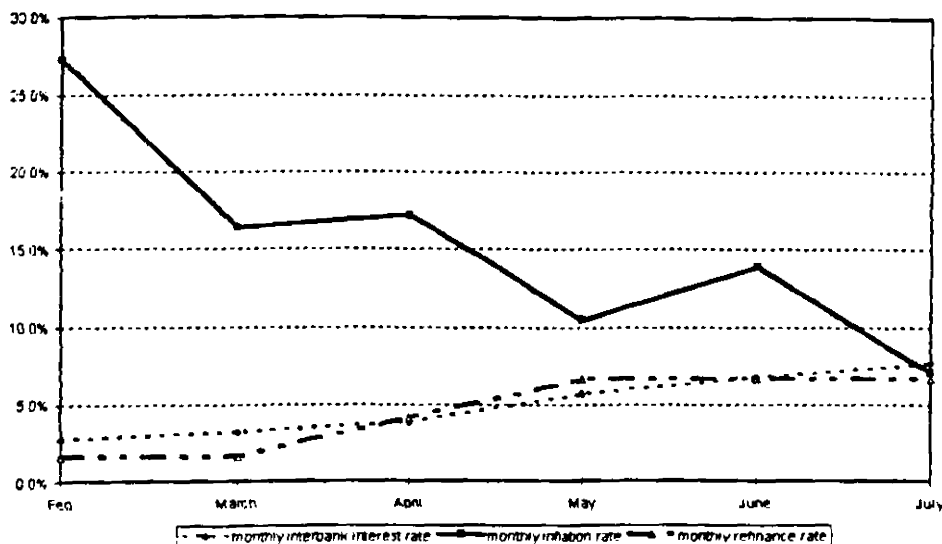
Source: data from Table S.III.V.2, Statistical appendix.

Figure III.V.4: movement of the CPI and of the average nominal exchange rate, first half 1992
(percent)
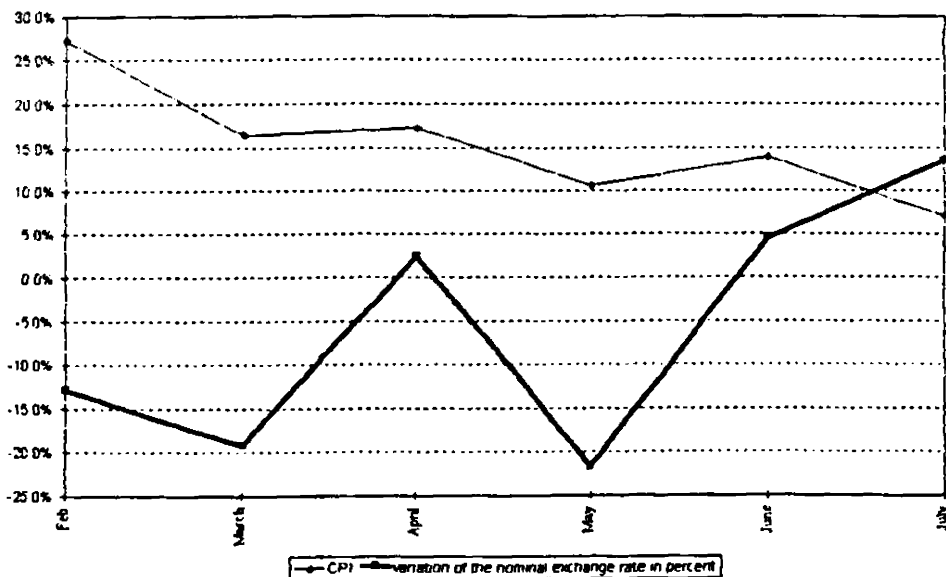
Source: Table S.III.V.3, statistical appendix

At that time, policy makers were considering fixing the exchange rate at around Rbs 80 to the dollar[11]. Inadequate foreign exchange reserves (less than a month of imports) made

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[11] New York Times, May 6 1992.

the provision of a stabilisation fund an essential condition for an exchange rate based stabilisation programme (Figure III.V 5).

Figure III.V.5 Gross Reserve holdings (in months of imports)
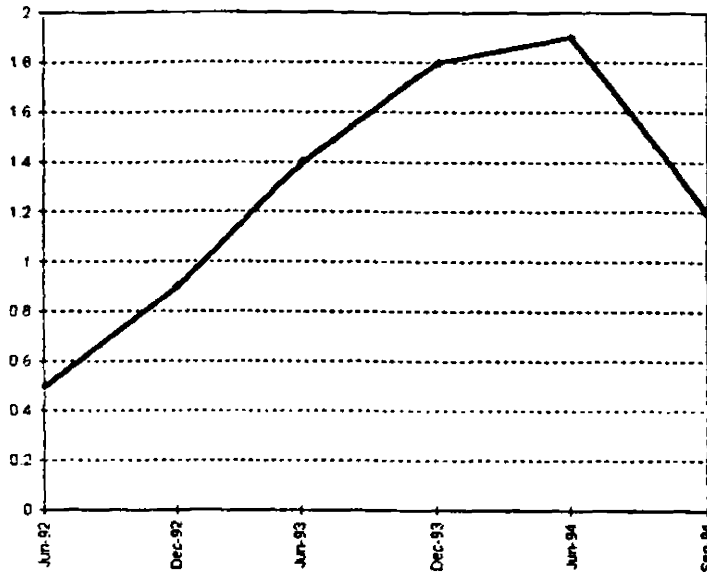
Source: calculated with data from IMF data (October 1995), p.98.

The fund, which was under discussion with the IMF, was to have amounted to US$ 6 bn; but it was never agreed upon, and the decision was taken by the monetary authorities not to peg.

Until July 1995, Russia retained a flexible exchange rate regime. The policy had been to smooth the nominal exchange-rate depreciation. The path of the exchange rate reflected the developments in the financial policies pursued by the authorities. Interventions (in US dollar or in roubles) from the CBR through the MICEX were all along substantial[12]. The Ministry of Finance also intervened, since it held some of the country's reserves, in the form of gold and foreign exchange acquired through the centralised exports/imports scheme.

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[12] According to Koen and Meyermans (1994), p. 7: "Following exchange rate unification, the share of CBR intervention in total MICEX turnover remained large, averaging one third if measured by monthly net totals".

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The exchange rate was heavily influenced by monetary conditions. When a monetary expansion pushed down interest rates, the exchange rate adjusted immediately. An excess supply of (demand for) money implied a corresponding excess demand for (supply of) foreign exchange. Failing CBR intervention, the exchange rate depreciated/appreciated until equilibrium was restored.

Figure III.V.6 Effects of the expansion of Rb M2 on the exchange rate (appreciation down), 1992-1995

Source: Data from Table S.III.III.1 and S.III.V.1, Statistical appendix.

Figure III.V.6 shows the relation between M2 and the nominal exchange rate. In order to test the relation between the exchange rate (ER) and the money supply (M2), I estimated the following equation with D(LER) equals to the first difference of the logarithm of the nominal average monthly exchange rate and D(LM2) equals to the first difference of the logarithm of M2.(the ADF test revealed that LER series was non-stationary).

(1) D(LER) = -0.0045855754 + 0.25476617*D(LM2) + 0.56816119*D(LM2(-1)) + [AR(1)=0.44091987]

The regression suggests that the exchange rate responded positively to the movement of Rouble M2 with no more than a one month lag (statistically significant with a t-ratio of 2.53). This means that when M2 increased, the exchange rate depreciated one month later.

Table III.V.2 - The nominal exchange rate and the money supply: monthly data, OLS, Sample period February 1992 - July 1995

D(LER) = C(1) + C(2)*D(LM2) + C(3)*D(LM2(-1)) + [AR(1)=C(4)]

LS // Dependent Variable is D(LER)
Sample: 1992:07 1995:07
Included observations: 37
Convergence achieved after 4 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.004586	0.047762	-0.096009	0.9241
D(LM2)	0.254766	0.234963	1.084284	0.2861
D(LM2(-1))	0.568161	0.224163	2.534589	0.0162
AR(1)	0.44092	0.162245	2.717624	0.0104

R-squared	0.353521	Mean dependent var	0.096749
Adjusted R-squared	0.29475	S.D. dependent var	0.103666
S.E. of regression	0.087058	Akaike info criterion	-4.780561
Sum squared resid	0.250109	Schwarz criterion	-4.606408
Log likelihood	39.93965	F-statistic	6.015238
Durbin-Watson stat	1.729772	Prob(F-statistic)	0.00219

Inverted AR Roots	0.44

D(LM2)=first difference of the logarithm of M2; D(LER)= first difference of the logarithm of the nominal exchange rate; AR= autoregressive correction.
Note: I first regressed DLM2 on DLER but when tested for autocorrelation using the Breusch-Godfrey serial LM correlation test, autocorrelation were deduced of the first and second order. I therefore corrected by adding the AR(1) (first order autoregressive correction).

From mid-1992 to mid-1993 the nominal exchange rate depreciated substantially (Figure III.V.7) amidst bleak expectations of future economic policy. Markets lost confidence in the Government ability to curb inflation. The behaviour of the exchange rate reflected the failure to tighten monetary policy.

Figure III.V.7 Movement of the CPI and the average nominal exchange rate, August 1992-June 1993
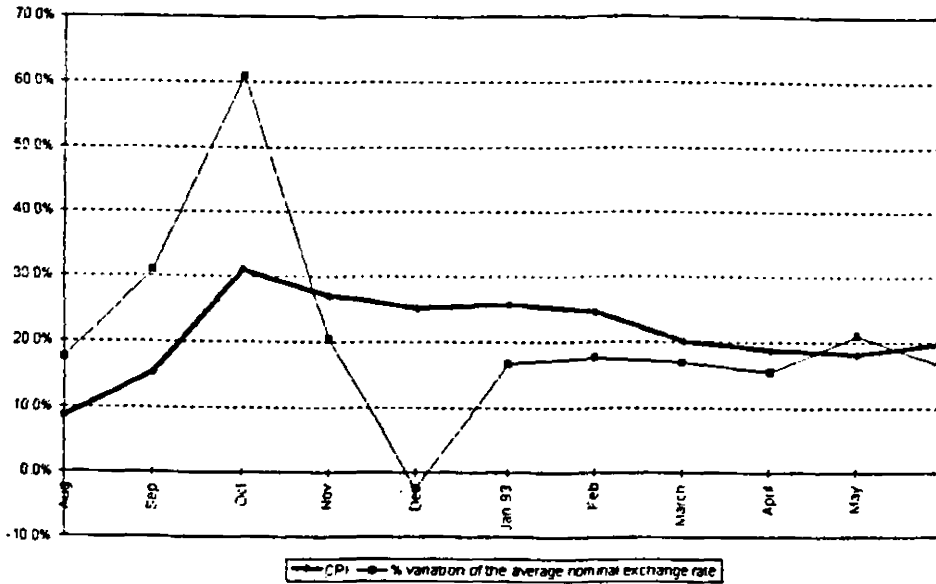
Source: Table S.III.V.3, Statistical appendix

On the other hand the real exchange rate rose sharply in the first five months of 1993. (the nominal average exchange rate of the rouble depreciated by 91% while domestic prices rose by 164% - Figure III.V.8).

Figure III.V.8 average nominal exchange rate and real exchange rate (July 1992=100)
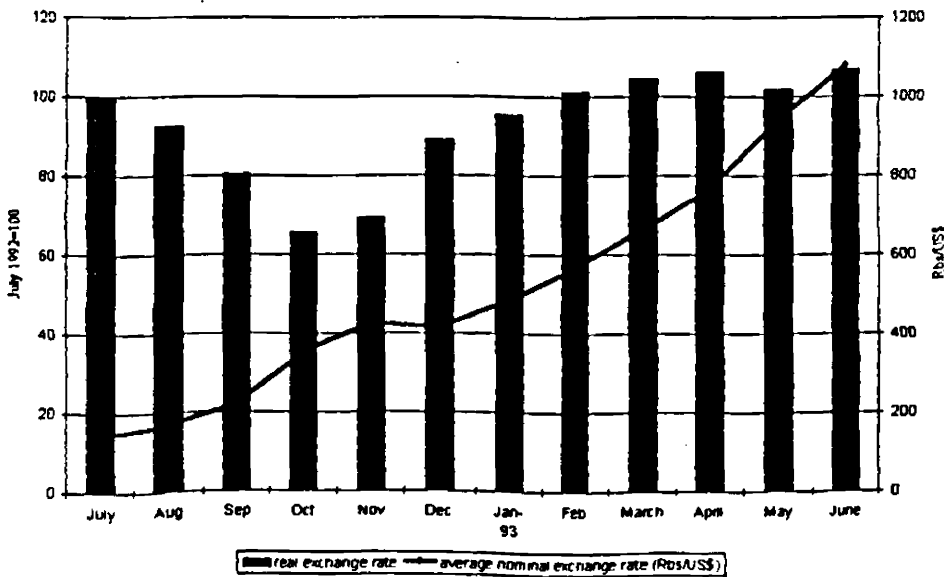
Source: calculated from MICEX data.

A turning point came at the end of May 1993 when the IMF reached agreement with the Government and CBR on a US$ 1.5 bn credit under the Fund's Systemic Transformation Facility (STF). With the ensuing increase in the CBR base rate (up to 210% that is 17.5% per month) a major shift in market expectations occurred. From June 1993 to the autumn, the rouble remained stable while inflation continued at a rate of more than 20% per month. As a consequence the real exchange rate appreciated by nearly 100% i.e. Russia's competitiveness halved. Following a 7% nominal appreciation in July 1993 the rate remained at around 1000 Rbs to the dollar in July-August, the market pressure being for it to appreciate had the CBR not intervened. With the central bank buying considerable amounts of dollars on the exchange market, net international reserves increased substantially through the summer of 1993 (Figure III.V.10). The movement was further sustained as real interest rates turned positive in the course of the autumn (Figure III.V.9).

Figure III.V.9 Real interest rates in percent per month
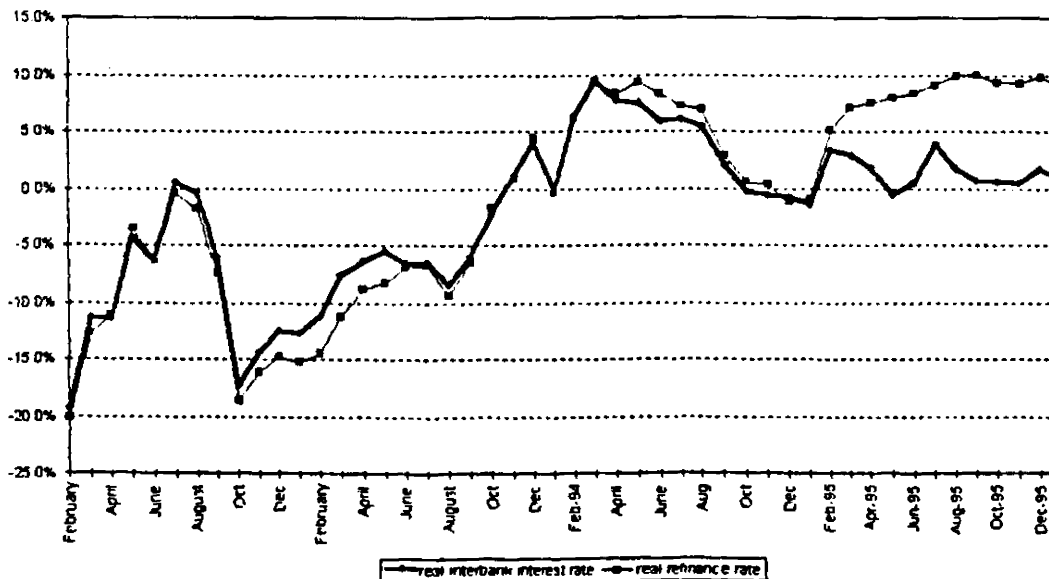
Source: calculated from Table S.III.V.2, Statistical appendix.

Figure III.V.10 Movement of net international reserves, May 1993 to January 1994 (bn of roubles)
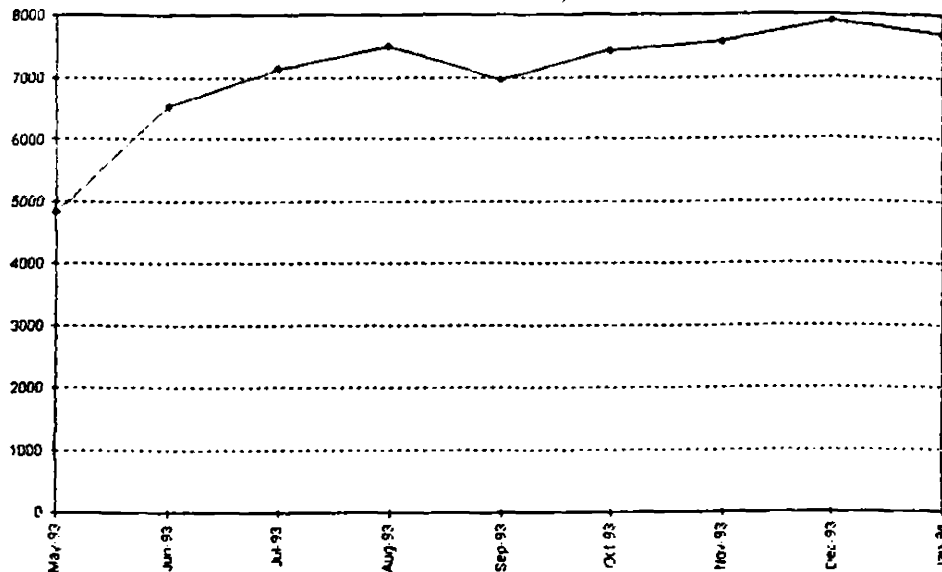
Source: Table S.III.V.4, Statistical appendix

By the end of 1993, the policy adopted by the government was to limit the fall in the rouble-dollar exchange rate to half the rate of inflation (Figure III.V.11).

Figure III.V.11: Movement of the CPI and the nominal exchange rate, second half of 1993
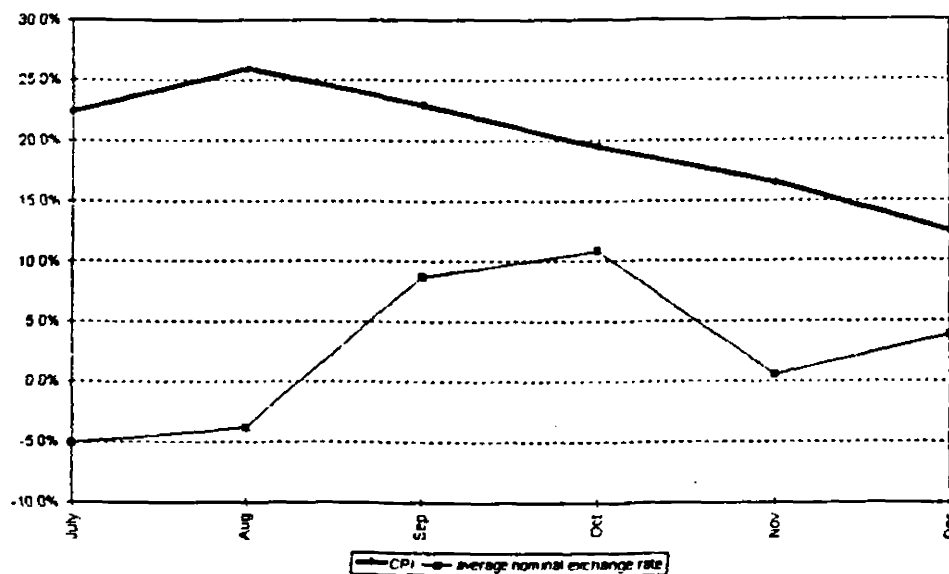
Source: Table S.III.V.3, statistical appendix

The political violence in September-October 1993 (clash between the government and the parliament), however brought a renewed sharp nominal depreciation. From October to December fell by 10% a month while the inflation rate averaged some 16% a month.

Following the defeat of the reformers in the December 1993 elections, and the resignation from the government of Yegor Gaidar and Boris Fedorov, the nominal exchange rate in January 1994 depreciated by 16 %. Thus was in line with the January 1994 inflation rate of 17.9% (Figure III.V.12). However, after 27% plunge of the rouble in the so-called Black Tuesday crash (11 October 1994), the CBR intervened heavily in order roughly to bring the real exchange rate gradually back to its September level of Rbs 3000 to the $. The event, which reflected loose monetary policy and sloppy fiscal policy, heralded a resurgence of inflation during the winter of 1994-95.

Figure III.V.12: Monthly % changes in CPI and the nominal exchange rate, December 1993 to December 1994
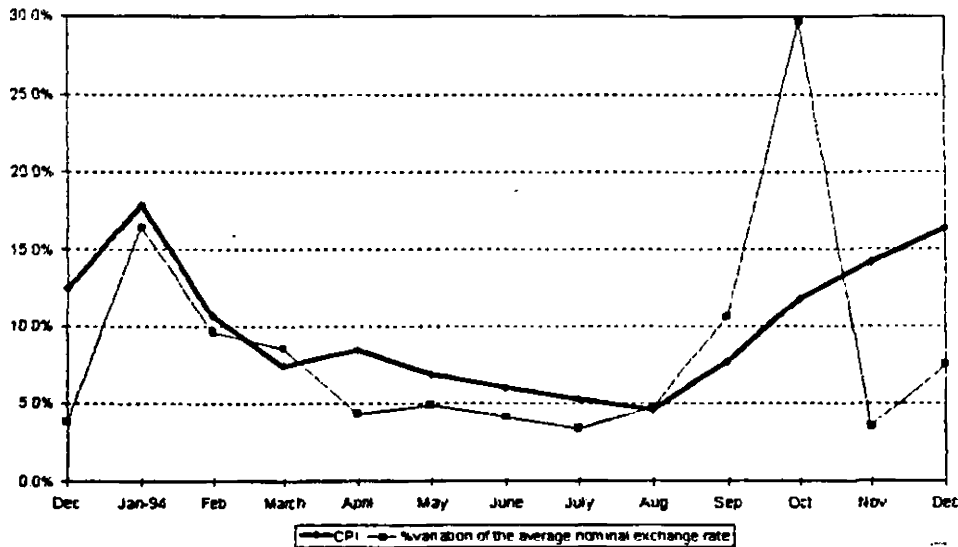
Source: Table S.III.V.3, Statistical appendix.

From January to April 1995, the policy of the monetary authorities was to keep the nominal depreciation of the rouble in line with the rate of inflation. The CBR intervened heavily on the MICEX to limit the real appreciation. Despite this, the average exchange

rate of the rouble depreciated by 30% while consumer prices rose by 54% over the same period. But with the negotiations on the IMF Stand By Agreement (SBA) in progress, market pressures were tending to make the exchange rate appreciate. The CBR was able to rebuild its international reserves through purchases on the MICEX (Figure III.V.13).

Figure III.V.13 Net international reserves (bn of Rbs)
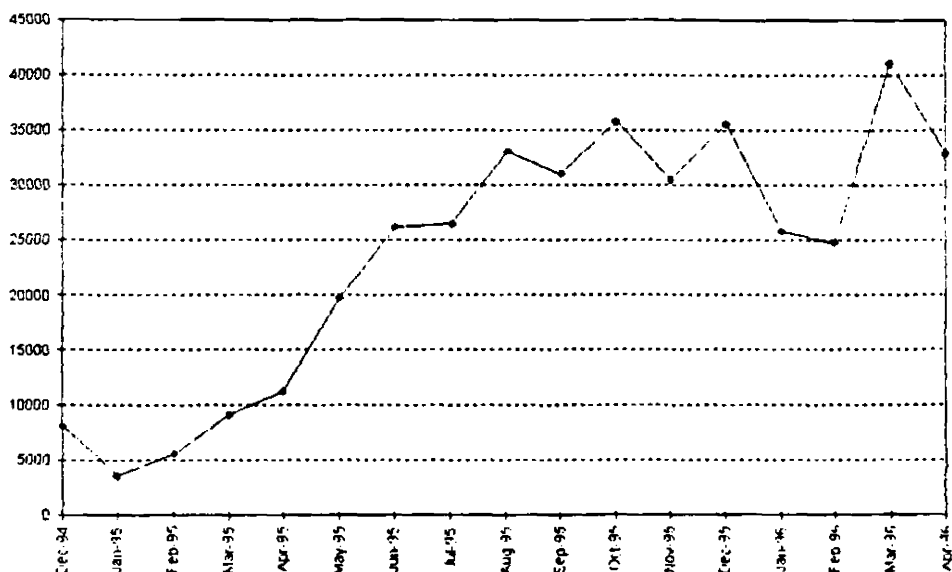
Source: Table S.III.V.4

However, this also means with the monetisation of foreign assets that the monthly inflation rate for the first quarter of 1995 have not come down as fast as envisaged in the SBA programme and averaged 11% instead of the 4-5% initially planned.

In July 1995, Russia switched to a fixed exchange rate within a band. The system introduced was called the corridor, . From July 1995 to October 1995 the band was first Rbs 4300-4900, the same band was then prolonged to the end of December 1995, after which it was lowered to Rbs 4550-Rbs 5150 until the end of 1996. As Figure III.V.14 shows, the exchange rate stayed within the band for the whole period.

Figure III.V. 14 The nominal exchange rate in the corridor - July 1995 - May 1996
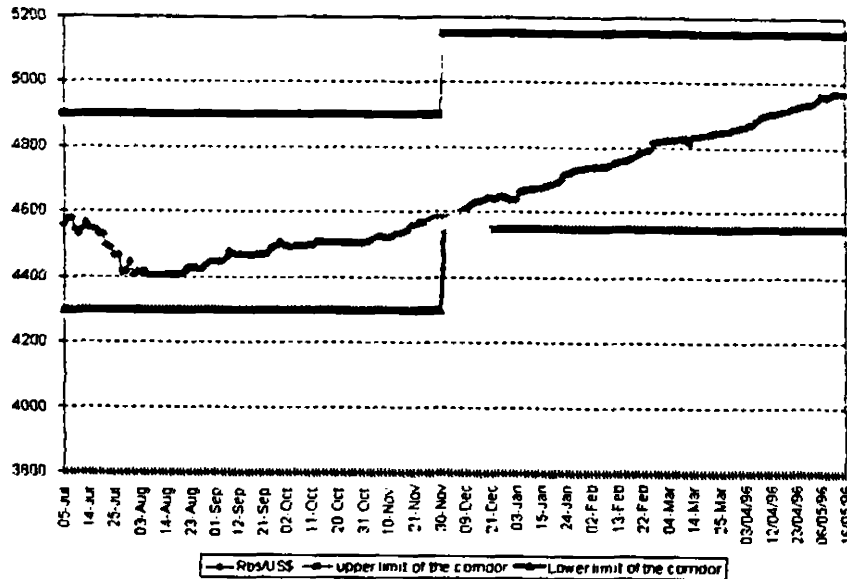
Source: Data from MICEX data

Yet it is the period before this move to an exchange rate peg that is most interesting for the purpose of comparative analysis of the different tools used to try and end inflation in Russia on the one hand, and in Poland and the CSFR on the other.

V.3 - The link between the exchange rate and inflation

The effectiveness of a disinflationary programme depends on how the intermediate target - the exchange rate or money - is linked to the ultimate target - the price level. We saw in Part III how tightly M2 and the inflation rate were linked. However the link between the exchange rate and the same price level was not so clear; and this had to do with trade regulations which were abolished only in 1995.

If we estimate the relation between the change in the exchange rate lagged by one month (DLER(-1)) and the change in the inflation rate (DLINFPLUS) for the period 1992-1994, the correlation coefficient is not statistically significant.

(2) D(LINFPLUS) = -0.0059447752 + 0.041824013*D(LER(-1))

Table III.V.3 Relation between the changes in the exchange rate and the rate of inflation

D(LINFPLUS) = C(1) + C(2)*D(LER(-1))

	LS // Dependent Variable is D(LINFPLUS) Sample(adjusted): 1992:03 1994:12 Included observations: 34 after adjusting endpoints			
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.005945	0.008187	-0.726154	0.473
D(LER(-1))	0.041824	0.053151	0.786889	0.4371
R-squared	0.018982	Mean dependent var		-0.002633
Adjusted R-squared	-0.011674	S.D. dependent var		0.040707
S.E. of regression	0.040944	Akaike info criterion		-6.334087
Sum squared resid	0.053645	Schwarz criterion		-6.244301
Log likelihood	61.43557	F-statistic		0.619194
Durbin-Watson stat	2.030846	Prob(F-statistic)		0.437136

D(LER(-1))= First difference of the logarithm of the nominal exchange rate lagged one month;
D(LINFPLUS)= first difference of the logarithm of the inflation rate (1+INF/100).

An explanation for the lack of correlation was suggested by Easterly and Vieira da Cunha (1993):

" The lack of direct effect between changes in the exchange rate and price formation can be traced to remaining institutional rigidities, notably the still highly distorted foreign trading system and the thinness of the foreign currency markets outside the main metropolitan areas. Especially in 1992 the huge volume of import subsidies effectively insulated vast segments of the economy from changes in the exchange rate."[13]

This hypothesis can be verified by correlating the real exchange rate with imports from non CIS countries. We saw that the real exchange rate appreciated considerably during 1992-1994; one should therefore expect to find a negative correlation between the real exchange rate and the value in US$ of imports from non-CIS countries. Instead no firm evidence of any influence of real rouble appreciation is shown on imports. Correlating imports from non CIS countries (IMNONCIS) with the real exchange rate (RER) for the period 1992-1994 gives a correlation coefficient of only 0.019, which means that while

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[13] Easterly and Vieira da Cunha (1993), pp. 19-20.

the real exchange rate appreciated, the value of US$ imports even fell slightly (Figure III.V.15).

Figure III.V.15 Relation between the real exchange rate and the value in US$ of imports to non-CIS, February 1992-December 1994
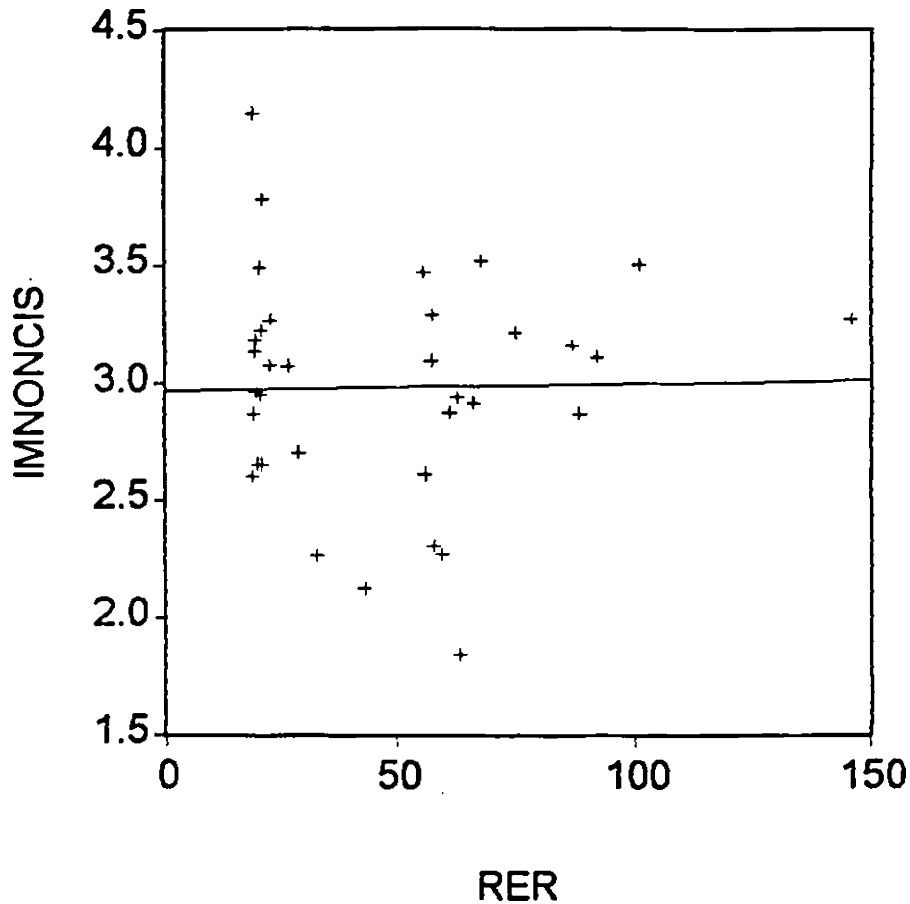
coefficient of correlation = 0.019

Source: data from Goskomstat, Kratkosrochnie Ekonomicheskie pokazateli, July 1996.

Among the various controls on foreign trade which (along with the general decline in GDP) explain this phenomenon, the most important were the imports subject to subsidised central purchasing (this category included medicine, meat, cereals). Consequently imports, despite the appreciation of the exchange rate in real terms,

decreased from US$ 37 bn in 1992 to US$ 32.8 bn in 1993[14] reflecting the sharp cut in centralised imports in 1993.

With regard to exports, the system of export licenses and quotas, especially on oil (the quotas determined the portion of domestic production that could be exported) explains why no export surge was observed during 1992 despite the highly depreciated exchange rate. In June and December 1993, in the face of declining export competitiveness, the Government removed export quotas on a range of products, including timber, fertilisers, coal and meat products.[15] Oil export quotas were only officially abolished on 1 January 1995[16].(Figure III.V.16).

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[14] Data from Goskomstat.

[15] IMF (1995), p. 51.

[16] IMF (1995), p. 223: "A decree (issued on May 23, 1994) stipulated the elimination of all export quotas as of July 1, 1994. The list of strategically important goods was maintained even for goods whose exports no longer require a quota, and the licensing requirement for these goods was replaced by a registration requirement. A second decree published on July 1, 1994 postponed the elimination of export quotas on oil and oil products until January 1, 1995."

Figure III.V.16 Relation between the real exchange rate and the value of US$ of exports to non-CIS - February 1992- December 1994
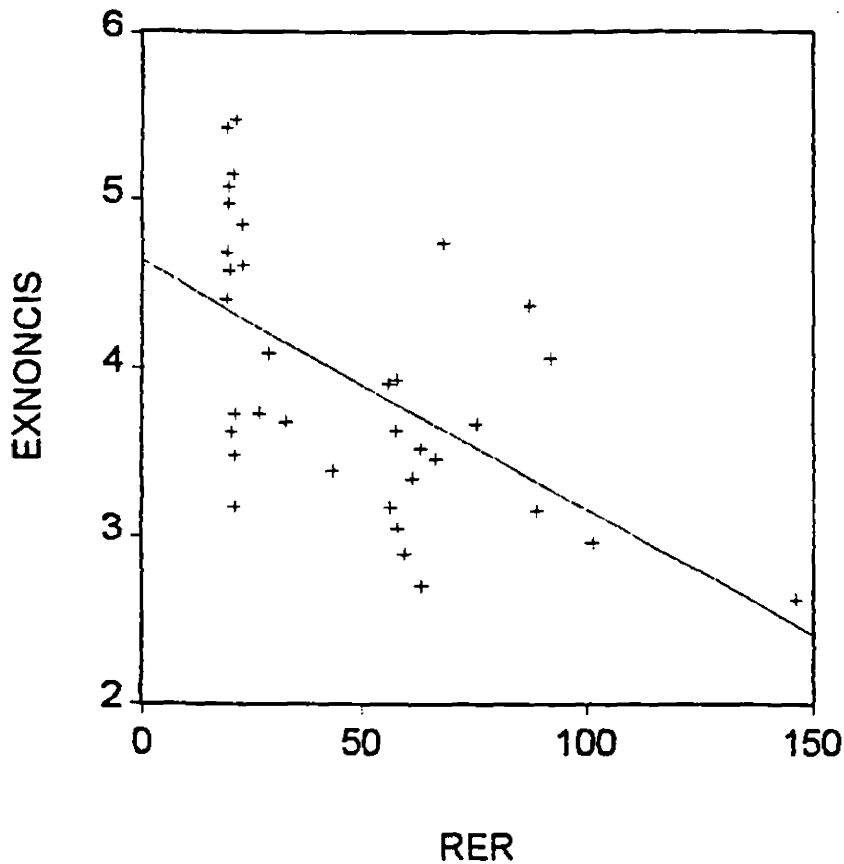
coefficient of correlation = -0.569

Source: Data from Goskomstat, Kratkosrochnie Ekonomicheskie pokazateli, July 1996.

In the case of exports, there is even less evidence of the influence of real rouble appreciation. During 1992-1994, the value in US$ of exports to non CIS countries (EXNONCIS) was correlated with the real exchange rate (RER) with a negative correlation coefficient of -0.569, which means that while the real exchange rate was appreciating the value of US$ exports was increasing while other things being equal it should have decreased. Exports, despite the appreciation of the exchange rate in real terms, increased over the three years from US$ 42.4 bn in 1992 to US$ 44.3 bn in 1993 and US$ 53.2 in 1994.[17]

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[17] Data from Goskomstat.

V.4 Ending high Inflation - money based versus exchange rate based programmes

As a strategy for ending high inflation, two nominal anchors are advocated in the literature - money and the exchange rate.

Contrary to Poland and the CSFR, Russia choose a money based stabilisation programme with considerably less success. The contention here is that given the state of affairs in 1992, this choice was the only reasonable one available.

Advocates of a fix peg argue that the adoption of an official parity prevents the monetary authorities from allowing excessive growth of the money supply, thereby imposing a degree of financial discipline. This discipline is absent if a country's currency floats freely and the domestic inflation rate is free to deviate permanently from that of its trading partners.

The textbook argument for the adoption of a fixed exchange rate is that the monetary authorities are then committed to a certain parity, while credit expansion is restricted by the availability of international reserves and the capacity to borrow internationally. If the authorities do not control the expansion of credit - including, as necessary, the way that the budget deficit is financed - they will have to devalue and so lose credibility compromising the whole stabilisation attempt. In the context of loose credit policies an exchange rate target would inevitably end in a succession of financial crises followed by devaluations, introducing a high degree of instability into the behaviour of the real exchange rate. This instability would in turn generate macroeconomic uncertainty and disrupt trade and investment flows.

We saw that in Poland and the CSFR inflation was reduced quite rapidly as a result of the use of the exchange rate as the nominal anchor and this despite a fiscal and quasi fiscal deficit brought only gradually down and structural reforms which were slow.

In the case of Russia, however, if we look at the conditions for a fixed exchange rate as suggested by Williamson (1991b), very few if any corresponded with the Russian situation from 1992 to 1995.

1. **The country should be small with regard to the rest of the world.**

2. **The currency to which the country pegs its rate should be that of the country's main trading partner.** The peg envisaged for Russia in 1992 was the dollar because of its wide use both as a means of payment and as a store of value; but the direction of trade in 1992 was 74.4 % of total exports and 63.1% of total imports to and from Europe. Only 3.5% of total exports and 13.2 % of total imports were to and from the Western Hemisphere[18].

3. **The targeted inflation rate must match that of the country to which the currency is pegged. In other words, strong convergence should be the aim.** The actual average monthly inflation rate in 1992 was 31.2%, 20.5% in 1993 and 10.1% in 1994.[19].

4. **The commitment to a fixed rate has to be credible, therefore the necessary institutional arrangements should be in place. This means above all that the central bank should be committed to the task and have the means to carry it through. To defend the parity of the currency, a minimum share of the domestic money supply should be backed by foreign exchange reserves.** None of these conditions were matched by Russia at the time. First the Central Bank was not committed to a low inflation rate[20]. Inflation was seen as the consequence of the fall of

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[18] Goskomstat

[19] Ibid.

[20] The story and the reasons are widely explained in Granville (1995).

production and the argument went that the Central Bank had to issue more money in order to stimulate production. This policy led to the first political crisis in reformed Russia with the fall of the Gaidar Government at the end of 1992 and ultimately to the clash of October 1993 with the parliament (the then constitutions gave the anti-reform parliament control over key institutions like the Central Bank, and also Goskomstat)[21]. Secondly in 1992 Russia had less than a month of imports in gross reserves holdings (Figure III.V.6), and very limited access to external financial assistance (Table III.V.4)

Table III.V.4 Official assistance to Russia, 1992-1993 (US$ bn)

	1992		1993		1992-1993	
	A^1	D^2	A	D	A	D
IMF	9	1	13	1.5	22	2.5
World Bank	1.5	0	5	0.5	6.5	0.5
EBRD						
Bilateral ^{3}	13.5	14	10	6	23.5	20
Total	24	15	28	8	52	23
Memo Items Aid from International						
Agencies	10.5	1	18	2	28.5	3
Budgetary Support ^{4}		0		2		2

1. A = Announced
2. D = Delivered
3. Included US$2.5bn of promised relief on interest payments that was not formally granted in 1992.
4. Estimates of aid that was directly in support of budget financing, not counting debt rescheduling. In 1993, approximately US$ 2.5bn could be used for budgetary support: $1 bn of the IMF loan, US$0.5 bn of the World Bank loan, and approximately US$0.5 bn of Western support.

Source: IMF, press release, February 1, 1994 quoted in Sachs (1994c), p.4.

5. In the presence of high elasticity of substitution between foreign and domestic currency, the economy may be left without a nominal anchor in a flexible exchange rate regime. In this situation, to choose the nominal exchange rate as an

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[21] See Granville and Shapiro (1994) for an account of data manipulations by Goskomstat at this time.

anchor is the right solution. On the face of it, this prescription fitted the Russian case. However, even if the dollarisation of the economy might have justified the adoption of the US dollar as the peg for the rouble, the actual budget deficit in 1992 was huge (see Chapter IV), and the only way to finance it was at least until after May 1993 - when the domestic treasury bill programme was launched - was exclusively through money creation. And money creation would have immediately undermined any stability of the exchange rate anchor. Therefore the only realistic option for Russia at the time was to adopt a smooth exchange rate float.

It can be argued in this light that even if an exchange rate stabilisation fund similar to the Polish one had been provided, it will have been insufficient. The total financial package under discussion amounted to US$ 24bn (including the US$ 6bn of stabilisation fund) in 1992, this represented 3% of GDP in 1992[22]. It is doubtful that this would have been enough to guarantee and to give credibility to such an exchange rate regime.

It is not sure that even if Russia had been in a position to finance exchange rate intervention through foreign borrowing like in Poland, Russia would have been able to peg the exchange rate at the beginning of the reform process and more important to sustain the peg long enough. A peg can only be sustained if it is accompanied by fiscal adjustment. This adjustment started to take place but only in 1994 after "Black Tuesday", which marked the collapse of the policy of adjusting the nominal exchange rate in line with inflation - i.e. pursuing a real target (competitiveness) using a nominal instrument. Besides showing the power of the rapidly developing financial markets, 'Black Tuesday' demonstrated to the authorities that a nominal depreciation is no substitute for bringing monetary and fiscal policies under control. If the relatively unambitious exchange rate policy of 1994 was undermined by broader macroeconomic policy failures, how much

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[22] The Russian GDP in US$ was 776 bn according to Goskomstat (1995).

greater fiscal discipline would have been required to maintain a fixed exchange rate anchor. Such a regime would have countenanced devaluation only in the face of external shocks beyond the authorities' control, not as an expedient to help the authorities overcome their own failures in the conduct of fiscal policy. The only response to such failures in the disciplined conditions of a pegged exchange rate would have been a tough fiscal retrenchment unalleviated by any devaluation.

We saw that Russia opted at least until July 1995 for a money based stabilisation programme complemented with interventions on the foreigne exchange market. This choice did not deliver low inflation because such drawbacks as the instability of the velocity of money; the lack of instruments of monetary control like open market operations, which only started in the second half of 1995; the unreliability of these instruments as required reserves; and finally the level of dollarisation of the economy measured as the ratio between foreign exchange deposits and broad money (though a precise measurement is very difficult). We saw that by June 1994 the level was 27.3% of broad money, which is high but not as high as in May 1993 when it was 46.% of broad money. But this is an underestimation since cash was not taken into account (chapter III).

The use of the nominal exchange rate as an anchor was discussed all through this period but the reality was that not only international reserves were low, but the budget deficit was high and also the necessary institutional reforms were not in place as well as the lack of political commitment and the economic understanding of basic macro relationships by the monetary authorities[23]. Therefore while the literature seems to agree that an exchange rate based stabilisation performed better in ending inflation, it is only true when the essential conditions are in place and in Russia they were not, at least not until 1995.

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[23] See Granville (1995) and also IMF (October 1995), pp. 117-124.

CHAPTER VI

THE SIGNIFICANCE OF ENDING HIGH INFLATION

The foregoing chapters have examine:' ˙ ɔ Russian experience in ending inflation versus those of Poland and the former CSFR. The unstated presumption throughout has been that inflation is bad. Nothing had been said however, about specific benefits (or costs) of reducing inflation.

The damage from high inflation is not transparent. This chapter analyses in a very tentative manner the differential effects of high inflation in the Russian Federation from 1992 to 1996. Section I examines the impact of the inflation tax on the stock of non-interest bearing monetary assets (money in circulation) and on interest bearing household deposits in commercial and savings banks. Section II looks at the effects of unexpected inflation on wages. Section III examines the simple correlation between inflation and real GDP growth.

VI.1 The Inflation Tax

The analysis in this section is based on the following measure of the inflation tax

$$(1) \quad it = [\frac{\pi_t - i_t}{\sqrt{1 + \pi_t}}]A_t$$

where A is nominal assets at time t, π is the inflation rate and i is the nominal interest rate payable on any of these assets.

It is intuitively straightforward to understand how inflation continuously "taxes" the real value of given nominal balances. To measure the inflation tax empirically requires a number of other decisions. The first is the measure of the price level should be used.

Even if the choice of the particular times series measuring consumer prices may turn uncontentious, there is still a decision on which inflation rate to use, prices as time t, t+1, or, for example a measure of prices at the midpoint[1]. This latter choice is far from trivial in the case of very high inflation. For the series, I have used the "Urban Consumer Price Index" of the Russian state statistics committee (Goskomstat) for 1992, a year when no true equivalent of the succeeding Laspeyres CPI is available.[2] For the following years I have taken the (new) Consumer Price Index. The series is presented in Table S.III.VI.1.

A wide variety of nominal assets present themselves as candidates for the calculation of the base for the inflation tax. I look first at base money. Government normally benefits solely from the inflation tax on base money, that is from the fall in the real value of base money which corresponds to a real depreciation in the liabilities of the central bank. I then look at the inflation "taxes" on nominal assets other than base money. As these are transfers between agents in the private sector, rather than transfers from the private to the public sector, it is arguable that they should not be labelled as taxes.

The inflation tax on the monetary base

The private sector (households, enterprises and banks) loses from inflation when non-interest bearing assets held, currency and reserves, fall in real value. Between 1992-1994, currency was about 50% of the monetary base and mainly held by households (Table S.III.VI.2). The rest was held by the banking-industry complex as required reserves.

The inflation loss (or equivalently the gain obtained by the government) is the inflation tax on base money defined as currency, reserve requirements and excess reserves. It is measured by the following equation:

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[1] Following Orszag (1993); see also Easterly et al (1995).

[2] Alternative series are discussed in detail in Granville and Shapiro (1994), as well as in the Granville *Monetary Report* . See Koen and Phillips (1994) for the authoritative IMF explanation. The series used is given in the appendix; information on alternative data is available from the authors.

$$(2)\ it = [\frac{\pi_t}{\sqrt{1+\pi_t}}](\frac{MB_t}{GDP_t})$$

where MB is the monthly monetary base, GDP is the monthly GDP, π is the inflation rate and it is the inflation tax. (Since demand for real money is a function of nominal interest rate, MB/GDP could be considered as a function of π as we will see later).

Short-run elasticity of demand for financial assets and inflation

If inflation is very high, it may normally be predicted that the demand for money will fall sharply, and the ratio of money to income also. This reduction in the tax base will reduce the inflation tax, and also accelerate the path to hyperinflation if the government attempts to maintain the real value of its inflation tax. In the Russian case, as shown below, the inflation tax as a percentage of GDP stayed quite high, and true hyperinflation was avoided. We can tentatively propose that the demand for real base money was not very sensitive to the rate of inflation. I was, unfortunately, unable to test this in a robust econometric format at this time, as the Central Bank of Russia stopped publishing regular data on excess reserves in December 1994. As I focus on the effects of inflation on the household sector, it is appropriate to confine ourselves to measuring the response to inflation of, first, the demand for currency in circulation (M0) and, second, the demand for rouble deposits in savings and commercial banks.(The actual inflation tax on cash is to be found in Table S.III.VI.2).

Inflation tax on currency in circulation - M0.

In order to measure the inflation tax on money in circulation, the following demand for real currency is estimated:

$$(3)\ \frac{M0}{P} = F\left(i, \frac{E}{P}, \frac{Income}{P}, \left(\frac{M0}{P}\right)_{-1}, \varepsilon\right),\ F_i < 0, F_{\frac{Income}{P}} > 0, F_{\frac{E}{P}} > 0, F_{\left(\frac{M0}{P}\right)_{-1}} > 0,$$

where $M0$ = currency in circulation, P = the price level, i = the nominal interest rate, E = the nominal exchange rate (Rbl/\$) and 'Income' = the nominal income of the population. Income of the population consists of wage income, social payments, and income from property and dividends; and can be held in cash, demand deposits, time deposits, foreign currency, financial assets and physical property. Real GDP and the average real wage are used as proxies for the real income of the population.

Using the Fisher relation $i = r + \pi^e$, which means that the negative effect of expected inflation on real money demand is captured by the nominal interest rate and assuming $\pi^e = \pi$, we obtain:

$$(3a) \quad \frac{M0}{P} = H\left(\pi, \frac{E}{P}, \frac{GDP}{P}, \frac{W}{P}, \left(\frac{M0}{P}\right)_{-1}, \varepsilon\right).$$

Changes in real interest rate are included into the disturbance term. The following regression was estimated using Ordinary Least Squares (OLS) with monthly data from February 1992 to April 1996.

$(4) D(LRM0) = 0.0070554205 + 0.27059226*D(LRM0(-1)) - 0.114987*D(LINF) + 0.16002209*D(LRER) + 0.42994145*D(LRW) + 0.15167138*D(LRGDP)$

Table III.VI.1

$D(LRM0) = C(1) + C(2)*D(LRM0(-1)) + C(3)*D(LINF) + C(4)*D(LRER) - C(5)*D(LRW) + C(6)*D(LRGDP)$

LS // Dependent Variable is D(LRM0)
Sample(adjusted): 1992:03 1996:04
Included observations: 50 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.007055	0.009934	0.710197	0.4813
D(LRM0(-1))	0.270592	0.10599	2.552999	0.0142
D(LINF)	-0.114987	0.036075	-3.187467	0.0026
D(LRER)	0.160022	0.091338	1.751978	0.0867
D(LRW)	0.429941	0.101033	4.255442	0.0001
D(LRGDP)	0.151671	0.09858	1.538557	0.1311

R-squared	0.57375	Mean dependent var	0.004722
Adjusted R-squared	0.525313	S.D. dependent var	0.090494
S.E. of regression	0.062348	Akaike info criterion	-5.437874
Sum squared resid	0.171041	Schwarz criterion	-5.208431
Log likelihood	70.99992	F-statistic	11.84517
Durbin-Watson stat	2.829408	Prob(F-statistic)	0

D(LRMO)=first difference of the logarithm of M0 - money in circulation; D(LINF)=first difference of the logarithm of the inflation rate; D(LRER)=first difference of the logarithm of the average real exchange rate; D(LRW)=first difference of the logarithm of average real wage; D(LRGDP)=first difference of the logarithm in real GDP.

The inflation tax on currency in circulation has the following functional form (using equation (1)):

$$(5) \quad it = e^c \frac{\pi}{\sqrt{1+\pi}} \pi^{-\sigma} \left(\frac{W}{P}\right)^{0.429} \left(\frac{GDP}{P}\right)^{0.151} \left(\frac{E}{P}\right)^{0.16} \left(\frac{M0}{P}\right)^{0.271}_{-1},$$

where σ is the short-run elasticity of real money demand with respect to inflation. According to equation (3), between 1992 and 1996, σ amounts to 0.114. This confirms that the demand for real currency in circulation is not very sensitive to inflation.

Inflation tax on households' deposits in Saving and Commercial Banks

The inflation tax on rouble deposits depends on whether relevant real interest rates are positive or not. The inflation tax on saving time and commercial bank deposits varied quite drastically (see Table S.III.VI.3). To understand the subsequent discussion one

needs to know that the Sberbank is the Russian bank formed from the former enormous set of savings banks established in the USSR. As such it has the advantage of inheriting an immense geographic coverage in terms of a national branch network. Note that as commercial bank deposits are given in the statistics without specification of maturity, (non-interest bearing) demand deposits may be included as well.

I calculated the demand for real deposits as a function of inflation, exchange-rate growth, the real wage and real GDP:

$$(6) \quad \frac{D}{P} = d\left(\pi, \frac{ER}{ER_{-1}}, \frac{W}{P}, \frac{GDP}{P}, \left(\frac{D}{P}\right)_{-1}, \varepsilon \right),$$

where D = demand for nominal deposits, P = price level, π = inflation, ER = exchange rate (Rbl/$), W = nominal wage, GDP = nominal GDP, ε = disturbance term.

I estimated the following regressions for the demand of Sberbank real deposits and for the demand for commercial banks' real deposits from February 1992 to June 1996 (OLS).

(7) D(LRDSBGKS) = -0.014728097 + 0.60264285*D(LRDSBGKS(-1)) - 0.12061207*D(LINF) + 0.052036546*DLER - 0.039752744*D(LRGDP) + 0.51428481*D(LRW)

Table III.VI.2

$D(LRDSBGKS) = C(1) + C(2)*D(LRDSBGKS(-1)) + C(3)*D(LINF) + C(4)*DLER + C(5)*D(LRGDP) + C(6)*D(LRW)$

<div align="center">

LS // Dependent Variable is D(LRDSBGKS)
Sample(adjusted): 1992:03 1996:06
Included observations: 52 after adjusting endpoints

</div>

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.014728	0.011693	-1.259595	0.2142
D(LRDSBGKS(-1))	0.602643	0.097659	6.170877	0
D(LINF)	-0.120612	0.038652	-3.120453	0.0031
DLER	0.052037	0.097691	0.532667	0.5968
D(LRGDP)	-0.039753	0.097533	-0.407584	0.6855
D(LRW)	0.514285	0.107058	4.803817	0

R-squared	0.586602	Mean dependent var	-0.013753
Adjusted R-squared	0.541668	S.D. dependent var	0.094748
S.E. of regression	0.064144	Akaike info criterion	-5.38507
Sum squared resid	0.189267	Schwarz criterion	-5.159927
Log likelihood	72.22703	F-statistic	13.05461
Durbin-Watson stat	1.95887	Prob(F-statistic)	0

D(LRDSBGKS)=first difference of the logarithm of real saving bank deposits; D(LINF)=first difference of the logarithm of the inflation rate; DLER=first difference of the logarith of the nominal average monthly exchange rate; D(LRGDP)=first difference of the logarithm in real GDP(nominal GDP delated by the CPI); D(LRW)=first difference of the logarithm of the real wage. No serial correlation was deduced using the Breusch Godfrey serial LM test.

This implies the following expression for inflation tax

$$(8) \quad it = e^{C} \frac{\pi - i}{\sqrt{1 + \pi}} \pi^{-\sigma} \left(\frac{W}{P}\right)^{0.514} \left(\frac{GDP}{P}\right)^{-0.04} \left(\frac{E}{E_{-1}}\right)^{-0.052} \left(\frac{D}{P}\right)^{0.602}_{-1}$$

with σ the short-term elasticity of demand for money with respect to inflation, 0.12, from the estimate in equation (7).

(9) D(LRDCBGKS) = 0.01695613 + 0.70789617*D(LRDCBGKS(-1)) -

0.060561308*D(LINF) + 0.1679797*D(LRW) + 0.082514248*D(LRGDP) -

0.082345658*DLER

Table III.VI.3

$D(LRDCBGKS) = C(1) + C(2)*D(LRDCBGKS(-1)) - C(3)*D(LINF) - C(4)*D(LRW) + C(5)*D(LRGDP) + C(6)*DLER$

LS // Dependent Variable is D(LRDCBGKS)
Sample(adjusted): 1992:03 1996:06
Included observations: 52 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob
C	0.016956	0.01245	1.361889	0.1799
D(LRDCBGKS(-1))	0.707896	0.094238	7.511773	0
D(LINF)	-0.060561	0.036819	-1.644825	0.1068
D(LRW)	0.16798	0.102238	1.64303	0.1072
D(LRGDP)	0.082514	0.09642	0.855783	0.3966
DLER	-0.082346	0.095089	-0.865982	0.391

R-squared	0.61572	Mean dependent var	0.056835
Adjusted R-squared	0.57395	S.D. dependent var	0.095896
S.E. of regression	0.062594	Akaike info criterion	-5.434012
Sum squared resid	0.180227	Schwarz criterion	-5.208869
Log likelihood	73.49952	F-statistic	14.74085
Durbin-Watson stat	2.05661	Prob(F-statistic)	0

D(LRDCBGKS)=first difference of the logarithm of commercial bank deposits

This time $\sigma = 0.06$ in the inflation tax equation (8).

Both OLS regressions show a negative and statistically significant effect for inflation, but in both cases the response is not immense, though larger than the short-run elasticity of demand for cash in circulation (see above). That is, for both Sberbank and commercial deposits, inflation decreases the demand for rouble deposits. The effect is more pronounced in the case of saving bank deposits.

VI.2 Does inflation affect wages?

Non-indexed real wages are eroded by inflation. In Russia, price growth has been accompanied by nominal wage increases which may either undershoot or overshoot inflation[3]. The graph shows monthly inflation and percentage nominal wage growth (moving average of current, previous and subsequent months) from 1992:03 to 1996:07.

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[3] In the public sector, wages are normally directly linked to the minimum wage which is reassessed quarterly by the authorities.

Figure VI. 2 Wage and inflation growth
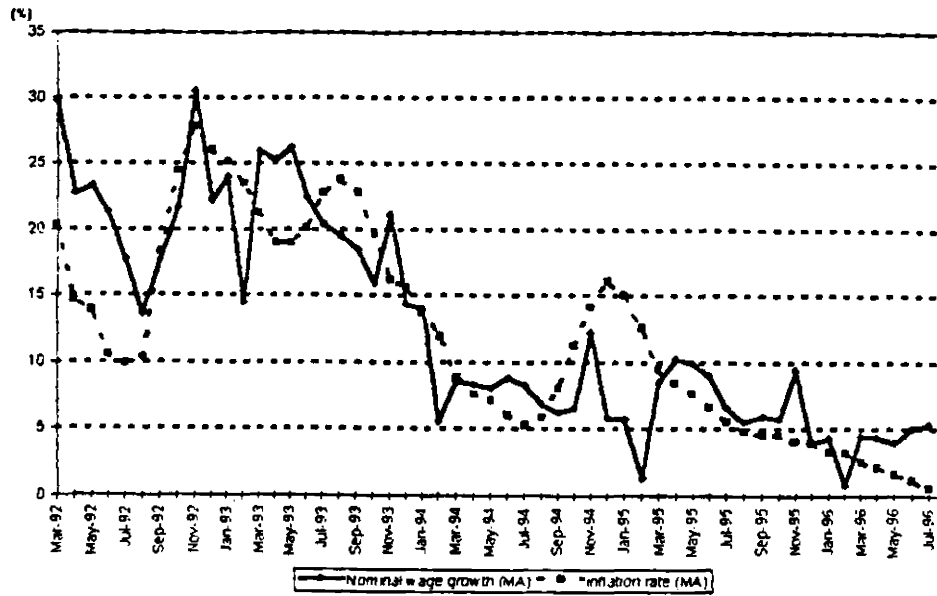
Source: calculated with data from Goskomstat.

I assume that the nominal wage increase tends to cover any loss from expected inflation. Since any prediction is based on information currently available, the real wage must be sensitive to sharp (unexpected) changes in the inflation rate. Figure VI.3 shows changes in the logarithm of the real wage (SA=seasonally adjusted). Seasonal adjustment is necessary, because changes in the real wage are highly seasonal in Russia. Traditionally there are clear peaks at the end of every quarter, a big rise in December, (when an extra year-end payment is made), and a big fall in January.

Figure VI.3

Change in the logarithm of the real wage
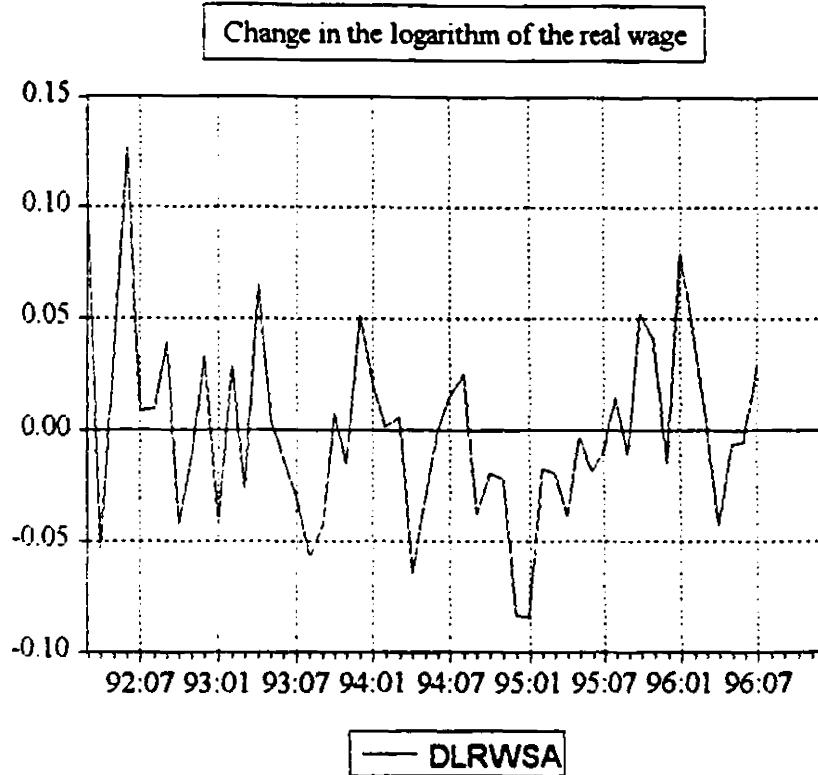
— DLRWSA

I examined the correlation between (seasonally-adjusted) differences in the logarithm of the real (CPI adjusted) wage[4] (DLRWSA) and differences in the logarithm of the price level (DLINFPLUSSA) from April 1992 to July 1996. I found a statistically significant negative correlation between the seasonally-adjusted differences in the logarithm of the real wage and (one month lagged) differences in the logarithm of the price level. The correlation coefficient was -0.23. Figure VI.4 presents the scatter diagram showing the level of correlation between changes in the price level and changes in real wage.

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[4] Goskomstat data is used for the average nominal monthly wage. The data does not include social payments.

Figure VI.4

Relation between change in the price level and change in real wage, April 1992 - July 1996
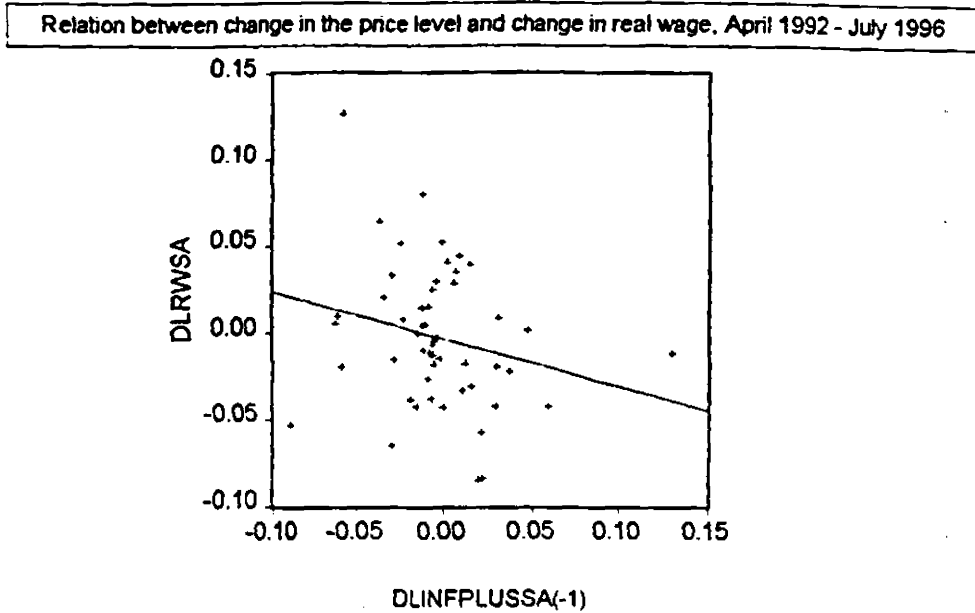
Thus, an increase in inflation rate erodes the real wage, and a decline in the inflation rate improves the real wage (other things being equal).

VI.3. Inflation and Growth

Further empirical research needs to be carried out - for instance on inflation and growth following the work of Barro (1995) and others. One reason for the limitation of empirical work in Russia has been the small number of observations. Another was the poor quality of the data. With time these difficulties will diminish.

Very preliminary tests have been conducted of a link between inflation and growth in Russia in 1992-1996. I considered real (CPI-adjusted) GDP compared with the same month of the previous year and inflation over the current and preceding eleven months have been found to be negatively correlated with a correlation coefficient of -0.26.

Figure VI.6 Yearly real GDP growth and inflation rate, February 1993 - August 1996

INFY(-1)
coefficient of correlation= -0.26
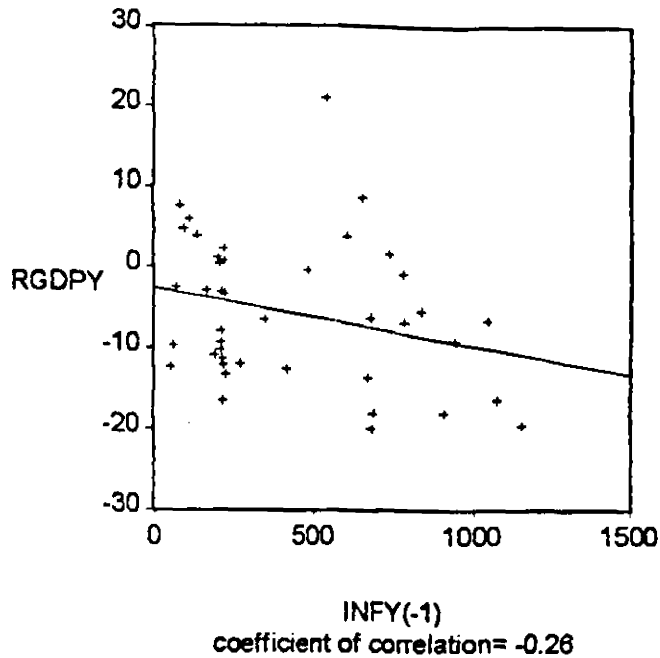
However the scatter diagram suggests that the relationship is different for annual inflation rates above and below 400%. Separate consideration of samples from 1992:01 to 1994:07 and from 1994:08 to 1996:07 provides correlations of -0.44 and -0.32.

Figure VI.7

Yearly real GDP growth and inflation rate, February 1993 - July 1994

INFY(-1)

Coefficient of correlation=-0.44

148
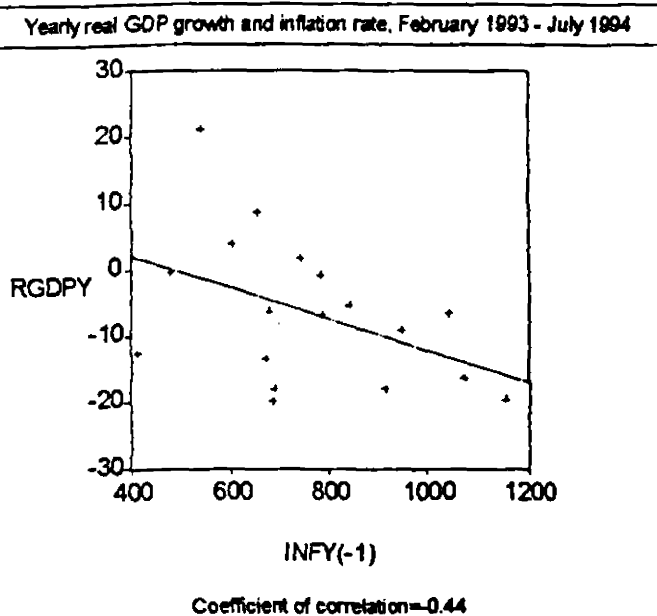
Figure VI.8

Yearly Real GDP Growth and Inflation rate, August 1994 - August 1996

coefficient of correlation = -0.32
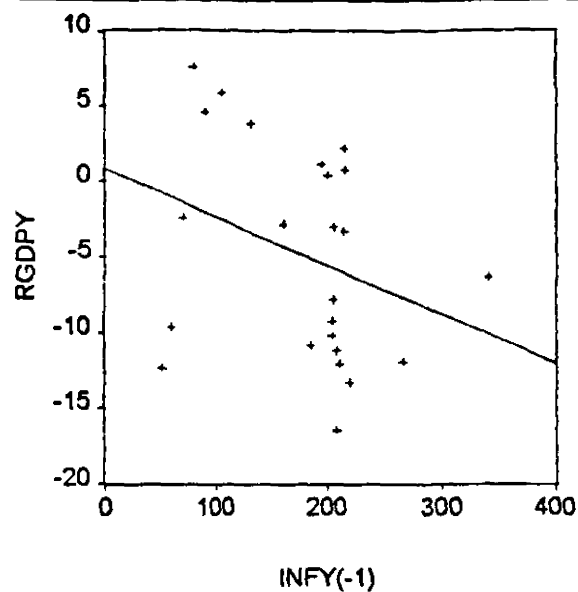
As such all correlations were found to be significantly negative and different according to whether the yearly inflation rate was below or above 400%.

The relation is described by the following equation (the t-statistics are in parenthesis) for the period 1993-1996. Although the inflation rate seems to be statistically significant at the 10% level, the t-statistics should probably not be trusted here. The ADF shows that INFY is not stationary.

(10) RGDPY = - 2.805636 - 0.0057988738*INFY(-1)

$$(-1.41) \qquad\qquad (-1.87)$$

R-squared	0.080641
Adjusted R-squared	0.057657
S.E. of regression	8.556419
Sum squared resid	2928.492
Log likelihood	-148.7315
Durbin-Watson stat	1.553109

Therefore, the main conclusion is not that these correlations have shown so clearly the negative effects of inflation on growth, but rather that inflation has no positive effect on growth.

STATISTICAL APPENDIX TO PART III

CHAPTER I

Table S.III.I.1 USSR Growth of Net Material Product[a]
Annual Average rate of growth

	NMP
1951-55	11.3
1956-60	9.1
1961-65	6.4
1966-70	7.7
1971-75	5.6
1976-80	4.3
1981-85	3.6
1986-1990	3.2

a. Net Material Product (NMP) is equal to net domestic product (NDP) less the net value added to the non material service sector. Basically most housing, education, cultural activities, health care, tourism and recreation are not included in the NMP accounts.
b. The IMF, IBRD, OECD and EBRD (1990), pp.3-4 reports that "Officially measured growth of net material product (NMP) averaged some 2 percent in 1986-87, below the average rate reported for the first half of the 1980s. Allowing for hidden inflation (price increases not included in the official price index because they are supposedly offset by quality improvements), output may well have stagnated."

Source: Narkhoz (various years) quoted in Smith (1993), Table 2.1, p. 30.

CHAPTER III

Table S.III.III.1 Russia: Monetary Base (MB, including excess reserves), Money Supply in Roubles, Monthly Inflation Rates and Monthly GDP, 1991 - 1996. end of period, stocks in bn of Rbs, and monthly variations in %.

Months	MB	%MB	CPI	Rbs M2	%M2	GDP
Dec-91	353		12.00%	998		104
Jan-92	368	4.25%	296.00%	1011	1.30%	500
Feb-92	396	7.61%	27.30%	1214	20.08%	600
Mar-92	556	40.40%	16.40%	...4	8.24%	700
Apr-92	686	23.38%	17.20%	1477.6	12.45%	800
May-92	857	24.93%	10.50%	1546	4.63%	900
Jun-92	1160	35.36%	13.90%	1931	24.90%	1100
Jul-92	1437	23.88%	7.10%	2650	37.23%	1400
Aug-92	2078	44.61%	8.60%	3322	25.36%	1600
Sep-92	2563	23.34%	15.20%	4218	26.97%	1900
Oct-92	3211	25.28%	31.10%	5277	25.11%	2700
Nov-92	3120	-2.83%	27.10%	5671	7.47%	2700
Dec-92	4284.5	37.32%	25.10%	6400	12.85%	3200
Jan-93	4566.6	6.58%	.25.80%	7187	12.30%	3400
Feb-93	5155.4	12.89%	24.70%	7782	8.28%	3900
Mar-93	6344.4	23.06%	20.10%	8913	14.53%	5900
Apr-93	7207.4	13.60%	18.80%	11063	24.12%	5900
May-93	8244.8	14.39%	18.10%	13460	21.67%	6200
Jun-93	9403.9	14.06%	19.90%	15765	17.12%	9900
Jul-93	12382	31.67%	22.40%	18428	16.89%	13200
Aug-93	13853	11.88%	26.00%	21121	14.61%	15400
Sep-93	14884	7.44%	23.00%	21771	3.08%	19900
Oct-93	16950	13.88%	19.50%	24554	12.78%	24800
Nov-93	19014	12.18%	16.50%	26788	9.10%	26400
Dec-93	22200	16.76%	12.50%	32601	21.70%	27400
Jan-94	21400	-3.60%	17.90%	33980	4.23%	28400
Feb-94	24201	13.09%	10.70%	36439	7.24%	30300
Mar-94	26778	10.65%	7.40%	39550	8.54%	33100
Apr-94	31294	16.86%	8.50%	46401	17.32%	39200
May-94	34161	9.16%	6.90%	52253	12.61%	43500
Jun-94	37824	10.72%	6.00%	59414	13.70%	50500
Jul-94	43114	13.99%	5.30%	64363	8.33%	50800
Aug-94	46692	8.30%	4.60%	70970	10.27%	52700
Sep-94	49900	6.87%	7.70%	77063	8.59%	56100
Oct-94	50407	1.02%	11.80%	80359	4.28%	69000
Nov-94	53454	6.04%	14.20%	84348	4.96%	73000
Dec-94	61000	14.12%	16.40%	97800	15.95%	83000

Months	MB	%MB	CPI	Rbs M2	%M2	GDP
Jan-95	54000	-11.48%	17.80%	93800	-4.09%	76000
Feb-95	58000	7.41%	11.00%	101900	8.64%	81000
Mar-95	62000	6.90%	8.90%	107300	5.30%	87000
Apr-95	71000	14.52%	8.50%	123200	14.82%	100000
May-95	80000	12.68%	7.90%	138200	12.18%	118000
Jun-95	93600	17.00%	6.70%	156600	13.31%	138000
Jul-95	94000	0.43%	5.40%	165000	5.36%	152000
Aug-95	100000	6.38%	4.60%	173800	5.33%	165000
Sep-95	102000	2.00%	4.50%	179700	3.39%	172000
Oct-95	105000	2.94%	4.70%	184200	2.50%	179000
Nov-95	109000	3.81%	4.50%	195200	5.97%	179000
Dec-95	119000	9.17%	3.20%	220800	13.11%	184000
Jan-96	114684	-3.63%	4.10%	216700	-1.86%	159000
Feb-96	121185	5.67%	2.80%	229200	5.77%	157000
Mar-96	128520	6.05%	2.80%	241800	5.50%	164000
Apr-96	134278	4.48%	2.20%	251000	3.80%	174000
May-96	132073	-1.64%	1.60%	254200	1.27%	178000
Jun-96	145197	9.94%	1.2%	266900	5.00%	183000
Jul-96	147012	1.25%	0.7%	271900	1.87%	188000
Aug-96			-0.2%	275300	1.25%	200000
Sep-96			0.3%	277200	0.69%	206000
Oct-96			1.2%			210000
Nov-96			1.4%			
Dec-96						

a. MB is the monetary base including excess reserves

b. The CPI is the urban index. for 1992 (see Koen (1994, p. 4).

c. M2 is defined as currency outside banks plus rouble deposits (demand deposits plus time and saving deposits);

d. The GDP series is the 1995 revised series (1991-1994).

Source: Calculated from CBR and Goskomstat data.

Table S.III.III.2 Rbs M2 and Broad M2 (including foreign deposits) Velocity

	V=GDP/M2	V=GDP/Broad M2
Jul-92	6.34	4.44
Aug-92	5.78	3.93
Sep-92	5.41	3.38
Oct-92	6.14	3.46
Nov-92	5.71	3.11
Dec-92	6.00	3.51
Jan-93	5.68	3.04
Feb-93	6.01	3.27
Mar-93	7.94	4.27
Apr-93	6.40	3.47
May-93	5.53	2.94
Jun-93	7.54	4.27
Jul-93	8.60	5.75
Aug-93	8.75	6.27
Sep-93	10.97	7.19
Oct-93	12.12	8.04
Nov-93	11.83	7.86
Dec-93	10.09	7.04
Jan-94	10.03	6.47
Feb-94	9.98	6.41
Mar-94	10.04	6.49
Apr-94	10.14	6.88
May-94	9.99	7.02
Jun-94	10.20	7.45
Jul-94	9.47	
Aug-94	8.91	
Sep-94	8.74	
Oct-94	10.30	
Nov-94	10.39	
Dec-94	10.18	

	$V=GDP/M2$	$V=GDP/Broad\ M2$
Jan-95	9.72	
Feb-95	9.54	
Mar-95	9.73	
Apr-95	9.74	
May-95	10.25	
Jun-95	10.57	
Jul-95	11.05	
Aug-95	11.39	
Sep-95	11.49	
Oct-95	11.66	
Nov-95	11.00	
Dec-95	10.00	
Jan-96	8.80	
Feb-96	8.22	
Mar-96	8.14	
Apr-96	8.32	
May-96	8.40	
Jun-96	8.23	
Jul-96	8.30	
Aug-96	8.72	
Sep-96	8.92	

a. Velocity is calculated as the yearly average GDP divided by either Rbs M2 or Broad M2 (including foreign exchange deposits).

Source: Calculated with data from CBR

Table S.III.III.3 Russia: Foreign Exchange Deposits, Rouble Deposits and Broad Money, in bn of Rbs, end of period.

	Currency outside banks	Rouble deposits	Foreign Exchange Deposits	Broad Money
December	167	831	203	1201
Jan-92	183.8	827.2	241	1252
February	209.3	1004.7	279	1493
March	247.6	1066.4	319	1633
April	317.5	1160.1	376	1853.6
May	365.6	1180.4	598	2144
June	455.1	1475.9	852	2783
July	643	2007	1132	3782
August	804	2518	1566	4888
September	950	3268	2534	6752
October	1146	4131	4100	9377
November	1380	4291	4749	10420
December	1678.4	4721.6	4538	10938
Jan-93	1902.5	5284.5	6227	13414
February	2278.6	5503.4	6539	14321
March	2559	6354	7671	16584
April	3308.7	7754.3	9353	20416
May	4019.6	9440.4	11824	25284
June	5112.7	10652.3	12053	27818
July	6260.9	12167.1	9123	27551
August	7306.9	13814.1	8341	29462
September	8408.7	13362.3	11421	33192
October	9825.6	14728.4	12473	37027
November	10951.9	15836.1	13532	40320
December	13277.7	19323.3	14080	46681
Jan-94	12968	21012	18666	52646
Feb	14373	21866	20243	56684
March	15940	23610	21637	61187
April	19411	26990	21930	68331
May	20669	31584	22157	74410
June	23810.8	35603.2	21952	81366
July	27048	37315		
Aug	27919	43051		
Sep	30016	47046.7		
Oct	30522	49837		
Nov	31982	52366		
Dec	36482	61318		
Jan-95	31582	62218		
Feb-95	34282	67618		
Mar-95	35182	72118		
Apr-95	41882	81318		
May-95	45882	92318		
Jun-95	55082	101518		
Jul-95	59682	105318		
Aug-95	63082	110718		
Sep-95	66482	113218		

a. Broad money is calculated as Currency outside banks plus Rouble deposits plus Foreign exchange deposits.

Source: calculated from CBR data.

Table S.III.III.4 Demand and Time deposits in the Saving Bank, Stocks, end of period, bn of Rbs.

	Demand Deposits in Sberbank	Time Deposits in Sberbank	Total
Jan-92	205.8	172	377.8
Feb-92	218.8	176.6	395.4
Mar-92	235.9	166.5	402.4
Apr-92	247	160	407
May-92	258.6	156.5	415.1
Jun-92	277.5	154.1	431.6
Jul-92	293.3	154	447.3
Aug-92	307.3	153.5	460.8
Sep-92	324.4	153.5	477.9
Oct-92	344	155.2	499.2
Nov-92	373.7	157.1	530.8
Dec-92	440.3	218	658.3
Jan-93	510.4	195.1	705.5
Feb-93	585.9	213	798.9
Mar-93	572.3	347.7	920
Apr-93	615.9	430.9	1046.8
May-93	644.2	558.1	1202.3
Jun-93	814.4	584.7	1399.1
Jul-93	920.7	685.8	1606.5
Aug-93	1035	799.7	1834.7
Sep-93	1123.3	891.8	2015.1
Oct-93	1226.3	1044.7	2271
Nov-93	1371.6	1256.1	2627.7
Dec-93	1850.9	2115.9	3966.8
Jan-94	1948.1	2278.6	4226.7
Feb-94	2094.9	2584.6	4679.5
Mar-94	2226.8	2941.6	5168.4
Apr-94	2346.5	3307.6	5654.1
May-94	2573	3859.4	6432.4
Jun-94	2578.7	5204.2	7782.9
Jul-94	2882.8	5890.2	8791.4
Aug-94	3063.8	7148.8	10212.6
Sep-94			11773.3
Oct-94			12399.2
Nov-94			13671.4
Dec-94	4557	12999.9	17556.9

	Demand Deposits in Sberbank	Time Deposits in Sberbank	Total
Jan-95			18749.5
Feb-95			20363.9
Mar-95	4780	17388	22168
Apr-95			24487
May-95			27330
Jun-95	6079	24226.5	30305.5
Jul-95			32256.6
Aug-95			34083
Sep-95	7325	28916	36241
Oct-95			38834
Nov-95			41860
Dec-95	10435	40710	51145
Jan-96			54916
Feb-96	.		59769
Mar-96	11645	51065	62710
Apr-96			65743
May-96			67644
Jun-96	14435	56337	70772
Jul-96			74971
Aug-96			78326
Sep-96			80951
Oct-96			84951

Source:calculated from Sberbank data.

Table S.III.III.5 Russia: Nominal and real interest rate[a] on commercial banks credits and deposits (in %, end of period)

	Commercial banks					
	Lending rates compounded, per annum	Monthly lending rates	Real lending rates	Deposit rates compounded per annum	monthly Deposit rates	Real deposit rates
Jan-92	29.3%	2.2%	-74.2%	16.1%	1.3%	-74.4%
Feb-92	49.6%	3.4%	-18.8%	21.9%	1.7%	-20.1%
Mar-92	55.5%	3.7%	-10.9%	28.1%	2.1%	-12.3%
Apr-92	63.2%	4.2%	-11.1%	46.8%	3.2%	-11.9%
May-92	99.3%	5.9%	-4.2%	54.1%	3.7%	-6.2%
Jun-92	136.0%	7.4%	-5.7%	74.5%	4.7%	-8.0%
Jul-92	156.5%	8.2%	1.0%	77.9%	4.9%	-2.0%
Aug-92	176.1%	8.8%	0.2%	91.9%	5.6%	-2.8%
Sep-92	181.3%	9.0%	-5.4%	91.9%	5.6%	-8.4%
Oct-92	197.1%	9.5%	-16.5%	101.2%	6.0%	-19.1%
Nov-92	208.2%	9.8%	-13.6%	107.0%	6.2%	-16.4%
Dec-92	216.7%	10.1%	-12.0%	112.9%	6.5%	-14.9%
Jan-93	234.4%	10.6%	-12.1%	110.9%	6.4%	-15.4%
Feb-93	249.8%	11.0%	-11.0%	121.0%	6.8%	-14.3%
Mar-93	293.1%	12.1%	-6.7%	138.2%	7.5%	-10.5%
Apr-93	303.7%	12.3%	-5.4%	158.9%	8.2%	-8.9%
May-93	329.6%	12.9%	-4.4%	171.1%	8.7%	-8.0%
Jun-93	349.0%	13.3%	-5.5%	197.1%	9.5%	-8.7%
Jul-93						
Aug-93	622.6%	17.9%	-6.4%	592.6%	17.5%	-6.8%
Sep-93	686.3%	18.7%	-3.5%	453.9%	15.3%	-6.2%
Oct-93	776.9%	19.8%	0.3%	421.2%	14.7%	-4.0%
Nov-93	799.1%	20.1%	3.1%	435.0%	15.0%	-1.3%
Dec-93	791.6%	20.0%	6.7%	435.0%	15.0%	2.2%
Jan-94	791.6%	20.0%	1.8%	435.0%	15.0%	-2.5%
Feb-94	791.6%	20.0%	8.4%	435.0%	15.0%	3.9%
Mar-94	653.9%	18.3%	10.2%	349.0%	13.3%	5.5%
Apr-94	622.6%	17.9%	8.7%	293.0%	12.1%	3.3%
May-94	535.9%	16.7%	9.1%	149.5%	7.9%	0.9%
Jun-94	473.5%	15.7%	9.1%	296.6%	12.2%	5.8%
Jul-94	390.3%	14.2%	8.4%	275.9%	11.7%	6.0%
Aug-94	286.1%	11.9%	7.0%	225.4%	10.3%	5.5%
Sep-94	318.4%	12.7%	4.6%	219.6%	10.2%	2.3%
Oct-94	259.4%	11.2%	-0.5%	181.3%	9.0%	-2.5%
Nov-94	259.4%	11.2%	-2.6%	178.7%	8.9%	-4.6%
Dec-94	357.0%	13.5%	-2.5%	161.3%	8.3%	-6.9%
Jan-95	357.0%	13.5%	-3.7%	161.3%	8.3%	-8.0%
Feb-95	345.1%	13.2%	2.0%	161.3%	8.3%	-2.4%
Mar-95	349.0%	13.3%	4.1%	161.3%	8.3%	-0.5%
Apr-95	399.0%	14.3%	5.4%	181.3%	9.0%	0.5%

a. The real interest rate is calculated as $R = \dfrac{1+i}{1+\pi} - 1$

Source: Granville, Monetary Report, and Russian Economic Trends various issues

TABLE S.III.III.6 Refinance rate changes

Period	Annual Rate
Before April 10, 1992	20%
April 10-May 28, 1992	50%
May 29 1992-March 29, 1993	80%
March 30-June 1, 1993	100%
June 2 - June 21, 1993	110%
June 22 -June 28, 1993	120%
June 29 - July 14, 1993	140%
July 15 - September 22, 1993	170%
September 23 - October 14, 1993	180%
October 15, 1993 - April 28 1994	210%
April 29 - 17 May ,1994	205%
May 18-31 May, 1994	200%
1 June-22 June, 1994	185%
23 June -1 July, 1994	170%
July 2-22 August 1994	155%
23 August 1994	130%
12 October 1994	170%
17 November 1994	180%
06-Jan-95	200%
16-May-95	195%
19-Jun-95	180%
24-Oct-95	170%
01-Dec-95	160%
10-Feb-96	120%
24-Jul-96	110%
19-Aug-96	80%
21-Oct-96	60%
02-Dec-96	48%

Source: Calculated from Press reports and CBR data.

Table S.III.III.7 Russia: Nominal, Real Refinance Rates[a] and Inflation, end of period, in %

	Refinance Rate	Effective Yield	Monthly rate	Inflation (monthly)	Real Refinance rate (monthly)
Jan-92	20.0%	21.9%	1.7%	296.0%	-74.3%
February	20.0%	21.9%	1.7%	27.3%	-20.1%
March	20.0%	21.9%	1.7%	16.4%	-12.7%
April	50.0%	63.2%	4.2%	17.2%	-11.1%
May	80.0%	116.9%	6.7%	10.5%	-3.5%
June	80.0%	116.9%	6.7%	13.9%	-6.4%
July	80.0%	116.9%	6.7%	7.1%	-0.4%
August	80.0%	116.9%	6.7%	8.6%	-1.8%
September	80.0%	116.9%	6.7%	13.2%	-5.8%
October	80.0%	116.9%	6.7%	31.1%	-18.6%
November	80.0%	116.9%	6.7%	27.1%	-16.1%
December	80.0%	116.9%	6.7%	25.3%	-14.9%
Jan-93	80.0%	116.9%	6.7%	26%	-15.2%
February	80.0%	116.9%	6.7%	25%	-14.5%
March	80.0%	116.9%	6.7%	20%	-11.2%
April	100.0%	161.3%	8.3%	19%	-8.8%
May	100.0%	161.3%	8.3%	18%	-8.3%
June	140.0%	275.9%	11.7%	20%	-6.9%
July	170.0%	390.3%	14.2%	22.4%	-6.7%
August	170.0%	390.3%	14.2%	26.0%	-9.4%
Sep	180.0%	435.0%	15.0%	23.0%	-6.5%
Oct	210.0%	592.6%	17.5%	19.5%	-1.7%
Nov	210.0%	592.6%	17.5%	16.5%	0.9%
Dec	210.0%	592.6%	17.5%	12.5%	4.4%
Jan-94	210.0%	592.6%	17.5%	17.9%	-0.3%
Feb	210.0%	592.6%	17.5%	10.7%	6.1%
March	210.0%	592.6%	17.5%	7.4%	9.4%
April	210.0%	592.6%	17.5%	8.5%	8.3%
May	202.5%	549.6%	16.9%	6.9%	9.3%
June	177.5%	423.5%	14.8%	6.0%	8.3%
July	155.0%	329.6%	12.9%	5.3%	7.2%
Aug	142.5%	284.4%	11.9%	4.6%	7.0%
Sep	130.0%	243.6%	10.8%	7.7%	2.9%
Oct	150.0%	311.0%	12.5%	11.8%	0.6%
Nov	175.0%	412.2%	14.6%	14.2%	0.3%
Dec	180.0%	435.0%	15.0%	16.4%	-1.2%

	Refinance Rate	Effective Yield	Monthly rate	Inflation (monthly)	Real Refinance rate (monthly)
Jan-95	200.0%	535.9%	16.7%	17.8%	-1.0%
Feb	200.0%	535.9%	16.7%	11.0%	5.1%
March	200.0%	535.9%	16.7%	8.9%	7.1%
April	200.0%	535.9%	16.7%	8.5%	7.5%
May	197.2%	520.9%	16.4%	7.9%	7.9%
June	187.5%	471.0%	15.6%	6.7%	8.4%
July	180.0%	435.0%	15.0%	5.4%	9.1%
Aug	180.0%	435.0%	15.0%	4.6%	9.9%
Sep	180.0%	435.0%	15.0%	4.5%	10.0%
Oct	170.0%	390.3%	14.2%	4.7%	9.0%
Nov	170.0%	390.3%	14.2%	4.5%	9.3%
Dec	160.0%	349.0%	13.3%	3.2%	9.8%
Jan-96	160.0%	349.0%	13.3%	4.1%	8.9%
Feb	120.0%	213.8%	10.0%	2.8%	7.0%
March	120.0%	213.8%	10.0%	2.8%	7.0%
April	120.0%	213.8%	10.0%	2.2%	7.6%
May	120.0%	213.8%	10.0%	1.6%	8.3%
June	120.0%	213.8%	10.0%	1.2%	8.7%
July	110.0%	186.5%	9.2%	0.7%	8.4%
August	95.0%	149.5%	7.9%	-0.2%	8.1%
Sep	80.0%	116.9%	6.7%	0.3%	6.3%
Oct	70.0%	97.5%	5.8%	1.2%	4.6%
Nov	60.0%	79.6%	5.0%	1.9%	3.0%
Dec	48.0%	60.1%	4.0%	1.4%	2.6%

a. The real interest rate is $R = [(1+r/12)/(1+\pi)]-1$

b. The urban price index is used for 1992, the expanded one thereafter.

Source: Calculated from Press reports, CBR and Goskomstat data.

Table S.III.III.8 - Russia: Narrow Monetary Base (MB1) and Monetary Base (including excess reserves) (MB), in bn of Roubles, and Money Multipliers, end of period.

	k=M2/MB	k1=M2/MB1	MB	MB1
Dec-91	2.83	5.48	353	182
Jan-92	2.75	4.98	368	203
Feb	3.07	4.88	396	249
March	2.36	3.91	556	336
April	2.15	3.99	686	370
May	1.80	3.37	857	459
June	1.66	3.40	1160	568
July	1.84	3.36	1437	789
Aug	1.60	3.37	2078	987
Sep	1.65	3.57	2563	1183
Oct	1.64	3.58	3211	1472
Nov	1.82	3.19	3120	1775
Dec	1.49	2.86	4284.5	2235
Jan-93	1.57	2.77	4566.6	2598.2
Feb	1.51	2.53	5155.4	3078
March	1.40	2.51	6344.4	3554
April	1.53	2.49	7207.4	4445
May	1.63	2.48	8244.8	5425
June	1.68	2.36	9403.9	6687
July	1.49	2.31	12382.1	7970
Aug	1.52	2.24	13853	9446
Sep	1.46	2.02	14884.3	10770
Oct	1.45	1.97	16950.2	12472
Nov	1.41	1.90	19014	14080
Dec	1.47	1.95	22200	16691
Jan-94	1.59	2.00	21400	17010
Feb	1.51	1.94	24201	18741
March	1.46	1.96	27058	20152
April	1.48	1.91	31294	24292
May	1.53	1.97	34161	26469
June	1.57	1.98	37948	30076
July	1.49	1.86	43114	34678
Aug	1.52	1.94	46692	36625
Sep	1.54	1.95	49900	39580
Oct	1.59	1.95	50407	41280
Nov	1.58	1.95	53428	43328
Dec	1.60	2.05	61000	47679

	$k=M2/MB$	$k1=M2/MB1$	MB	MB1
Jan-95	1.74	2.12	54000	44200
Feb	1.76	2.17	58000	47000
March	1.73	2.16	62000	49623
April	1.74	2.17	71000	56900
May	1.73	2.17	80000	63600
June	1.68	2.14	93000	73132
July	1.76	2.03	94000	81200
Aug	1.74	2.02	100000	86000
Sep	1.76	2.02	102000	89000
Oct	1.75	2.05	105000	89900
Nov	1.79	2.07	109000	94400
Dec	1.86	2.13	119000	103800
Jan-96	1.89	2.15	114684	100800
Feb	1.89	2.15	121185	106600
March	1.88	2.13	128520	113700
April	1.87	2.08	134278	120900
May	1.92	2.14	132073	118800
June	1.84	2.06	145197	129400
July	1.85	2.08	147012	130800
August		2.13		129000
Sep		2.21		125700

a. K = M2/MB (including excess reserves)

b. K1 = M2/MB(excluding excess reserves)

c. MB = Currency + Legal reserves + excess reserves

d. MB1= Currency + Legal reserves

Source: Calculated from CBR data.

Table S.III.III.9 Russia: Total Reserves (end of period) in bn of Rbs.

	Rouble Deposits (RD)	Minimum Reserves (MR)	Excess Reserves (ER)	Total Reserves (TR)	MR/RD	ER/RD	TR/RD
Dec-91	831	8	171	179	1.0%	20.6%	21.5%
Jan-92	827	12	165	177	1.5%	20.0%	21.4%
Feb	1007	35.4	147	182.4	3.5%	14.6%	18.1%
March	1075	86	220	306	8.0%	20.5%	28.5%
April	1131	91.7	316	407.7	8.1%	27.9%	36.0%
May	1189	94	398	492	7.9%	33.5%	41.4%
June	1488	113.5	592	705.5	7.6%	39.8%	47.4%
July	1951	147	648	795	7.5%	33.2%	40.7%
Aug	2592	185	1091	1276	7.1%	42.1%	49.2%
Sep	3516	254	1380	1634	7.2%	39.2%	46.5%
Oct	4526	345.8	1739	2084.8	7.6%	38.4%	46.1%
Nov	4589	420.8	1345	1765.8	9.2%	29.3%	38.5%
Dec	4721.6	472.4	2050	2522.4	10.0%	43.4%	53.4%
Jan-93	5284.5	569	1968	2537	10.8%	37.2%	48.0%
Feb	5503.4	639	2077	2716	11.6%	37.7%	49.4%
March	6354	731	2790	3521	11.5%	43.9%	55.4%
April	7754.3	891	2762	3653	11.5%	35.6%	47.1%
May	9440.4	1067	2820	3887	11.3%	29.9%	41.2%
June	10652.3	1227	2717	3944	11.5%	25.5%	37.0%
July	12167.1	1389	4412	5801	11.4%	36.3%	47.7%
Aug	13814.1	1615	4407	6022	11.7%	31.9%	43.6%
Sep	13362.3	1895	4114	6009	14.2%	30.8%	45.0%
Oct	14728.4	2145	4478	6623	14.6%	30.4%	45.0%
Nov	15836.1	2427	4934	7361	15.3%	31.2%	46.5%
Dec	19323.3	2710	5509	8219	14.0%	28.5%	42.5%
Jan-94	21012	3145	4390	7535	15.0%	20.9%	35.9%
Feb	21866	3303	5460	8763	15.1%	25.0%	40.1%
March	23610	3603	6906	10509	15.3%	29.3%	44.5%
April	26990	4027	7002	11029	14.9%	25.9%	40.9%
May	31584	4599	7692	12291	14.6%	24.4%	38.9%
June	35603.2	4917.184	7872	12789.184	13.8%	22.1%	35.9%
July	37315	5913.903	8436	14349.903	15.8%	22.6%	38.5%
Aug	43051	6718.74	10067	16785.74	15.6%	23.4%	39.0%
Sep	47046.7	7569.918	10320	17889.918	16.1%	21.9%	38.0%
Oct	49837	8303.299	9127	17430.299	16.7%	18.3%	35.0%
Nov	52366	9240.785	10126	19366.785	17.6%	19.3%	37.0%
Dec	61832	10100.557	13321	23421.557	16.3%	21.5%	37.9%

	Rouble Deposits (RD)	Minimum Reserves (MR)	Excess Reserves (ER)	Total Reserves (TR)	MR/RD	ER/RD	TR/RD
Jan-95	63104	10988.231	9800	20788.231	17.4%	15.5%	32.9%
Feb	68622	11593.696	11000	22593.696	16.9%	16.0%	32.9%
March	72281	13106.647	12377	25483.647	18.1%	17.1%	35.3%
April	81412	13934.322	14100	28034.322	17.1%	17.3%	34.4%
May	92332	16619.653	16400	33019.653	18.0%	17.8%	35.8%
June	101577	15916.533	19868	35784.533	15.7%	19.6%	35.2%
July	105372	20237.48	12800	33037.48	19.2%	12.1%	31.4%
Aug	110575	20844.319	14000	34844.319	18.9%	12.7%	31.5%
Sep	112997	20885.418	13000	33885.418	18.5%	11.5%	30.0%
Oct	116907	18868.919	15100	33968.919	16.1%	12.9%	29.1%
Nov	123765	20455.349	14600	35055.349	16.5%	11.8%	28.3%
Dec	140000		15200	15200	0.0%	10.9%	10.9%
Jan-96	141300	21223.908	13884	35107.908	15.0%	9.8%	24.8%
Feb	148800	21906.043	14585	36491.043	14.7%	9.8%	24.5%
March	155100	22729.235	14820	37549.235	14.7%	9.6%	24.2%
April	157900	23364.725	13378	36742.725	14.8%	8.5%	23.3%
May	160500	20822.24	13273	34095.24	13.0%	8.3%	21.2%
June	162500	20259.038	15797	36056.038	12.5%	9.7%	22.2%
July	169100	22837.972	16212	39049.972	13.5%	9.6%	23.1%
august	174200						

a. TR = Total Reserves = Minimum Reserves + Excess Reserves (Correspondent Accounts).

b. MR/RD = Minimum Reserve-Deposit ratio.

c. ER/RD = Excees Reserve-Rouble Deposit ratio.

d. TR/RD = Total Reserve-Rouble Deposit ratio.

Source: Calculated from CBR data.

CHAPTER V

Table S.III.V.1 Russia: Moscow Currency Exchange Market,
Volume of transactions in millions of US dollar, the exchange rate in Rbs per US
dollar and Central Bank of Russia Interventions (CBR).

DATE	Exchange rate End of period (1)	Exchange Rate Average(2)	Monthly Volume of transactions in millions of US$	Central Bank of Russia Intervention (3) in millions of US$
Jan-92	230	213.4	18	
Feb	139	186	33	
March	160.4	150.2	99	
April	143.6	154	47	
May	113	120.5	100	
June	144	126	308.92	
July	161.2	143	253.57	
Aug	210.5	168	261.3	
Sep	309	220	453.1	
Oct	398	354	408.9	
Nov	417	426	353.2	
Dec	414.5	415	453	-102.00
Jan-93	572	484	485.1	154.60
Feb	593	569	518.6	185.00
March	684	665	494.9	122.10
April	823	767	576.8	244.00
May	1024	928	437.13	197.20
June	1060	1080	676.8	-101.50
July	987	1025	1361.7	-923.40
Aug	992.5	986	1236.9	447.10
Sep	1169	1072	2190.1	1005.20
Oct	1184	1187.7	1244.9	4.00
Nov	1231	1194.5	1616.3	425.10
Dec	1247	1240.3	1848.9	-143.40
Jan-94	1548	1444.4	2094.8	1053.10
Feb	1659	1583.3	1696.8	180.70
March	1753	1718.68	1279.05	123.10
April	1832	1793.7	1157.9	-60.40
May	1916	1881.7	1112.8	267.30
June	1989	1959.2	1395.6	
July	2060	2025.9	1456.75	
Aug	2197	2121.7	3802.85	
Sep	2633	2346.9	3569.7	
Oct	3075	3043.5	2550.27	
Nov	3234	3151.4	1502.92	
Dec	3550	3387.7	1673.01	

	Exchange rate End of period (1)	Exchange Rate Average (2)	Monthly Volume of transactions	Central Bank of Russia Intervention (3)
Jan-95	4034	3858.3	2798.79	
Feb	4473	4259.4	1898.71	
March	4899	4748.7	2031.83	
April	5130	5029.9	3160	
May	4990	5060.2	3191.16	
June	4539	4708.8	3843.34	
July	4445	4518.8	1508.5	
Aug	4447	4416.3	1604.4	
Sep	4499	4472	1107.12	
Oct	4504	4501.4	729.11	
Nov	4580	4544.5	844.08	
Dec	4640	4621.6	802.09	
Jan-96	4734	4689.4	570.74	
Feb	4818	4765.4	856.85	
March	4856	4836	487.92	
April	4940	4904.4	835.88	
May	5031	4988.2	575.5	
June	5105	5060	385.19	
July	5189	5147	321.06	
Aug	5352	5337	235.97	
Sep	5407	5381	235.05	
Oct			151.47	
Nov			149.04	

a. Central Bank of Russia net sales/purchases at MICEX.

Source: own calculations, MICEX, and CBR interventions from IMF (1995), Table 59, p. 122.

Table S.III.V.2 Real Interbank interest rate and refinance rate.

	Interbank Lending rate on 1-3 months Yields 'monthly	CPI	Refinance rate monthly	real interbank rate	refinance rate real
Jan-92	2.2%	296.0%	1.7%	-74.2%	-74.3%
February	2.8%	27.3%	1.7%	-19.3%	-20.1%
March	3.2%	16.4%	1.7%	-11.3%	-12.7%
April	3.9%	17.2%	4.2%	-11.3%	-11.1%
May	5.7%	10.5%	6.7%	-4.3%	-3.5%
June	6.8%	13.9%	6.7%	-6.3%	-6.4%
July	7.7%	7.1%	6.7%	0.6%	-0.4%
August	8.2%	8.6%	6.7%	-0.3%	-1.8%
Sep	8.3%	15.2%	6.7%	-6.0%	-7.4%
Oct	8.6%	31.1%	6.7%	-17.2%	-18.6%
Nov	8.9%	27.1%	6.7%	-14.3%	-16.1%
Dec	9.6%	25.1%	6.7%	-12.4%	-14.7%
Jan-93	9.9%	25.8%	6.7%	-12.6%	-15.2%
Feb-93	10.7%	24.7%	6.7%	-11.2%	-14.5%
March	11.0%	20.1%	6.7%	-7.6%	-11.2%
April	11.3%	18.8%	8.3%	-6.3%	-8.8%
May	11.7%	18.1%	8.3%	-5.4%	-8.3%
June	12.1%	19.9%	11.7%	-6.5%	-6.9%
July	14.5%	22.4%	14.2%	-6.5%	-6.7%
August	15.4%	26.0%	14.2%	-8.4%	-9.4%
Sep	15.6%	23.0%	15.0%	-6.0%	-6.5%
Oct	16.8%	19.5%	17.5%	-2.2%	-1.7%
Nov	17.8%	16.5%	17.5%	1.1%	0.9%
Dec	17.1%	12.5%	17.5%	4.1%	4.4%
Jan-94	17.9%	17.9%	17.5%	0.0%	-0.3%
Feb-94	17.8%	10.7%	17.5%	6.4%	6.1%
March	17.5%	7.4%	17.5%	9.4%	9.4%
April	16.9%	8.5%	17.5%	7.8%	8.3%
May	15.0%	6.9%	16.9%	7.6%	9.3%
June	12.3%	6.0%	14.8%	5.9%	8.3%
July	11.7%	5.3%	12.9%	6.1%	7.2%
Aug	10.4%	4.6%	11.9%	5.5%	7.0%
Sep	10.0%	7.7%	10.8%	2.1%	2.9%
Oct	11.6%	11.8%	12.5%	-0.2%	0.6%
Nov	13.6%	14.2%	14.6%	-0.5%	0.3%
Dec	0.1557	16.4%	15.0%	-0.7%	-1.2%

	Interbank Lending rate on 1-3 months Yields 'monthly	CPI	Refinance rate monthly	real interbank rate	refinance rate real
Jan-95	16.2%	17.8%	16.7%	-1.4%	-0.9%
Feb-95	14.8%	11.0%	16.7%	3.4%	5.1%
Mar-95	12.1%	8.9%	16.7%	2.9%	7.2%
Apr-95	10.5%	8.5%	16.7%	1.8%	7.6%
May-95	7.3%	7.9%	16.5%	-0.6%	8.0%
Jun-95	7.3%	6.7%	15.6%	0.6%	8.3%
Jul-95	9.5%	5.4%	15.0%	3.9%	9.1%
Aug-95	6.5%	4.6%	15.0%	1.8%	9.9%
Sep-95	5.3%	4.5%	15.0%	0.8%	10.0%
Oct-95	5.4%	4.7%	14.5%	0.7%	9.4%
Nov-95	5.0%	4.5%	14.2%	0.5%	9.2%
Dec-95	5.0%	3.2%	13.3%	1.7%	9.8%
Jan-96	5.0%	4.1%	13.3%	0.9%	8.9%
Feb-96	7.4%	2.8%	10.0%	4.5%	7.0%
Mar-96	3.3%	2.8%	10.0%	0.5%	7.0%
Apr-96	6.3%	2.2%	10.0%	4.0%	7.6%
May-96	6.8%	1.6%	10.0%	5.1%	8.3%

Source: calculated with data from CBR

Table S.III.V.3 Russia: Monthly inflation rate and average exchange rate.

	CPI	Average exchange rate *Variation en %*
Jan-92	296%	
Feb	27.30%	-12.80%
March	16.40%	-19.20%
April	17.20%	2.50%
May	10.50%	-21.80%
June	13.90%	4.60%
July	7.10%	13.50%
Aug	8.60%	17.50%
Sep	15.20%	31.00%
Oct	31.10%	60.90%
Nov	27.10%	20.30%
Dec	25.10%	-2.60%
Jan-93	25.80%	16.60%
Feb	24.70%	17.60%
March	20.10%	16.90%
April	18.80%	15.30%
May	18.10%	21.00%
June	19.90%	16.40%
July	22.40%	-5.10%
Aug	26.00%	-3.80%
Sep	23.00%	8.70%
Oct	19.50%	10.80%
Nov	16.50%	0.60%
Dec	12.50%	3.80%
Jan-94	17.90%	16.50%
Feb	10.70%	9.60%
March	7.40%	8.60%
April	8.50%	4.40%
May	6.90%	4.90%
June	6.00%	4.10%
July	5.30%	3.40%
Aug	4.60%	4.70%
Sep	7.70%	10.60%
Oct	11.80%	29.70%
Nov	14.20%	3.50%
Dec	16.40%	7.50%

	CPI	Average exchange rate Variation en %
Jan-95	17.80%	13.90%
Feb	11.00%	10.40%
March	8.90%	11.50%
April	8.50%	5.90%
May	7.90%	0.60%
June	6.70%	-6.90%
July	5.40%	-4.00%
Aug	4.60%	-2.30%
Sep	4.50%	1.30%
Oct	4.70%	0.70%
Nov	4.50%	1.00%
Dec	3.20%	1.70%
Jan-96	4.10%	1.50%
Feb	2.80%	1.60%
March	2.80%	1.50%
April	2.20%	1.40%
May	1.60%	1.70%
June	1.2%	1.4%
July	0.7%	1.7%
Aug	-0.2%	3.7%
Sep	0.3%	0.8%
Oct	0.1%	0.9%
Nov	1.9%	0.9%

Source: calculated with data from Goskomstat and MICEX.

CONCLUSION

This dissertation has studied inflationary pressures and the process of ending inflation in early transition economies using either the exchange rate or money as the nominal anchor. I compare the experiences of Poland and the CSFR in the first stage of their respective reform programmes with each other and above all with the central case of Russia.

I have tried to show that in order to understand the difficulties of these economies in ending inflation, it is essential to analyse the economic legacy of the former 'command' system. The monetary system inherited from central planning constrained attempts to control inflation in economies in transition, and especially in Russia. These constraints, which comprised political and cultural factors as well as complications in economic policy formation, proved difficult to overcome.

I have argued that complete price liberalisation was essential both to absorb excess demand and to reduce government subsidies in the interests of budget management. I therefore went on to argue that price liberalisation in 1992 Russia did not go far enough, especially in failing to liberalise energy prices.

I have shown that inflation in Russia was mainly a monetary phenomenon. I have explained the mechanisms linking money growth and inflation, and the factors that undermined the use of money as an anchor for stabilising inflation - namely the lack of instruments of monetary control and the instability of the velocity of money. I have described how the expansion of the money supply was driven by the size of quasi-fiscal expenditures and the way they were financed.

Because the budget constraint on enterprises remained 'soft'. and given the inherited absence of a distinction between monetary and fiscal policies. ending inflation in transitional economies demanded that credit expansion be controlled and efficient financial intermediation be developed. The chosen instruments for the macro stabilisation programme - tight monetary and fiscal policy aimed at a sustainable budget balance - are shown to have succeeded rapidly in Poland and the CSFR. By contrast in Russia, the process took longer, both because of the difficulty of reforming the monetary and fiscal system, and due to the absence of early commitment by the monetary authorities.

Poland and the CSFR both chose an exchange-rate based stabilisation and introduced internal convertibility. Russia embarked on a stabilisation programme similar in principle to the one of Poland and the former CSFR, but the lack of international reserves and access to a stabilisation fund of the Polish type persuaded Russia to use a money-based anchor. While there are convincing arguments in principle for favouring an exchange rate anchor, I analysed the role of the exchange rate from 1992 to July 1995 and showed that Russia had no choice but to attempt a money-based programme stabilisation. There is insufficient evidence to judge whether Russia would have succeeded in controlling inflation as quickly as Poland and the CSFR if it had been in a position to opt for an exchange rate anchor (for instance with Western financial assistance). One good reason for supposing that Russia could not have reproduced the experience of Poland and the CSFR based on an exchange-rate anchor was the fact that for the first twenty-two months of reform in Russia (until October 1993), policy was obstructed and undermined by a hostile parliament enjoying wide constitutional powers - notably control of the Central Bank. Since the second half of 1994, the Russian authorities have placed emphasis on the achievement of low and stable inflation based on a money stabilisation programme, complemented (since July 1995) by the so-called 'rouble corridor'.

The main standard argument in favour of low inflation is that inflation is economically costly, and that very high inflation (above 100% a year) creates immense obstacles to investment and growth, while imposing high welfare costs. On the costs of inflation. I have reached some fairly specific results by analysing the variation in the impact of the inflation tax on the monetary assets of Russian households with respect to changes in the inflation rate, and thereafter the impact of changes in the inflation rate on wages. In Russia, inflation coincided with dramatic falls in output. Output declined by 14.5 percent in 1992, 8.7 percent in 1993, 12.6 percent in 1994, 4 percent in 1995 and 5 percent in the first half of 1996. The relation between inflation and economic performance was established to be negative; but more importantly this analysis shows that inflation had no positive effects on growth.

An examination of the experience of price stabilisation in Russia and these other transition economies can help cast new light on the debate about inflation and the limits of deficit financing. By mid 1996 Russia had managed to reduce its monthly inflation rate to 2% on average by pegging its exchange rate and avoiding monetary financing of the deficit. This involved making heavy demands on the domestic Treasury bill programme. As a result, the T-bill market became very unstable, with abnormally high yields. The first T-bills were issued in May 1993, the market started to be fully operational in 1994. But as the government financed the budget deficit through the T-bill market in the first half of 1996, the size of the market doubled. The amount of T-bills outstanding (with maturities ranging from 3-6 months ('GKOs) to two years ('OFZs')) reached 146.4 trn Rbs at face value at the end of May 1996. The size of the stock of T-bills outstanding grew to 6.5% of annual GDP in early 1996 from 4.5% at the end of 1995. The percentage remained well below that in OECD countries. But with average nominal GKOs yields rising to over 200% in mid 1996, the cost of this debt is unsustainably high. For the first four months of 1996, the GKO and OFZ financing amounted to Rb 19 trn of the Rb 30 trn deficit, that is about 65%. Put another way, with annual T-bills yields averaging around 80%, an outstanding stock at 6.5% of GDP, the cost to the government of servicing this debt

comes to about 5.2% of GDP. This has to be compared to the revenue which represent about 11% of GDP (Federal budget and 25% for the consolidated budget).

With Russia breaking definitively with its economic as well as political legacy (that is, a passive monetary system accommodating whatever budgetary requirements there might be) another problem still in the future concerns the limit of deficit financing. If the case of Russia does not yet shed much light on the general question of the limits of budget deficit financing, it may do so at a later stage, when the new domestic bond market has grown to a more typical size. The initial task of ending high inflation in transition economies may lead (mainly, but not only, in Russia) to new problems with inflation in the medium term.

APPENDIX I

DATA DESCRIPTION

This appendix is designed to explain the Russian data used in this dissertation, and also to explain the inevitability of occasion.¹ ' `k of precision.

The data for Poland and the CSFR are straightforward in the sense that national state statistics or international organisations series are available and are used as mentioned in the sources of tables and figures. But statistics for Russia vary in quality and availability and are generally poor by Western standards. I have used the IMF series where possible although these series also have shortcomings. In the real sector the source of data is the State Committee for Statistics (Goskomstat), in the monetary sector the Central Bank of Russia.

MONETARY DATA

There is particular difficulty in compiling monetary statistics for Russia. The problems include the authorities' failure to provide regular updated series of comparable figures (many of which in 1992 and unfortunately still in 1996 are regarded as classified information).

Until 1995, there existed four different time series for M2 all produced by different departments of the CBR. The IMF recalculates its own series using the balance sheet of the CBR. Here the series is the one used by the monetary authorities in the IMF negotiations.

For some reason (not known to me) the CBR stopped publishing its monetary survey in February 1994. The series on excess reserves has nonetheless been completed to December 1994 thanks to personal contacts.

In the case of Sberbank and commercial bank deposits I had numerous data problems. The series published in *'Banking Statistics Bulletin'* (June 1995) of the Central Bank of Russia does not correspond with the series published by Goskomstat in *Sotsial'no-Ekonomicheskoe Polozhenoe Rossiskoi Federatsii (Socio-Economic Situation of Russia)*. In this dissertation I used the Goskomstat figures.

Foreign exchange deposits are deposits held by the Russian banking system and reported by the IMF until December 1994. Reported residents foreign exchange deposits, excluding the deposits of Vneshekonombank that were "frozen" in late 1991." And as emphasized by the IMF (1995), pp. 31-32: "Data on resident foreign exchange deposits remain highly uncertain, and the figures mentioned here should therefore be viewed as indicating orders of magnitude rather than exact levels. Data on foreign exchange deposits (and hence on total broad money) are collected via a special survey, as the commercial banks' regular reporting forms do not distinguish appropriately between residents and nonresidents."

FOREIGN EXCHANGE RESERVES

Monthly data on gross CBR reserves and foreign assets and liabilities of the government are published (not regularly) by the CBR in *Current Tendencies in the Monetary and Credit Sphere*. Net International Reserves include Gold from both the CBR and the government. Official gold is valued at US$300 per troy ounce.

GROSS DOMESTIC PRODUCT

GDP is published monthly in the Goskomstat report *Ekonomicheskoe Polozhenoe Rossiskoi Federatsii*. The series was frequently changed: in IMF (1993) for 1992, GDP is quoted as Rbs 15,552 bn, but Goskomstat published a final figure given for 1992 of Rbs 18,064.5 bn. The 1991- 1994 GDP time series was revised once again in the summer of 1995. The nature of revisions differs from year to year is explained in the Goskomstat-World Bank Report on National Accounts (1995).

INTEREST RATES

Interest rates were freed at the end of 1991 for both deposits and loans, but they nevertheless remained negative in real terms in 1992 and for most of 1993.

In Russia, interest rates are quoted on an annual percentage rate (APR) basis rather than on an annual yield (or effective interest) basis. When the compounding basis is monthly, this implies that the annual yield is:

$$y = (1+n/12)^{12}- 1, \text{ with } y > n$$

In comparing the annual nominal interest rate and the annual inflation rate, the yield and not the APR is the appropriate nominal interest rate.

The CBR refinance rate is quoted from the press which reports all changes made by the CBR and is quoted in Granville, Monetary Report, Various issues. This is the rate at which the CBR lends to commercial banks.

The Interbank interest rates are calculated from press reports (average) until December 1993. Starting in December 1993 the interbank rate given is the average of the weekly rates quoted in *Vestnik Banka Rossi* produced by the CBR every week.

Commercial bank Deposit and Credit interest rates are *Russian Economic Trends* (various issues)

Interest rates on Sberbank deposits were given to me by the World Bank

Households deposits of commercial banks are estimated by subtracting Sberbank deposits from total deposits in banks. Total bank deposits including Sberbank deposits are given by Goskomstat in *Kratkosrochnye ekonomicheskie pokazeteli Rossiiskava Federatsiya*. They differ from the Central Bank ones (I have no explanation why). It might be thought that it would have been simplest to use savings. Although this is a logical response, the basic method for obtaining the Goskomstat savings series is apparently a residual one, in which savings estimates are calculated by subtracting estimated consumption, by reference to actual financial returns.

PRICES

Monthly: For the calculations of the time series, the urban CPI is used for 1992 and for 1993 and 1994 the expanded CPI. The urban index was a standard Lasperes designed in mid 1992, it covered 27 urban areas and 262 items while for 1993 and 1994 its coverage was "expanded" to all oblast centres and 407 items. However through 1993 Goskomstat quoted the hybrid index as the CPI so did the press and the literature: the hybrid index was a mixture of Paasche and Laspeyres indices and it is why Koen and Phillips (1993) called it the hybrid CPI. The hybrid and urban index led to substantial different results for instance for January 1992 the CPI is either 245% or 296% depending on the index used.

These issues are far from trivial since it makes an enormous difference when for instance calculated real wages. Detailed descriptions of these indices are given in Koen and Phillips (1993), Koen (1994), and in Granville and Shapiro (1994).

Goskomstat initially published two series, one monthly and the other weekly. Because of discrepancies between the two series and the desire to have up-to-date indexes, Goskomstat discontinued publishing the monthly index in January 1995 and is now publishing only the weekly index. This means an unfortunate break in my times series, starting in December 1994. I considered recalculating the whole series starting in January 1992 using the weekly indexes, however my 1992 weekly indexes are not totally reliable, so the case for the recalculation is not overwhelming.

EXCHANGE RATES

The Interbank exchange rate is the rate quoted and published by the Moscow Interbank Currency Exchange (MICEX). It is published 5 times a week.

The real exchange rate is defined as the nominal exchange rate multiplied by the ratio of the US price level to the Russian CPI. The CPI was used as deflator because other deflators such as the wholesale price index or the GDP deflator are just too troublesome in Russia

WAGES

Figures are published by Goskomstat in *Ekonomicheskoe Polozhenoe Rossiskoi Federatsii*. Average monthly wages for Russia are net of benefits. The variations in December and January are not significant because in December traditionally a 13th month is paid.

UNEMPLOYMENT

Russian unemployment statistics like output statistics (see Gavrilenkov and Koen, 1994) are subject to several biases: the Russian definition excludes all job seekers who have an alternative income e.g. students, pensioners. Only a small proportion of 'real' job seekers register as unemployed owing to the small benefits given and to the bureaucracy involved in getting such benefits. State enterprises tend to keep workers on their payroll who are in fact on indefinite vacation or who are working substantially reduced hours. Also, some industrial enterprises have been forced into temporary closures (which led to a reduction of total working days by 6 days for each industrial worker in 1993 (Yemtsov, 1994))[1]. On the other hand, new employment in the private sector is not well reported.

FOREIGN TRADE

Figures are published by Goskomstat in *Ekonomicheskoe Polozhenoe Rossiskoi Federatsii*. However, statistics on foreign trade are to be treated with caution, they are even less statistically sound than other statistics. Ministry of Economic Relations (MFER) and Goskomstat figures have very conflicting sets of foreign trade statistics. Underreporting and smuggling following the dissolution of the Soviet Union were substantial in 1992. Also exports of many goods decreased at current prices but measured at constant prices actually increased.

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[1] Yemtsov (1994), p. 2.

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Abbreviations used

CEPR   Centre for Economic Policy Research
CEC   Commission of the European Communities
CES   Centre for Economic Studies
EBRD   European Bank for Reconstruction and Development
ECARE   European Centre for Advanced Research in Economics
IIASA   International Institute for Applied Systems Analysis
IMF   International Monetary Fund
LBS   London Business School
LSE   London School of Economics and Political Science
MFU   Macroeconomic and Financial Unit, Ministry of Finance of the Russian Federation
NBER   National Bureau of Economic Research
OECD   Organization for Economic Cooperation and Development
RIIA   Royal Institute of International Affairs
WIDER   World Institute for Development Economics Research

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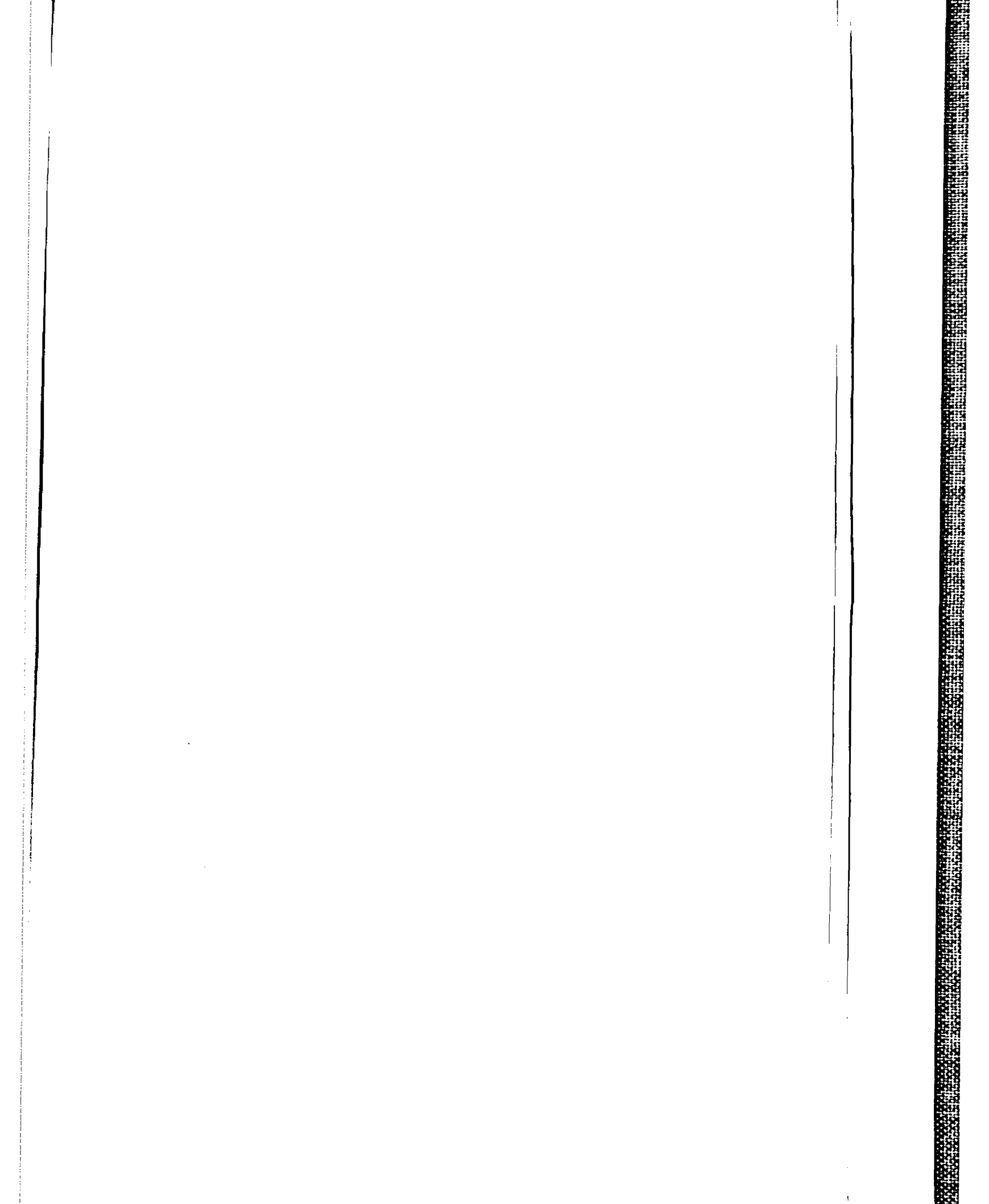
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