

Ruble Overhang and Ruble Shortage

Were They the Same Thing?

Patrick Conway

"Ruble overhang" and ruble shortages in the Soviet Union and its successor states were manifestations of the same economic phenomenon: the household sector's inability to convert financial assets into purchasing power over commodities.



Summary findings

Economists and policymakers in the Soviet Union before its dissolution were concerned about the growth of the "ruble overhang." The concern was that the rationing of consumer goods evident in prior years had led to an excess of purchasing power in households. Price liberalization was expected to lead to a jump in consumer prices as households tried to exercise their purchasing power.

But after the Soviet Union dissolved, a new concern emerged: a ruble shortage. Throughout the ruble currency area, governments and state enterprises could not get enough rubles to pay wages and pensions. As a result, households were unable to make the purchases they wanted to make. Ruble shortages contributed greatly to the progressive deterioration of the ruble area, from its beginning with fifteen members to its present membership of two.

The names given to these two episodes — "ruble overhang" and "ruble shortage" — are misleading,

because they are both manifestations of the same phenomenon. In both cases, forced saving led to a reduction in purchasing power and downward pressure on inflation.

The difference was in the mechanism that induced forced saving.

For the ruble overhang, the government maintained price rigidity; there was nonprice rationing of output that was insufficient to satisfy demand at those rigid prices.

For the ruble shortage, the government — through the government-controlled banking system — imposed the holding of bank deposits on households, through mandatory wage deposit programs and through the de facto inconvertibility of deposits to currency.

The result was the same: a rationed household sector unable to trade financial assets for commodities.

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**Ruble Overhang and Ruble Shortage:
Were They the Same Thing?**

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Economists and policy-makers in the Soviet Union prior to its dissolution were quite concerned with the growth of the "ruble overhang". The concern was that the rationing of consumer goods that had been evident in prior years had led to an excess of purchasing power with households. Price liberalization was expected to lead to a massive surge of consumer prices as households attempted to use their purchasing power.

After the dissolution of the Soviet Union a new concern emerged: the ruble shortage. Throughout the ruble currency area, governments and state enterprises could not obtain sufficient rubles to pay wages and pensions. Households were as a consequence unable to make desired purchases. These shortages were a major cause of the progressive disintegration of the ruble area from its beginning with 15 members to its present membership of three.

The names given to these two episodes are misleading, for they are each a manifestation of the same phenomenon. In each case, forced saving led to a reduction of household purchasing power and downward pressure on inflation. The difference occurred in the mechanism that induced forced saving. In the ruble overhang the government maintained price rigidity; there was thus non-price rationing of output insufficient to satisfy demand at those rigid prices. In the ruble shortage, the government through the government-controlled banking system imposed forced holdings of bank deposits on households through mandatory wage deposit programs and a de facto inconvertibility of deposits to currency. The end result is the same: a rationed household sector unable to trade financial assets for commodities.

In the next section I provide evidence of the ruble-overhang and ruble-shortage episodes. In section II I present a simple model of private behavior that illustrates the shared forced-saving phenomenon. Section III summarizes the argument and suggests extensions.

I. From Ruble Overhang to Ruble Shortage.

Ruble Overhang.

The Soviet Union of the late 1980s was characterized by fiscal deficits, price controls and an allocation of resources disproportionately to national defense and producer-good output. As Nordhaus (1990) reports, this led to shortages of consumer goods, repressed inflation and an undesired build-up in household holdings of liquid assets. McKinnon (1991) also notes the positive correlation of the liquid-asset buildup with the Soviet budget deficit. His figures are provided in Table 1. Prior to 1986 household saving deposits rose at a roughly one-for-one rate with the government budget deficit — the Soviet government was mobilizing private saving through the financial sector to offset the budgetary deficit. Subsequent to that time the budget deficit totalled much more than the increase in saving deposits, with the balance being made up through excess growth in both currency and credit stocks.

This excess growth did not lead to substantial inflation because of the extensive system of price controls. As Table 2 indicates, despite currency emission during the 1987-1989 period that averaged over 13 percent growth per annum, retail inflation rates averaged under three percent per annum.¹ Figure 1 illustrates this build-up in private-sector holdings of financial assets. Holdings of both currency and household deposits rose as a share of GNP over that period, representing forced saving by households since goods and services were not available for purchase. The ratio of household liquid assets to household income rose from about .60 in the 1970s to about .95 in 1989.²

There was widespread recognition that this forced saving had not removed the inflationary

¹ Dornbusch (1992), Table 1.

² In economies with greater financial development the government will finance budget deficits through issuing bonds. In the Soviet Union the government used the banking system as the intermediary to channel resources to the government, and household deposits in the commercial banks (in addition to hoarding of currency) became claims on the government.

pressure, but simply postponed it until a later price liberalization. Remedies suggested for this inflationary pressure, or "ruble overhang", can be organized into "supply-side" and "demand-side" policies. On the demand side, McKinnon (1991) suggested the raising of interest rates on deposits to convert forced saving into desired saving and to encourage the reduction in currency hoarding. On the supply side, proposals included the exchange of government assets and gold holdings for the excess currency and deposits. In January 1991 the Soviet government undertook a draconian supply-side policy by declaring large-denomination bank notes to be no longer legal tender. Holders were allowed to exchange them for smaller bills up to a maximum governed by a worker's monthly salary or a fixed quantity, whichever was less. Household saving accounts were frozen, with individuals allowed to withdraw only 500 rubles per month.³ The republics softened these regulations somewhat in subsequent actions.

In 1991 the aggregate fiscal deficit of the members of the Soviet Union reached 26 percent of GDP.⁴ Price controls were relaxed somewhat, and inflation reached previously unimagined rates: 142 percent on retail goods and 236 percent on wholesale products. This inflation induced the government to provide transfers to wage-earners, pensioners and savers to index partially the value of their incomes and financial assets. However, due to a lack of goods and services the households retained the transfers in forced saving of deposits or currency holding. The real value of household deposits was reduced somewhat by the inflation, while the ratio of currency in circulation to GDP remained nearly constant.

The former republics of the Soviet Union cooperated nearly unanimously on the liberalization of the majority of wholesale and retail prices on 2 January 1992. Those not liberalized were nearly

³ These details are reported in McKinnon (1991, p. 157).

⁴ The information in these two paragraphs is drawn from World Bank (1992).

all raised in price by between 300 and 500 percent. Given the repressed inflation represented by the ruble overhang, prices jumped rapidly – in the first three months of 1992 retail prices rose by 600 percent and wholesale prices by over 1000 percent. This rise in prices greatly reduced the value of nominal assets like savings deposits and currency: by the end of January 1992 the ratio of money broadly defined to GDP had fallen to less than 20 percent.

Ruble Shortage.

Currency shortages were reported throughout the ruble currency area shortly after the dissolution of the Soviet Union. The features were strikingly similar across countries: producers and government had too little access to currency through their financial accounts, and thus could not pay wages and pensions in currency. Wage-earners and pensioners then received insufficient currency to make necessary purchases. The problem was exacerbated by the rapid rise in retail prices throughout the currency area. A premium arose in the financial intermediaries, with ruble-denominated bank deposits selling at a discount to currency rubles.

Table 3 provides a chronology of currency shortages in seven of the republics. As noted there, the incidence of currency shortage is associated with an inability of enterprises to pay wages and of the governments to pay pensions, benefits and other transfers. There is as well a secondary effect in purchase of consumer goods, as consumers request to purchase on account because of the incidence of wage arrears.

These countries can be separated into two groups. In the first, currency shortages were endemic throughout 1992 and 1993. The countries in which these sustained shortages have been observed are Ukraine and Georgia. In Belarus, Kazakhstan, Lithuania and Russia the shortage of rubles became acute in April 1992 and continued until the fall; there was a further episode of currency shortage in May/June 1993 for Belarus, Kazakhstan and Lithuania. Estonia provides a third model. As Hansson (1992) notes, ruble shortages existed there prior to the introduction of a new

currency in June 1992; since that time, there have been no such shortages.

Since independence there have been substantial premia for currency over account credits.⁵ Table 4 illustrates this point with premia drawn from the foreign-exchange markets in Belarus, Georgia and Kazakhstan: these are the premia implied by enterprise transactions to convert both currency and credits to foreign exchange. Similar premia exist for the direct conversion of accounting credits to currency. In Belarus, for example, "obnalichka" dealers converted bank credits to currency for a 30 percent fee.⁶ These dealers had established personal contacts with the management and staff of banks, and exploited those contacts to circumvent the regulations or to "jump the queue" among those legally entitled to the scarce domestic currency.

The non-convertibility of bank credits to currency can take the form of rationing based on availability of currency. Alternatively, non-convertibility may be stated explicitly in regulations. In 1992 in Georgia, for example, the ability to convert bank credits (deposits) to currency was regulated by the National Bank of Georgia. State enterprises faced minor restrictions in access to currency while households were in most cases denied convertibility of existing deposits. Kazakhstan introduced similar restrictions on the availability of currency for deposits in February 1992 and renewed them in June 1993. One feature of the former restrictions was the automatic deposit of 30 percent of private wage earnings in banking system deposits — these were then not convertible into currency in most cases. The innovation of the latter restrictions was the declaration that all shops must introduce cash registers for currency trade, with the evident hope that the machines would allow a more accurate

⁵ Indirect evidence of ruble shortages predates the dissolution of the Soviet Union. During the period of stable prices (i.e., pre-1991) there was nevertheless an excess demand for currency rubles relative to credit or account rubles. This pressure came in large part from the value of currency rubles in untraceable or black market transactions, and led to a premium estimated to be roughly 10 percent.

⁶ Minsk Economic News, July 1993.

tracking of cash flows.⁷

II. A Simple Model of Ruble Overhang and Shortage.

Consider an economy with three sectors. The public sector includes both government and state enterprises. The banking sector includes both the central bank and the formal commercial banking system. The private sector combines households with private enterprises. There will be economic transactions within each of these sectors, but those transactions are not of immediate interest. I will focus on the currency and credit flows among sectors.

Macroeconomic balance conditions can be stated in real terms as:

- | | | |
|-----|---------------|----------------------------|
| (1) | $y^d = C + I$ | aggregate demand |
| (2) | $y^s = y$ | exogenous aggregate supply |
| (3) | $y = C + S$ | household use of income |

C represents private-sector consumption, I government investment and S private-sector saving.⁸

The increase in the price index is modelled as a tatonnement process in excess demand.

- | | | |
|-----|----------------------------|----------------------|
| (4) | $\Delta p = \phi(y^d - y)$ | inflation generation |
|-----|----------------------------|----------------------|

The private-sector decision can be thought of in two parts. The first is the allocation of

⁷ Ukase of N. Nazarbayev, 13 February 1992; Resolution #483 of the Cabinet of the Republic of Kazakhstan, 8 June 1993.

⁸ The totals are defined net of taxes and government current expenditure, and I can be thought to include any residual from that netting-out process.

current real income to consumption and saving. The second is the allocation of saving among real holdings of bank deposits (ΔD) and currency (ΔH). The optimal allocation can be represented in two stages: the allocation in the absence of rationing or rigidities, and the allocation once spillover from rationing is considered.⁹ Quadrant 1 in Figure 3 illustrates the unconstrained optimum through reference to an indifference curve in (C,S) space; the method of generation of this unconstrained optimum is not crucial.¹⁰ Saving is then allocated to real holdings either of deposits or of currency.

$$(5) \quad S = \Delta H + \Delta D$$

This is illustrated in quadrant 2.

The payments mechanism for the private sector in the Soviet Union and the independent successor states has been (and continued to be) idiosyncratic: currency is used for the great majority of transactions. This can be stated as the following modified quantity equation, with v as the velocity of currency.

$$(6) \quad Hv = C$$

This relationship is illustrated in quadrant 4 of Figure 3. This non-reliance on bank deposits (e.g.,

⁹ This distinction is standard in the literature. See, for example, Muellbauer and Portes (1978) and more recently Lin (1993).

¹⁰ I also specify the equilibrium with positive consumption and saving, but that is not crucial either. The argumentation will be identical for periods of dissaving.

checking accounts) for purchases is quite important to the results on inflation suppression that follow.¹¹

The benchmark equilibrium is thus defined by C^* , S^* , H^* and ΔD^* . I assume that the economy begins at this optimum with H^* in circulation.

Ruble overhang.

During the period of ruble overhang, the government's excess expenditure and controls over price required commodity rationing. Consider the comparative static of an increase in investment from I to I^* for given y . From (4) and (1) for unchanged price:

$$(7) \quad y - I^* = C^* < C^*$$

with C^* the rationed quantity of consumption. That rationed quantity causes saving in excess of desired at quantity S^* , and generates larger real accumulation of financial assets $(\Delta D + \Delta H)^*$. The excess accumulation of currency in that total can be derived from quadrant 4 as the quantity of currency H^* in excess of the new, lower H^* .¹²

This rationing equilibrium leads to the quantity $(S^* - S^*)$ of forced saving. Recurrence of this process in each period will cause a build-up of the real stocks of financial assets and an increase in purchasing power as in Figure 1. For given y , each subsequent period will have larger C^* due to positive propensity to consume from wealth. There will thus be increased rationing in each period.

¹¹ As Conway (1994c) demonstrates, this preference for currency in transactions need not be assumed. It can be explained in the present market-oriented economy as an equilibrium outcome of the illiquidity of bank (including demand) deposits. I maintain it as an assumption here to clarify the main result of the paper.

¹² There is thus in this example no desired portfolio holdings of currency ex ante. In Conway (1994c) I examine the more general case of both transaction and speculative demands for currency in the private sector and arrive at the same conclusion of this simpler example.

The ruble overhang will end with price liberalization. When price controls are removed the tatonnement process in (4) will cause an upward surge in price. This upward surge depreciates the purchasing power of the saving overhang. The surge in price may be sustained through a number of periods as consumers anticipate the inflationary path and allocate wealth drawdowns across periods to reflect that path: Conway (1994b) derives this property in a dynamic model of private-sector saving.

Ruble Shortage.

I begin again from the benchmark equilibrium with the comparative-static increase in investment from I to I^* . Price controls are no longer in place, and (4) describes the translation of excess demand into inflation. As inflation occurs, other things equal, the real stock of currency balances falls. When the real stock of currency falls below the quantity necessary for real consumption C^* from (6), then a ruble shortage exists.¹³ Consumption is reduced because currency is unavailable for purchases. Real saving is increased relative to the benchmark amount and there is an increase in holdings of financial assets. For positive real saving ΔD must be positive as ΔH is negative by assumption. This increase in forced saving reduces inflationary pressure. Final-good prices will rise by less than in the free-market case due to the rise in forced saving.

Figure 3 can be used to illustrate the ruble shortage case of I^* causing a sufficient rise in the price index to reduce the real money stock to H^* . The "ruble shortage" causes a reduction in consumption expenditures below desired because many would-be consumers cannot convert their wealth into a medium of exchange.

For the great majority of the population, deposits were not convertible into currency during the ruble-shortage episodes. The premia observed were typically in thin markets – there were few traders willing to surrender currency (or goods or foreign exchange) for accounting credits. Conway

¹³ The reduced real stock of currency may be due to a reduction in the supply of currency, or to a growth rate of currency emission less than the inflation rate.

(1994a) outlines the reasons for this unwillingness to hold bank deposits: an artificially low nominal interest rate implying very negative real interest rates, restrictions on withdrawals that severely limited the liquidity of the deposit, and the use of these accounting credits in the case of producers as the basis for taxation of activities. Traders responded to these incentives with an unwillingness to accept claims on bank deposits as payments: although the governments of these countries encouraged the use of checks, they were widely accepted only at state-owned shops.

Can the inflation rate in the consumer price index rise more rapidly than the growth rate in the supply of currency? This has been universally true in the former Soviet economies during their period of participation in the ruble currency area. The public sector was given purchasing power through creation of accounting credits not offset by desired saving. This was inflationary in that public-sector demand was augmented, leaving fewer goods for private-sector consumption. The public sector was unable to obtain sufficient flows of currency to make wage and pension payments and often simply passed the accounting credits on to the households through direct deposit in saving accounts. The banking system is then unwilling or unable to convert the deposits into currency. This non-convertibility brings about the premia on currency noted in the previous section.

III. Conclusions and Extensions.

The illustrative example of this paper demonstrates that the ruble overhang and ruble shortage observed at various times in the Soviet Union and its successor states had sprung from the same roots — a rationing equilibrium in commodity markets. This is the accepted explanation for the ruble overhang; in this paper I demonstrate that the phenomenon of ruble shortage can be attributed to the same equilibria.

The terminology of overhang and shortage is imprecise in describing these phenomena. The "ruble overhang" was really a wealth overhang, with private purchasing power augmented over the

years by forced saving until potential demand for goods and services greatly exceeded supply. The "ruble shortage" was really a currency shortage coincident with a wealth overhang. In both cases the private sector had built up holdings of financial assets in excess of the stock it wished to hold; its inability to liquidate these holdings for commodities is at the heart of the two crises.

The record on inflation coincident with the two crises is quite different. The phenomenon modeled predicts suppressed inflation through forced saving. This certainly characterized the "ruble overhang" period, but seems inconsistent with the high inflation of the "ruble shortage" period. That high inflation, however, was due to increases in public-sector borrowing requirements well in excess of the forced saving achieved. An indicator of the effectiveness of this rationing mechanism in holding down price increases can perhaps be found in the sustained divergence of the consumer and producer price indices in these countries: producer-price indices dependent upon public-sector demand and supply have been significantly and consistently above the consumer price indices based upon private-sector demand.

The model of this paper has been kept skeletal, and the analysis diagrammatic, to simplify the exposition. In other papers I have examined dynamic adjustment and private-sector portfolio holdings in more complex economic models (Conway (1994b, 1994c)) and have derived conclusions identical in spirit to these. Inclusion of international trade or holdings of foreign exchange do not change the spirit of these results. Trade deficits become a non-inflationary source of commodities in the short run, with long-run payment implications; foreign exchange provides an alternative medium of exchange. So long as deposits are not convertible into foreign exchange the argument still holds.

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Table 1
Financial Statistics for the Soviet Economy

	Government Budget Deficit		Government Debt		Household Saving Deposits	
	billions of rubles	percent of GNP	billions of rubles	percent of GNP	billions of rubles	percent of retail sales
1979	n.a.	n.a.	64	n.a.	146.2	57.6
1980	12	1.9	76	12.2	156.5	57.9
1981	9	1.4	85	13.1	165.7	57.9
1982	15	2.2	100	14.4	174.3	58.9
1983	10	1.4	110	15.1	186.9	61.1
1984	9	1.2	119	15.7	202.1	63.9
1985	14	1.8	133	17.1	220.8	68.0
1986	46	5.8	179	22.4	242.8	73.1
1987	52	6.3	231	28.0	266.9	78.2
1988	81	9.3	312	35.7	296.7	81.0
1989	92	6.9	404	43.4	337.7	83.7

Source: McKinnon (1991, Table 11.1)

Table 2
Growth of Currency in Circulation, 1987-1990

	1987	1988	1989	1990
Growth of currency in circulation	7.7	13.6	19.5	24.3
Real growth in Net Material Product	0.7	4.6	1.9	-3.6
Retail price inflation	2.0	0.0	6.0	5.6

Sources: World Bank (1992, p. 8), Goskomstat USSR (1991, p. 28).

Table 3
Chronology of Currency Shortages: Selected Republics

Country	Period	Source and magnitude of shortage
Belarus	May 1992	4 billion rubles; wage arrears.
	March 1993	ruble shortage; currency flight.
	May/July 1993	reported wage arrears
Estonia	March 1992	ruble shortage requires sale of hard currency reserves.
Georgia	May/December 1992	severe arrears on wage and pension payments.
	January/April 1993	4 months of wage and pension arrears, and widespread efforts of consumers to purchase on account for lack of rubles. (60-80 percent of potential purchasers)
Kazakhstan	February/March 1992	Ruble shortages lead to Cabinet of Ministers edicts 148 and 300, limiting withdrawals of currency from bank accounts.
	May/August 1992	wage and benefit arrears building from 6 billion to 15.4 billion rubles.
	May/September 1993	Ruble shortfall; many firms in July were in "pre-strike" situation due to wage arrears. "New" Russian rubles not yet accepted as legal tender, despite entry into circulation through trade with Russia.
Lithuania	February 1992	monthly salaries not paid to government officials (including Prime Minister)
	May 1992	3 billion rubles in wage and pension arrears.
	May/June 1993	talonas shortfall; in part due to the withdrawal of counterfeitable banknotes from circulation.
Russia	December 1991 /January 1991	CBR short 12 billion rubles. Russian Supreme Soviet places restrictions on currency use and withdrawals.
	May 1992	2 trillion rubles in wage and benefits arrears
	June 1992	Kuzbass workers and trade union FNPR threaten strike over non-payment of wages.
Ukraine	January 1992	Ruble shortage equal to 25 percent of wage payments leads to introduction of coupon.
	June/August 1993	Wide-spread currency shortages lead to restrictions on currency withdrawal and use.

Sources: data collection network and news accounts. Individual months indicate a news account, while ranges indicate a series of accounts or reports from data collectors begun in 1993.

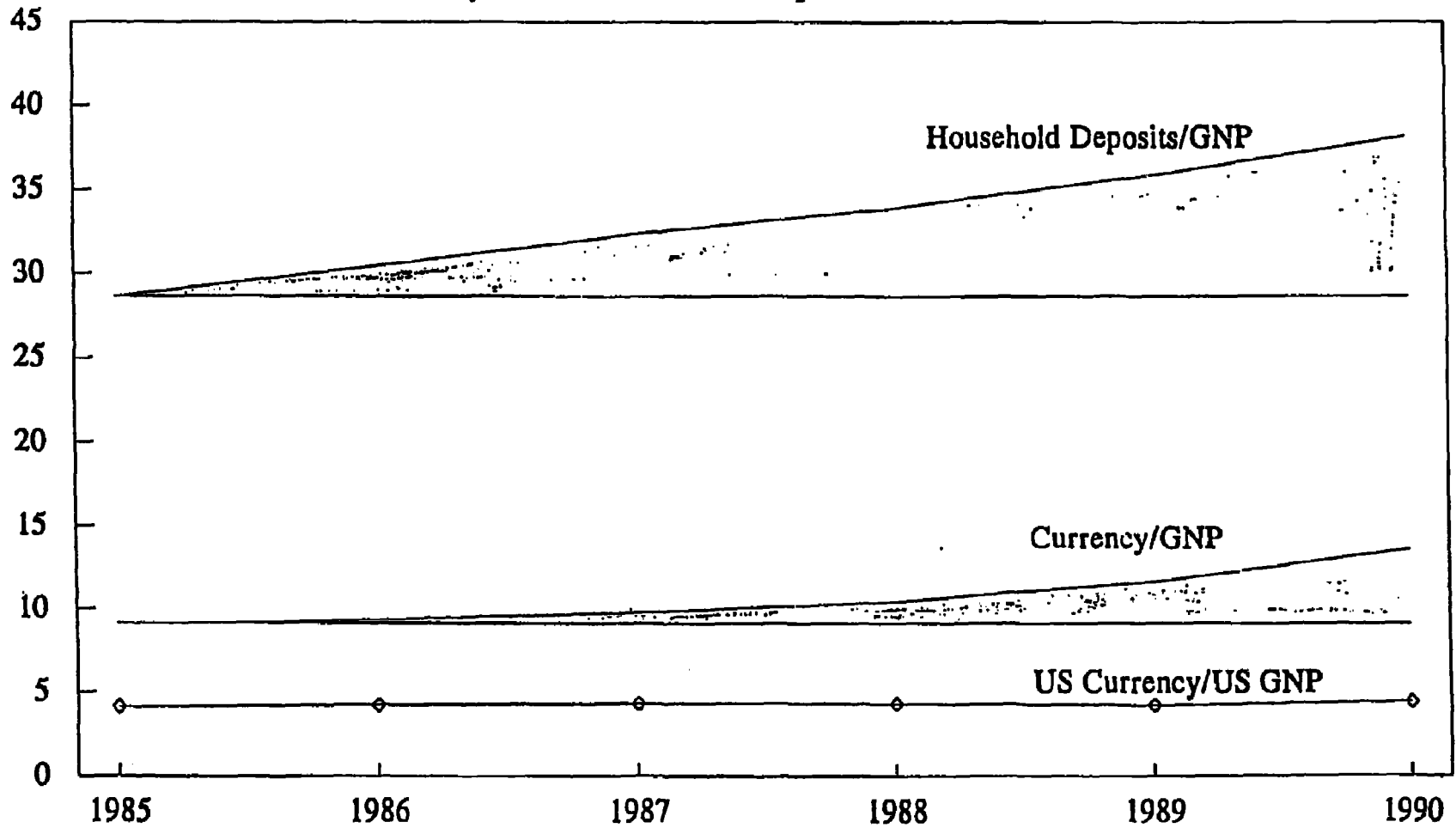
Table 4
Premium of Currency over Accounting Credits in Foreign-Exchange Markets

Country	Period	Foreign Exchange Price Ratio: Currency/Accounting Credit
Belarus	12 June 1993	1.80
	15 August 1993	2.52
	3 November 1993	6.10
Georgia	1 April 1993	7.69
	18 June 1993	2.21
	4 October 1993	2.54
Kazakhstan	16 June 1992	1.35
	15 December 1992	1.15
	20 May 1993	1.34
	24 August 1993	1.37

Source: data collection network.

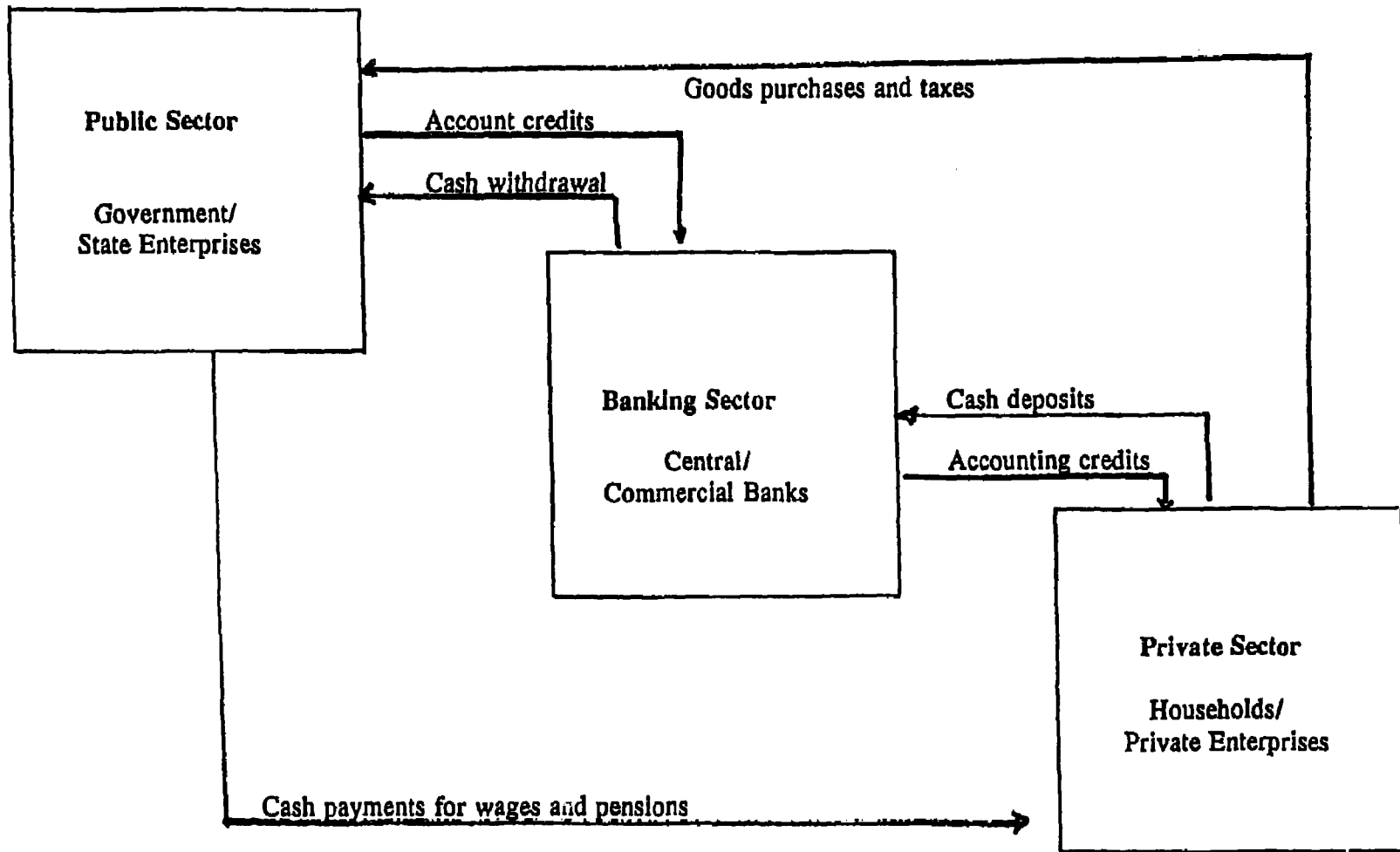
Figure 1
Ruble Overhang in the Soviet Union

Currency and Household Deposits as shares of GNP



Shaded areas in diagram represent estimate of overhang.

Figure 2
Stylized Flow of Funds between Public, Banking and Private Sectors



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