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Friedrich L. Sell*

Stabilizing the Rouble: Is There a Case for a New Fisher Rule?

The management of the exchange rate by the Russian authorities obviously lacks both effectiveness and efficiency. "Black Tuesday" has vividly shown how vulnerable the rouble is to speculative attacks. In this article, a "classical" proposal is evoked and is discussed as an alternative to the present exchange-rate policy from the sustainability point of view.

"Credibility" has become one of the most prominent notions in economics over the last ten years. This holds especially for the field of exchange rate/monetary policy tools. Single or packaged policy instruments are assessed from the credibility criterion point of view. Yet, there seems to be no universal understanding of what credibility really means – beyond the statement that only time-consistent policies¹ can be credible – and which ingredients it consists of. Moreover, the relationship between credibility on the one hand and speculation/speculative attacks on the other hand is far from being clear. What about the capability of rules to meet the challenges of speculation? The credibility of monetary and/or exchange rate arrangements is one of the major issues within the debate on the optimal transition path for post-socialist economies. Earlier contributions² have emphasized that modifications of the classical gold standard can meet – under certain conditions – most of the requirements of the credibility criterion and hence be helpful as a policy recommendation for economies in transition to the market system. It remains to be seen in more detail how vulnerable such proposals are to the occurrence of speculation and arbitrage processes.

With a view to currencies of reform countries in

Eastern Europe, the current development of the rouble is of special interest. This is not only due to the occurrence of "Black Tuesday" where the rouble exchange rate suffered a tremendous downswing, but to the obvious inability of the Russian central bank to "manage" the rouble in a proper way. Most interestingly, there is a lively discussion in Russia on the emission of gold certificates, an idea which goes back to Irving Fisher's compensated dollar plan of the 1920s. The authorities seem to be beginning to understand that selling away Russia's jewellery on the world gold market might be a much too costly and inefficient policy. Under certain (pre)conditions the setting up of a domestic market for gold and/or gold certificates could help to "anchor" the rouble and to establish a credible exchange rate regime. Among the ingredients of credibility the most important one seems to be the criterion of "sustainability". What Russia urgently needs is a sustainable exchange rate.

In this article, we first intend to incorporate the notion of sustainability into the concept of credibility. Then, we will reconsider I. Fisher's compensated dollar plan³ from the sustainability point of view and finally proceed to "rescue" important aspects of

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¹ Finn E. Kydland and Edward C. Prescott: Rules rather than Discretion: The Inconsistency of Optimal Plans, in: Journal of Political Economy, Vol.85, No.3, 1977, pp.473-491.

² Volker Hofmann and Friedrich L. Sell: Credibility, Currency Convertibility and the Stabilisation of the Rouble, in: INTERECONOMICS, Vol.28, No.1, 1993, pp.11-16.

³ Irving Fisher: Stabilizing the Dollar, New York 1920.

Fisher's proposal for the current discussion by extending his concept to an exchange rate mechanism. The article ends with a summary and some policy conclusions.

Criteria for Credibility

As outlined elsewhere,⁴ the concept of credibility – if it aims at becoming more operational – can be divided into three criteria, 'which in our opinion must all be met if the confidence of economic agents is to be won. We have termed these three criteria "transparency", "competence" and "creditor protection".⁵ *Transparency* means that any rule pursued by monetary/exchange rate policy should, if possible, be known to economic agents and its application should be predictable. *Competence* can be taken as the demonstrable ability of any institution to follow its own rules. Finally, *creditor protection* has to do with the demonstrable intention of the same institution to follow the rules that have been set up. It is a widely accepted conviction that in general, "the more an institution limits its own scope for discretionary action ('tying its own hands'), the more credible will this intention be".⁶

The notion of "competence" should be extended to the concept of "sustainability". Here, there are at least two aspects which have to be distinguished: the *absolute* loss of sustainability is reached whenever a government is forced to abandon a specific regime due to the depletion of foreign exchange reserves, to rationing on international capital markets, etc. Loss of sustainability is only *relative* if – as a consequence of (speculative) market forces – the intended policy effects are neutralized, i.e. are made (more or less) ineffective.

Irving Fisher's Original Plan

As expressed by Cooper⁷ and Patinkin⁸, the general price level of a country in units of its own currency can be divided into the product of a currency/gold ratio and a gold/goods ratio – provided that not only

roubles, but physical quantities of gold ... are part of the circulating medium of exchange.⁹

$$(1) \left[\frac{\text{Roubles}}{\text{Goods}} \right] = \left[\frac{\text{Roubles}}{\text{Gold}} \right] \times \left[\frac{\text{Gold}}{\text{Goods}} \right]$$

Fisher suggested that when the price level changed the central bank should consciously deviate from the fixed parity between the national currency (here: roubles) and gold. Applied to the rouble, this would have the following consequences: if the purchasing power of gold in the rouble area falls and hence causes the prices of goods to rise (the gold/goods ratio in equation (1) rises), the central bank must likewise increase the amount of gold per rouble or the weight of the gold rouble, which implies a fall in the price of gold in roubles (the rouble/gold ratio in equation (1) falls). Even if one ignores the effects of reduced gold production or of an outflow of gold as a result of rising imports (which foster the adjustment process), the non-bank sector will increase its purchases of gold. The effective money supply will diminish, and the original inflationary tendency will be eliminated. According to Fisher, exactly the opposite should be done if the general price level falls, so that overall the purchasing power of the rouble (rouble/goods) will remain constant in the long run. This situation can be illustrated easily in equation (1a) with the help of growth rates:

$$(1a) \left[\frac{\hat{\text{Roubles}}}{\text{Goods}} \right] = \left[\frac{\hat{\text{Roubles}}}{\text{Gold}} \right] + \left[\frac{\hat{\text{Gold}}}{\text{Goods}} \right]$$

!

< 0

←

> 0

0

> 0

←

< 0

"Here, then, was a rule in the modern sense of the term."¹⁰ As far as the criterion of *credibility* is concerned, the Fisher mechanics do fairly well: the central bank uses an easily understood mechanism (*transparency*), so that if the arrangement is adhered to, economic agents do not need to weigh up the consequences of a change in monetary policy. From first glance, *competence* problems could (only) arise if a sharp increase in domestic prices necessitated such a large downward adjustment in the rouble's gold parity that the central bank had difficulty satisfying the demand for gold with its available gold reserves. However, this problem should be eased by the status of Russia or the CIS as an important gold producer and/or by making use of strict capital, i.e. gold export controls.

Fisher's proposed modification of the gold standard gives greater stability to the purchasing power of the

⁴ Volker Hofmann and Friedrich L. Sell, op. cit.

⁵ Volker Hofmann and Friedrich L. Sell, op. cit., p.12.

⁶ Ibid.

⁷ Richard N. Cooper: The Gold Standard: Historical Facts and Future Prospects, Brookings Papers on Economic Activity, No. 1, 1982, pp.1-56.

⁸ Don Patinkin: Irving Fisher and his Compensated Dollar Plan, in: Federal Reserve Bank of Richmond Economic Quarterly, Vol. 79/3, 1993, pp. 1-33.

⁹ Don Patinkin, op. cit., p.6.

¹⁰ Don Patinkin, op. cit., p.5.

rouble, as changes in the domestic price level and/or in the world gold market and resultant variations in the inflow/outflow of gold can be offset by rule-based central bank intervention. Hence, a contribution to a greater degree of *creditor protection* is made.

But what about the status of Fisher's proposal vis-à-vis the criterion of *sustainability*? As pointed out with reference to the *competence* of the Russian (or any other) central bank to pursue the Fisher rule, exogenous shocks on the world gold or commodity market may heavily draw on its reserves. It is even more interesting, however, to inquire whether the Fisher arrangement "invites" speculators and/or arbitrageurs to neutralize the actions of the central bank. As Patinkin puts it, "Fisher was fully aware of the danger that anticipated changes in the price of gold in accordance with his plan could encourage speculative purchases or sales of gold to the mint that would generate losses for the government. In order to prevent such speculation, he stipulated that there be a difference between the mint buying and selling price ("brassage") and that any change in the price index be less than this difference".¹¹ Without such a price difference it is clear what speculators "have" to do: if the official gold price is expected to drop, they will sell own gold holdings today to the mint, in order to buy them back at a lower price tomorrow. The *net* result in terms of the amount of money in circulation, of course, is not in line with Fisher's original idea.

If the authorities wish to avoid such speculative windfall gains, they may – for example – introduce the mentioned "brassage". If we define the "brassage" to be the difference between the domestic buying price (p_B) and the domestic selling price (p_S) from the private agents' point of view and if we assume domestic inflation to rise so that the domestic selling and buying price of gold are *expected* (E) to be lowered, three alternative situations may, then, arise (at a given world market price (p_W) and a fixed exchange rate (e) of 1:1) :

$$(2) p_W \leq p_S^E \leq p_B^E$$

$$(3) p_S^E \leq p_W \leq p_B^E$$

$$(4) p_S^E \leq p_B^E \leq p_W$$

In the first case, domestic and foreign speculators will buy gold on the world market and sell it to the domestic mint (and so elevate further domestic high powered money). In the second case it is rational for

domestic speculators to buy on the world market, but there will be no sales (or purchases) on the domestic market. Finally, in the third case, it is appealing to postpone purchases on the world market and to buy instead on the domestic market and to sell abroad (and so to decrease domestic high powered money). Whereas the first case is not very likely (because, then, the wedge between domestic and world market prices would have been "too" big to avoid large arbitrage flows) and the last case seems to back the Fisherian mechanics, the outcome for the authorities is so to say "neutral" in the second case as domestic high powered money is not affected. The reason for this is that a more or less significant number of the market participants are reluctant to buy any more gold from the domestic mint. In other words: the introduction of a "brassage" is in principle capable of offsetting largely speculative attacks; however, in order to be broadly effective the authorities should avoid the possibility of case one. This can be done by adding the following restriction to Fisher's rule:

$$(2a) p_S^E \leq p_W$$

Adjusting the Exchange Rate

One of the main shortcomings in I. Fisher's plan is the fact that he did not carefully reflect the repercussions on the exchange rate: "Under the gold standard that then prevailed, changing the dollar (rouble) price of gold in accordance with his proposal meant changing the foreign exchange rate."¹² Therefore, a "modern" extension of his beliefs must incorporate the exchange rate as a variable right from the beginning. While Fisher assumed the individuals to hold their money balances partly in the form of roubles and partly in the form of gold slugs, the following exposition allows for the existence of speculative dollar holdings as well. Also, we assume that there are two distinct gold markets, a domestic one and a world market, and that the monetary authorities pursue a crawling peg exchange rate regime but do not intervene on the domestic gold market. We start by extending formally relation (1) and then giving some insight into the comparative statics.

Let us assume that the original "Cooper-Patinkin" equation (see above) can be extended to the following expression:

$$(1b) [\text{Rouble/Goods}] = [\text{COM/Goods}] \underbrace{[\$/\text{COM}][\text{Rouble}/\$]}_{[\text{Rouble/COM}]}$$

As with the original Fisher plan, relation (1b) holds only in an economy in which not only roubles, but also

¹¹ Don Patinkin, op. cit., p.7.

¹² Don Patinkin, op. cit., p.8.

gold and dollars are part of the circulating medium of exchange ("currency substitution"):

$$(1c) \left[\frac{\text{Rouble}}{\text{Goods}} \right] = \left[\frac{\$}{\text{Goods}} \right] \left[\frac{\text{Rouble}}{\$} \right]$$

According to (1b) it thus seems now that any change in the commodity or gold price of a basket of goods can be offset by an appropriate change of the rouble/dollar exchange rate at a given world market price of the commodity or gold and that any change in the world market price of the commodity or gold can be neutralized by an equivalent change in the rouble/dollar exchange rate so that the commodity price and hence the rouble price of goods is not affected. Let us consider a situation where inflation in Russia is fuelled no matter for what reasons and where the authorities make use of an exchange rate manipulation to reach a Fisherian adjustment.

Assume the initial exchange rate (e) between the rouble and the US-\$ to be 1:1, with gold prices being the same in New York and in Moscow. According to the extended Fisher rule, the authorities will revalue the rouble, the exchange rate for example to become 0.5:1. What happens now is that the rouble equivalent of the gold price on the world market (New York) is only half of the rouble gold price in Moscow. Strong incentives for arbitrage flows emerge.

As a result, arbitrageurs will sell (buy) gold on the Moscow (New York) market until the law of one price is again restored. For these transactions, Russian agents need foreign exchange and deliver roubles to their central bank, while international agents receive roubles for their gold sales, change them into dollars and leave the country. Both transactions draw on the reserves of the Russian central bank and reduce high powered money (B) and, hence, money supply (M) at a given money multiplier (m):

$$(5) \Delta M = m (-\Delta B)$$

In addition, the appreciation of the rouble has two effects on the "real" side of the economy that tend to put domestic inflation under downward pressure: import goods automatically gain additional competitiveness on the goods markets and the balance on current account can be expected to deteriorate further. So there is another squeezing impact on foreign exchange reserves.

What about the situation when there are sudden changes on the world commodity or gold market? One can expect that arbitrage processes will again take place: a drop (rise) in the world market prices will lead to a decrease (an increase) of foreign exchange

reserves at the Russian central bank and to corresponding monetary effects (see above).

As with the classical gold standard, fluctuations in the world commodity or gold price would be transmitted to the domestic money supply. But, in contrast to the gold standard the monetary authorities can now make use of the exchange rate instrument (very much like an active crawl) to offset these disturbances. This can be explored with the help of the following two equations:

$$(6) p_w^E \cdot e^E = p$$

$$(7) e^E = \frac{p}{p_w^E}$$

where p_w^E stands for the (new) world market price after the exogenous change, p stands for the original gold price in Moscow and e^E for the new exchange rate to be chosen by the monetary authorities. If the world market price of the commodity or gold drops (rises) from an old to a new level, the new exchange rate (7) to be chosen by the Russian authorities must satisfy equation (6). As a result, the gold in- (out-) flows and foreign exchange out- (in-)flows outlined above can be avoided.

Now, it remains to be seen how the extended compensated dollar plan is able to avoid or neutralize speculative attacks (criterion of *sustainability*), given the fact that it should meet the components of credibility just as much as the original Fisher plan does.

There are two sources for a speculative interest in the mechanism outlined above: one is a pure foreign exchange speculation and the other is a traditional gold price speculation. If speculators anticipate correctly the intention of the domestic authorities to revalue the domestic currency, they will sell as much foreign exchange as they can to the central bank, and (possibly) buy back on the day of the revaluation. While the first transaction boosts the supply of money, the second has a contractionary effect, precisely when it is wanted by the central bank. The *net* result of both of these transactions will be positive, however. As far as the gold price speculation is concerned, the following calculus is relevant:

$$(8) p_w \cdot e^E \leq p_w^E \cdot e^E \leq p$$

where e again stands for the exchange rate, and for any economic variable x

$$(9) x^E = E[x_t / I_{t-1}]$$

rational expectations (E) are widespread, given the set of information available (I_{t-1}).

In the most simple case of perfect foresight, speculators anticipate correctly the future exchange rate and the future gold price so that they act upon the right side of (8) : it is rational, then, to sell gold today to the mint or to any other of the many potential gold suppliers – and to buy back after price adjustment has taken place on the domestic and the world gold market. By doing so, they act in line with the aims of the central bank, as there will be no positive effects on the domestic money in circulation.

In a situation where the authorities intend to avoid arbitrage, the following rule is applied:

$$(10) \quad p = p_w \cdot e \stackrel{!}{=} p_w^E \cdot e^E$$

$$(10a) \quad \frac{p_w}{p_w^E} = \frac{e^E}{e} ; e^E = \frac{p_w}{p_w^E} \cdot e$$

Here, gold speculation is not worthwhile under the assumptions made so far. Foreign exchange speculation should run as follows (see above) : if the world market price of gold is expected to rise (drop), the expected exchange rate will come down (go up) by the rule of the central bank; hence, it is rational for speculators to sell (buy) foreign exchange now to (from) the central bank at the higher price and to buy (sell) from (to) the central bank at the lower price later. The first transaction has an expansionary effect on domestic money supply, whereas the second is of a contractionary nature. The *net* contribution to money in circulation is positive, however. This type of adjustment is still in accordance with the goals of the authorities as foreign (domestic) inflation presumably exceeds domestic (foreign) inflation and the exchange rate appreciation is a means of defending domestic price stability against an inflationary world. In the opposite case, i.e. when the world-wide price stability increases, the *net* effect on money in circulation will be negative, so that speculation helps to reduce the domestic inflation bias vis-à-vis the rest of the world.

An additional instrument available to the authorities consists in splitting the exchange rate, making a difference between the buying (e_B) and the selling (e_S) price of foreign exchange. As above with the Fisherian “brassage”, three alternative expected (E) scenarios emerge:

$$(11) \quad p \leq p_w^E e_S^E \leq p_w^E e_B^E$$

$$(12) \quad p_w^E e_S^E \leq p \leq p_w^E e_B^E$$

$$(13) \quad p_w^E e_S^E \leq p_w^E e_B^E \leq p$$

Quite analogously to the cases one to three in the original Fisher economy, equations (12) and (13) do

not cause much headache to the authorities. In order to meet the challenges of (11), the following rule must be met:

$$(11a) \quad p \geq p_w^E e_S^E$$

Considering (10) it follows that,

$$(14) \quad e_S \leq \frac{p}{p_w}$$

and

$$(15) \quad e_S^E \leq \frac{p}{p_w^E}$$

Summary and Policy Conclusions

The reconsideration of I. Fisher's compensated dollar plan has produced some remarkable results for economies in transition – like today's Russia – affected by high and volatile inflation rates and in search of a sustainable exchange rate regime:

- from the stabilization point of view any crawling peg system in a highly inflationary environment should not pursue a devaluation but a revaluation strategy;
- a rule based exchange rate crawl can survive (only) as long as it is sustainable, that is when it cannot be neutralized by arbitrage processes and/or speculative attacks against the price stability goals of the monetary authorities;
- the original as well as the extended compensated dollar plan do not encourage the active depletion of foreign exchange reserves by speculative agents;
- as is the case with the original, the extended Fisher rule – revalue your currency whenever inflation is making progress – is in need of wage flexibility if the aggregate price level is to be stable;¹³
- speculative actions to the detriment of the monetary authorities can be largely avoided by the introduction of a “brassage” (in the Fisher original) or of a dual exchange rate regime within the extended compensation plan;
- the rationality of the extended Fisher proposal is to be tested according to the desirability and the consequences of the induced transaction costs on the one hand and the possible resurgence of a parallel market for foreign exchange on the other hand.

¹³ Stanley Fischer: Rules versus Discretion in Monetary Policy, in: Benjamin M. Friedman and Frank H. Hahn (eds.): Handbook of Monetary Economics, Vol. II, Amsterdam 1990, pp.1155-1184, here p. 1168.