On Money Stock Targets and Exchange Rate Stabilization – A Comment

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The main question discussed by Hans Genberg and Jean-Pierre Roth (henceforth G-R) in their paper concerns the possibility and advisability of a policy of exchange rate smoothing by a central bank which has set itself a money stock growth target. I will divide my comments on the paper, which I find very interesting and stimulating, into three sections.

1. G-R begin their discussion by pointing to the analogy between the question of exchange rate smoothing, and the one of interest rate smoothing which has often been discussed in the closed economy analysis of monetary stabilization policy. Following Poole (1976) they demonstrate that, just as there is a tradeoff between interest rate stability and money stock stability, there is a similar tradeoff between exchange rate stability and money stock stability. Thus, given a strict money stock target, the central bank’s ability to stabilize a variable (such as the exchange rate e, or the interest rate R) via manipulating the money stock, in the face of stochastic shocks operating on this target variable, will be seriously constrained or even made impossible, depending on how strict the money stock target is. (Note that exchange rate effects via changes in the composition of the central bank’s portfolio, with a given total money stock, are disregarded throughout. Of course, some margin of operation, at least in the short run, might be sought in this area. This margin is doubted by the authors, however, and not subject of the discussion. I simply accept here this limitation of the discussion.)

In my opinion, G-R assign a bit too much weight to this observation. While certainly correct, it is neither particularly startling nor novel. If this kind of consideration has any interesting implication, it would, to me, be that it makes no sense to impose a short-term constraint on the money stock M, given that the objective is to stabilize e, or R (without at this point judging whether this is a desirable objective or not). Obviously, you cannot (completely) stabilize e or R, e.g. over two periods or “half-years”, as in the Polle-G-R model, and at the same time constrain M to a given rate of growth over the same two periods (e.g. to zero, $\Delta M_2 = -\Delta M_1$, as in equation 4), unless the disturbances just happen to cooperate ($u_2 = -u_1$). Given that you have no reason to expect that $u_1 + u_2 = 0$, and given that you wish to stabilize e (or R), why should you constrain $\Delta M_1 + \Delta M_2 = 0$? After all, the idea in successfully stabilizing e (or R) is to manipulate the time path of M such as to offset the random disturbance $u_1$. A self-imposed constraint which prevents you from doing just that will doom your efforts to begin with. Note, how-
ever, that over the long run $\sum u_t = 0$, according to model specification. A long-term constraint $\sum \Delta M_t = 0$, therefore, represents no problem. Thus, in the context of the given model, and given that your objective is to stabilize $e$ (or $R$), it makes sense to impose a rigid constraint on the growth of $M$ only for a period of sufficient length, for which you can reasonably expect the disturbances which you want to neutralize to cancel out. Such a long-term constraint, furthermore, should be all that is needed for long-term price stability.

One interesting question which is raised by this, and which places the idea of shorter-term constraints on $M$ in a somewhat different light again, is the question of the enforceability of such long-term constraints. Maybe this does provide a rationale for shorter-term constraints. The optimal length of such a constraint might involve a tradeoff between the extent to which you can stabilize your objective variable (here, $e$ or $R$) and the probability that the long-term constraint on $M$ (and thus long-term price stability) will be maintained. Of course, in the context of the simple framework referred to above, such a conflict does not exist. It does exist, however, in a framework which does include both transitory and permanent shocks, and where these two are difficult to distinguish ex ante.

In the following, however, I will return to the assumption that a rigid short-term constraint (over two periods, or “half-years”) has been imposed, since this is the case which G-R have chosen to analyze. This case, of course, does have some practical policy relevance. The question is whether a smoothing of the exchange rate $e$ over the two periods (i.e. over the year), brought about via appropriately changing the time profile of the money stock $M$ over the year, is still possible.

2. Before the authors turn to this (their central) question, they mention quite correctly that the variability of output (or some related measure) is probably more relevant than exchange rate variability for its own sake. They point out that the former might depend not just on deviations of exchange rates from their equilibrium level, and thus exchange rate variability, but also on deviations of interest rates from the “real” rate, and thus on interest rate variability. This creates the possibility that a policy of exchange rate stabilization, even if successful, might be detrimental to output stability, if it implies a sufficiently higher variability of the money stock and interest rate. While this is a useful point which deserves consideration, some further comments seem appropriate.

First, it should be pointed out, that in the case where exchange rate fluctuations occur because of shifts in the demand for (domestic) money, an accommodating (and thus variable) money stock policy would not cause, but rather prevent higher interest rate variability. (Note that in G-R random shocks come into the system only via the foreign interest rate $i^*$. Of course, the problem of identifying the source and nature of random shocks is precisely one of the major problems facing the policy maker.)
Second, even if a more variable money stock policy does lead to fluctuations of the domestic money stock relative to the demand for it, and thus requires interest rate adjustments, this does not necessarily involve output adjustments to a great extent. As long as it is simply a matter of short-term variations of M around a given mean, and is recognized as such, the main effect should be on short-term rates, and not so much on long-term rates and production decisions.

Finally, and related to this, the role of inventory variations deserves much more attention. It is not clear why they should not be able to take care of short-term deviations of exchange rates and interest rates from their (longer-term) equilibrium levels, thereby preventing immediate revisions of production and supply decisions in these cases.

3. I will return now to the central issue analyzed by G-R, the issue of exchange rate stabilization within a money stock target framework. G-R study this question under two different scenarios:

a) Under adaptive expectations, they find that there is some scope for an active stabilization policy (although this does not necessarily mean that a beneficial policy is easy to find and execute, as it must always be emphasized). Since this is consistent with the usual evaluations, and not very controversial, I will not further discuss it. (It might be added, however, that even if a target is not announced, and the public has not yet enough observations of actual central bank behavior to infer its policy rule, expectations about money stock behavior might still be formed by the public more rationally than is assumed by G-R, namely by considering the underlying policy objectives [price stability, exchange rate stability], rather than on the basis of lagged values of M alone.)

b) Under rational expectations, on the other hand, the possibilities of an active stabilization policy are more controversial. G-R here consider two alternative forms of a monetary target strategy, an “end-of-period target”, and an “average-yearly target”.

Under the former, as formulated by G-R, the policy maker is perfectly free (i.e. not restricted by the target) in the first half-year, while (exactly) constrained by the target (but not by his decision in the first half-year) in the second half-year. That is, the policy maker is allowed any active stabilization policy in the first half-year, but none whatsoever in the second half-year. This results in an obvious asymmetry concerning the possibilities of a stabilization policy: in the first half-year (uneven-numbered periods), e can be influenced and stabilized, while in the second half-year (even-numbered periods) it cannot.

It must be added here, that the ability of monetary stabilization policy to affect exchange rates (and output) in the rational expectations version of the G-R model results from an assumed intertemporal price rigidity (which, incidentally, is not made in the adaptive expectations version of the model). The price level is assumed to stay unchanged at its (average) equilibrium value over the two half-years, i.e. at
the level which would be market clearing in the absence of disturbances, and with
the money stock equal to its target level $M$. If prices would continuously adjust to
market-clearing levels, the result of the usual rational expectations models would
be obtained, i.e. attempts to pursue an active stabilization policy would be fruit­
less.

Under an average-yearly target, on the other hand, the policy maker's decision in
the first half-year simultaneously determines his policy for the second half-year,
where he has to undo what he has done in the first half-year. That is, in the second
half-year, he is the prisoner of his earlier decision in the first half-year. The treat­
ment of the two periods (half-years) again is asymmetric, insofar as a "new" decision
is made every other period only (i.e. in each first half-year, or uneven-numbered
period), without any knowledge of the disturbance in the following (even-numbered)
period. The problem under this kind of strategy is, that the policy maker will
in general (i.e. on average) be forced into actions in the even-numbered periods
which are wrong with respect to the concurrent disturbances ($u_{2t}$). Furthermore, it
turns out that any stabilization attempt in the unevennumbered periods will be ne­
gated (and thus without effect in that period) by the known reversal of this inter­
tervention in the subsequent even-numbered period. (This reversed intervention, on the
other hand, will have a real effect, since it will not in turn be expected to be reversed
again in the following uneven-numbered period, when a "new" decision will be
made, based on the disturbance of that period.) It follows that the optimal inter­
tervention policy under this strategy is one of no intervention.

However, it can be argued that all this interprets the idea of a monetary target in
maybe too restrictive a sense. I would argue that there is a third form of monetary
target strategy, which deserves this name just as much as the two discussed ba G-R,
and which may actually be more descriptive of the way in which central banks view
and employ such targets. This strategy lacks the asymmetry of those considered by
G-R, and thus allows an active stabilization policy in all periods in a perfectly sym­
metric way (as long as the G-R price rigidity assumption is maintained.)

It is clear, that in the G-R framework an active intervention policy in any
period, e.g. period $2t - 1$, is able to affect the exchange rate in that period ($e_{2t-1}$)
beneficially, if the policy decision for that period does not constrain the decision
for the following period. Suppose, e.g., that $M_t = \bar{M} + \varepsilon_t$, for all $t$, with $\varepsilon_t = -\delta u_t$
(or $\varepsilon_t = -\gamma \varepsilon_t$, if $u_t$ is not observable). Then, we have

$$E_{2t-1}(e_{2t}) = \frac{1}{\beta} E(M_{2t} - \bar{M}) + \bar{e} = \frac{1}{\beta} E(\varepsilon_{2t}) + \bar{e} = \bar{e}$$

and

$$E_{2t}(e_{2t+1}) = \frac{1}{\beta} E(\varepsilon_{2t+1}) + \bar{e} = \bar{e},$$
and thus
\[ e_{2t-1} = \frac{1}{\beta} (M_{2t-1} - \overline{M}) + \bar{e} + u_{2t-1}. \]

Similarly, disturbances in the subsequent period (2t) can be smoothed, in a perfectly symmetric way. The reason, of course, is that policy discretion \((\varepsilon_t \neq 0)\) here is possible in each future period, but in a currently unpredictable form, since it will depend on future disturbances. In other words, the central bank here will not attempt to, and is not expected by the public, to correct a given deviation from target in one period in the immediately following period. It will attempt to correct such deviations sooner or later, but it will wait (and is expected by the public to wait) for the next good opportunity to do so, knowing that in the longer run these deviations will cancel out. As long as the model specification is correct, i.e. \(u_t\) and thus \(\varepsilon_t\) are random with zero expectation, such a policy is unproblematic, i.e. it represents an effective long-term constraint on \(M\).

Alternatively, but more or less equivalently, one could express this type of strategy by saying that the policy maker considers consecutive and overlapping 2-period spans (or, maybe more realistically, overlapping 12-month periods, one beginning on the first of each month). For each of these, a given average \(M\) is attempted, but with the understanding that deviations are allowed, depending on the situation in each period, e.g.

\[ \frac{1}{2} (M_t + M_{t+1} + \varepsilon_{t+1}) = \overline{M}, \quad \text{for all } t, \quad \text{with } \varepsilon_t = -\delta u_t, \]

or, expressed differently
\[ M_{t+1} - \overline{M} = -(M_t - \overline{M}) - \varepsilon_{t+1}. \]

That is, the central bank will in each period attempt to offset the previous period's deviation from target. But it will take the liberty (and the public expects this) to wait with this correction, until a good opportunity (a "cooperating" value of \(u_t\)) comes around. This again implies a situation of complete symmetry between all periods.

I believe that this more flexible type of strategy is probably more representative of the way in which central banks view and use monetary targets, and that it also at the same time represents a more reasonable policy than one of rigid short-term targets. After all, what is so magic about the length of a year? If a rigid short-term constraint is so good, why not a quarter, or a month, or a week? On the other hand, why not two years, or five years? This, of course, leads back to the first point I have made in this note. In a sense, therefore, it seems to me that the G-R analysis, given their framework, is a verdict not so much against a policy of exchange rate smoothing, but rather against the use of very rigid short-term money stock constraints.
On the other hand, note again that in all this the possibility of a smoothing policy was based on the price rigidity assumption mentioned earlier. Remember also that in the presence of both transitory and permanent shocks, and of shocks originating from different sources within the system, a successful stabilization policy, even if it exists, would be much more complex and difficult than in the simple framework referred to above. Given these additional considerations, I share the scepticism which is expressed by the authors in their concluding statement concerning the possibility and advisability of a policy of exchange rate smoothing within a money stock target policy, even if the latter is interpreted in the more flexible and less restrictive way I have suggested above. This is reinforced by the fact that I am not convinced that short-term exchange rate variability of the kind discussed here is a very serious problem in the first place. Note, however, that this is not inconsistent with the view that the exchange rate can play a certain indicator role in connection with the question of what constitutes an appropriate money stock target (i.e. one which is consistent with medium- to long-term price stability), in view of the possibility of medium- to long-term money demand shifts. Of course, this may in the end result in some kind of exchange rate smoothing, too, but of an entirely different kind, namely not one within a given money stock target constraint, but rather one within a (long-term) price level target constraint. In view of the difficulty of identifying the nature of structural shifts, I believe, however, that revisions of money stock targets in response to suspected money demand shifts should not be taken lightly, but only with great hesitation in cases of dramatic and sustained deviations from purchasing power parity, such as experienced in Switzerland in 1978.