Referee Report on

"Seigniorage"

by Willem H. Buiter

for *e-conomics*

The paper carefully defines and compares four related concepts of seigniorage. Seigniorage may be viewed at as (i) stemming from the increase in base money, (ii) saved interest payments on the outstanding base money liabilities, (iii) inflation tax or simply as (iv) operating profits of the central bank (CB). First, Buiter defines the first three concepts and shows how they are related to the rate of inflation and how their maxima are ordered in a steady state.

In a generalisation, the author allows for interest payments on base money and for economies outside the steady state (paraphrased "in real time"). Here, the focus is on the present value of current and future seignorage. The author establishes that here maximizing seignorage according to definitions (i) and (ii) is equivalent, if the initial price level is predetermined.

Section II basically re-establishes well-known properties of seigiorage equations. Sections III and IV argue that the treasury, through fiscal claims on the CB, can prevent the CB from implementing its mandates. The logic behind this argument is as follows: assuming a hump-shaped Laffer curve, seigniorage is increasing in the rate of inflation up to its unique maximum and decreasing thereafter. If the treasury requires certain funds from the CB, there is a minimum rate of inflation, $\pi_{\min}$, necessary to raise these funds as seigniorage. Thus, fiscal claims may be inconsistent with inflation targets smaller than $\pi_{\min}$. The same logic applies to a consolidated government for a given plan of expenditures.

In order to establish the relation between fiscal claims on the CB and minimum rate of inflation, the intertemporal budget constraints of treasury and CB must be considered separately.

Comments:

1. Equations (14) – (21) are not needed for the subsequent Proposition 2. They can be omitted.
2. Equivalence results rely on the initial price level being independent from CB policy. This, however, cannot be taken for granted. The equivalence results are basically

trivialities (although on a high formal level), and they do not deliver new insights. (Why distinguish concepts that are equivalent?) It would be much more interesting to analyse conditions for which the different concepts of seigniorage are not equivalent, which requires taking into account the effects on the initial price level.

3. The logic behind the central thesis that fiscal claims on the CB may be inconsistent with inflation targets is closely related to the fiscal theory of the price level. The paper does not refer to this theory, though.

4. Instead, the author sticks to the assumption of a predetermined price level, which contradicts (in my view) rationality: Agents do not foresee that the CB will (in period t) start a policy of maximizing seignorage or (in Section IV) pursue a new policy (deviate from an inflation target) in order to raise funds for fiscal claims.

5. For Proposition 4 the authors fix the debt of the consolidated government. It seems to me that this is not even necessary: using the no-Ponzi-game condition, a fixed level of expenses and taxes should be sufficient to determine a minimum rate of inflation needed to fill the gap.

6. It is odd that the treasury can fix a lump sum tax on the CB. As far as I understand the relationship between treasuries and CBs, an independent CB cannot be required to provide more funds to the treasury than its operational profit (plus eventually dissolved reserves). Thus, the problem of a target rate being inconsistent with fiscal claims does not occur. Put in other words: operational target independence requires a transfer mode for payments from CB to treasury that guarantees that the CB can implement its target. This does, however, create an additional uncertainty on behalf of the treasury who cannot rely on receiving certain funds from the CB.

7. This critique does not apply to the author's considerations in section V: acting as lender of last resort may indeed prevent an implementation of the targeted rate of inflation, unless the treasury steps in with transfers either to the CB or to private banks.

8. Considerations about how the CB can escape a liquidity trap (Section V.2) are interesting, but they are not treated with the formal framework developed earlier. Indeed it would be interesting to analyze the means by which the CB can operate, once the interest rate is at zero. However, this requires an extended framework including incentive aspects and an endogenous growth rate of real GDP.

Summing up, the value added by the 5 propositions in this article is minor compared to the technical efforts associated with reformulating budget constraints. The major contribution is the stringent framework itself that allows a better formal analysis of the relation between inflation, seigniorage and budget constraints (in particular No-Ponzi-game conditions) for given preferences / money demand functions.

Minor comments:

1. Notation: the author uses index *t* for stocks at the end of "period *t*" and e.g. $i_{t,t-1}$ for the interest rate "between periods *t-1* and *t*" Since there is at most one date between periods, it would be better to define i_t as the interest rate in period *t*.
2. Page 6: in equations (5) – (7), $f(\overline{\pi})$ should be replaced by $\ell(\overline{\pi})$ as defined on page 5.
3. Page 14, line 21, typo? "… maximizing σ_1 in real time <u>will be</u> equivalent to …"
4. Page 15, following (24), typo: "If <u>the monetary</u> authority …"
5. Page 23, line 4, typo: "… that <u>in</u> order to obtain …"
6. Page 23, line 6 and 8: "liabilities" should be replaced by "assets"
7. Page 24, line -5 bottom up, typo: "at all at all"
8. Page 36-37: the last two sentences of the last paragraph on page 36 and the last sentence of the paragraph on page 36-37 state the same.
9. Proposition 5 follows directly from Propositions 3 and 4. I would at most call it a corollary.