Discussion of
"Nominal debt as a burden on monetary policy"
by
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Some important public finance questions

- **Most private individuals have positive net asset holdings, but virtually all governments, have nontrivial negative asset holdings. Why do governments end up in debt?**

- **Basic theory predicts that government debt does not matter – Barro (1974)'s Ricardian equivalence result – or its long-run level depend entirely on initial debt.**

- **Why do governments from industrial countries rely predominantly on nominal debt – which they can partially default on through inflation?**

- **How does government debt interact with monetary policy?**

- **What are the losses from lack of commitment?**

Optimal monetary and fiscal policy: Two distinct literatures

- The first is on **dynamic optimal taxation**, stemming from Lucas & Stokey (1983): government policy is a source of frictions due to fiscal shocks and distortionary taxes.

- The second literature on **optimal monetary stabilization** policy, as in Goodfriend & King (1997), and Woodford (2003), considers environments with nominal price rigidities and imperfect competition but usually lump-sum taxes.

- Both consider a benevolent government optimally choosing a combination of fiscal and monetary policies under **commitment** – i.e. once and for all at some previous date.

- Both have not provided a theory of debt (Krusell & al., 2004).

- The impressive paper by Giorgia, Ramon and Pedro falls under the first category, with distinctive key achievements.

Paper's main ideas and contributions

- **Study fiscal and monetary policy interactions in classic monetary model with distortionary taxation – Lucas and Stokey (1983).**

- **Novelty is full characterization of equilibria under (limited) <u>lack of commitment</u>:**

    - **Government can promise to pay back debt but set policy sequentially.**

- **Key message: Optimal discretionary inflation/debt paths reflect tax procrastination but also gains from nominal debt reduction.**

    - **Better understanding of nominal debt's role: Not always a burden**

- **Nice extension to truly dynamic setting of classic Kydland and Prescott critique of discretionary policy.**

- **Have to tackle hard technical problem – the Generalized Euler Equation (GEE).**

The paper's basic framework

- **Preferences** $U(c,n) = \dfrac{c^{1-\sigma}-1}{1-\sigma} - \alpha n$

- **Technology and resource constraint (no shocks)**
$$c + g = n$$

- **First best allocation** $c^{-\sigma} = \alpha$

- **Distortions: CIA constraint, inflation tax, (nominal) debt**
$$Pc \leq M$$
$$Pc + M' + qB' = M + B + Pn$$
$$M^{s\,\prime} + qB^{s\,\prime} = M^{s} + B^{s} + Pg$$

- **Predetermined nominal variables and forward-looking choices provide opportunity (and danger) for (discretionary) policy**

The sources of time-inconsistency

- **From the competitive equilibrium conditions:**

$$c'^{-\sigma} = \frac{\alpha}{q}$$

$$\frac{1}{q} = \beta^{-1} \frac{P'}{P}$$

- **Current choices depend on tomorrow's price level and thus government (promises on) future policies.**

- **Consumption today can be increased by increasing debt at the expense of consumption tomorrow and vice versa.**

- **The current government will take this into account, but future government will not internalize this effect.**

Policy scenarios and Main results

- **Ramsey equilibrium (full commitment)**

- **Markov sequential policies**

- **Hybrid cases with more tax instruments**

Results

- **Ramsey inflation and debt change only in first period:**

  – **Indexed debt always better than nominal debt.**

- **Lack of MP commitment results in persistent accumulation or decumulation of debt: <u>Positive bias</u> in debt and inflation**

  – **Nominal debt can dominate indexed debt as incentive to monetize it offsets incentive to postpone taxation.**

- **If FP can commit, MP implements Friedman rule.**

Optimal discretionary policy

- The discretionary government solves this program:

$$V(z) = \max_{z'} U\left(\frac{1}{p(z, z', p')}, 1 - \frac{1}{p(z, z', p')} - g \right) + \beta V(z')$$

s.t.

$$p' = \Psi(z')$$

- The solution is thus given by functions **V**, **Ψ** and **Z**.

- The atypical constraint reflects time-inconsistency – future governments may disagree with incumbent.

- Generalized Euler Equation in which **Ψ**'s derivatives show up.

- **Hard problem**: There may be also discontinuous solutions which do not satisfy the **GEE** with equality everywhere (Krusell & Smith (2003), Martin (2007)).

Rules vs discretion redux

- **Contrast the GEE with the Ramsey optimality condition in t=0:**

$$\frac{\left(c^{-\sigma}-\alpha\right)}{1+z}=\left(c'^{-\sigma}-\alpha\right)\left(1-\frac{(1-\sigma)c'^{-\sigma}}{\alpha}\right)^{-1}$$

$$\frac{\left(c^{-\sigma}-\alpha\right)}{1+z}=\frac{\left(c(\Psi(z'))^{-\sigma}-\alpha\right)}{1+z'}\left(1-f\left(\Psi_z(z')\right)\left(1+\frac{(1-\sigma)c(\Psi(z'))^{-\sigma}}{\alpha z'}\right)\right)^{-1}$$

- **The inflation tax is distortive on today's consumption but <u>non-distortive</u> on predetermined nominal liabilities z.**

- **The forward-looking governement takes into account the effect of z' on future distortions through Ψ.**

- **Debt dynamics will depend on which effect dominates: If inflation tax very distortionary, debt will grow ($\sigma > 1$).**

Summary of results for $\sigma > 1$

	Ramsey	Markov
Real Debt (b)		
Debt	$b_0 < b_1 = b_\infty$	$b_t < b_{t+1}$
Welfare	$V^b > V^z$	$V^b < V^z$
Nominal Debt (z)		
Debt	$z_0 < z_1 = z_\infty$	$z_t < z_{t+1} \leq z_\infty$
Welfare	$V^z < V^b$	$V^z > V^b$

- **Quantify welfare differences $V^b - V^z$ in terms of consumption?**

Robustness and extensions

- **Obvious but interesting extensions include shocks, more general settings, monetary and fiscal policy interactions…**

- **The paper does show that results are robust to introducing discretionary FP presetting taxes on labor, consumption:**

  - **Niemann (2005) extends analysis to whole range of strategic interactions.**

- **Insurance role of nominal debt against fiscal shocks (Chari, Christiano & Kehoe, 1991).**

- **Monetary and non-monetary distortions shaping inflation costs matter a lot:**

  - **Martin (2007) shows that what matters is substitutability between "cash" and "credit" goods, rather than intertemporal substitution.**

Indexed and nominal debt with shocks

- **While in a monetary economy it is possible to make nominal bond returns state contingent by setting ex post inflation, indexed debt would prevent this (Chari, Christiano & Kehoe, 1991, 1995).**

- **In a setting similar to the paper:**

    - **Martin (2007): Debt and inflation increase sharply in response to large positive expenditure shocks – but no welfare analysis.**

    - **Cosimano & Gapen (2003) find that gains from using nominal debt to hedge against shocks are large under <u>commitment</u>.**

- **However, if nominal price rigidities are present, there is a trade off between the costs of market incompleteness and the costs of volatile inflation (Schmitt-Grohe & Uribe, 2004, and Siu, 2004).**

The auxiliary role of optimal monetary policy

- The interdependence between fiscal and monetary policy is generated by a lack of "appropriate" fiscal instruments or lack of commitment.

- Conversely, given appropriate instruments, the government

  - Would be indifferent to the stochastic path of inflation under commitment – Correia, Nicolini & Teles (2004);

  - Would solve the time consistency problem – Alvarez, Kehoe and Neumayer (2004) show how to reach this with a combination of nominal and indexed debt.

- This auxiliary role for monetary policy stems from the fact that money is not essential – agents are forced to use it for transactions (Kocherlakota, 1998).

Optimal policy when money is essential

- **Kocherlakota (2005): A major lesson of the applied literature is that not only the inflation tax but also other tax instruments matter greatly for the conduct of policy.**

- **(He also suggests that sticky prices should be integral part of monetary models used for policy analysis).**

- **Arouba & Chugh (2006) study the canonical Ramsey problem of optimal fiscal and monetary policy in a tractable model in which money is essential:**

  - **Inflation is not a substitute instrument for a missing tax; rather, the inflation tax is exactly the right tax to use because the use of money has a rent associated with it.**

  - **Thus the Friedman Rule is typically not optimal and inflation is stabilized in the face of shocks.**

Concluding remarks

- Macroeconomists have long recognized the importance of time-inconsistency, but only recently this has been studied in truly dynamic settings.

- This paper has successfully brought this methodology to bear on the issue of dynamic monetary and fiscal policy interactions.

- New, exciting area of research in macro as shown by the number of papers already following in their footsteps.