DISCUSSION OF
“PUBLIC DEBT AS PRIVATE LIQUIDITY: OPTIMAL POLICY”
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SUMMARY

This paper

- solves for optimal fiscal policy with distortionary taxes & debt liquidity yield
- finds that the gov. trades off tax smoothing/liquidity provision/interest rate manipulation
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**Approach**

- microfoundations + reduced-form Ramsey problem
- Analytical results + phase diagrams
This paper solves for optimal fiscal policy with distortionary taxes & debt liquidity yield.

- finds that the gov. trades off tax smoothing/liquidity provision/interest rate manipulation.

**Approach**

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A very interesting and polished paper on an important question!
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**Discussion**
1. Overview
2. Comments
A SIMPLIFIED 2-PERIOD MODEL
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Environment

- **Households**
  \[
  \max_{c_1,c_2,a_1,n_1,n_2} \quad c_1 - n_1^2/2 + V(a_1) + \beta \left( c_2 - n_2^2/2 \right)
  \]
  \[
  \text{s.t.:} \quad c_1 + q_1a_1 = w_1n_1
  \]
  \[
  c_2 = w_2n_2 + a_1
  \]

- **Firms:** \( \max \{ (1 - \tau_t)An_t - w_tn_t \} \)

- **Government:** \( g = \tau_1An_1 + q_1b_1, \quad g + b_1 = \tau_2An_2 \)

- **Market clearing:** \( c_t + g = An_t, \quad b_1 = a_1 \)
A SIMPLIFIED 2-PERIOD MODEL

Environment

- Households

$$\max_{c_1, c_2, a_1, n_1, n_2} c_1 - n_1^2/2 + V(a_1) + \beta \left( c_2 - n_2^2/2 \right)$$

s.t.: \(c_1 + q_1 a_1 = w_1 n_1\)

\(c_2 = w_2 n_2 + a_1\)

- Firms: \(\max \left\{ (1 - \tau_t) A n_t - w_t n_t \right\} \)

- Government: \(g = \tau_1 A n_1 + q_1 b_1, \ g + b_1 = \tau_2 A n_2\)

- Market clearing: \(c_t + g = A n_t, \ b_1 = a_1\)

Solution

- Allocation: \(n_t = w_t = (1 - \tau_t) A, \ c_t = (1 - \tau_t) A^2 - g\)

- Prices: \(q_1 = \beta + V'(b_1)\)

- Government revenue: \(s_t = \tau_t (1 - \tau_t) A^2\) (the Laffer curve)
A SIMPLIFIED 2-PERIOD MODEL

Environment

- Households

\[
\max_{c_1,c_2,a_1,n_1,n_2} \quad \min \quad c_1 - n_1^2/2 + V(a_1) + \beta \left( c_2 - n_2^2/2 \right)
\]

s.t.: \quad c_1 + q_1a_1 = w_1n_1

\[
c_2 = w_2n_2 + a_1
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- Firms: \max \{(1 - \tau_t)A n_t - w_t n_t\}

- Government: \quad g = \tau_1 A n_1 + q_1 b_1, \quad g + b_1 = \tau_2 A n_2

- Market clearing: \quad c_t + g = A n_t, \quad b_1 = a_1

Solution

- Allocation: \quad n_t = w_t = (1 - \tau_t)A, \quad c_t = (1 - \tau_t)A^2 - g

- Prices: \quad q_1 = \beta + V'(b_1)

- Government revenue: \quad s_t = \tau_t(1 - \tau_t)A^2 \text{ (the Laffer curve)} \Rightarrow \tau_t = \tau(s_t)
**Main Result**

Policy problem

\[
U = c_1 - n_1^2 / 2 + V(a_1) + \beta \left( c_2 - n_2^2 / 2 \right) \\
= \frac{1}{2} A^2 \left[ 1 - \tau(s_1)^2 \right] + \beta \frac{1}{2} A^2 \left[ 1 - \tau(s_2)^2 \right] + V(b_1) + t.i.p. \\
= U(s_1) + \beta U(s_2) + V(b_1) + t.i.p.
\]

s.t.: \( g = s_1 + b_1 \left[ V'(b_1) + \beta \right] \), \( g + b_1 = s_2. \)
**Main Result**

Policy problem

\[
U = c_1 - n_1^2/2 + V(a_1) + \beta \left( c_2 - n_2^2/2 \right)
\]

\[
\begin{align*}
&= \frac{1}{2} A^2 \left[ 1 - \tau(s_1)^2 \right] + \beta \frac{1}{2} A^2 \left[ 1 - \tau(s_2)^2 \right] + V(b_1) + t.i.p. \\
&= U(s_1) + \beta U(s_2) + V(b_1) + t.i.p.
\end{align*}
\]

s.t.: \( g = s_1 + b_1 \left[ V'(b_1) + \beta \right], \)

\( g + b_1 = s_2. \)

The main formula

\[
V'(b_1) + [-U'(s_1)]V'(b_1) \left[ 1 + \frac{V''(b_1)b_1}{V'(b_1)} \right] + \beta \left[ U'(s_2) - U'(s_1) \right] = 0
\]
A dynamic model

Steady state

\[
V'(b^*) + [-U'(s^*)]V'(b^*) \left[ 1 + \frac{V''(b^*)b^*}{V'(b^*)} \right] = 0
\]

where \( s^* = g + (\rho - V'(b^*))b^* \).
Comment 1: where is the cherry?
Steady state optimum

\[ V'(b^*) + [-U'(s^*)] V'(b^*) \left[ 1 + \frac{V''(b^*) b^*}{V'(b^*)} \right] = 0 \]
**Comment 1: Where is the cherry?**

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\[ V'(b^*) + [-U'(s^*)]V'(b^*) \left[ 1 + \frac{V''(b^*)b^*}{V'(b^*)} \right] = 0 \]

A simple numerical exercise
**Comment 1: Where is the cherry?**

Steady state optimum

\[
V'(b^*) + \left[-U'(s^*)\right]V'(b^*) \left[1 + \frac{V''(b^*)b^*}{V'(b^*)}\right] = 0
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A simple numerical exercise

- \( \rho = 0.035, \ r \approx 0 \) (TIPS, May 27, 2022) \( \Rightarrow V'(b) = \rho - r = 0.035 \)
**COMMENT 1: WHERE IS THE CHERRY?**

Steady state optimum

\[ V'(b^*) + [-U'(s^*)]V'(b^*) \left[ 1 + \frac{V''(b^*)b^*}{V'(b^*)} \right] = 0 \]

A simple numerical exercise

- \( \rho = 0.035, \ r \approx 0 \) (TIPS, May 27, 2022) \( \Rightarrow V'(b) = \rho - r = 0.035 \)
- \( dV'(b)/d \log b = -0.017 \) (Krishnamurthy, Vissing-Jorgensen, 2012)

\[ 1 + \frac{V''(b)b}{V'(b)} = 1 + \frac{1}{V'(b)} \cdot \frac{dV'(b)}{d \log b} = 1 + \frac{1}{0.035 - 0} \cdot (-0.017) > 0 \]
**COMMENT 1: WHERE IS THE CHERRY?**

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- It seems we are not at internal optimum!
**COMMENT 1: WHERE IS THE CHERRY?**

Steady state optimum

\[ V'(b^*) + \left[ -U'(s^*) \right] V'(b^*) \left[ 1 + \frac{V''(b^*) b^*}{V'(b^*)} \right] = 0 \]

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- It seems we are not at internal optimum!

Numerical value of optimal debt?
COMMENT 2: OPEN ECONOMY

Current paper considers a closed economy.

Foreign demand for safe assets
- Domestic safe assets are purchased by foreigners
- The benefits of liquidity creation may not all be felt at home

Foreign supply of safe assets
- Safe interest rate may be determined by the world supply of safe assets
- Domestic debt issuance may have a limited effect on liquidity yield

Over/under supply of safe assets in the world?
COMMENT 3: SOURCE OF $V(b)$ MATTERS

$$r(b) = \rho - V'(b)$$

Microfoundation in the paper
- precautionary saving (Bewley, Aiyagari)
- debt as collateral (Woodford, 1990; Holmström and Tirole, 1998)

Other sources
- Adverse selection + info-insensitive debt (Dang, Gorton, Holmstrom, 2020)
- Disasters (Kocherlakota, 2021; Mian, Straub, Sufi, 2022)
Comment 3b: Disasters + Default

Mehrotra, Sergeyev (2021)

- An increase in the probability of disasters \( p \uparrow \)
- A (potential) decline in the safe interest rate \( r_t \downarrow \)
- A decline in the level of maximum sustainable debt \( \bar{b} \downarrow \)

It is possible that the optimal response here is to reduce government debt
CONCLUSION

- A very interesting, polished, and relevant paper!

- Comments:
  - a simple calibration
  - open economy
  - the source of low $r$ matters + lower rates may imply lower debt