

Discussion of “A p Theory of Government Debt and Taxes”

Narayana Kocherlakota

University of Rochester and NBER

July 2022

## Motivation: Great Questions

- The opening paragraph is a fantastic example of how to write an introduction.
- It poses several outstanding important questions about US fiscal policy.
  - What is the maximal sustainable debt/GDP ratio for the US?
  - How long will it take for the US to get there?

## Focus on Trade-offs

- Starting point: There is an intertemporal government budget constraint (IGBC).
- This means that the government has to repay current debt with future tax collections.
  - Limit 1 to debt: Taxes are distorting and so repayments impose social costs (Barro, 1979).
  - Limit 2 to debt: The government has a costly (off-equilibrium) option to not repay.

## Recommended Reading!

- I found this paper VERY stimulating.
- Big plus (among many others): It takes (aggregate) risk seriously.
  - Not common in 2000s macro.
- BUT ...

## **My Discussion**

1. Needed: A Model of the US
2. IGBC with Aggregate Risk
3. Wrap-Up

**NEEDED: A MODEL OF THE US**

## Some Key Elements of the Model

- Asset prices are exogenous.
- All debt is real.
- Impatient government.
- Default results in:
  - loss of GDP
  - elimination of all access to asset markets.

## Sounds Like Argentina ...

- These strike me like reasonable elements for a model of debt sustainability for a country like Argentina.
  - small economy
  - borrows in currency that it can't print
  - “irresponsible” governments
- In this sense: the paper is an extension of recent vital literature on sovereign default in **emerging market economies**.
  - Arellano (2008), etc.
- Main difference: default is off-equilibrium in Jiang, et al.



## **But It Doesn't Sound Like the US ....**

- US debt policy affects the riskfree rate and (probably) risk-neutral pricing.
- The US borrows in dollars that it can always print.
- The “impatient government” assumption seems, at best, strained in the US context.
  - Note: domestic investors own over 2/3 of US debt.

## Toward a US Model of Debt Sustainability?

- To address the questions about the US posed by the authors, it seems like we need a completely different model.
- Natural starting point is the enormous change in the debt-real yield schedule faced by the US in the past three decades or so.
  - this schedule seems to have shifted to the right - by a lot!  
Why?
  - Should we expect that growth in demand to slow over, say, the remainder of the century? By how much?

- I'm skeptical of the relevance of Argentina-like defaults for advanced economies like the US (or Japan) that are borrowing in a currency that they print.
- If it does get close to its debt capacity, the US will likely ease its burden in ways other than default (strictly defined).
  - periodic bursts of surprise inflation?
  - periodic bursts of financial repression (Reinhart and Sbrancia (2015))?
- How would these kinds of (on-equilibrium!) actions affect the subsequent growth path for demand for US government debt?
- Critical: need to explicitly model the substitutability of other assets for US government liabilities in the financial system.

## **THE IGBC WITH AGGREGATE RISK**

## IGBC

- The paper treats the IGBC as an obvious technical assumption (equation (28)).
- But it won't be satisfied in a riskless world if  $r^f = 1\%$  and  $g = 3\%$ .
- The assumption in the paper is that there's enough *aggregate risk* to fix this problem.
- But is that true?

## A Simple Model of Risk

- Suppose, as in the paper, output growth is:

$$g_{t+1} = \alpha_0 + \beta(r_{t+1}^{mkt} - r_f) + z_{t+1}.$$

where:

$(g_{t+1}, r_{t+1}^{mkt}, z_{t+1})$  are i.i.d. over time

$$E_t z_{t+1} = E_t r_{t+1}^{mkt} z_{t+1} = 0.$$

$$E_t g_{t+1} = \mu_y$$

## Sustainable Debt

- Suppose the government issues one-period **risky** bonds with risky payoff  $(1 + g_{t+1})$ .

- The price of the bond is:

$$p^{bond} = \frac{(1 + \mu_y)}{(1 + r_f + r_{py})},$$

where  $r_{py}$  is the risk premium on the one-period risky bond.

- What I'll show: if  $p^{bond} \geq 1$ , the IGBC (28) isn't satisfied.

- In period  $(t + 1)$ , the government owes:

$$b^*Y_t(1 + g_{t+1})/p^{bond}$$

on its (risky) one-period debt.

- It raises:

$$b^*Y_{t+1} = b^*Y_t(1 + g_{t+1})$$

by issuing new debt.

- If  $p^{bond} \geq 1$ , the IGBC (28) isn't satisfied.

– Any  $b^*$  - no matter how large - is sustainable **without any taxation.**

- Punchline: To satisfy (28) in paper,  $rpy$  must be large enough so that  $\mu_y < rpy + r_f$ .



## How Big is the Risk Premium?

- In this CAPM world, the answer is:

$$\begin{aligned} rpy &= \beta r p_{mkt} \\ &= \rho_{ym} \frac{\sigma_y}{\sigma_{mkt}} r p_{mkt} \\ &\leq \frac{\sigma_y}{\sigma_{mkt}} r p_{mkt}. \end{aligned}$$

- What numbers to plug in?
  - $\mu_y = 0.03$ ;  $r_f = 0.01$  (from paper and data).
  - $\sigma_y = 0.025$  (from post-WW2 US data).
  - $\sigma_{mkt} = 0.21$  (Nagel-Xu (2022))
  - $r p_{mkt} = 0.08$  (Nagel-Xu (2022))

## Too Little Aggregate Risk ...

- $\mu_y = 0.03$
- $r_f = 0.01 \rightarrow \mu_y - r_f = 0.02.$
- $r_{py} \leq \frac{0.025}{0.21}(0.08) \approx 0.01.$
- The risk premium is too small.
  - Note: upper bound is pretty loose ( $\rho_{ym} < 1$ ).

## Paper's Approach

- Paper assumes  $rpy = 0.04$  - this is FOUR times larger than the above upper bound.
- One what basis do they do this? By assuming output  $\beta = 2/3$  (reference to Shiller (1994)?).
- But such a large  $\beta$  requires:

$$\sigma_y \geq \beta \sigma_{mkt} = (2/3)(0.21)$$

(about six times larger than what's in the data).

– I can't see how to justify this.

## Fixes

- **Idea 1:** A different (more modern) model of risk pricing?
  - My conjecture: what's needed is a model that generates a lot more volatility in the price(-dividend) ratio for a long-run claim to output.
  - Note: with such a model, the constancy of the debt/output ratio would no longer be valid.
- **Idea 2:** A different model of debt limits without the IGBC?
  - for example, Hellwig and Lorenzoni (2009).

## Wrap-Up

- The paper asks appropriately big questions about US fiscal policy.
- But these questions about the US can't be answered compellingly by extending the existing models, as they were really designed for emerging markets like Argentina.
- I expect that in an appropriately US-oriented model:

**Debt sustainability will be centered on considerations other than the trade-offs embedded in the IGBC.**