Discussion of

J. Bejarano's F. Hamann's and D. Rodríiguez's "Monetary Policy Implications for an Oil-Exporting Economy of Lower Long-Run International Oil Prices"

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• Goal: Understand the effect of permanent oil shocks in an oil exporting economy.

• **Approach:** Study a series of increasingly rich SOE models:
(1) A one-good model
(2) A tradable-nontradable model
(3) A tradable-nontradable model with oil production
(4) Previous model plus nominal frictions, labor, intermediate inputs, and inflation targeting.
(5) Previous model plus financial frictions.

• **Noteworthy:** While most papers take oil production as an exogenous variable, this paper presents an explicit model of optimal oil extraction.

Main Results

A permanent fall in the price of oil causes:

- A significant reduction in oil extraction.
- An increase in external debt in the short and long run.
- An initial current-account deterioration.
- A significant depreciation of the real exchange rate.
- An increase in the country risk premium.
- A tightening of monetary policy.
- Financial frictions not essential for aggregate adjustment.

- The dynamics of **external debt** play an important role in the adjustment process, both in the short run and in the long run. I will focus much of my discussion on this issue.

How should one measure the response of a model economy to a permanent fall in the price of oil?

This question is nontrivial when the model features:

- Precautionary savings.
- incomplete asset markets.
- impatient consumers.

The One-Good Economy

$$v(d, y) = \max_{d', c} \left\{ \frac{c^{1-\sigma}}{1-\sigma} + \beta E[v(d', y')] \right\}$$

subject to

$$c + d = y + \frac{d'}{1+r}$$

$$d' \leq \phi$$

Assume that y is exogenous and stochastic and impose

$$\beta(1+r) < 1,$$

where β, r, σ, and ϕ are constant parameters.

A Permanent Fall in Output

Suppose in period 0 the mean of output falls from 1 to 0.975. All other moments remain unchanged.

How the Model Response Is Compute in the Paper

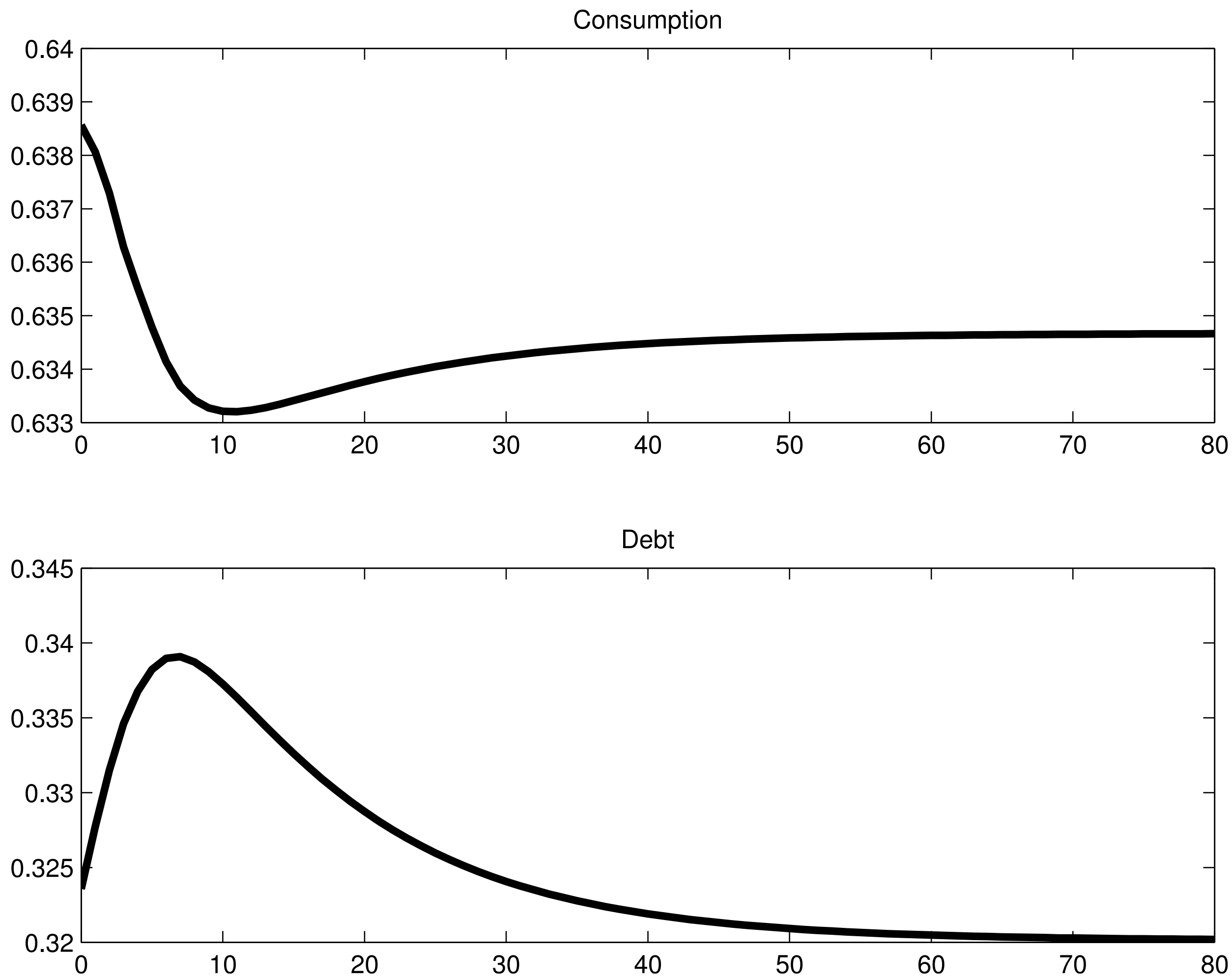
Trace the expected adjustment of the economy assuming that the initial state is

$$y_0 = 0.975$$

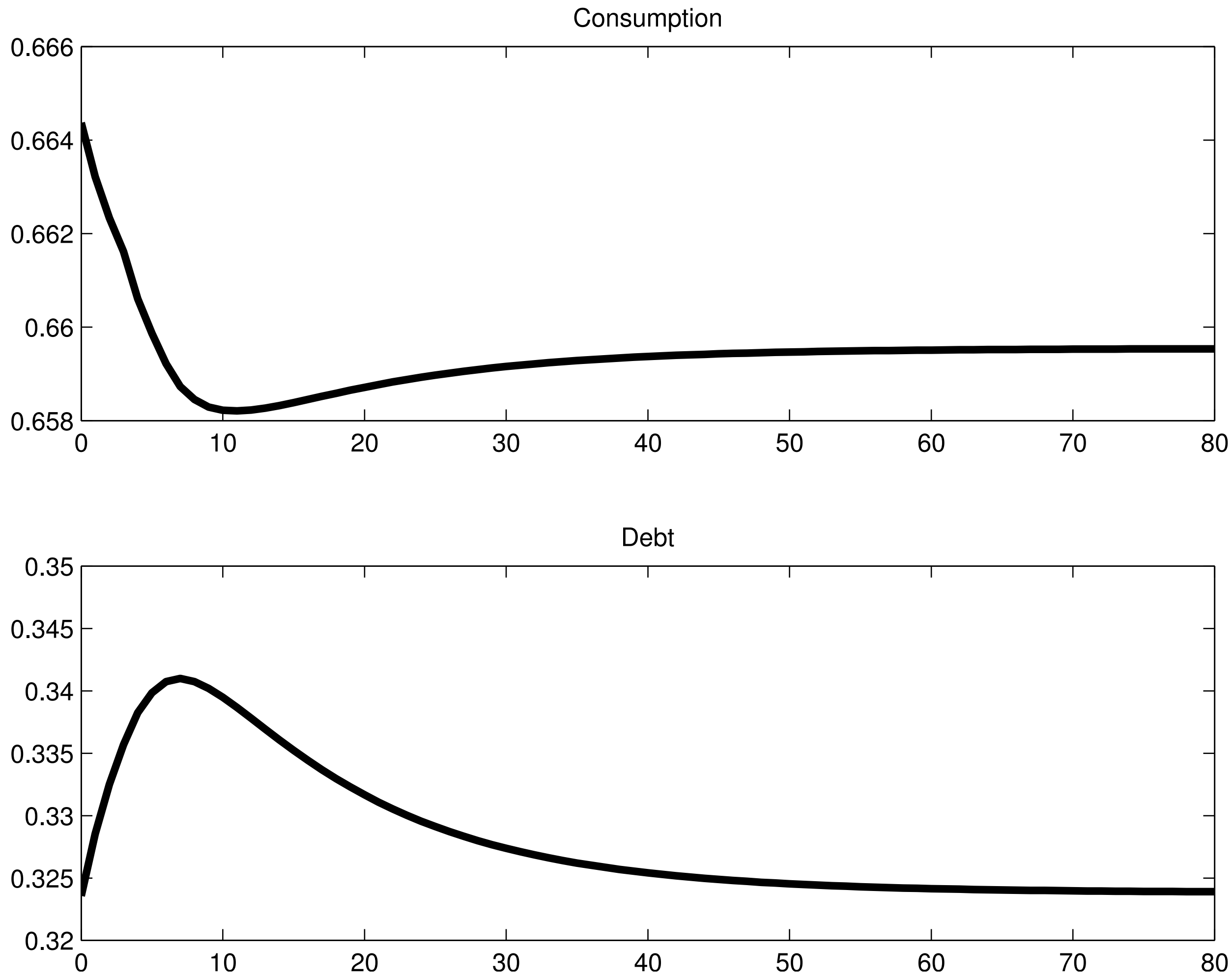
$$d_0 = E(d)$$

where $E(d)$ denotes the unconditional mean of debt pre-shock.

Response of the Economy to a Permanent Fall in Output From y to $y - 0.025$



Response of the Economy to NO Permanent Fall in Output



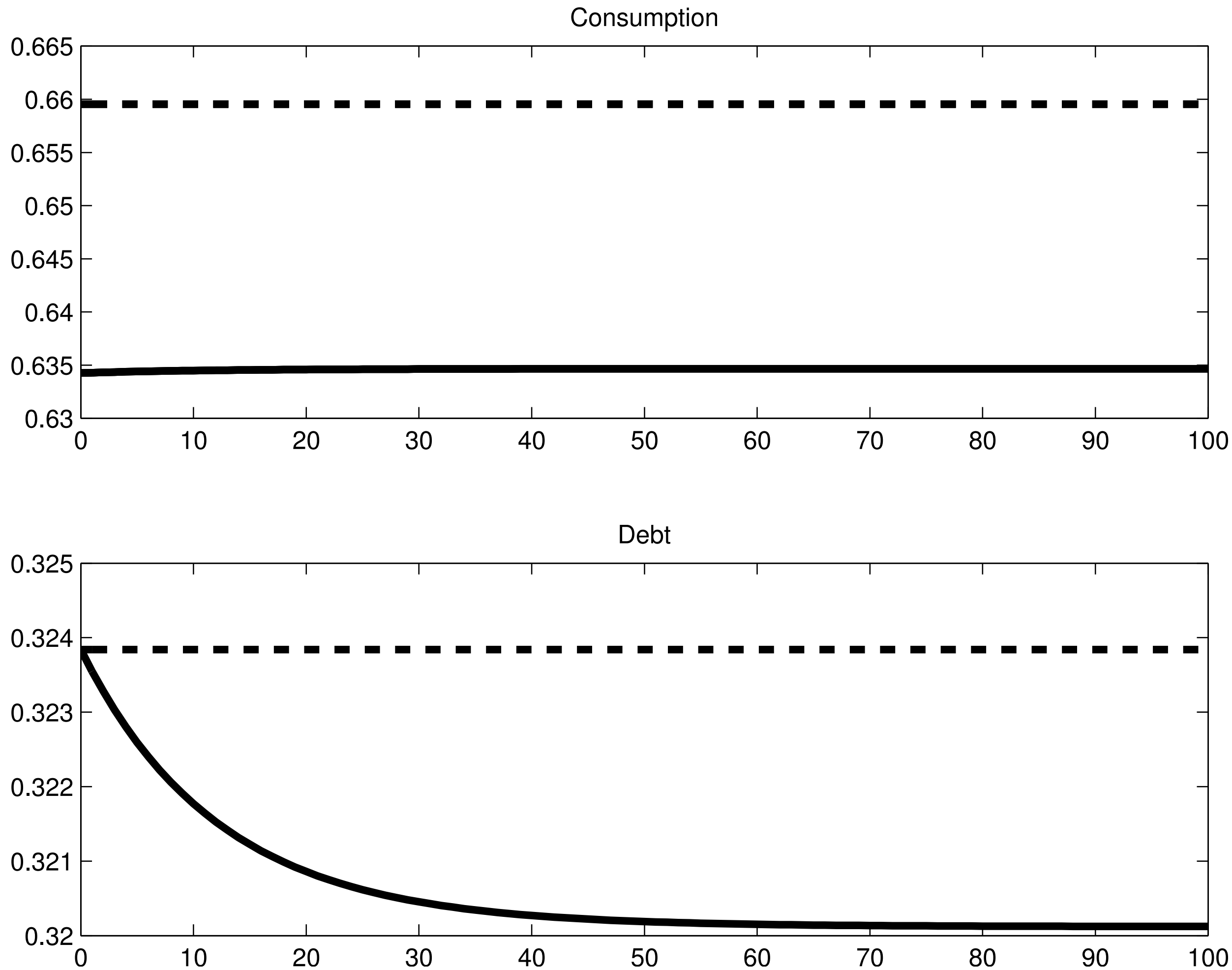
A More Informative Way To Measure the Economy's Response to a Permanent Output Shock

Suppose that the only piece of information is the distribution of the endowment.

In particular, no information is available about the state $\{y, d\}$.

What is the expected path of the economy for $t = 0, 1, 2, \ldots$?

Response of the Economy to a Permanent Fall in Output from y to $y - 0.025$



Result

When appropriately measured, the effect of a permanent fall in output is:

- A permanent fall in consumption.

- A *monotonic* improvement in the country's net foreign asset position. In particular, there is no initial deterioration in the net asset position.

Proportional Versus Additive Fall in Output

Let y be a stochastic process with mean 1 and standard deviation σ.

Consider the following two alternative processes:

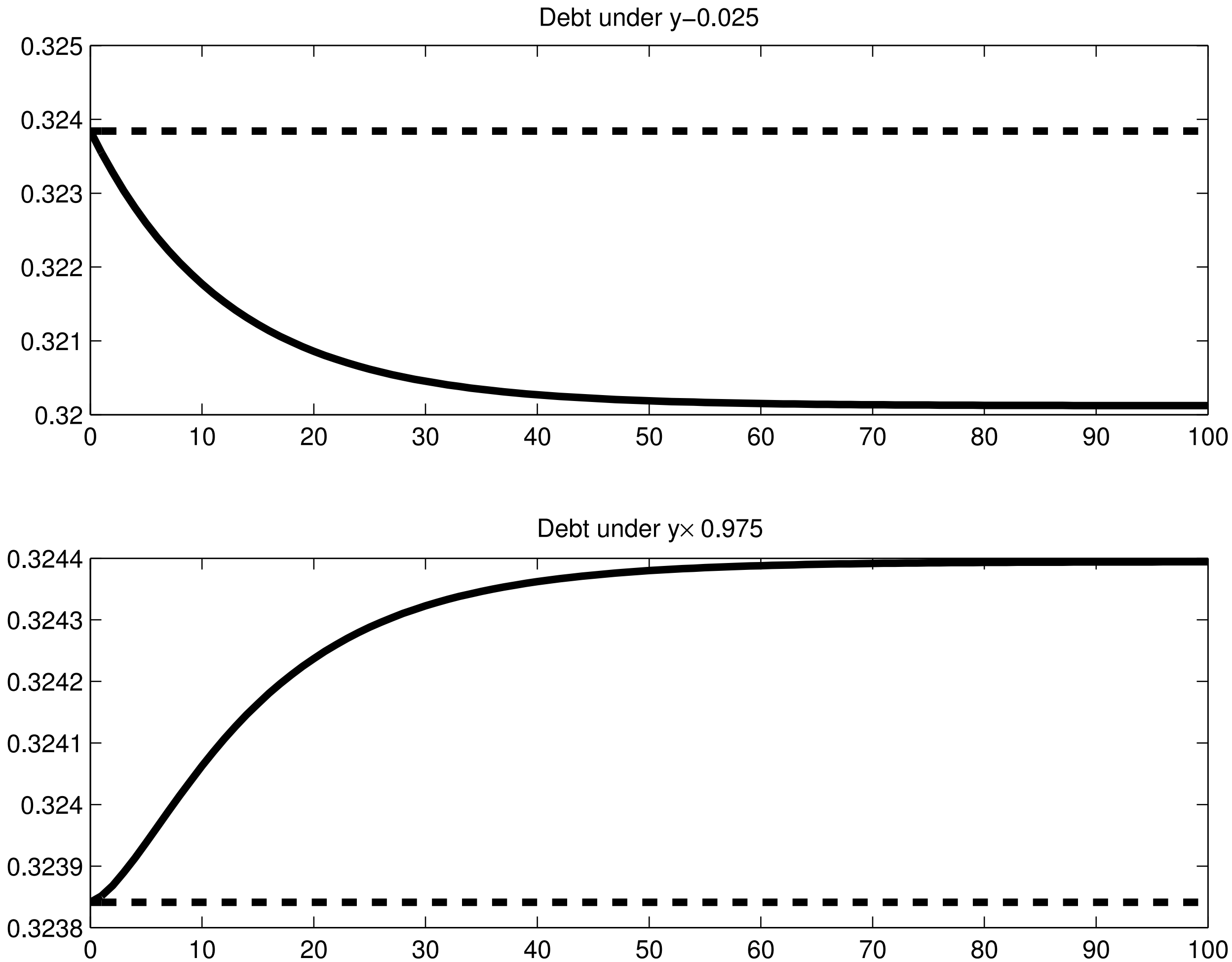
$$y - 0.025 \qquad \text{and} \qquad y \times (1 - 0.025)$$

Both have mean 0.975, but the first one has a standard deviation of σ and the second a standard deviation of 0.975σ.

How does this affect the long-run behavior of debt? We already saw that in the first case the long-run level of debt is lower (households are more sensitive to risk as they become poorer).

Under the second process, the fall in mean is accompanied by a fall in uncertainty. So it is not clear how the will behave...

Response of the Economy to a Permanent Fall in Output



Conclusion

- This is an excellent paper.

- The topic is relevant and timely.

- The series of models shed much needed light on the macroeconomics of permanent oil-price changes.

- This is the first attempt I know at explicitly incorporating the oil-extraction decision into a medium-scale business-cycle model.

- **Calibration:** $\beta = 0.96$, $\sigma = 4$, $r = 0.035$, $A = 0.3295$, $\phi = 0.4$.

- **Output Process:** Discrete Markov process with mean 1 and standard deviation 0.026, and serial correlation 0.75 (9 nodes).

- **Solution method:** value function iteration using 500 points equally spaced for d in the interval $[0, \phi]$.