Discussion of

J. Bejarano’s F. Hamann’s and D. Rodríguez’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 \( \beta, r, \sigma, \) and \( \phi \) 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

Consumption

Debt
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 $\sigma$.

Consider the following two alternative processes:

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

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

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

Debt under $y-0.025$

Debt under $y \times 0.975$
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 $[0, \phi]$. 