# The Fiscal Multiplier Morass: A Bayesian Perspective
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*Comments by*

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# The Fiscal Multiplier Morass: A Bayesian Perspective

- **Objective**: Paper studies how model assumptions may constrain empirical inferences. Focus on fiscal multipliers.
  - Main model: New-Keynesian open economy with rule-of-thumb agents.
  - Four more restrictive alternatives: No openness, no rule-of-thumb, no nominal rigidities, no real frictions => Basic RBC.
  - Computational exercise: Start with Bayesian priors on the parameters. Translate them into priors about fiscal multipliers. No data.
- **Main findings**: Multipliers smallest in basic RBC – greatest in New-Keynesian closed economy. (Documented in Tables 3 and 7.)
- Quibble: Draft received last week – different topic than advertised.

# Where is the Morass?

- Paper focuses on models: Different models – different multipliers.
- Greater sources of confusion:

1. Fiscal policy has many degrees of freedom – too many policy options:

   Types of spending, forms of taxation, ways in which current policy may influence expectations about future policy.

   => Many multipliers conditional on any given model.

   => Difficult to understand what policy experiment is at issue.

   - Assumptions here: Experiment = Shock to G. Bayesian priors over fiscal rules that specify how fiscal shocks propagate.

2. What is the choice problem? Shocks are exogenous—no choice.
   - Unclear how multipliers relate to optimal policy choices.

## If "Fiscal Multiplier" is the answer:

# What is the question?

1. Naïve perspective: Policy makers are asking about multipliers to determine the impact of discretionary fiscal policy "interventions." *Caution: Lucas Critique!*
2. Cynical citizen's view: Politics = series of random shocks. Fiscal multipliers are about resulting effects (harmful fluctuations?)
3. Sympathetic view: Policy makers ask about multipliers because they seek advice how to react to *non-policy* disturbances (e.g. a financial crisis).

=> Question is how to find optimal policy responses to real shocks.

- Conjecture: if fiscal policy is formalized in terms of reaction functions, fiscal multipliers *may* help to determine the optimal response coefficients to shocks.

# Simple Example

- Model of the economy: $Y_t = \beta \cdot G_t + \varepsilon_t^Y$. Exogenous $\varepsilon_t^Y$, $\sigma_Y^2 = \text{var}(\varepsilon_t^Y)$.
- Policy reaction function: $G_t = -\gamma \cdot \varepsilon_t^Y + \varepsilon_t^G$ Choice of response $\gamma$.

Shock $\varepsilon_t^G$ = discretionary policy; determines $\sigma_G^2 = \text{var}(\varepsilon_t^G)$.

Note that $\beta = \frac{dY_t}{d\varepsilon_t^G} = \frac{\Delta Y_t}{\Delta G_t}\Big|_{\Delta \varepsilon_t^G}$ is the government spending multiplier.

1. Suppose fluctuations in Y are undesirable: $U \approx -E[Y_t^2] = \sigma_Y^2(1-\beta\gamma)^2 + \sigma_G^2\beta^2$

   => Optimal policy is $\gamma^* = \frac{1}{\beta}$, and $\sigma_G^* = 0$, so $\varepsilon_G^* \equiv 0$.

   - Fiscal multiplier provides intuition: If $\beta >> 0$, small $\gamma$ suffices to stabilize Y.

2. Suppose agents also care about stable G: $U \approx -E[Y_t^2 + \alpha G_t^2]$.

   Then $\gamma^* = \frac{\beta}{\beta^2 + \alpha}$ (Inverse-U shaped with maximum at $\beta = \sqrt{\alpha}$); and $\sigma_G^* = 0$.

   - Intuition: $\beta > 0$ justifies $\gamma > 0$ even if G is destabilized. But link is not simple!

- Robust conclusion: Policy shocks are undesirable.

So multiplier effects of policy shocks are an odd way to think about policy.

# Propagation of Shocks & Choice of Policies

- Paper considers dynamic fiscal policy rules.

  Bayesian priors over policy a major departure from the literature

  => Coefficients in policy rules are random variables.

- Raises questions, e.g.: How permanent is the fiscal shock? How accommodating is monetary policy?

  => Fiscal multipliers here are in effect "mixing" the effects of many different "policy experiments".

  - Matters for impact effects via expectations. Matters for present value multipliers.
  - Obscures role of monetary accommodation. (E.g.: Is Prob(Taylor principle)<1?)

- Economic interpretation is unclear:
  - Are policy makers themselves uncertain about future fiscal/monetary policy?
  - Constructive suggestion: Do Bayesian analysis for economic parameters conditional on deterministic parameters for policy.

# Why exactly do we care about present value multipliers?

## A Simple Dynamic Example

- Model of the economy: $Y_t = \beta_0 G_t - \beta_1 G_{t-1} + \varepsilon_t^Y$, Given $\beta_0, \beta_1 > 0$.
- Policy reaction function: $G_t = -\sum_{i\geq 0} \gamma_i \varepsilon_{t-i}^Y + \varepsilon_t^G$. Choices $\{\gamma_i\}_{i\geq 0}$.
  - Impact multiplier: $\left.\frac{\Delta Y_t}{\Delta G_t}\right|_{\Delta \varepsilon_t^G} = \beta_0$
  - PV-multiplier for 2 periods: $\left.\frac{\Delta Y_t + R^{-1}\Delta Y_{t+1}}{\Delta G_t + R^{-1}\Delta G_{t+1}}\right|_{\Delta \varepsilon_t^G} = \beta_0 - R^{-1}\beta_1$. Same for all k≥2.
- Optimal policy to stabilize Y is $\gamma_0^* = \frac{1}{\beta_0}$, $\gamma_i^* = \frac{\beta_1}{\beta_0}\gamma_{i-1}^*$.
  - Optimal instantaneous response again related to the impact multiplier ($\gamma_0^* = \frac{1}{\beta_0}$)
  - Negative lagged effect means output would fall if stimulus is withdrawn quickly.
- No clear role for the present value multiplier
  - Bounded policy responses, if $\beta_1 < \beta_0 \Leftrightarrow$ Positive PV multiplier with R=1.
  - May argue that (PV of "cost" of stimulus) ~ 1/(multiplier); but so what?

# Analogy to Monetary Policy

- Standard economic approach to monetary policy:
  - Focus on coefficients in policy rules (e.g., in Taylor rule).
  - Tradeoffs are about fluctuations (variances, given agreement on level).
  - Monetary policy shocks are undesirable (merely create noise).
  - Prefer systematic, rule-bound policy over discretion.
- Same principles applied to fiscal policy suggests:

  *Search for optimal responses to non-policy shocks is more promising than worrying about multiplier effects of discretionary interventions.*

# Bayesian Perspective: Priors over what?

- Paper allows priors over just about all variables: Why not over models?
  - For example: Discrete prior distribution $p(A_j)$ over $A_j$
  - Restricted models would have positive probability of being "correct".

- Scope for sensitivity analysis: How much confidence in a restricted model is needed to be confident about its implications?
  - Example (from Table 3):

    $P(\Delta Y/\Delta G>1|\text{Basic RBC}) = 0.0$; $P(\Delta Y/\Delta G>1|\text{NK non-saver}) = 88\%$

    If $P(\text{Basic RBC}) = P(\text{NK non-saver}) = 50\%$ $\Rightarrow P(\Delta Y/\Delta G>1) = 44\%$

- Note: Priors over policies also seem to matter:

  $P(\Delta Y/\Delta G>1|\text{"PMAF"}) = 100\%$

# Bayesian Priors and Nested Models

- General model #5: New Keynesian open economy.
  - Model #4: restricts import and export parameters = 0
  - Model #3: restricts share of non-savers = 0
  - Model #2: restricts price and wage stickiness parameters = 0
  - Model #1: restricts parameters for real frictions = 0

- Note: Restricted models = General model with "strong" priors.

  => All comparative results must due to different priors.

  - Given Model-5 priors, Models 1-4 are false with probability ONE.
  - In Table 3, most of the 90% intervals for priors over parameter *exclude* the values imposed by Models 1-4.
  - In what sense are the restrictive model *nested alternatives*?

    The priors appear to be mutually exclusive with Prob=1.

# Final Comments

- Is there an agenda?

  Page 14: The preceding RBC models were unable to produce … long run positive values, implying a New Keynesian-style model is necessary to produce long run multipliers that encourage discretionary expansionary policy. (Similar quotes elsewhere; my underlining)

- How informative are the data?
  - Sufficient to overturn strong priors over models?
  - Open question here: inferences without data.

- Overall: Bayesian priors are an interesting way to characterize relevant properties of economic models.