Discussion of " A Monetary Policy Asset Pricing Model "

by Caballero and Simsek

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Roadmap

- I really enjoyed reading and re-deriving the results in this paper!
- Elegant and simple model → tons of implications
- Part of an exciting agenda at the intersection of AP and ME
- My plan
  - 10K foot view: how does monetary policy work?
  - Summarize the key main model in the paper: fully sticky prices, lag and inertia in consumption responses
    - Partially sticky prices (standard NKPC) doesn't change results much
    - Disagreement between market and Fed is interesting, setup similar to the author's other paper on that topic specifically
  - Derive some additional (testable) implications
  - Leave as questions what I didn't/couldn't derive

How does monetary policy work?

- With nominal frictions, economic output deviates from its optimal path after supply or demand shocks hit
- Goal: close the output gap by stimulating/dampening demand
  - Consumption = MPC * HH Wealth
  - For the next 10 minutes let's pretend no I, G, NX
- To stimulate consumption, policy must either
  - Substitution Effect: Raise MPC
  - Income effect: Raise HH Wealth
- (Gross simplification of the) authors' agenda: stress the income effect channel
  - Shut down MPC channel by using log preferences

Textbook Two-Period Model

- $\max_{c_1,c_2,a} \frac{c_1^{1-\gamma}-1}{1-\gamma} + \frac{c_2^{1-\gamma}-1}{1-\gamma}$
- $c_1 + a = E; c_2 = Ra$

Consumption Policy:

- $c_1 = \frac{E}{1+R^{\frac{1}{\gamma}-1}}$
- Wealth: E
- MPC: $\frac{1}{1+R^{\frac{1}{\gamma}-1}} = \frac{1}{2}$ for all R

  with log preferences ($\gamma = 1$)

How does MP affect HH Wealth?

- Essentially an asset pricing question b/c wealth = price = NPV of all future consumption
  - Cash flow news: MP affects future output
  - Discount rate news:
    - Risk-free rate news: MP affects future path of real rates
    - Risk premium news: MP affects prices of risk
- Goal of changing the nominal rate isn't just to affect the real (risk-free rate) but to affect HH wealth by changing all asset prices
- This paper: what kind of price/dividend ratios and risk premia arise when the Fed effectively sets asset prices to close output gaps?

Depends on how successful the Fed is at closing output gaps

- "Capitalists'" optimal consumption policy with log preferences:

$$\alpha Y_t = C_t^H = (1-\beta)\Upsilon_t$$

- (Hand-to-mouth worker) labor constant under flexible prices so potential output moves only due to permanent supply shocks:

$$y_t^* = y_{t-1}^* + z_t$$

Depends on how successful the Fed is at closing output gaps

- "Capitalists'" optimal consumption policy with log preferences:

$$\alpha Y_t = C_t^H = (1-\beta)(\alpha Y_t + P_t)$$

- Split wealth into dividends αY_t and ex-dividend price P_t

- (Hand-to-mouth worker) labor constant under flexible prices so potential output moves only due to permanent supply shocks:

$$y_t^* = y_{t-1}^* + z_t$$

Depends on how successful the Fed is at closing output gaps

- "Capitalists'" optimal consumption policy with log preferences:

$$\alpha Y_t = C_t^H = (1-\beta)(\alpha Y_t + P_t e^{\delta_t})$$

- Split wealth into dividends αY_t and ex-dividend price P_t
- Demand shocks δ_t : shocks to the MPC out of the ex-dividend price
- Implies price-output ratio:

$$(py)_t - \overline{(py)} = \delta_t$$

- (Hand-to-mouth worker) labor constant under flexible prices so potential output moves only due to permanent supply shocks:

$$y_t^* = y_{t-1}^* + z_t$$

- Fed can choose asset price to close the output gap instantly:

$$y_t = y_t^*$$

- Fed's job: plug in desired y_t^* to get desired p_t^*
- solve for return, compute (constant) risk premium, subtract from E[R] → policy rate

Depends on how successful the Fed is at closing output gaps: Lags

- "Capitalists'" ~~optimal~~ consumption policy with log preferences:

$$\alpha Y_t = (1-\beta)(\alpha Y_t + P_{t-1}e^{\delta_t})$$

- Lags: Consumption driven by previous period's prices instead
  - "Main St is slower than Wall St"
  - No MPC out of one-period capital gains
  - **No contemporaneous effect of supply shocks regardless of policy!**
- Forward-looking price-output ratio is now a result of Fed policy:

$$(py)_t^* - \overline{(py)} = -E_t[\delta_{t+1} - z_{t+1}]$$

- (Hand-to-mouth worker) labor constant under flexible prices so potential output moves only due to permanent supply shocks:

$$y_t^* = y_{t-1}^* + z_t$$

- Fed can only close output gaps in expectation:

$$E_t[y_{t+1}] = E_t[y_{t+1}^*]$$

- Must anticipate next period's shocks when "setting" prices
  - Can forecast $E_t[\delta_{t+1}] = \gamma s_t, \gamma \in (0,1)$
- Precise forecasts (high γ) improve macro stabilization but make asset prices more volatile!

Depends on how successful the Fed is at closing output gaps: Lags & Inertia

- "Capitalists'" ~~optimal~~ consumption policy with log preferences:

$$\alpha Y_t = (1-\beta)(\alpha Y_t + [\eta\beta\alpha Y_{t-1} + (1-\eta)P_{t-1}]e^{\delta_t})$$

- Inertia: Consumption out of ex-dividend wealth anchored by past consumption
  - Dampened MPC
  - Direct examples: external habit, bounded rationality
  - Analogy: capital adjustment costs
- Future shocks matter more for price-output ratio, present output gap **lowers** valuations:

$$(py)_t^* - \overline{(py)} = -\frac{1}{1-\eta}E_t[\delta_{t+1} - z_{t+1}] - \frac{\eta}{1-\eta}(y_t - y_t^*)$$

- (Hand-to-mouth worker) labor constant under flexible prices so potential output moves only due to permanent supply shocks:

$$y_t^* = y_{t-1}^* + z_t$$

- Fed can only close output gaps in expectation:

$$E_t[y_{t+1}] = E_t[y_{t+1}^*]$$

- Still succeeds but must overshoot in terms of asset prices
  - E.g. negative demand shock today → lower consumption tomorrow: effectively a bigger demand shock, which requires a bigger increase in price/output ratio

Other Asset Pricing Implications: Predictability

- High price-~~dividend~~ output ratios predict
  - High output growth:
    $$\mathrm{Cov}_0[(py)_t, \Delta y_{t+1}] = \frac{\eta}{1-\eta}\left(\sigma_z^2 + \sigma_{\bar{\delta}}^2\right) > 0$$
    - No cash flow predictability absent inertia
  - Low returns:
    $\mathrm{Cov}_0[(py)_t, r_{t+1}] < 0$ always (expression a bit ugly)
    - Gets stronger in inertia η
    - It's all risk-free rate predictability b/c risk premia are constant in the model

$$r_{t+1} = \alpha_r + \kappa_r dp_t + \tau_{t+1}^r,$$
$$\Delta d_{t+1} = \alpha_d + \kappa_d dp_t + \tau_{t+1}^d,$$

Panel A: Return Predictability

	Div. Reinv. at R^f			Div. Reinv. at R^m		
	κ_r	$t-stat$	R^2	κ_r	$t-stat$	R^2
1926-2009	0.077	1.31	2.90	0.104	2.08	4.82
1945-2009	0.130	2.56	10.84	0.126	2.58	10.02

Panel B: Dividend Growth Predictability

	Div. Reinv. at R^f			Div. Reinv. at R^m		
	κ_d	$t-stat$	R^2	κ_d	$t-stat$	R^2
1926-2009	-0.078	-1.48	7.64	0.008	0.20	0.05
1945-2009	0.017	0.68	1.13	0.044	1.10	2.03

Source: Koijen and Van Nieuwerburgh (2011), Table 1

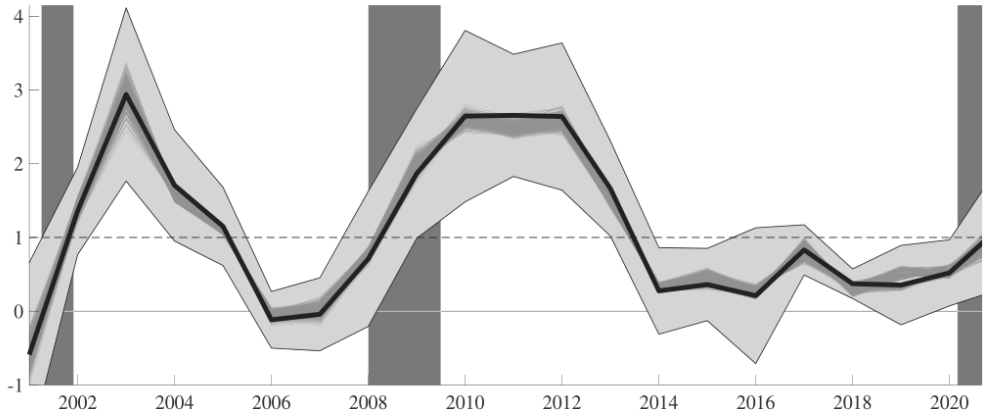
Other Asset Pricing Implications: Macro News

- Data: Stocks go up on good macro news but only when the output gap is negative
- Return surprise:

$$\left((1-\beta)-\beta\frac{\eta}{1-\eta}\right)(\delta_{t+1}-\gamma s_t)+\frac{\beta}{1-\eta}(z_{t+1}-\gamma s_{t+1})$$

- What are macro news if shock realizations are not directly observable?
  - News about the state of the economy today $y_{t+1}-E_t[y_{t+1}]=\delta_{t+1}-\gamma s_t$
    - In this model, can only happen due to demand shocks
    - Good demand news can either raise or lower prices depending on inertia and Fed's response to it
  - News about the state of the economy in the future $E_{t+1}[y_{t+2}]-E_t[y_{t+2}]=z_{t+1}$ (supply shock)
    - Raise asset prices in anticipation of growth
  - Signals about future demand γs_{t+1}
    - Lower asset prices because the Fed anticipates boom
- If the Fed believes that the precision of their signal about future demand is higher in good times, they will be more aggressive in lowering prices
  - Dampens the net effect of good macro news

Figure 2: Time variation in stock return sensitivity to macroeconomic news



Notes: The benchmark MNAs are the change in nonfarm payrolls (CNP), initial jobless claims (IJC), ISM manufacturing (ISM), and the consumer confidence index (CCI). We set $\Delta = 30$ min. We impose the following restriction: that β^τ (solid-black line) in (1) averages one. We provide ±2-standard-error bands (light-shaded area) around β^τ. The shape is robust to all possible combinations (solid light-gray lines) of the next eight influential MNAs. NBER recession bars are overlain on the graph. The individual estimates and standard errors (in parentheses) for γ are as follows:

CNP	IJC	ISM	CCI
0.087	-0.021	0.070	0.051
(0.011)	(0.003)	(0.011)	(0.008)

The sample period is from January 1999 through December 2020.

Source: Elenev, Law, Song, Yaron (2023)

Extensions (at the expense of tractability)

- Bring back the substitution effect: more powerful MP → less need to move asset prices so much
- Persistent shocks vs. persistence through inertia
- Inertia in monetary policy: is the Fed really this good at closing output gaps? Are they willing to create so much stock market volatility?
  - Equilibrium under alternative policies also useful as a pedagogical device to isolate effect of optimal MP on asset prices
- Time-varying risk premia: authors have a good framework for this in a prior paper (changes in relative wealth of a more risk-tolerant agent)
- Cheap Lucas critique: Is η policy-invariant?
- All of these extensions "matter." Hard to say how much without trying. Room in the literature for a quantitative paper to assess this.