Discussion of "Investment Hangover and the Great Recession" Rognlie, Schleifer, and Simsek

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What this paper is about

- Residential overbuilding led to excess housing capital by 2007
- Once housing bubble burst, residential investment fell
- Reallocation to consumption and non-residential investment should have occurred
- However, reallocation was undermined by the zero lower bound

First Best Benchmark

$$V\left(h_t, k_t\right) = \max u\left(c_t\right) + \beta V\left(h_{t+1}, k_{t+1}\right)$$

s.t.

$$\begin{aligned} c_t + i_t^k + i_t^h &= \max_{\ell} F\left(k_t, \ell_t\right) - v\left(\ell_t\right) \\ i_t^k &= k_{t+1} - \left(1 - \delta^k\right) k_t \\ i_t^h &= h^* - \left(1 - \delta^h\right) h_t \end{aligned}$$

- Standard RBC with GHH preferences, except for $h_{t+1} = h^*$
  - housing investment i_t^h must hit target level h^*
  - hard-wired into preferences

$$u\left(c\right) + u^h \mathbb{I}\left(h_t \geq h^*\right)$$

Households

$$\max \sum \beta^t u\left(c_t\right)$$

s.t.

$$\begin{aligned} c_t + a_{t+1} + i_t^h &= \left\{ \max_{\ell} w_t \ell_t - v\left(\ell_t\right) \right\} + a_t\left(1 + r_t\right) + \pi_t \\ i_t^h &= h^* - \left(1 - \delta^h\right) h_t \end{aligned}$$

Capital Market and the Zero Lower Bound

- Capital Market Clearing

$$\begin{aligned} a_t &= k_t \\ r_{t+1} &= R_{t+1} - \delta^k \end{aligned}$$

- Zero lower bound

$$r_{t+1} \geq 0$$

Production

$$\max F\left(k_t, \ell_t\right) - w_t \ell_t - R_t k_t$$

$$\text{s.t.} \quad F\left(k_t, \ell_t\right) \leq \hat{c}_t + i_t^k + i_t^h$$

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- optimality conditions:

$$\begin{aligned} \left(1 - \tau_t\right) F_{k,t} &= R_t \\ \left(1 - \tau_t\right) F_{\ell,t} &= w_t \end{aligned}$$

The Mechanism

Residential Overbuilding

- Suppose housing happens to be higher than target

$$h_t > h^*$$

- Then clearly housing investment must fall

$$i_t^h = h^* - \left(1 - \delta^h\right) h_t < h^* - \left(1 - \delta^h\right) h^*$$

- This affects aggregate demand

$$c_t + i_t^k + \underbrace{i_t^h}_{\downarrow}$$

GE with Flexible Real Interest Rate

- Suppose that r_{t+1} were fully flexible

$$c_t + i_t^k + i_t^h = y_t = \max_{\ell} F(k_t, \ell_t) - v(\ell_t)$$

- If i^h falls, then clearly $c + i^k$ must rise

GE with Flexible Real Interest Rate

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$$c_t + i_t^k + i_t^h = y_t = \max_{\ell} F(k_t, \ell_t) - v(\ell_t)$$

- If i^h falls, then clearly $c + i^k$ must rise
- c, i^k increase as long as the real interest rate falls

$$\begin{aligned} r_{t+1} &= F_k(k_{t+1}, \ell_{t+1}) - \delta_k \\ u'(c_t) &= \beta(1 + r_{t+1}) u'(c_{t+1}) \end{aligned}$$

- Therefore, aggregate output is unaffected

$$\underbrace{c_t + i_t^k}_{\uparrow} + \underbrace{i_t^h}_{\downarrow} = \underbrace{y_t}_{\text{constant}} = \max_{\ell} F(k_t, \ell_t) - v(\ell_t)$$

GE with Constrained Real Interest Rate

- Now suppose that r_{t+1} is bounded at zero
- As i^h falls, c and i^k increase as long as the real interest rate falls

GE with Constrained Real Interest Rate

- Now suppose that r_{t+1} is bounded at zero
- As i^h falls, c and i^k increase as long as the real interest rate falls
- However at ZLB, these cannot increase anymore

$$\begin{aligned} k_{t+1} &= \bar{k}_{t+1} \quad \text{where} \quad F_k\left(\bar{k}_{t+1}, \ell\right) - \delta^k = 0 \\ c_t &= \bar{c}_t \quad \text{where} \quad u'\left(c_t\right) = \beta u'\left(c_{t+1}\left(\bar{k}_{t+1}\right)\right) \end{aligned}$$

- After this point, (demand-determined) output must fall

$$\underbrace{c + i_t^k}_{\text{constant}} + \underbrace{i_t^h}_{\downarrow} = \underbrace{y_t}_{\downarrow} < \max_{\ell} F\left(k_t, \ell_t\right) - v\left(\ell_t\right)$$

Main Take Aways

- Reallocation of resources can only occur if the interest rate adjusts
- ZLB hinders this reallocation
- Output and Employment fall: "Investment Hangover"

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- Reallocation of resources can only occur if the interest rate adjusts
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- Output and Employment fall: "Investment Hangover"
- Can also generate an initial fall in investment if liquidity trap occurs later in the future
  - intuition: liquidity trap $\longrightarrow$ tax on return to capital

$$(1 - \tau_{t+s}) F_{k,t+s} = R_{t+s}$$

Comments

Some Modelling Quibbles

- Lower bound on the real rate–where does it come from?
  - Nominal rigidities and cash in the background
  - Monetary Policy tools unclear
- Housing

$$u(c) + u^h \mathbb{I}(h_t \geq h^*)$$

  - Should we take this as a serious model of housing?
  - How does the housing boom arise in the first place?

Mechanism similar to NK, discount rate shock

- Consider standard New Keynesian model with a discount rate shock
- Household becomes more patient:

  would like to consume less today and more tomorrow

- If r_{t+1} fully flexible $\longrightarrow$ no change in y_t, ℓ_t, c_t
- If r_{t+1} is stuck $\longrightarrow$ y_t, ℓ_t, c_t today fall

Predictions about Wedges

- Investment Wedge and Labor Wedge move in tandem

$$\begin{aligned} (1-\tau_t)\, F_{k,t} &= R_t \\ (1-\tau_t)\, F_{\ell,t} &= w_t \end{aligned}$$

- Not true post 2008: labor wedge moved, not the investment wedge

Policy

$$h_t > h^* \text{ thus } i_t^h = h^* - \left(1 - \delta^h\right) h_t \implies \text{investment hangover}$$

- Monetary Policy constrained, Fiscal Policy ruled out

  no consumption and labor taxes (Correia, Farhi, Nicolini, Teles)

- Tool: inducing more or less housing investment

Policy

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Result: constrained planner would choose $i > h^* - \left(1 - \delta^h\right) h_t$

- Should support the housing market
- Marg. cost of housing investment the same, but planner sees greater marg. benefit due to aggregate demand externality
- But, it's unclear why marginal cost should be the same for both household and planner

Investment Hangovers and Real Hangovers

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"The best way to prevent a hangover..

is to keep on drinking"