

WHY ARE REAL INTEREST RATES SO LOW?

DISCUSSION

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SUMMARY

Five Trends:

1. Decline in real interest rates
2. Decline in investment share
3. Rising house prices
4. Rising household debt levels
5. Falling relative price of investment goods

Explanation:

- ▶ Argue that 5 explains 1-4
- ▶ Offers a stylized model capturing trends qualitatively

KEY MECHANISMS

Three key elements:

- ▶ Capital-labor complementarity $\sigma < 1$
- ▶ Overlapping generations structure
- ▶ Fixed housing stock

Fall in relative price of investment goods:

- ▶ Capital-labor complementarity delivers fall in investment share
- ▶ OLG delivers fall in real interest rate
- ▶ Fixed housing stock delivers rise in house prices

CAPITAL-LABOR COMPLEMENTARITY

Firm optimality condition:

$$MPK = p(r + \delta)$$

$$MPK = \alpha \left(\frac{Y}{K} \right)^{\frac{1}{\sigma}}$$

Ratio of nominal investment to GDP:

$$\frac{pI}{Y} = \frac{\delta pK}{Y}$$

$$\frac{pI}{Y} = \delta p^{1-\sigma} \left(\frac{\alpha}{r + \delta} \right)^{\sigma}$$

CAPITAL-LABOR COMPLEMENTARITY

Nominal investment to GDP:

$$\frac{pI}{Y} = \delta p^{1-\sigma} \left(\frac{\alpha}{r + \delta} \right)^\sigma$$

Fact 1: Decline in nominal investment share

- ▶ Fall in p reduces pI/Y if $\sigma < 1$
- ▶ Necessary and sufficient to deliver decline in nominal investment share
- ▶ Capital to output ratio K/Y still rises

HOW REALISTIC IS $\sigma < 1$?

Recent literature emphasizes $\sigma > 1$ and fall in p :

- ▶ Decline in the labor share
 - ▶ Reduction in p raises labor share in Greg's paper
 - ▶ Labor share declining globally (Karabarbounis and Neiman (2014))
- ▶ Labor market polarization
 - ▶ Expanding skill premium and increasing labor income inequality
 - ▶ Autor and Dorn (2013), Autor, Levy and Murnane (2003)

Criticism of capital-labor substitutability:

- ▶ Disaggregated estimates of σ (Oberfield and Raval (2014))
- ▶ Mismeasurement of capital share (Rognlie (2015))

OVERLAPPING GENERATIONS

Representative agent benchmark:

$$r = \frac{1}{\beta}$$

- ▶ Saving falls to fully offset decline in investment demand

Fact 2: Decline in real interest rates

- ▶ Savings curve may be upward sloping (or vertical)
- ▶ Decline in p reduces r moving along saving curve
- ▶ Decline in r could be generated by other forces

OVERLAPPING GENERATIONS

Household budget constraints:

$$\begin{aligned}\eta W &= c_1 + s_1 + p_h h \\ (1 - \eta) W &= c_2 + s_2 - (1 + r) s_1 \\ pK &= s_1 + s_2\end{aligned}$$

Fact 3: Rising household debt

- ▶ Three-generations needed for $s_1 < 0$
- ▶ Only two-generations, then $s = pK > 0$
- ▶ Sufficiently small η and sufficiently high value of housing needed

FIXED HOUSING STOCK

Housing price determination:

$$p_h \approx \frac{r_h}{r}$$

- ▶ Housing does not depreciate (land)

Fact 4: Rising house prices

- ▶ Lower real rates raise value of housing
- ▶ Housing value also rising due to capital deepening

ALTERNATIVES TO FIXED HOUSING STOCK

Constant marginal cost of producing housing:

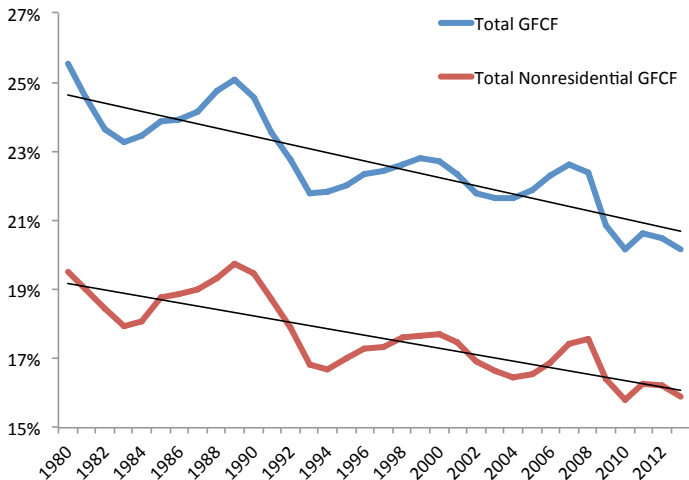
- ▶ In Greg's model, $h = \bar{H}$ and p_h varies freely
- ▶ With constant marginal cost, p_h fixed and h varies freely
- ▶ Some intermediate case is most realistic

Consequences for measurement?

- ▶ Housing is a component of fixed investment
- ▶ Fall in p should reallocate some investment from nonresidential to residential investment
- ▶ Will nominal investment I/Y still fall?

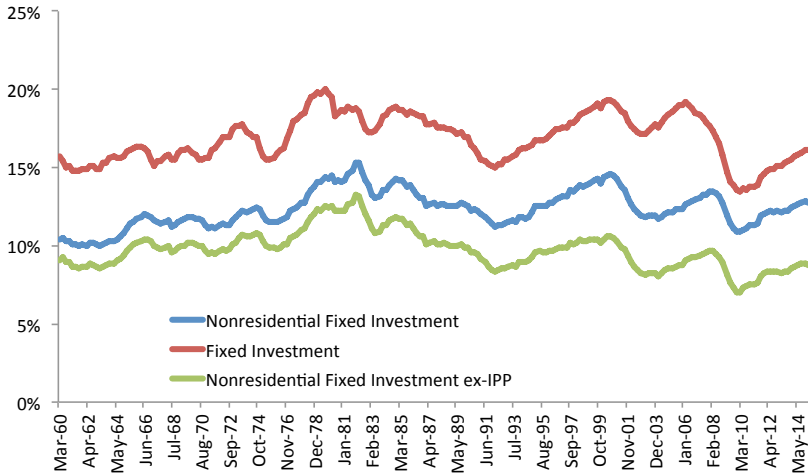
AVERAGE INVESTMENT TO GDP

TOTAL AND NONRESIDENTIAL INVESTMENT



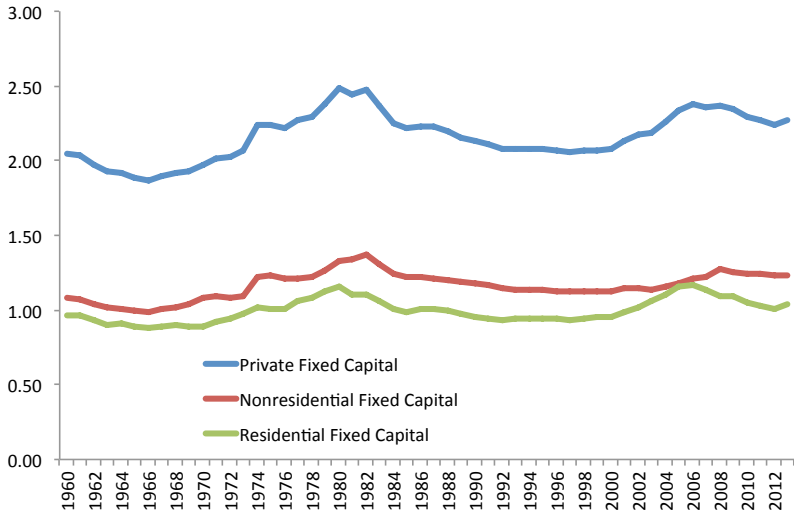
INVESTMENT TO GDP IN THE US

TOTAL AND NONRESIDENTIAL INVESTMENT



CAPITAL TO GDP RATIO IN THE US

TOTAL PRIVATE AND NONRESIDENTIAL PRIVATE INVESTMENT



ALTERNATIVE EXPLANATIONS

1. Slowdown in population growth

- ▶ Countries with largest fall in pI/Y also experiencing slower population growth
- ▶ Reduces investment demand, lowers real rates, and raises land prices
- ▶ Perhaps harder to explain fall in pI/Y

2. Safe asset shortage

- ▶ Increasing wedge between return on risky assets and safe assets
- ▶ Low real interest rates and sluggish investment