The Secular Stagnation of Investment?

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Investment and Operating Profits

- Net investment rate

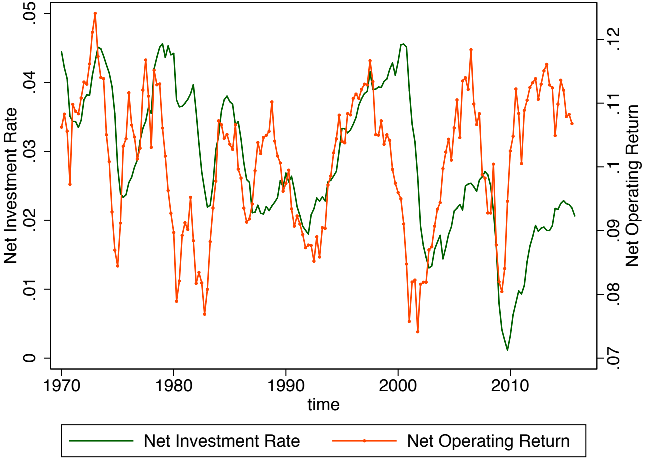
$$x_t \equiv \frac{I_t}{K_t} - \delta_t = \frac{K_{t+1} - K_t}{K_t}$$

- Net operating return

$$\frac{P_t Y_t - \delta_t P_t^k K_t - W_t N_t - T_t^y}{P_t^k K_t}$$

Fact 1: Business is Profitable but does not Invest

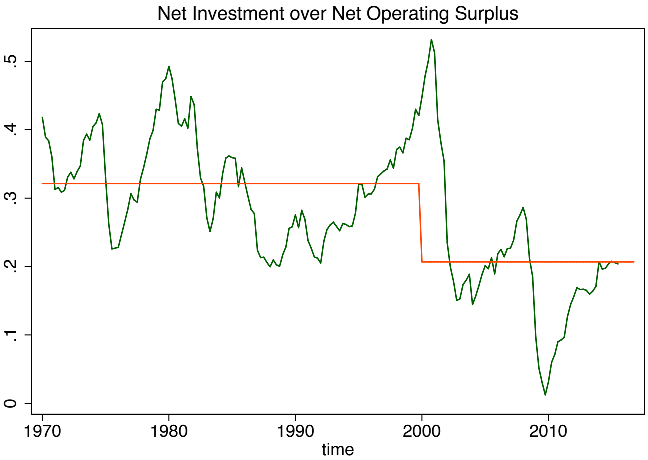
Figure: x_t and operating return



Notes: Annual data for Non financial Business sector (Corporate and Non corporate).

Fact 1: Business is Profitable but does not Invest

Figure: x_t / Operating Surplus



Notes: Annual data for Non financial Business sector (Corporate and Non corporate).

Q-Theory

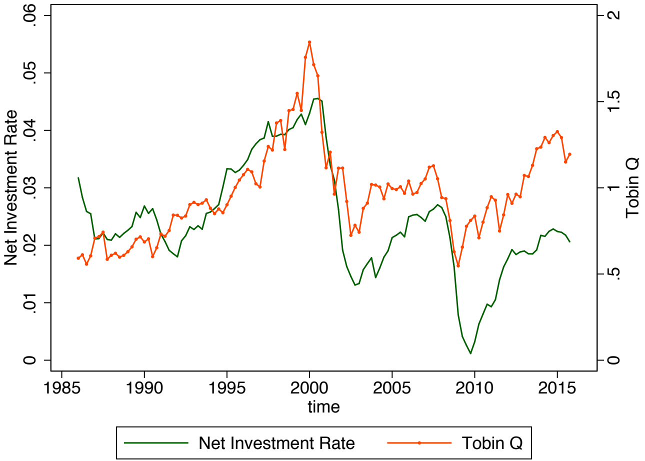
- FOC

$$x_t = \frac{1}{\gamma}(Q_t - 1)$$

- Tobin's Q

$$Q_t \equiv \frac{\mathbb{E}_t[\Lambda_{t+1} V_{t+1}]}{P_t^k K_{t+1}}$$

Fact 2: I/K is low while Q is High



Note: Annual data. Q for Non Financial Corporate sector from Financial Accounts.

Theory

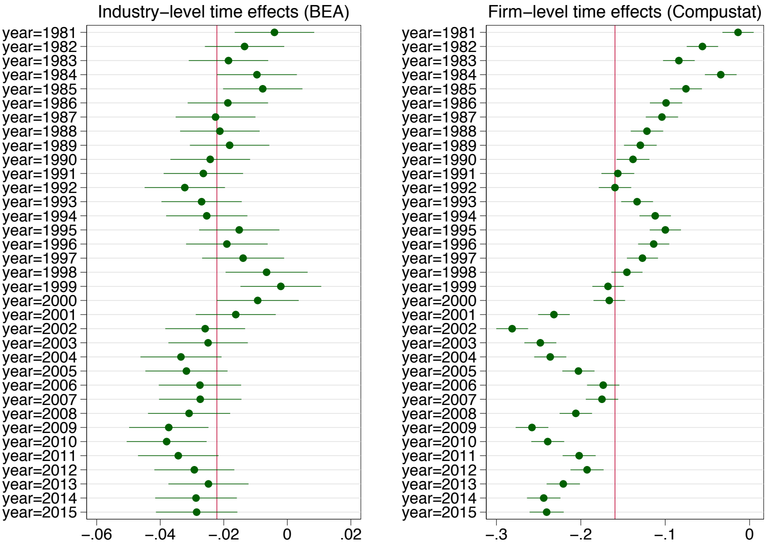
- Theories that predict low I/K *because* they predict low Q
  - E.g.: spreads & risk premia, low expected growth, savings glut, regulatory uncertainty...
  - Solve the wrong puzzle: Q is high, but I/K is low.

- Theories that predict a *gap* between Q and I/K
  - gap between average Q and marginal Q
  - gap between Q and manager's objective function

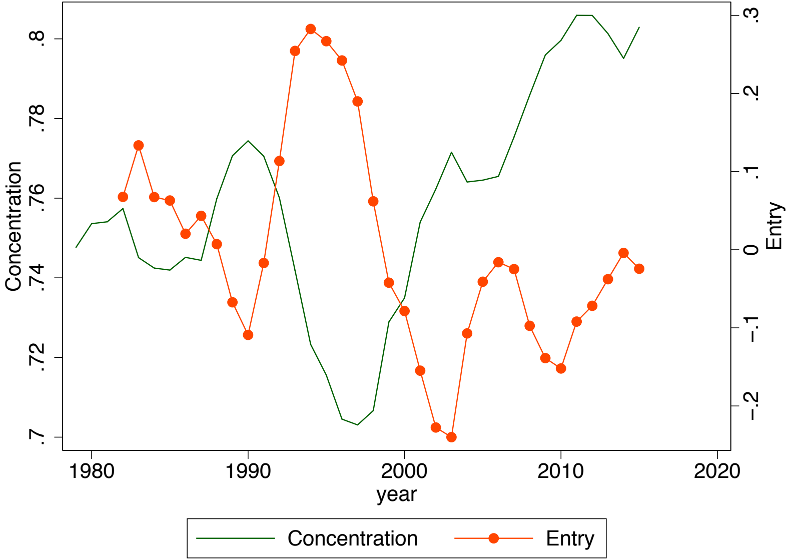
Gutiérrez & Philippon (2016)

- Use industry and firm level data
- Investment gap *NOT* explained by credit constraints, safety premium, intangibles, globalization, regulation,...
- Only two robust explanatory variables
  - lack of competition
  - governance
- **Fact 3: Concentration Explains Gap in Micro Data**

Fact 4: Gap Starts in 2000



Concentration & Entry



Model: Households

- Preferences

$$\mathbb{E}_0 \left[\sum_{t=0}^{\infty} \beta^t \left(\frac{C_t^{1-\gamma}}{1-\gamma} - \frac{N_t^{1+\varphi}}{1+\varphi} \right) \right],$$

- Wages setting à la Calvo
- Kernel

$$\mathbb{E}_t \left[\Lambda_{t+1} \frac{P_t}{P_{t+1}} \tilde{R}_{t+1} \right] = 1$$

Model: Capital Producers

- Firm Value

$$V_t = \sum_{j=0}^{\infty} \Lambda_{t,t+j} Div_{t+j}$$

- Accumulation

$$K_{t+1} = (1 - \delta_t) K_t + I_t$$

- Payments

$$Div_t = R_{k,t} K_t - P_{k,t} I_t - \frac{\varphi_k}{2} P_{k,t} K_t \left(\frac{I_t}{K_t} - \delta_t \right)^2 .$$

Model: Final Producers

- Objective

$$\min {}^{W}\!/_{P} N + R_k K$$
$$s.t.$$
$$Y = AK^{\alpha} N^{1-\alpha}$$

- Price setting à la Calvo, desired markup

$$\mu_t = \frac{\varepsilon_t}{\varepsilon_t - 1}$$

- Market Value of Producers

$$V_t^{\varepsilon} = P_t Y_t (1 - \mathtt{MC}_t) - \Phi_t + \mathbb{E}_t \left[\Lambda_{t+1} V_{t+1}^{\varepsilon} \right]$$

Micro Calibration

- Firm i in industry j

$$C_{j,t} = \left(\int_0^j C_{i,j,t}^{\frac{\varepsilon_{j,t}-1}{\varepsilon_{j,t}}} di \right)^{\frac{\varepsilon_{j,t}}{\varepsilon_{j,t}-1}}$$

$$C_t = \left(\int_0^1 C_{j,t}^{\frac{\varepsilon-1}{\varepsilon}} dj \right)^{\frac{\varepsilon}{\varepsilon-1}}$$

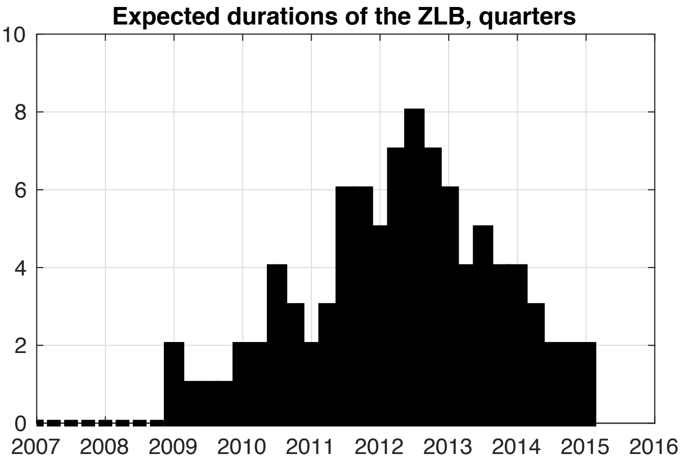
- Desired markup: $\frac{P_{j,t}}{P_t} = \mu_{j,t}\mathtt{MC}_t$ where $\mu_{j,t} = \frac{\varepsilon_{j,t}}{\varepsilon_{j,t}-1}$
- Capital demand

$$\log K_{j,t} = A_t - \varepsilon \log \mu_{j,t}$$

- Estimate in panel of industries

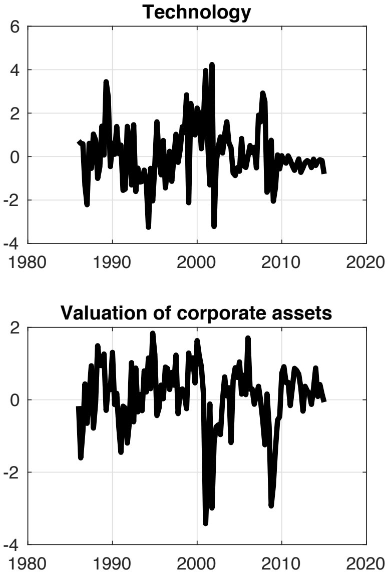
$$\log \bar{\mu}_t = \log \frac{\varepsilon_t}{\varepsilon_t - 1} \approx 1.3\bar{\chi}_t$$

ZLB



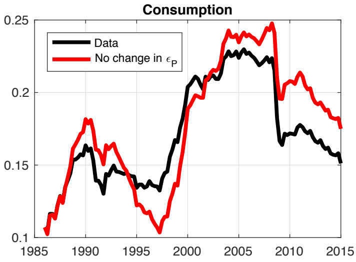
Expected durations of the ZLB, quarters
10
8
6
4
2
0
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016

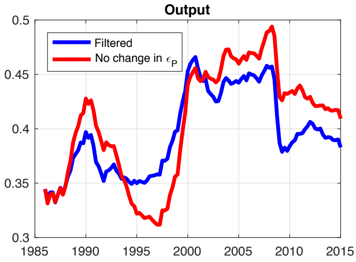
Shocks

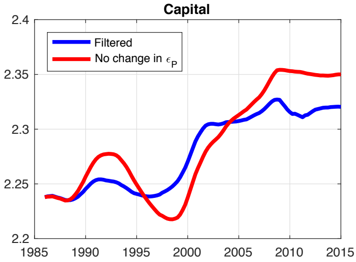


Technology
6
4
2
0
-2
-4
1980
1990
2000
2010
2020
Preference
5
0
-5
-10
1980
1990
2000
2010
2020
Valuation of corporate assets
2
0
-2
-4
1980
1990
2000
2010
2020
Steady-state markup
1.4
1.35
1.3
1.25
1.2
1.15
1970
1980
1990
2000
2010
2020

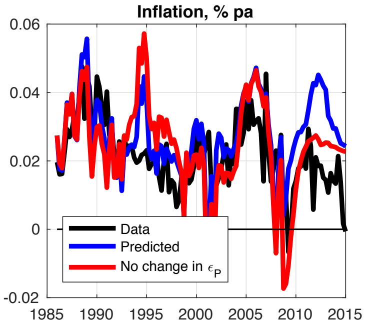
Counter-Factual







Counter-Factual



EXTRA: Shocks

- TFP

$$a_t = \rho_a a_{t-1} + \varepsilon_{a,t}$$

- Discount rate shock to the pricing kernel

$$\lambda_{t+1} = \log\beta - \gamma(c_{t+1} - c_t) + \zeta_t^d$$
$$\zeta_t^d = \rho_d \zeta_{t-1}^d + \varepsilon_t^d$$

- Risk premium on corporate assets

$$q_t^k = \mathbb{E}_t\left[\lambda_{t+1} + \log\left(r_{t+1}^k + q_{t+1} + 1 - \delta + \frac{1}{2\gamma}q_{t+1}^2\right)\right] + \zeta_t^q$$

- Time-varying elasticity of substitution between goods

$$\varepsilon_t = \varepsilon_{t-1} + \varepsilon_t^{\varepsilon}$$