Title

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A very big question

Broad consensus on secular stagnation.

The literature has agreed that there are two main factors driving this:

- decreasing labor force participation
- decreasing TFP growth

A smaller, but still big question

Why has TFP slowed down?

Two possible mechanisms

- a permanent, or very persistent exogenous shock to TFP
- an endogenous mechanism

$\rightarrow$ What we do in a nutshell: test for the endogenous mechanism (main analysis will be a SVAR)

Related literatures

- One strand of literature: Exogenous TFP and news shocks
  - Beaudry & Portier (2006)
  - Barsky & Sims (2011)

  Our contribution: allow in this setting the existence of an endogenous mechanism that affects future TFP

  Barsky & Sims quote

- Another strand of literature: Endogenous TFP with R&D investment as the key variable
  - Comin & Gertler (2006)
  - Moran & Queralto (2017)

  Our contribution: provide what we think is a more convincing test for the endogenous mechanism

Why more convincing?

Because the endogenous TFP literature faces a big problem: The endogenous mechanism is rationalized entirely using R&D investment.

1. But R&D in the data is almost acyclical.... $\rightarrow$ hard to rationalize as a driver of business cycle fluctuations Graph of acyclical R&D
2. Timing issue: the TFP slowdown begins around 2006, i.e. *before* the Great Recession and thus *before* the marked drop in R&D Graph of timing

$\Rightarrow$ Following the suggestion of Fernald, Hall, Stock & Watson (2009), we propose to use investment in information technology (IT) Graph of IT investment

Empirical analysis

We run a SVAR using aggregate, quarterly US data. The data vector is:

$$\mathbf{X_t} = \begin{bmatrix} TFP_t \\ SP_t \\ IT_t \\ GDP_t \\ C_t \\ RP_t \end{bmatrix} \tag{1}$$

- $RP = \pi^{IT} / \pi^{CPI}$.
- All variables are in log levels except for RP, which is in growth rates.
- The dataset ranges from 1989:q1 - 2017:q1.

From reduced form to structural form

$$(\mathbf{AD})^{-1}\mathbf{X_t} = \mathbf{C(L)X_{t-1}} + \mathbf{S_t} \tag{2}$$

Identification strategy

$$TFP_t = \underbrace{\varepsilon_t}_{\text{surprise tech shock}} + \underbrace{V_{t-k}}_{\text{news shock}} + \underbrace{IT_{t-k}}_{\text{IT shock}} \tag{3}$$

1. The news shock V_{t-k} maximizes the FEV of future TFP subject to the restriction that it has no effect on the relative price RP in the long run;
2. The IT shock maximizes the remaining FEV of future TFP;
3. The tech shock ε_t is considered as a residual shock and is left unrestricted.

Barsky & Sims say:

"*A more general objection to our empirical approach would be that a number of structural shocks, which are not really "news" in the sense defined by the literature, might affect a measure of TFP in the future without impacting it immediately. Among these shocks might be research and development shocks, investment specific shocks, and reallocative shocks. Our identification (and any other existing VAR identifications) would obviously confound any true news shock with these shocks.*"

Barsky & Sims (2011), p. 278.

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Growth rate of RD vs growth rate of TFP

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Timing: RD drop vs TFP drop

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IT investment: a break at the right time

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