Financial Markets and Unemployment

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The question, the model, the answers

"Study the importance of financial markets for unemployment fluctuations"

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H-P filtered standard deviations relative to output		
1977:1-2005:4	U.S. data	Standard labor search
V	8.82	3.78
θ	15.41	4.61
U	6.82	1.46
$\sigma(y)$	1.59	1.05

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Some proposed solutions:

1 - Wage rigidity: Shimer (2005), Hall (2005), Gertler and Trigari (2007)

2 - Small labor suplus: Hagerdorn and Manovskii (2008)

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This paper: Standard Pissarides model augmented with financial friction

- Financial constraint: borrowing limited by equity value of the firm as collateral
- Wage determination: excess borrowing motive to drive down wages

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Interaction of both financial and labor frictions:

- Credit shock: firms cut hiring as borrowing (hence ability to drive down wage) is limited
- **Large and endogenously persistent response to financial shocks**
- **"Quantitative confidence" from estimation and VAR**

Understanding the Mechanism: basic framework

Labor market fluctuations driven by market tightness $\theta = \frac{v}{u}$

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θ determined by a firm entry condition:

$$\frac{\kappa}{q(\theta_t)} = Q_t$$

- Q_t: value of a vacancy filled with a worker
- $\kappa > 0$: cost of a vacancy per unit of time
- $q(\theta_t)$: probability of filling vacancy in a unit of time

Key: what drives Q_t over the business cycle?

$$\text{Since } \frac{\partial q(\theta)}{\theta} < 0 \Rightarrow \frac{\partial \theta}{\partial Q_t} > 0$$

What drives Q_t over the business cycle? $\frac{\partial \theta}{\partial Q_t} > 0$

In general Q_t is the value of profit flows from employing labor over the lifetime of the job:

$$\begin{aligned} Q_t &= \mathbb{E}_t \left[z_{t+1} - w(z_{t+1}) + (1-\lambda)\beta Q_{t+1} \right] \\ &= \mathbb{E}_t \sum_{i=0}^{\infty} (1-\lambda)^i \beta^i \left[z_{t+1+i} - w(z_{t+1+i}) \right] \end{aligned}$$

- z_t : labor productivity; persistent process
- $w(z_t)$: wage rate

Solutions to increases elasticity to productivity shocks, $\frac{\partial Q_t}{\partial \epsilon_t^z}$:

1 - Wage rigidity

2 - Small labor suplus: small gap between z and w

What drives Q_t over the business cycle? $\frac{\partial \theta}{\partial Q_t} > 0$

With financial frictions Q_t in MQT 2011, the value now depends on debt b:

$$Q_t = \mathbb{E}_t \left[z_{t+1} - w(z_{t+1}, b_{t+1}) + (1 - \lambda)\beta Q_{t+1} \right]$$

- By increasing debt, firm can lower the wage negotiated with workers

Why?

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Consequence:

- without restriction on borrowing, firms can push workers down to their reservation wage - a constant value a
- a relaxation of borrowing limits increases Q_t and hence hiring

Understanding the Mechanism: Summarizing

$$\frac{\kappa}{q(\theta_t)} = \mathbb{E}_t Q(z_{t+1}, b_{t+1})$$

- Original credit market channel:

  $\rightarrow$ shocks to credit market affect future profit margin on labor

  $\rightarrow$ distinct from a credit channel that would impact cost of hiring

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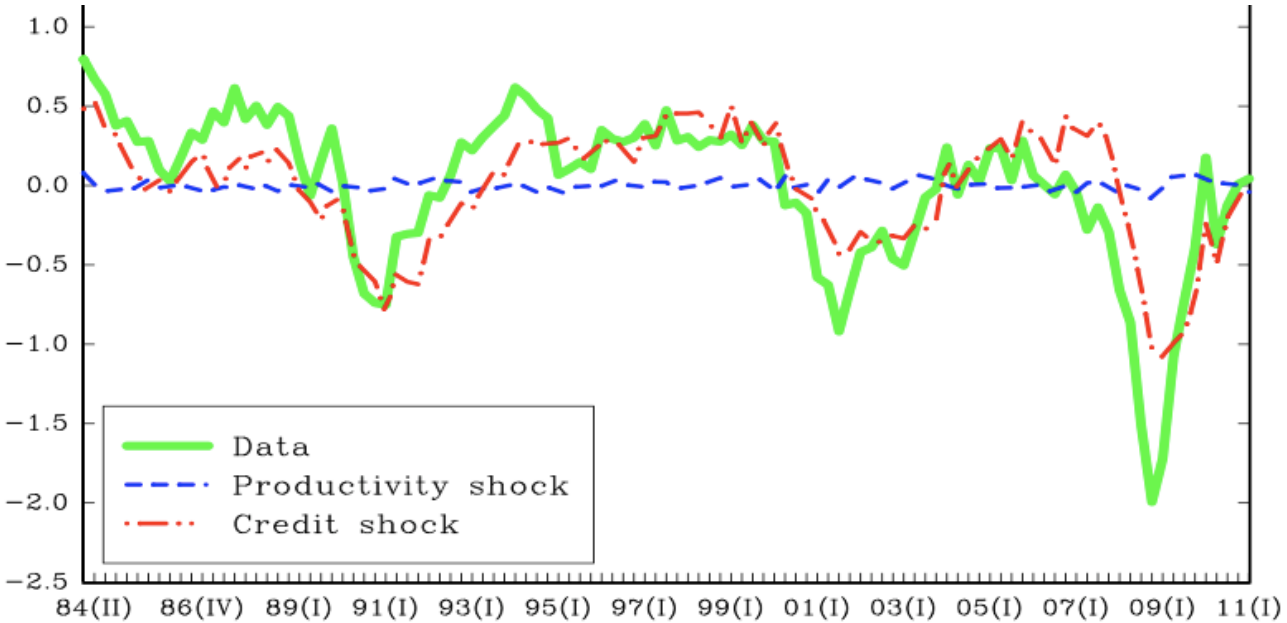

Decomposition of employment growth

Understanding Labor market Fluctuations

Extended model with three shocks estimated by Bayesian methods

- add a shock to the efficiency of the matching function (to $q(\theta_t)$)

VARIANCE DECOMPOSTION

	TFP shock z	*Credit shock* ϕ	*Matching shock* ξ
Output	45.9	27.9	26.2
Employment	0.4	51.4	48.2
New debt/output	0.2	65.7	34.1
Hourly wage	0.1	40.5	59.4

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Loose credit markets drive down wages

- Hiring done by new, entering firms
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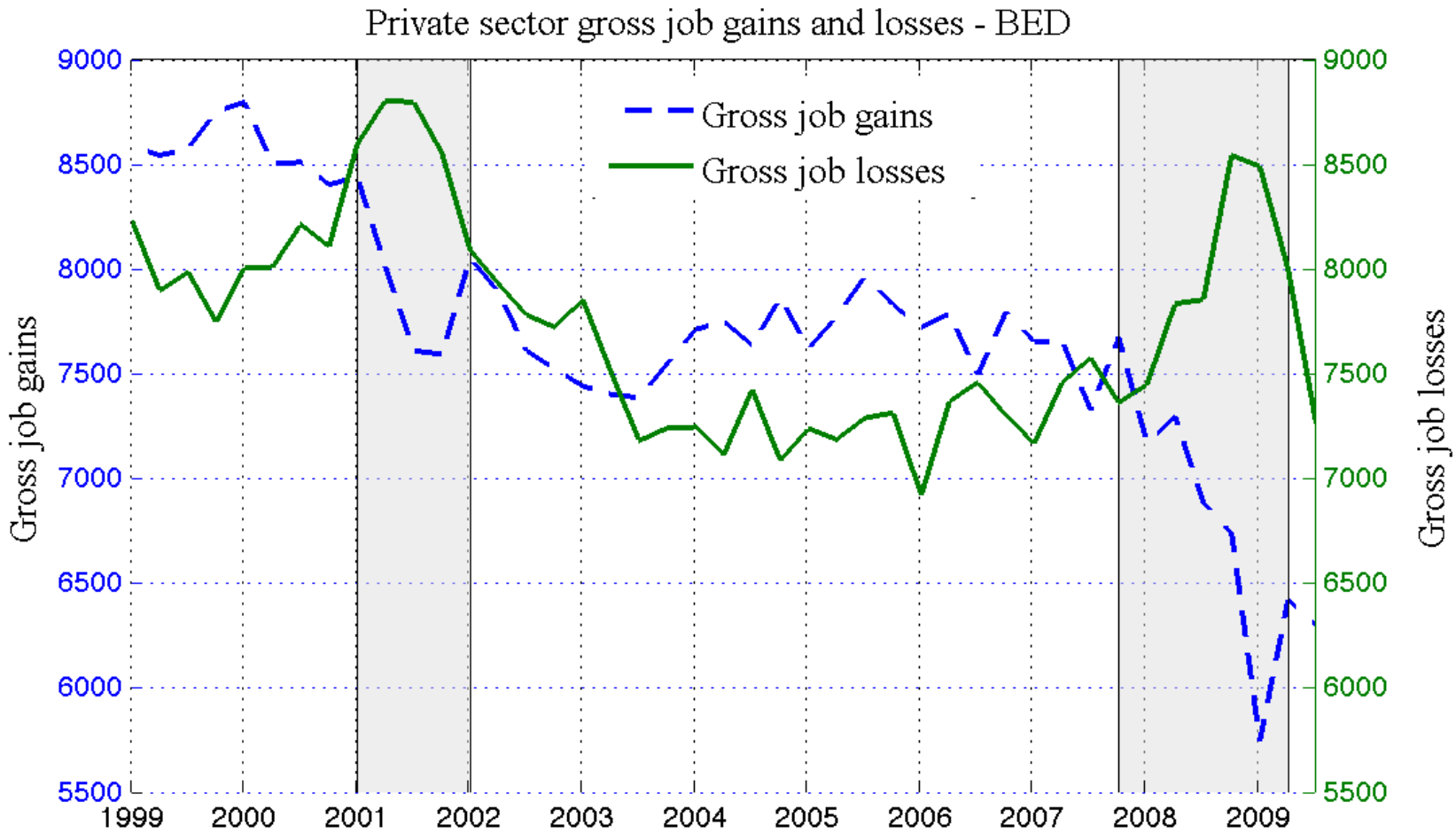
1. Wages: 2008:Q3 to 2009:Q2, 1% increase in real wage
2. U.S. vs German labor markets:
   - German firms rely more heavily on debt finance
   - Little to no decline in employment during the crisis
3. Job flows:

Labor markets during the Great Recession



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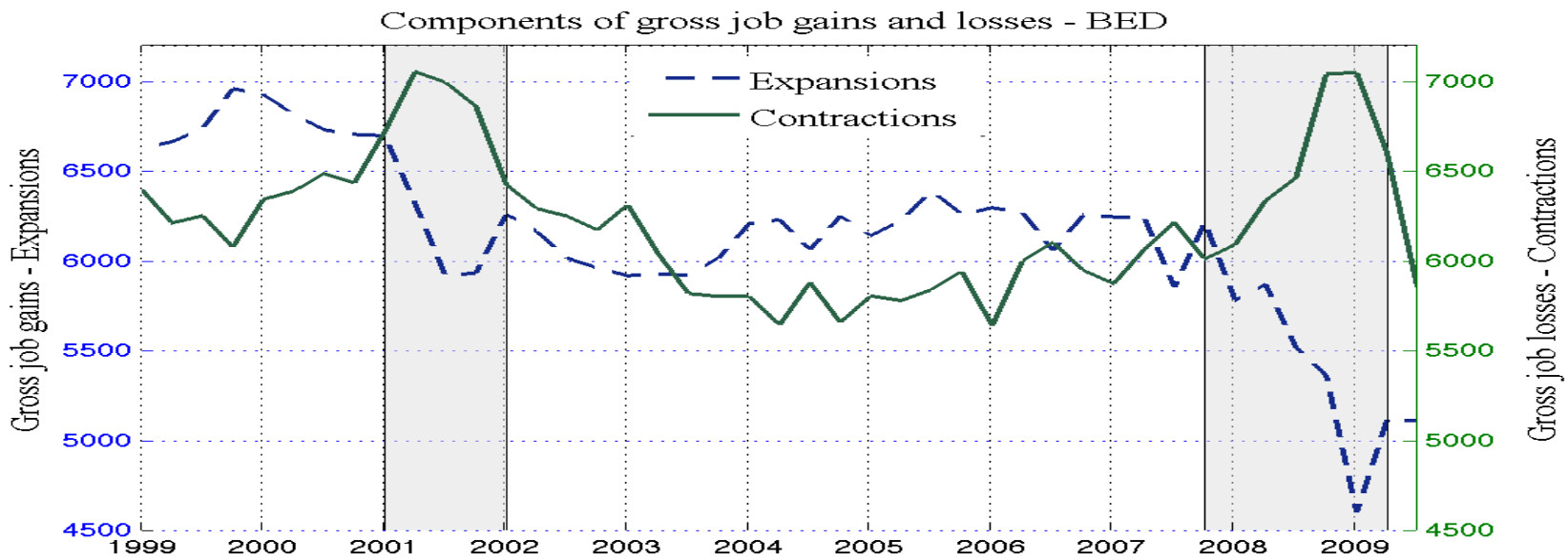

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Petrosky-Nadeau (2009):

- Borrowing to finance part of working capital
- Agency problem between borrowers and lenders

Modified entry condition:

$$\frac{\phi_t \kappa}{q(\theta_t)} = \mathbb{E}_t Q(z_{t+1}, \phi_{t+1})$$

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- By the LHS: traditional credit channel affecting costs
- By the RHS: ϕ_t enters wage bargaining

  - positive credit shock improves position of firms and lowers wage

  - similar effect on the incentive to hire workers

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- Partially indistinguishable from model's matching shocks

An Original Channel: prices and quantities

Risk neutral lenders and borrows: return on loan pinned by arbitrage condition:

$$R(1-\lambda) = 1 + r$$

- r: risk free rate
- R: return on debt
- λ: job destruction / default rate

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  $\lambda = 0.05$ per quarter in model, closer to 0.1 in the data

  $\Rightarrow$ IMPLIED MODEL $R > 25\%$ PER YEAR

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Sluggish employment recovery requires highly persistent credit shock

- Does is show up anywhere else that the labor market?.....

Financial Markets and Unemployment

Burgeoning literature studying the interaction of labor and credit markets

This paper zeros in on the strategic use of debt in wage negotiations

- New channel for credit market to affect real aggregate quantities
- Finds shocks to credit market play an important part in explaining the dynamics of the labor market