Discussion: "The Propagation of Technology Shocks" by Nicolas Petrosky-Nadeau and Etienne Wasmer

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The Propagation of Technology Shocks

Do Good, Labor and Credit Market Imperfections Matter and How Much?

- Develop a model with 3 market frictions
  - Labor market frictions
  - Credit market frictions
  - Goods market frictions
- Assess the contribution of each friction for:
  - Amplification $\Rightarrow$ volatility of unemployment
  - Propagation $\Rightarrow$ persistence of unemployment
- Results:
  1. Credit market frictions amplify fluctuations
  2. Goods market frictions propagate fluctuations

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Table 3: Second moments - data and model

	US data		Credit, labor and goods frictions		Credit & Labor		Labor & Goods		Labor only	
	a	b	a	b	a	b	a	b	a	b
Vacancies	8.88	0.89	6.88	0.91	2.47	0.84	7.08	0.90	2.16	0.85
Unemployment	7.98	-0.84	4.62	-0.74	1.60	-0.78	5.00	-0.77	1.40	-0.78
Labor tightness	16.34	0.90	9.93	0.97	3.35	0.99	10.26	0.99	2.93	0.99
Wage	0.69	0.55	0.44	0.95	0.45	0.99	0.44	0.95	0.45	0.99
Consumption	0.80	0.85	0.71	0.81	0.83	0.52	0.66	0.93	0.80	0.80
$\sigma(GDP)$	1.56		1.06		1.05		1.05		1.03	

Persistence:	GDP	θ	GDP	θ	GDP	θ	GDP	θ	GDP	θ
$corr(\Delta x_t, \Delta x_{t-1})$	0.44	0.72	0.12	0.30	0.15	-0.01	0.03	0.14	0.13	-0.01
$corr(\Delta x_t, \Delta x_{t-2})$	0.32	0.36	0.23	0.28	-0.03	0	0.25	0.08	-0.03	0
$corr(\Delta x_t, \Delta x_{t-3})$	0.18	0.09	0.08	0.27	-0.01	0	0.05	0.08	-0.01	0

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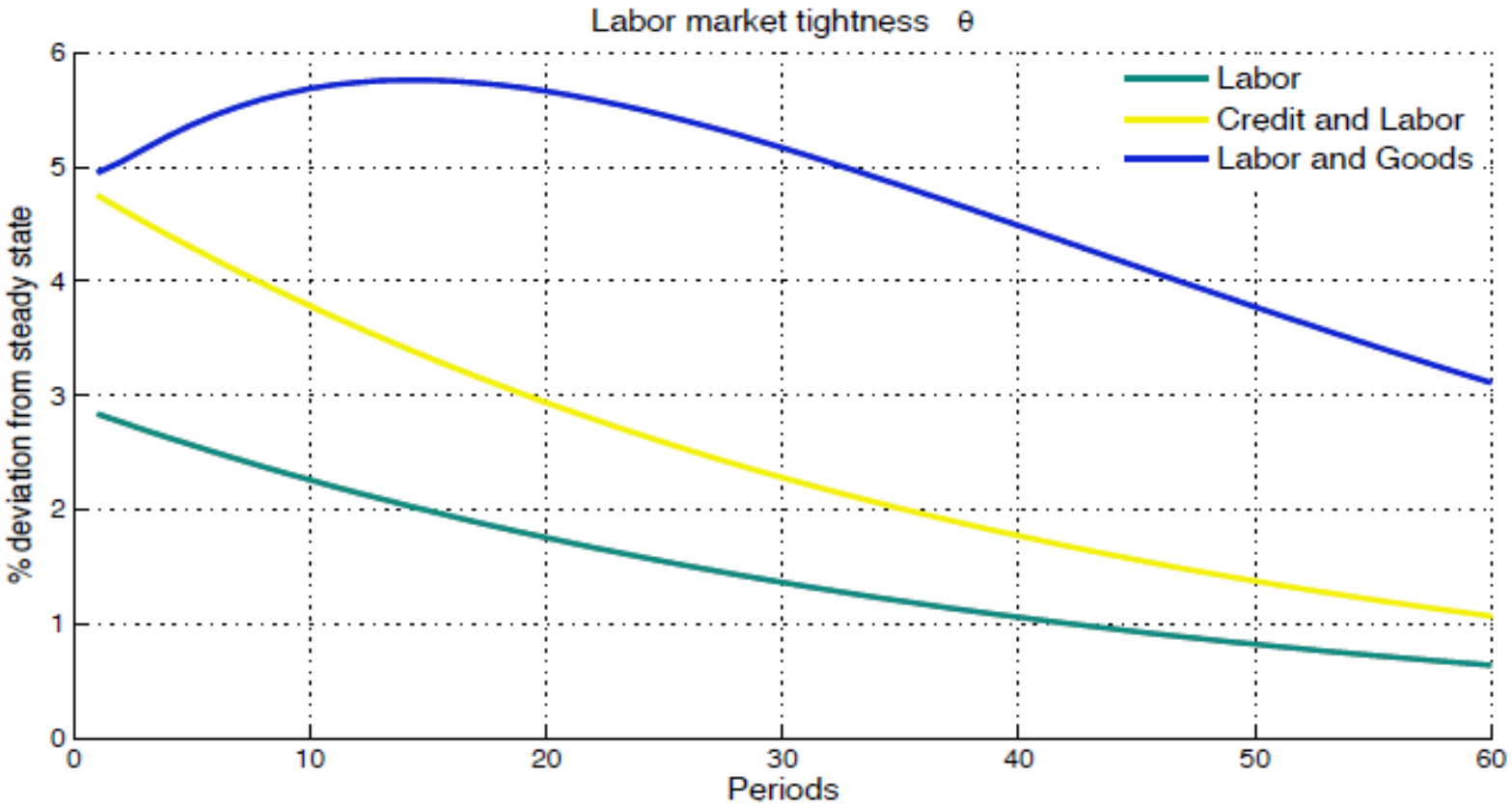

Model

- Labor market frictions
  - Costly matching of firms and workers
  - Bargain over the wage
- Credit market frictions
  - Costly matching of enterpreneurs and banks
  - Bargain over the credit agreement
- Goods market frictions
  - Costly matching of firms and customers
  - Bargain over the price

Discussion

- Good things
  - Topic is important, approach is novel
  - Focus on volatility as well as persistence
  - Framework is very elegant
- Bad things (some cheap shots)
  - What is a 'friction'?
  - Does the standard model (with rigid wages) lack amplification?
  - Why focus (only) on technology shocks?
  - Unclear link to standard models (Bernanke-Gertler, price rigidity)
  - Compromises on the elegance (symmetry) of the model
- More important concerns
  - What is the intuition for the results?
  - Does this model capture important features of the real world?

Credit market frictions and amplification

- Job creation in the standard model

$$\frac{\gamma}{q(\theta_t)} = \frac{1}{1+r} E_t S_{t+1}$$

- Job creation with credit frictions

$$K(\phi_t) + \frac{\gamma}{q(\theta_t)} = \frac{1}{1+r} E_t S_{t+1}$$

- Costs of financing $K(\phi_t)$
  - ENPV of flow costs of enterpreneurs and bank while searching
  - depends on credit market tightness (ϕ_t)
- Credit market frictions = fixed cost vacancy creation

$$\hat{\theta}_t = \frac{1}{\eta_L} \frac{S}{S - K(\phi)} E_t \hat{S}_{t+1}$$

  - Amplification because of small surplus
  - No propagation because $\phi_t = \phi^*$ by free entry (and no shocks to CM)

Goods market frictions and propagation

- Job creation in the standard model

$$\frac{\gamma}{q(\theta_t)} = \frac{1}{1+r} E_t S_{t+1}$$

$$S_t = y_t - w_t + \frac{1-s}{1+r} E_t S_{t+1} \Rightarrow S_t = \text{ENPV}(\text{profits})$$

- Job creation with goods market frictions

$$\frac{\gamma}{q(\theta_t)} = \frac{1}{1+r} E_t S_{g,t+1}$$

$$S_{g,t} = -w_t + \frac{1-s}{1+r} E_t \left[\lambda_t S_{\pi,t+1} + (1-\lambda_t) S_{g,t+1}\right]$$

$$S_{\pi,t} = \text{ENPV}(\text{profits}) \Rightarrow S_{g,t} \simeq \lambda_t \cdot \text{ENPV}(\text{profits}) - \text{costs}$$

- Goods market frictions matter for job creation
  - λ_t = probability firm finds a customer
  - Goods market tightness (and thus λ_t) responds to technology shocks

Goods market frictions and propagation (cont'd)

- Direct effect technology shock on job creation

$$y_t \uparrow \Rightarrow \text{profits} \uparrow \Rightarrow S_{g,t} \uparrow \Rightarrow \theta_t \uparrow$$

  - Strongest effect on impact
  - LR: LM gets congested, and shock dies out

- Effect technology shock on probability to find a customer λ_t

$$y_t \uparrow \Rightarrow w_t \uparrow \Rightarrow \text{disp inc} \uparrow \Rightarrow \text{demand} \uparrow \Rightarrow \lambda_t \uparrow$$

  - Strongest effect on impact, LR: firms meet increased demand
  - Net effect on job creation is strongest on impact

- Effect technology shock on λ_t (endogenous search effort)

$$y_t \uparrow \Rightarrow w_t \uparrow \Rightarrow \text{disp inc} \uparrow \Rightarrow \text{MU cons} \downarrow \Rightarrow e_t \downarrow \Rightarrow \lambda_t \downarrow$$

  - Strongest effect on impact, LR: firms offer more and cheaper products
  - Net effect on job creation is hump-shaped

- Increased disposible income makes it harder for firms to sell their product?

Concluding

- Very interesting paper
  - Important topic
  - Beautiful framework
- But, in the end: What do we learn?
  - Amplification from credit market frictions like any fixed cost
  - Lack of propagation from credit market seems model-dependent
  - Propagation from goods market frictions seems counterintuitive
- Questions
  - What can we do with this framework that we cannot do with standard ones?
  - Do we need all frictions in one model? What do we get from the interaction?