

What shape the spillovers of China's industrial upgrading and renminbi internationalization to ASEAN? Lessons from a New Keynesian model of endogenous firm entry and invoicing currency

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What motivates us?

- The Chinese yuan has been appreciating by nearly 1 percent per quarter on average for eight years consecutively in the aftermath of abandoning its dollar peg
- Hsu et al. (2014), for instance, find that China's export structure became more similar to that of the developed countries after the currency appreciation

Yuan appreciation facilitates China's industrial upgrading...

- Li et al. (2014) evidence that yuan appreciation significantly increases the probability of firm entry and products adding, more in ordinary than processing trade
- China is leveraging on appreciation, whether being a deliberate strategy or not, to move up the value chains.

...and the renminbi to go global

- Trend appreciation which upholds the renminbi as a stable and even increasingly-yielding currency has greased the wheel to make the renminbi goes global.
- Ito and Chinn (2015) predict that the share of renminbi invoicing in China's exports will rise to above 25% in 2015 and above 30% in 2018.

Of question is...

- How exactly China's industrial upgrading and renminbi internationalization associated with yuan appreciation would have impacted on ASEAN Economic Community (AEC)?
- What're the underlying mechanisms?
- Any stabilization role for AEC central banks?

Previewing what we find

- AEC industrial upgrading can be favorably coupled to China's one.
- Yuan appreciation strategy in the face of a liberalized capital account would instigate drastic capital flows that disrupt industrial upgrading in both regions.
- Anchoring exchange rates either against yuan or dollar is of little help for AEC.

Central bank could play a stabilization role

- By including downstream export price inflation in monetary policy deliberation, favorable spillovers from China's industrial upgrading to AEC can be recouped even in the face of China's liberalized capital account.
- Even better: entry in AEC skill-based sector expands much stronger and skill-biased technical progress become more persistent

Our approach: A two-country New Keynesian model

- Expanded with
 - Global upstream-downstream linkage with feedback loop
 - Skill-based vs. nonskill-based sectors in upstream industry
 - Firm entry into upstream sectors are endogenous
 - Directed technical change
 - Currency choice of trade invoicing is endogenous
 - Portfolio balance approach to international capital flows

Defining industrial upgrading

- Entry into skill-based sector depends on expected sector's profit relative to industry's profit

$$N_{et}^h = V_t^h / (V_t^h + V_t^l)$$

- Entry leads to expanding business formation

$$N_t^h = (1 - \delta)(N_{t-1}^h + N_{et-1}^h)$$

- Leading to skill-biased technical progress

$$A_t^h = (1 + \gamma^h \text{prop} N_t^h) A_{t-1}^h$$

where expected sector's profitability is derived as

$$V_t^h = \frac{N_t^h}{1 - (1 - \delta)q_t^h} \left\{ \left(1 - \frac{1 - \theta(1 - \delta)/(1 + \pi_{aa,t}^h)}{\omega_t^h q_t^h} \right) \mathbb{R}_{aa,t}^h + \left(1 - \frac{1 - \theta(1 - \delta)/(1 + \pi_{ac,t}^h)}{\omega_t^{*h} q_t^h} \right) \mathbb{R}_{ac,t}^h - \mathbb{F}^h (A_t^h)^\mu \right\}$$

Where $\mathbb{R}_{aa,t}^h$ refers to domestic sales revenue and $\mathbb{R}_{ac,t}^h$ refers to export revenue.

Facing firm entry is Sutton's (2012) sunk cost

$$f_{et}^h = \mathbb{F}^h (A_t^h)^{\mu_h}$$

- where $\mathbb{F}^h (> 0)$ denotes the minimum outlay incurred by an entrant in skill-based production.
- A low value of μ means that fixed cost outlays, which we may think of as R&D outlays, is very effective in raising the quality.

U.S dollar versus Chinese yuan pricing

- Average export prices of high-quality intermediates and downstream output in local currency are given by

$$\mathcal{P}_{ac,t}^h = (1 - \phi_t)S_{ad,t}d\mathcal{p}_{ac,t}^h + \phi_t S_{ac,t}\psi\mathcal{p}_{ac,t}^h$$

$$\mathcal{P}_{ac,t} = (1 - \phi_t)S_{ad,t}D\mathcal{P}_{ac,t} + \phi_t S_{ac,t}Y\mathcal{P}_{ac,t}$$

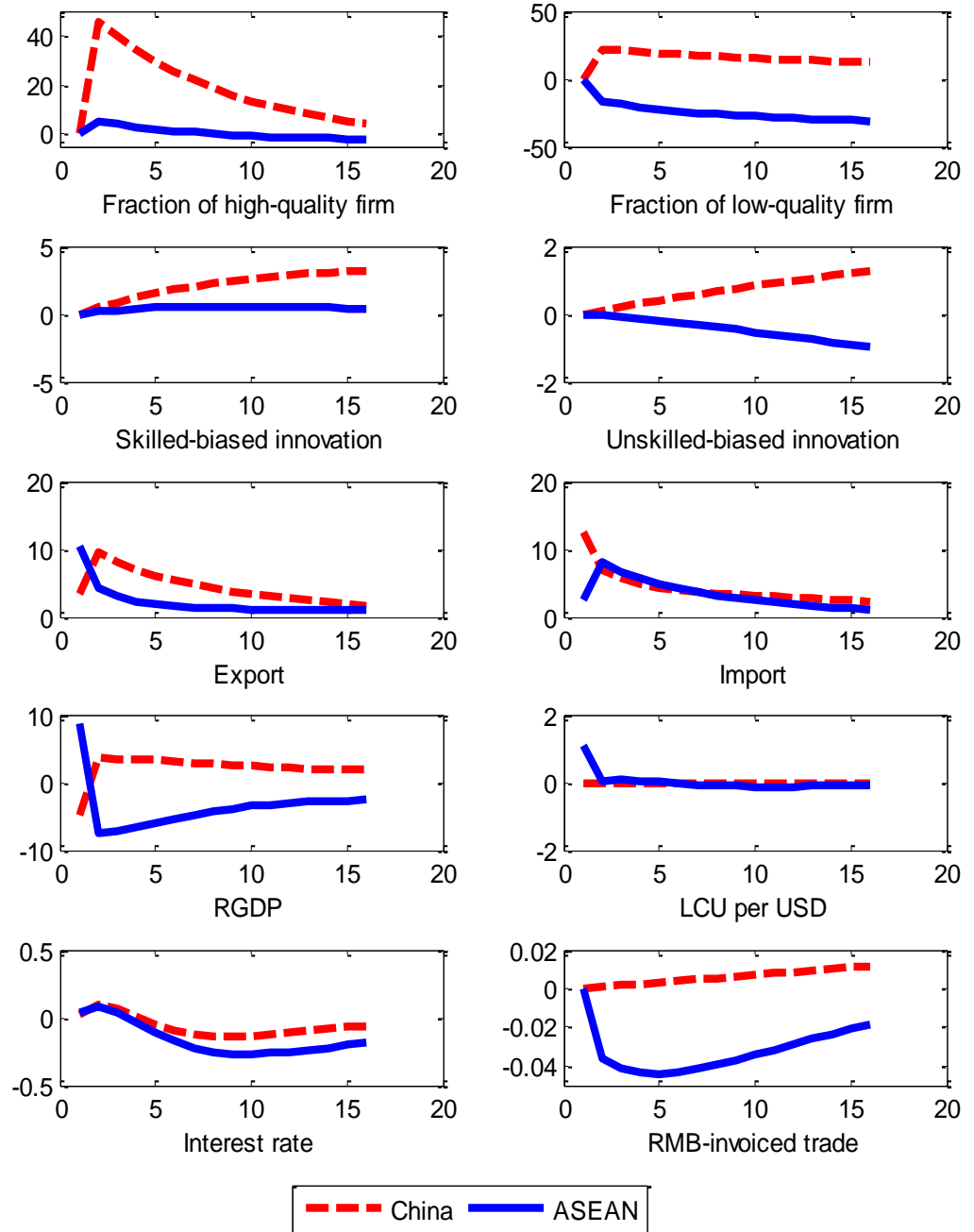
Defining renminbi internationalization as increasing use of renminbi in international trade as invoicing currency

$$\phi_t = \zeta \frac{\exp(\widehat{yP}_{ac,t-1}^h - \widehat{yP}_{ac,t-1}^h)}{\exp(\widehat{yP}_{ac,t-1}^h - \widehat{yP}_{ac,t-1}^h) + \exp(\widehat{dP}_{ac,t-1}^h - \widehat{dP}_{ac,t-1}^h)}$$

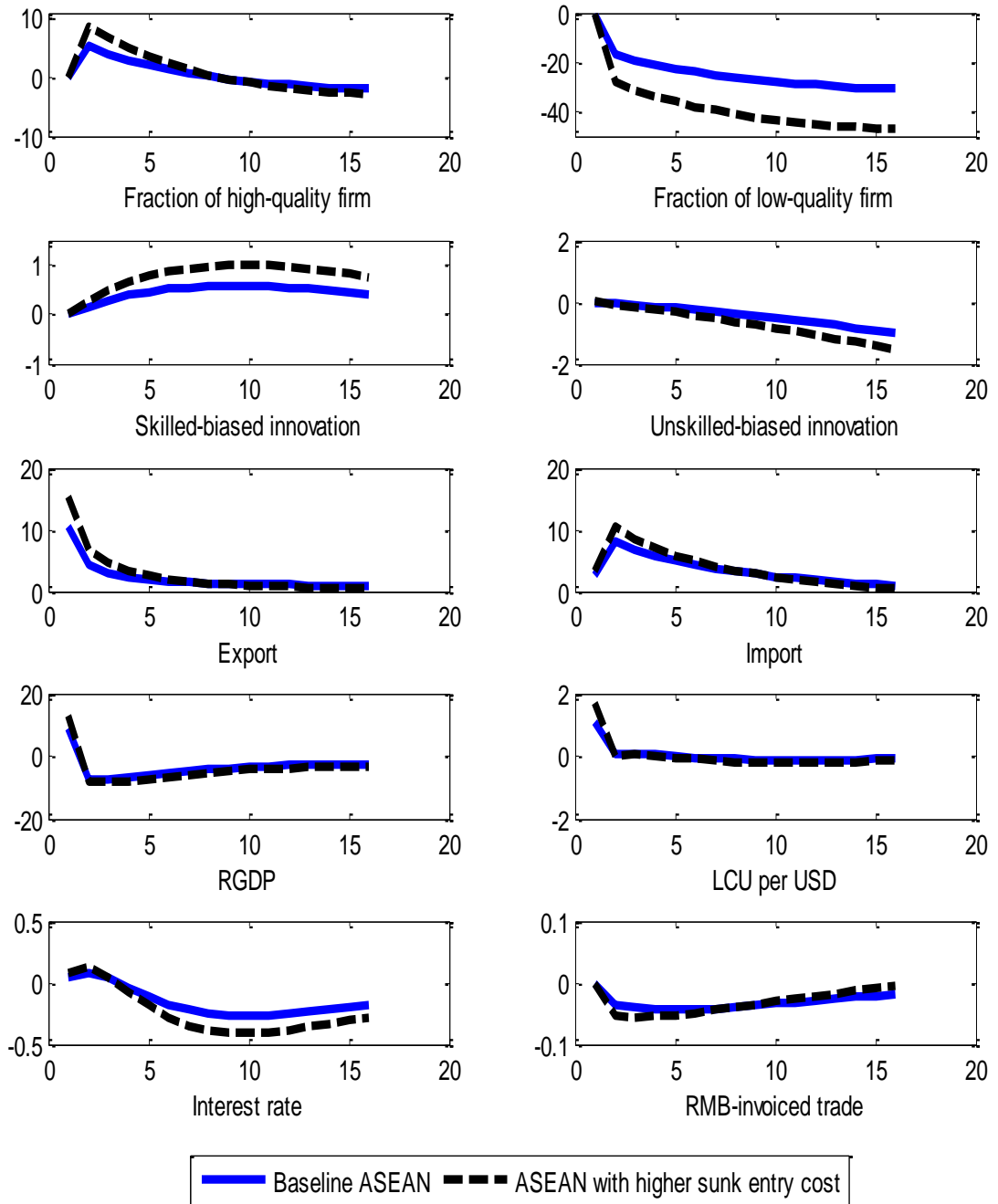
Also as China's capital account liberalization

- $\mathbb{K}_{ac,t}^B = \left(\frac{S_{ac,t} B_{p,ca,t-1}^*}{P_t} \right) \left(\frac{1}{\Phi_{\mathbb{K}}} (q_{ac,t}^B e^{Z_{\mathbb{K},t}} - 1) + \varpi_{\mathbb{K},ac}^B \right)$
- $q_{ac,t}^B = \mathbb{E}_t \left(\frac{S_{ac,t+1}}{S_{ac,t}} \right) \left(\frac{1}{1+r_t} \right) (q_{ac,t+1}^B (1+r_t^*) + p_{ac} B_{ac,t+1}^B)$
- $\Phi_{\mathbb{K}}$ measures degree of capital account convertibility

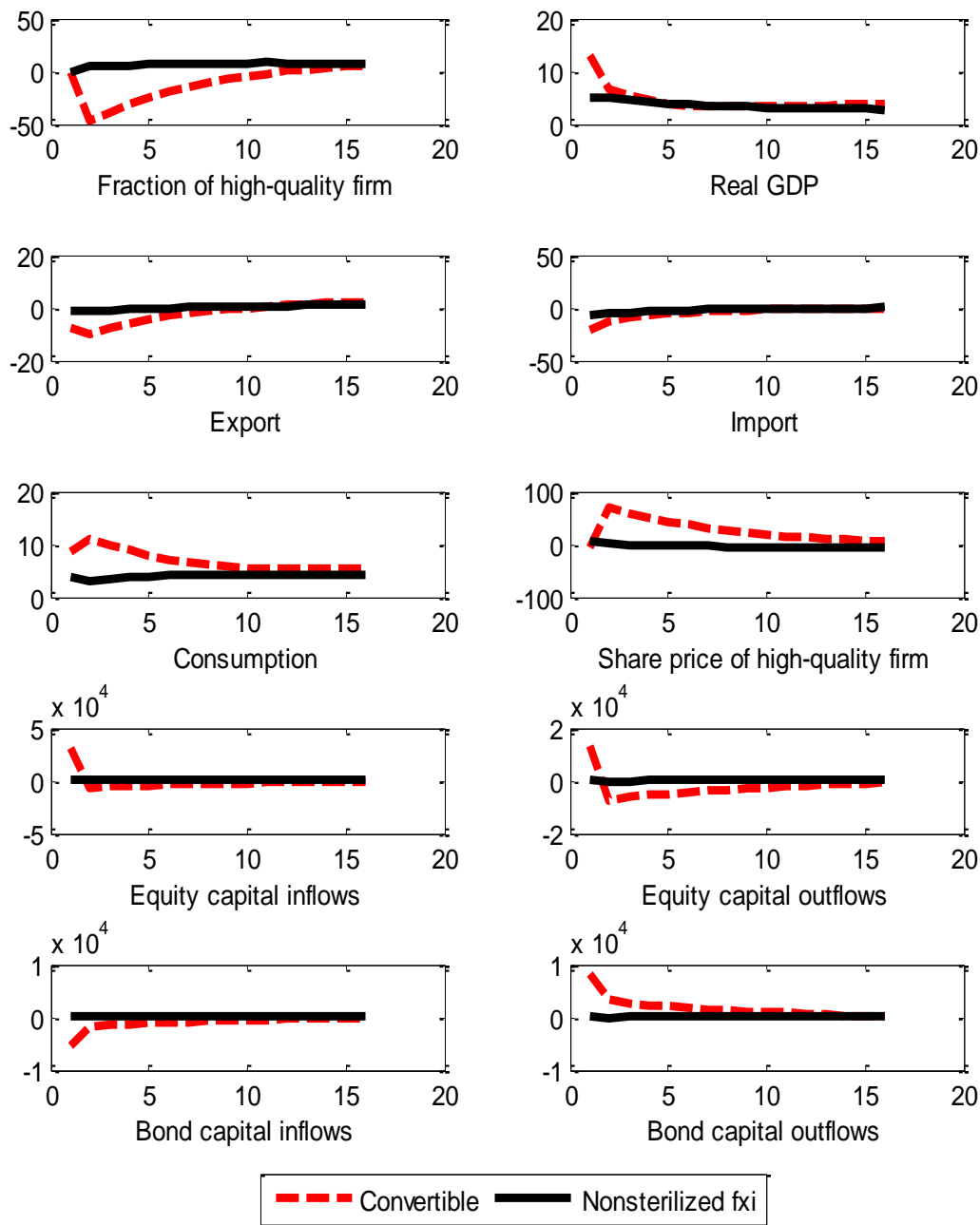
- China's industrial upgrading associated with yuan appreciation benefits AEC through **global input-output linkage** and **dollar pricing effect**



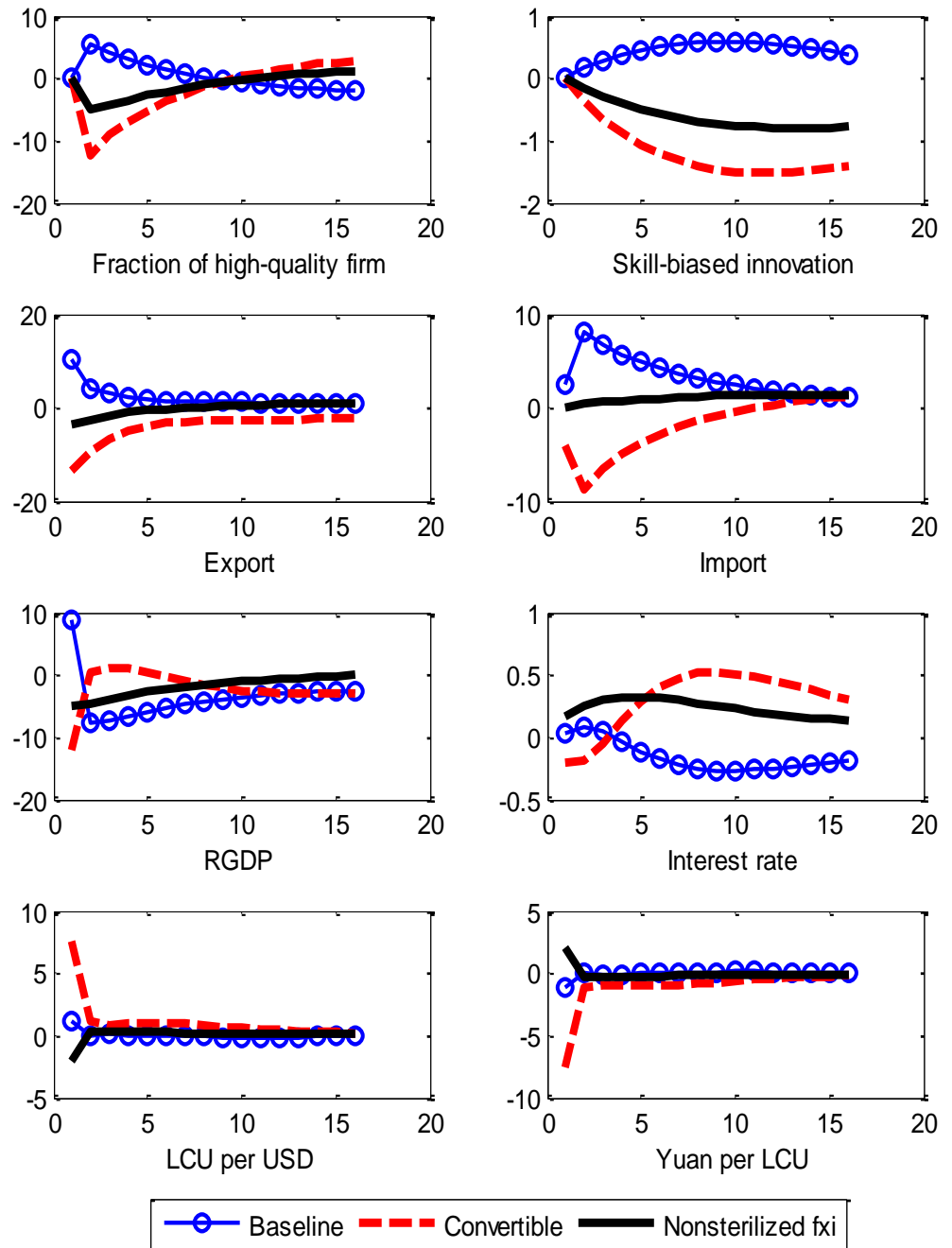
- Even when Chinese firms are more responsive than AEC's to R&D outlays, AEC firms can still be benefited through **quality competition channel**
- Condition is the quality gap between Chinese and AEC firms are not too wide



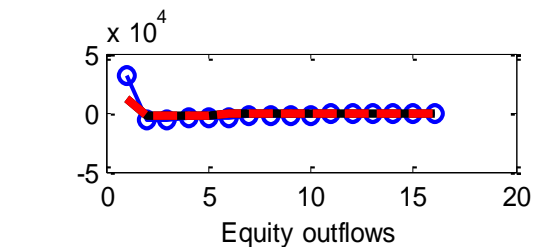
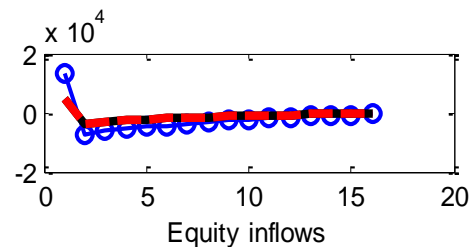
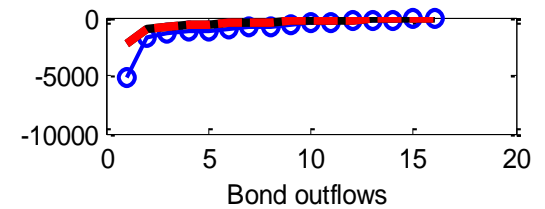
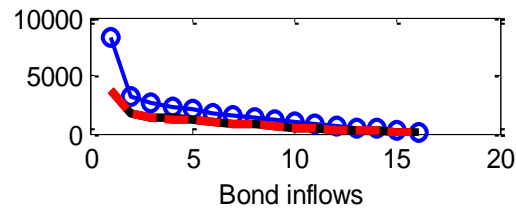
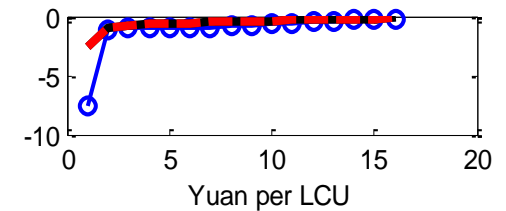
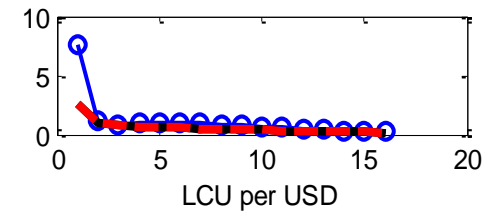
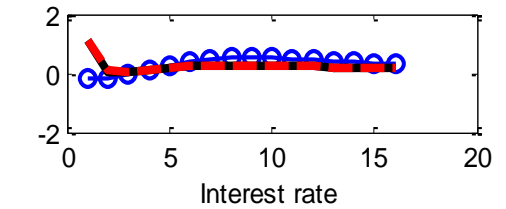
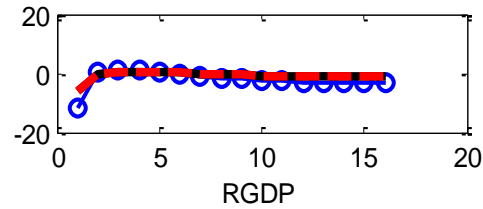
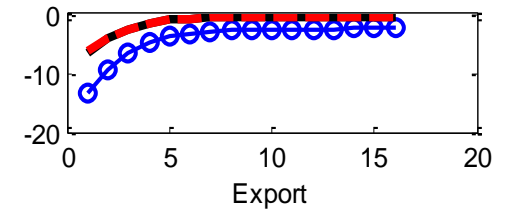
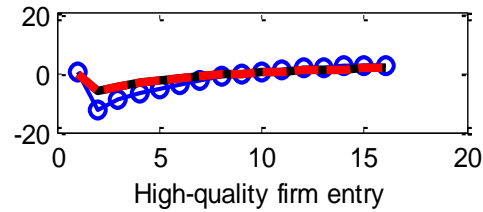
- Capital account liberalization
- and unsterilized foreign exchange intervention
- overturn China's responses to yuan appreciation



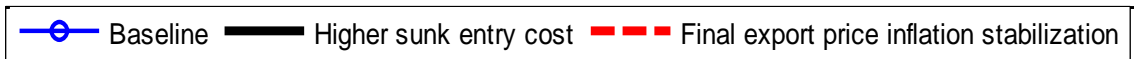
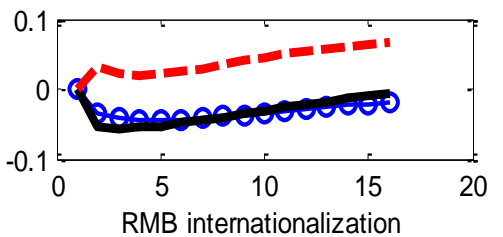
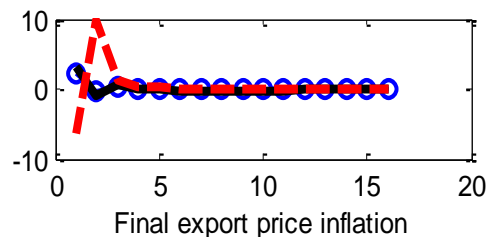
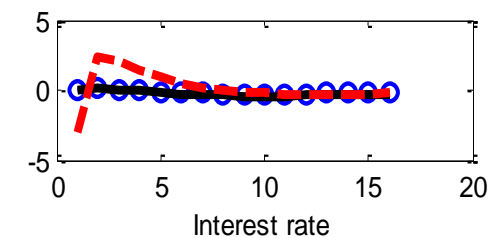
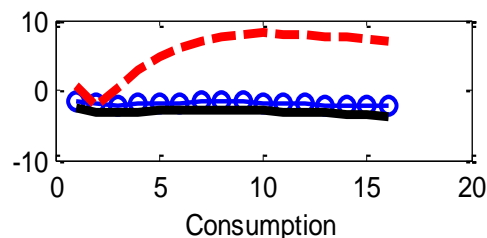
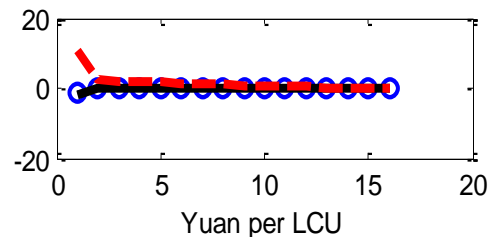
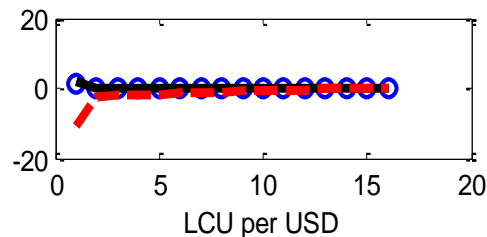
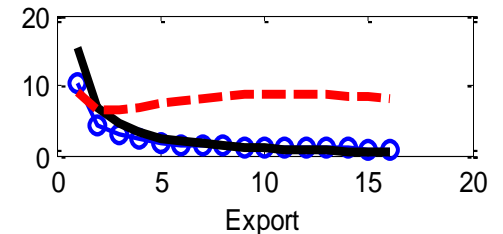
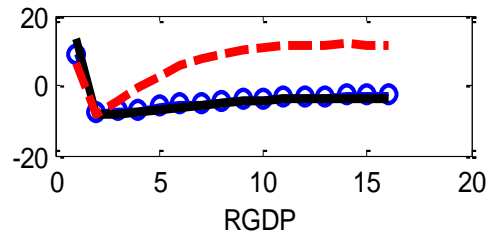
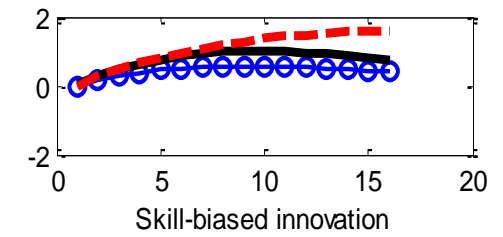
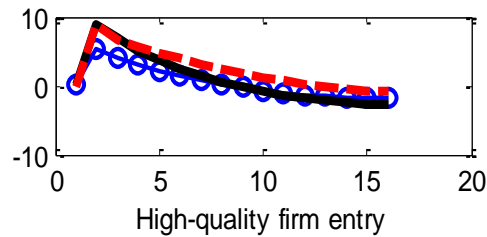
- So does the spillovers to AEC



- Stabilizing exchange rates is of little help to shield AEC from adverse effects of persistent yuan appreciation under China's liberalized capital account



- **Stabilizing final export price inflation** generates benign spillover effects from China's industrial upgrading even when China's capital account is convertible
- Export price inflation targeting provides cost stability conducive for quality upgrading



Concluding remarks

- To incorporate vertical FDI into the model for a more realistic trade-FDI-capital nexus, as trade and MNCs are closely linked
- To incorporate credit friction, as finance can be a rising (receding) tide that lifts (lowers) the boats of international trade
- Welfare assessment for optimal monetary policy