

China-Japan-US Integration and Global Economic Crisis: A Dynamic General Equilibrium Analysis

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What we had done in the earlier version of our paper?

- A static, multi-country computable general equilibrium (CGE) model with firm heterogeneity
- Estimate the long-term effects of dwindling US import demands on Asian economies
- Investigate the impacts of alternative FTA configurations among China, Japan and the US

Major comments we received from the pre-conference workshop

- There seems to be two papers, with two sets of simulations performed not being tightly linked.
- Is a regional FTA a good idea in the context of US demand drop?

What did we do in this version of paper?

- Building a NOEM-type, multi-country dynamic general equilibrium model of the world economy, which captures both short-term adjustment dynamics and long-term equilibrium
- Simulating the scenarios of US recession, global exchange rate adjustment, and regional FTAs using this coherent analysis framework

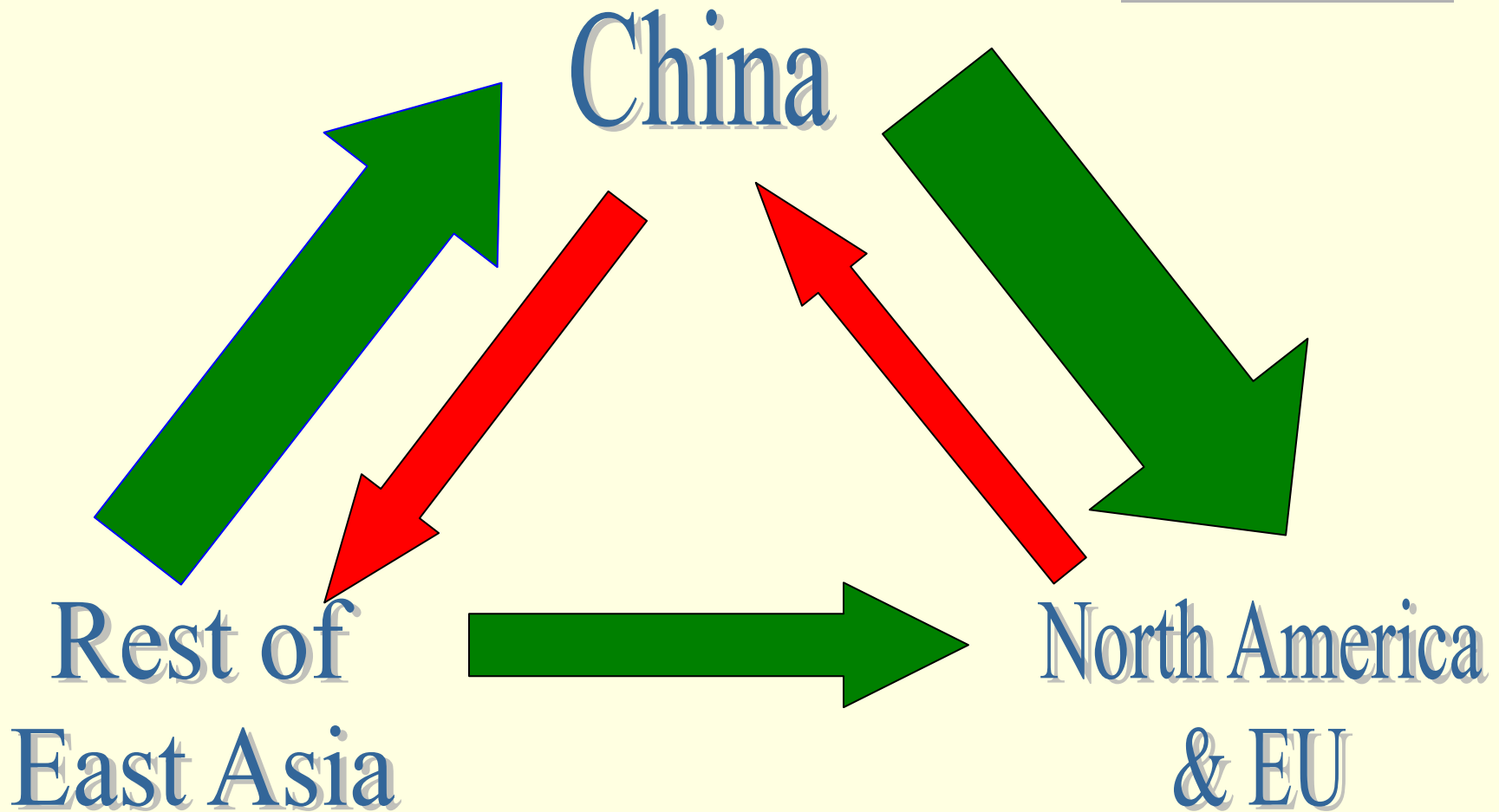
But there is always a trade-off...

- We lose regional and sectoral details in the new model.
 - It has only 5 countries/regional blocs and 3 sectors
 - US, Japan, PRC, other East Asian economies (OEA), ROW
 - Agriculture, manufacturing and services

Background

- China's high growth has been accompanied by its rapid integration with the world economy.
- Despite efforts of diversifying export markets, China's trade is still heavily oriented towards western OECD markets.
- This has been underpinned by the rise of regional production networks.

Asia's Triangular Trade



Critical roles of the three giants

Their roles in Asia's production network

- **US:** Destination of a large proportion of Asia's final output
- **China:** Conduit of exports from Asian countries to western countries
- **Japan:** Leading provider of finance, technology and marketing knowhow for the regional production networks

The trilateral integration has significantly reshaped the economic landscape of Asia.

Challenges for the current pattern of trilateral integration

- Heavy reliance on the final demand of US makes Asian economies vulnerable to the turbulence in the US economy.
- The resulting global imbalances, which are unsustainable and have to be corrected, suggest an inevitable adjustment in the trade pattern among China, Japan and the US.
- The current global economic crisis may suggest that a market-led adjustment in global imbalances is underway.

Objective of the study

- Explore the implications of the global financial and economic crisis and of China-Japan-US integration for Asian economies
- Focus on two issues:
 - Impacts of US recession and global rebalancing on Asian economies
 - Long-term impacts of FTAs and its potential role in mitigating the effects of the current crisis for Asia

Methodology

- A multi-country, global dynamic general equilibrium model with
 - Forward-looking behavior of households and firms
 - Habit persistence
 - Nominal wage and price stickiness
- Largely follow the structure of IMF's GEM
- Deterministic with annual frequency.

Price setting

- Agricultural sector is characterized by perfect competition and flexible price of products
- Manufacturing and services sectors are characterized by monopolistic competition, with Rotemberg-type adjustment costs for nominal price changes
 - Exports are invoiced in currency of import countries (LCP)

Investment

- Capital is sector-specific and capital accumulation is subject to adjustment costs, leading to variations in Tobin's q which determines investment.
- There is an international bond, issued by the US and denominated by the US dollar.

Foreign Assets

- There is an international bond, issued by the US and denominated by the US dollar.
- The financial intermediation fees involved for lending and borrowing international bonds lead to a wedge in the interest rate parity condition

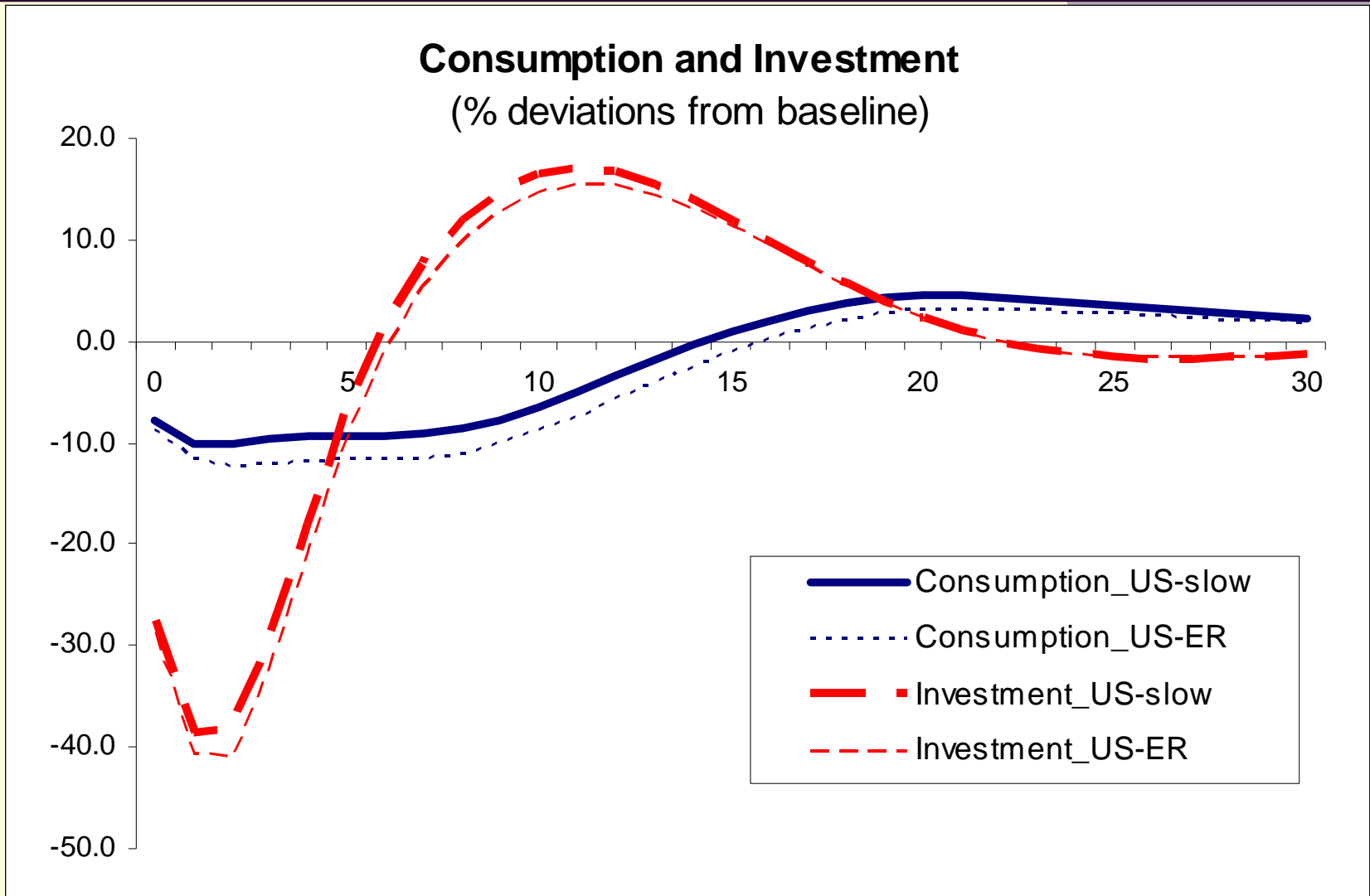
$$\frac{\pi_{t+1}}{1 + i_{t+1}} = \frac{\pi_{t+1}^*}{(1 + i_{t+1}^*)(1 - \Gamma_t^B)} \frac{\varepsilon_t}{\varepsilon_{t+1}}$$

$$1 - \Gamma^B = \left(1 - \phi^{b1} \frac{\exp\left(\phi^{b2} \left[\varepsilon B^* / GDP - bss^* \right]\right) - 1}{\exp\left(\phi^{b2} \left[\varepsilon B^* / GDP - bss^* \right]\right) + 1} \right) \frac{\beta^*}{\beta}$$

Simulation scenarios-1: US recession and global exchange rate adjustment

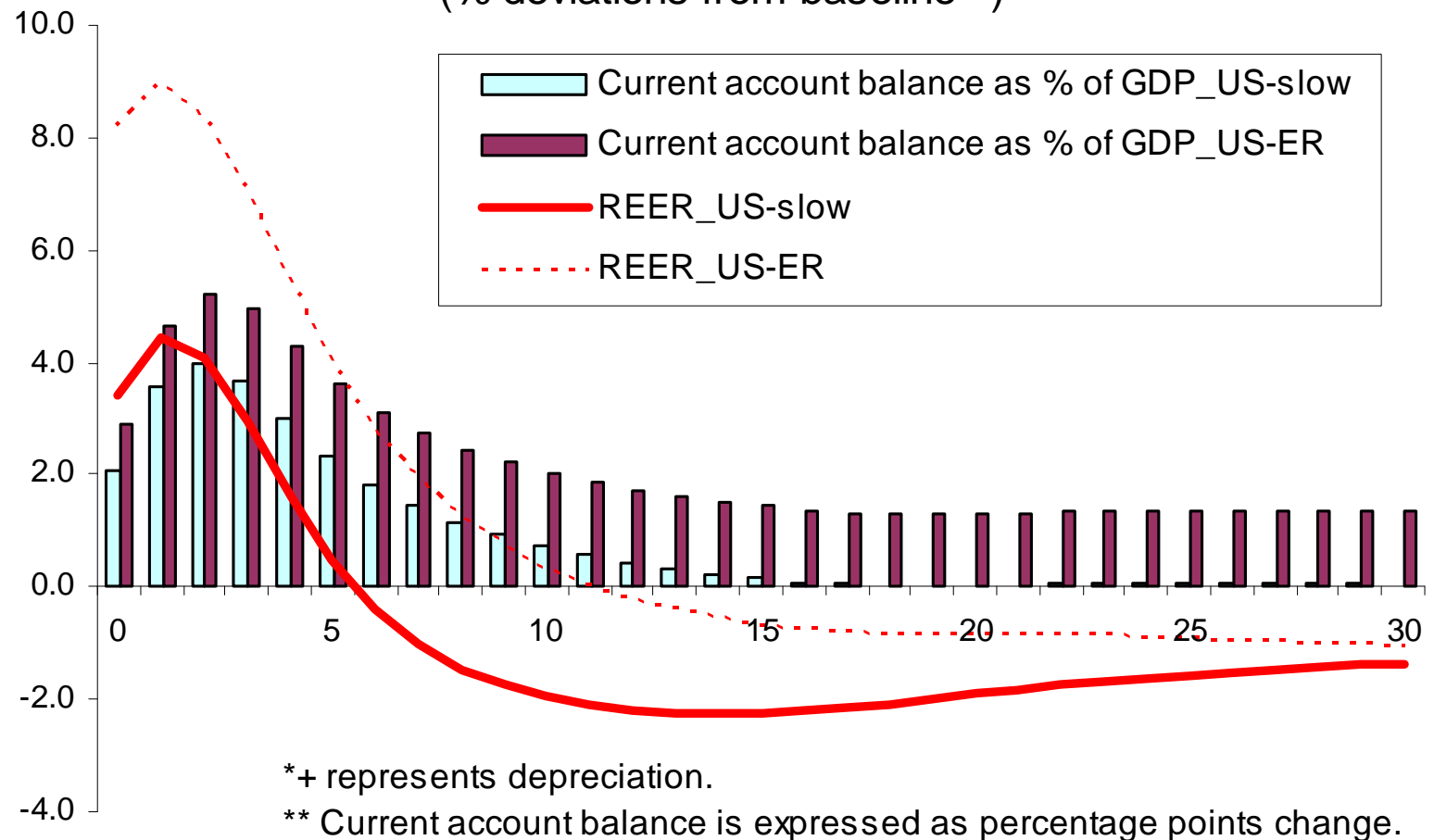
- *US-slow*: Declined investment and consumption demand in the US
 - US consumers' time preference rates decrease by 1 ppt for 10 years
 - Investors' risk premiums increase by 5 ppts for 3 years
- *US-ER*: *US-slow* plus sharper US dollar depreciation
 - Net creditor countries reduce their desired net foreign asset positions

Effects on the US – Consumption and Investment

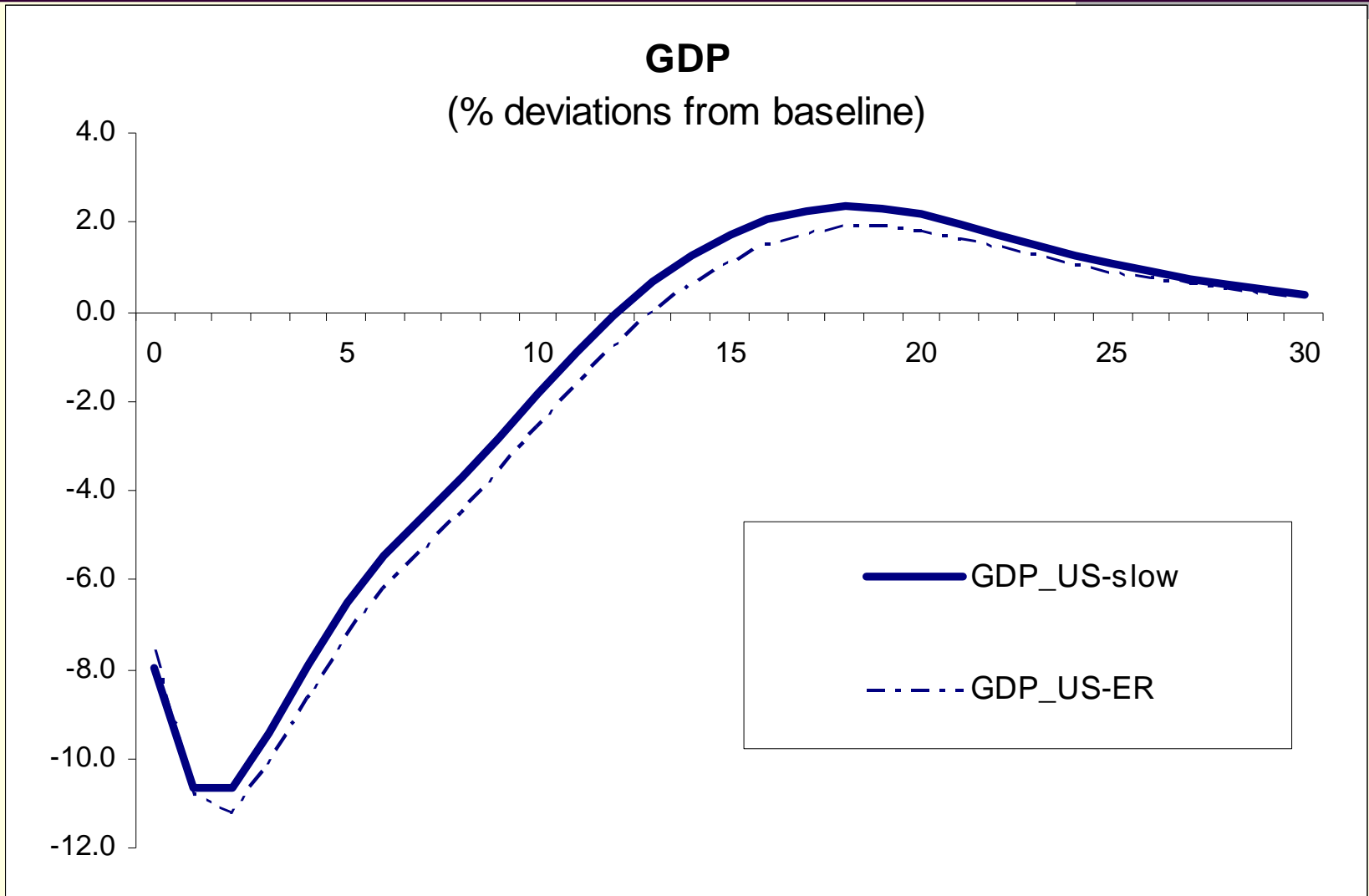


Effects on the US CA and REER

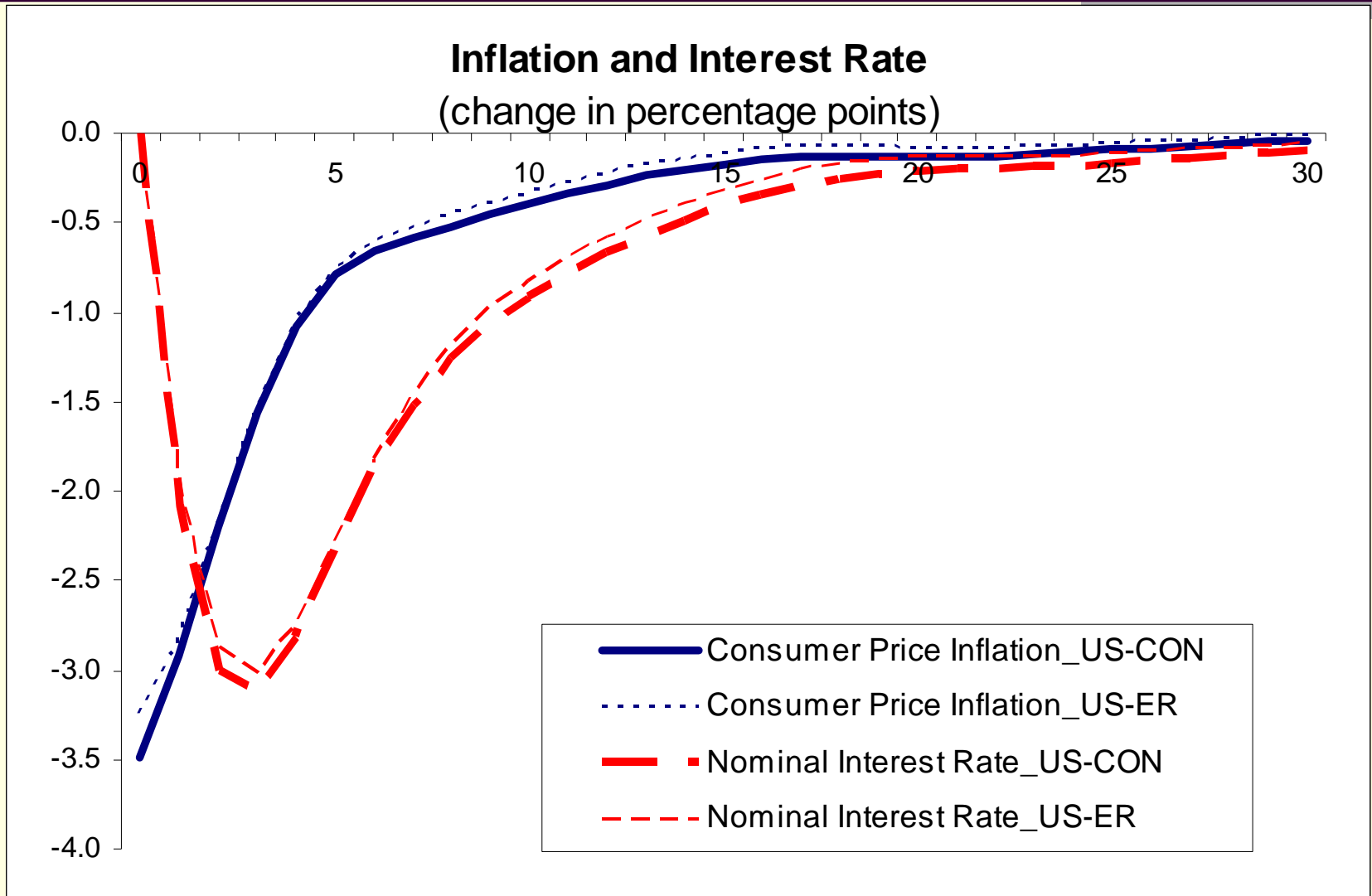
Current Account Balance and REER*
(% deviations from baseline**)



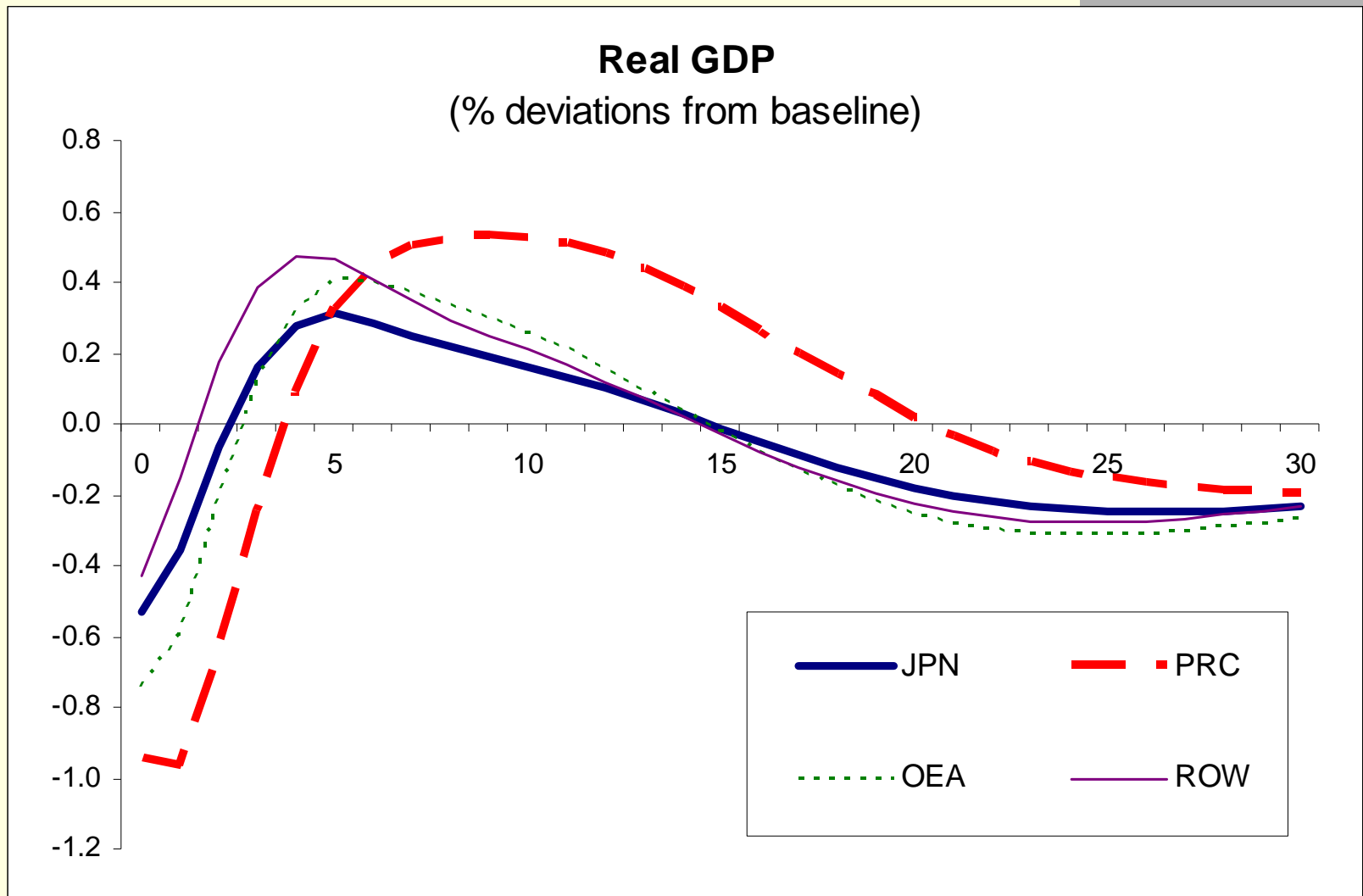
Effects on US Real GDP



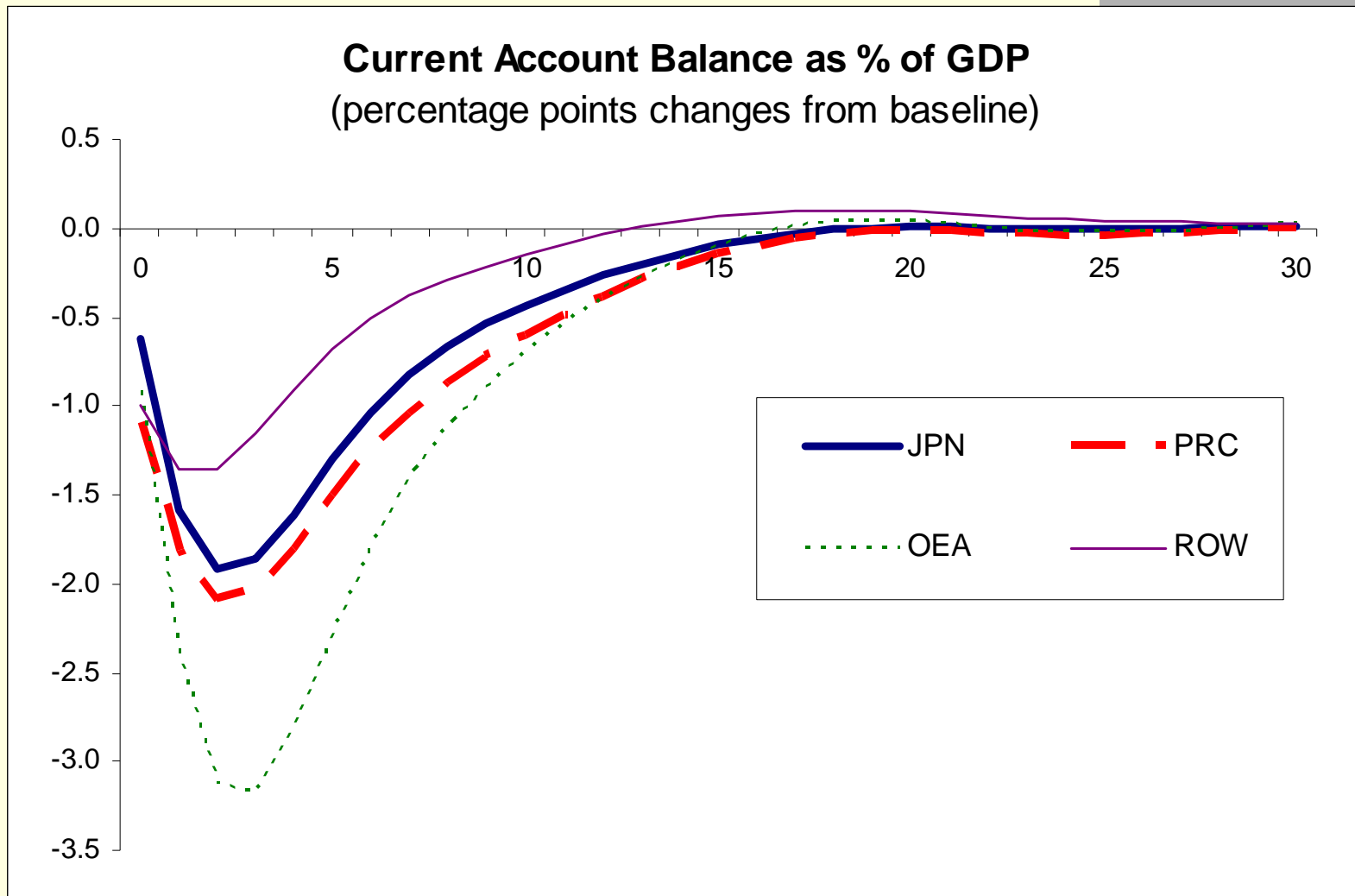
Effects on US Inflation and Interest rate



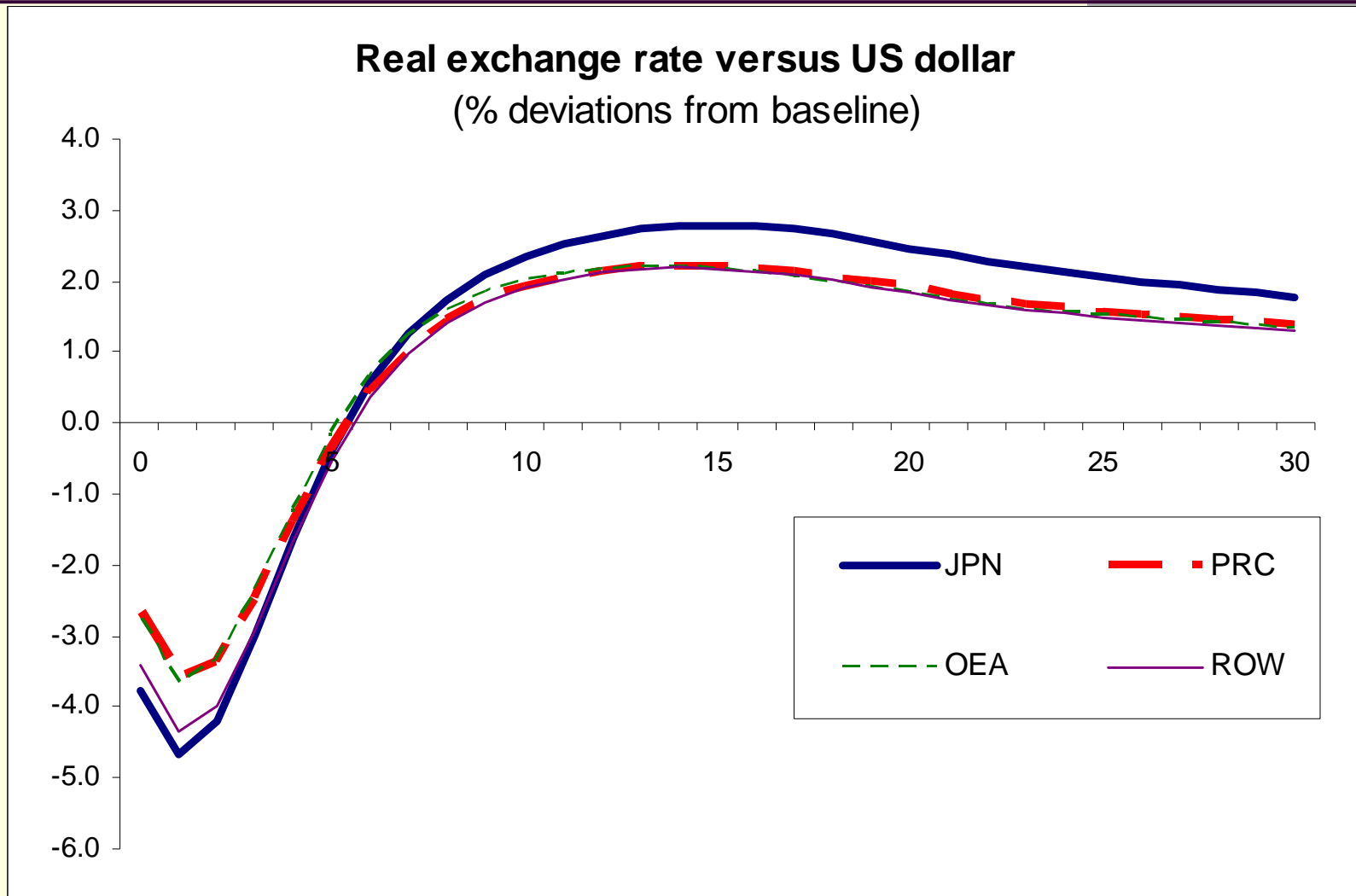
Spillover Effects of *US-slow* on Real GDP of other countries/regions



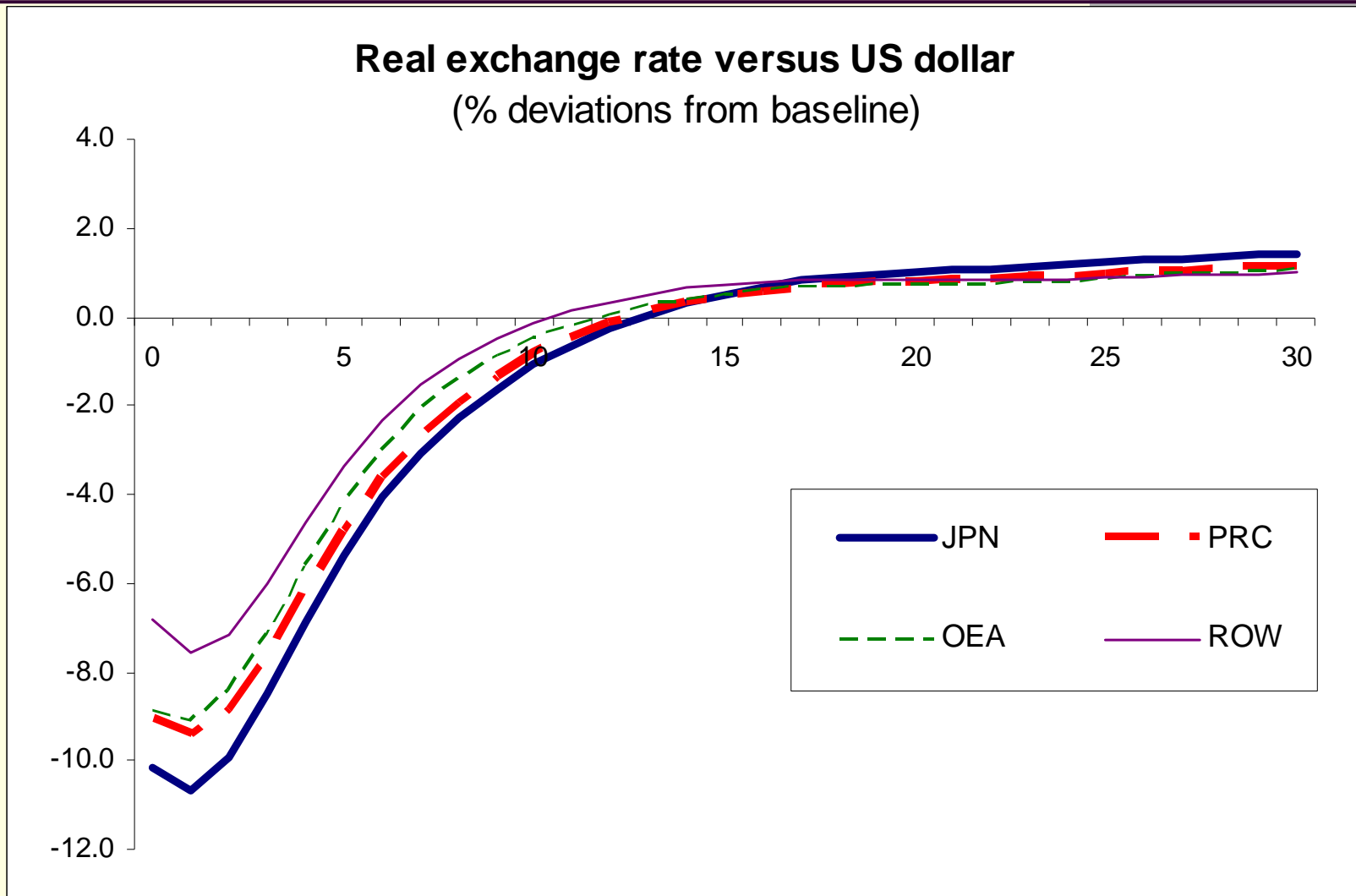
Spillover Effects of *US-slow* on the current account of other countries



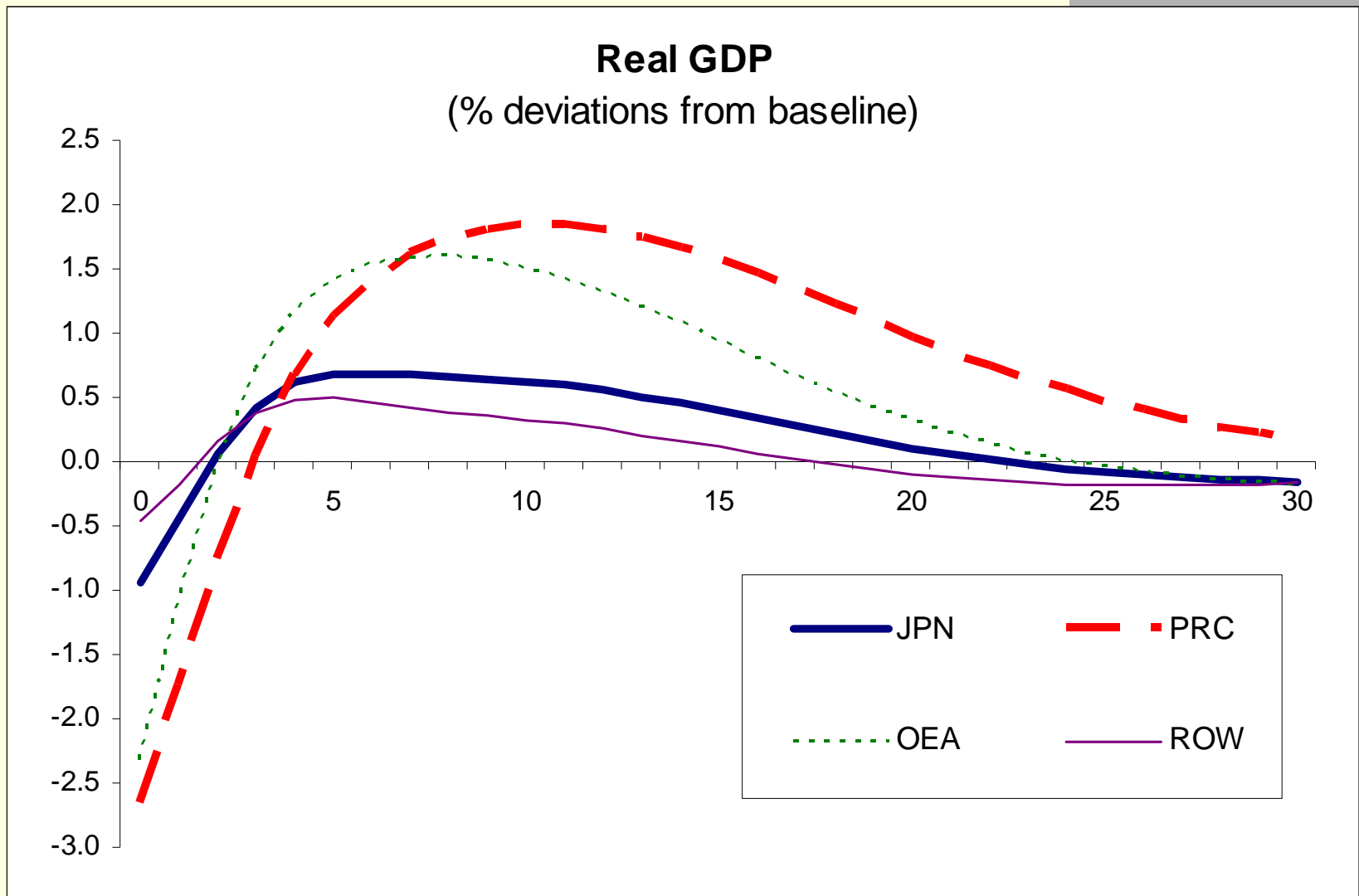
Spillover Effects of *US-slow* on the real exchange rates of other countries



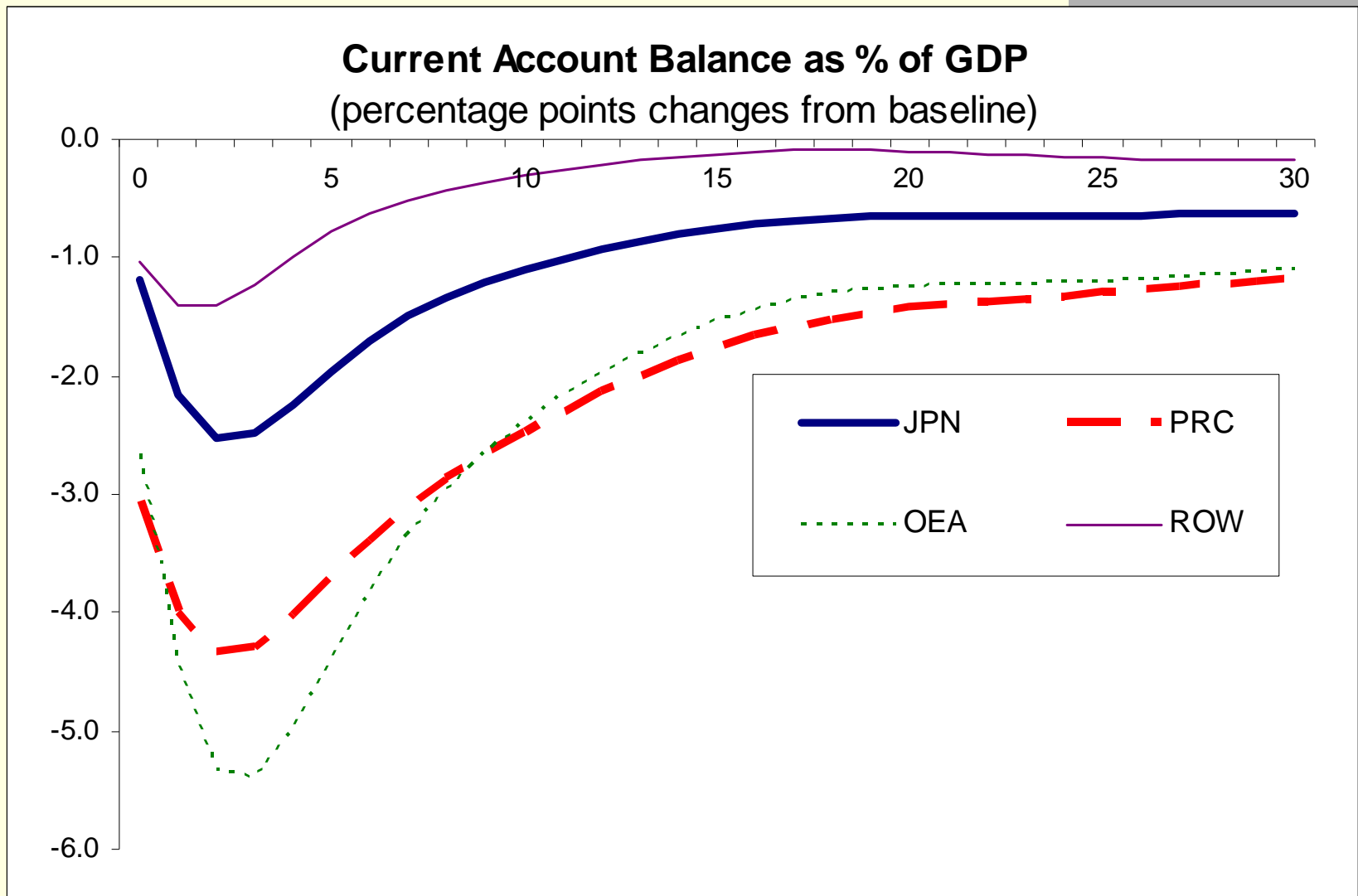
Effects of adding global exchange rate realignment (*US-ER*) on RER



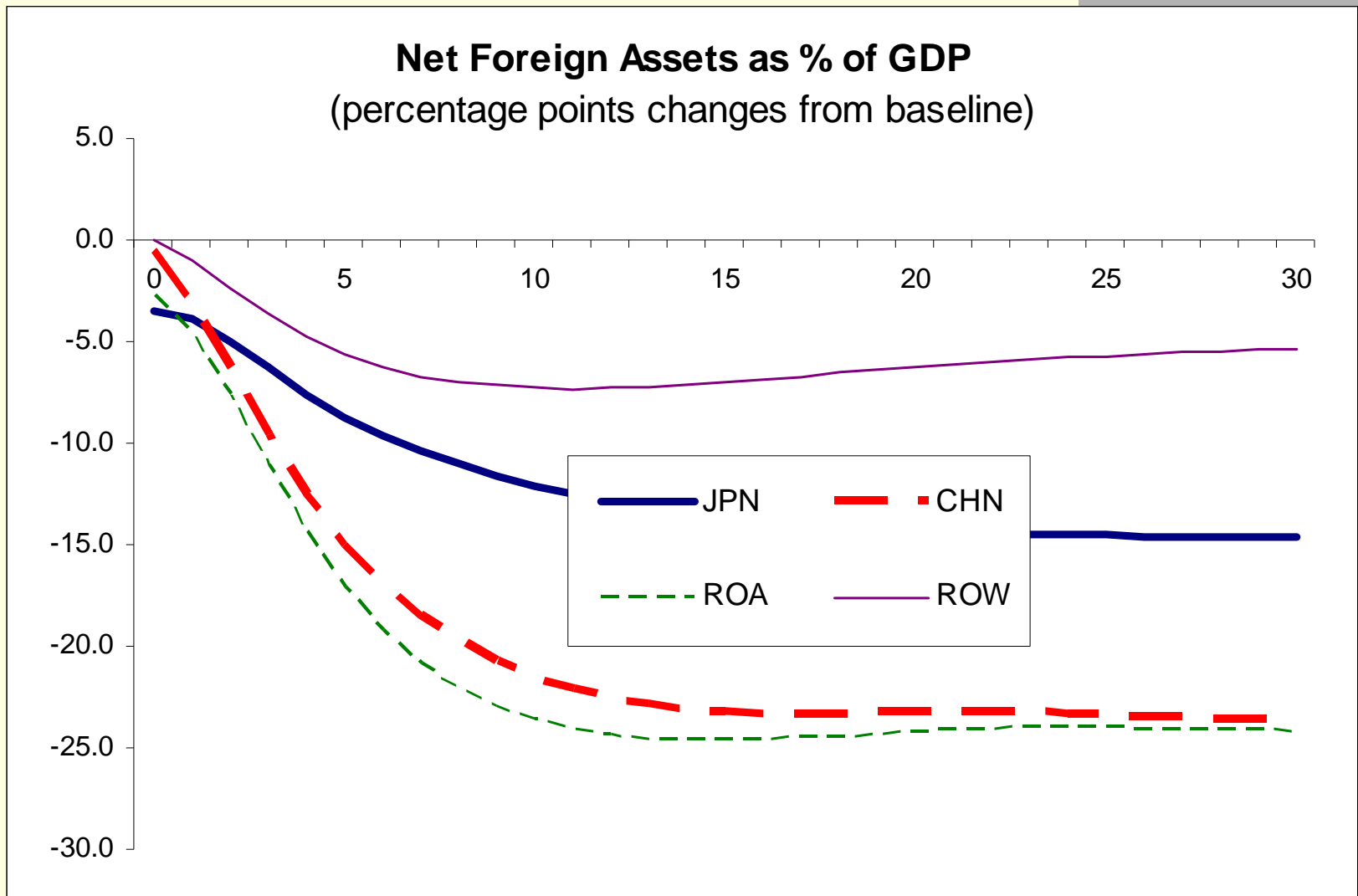
Effects of adding global exchange rate realignment (*US-ER*) on GDP



Effects of adding global exchange rate realignment (*US-ER*) on CA



Effects of adding global exchange rate realignment (*US-ER*) on NFAs



Simulation scenario-2: FTAs

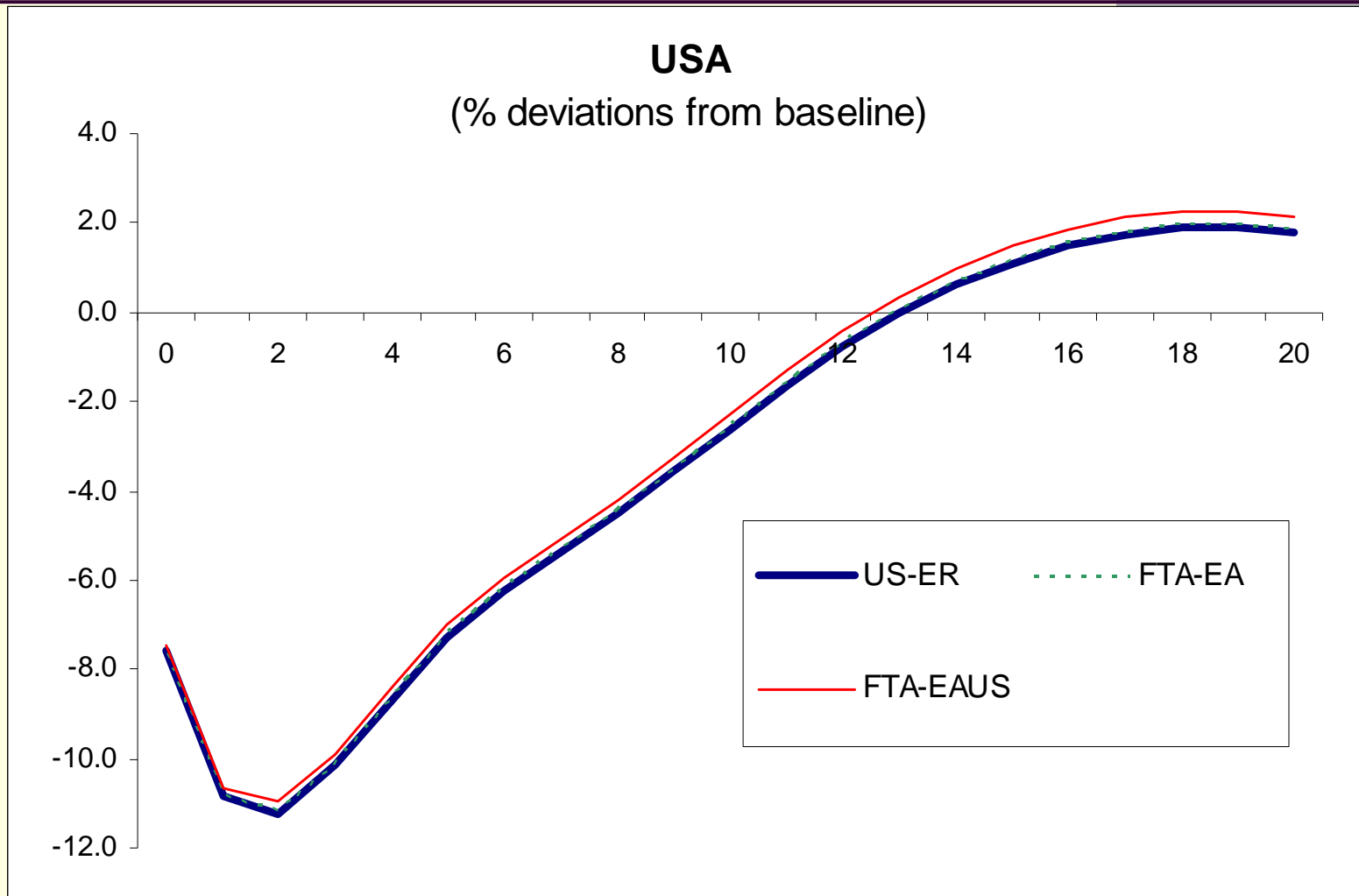
- **Three FTA scenarios built on *US-ER***
 - *FTA-CJU*: China-US-Japan FTA
 - *FTA-EA*: East Asia-wide FTA
 - *FTA-EAUS*: East Asian-US FTA
- **Implemented immediately in the beginning of simulation periods**

Long-term macroeconomic impacts of FTAs

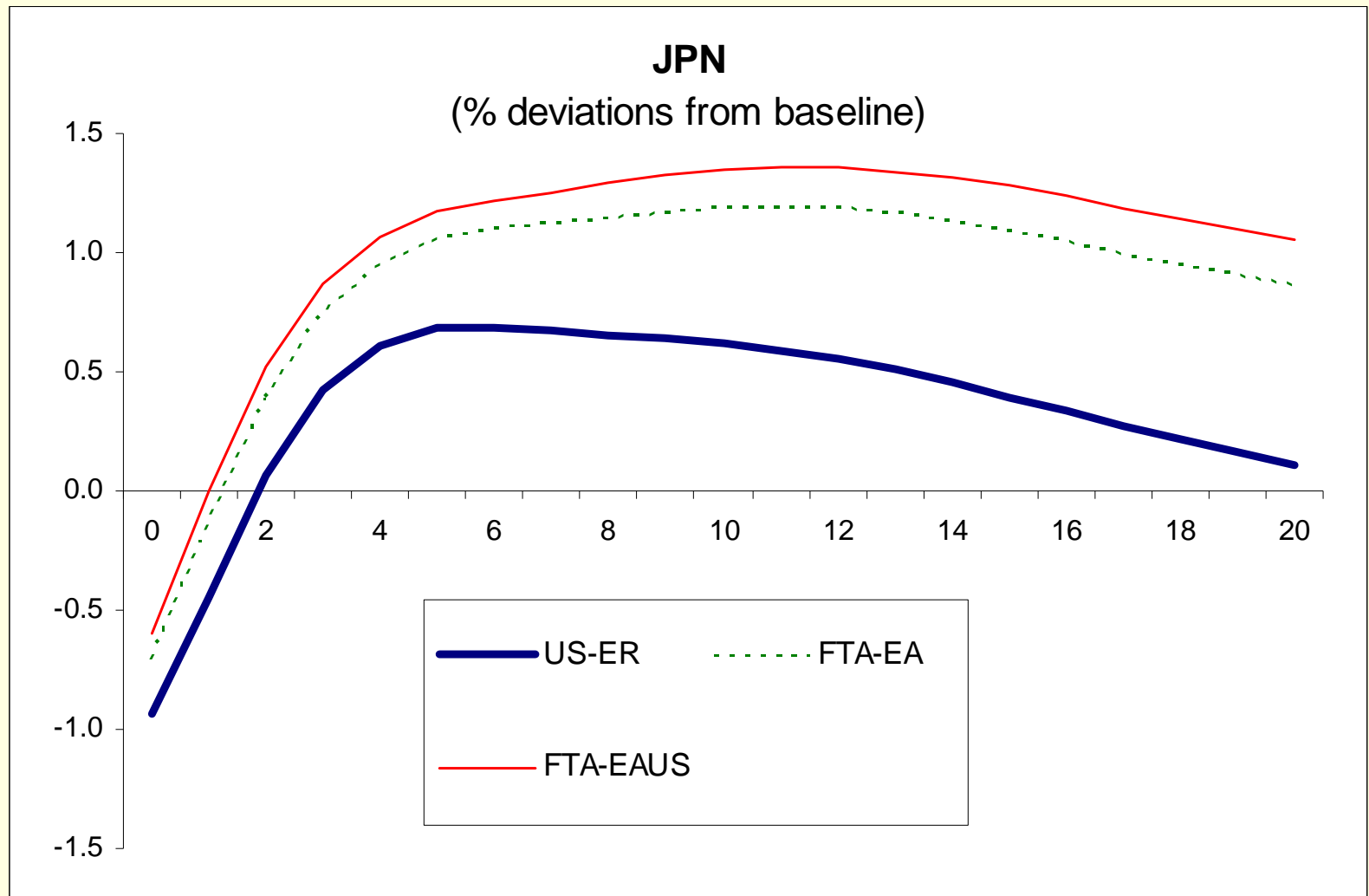
(% change relative to scenario US-ER)

	USA	Japan	PRC	OEA
<u>FTA-CJU</u>				
Real GDP	0.2	0.6	1.5	-0.1
Consumption	0.2	1.1	0.9	-0.1
Investment	0.5	1.2	2.0	-0.1
<u>FTA-EA</u>				
Real GDP	0.0	0.8	3.0	3.6
Consumption	0.0	1.7	1.2	3.7
Investment	0.1	1.7	4.4	5.4
<u>FTA-EAUS</u>				
Real GDP	0.4	1.0	3.8	4.0
Consumption	0.5	1.9	1.9	4.0
Investment	0.9	2.0	5.4	6.0

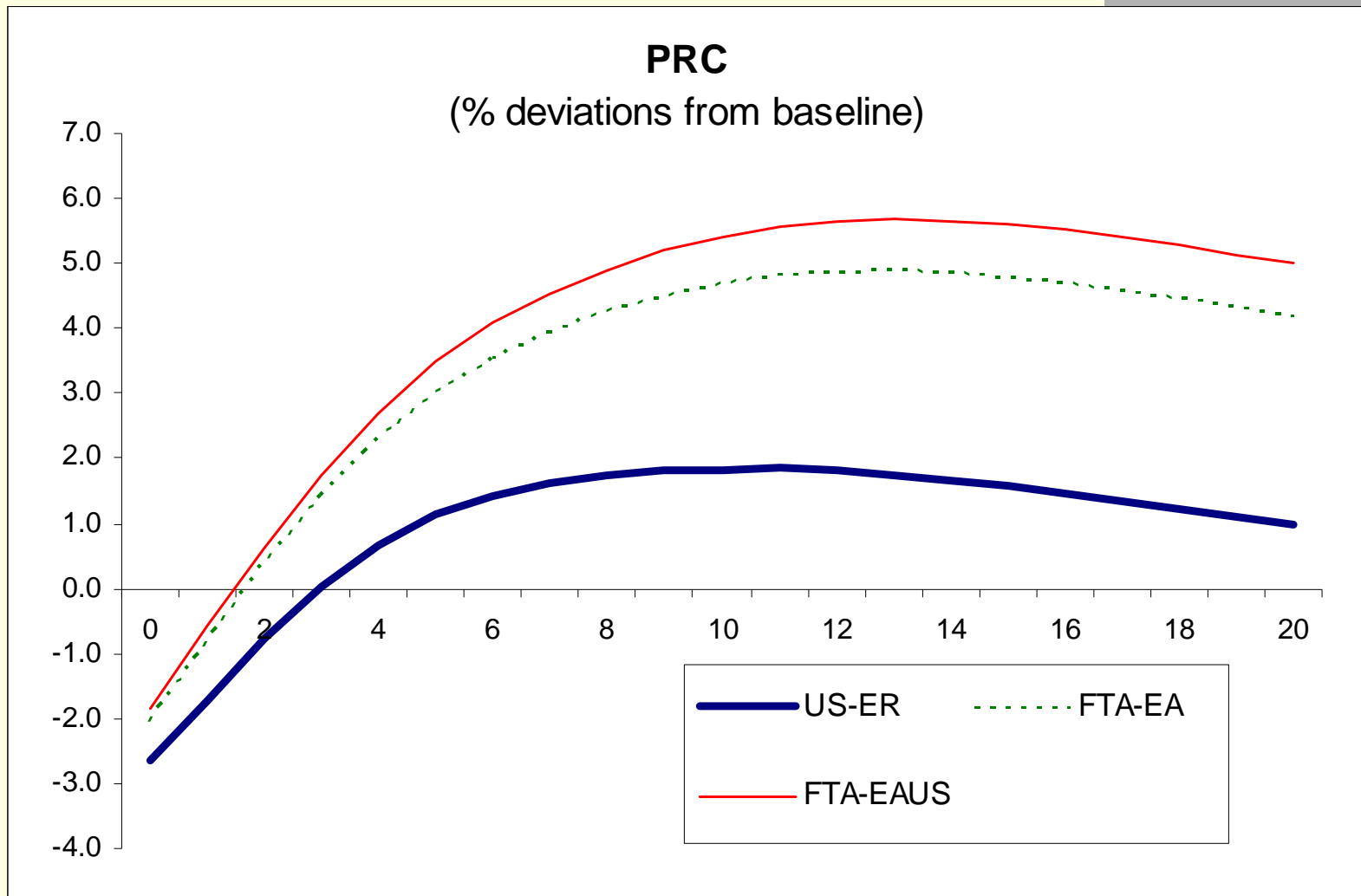
Short-term Output Impact of Global Crisis and FTAs - USA



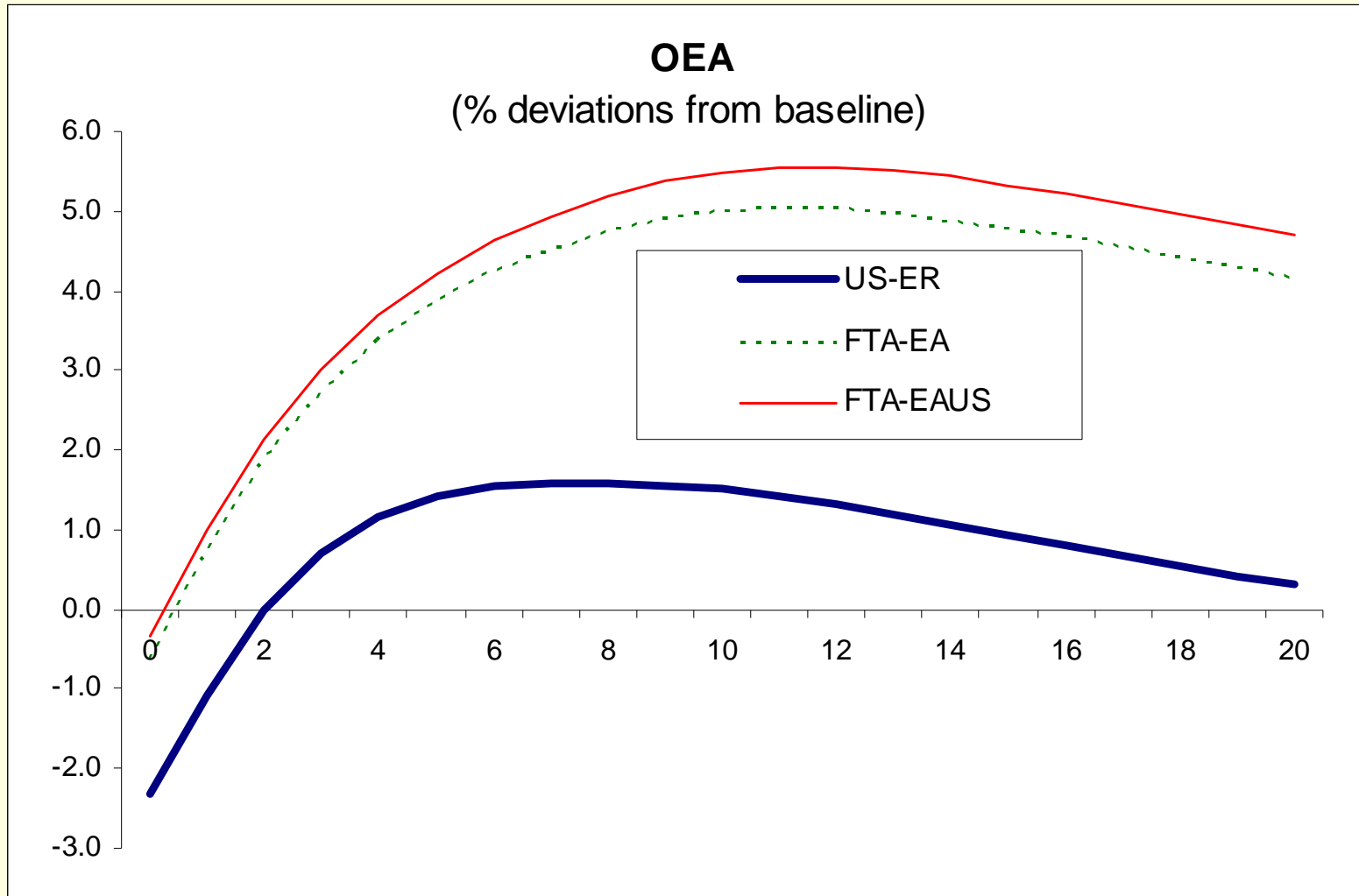
Output Impact of Global Crisis and FTAs - Japan



Output Impact of Global Crisis and FTAs - China



Output Impact of Global Crisis and FTAs – Other East Asian Economies



Conclusions

- China and other East Asian developing economies would be disproportionately and more severely hit by the recession in the US, given their high export exposures to the US.
- But the trade related spillover effect is generally modest compared with the output decline in the US.
- An abrupt exchange rate adjustment imposed by financial markets may entail larger risks on East Asian economies than US demand reduction.

Conclusions (cont'd)

- In terms of short-term impacts, a regional FTA with broad coverage may mitigate the impacts of crisis for some small open Asian developing economies.
- From a longer term perspective, FTAs do represent large benefits for regional economies.

Conclusions (cont'd)

- A trans-Pacific FTA between East Asia and US (EAUS FTA) gives the largest gains for both East Asian countries and the US. If this best scenario FTA is difficult to realize, East Asia can choose between (1) the China-Japan-US FTA (CJU FTA) and (2) the East Asia-wide FTA (EA FTA).
- Between the two, both Japan and China should choose (2) as it gives larger benefits for both countries and provides benefits for other East Asian economies. (1) leads to welfare losses on the part of other East Asian economies.
- Then, China, Japan and other East Asian countries can consider forming an FTA with the US, i.e., a trans-Pacific FTA (EAUS FTA).
- In this sense, an East Asia-wide FTA may be a practical bridge towards a broad inter-regional FTA covering both East Asia and the US.

Limitations of our study

- Transmission channels besides trade
- Monetary policy framework
- Sectoral details and inter-sectoral adjustment frictions
- Dynamics of firm entry and exit and firm heterogeneity