



"I know nothing about the subject,
but I'm happy to give you my expert opinion."

What Do GVCs Mean for Macroeconomic Policies?

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Disclaimer! *The views presented in this presentation are those of the author and do not necessarily reflect the views of the institutions he is affiliated with.*

Three Questions

- **What are the channels through which GVCs affect macroeconomic outcomes?**
- **What are the possible implications of GVCs for monetary policy?**
- **What type of model can help us understand these implications?**

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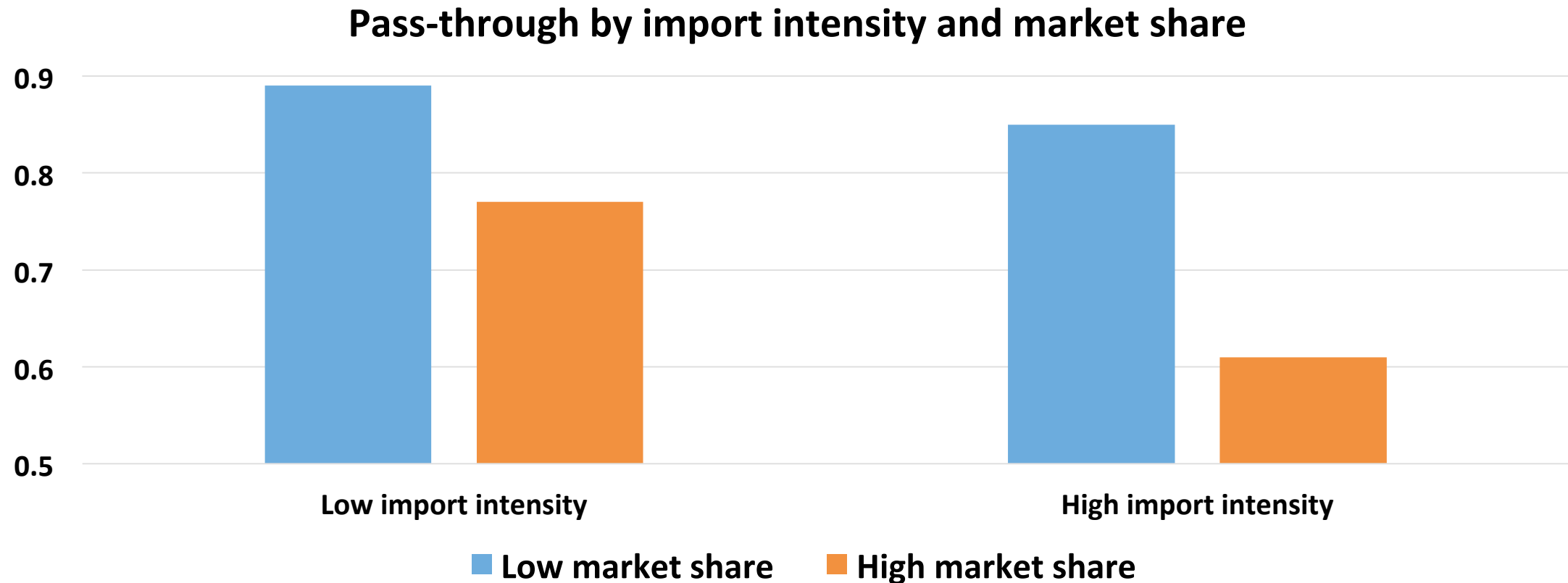
- **What are the channels through which GVCs affect macroeconomic outcomes?**

GVCs affect macro outcomes through multiple channels

- Exchange rate pass through
- Exchange rate elasticity of exports
- Transmission of cross-border shocks

Weaker exchange rate pass through?

The exchange rate pass through would be weaker in GVCs (relative to completely domestic production) due to changes in the cost of intermediary and factor inputs. Large and import-intensive firms have weaker exchange rate pass through since they naturally hedge through import prices and change profit margins instead of changing export prices (Amiti et al. 2015).

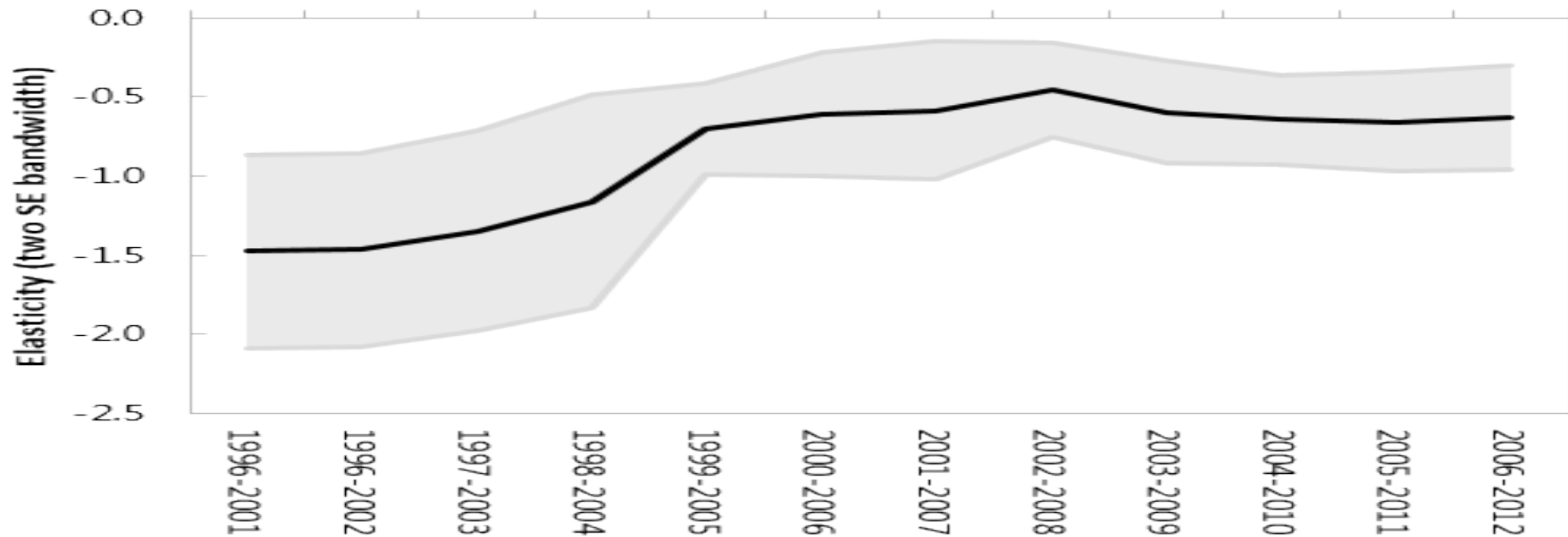


Source: Amiti et al. (2015). Market shares represent the firm's sector-destination-year specific export value divided by the sectors export value for the given destination and year. A high market share firm has a market share in the export market that is higher than average. Import intensity of a firm is defined as the ratio of total non-euro import value divided by total variable cost, average over time. A high import intensive firm has import intensity higher than the median.

Weaker impact of currency movements on exports?

RER-export elasticity: There has been a significant decline in exchange rate elasticity of exports over time (Ahmed, Appendino and Ruta 2015). The countries that are more tightly integrated in German supply chains experienced a much stronger flattening of the relationship between REER growth and export growth to Germany than those that are more loosely integrated in German supply chains.

Real Exchange Rate Change Elasticity

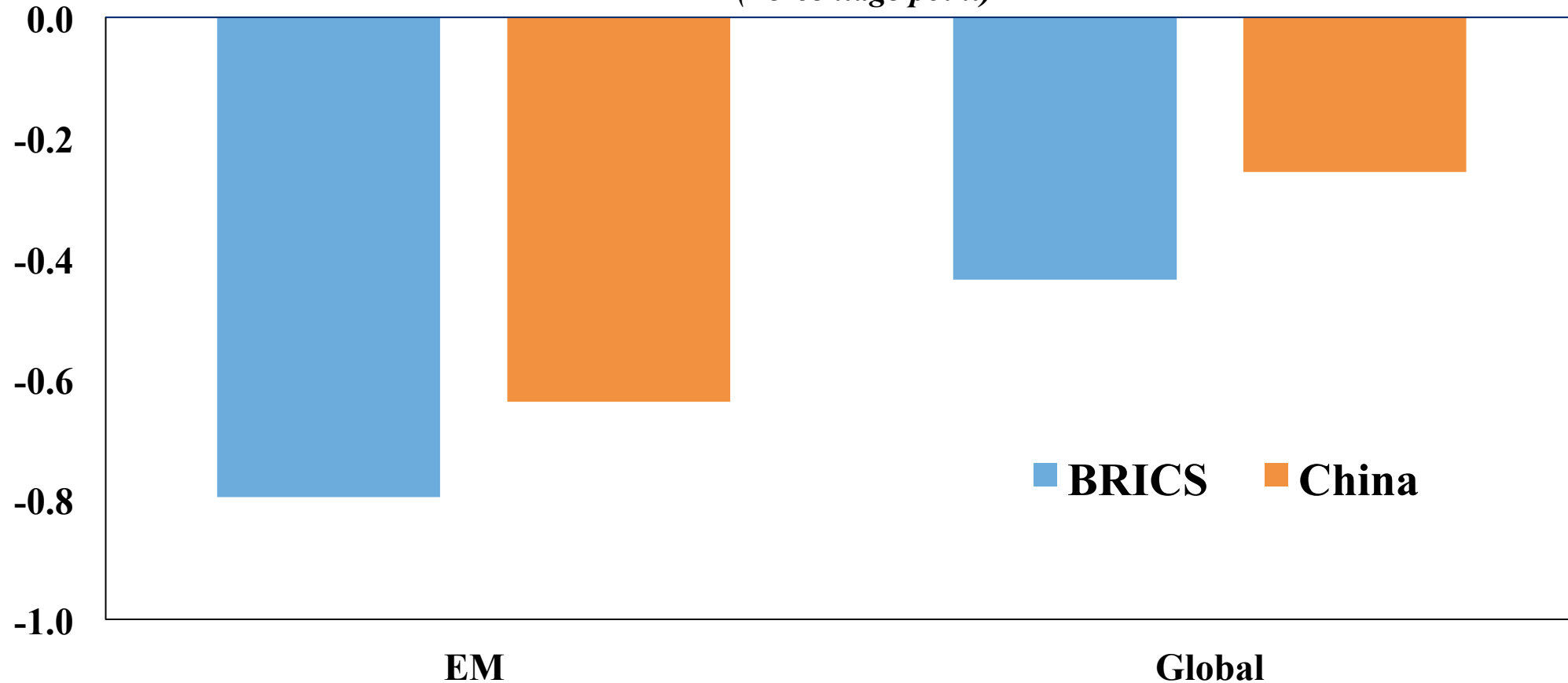


Stronger transmission of cross-border shocks and higher synchronization of cycles

- The relationship between trade intensity and business cycle synchronization depends on substitutability between traded goods.
- Trade in complements (substitutes) increases (decreases) business cycle synchronization between countries (Kose and Yi 2006, Burnstein et al. 2008, Giovanni and Levchenko 2010).
- Global value chains imply larger trade in complements, hence stronger co-movement between business cycles of production sharing countries (Ng 2010, Takeuchi 2011, De Soyres 2016, Duval et al. 2016).

But also need to know to what extent external shocks affect output through GVCs..

Impact on Growth of 1 Percentage Point Decline in BRICS and China's Growth on Other Emerging Markets and World
(Percentage point)



Source: World Bank staff estimates. ; Note: Cumulated impulse responses of EM and global growth at the two-year horizon. The shock size is such that BRICS growth declines by one percentage point on impact. The shock size for China is calibrated such that its growth declines by exactly the same amount as BRICS at the end of two years. Solid bars denote the median and the error bars denote the 33-66 percent confidence bands.

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GVCs: Changing nature of monetary policy transmission?

Channels	Monetary policy	
	Traditional trade	Channels affected by GVCs?
FX	Interest Rate -> Exchange Rate -> Exports -> AD	Exchange Rate-> Export
Interest rate	Interest Rate -> Investment -> AD	Interest Rate -> Investment
Balance sheet	Interest Rate -> Domestic Asset Prices -> Balance Sheets -> Investment -> AD	Domestic Asset Prices -> Balance Sheets -> Investment
Credit channel	Interest Rate -> Credit Channel -> Investment, Consumption -> AD	Credit Channel -> Investment
Spillovers	Interest Rate -> Domestic AD -> Imports -> Foreign AD	Third Country Monetary Policies

Three Questions

- **What are the channels through which GVCs affect macroeconomic outcomes?**
- **What are the possible implications of GVCs for monetary policy?**
- **What type of model can help us understand these implications?**

Wanted! A model to study monetary policy implications of GVCs - 1

- A multi-country DSGE model with cross-border input trade and nominal rigidities
- A three (or multi-) country, multi-sector international RBC model similar to Johnson (2014)
- Allowing cross border input trade (so analysis of GVCs possible): sector-level production takes a CES form using
 - the composite domestic factor inputs (a Cobb-Douglas function of capital and labor)
 - a composite of intermediate goods from other sectors and countries (aggregated with CES)
 - sector-specific productivity shocks

Wanted! A model to study monetary policy implications of GVCs - 2

- Employ nominal frictions as standard DSGE models
(Smets and Wouters 2007; Christiano, Eichenbaum, and Evans 2005).
- Analyze the following issues under high/low GVC integration (implement by adjusting elasticity parameters in CES aggregators of intermediate goods):
 - Impact of a domestic monetary policy shock
 - International spillovers through monetary policy and productivity shocks

Three Questions

- What are the channels through which GVCs affect macroeconomic outcomes?
exchange rate channel, transmission of shocks
- What are the possible implications of GVCs for monetary policy?
likely affects the transmission channels of monetary policy
- What type of model can help us understand these implications?
a DSGE model that has GVCs and clear role for policy

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“I would like to know how the macroeconomic model that I more or less believe can be reconciled with the trade models that I also more or less believe. [...] What we need to know is how to evaluate the microeconomics of international monetary systems. Until we can do that, we are making policy advice by the seat of our pants.”

Paul R. Krugman (1995), “What Do We Need to Know about the International Monetary System?” in Peter B. Kenen, ed., *Understanding Interdependence*, Princeton U Press.

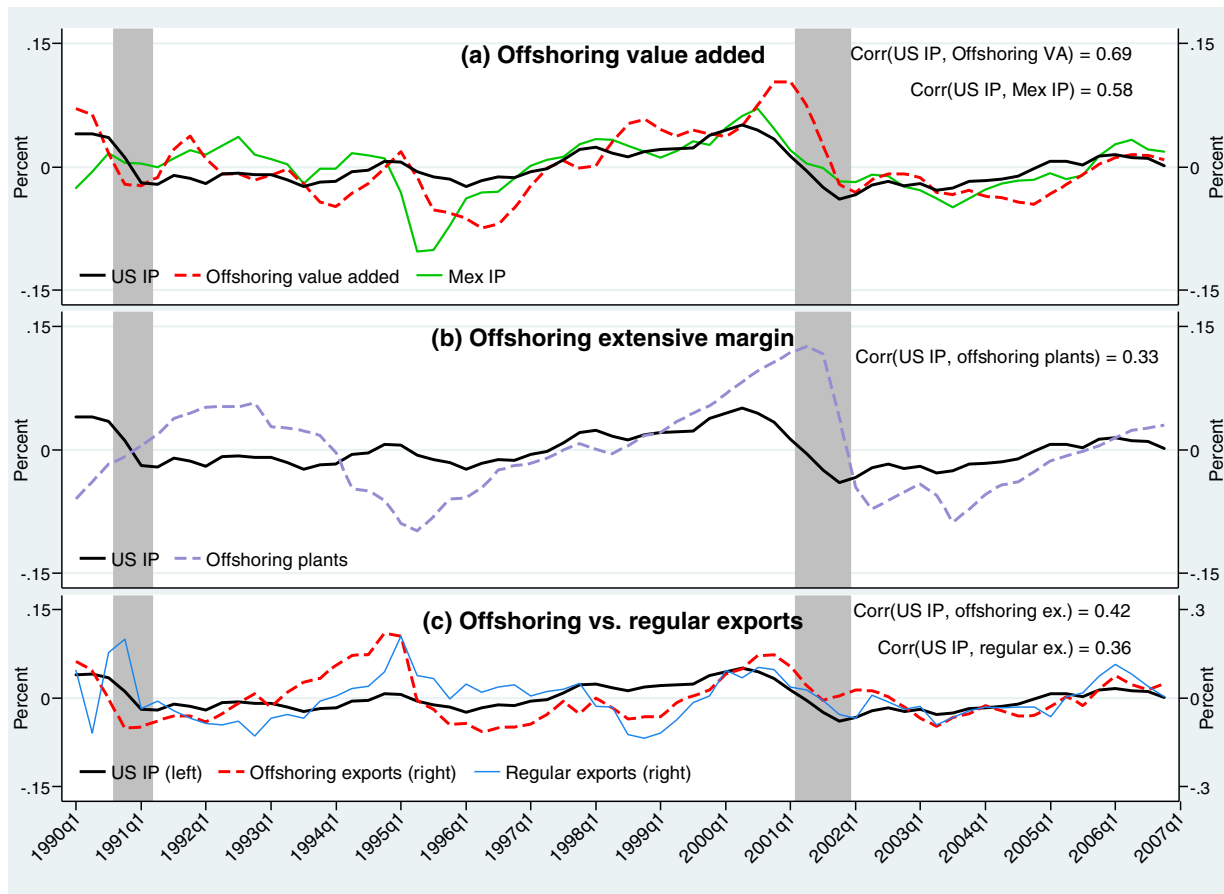


Fig. 1. Business cycle properties of offshoring to Mexico. Note: The data series are from Federal Reserve Board (for the U.S. manufacturing IP and U.S. real GDP), INEGI (for Mexico's manufacturing IP, real GDP, the maquiladora real value added, and the number of establishments), and the International Financial Statistics via Haver Analytics (for Mexico's maquiladora and non-maquiladora exports in dollars, deflated by PPI). The series are seasonally adjusted, converted in natural logs, and expressed in deviations from a Hodrick-Prescott trend. The shaded areas represent the U.S. recessions during 1990:Q3–1991:Q1 and 2001:Q1–2001:Q4, as defined by the NBER. If the U.S. and Mexico's real GDP are used instead of manufacturing IP, the correlations are largely similar: 0.54 and 0.45 for the U.S. GDP with the maquiladora value added and Mexico's GDP; 0.34 for the U.S. GDP with and the number of maquiladora establishments; 0.55 and 0.34 for the U.S. GDP with Mexico's maquiladora and non-maquiladora real exports, respectively.

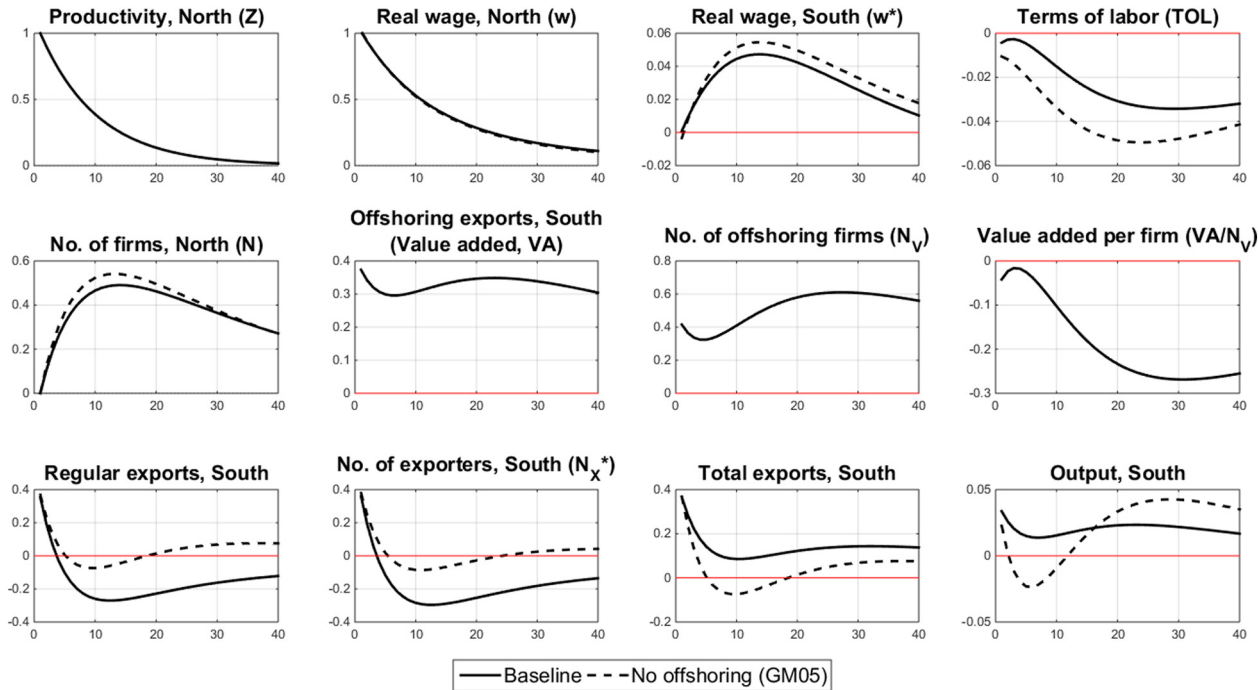


Fig. 4. Impulse responses, (1) baseline model vs. (2) model with no offshoring (GM05).

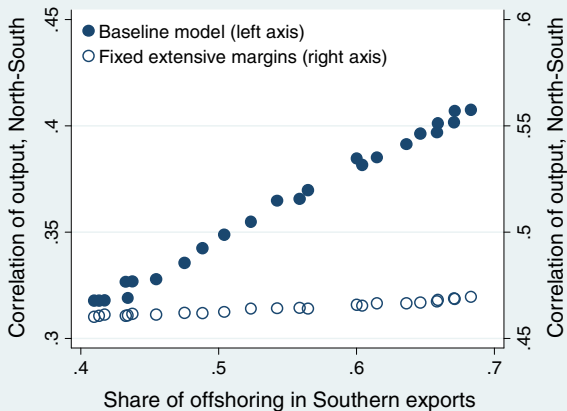
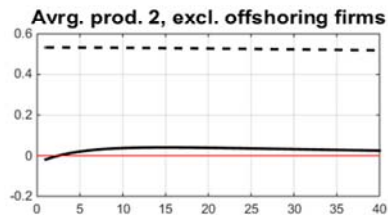
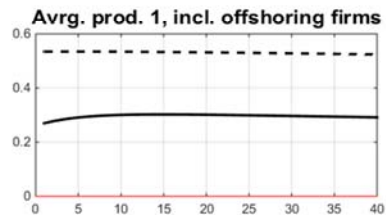
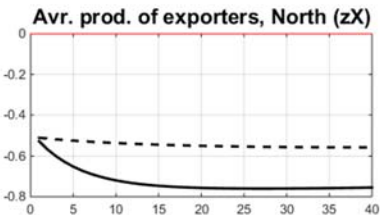
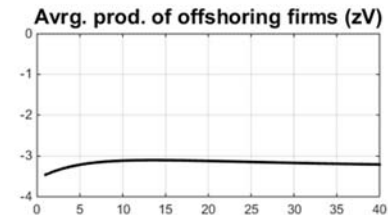
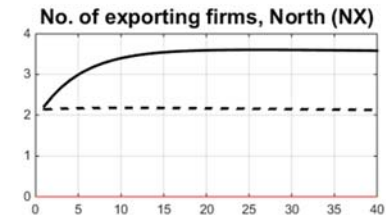
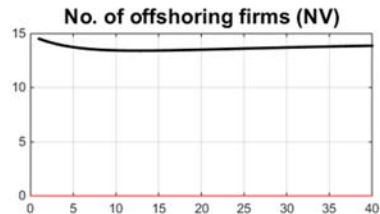
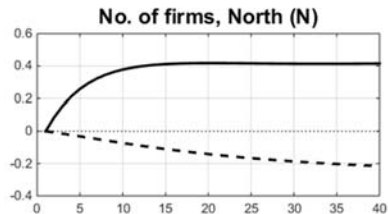
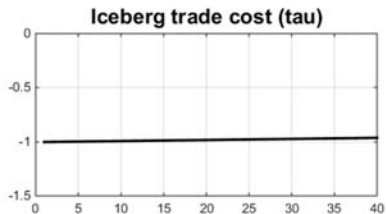


Fig. 7. Offshoring and output comovement. Note: “Fixed extensive margins” refers to the model with fixed firm entry and fixed cutoffs for offshoring and exporting. The alternative calibrations vary the share of offshoring in Southern exports (on the horizontal axis) while keeping the ratios of exports to GDP in the North and the South close to their steady-state levels from the baseline model.



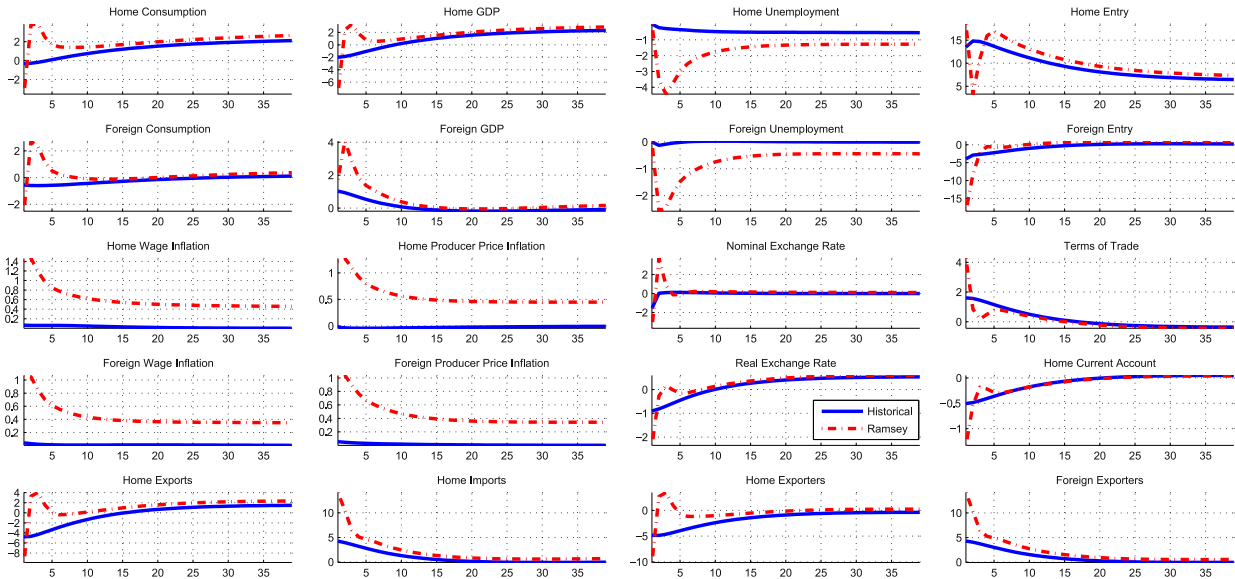
— Baseline - - - No offshoring (GM05)

TABLE 7: TRADE INTEGRATION AND GDP COMOVEMENT

	$\Delta corr(Y_{R,t}, Y_{R,t}^*)$ —Producer Currency Price		
	$\frac{Trade}{GDP} = 0.1$	$\frac{Trade}{GDP} = 0.2$	$\frac{Trade}{GDP} = 0.35$
Historical Rule	0.36	0.45	0.49
Peg	0.05	0.19	0.27
Ramsey	0.07	0.29	0.43
Nash	0.28	0.35	0.48
	$corr(Y_{R,t}, Y_{R,t}^*)$ —Local Currency Price		
	$\frac{Trade}{GDP} = 0.1$	$\frac{Trade}{GDP} = 0.2$	$\frac{Trade}{GDP} = 0.35$
Historical Rule	0.33	0.42	0.47
Peg	0.05	0.20	0.27
Ramsey	0.36	0.53	0.62
Nash	0.28	0.36	0.42

TABLE 6: TRADE INTEGRATION – NON STOCHASTIC STEADY STATE

	Ramsey Gain	Ramsey Inflation
$\frac{Trade}{GDP} = 0.1$	0.34%	1.40%
$\frac{Trade}{GDP} = 0.2$	0.22%	1.20%
$\frac{Trade}{GDP} = 0.35$	0.16%	1.05%



Home product market deregulation, flexible regulation in foreign. Historical policy (solid) versus optimal policy (dashes).

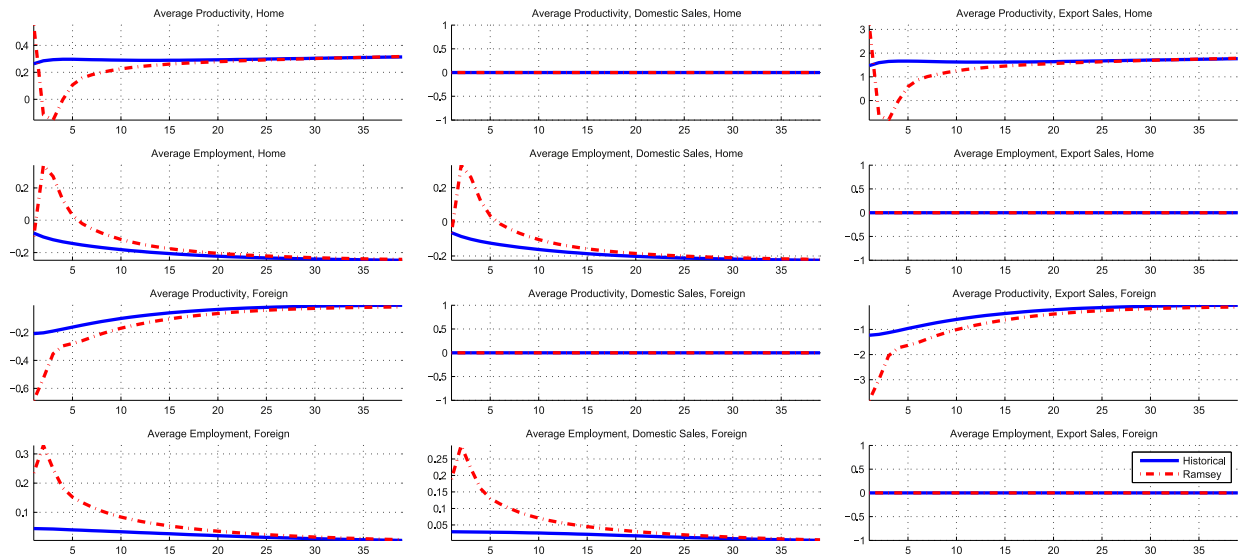


Fig. 2. (b) Home product market deregulation, productivity and labor reallocation effects.

Table 3

Welfare effects of reforms, non-stochastic steady state.

Market reform	Δ Welfare (Historical)		Δ Welfare (Ramsey)		Ramsey inflation	
	Home (%)	Foreign (%)	Home (%)	Foreign (%)	Home (%)	Foreign (%)
Status quo (Flexible Foreign)	0	0	0.54	0.27	1.85	1.38
PMR	2.34	0.04	2.84	0.31	1.81	1.37
LMR	3.93	0.17	4.23	0.43	1.40	1.36
JOINT	6.10	0.21	6.37	0.46	1.36	1.36

Note: PMR \equiv product market reform; LMR \equiv ; labor market reform; JOINT \equiv product and labor market reform; Δ Welfare (historical) \equiv welfare change under historical policy; and Δ Welfare (Ramsey) \equiv welfare change under Ramsey policy.

Are GVCs Macro Relevant?

Martin Kaufman

Assistant Director

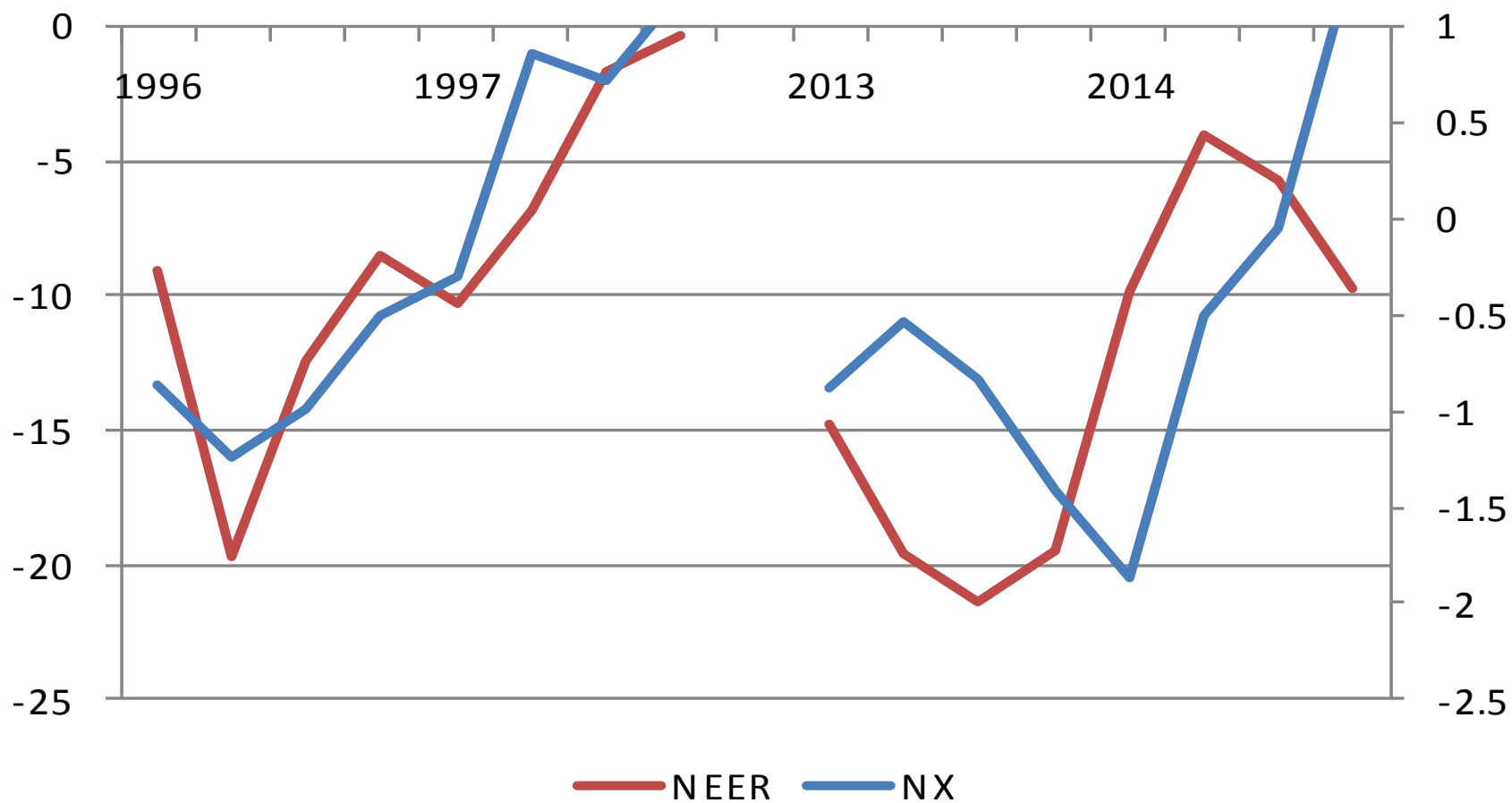
Strategy, Policy and Review Department

IMF

Do GVCs matter for...?

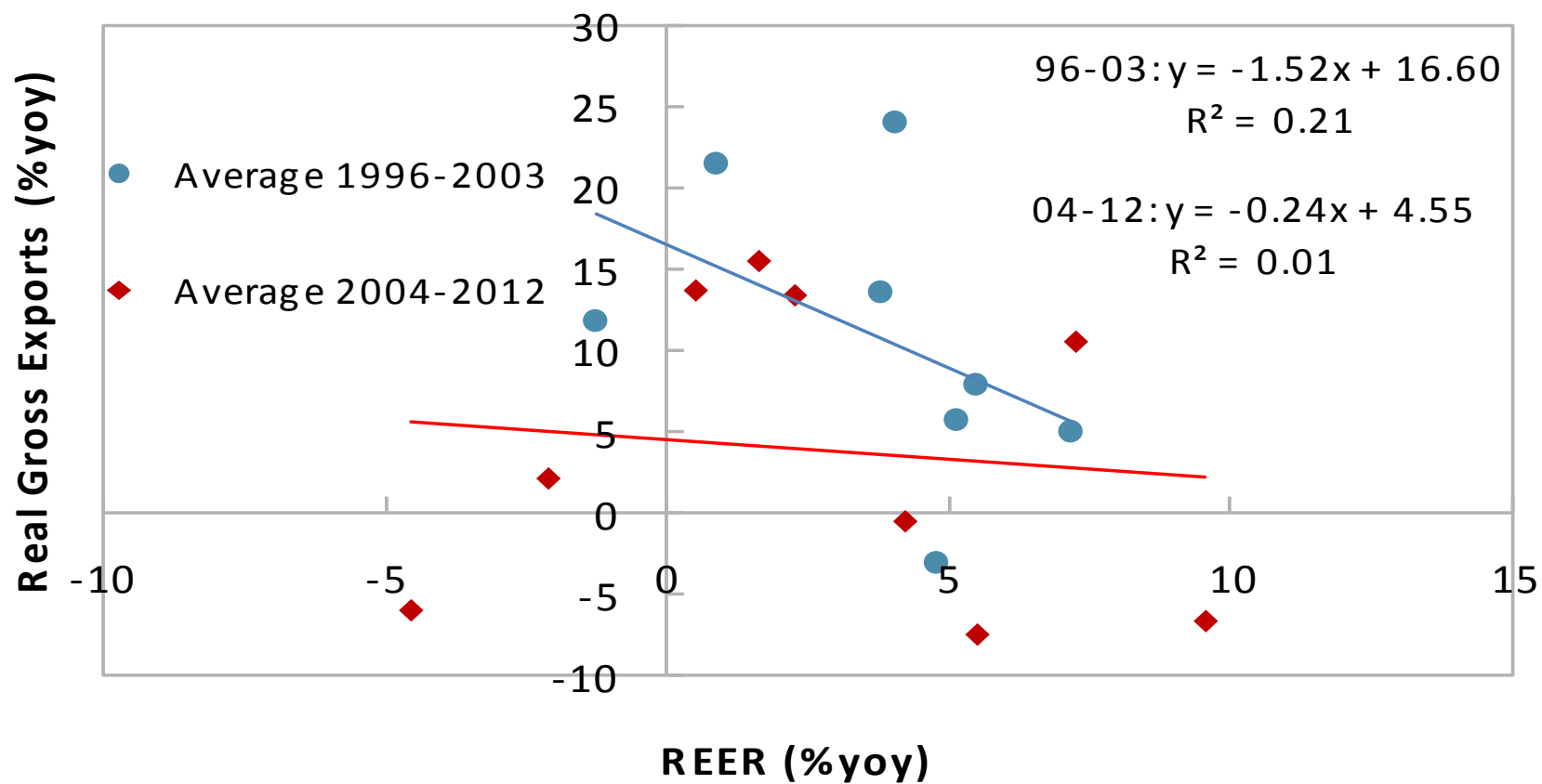
- ❖ ER elasticities
- ❖ Competitiveness
- ❖ Spillovers

ER Elasticities



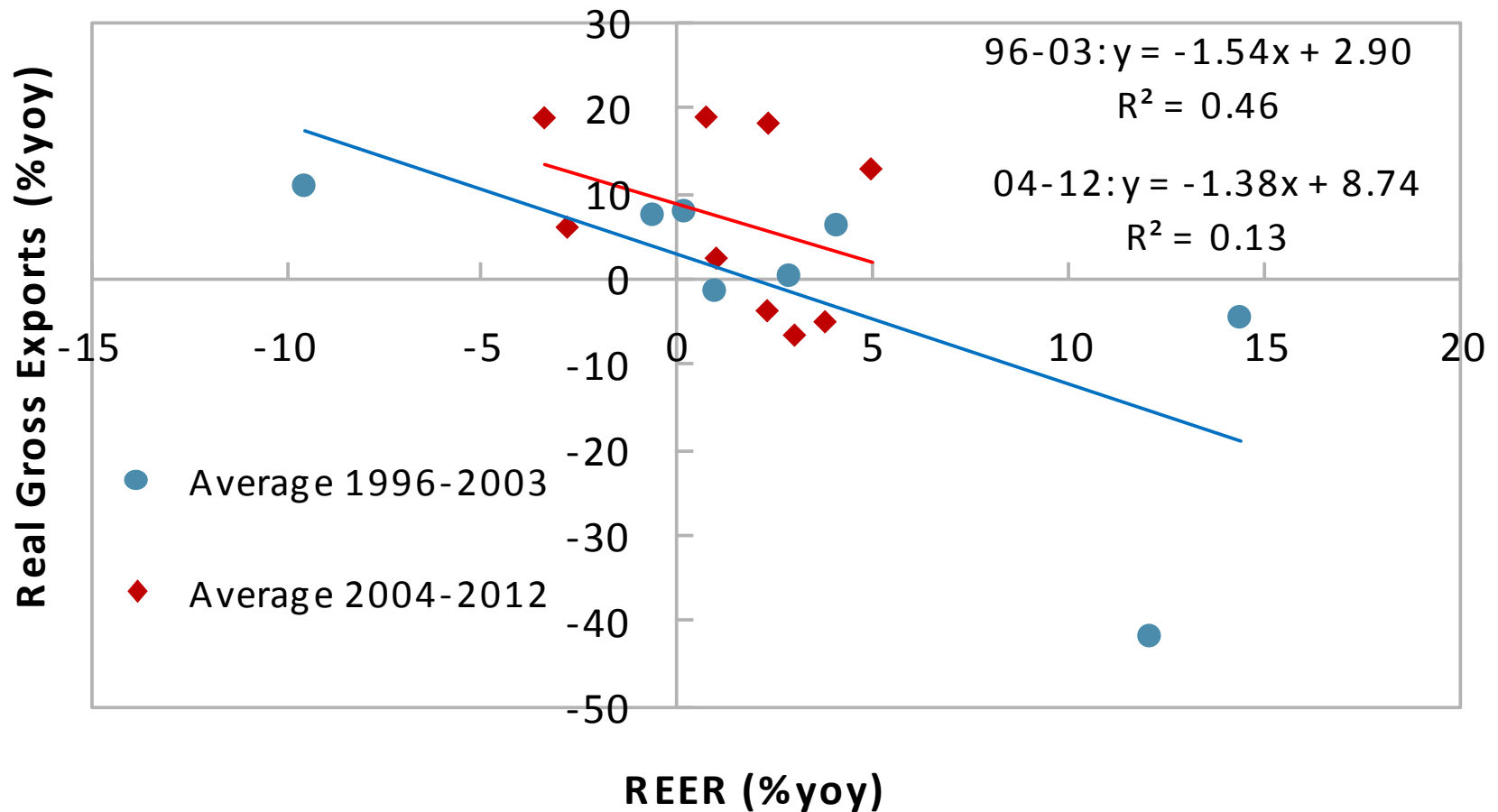
Source: IMF

Poland, Hungary, Czech Republic and Slovakia - Exports to Germany

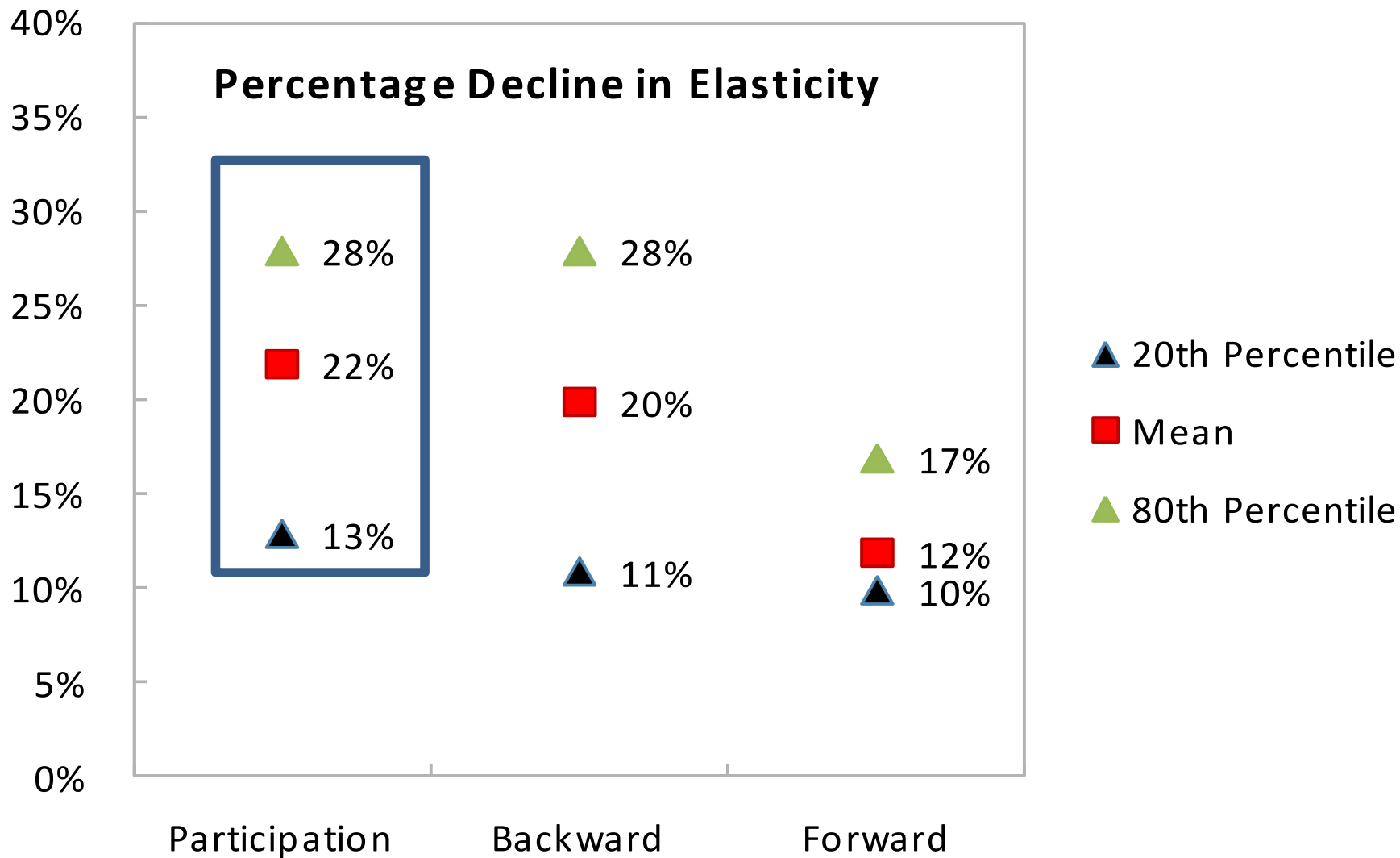


Sources: Ahmed, Appendino and Ruta (2015)

Bulgaria, Latvia, Lithuania, Romania and Slovenia - Exports to Germany



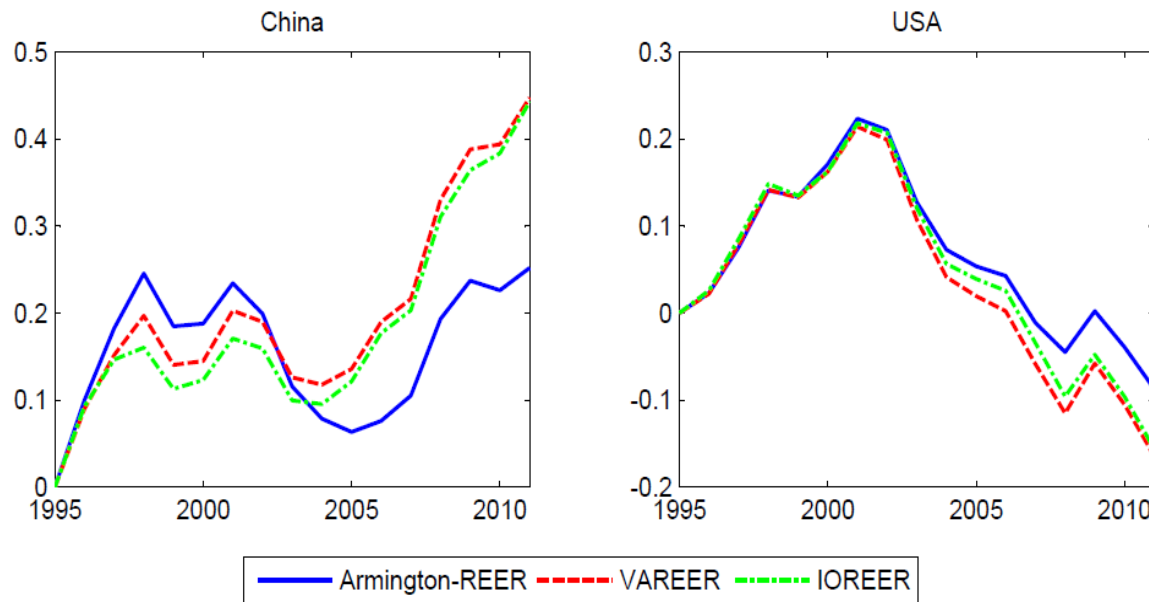
Sources: Ahmed, Appendino and Ruta (2015)



Sources: Ahmed, Appendino and Ruta (2015)

GVCs and Competitiveness

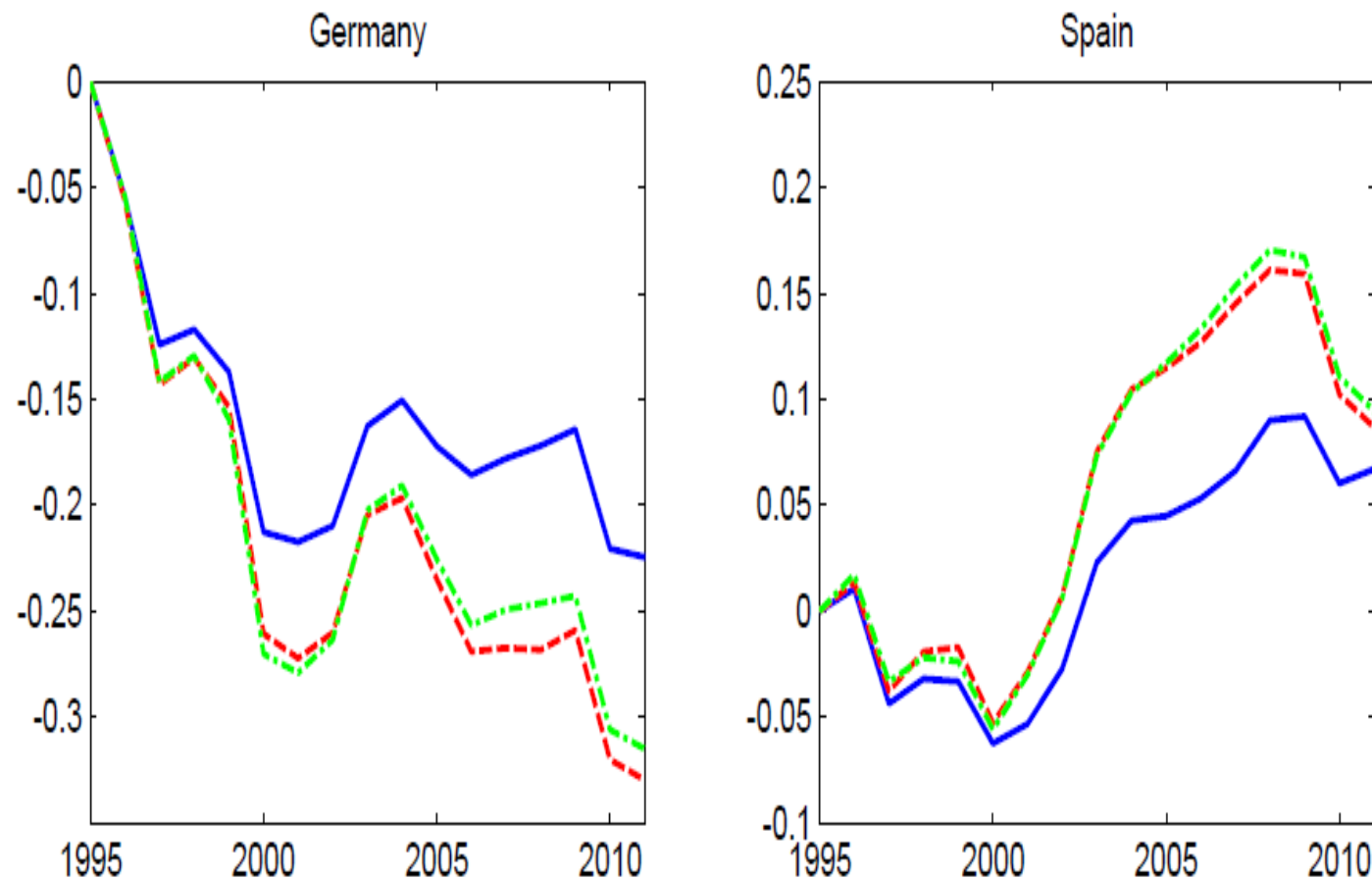
Figure 10: Real Effective Exchange Rates for China and United States, 1995-2011



Note: VAREER weights are based on final demand and production elasticities $\{\sigma, \gamma, \rho\} = \{1, 1, 1\}$. IOREER weights are based on final demand and production elasticities $\{\sigma, \gamma, \rho\} = \{3, 0, 0\}$. The level of the log REERs is normalized to zero in 1995. Data from WIOD.

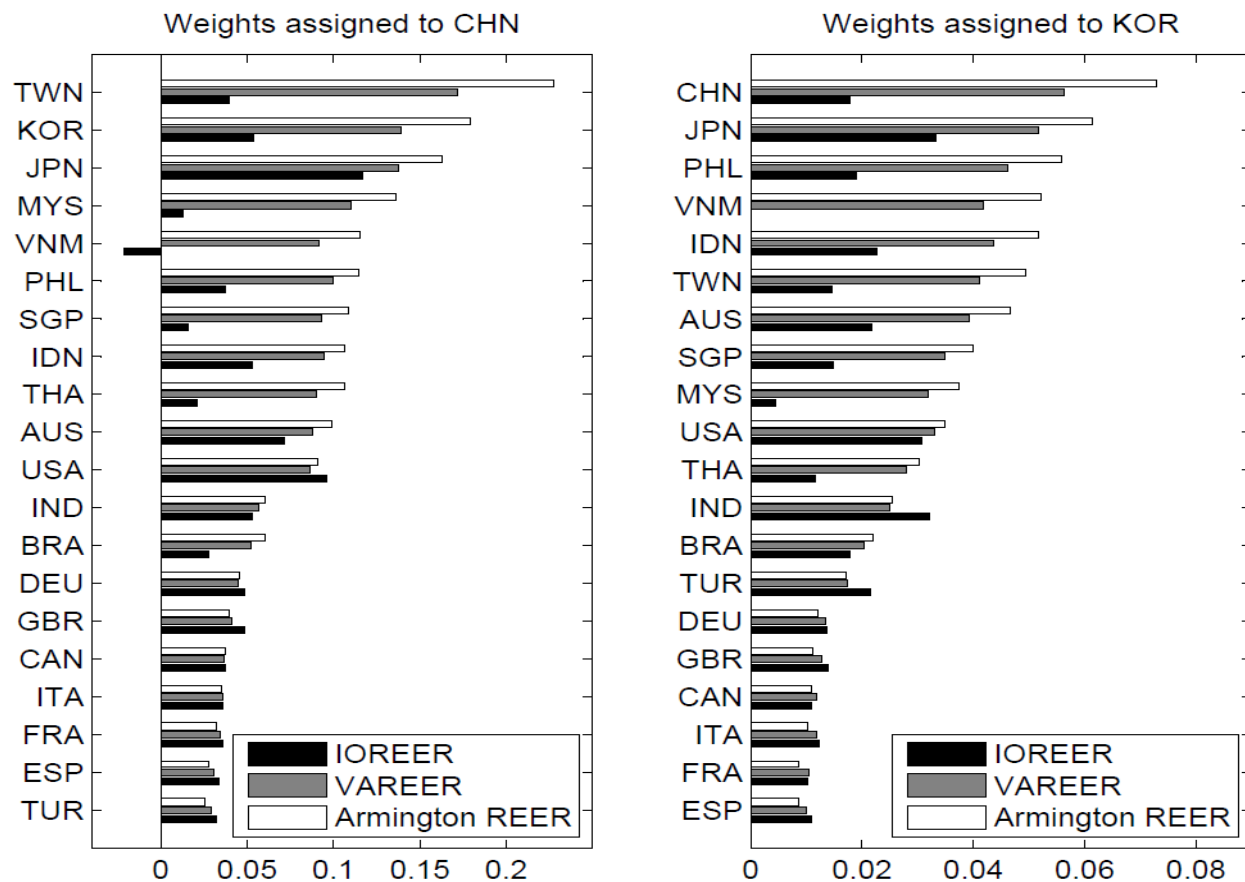
Sources: Bems and Johnson (2015)

Figure 9: Real Effective Exchange Rates for Select EMU Countries, 1995-2011



Sources: Bems and Johnson (2015)

Figure 4: REER Weights Assigned to China and South Korea, 2004



Note: VAREER weights are based on final demand and production elasticities $\{\sigma, \gamma, \rho\} = \{1, 1, 1\}$. IOREER weights are based on final demand and production elasticities $\{\sigma, \gamma, \rho\} = \{2.9, 0, 0\}$. Data from GTAP.

Sources: Bems and Johnson (2015)

China has become an important trade partner for most EMs...



But list is much longer...

- GVCs: role of macro environment (e.g., German supply chain: E vs. S)?
- What does comparative advantage mean with production fragmentation? Is H-O-V dead?
- Do GVCs accelerate catch up? Increased complementarities/benefits with structural reforms?
- GVCs and new trade policy frontiers