

# The trade and demand nexus: Do global value chains matter?

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**WORK IN PROGRESS...**

Enhancing competitiveness and fostering sustainable growth:  
methodological issues and empirical results  
Frankfurt, 25 June 2015

- 1 Motivation
- 2 Literature
- 3 Empirical set-up
- 4 Results
- 5 Concluding remarks

## 1 Motivation

2 Literature

3 Empirical set-up

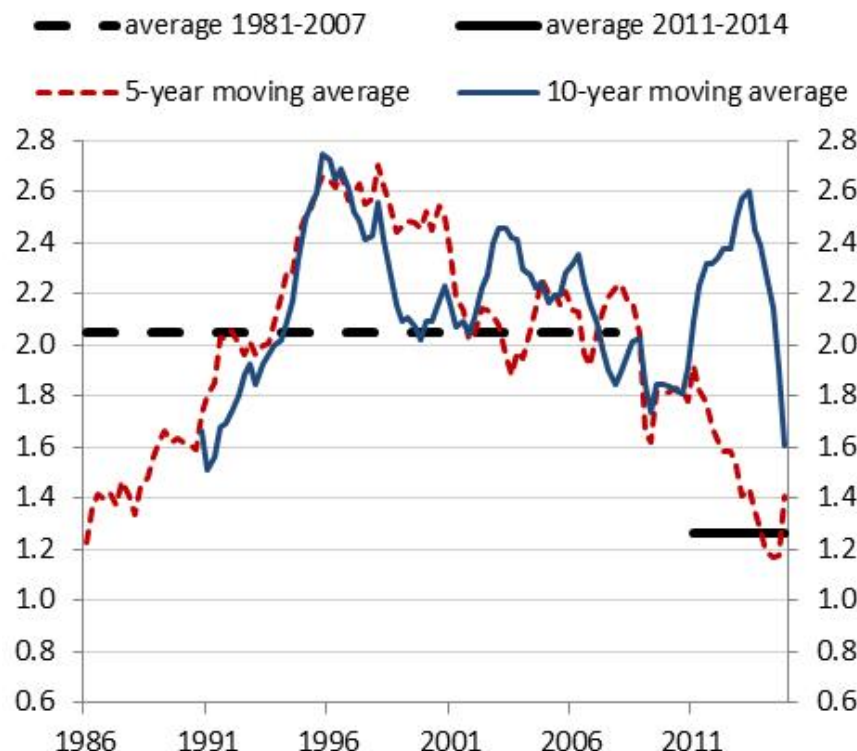
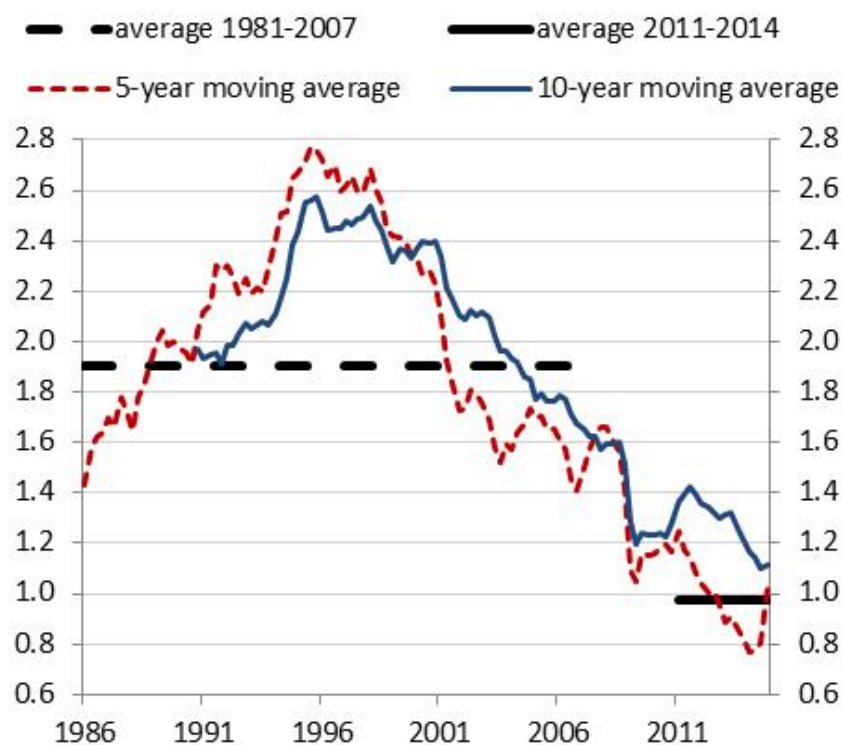
4 Results

5 Concluding remarks

**Puzzle 1: Trade grew consistently faster than GDP.**

**Puzzle 2: The trade-GDP ratio declined since the mid-90s.**

Ratio of global import growth to GDP growth  
(in PPP) (in USD)



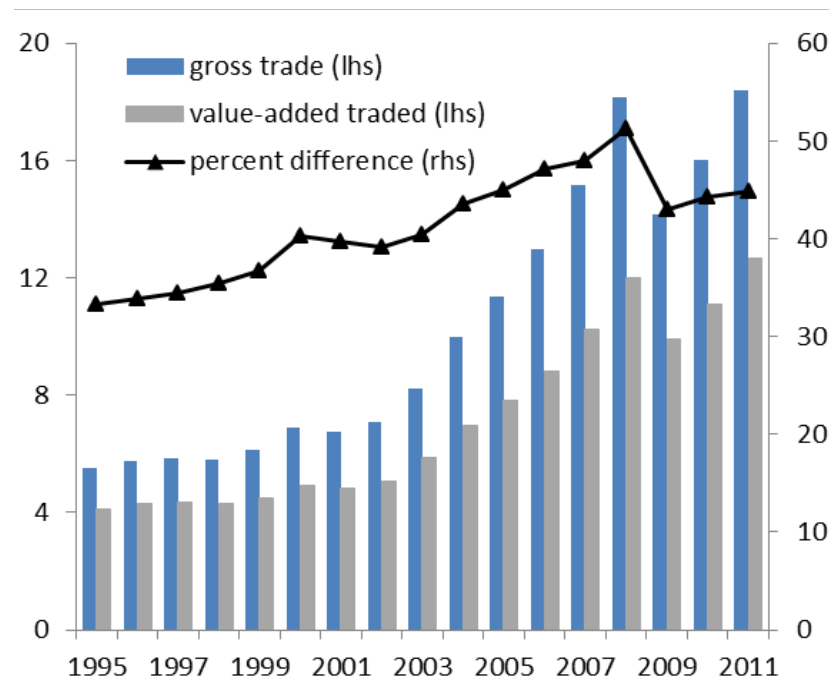
Source: ECB staff calculations.

- **Impressive increase in world trade over past decades facilitated by:**

- Dismantling of tariff barriers (GATT / WTO), unprecedented trade liberalization
- Entry of new global traders (rising importance of EMEs)
- Financial account liberalization (FDI, trade in services)
- Technological progress in ICT

- **All these structural innovations fostered the emergence of “global value chains” (GVCs)**

## Global gross versus value-added trade



Source: WIOD and ECB staff calculations.

- **Standard trade models failed to explain changes in trade-GDP growth ratio**
- **Reasons for these changes are unknown, cyclical or structural?**
- **This paper analyses the role of GVCs in this context (= possible structural reason).**
- **We include indicators for the participation in GVCs in a standard import demand equation.**

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- **Yi (2001):**
  - Falling trade barriers too weak and too early to explain high trade growth, but vertical specialisation can explain the puzzle
- **Gangnes, Ma & Assche (2014):**
  - 2 channels how GVCs have increased trade income elasticity: composition effect and supply chain effect
- **Eaton, Kortum & Romalis (2011):**
  - During the crisis, spending shifted away from durable goods → evidence for composition effect hypothesis
- **Alessandria, Kaboski & Midrigan (2010); Altomonte, di Mauro, Ottaviano, Rungi & Vicard (2012); Bems, Johnson & Yi (2012):**
  - Disproportionally large inventories in GVC trade, higher sensitivity of trade to foreign income shocks, bullwhip effect
- **Constantinescu, Mattoo & Ruta (2015):**
  - decline in trade-GDP ratio started long before the crisis, thus reflecting longer term structural reasons



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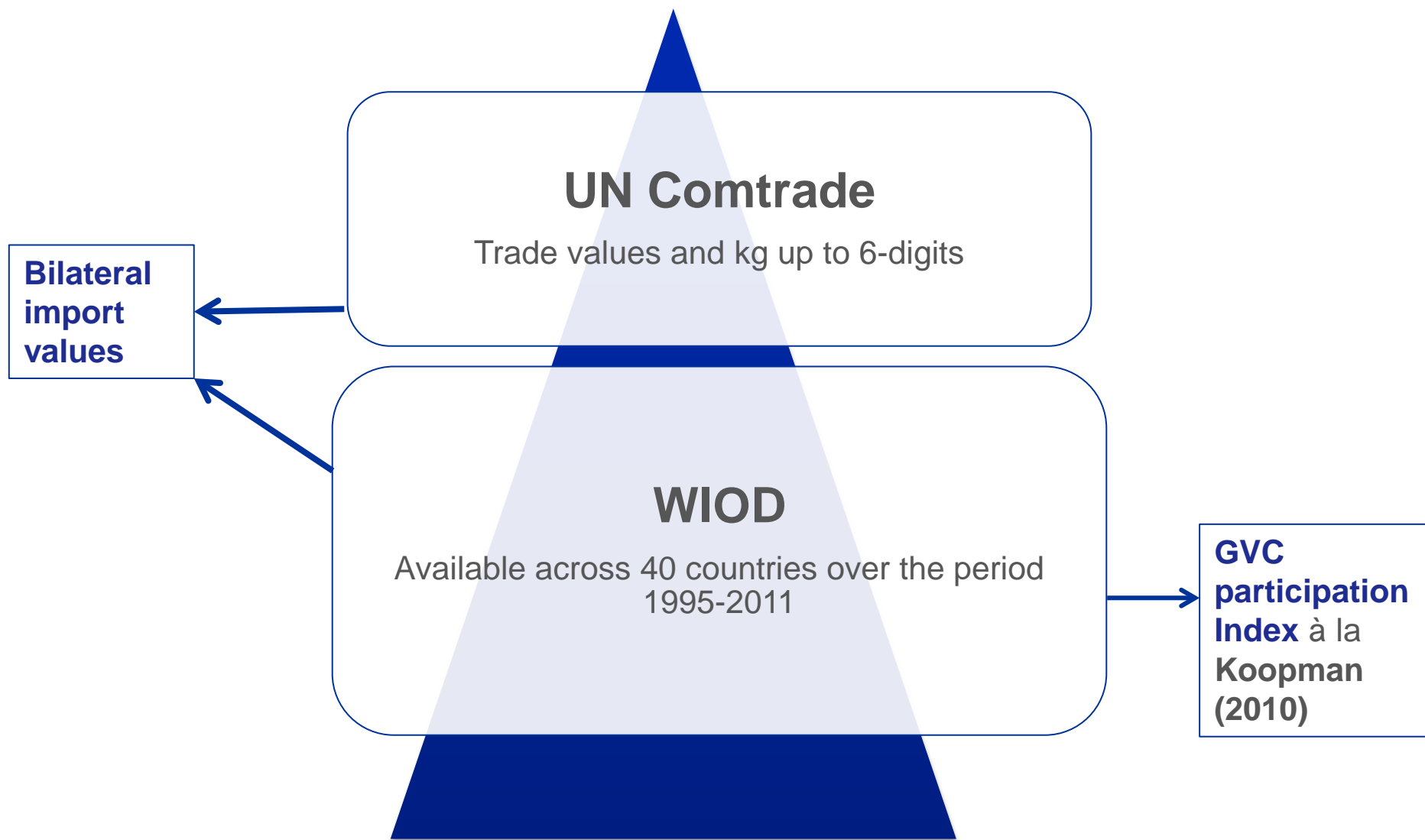
5 Concluding remarks

$$\ln(M_{ijt}) = \alpha_{ij} + \alpha_1 \ln(TFE_{it}) + \alpha_2 \ln\left(\frac{P_{jt}}{P_{it}}\right) + \alpha_3 \ln(ER_{ijt}) + \varepsilon_{ijt}$$

$$\begin{aligned} \ln(M_{ijt}) = & \gamma_{ij} + \gamma_1 \ln(TFE_{it}) + \gamma_2 \ln\left(\frac{P_{jt}}{P_{it}}\right) + \gamma_3 \ln(ER_{ijt}) \\ & + \gamma_4 \ln(TFE_{it}) * \ln(GVC_{part}_{it}) + \varepsilon_{ijt} \end{aligned}$$

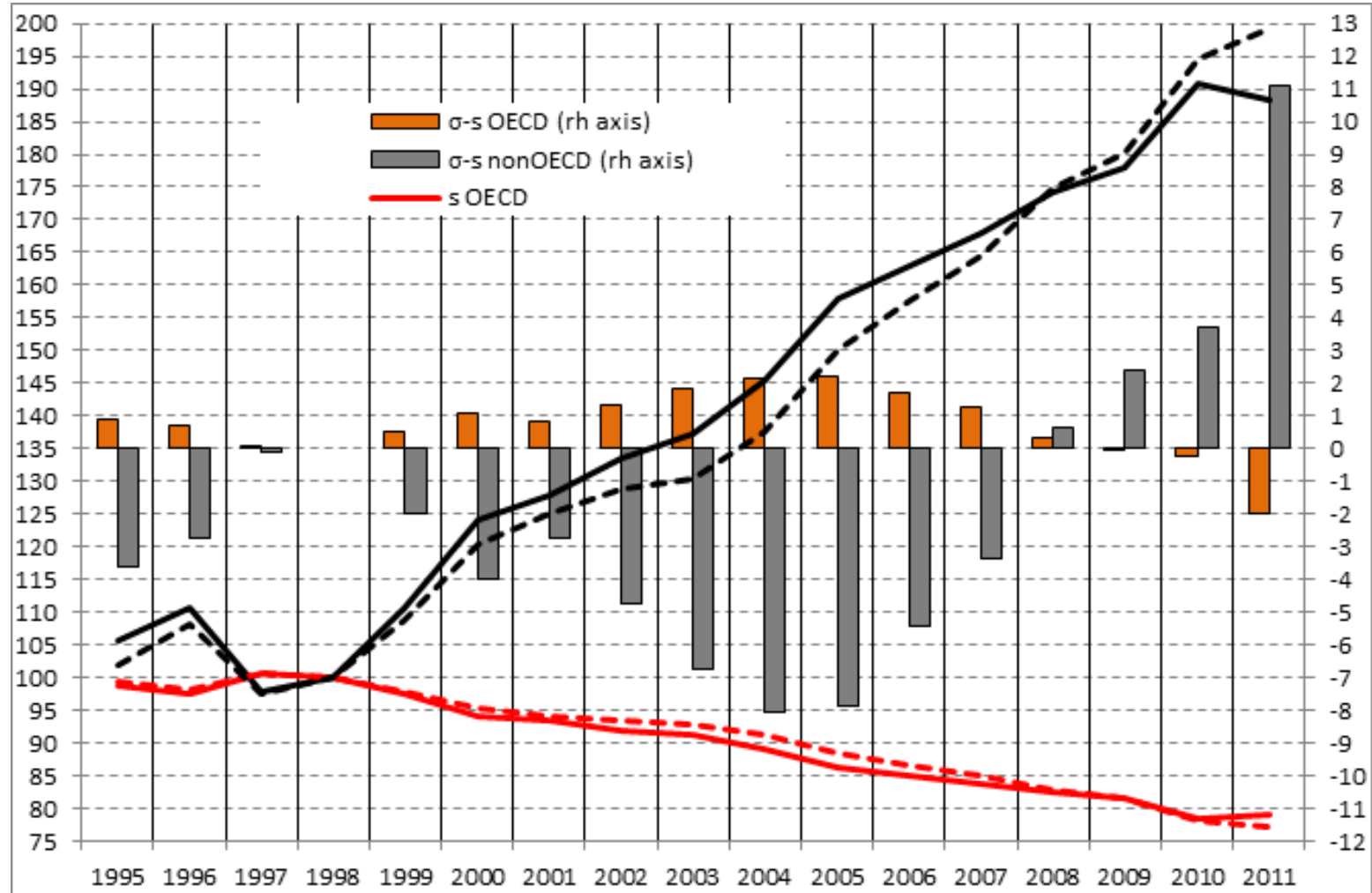
- **First estimation 1995-2011**
- **Most G20 and EU countries**

## Two different data sources for the trade variables:



## Domestic value added content of exports and gross exports

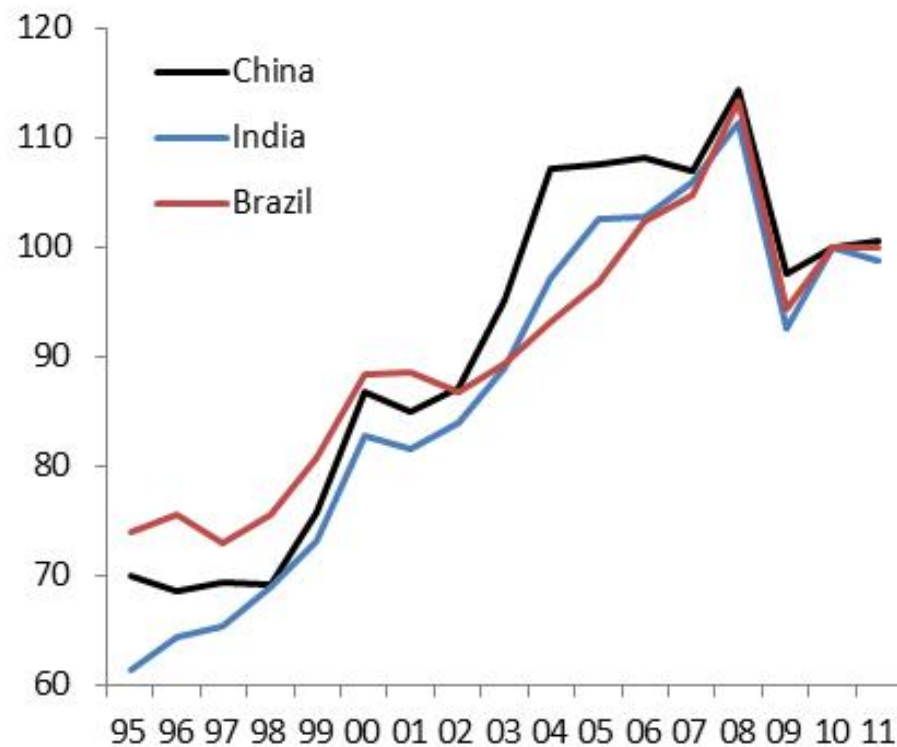
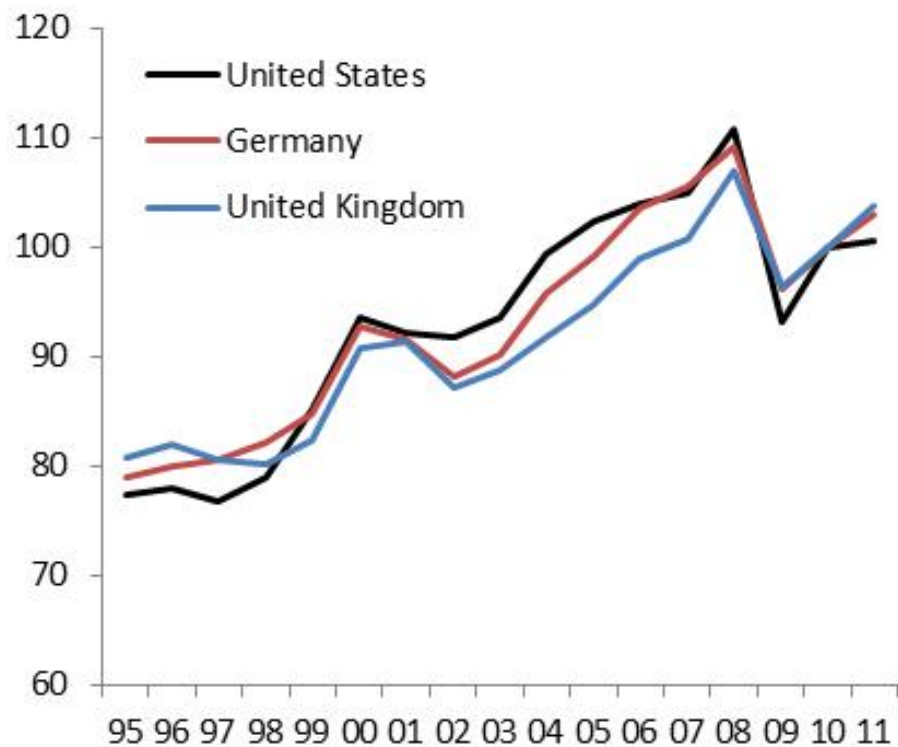
1998=100



Source: Felettigh and Oddo (2015)

## GVC participation index

2010=100



Source: WIOT

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## Regression results advanced and emerging economies in values, 1995-2011

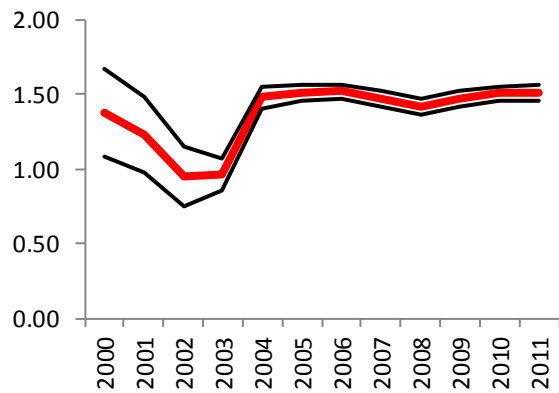
	Advanced economies				Emerging economies			
	Fixed effects with AR(1) dist.		Dynamic panel		Fixed effects with AR(1) dist.		Dynamic panel	
Lagged dep.			0.72***	0.72***			0.69***	0.69***
TFE	1.51***	1.41***	0.35***	0.25***	1.42***	1.40***	0.48***	0.36***
<i>Long-term coef.</i>			1.27	0.90			1.55	1.16
Relative prices	-0.02	-0.05*	0.21***	0.13***	-0.023	-0.06	0.15***	0.07*
<i>Long-term coef.</i>			0.76	0.46			0.47	0.24
ER	0.43***	0.3***	0.13***	0.06**	0.40***	0.38***	0.11***	-0.01
<i>Long-term coef.</i>			0.46	0.21			0.37	-0.03
TFE*GVC_part		0.05***		0.03***		0.03***		0.065***
<i>Long-term coef.</i>				0.11				0.21

## Recursive estimates

**Fixed effects with AR, advanced economies**

recursive

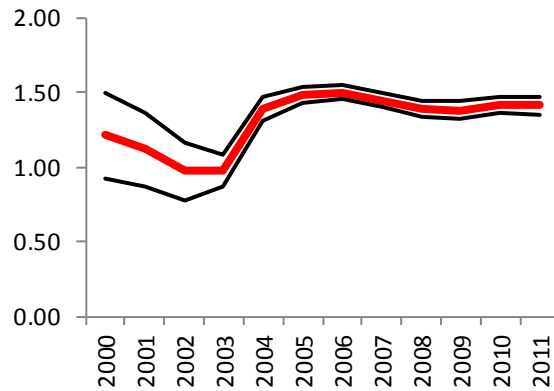
Intfe\_d



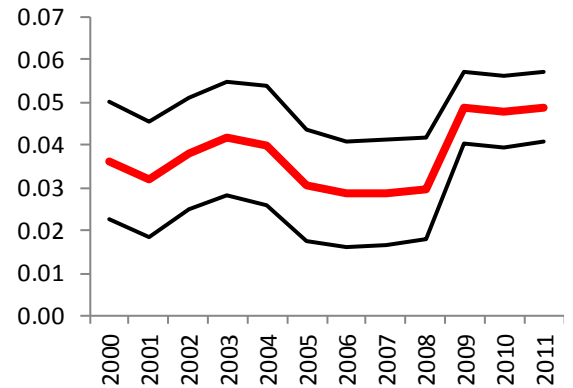
**with interaction term**

recursive

Intfe\_d



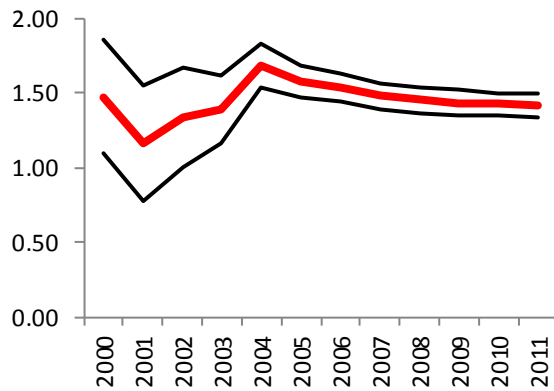
Intfe\_d\_part



**Fixed effects with AR, emerging economies**

recursive

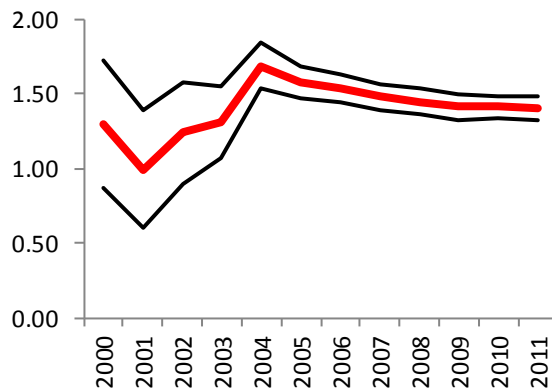
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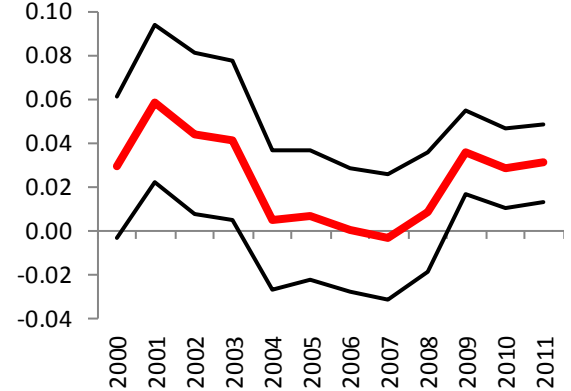
**with interaction term**

recursive

Intfe\_d



Intfe\_d\_part

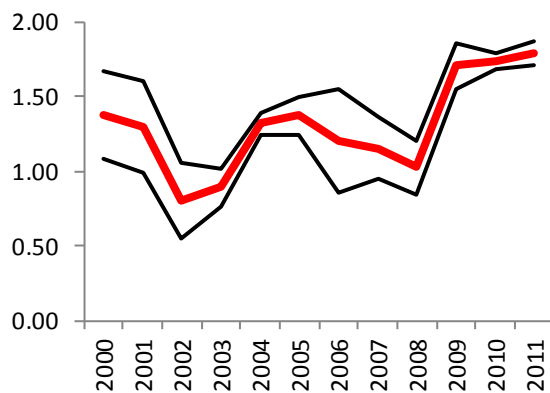




## Rolling coefficient estimates

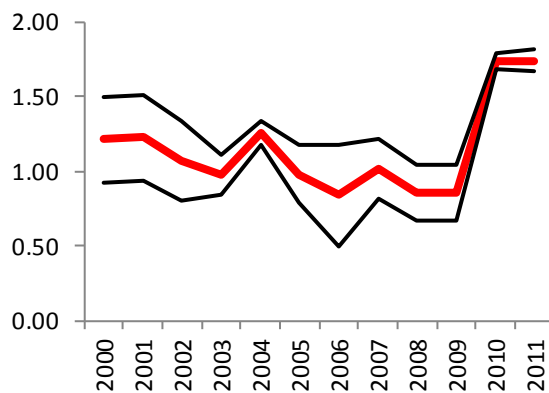
**Fixed effects with AR, advanced economies**

rolling sample  
Intfe\_d

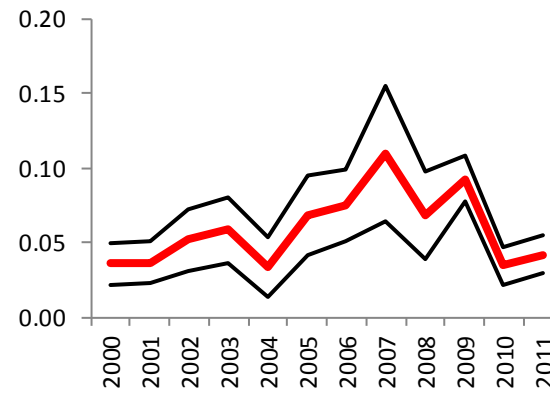


**with interaction term**

rolling sample  
Intfe\_d

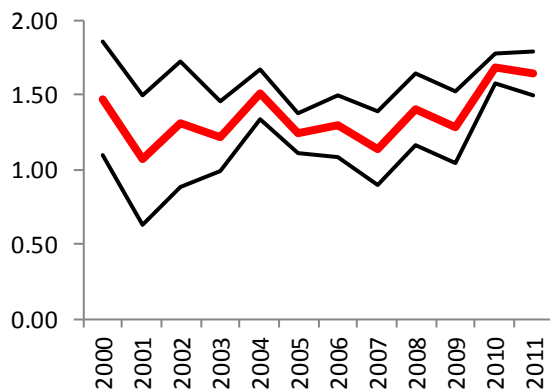


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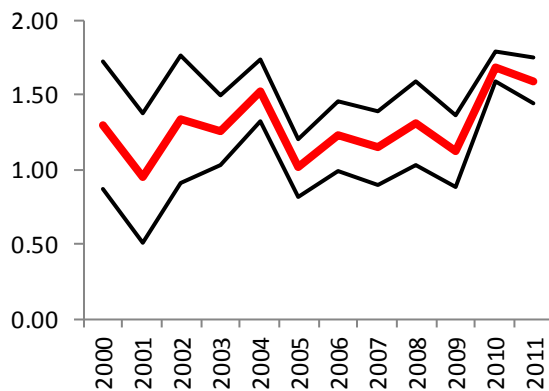
**Fixed effects with AR, emerging economies**

rolling sample  
Intfe\_d

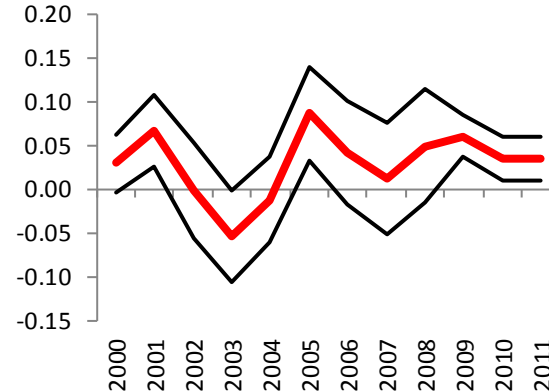


**with interaction term**

rolling sample  
Intfe\_d



Intfe\_d\_part



## Extension

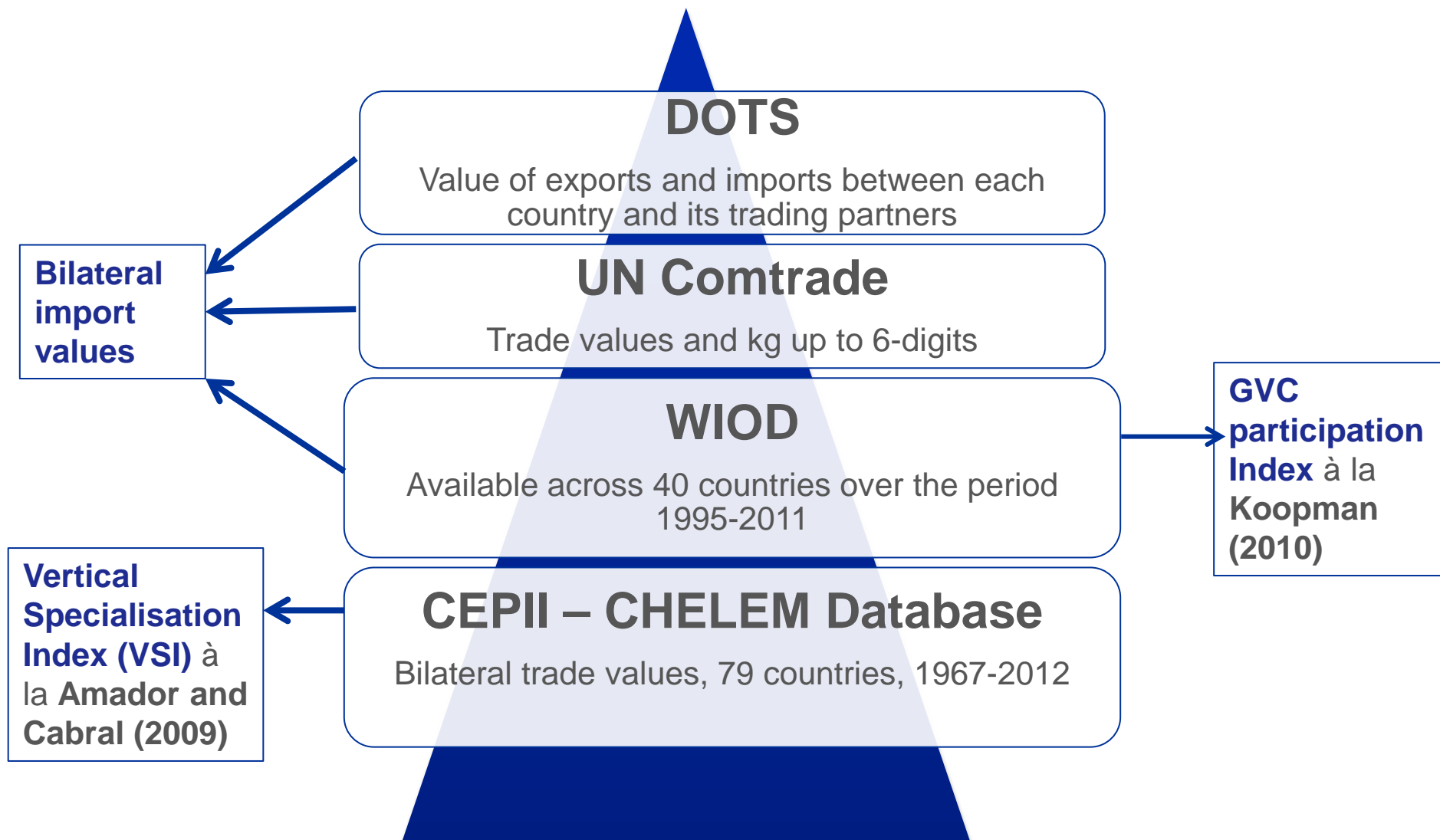
- **Check for influence of prices -> deflate all variables**
- **Start estimation in 1980**
- **Estimate GVC participation separately and as interaction term**

$$\ln(M_{ijt}) = \alpha_{ij} + \alpha_1 \ln(GDP_{it}) + \alpha_2 \ln\left(\frac{XP_{jt}}{P_{it}}\right) + \alpha_3 \ln(ER_{ijt}) + \varepsilon_{ijt}$$

$$\ln(M_{ijt}) = \beta_{ij} + \beta_1 \ln(GDP_{it}) + \beta_2 \ln\left(\frac{XP_{jt}}{P_{it}}\right) + \beta_3 \ln(ER_{ijt}) \\ + \beta_4 \ln(GVC\_part_{it}) + \varepsilon_{ijt}$$

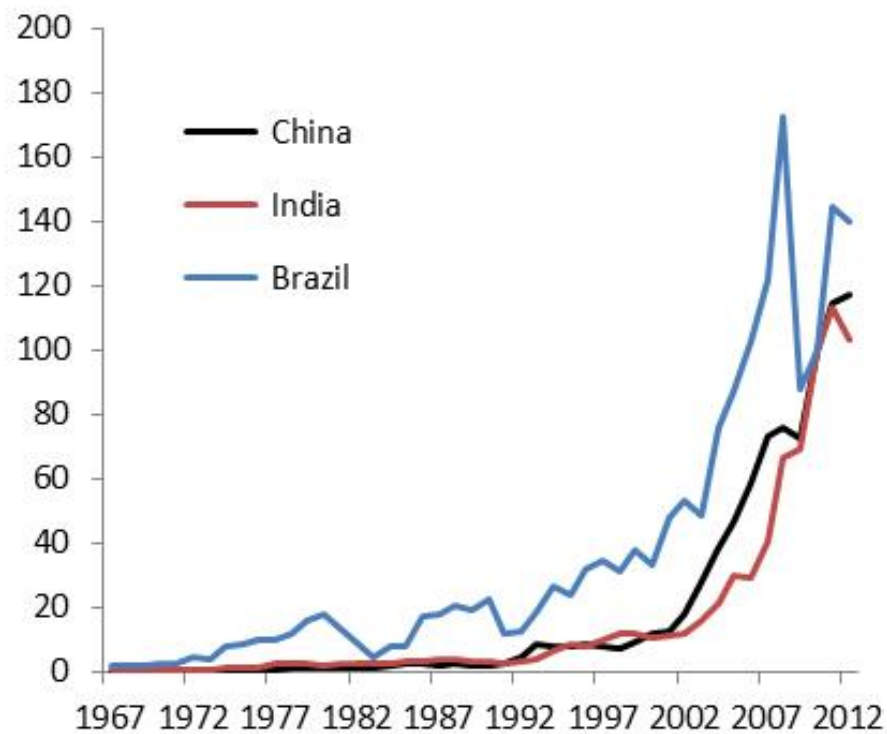
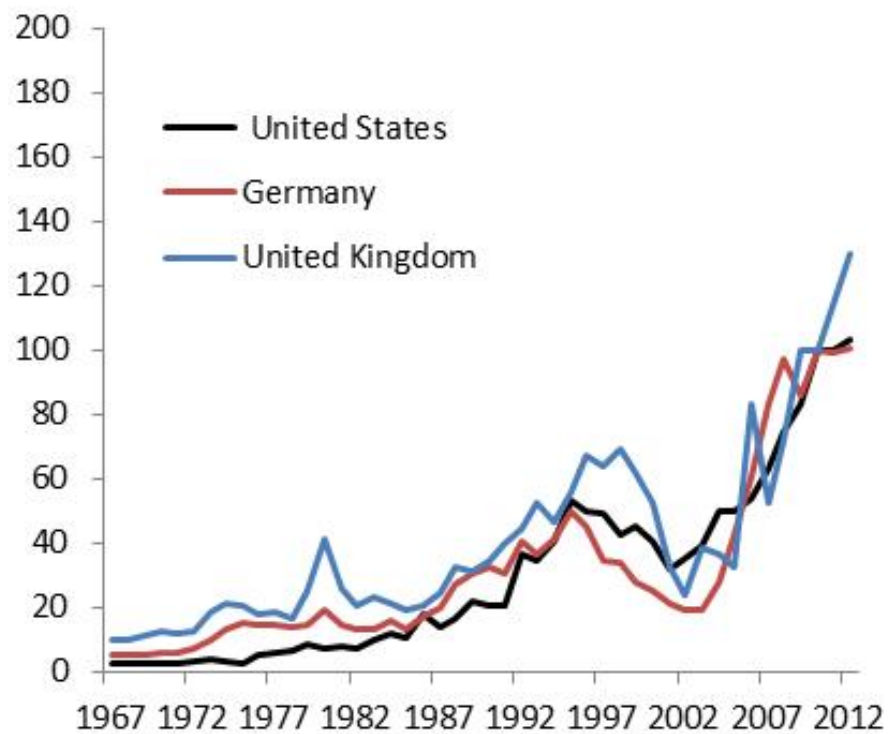
$$\ln(M_{ijt}) = \gamma_{ij} + \gamma_1 \ln(GDP_{it}) + \gamma_2 \ln\left(\frac{XP_{jt}}{P_{it}}\right) + \gamma_3 \ln(ER_{ijt}) \\ + \gamma_4 \ln(GDP_{it}) * \ln(GVC\_part_{it}) + \varepsilon_{ijt}$$

## Four different data sources for the trade variables:



## Vertical specialisation index (indicator for GVC participation)

2010=100



## Advanced economies

## Emerging economies

1995-2012

<b>GDP</b>	2.63***	2.69***	2.62***	2.11***	1.32***	1.10***
<b>Rel. MP</b>	-0.74***	-0.73***	-0.73***	-0.73***	-0.69***	-0.67***
<b>ER</b>	-0.063**	-0.063**	-0.064**	-0.43***	-0.39***	-0.36***
<b>GVC_part</b>		0.060***			0.31***	
<b>GDP*GVC_part</b>			0.014***			0.069***
<b>total GDP &amp; interact</b>			2.66 (2.65-2.67)			1.33 (1.22-1.41)

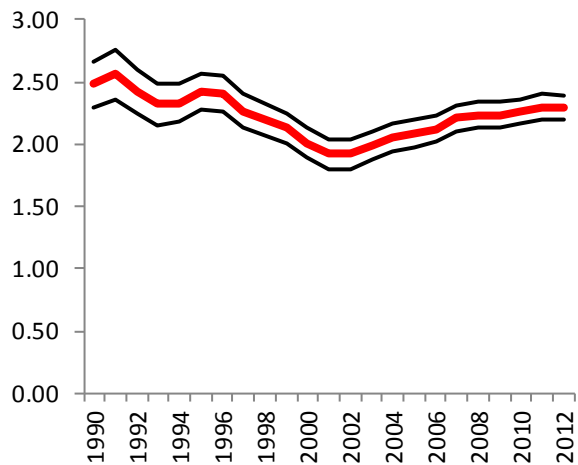
1980-2012

<b>GDP</b>	2.29***	2.08***	1.99***	2.13***	1.31***	1.04***
<b>Rel. MP</b>	-0.84***	-0.84***	-0.84***	-0.34***	-0.31***	-0.30***
<b>ER</b>	0.0028	0.0049	0.0058	-0.21***	-0.20***	-0.19***
<b>GVC_part</b>		0.085***			0.32***	
<b>GDP*GVC_part</b>			0.021***			0.075***
<b>total GDP &amp; interact</b>			2.06 (2.02-2.09)			1.25 (1.04-1.4)

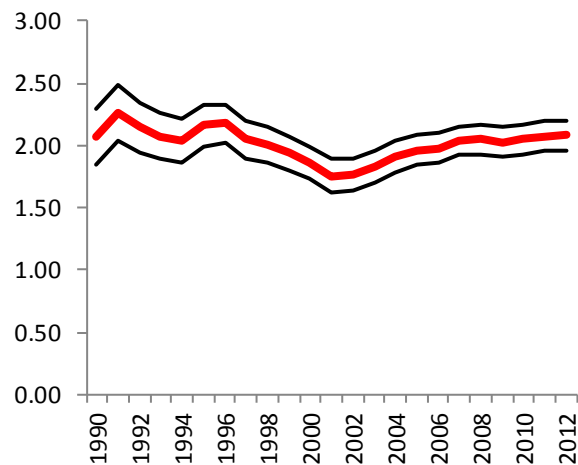
## Recursive estimates

### Advanced economies

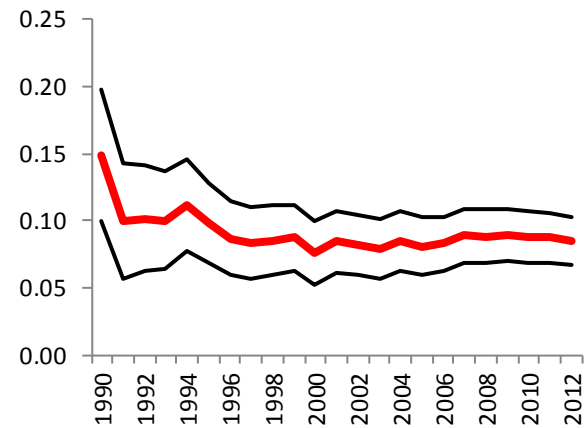
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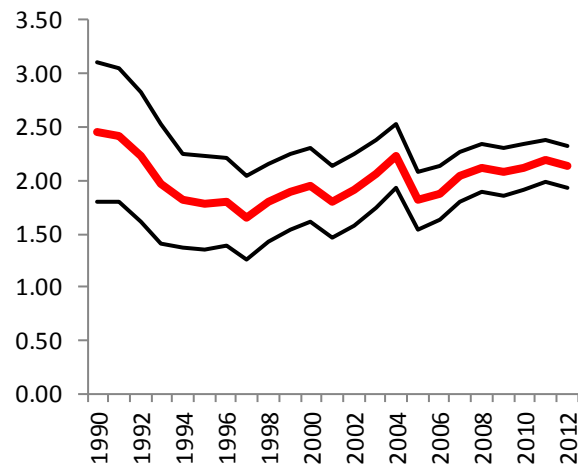


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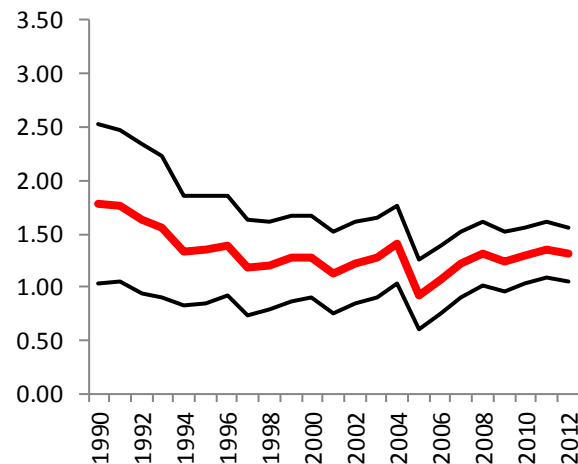


### Emerging economies

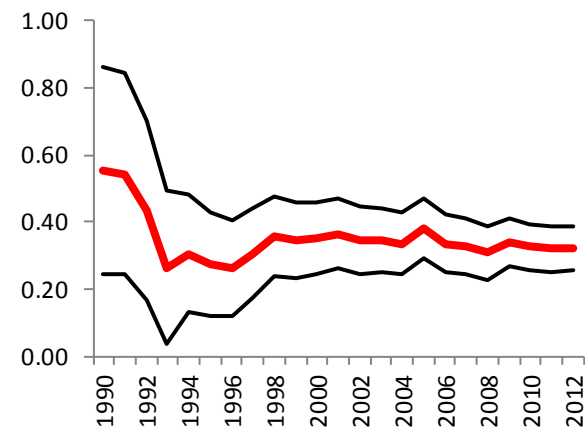
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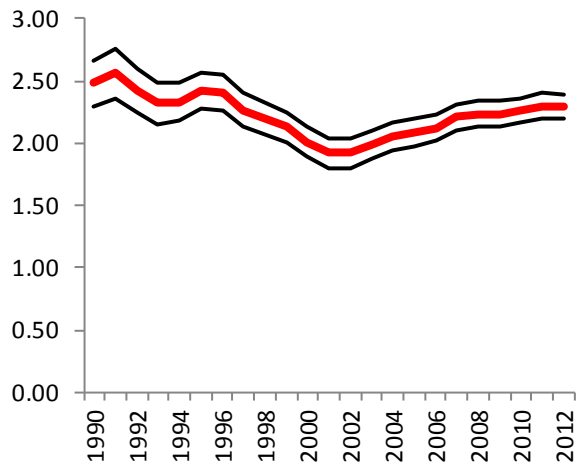
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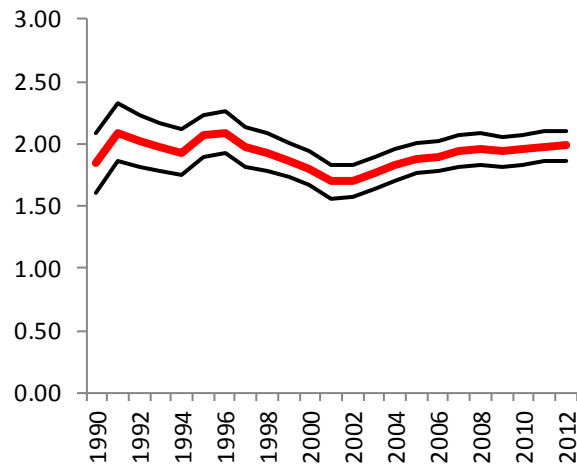
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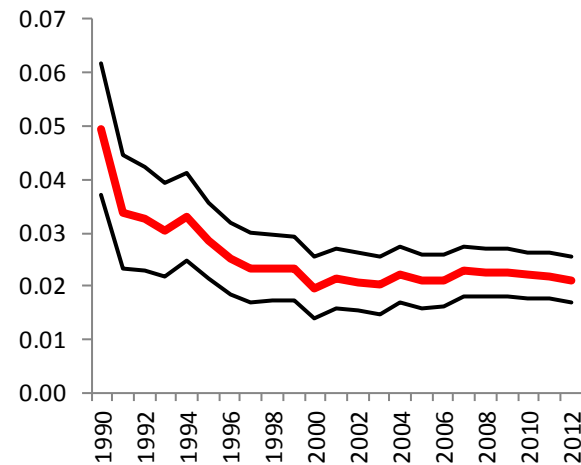
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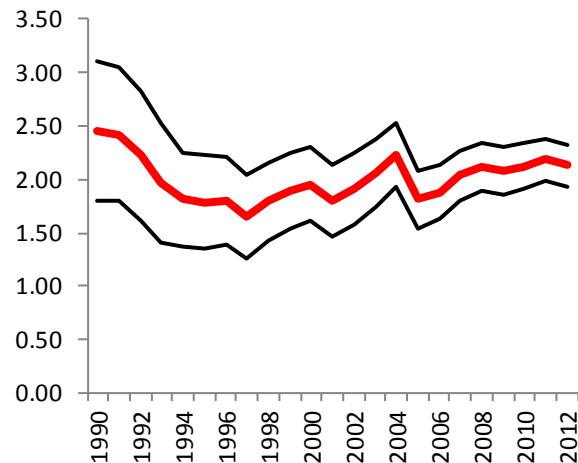


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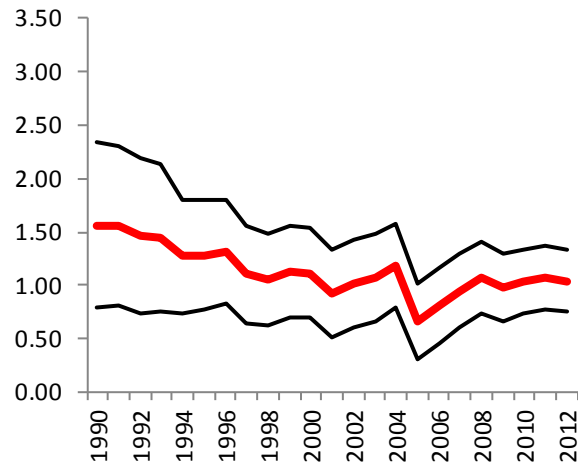


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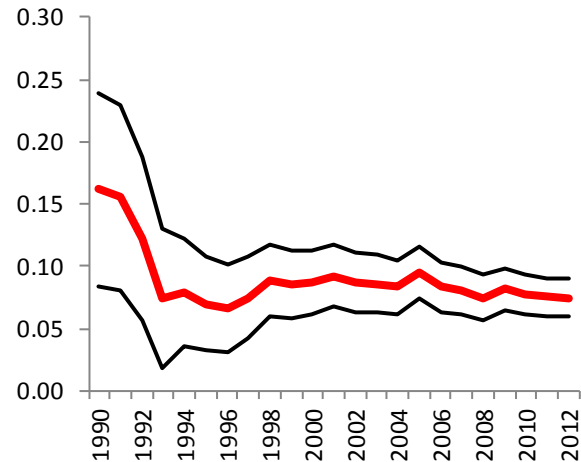
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## Main findings:

- **Countries with stronger involvement in GVCs tend to import more, beyond the effect of the demand variable**
- **Omitting these variables leads to higher estimates of income elasticities**
  - larger difference for EME and for longer sample
  - Confirming our hypothesis that GVCs explain part of the high trade to GDP growth ratio
- **Income elasticity lower in advanced than emerging countries**
- **For advanced economies, income elasticity higher in the more recent sample (1995-2012)**

## Further work planned:

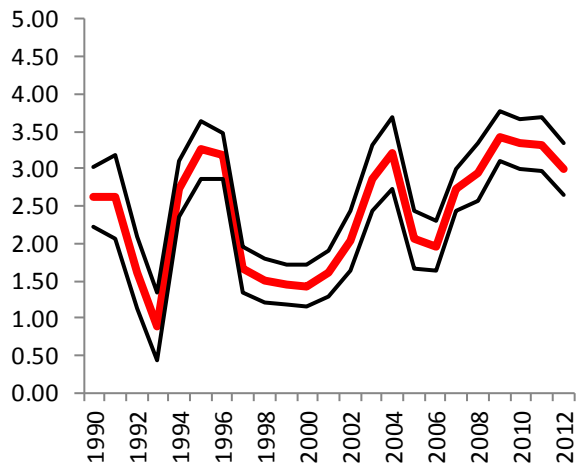
- **Check VSI indicator, use alternative version**
- **Comtrade prices**
- **Declaring country estimates**
- **Other estimation methods: panel ECM**
- **Any suggestions?**

Thank you !

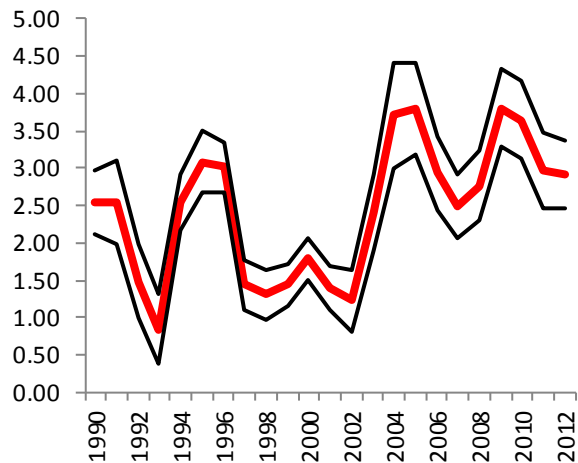
## Rolling sample estimates

### Advanced economies

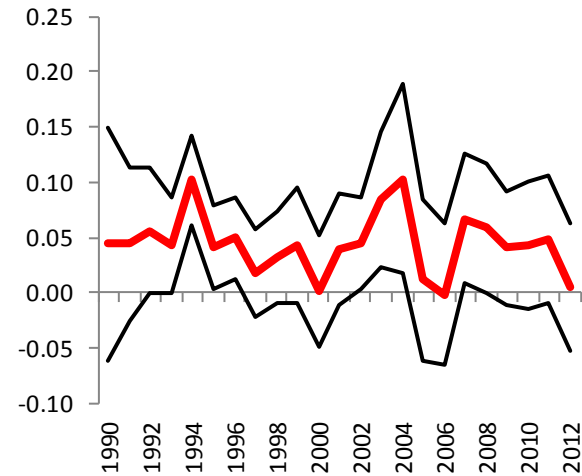
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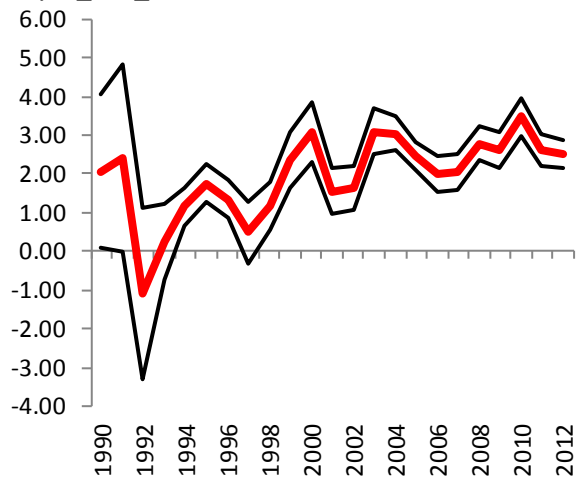


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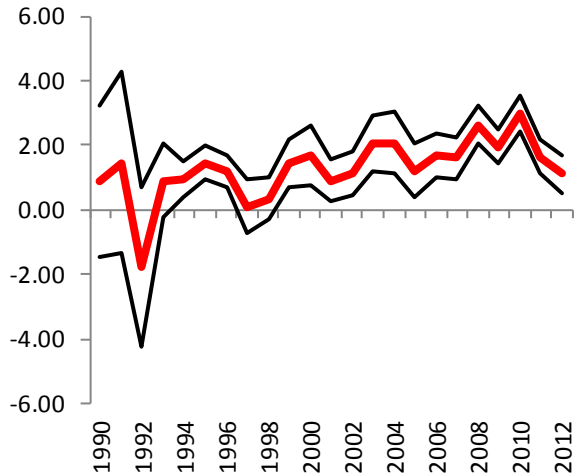


### Emerging economies

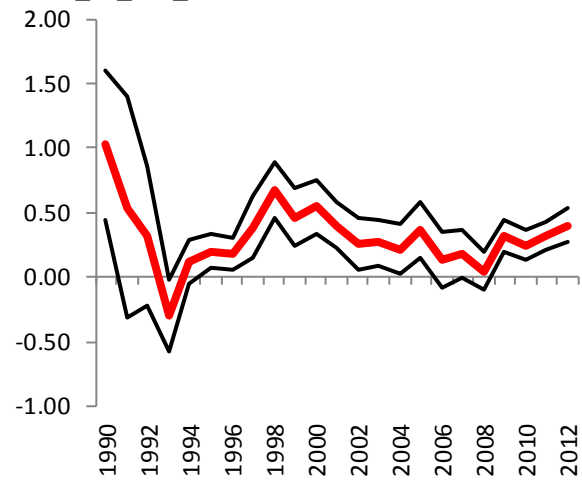
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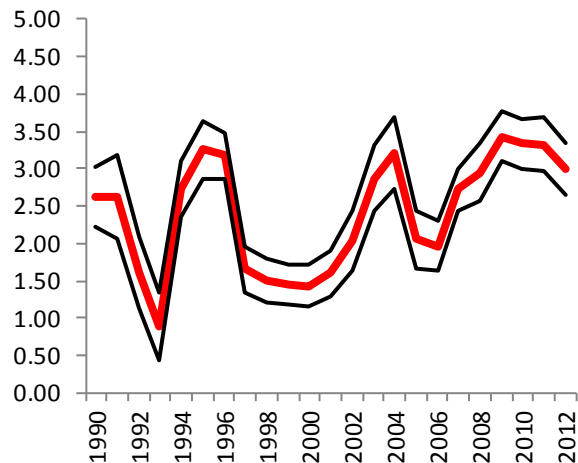
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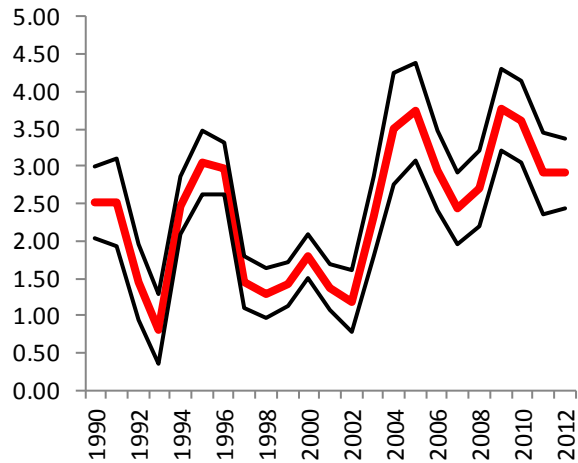
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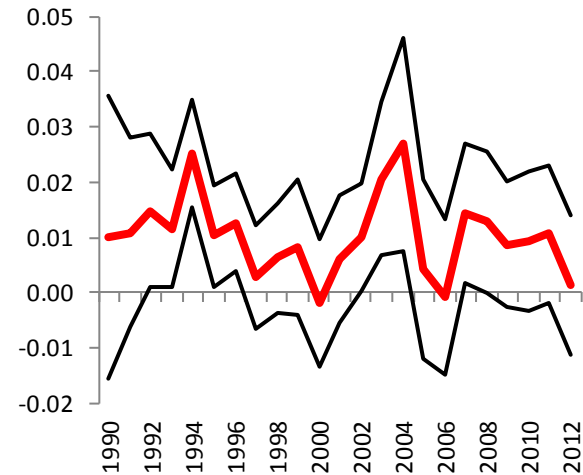
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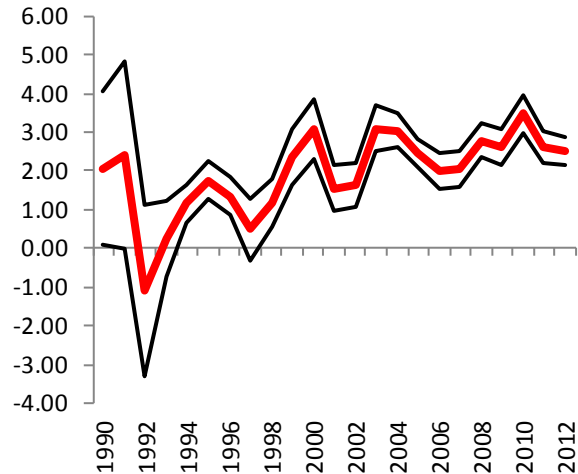


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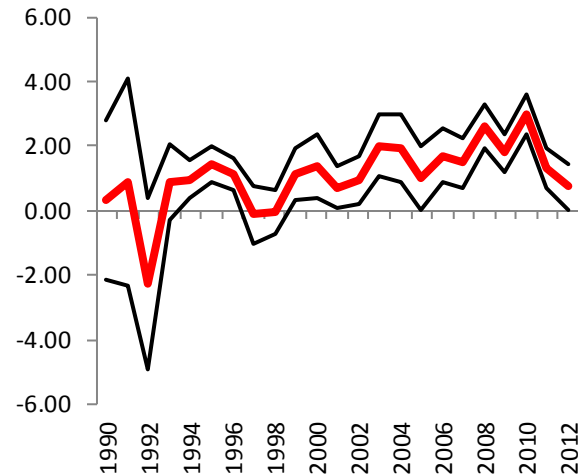


### Emerging economies

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