

Tradability, Openness and Growth: Revisiting Baumol's 'Growth Disease'

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Motivation

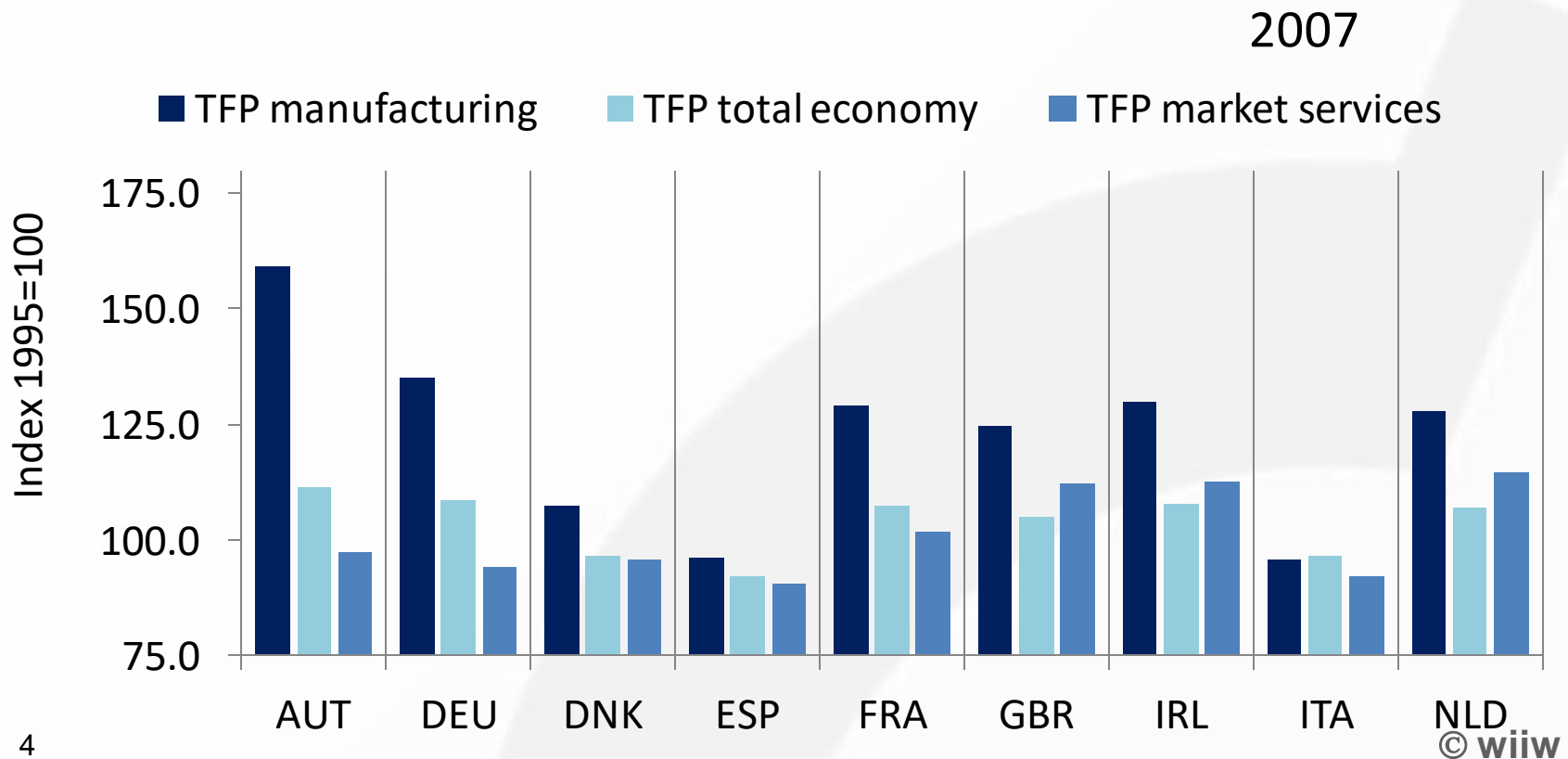
- Concerns about ‘de-industrialisation; structural change contributing to ‘secular stagnation’ (Summers, 2014)
- Globalisation, increasing specialisation, structural divergence
- ‘Unbalanced growth’ intensifies
- Global trend towards less tradable output
→ Test of the tradability-growth nexus

Baumol's hypothesis

- Productivity advances differ across sectors
(unbalanced growth)
- Productivity growth is higher in 'progressive sectors'
- Nominal share of non-progressive sector increases if
 - i) wages progress uniformly across sectors
 - ii) price elasticity of demand is not high
- This composition effect acts as a drag on economic growth
→ Baumol's 'growth disease' (Nordhaus, 2008)

What is a 'progressive sector'?

- Manufacturing because of supply side considerations
→ higher productivity growth



Source: EU KLEMS, author's calculations

What is a 'progressive sector'?

1. Manufacturing because of supply side considerations
→ higher productivity growth
 2. Manufacturing because there are no demand constraints
(Rodrik, 2010; 2013; Smirzai & Verspagen, 2015)
→ tradability
- According to 2.) the growth enhancing effect hinges on the tradability of the sector:
→ Progressive sectors are the more tradable sectors

Research Question

- Does specialisation in producing tradable output spur economic growth?
 - All sectors are tradable but some are more tradable
→ measured by the [tradability index](#)
 - Sectors producing more output for international markets are 'progressive' sectors
 - The potential growth enhancing effect of manufacturing hinges on the quality of tradability
 - Research question embedded in a cross-country endogenous growth model with international spillovers

Related literature

- Baumol (1967), *American Economic Review*
'Progressive' sectors have higher productivity growth
→ *relative decline of these sectors acts as a drag on overall growth.*
- Szirmai and Verspagen (2015), *Structural Change and Economic Dynamics*
Long-term shift towards services since the 1950s.
- Nordhaus (2008), *B.E. Journal of Macroeconomics*
Test of 'Baumol's Growth Disease' for the US (1948-2001)
→ *Composition effect slowed down productivity growth by 0.5 p.p.*
- Rodrik (2010), *Globalization and Growth*, World Bank
Output of (nontraditional) tradables are matter for growth
- Rodrik (2013), *Quarterly Journal of Economics*
Unconditional convergence in manufacturing sector

The Tradability Index (TI)

The Tradability Index

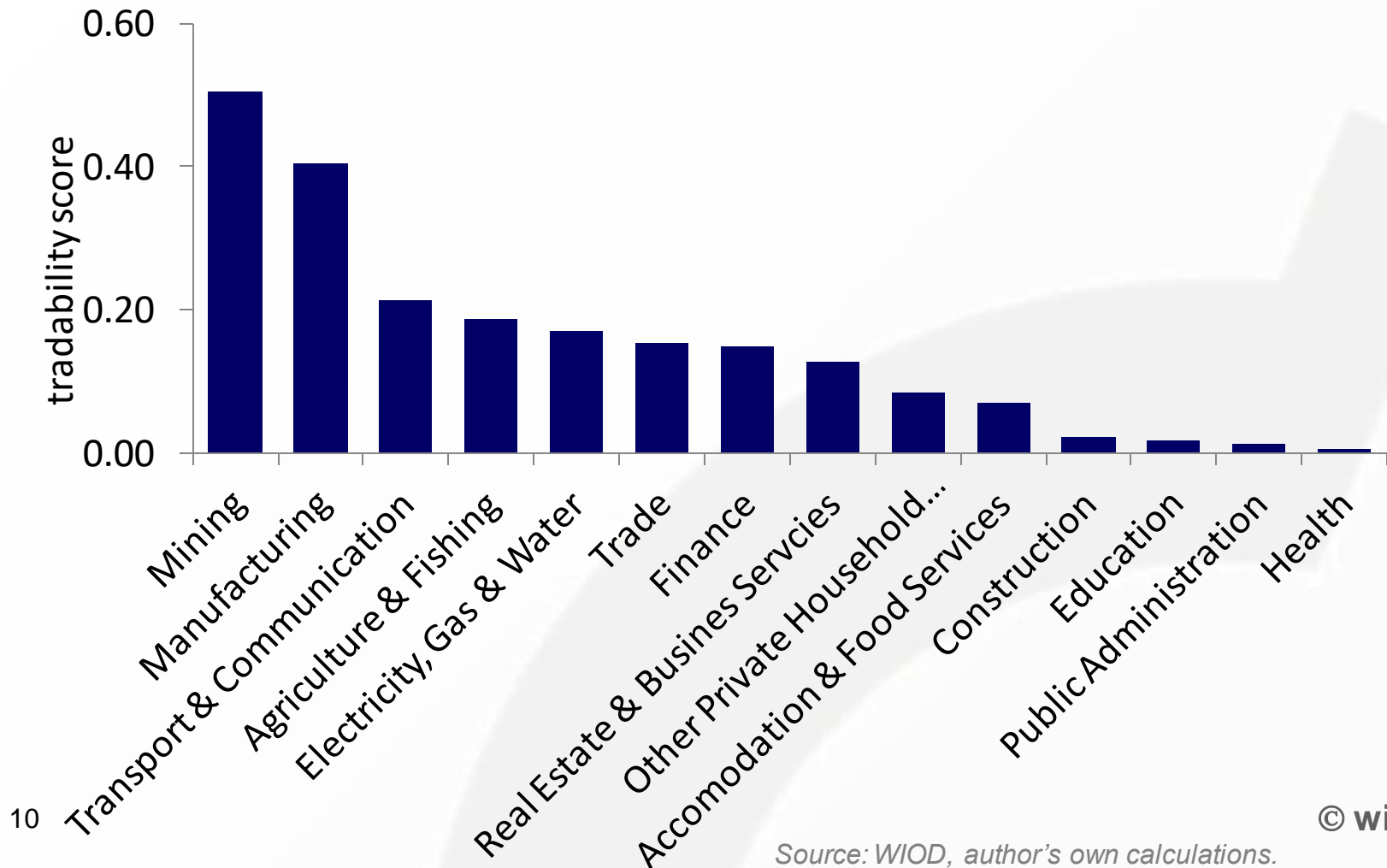
- The TI is calculated based on (i) the global tradability score of industries i and (ii) country j 's industry structure:

$$TI_t^j = \sum_i \frac{VAX_i^{global}}{VA_i^{global}} \cdot \frac{VA_{i,t}^j}{\sum_i VA_{i,t}^j}$$

tradability score (TS) of industry i *value added shares of country j*

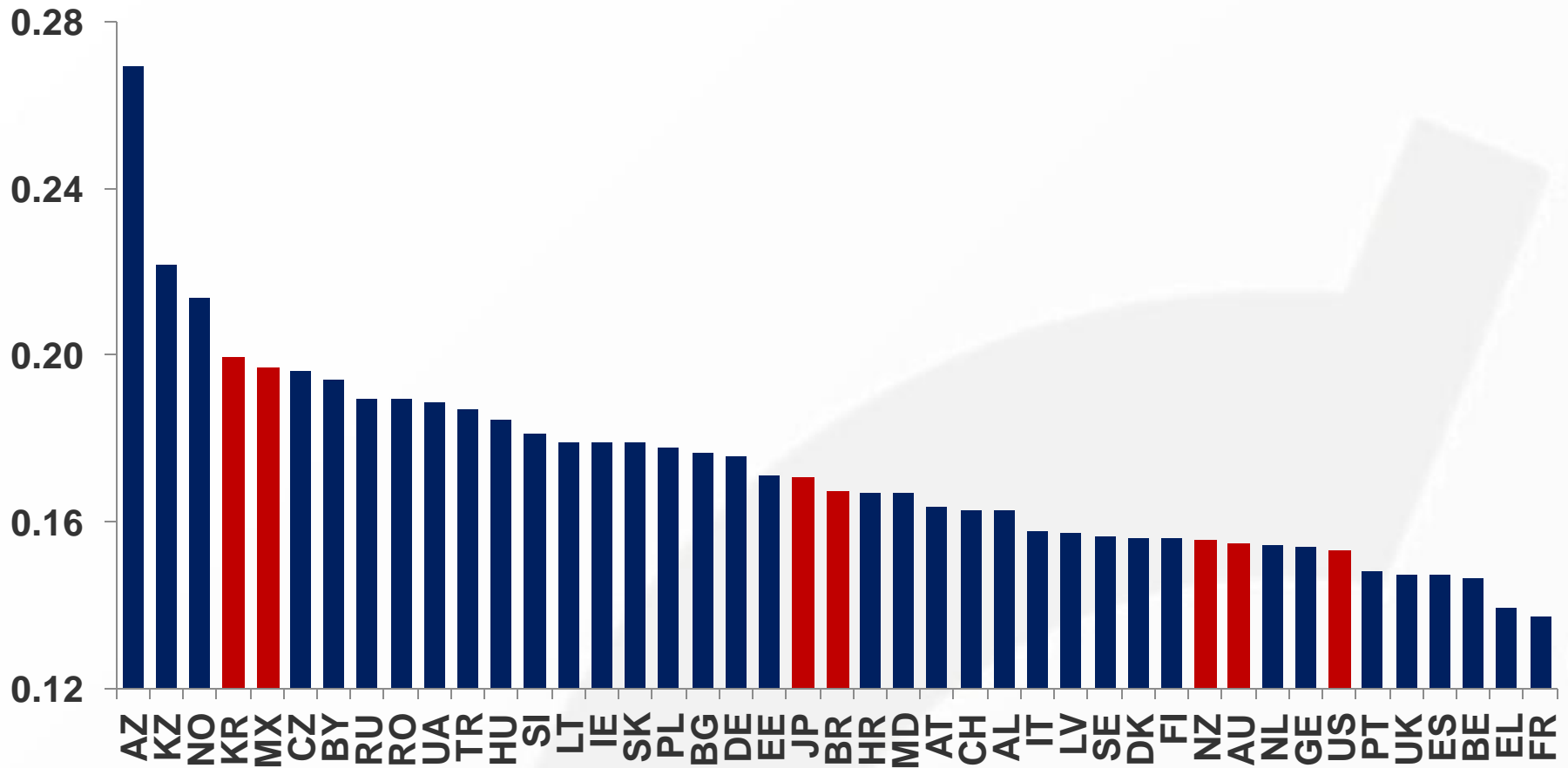
- The TI
 - is the expected openness of a country given its economic structure
 - is independent of country size
 - does not reflect a country's exports
 - is (to a large degree) independent of a country's trade policy

The Tradability Scores (TS) across Industries



Source: WIOD, author's own calculations.

The Tradability Index *(43 countries, average 1995-2014)*



The Tradability Index

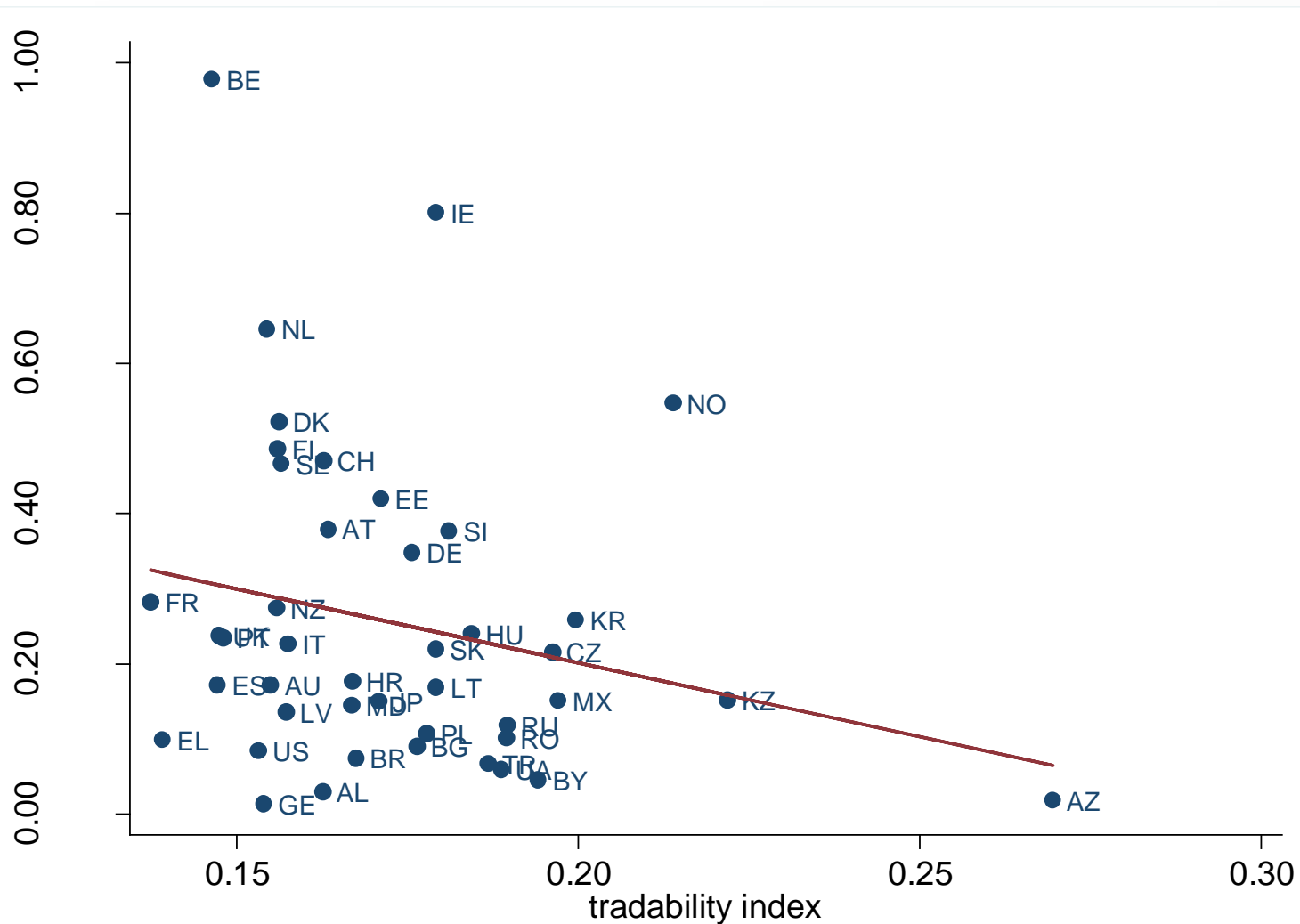
- The TI is calculated based on (i) the global tradability score of industries i and (ii) country j 's industry structure:

$$TI_t^j = \sum_i \frac{VAX_i^{global}}{VA_i^{global}} \cdot \frac{VA_{i,t}^j}{\sum_i VA_{i,t}^j}$$

tradability score (TS) of industry i *value added shares of country j*

- The TI
 - is the expected openness of a country given its economic structure **≠ actual openness**
 - is independent of country size
 - does not reflect a country's exports
 - is (to a large degree) independent of a country's trade policy

Actual vs predicted openness



Source: PWT 9, WIOD, author's own calculations.

Empirical Growth Model

Empirical Growth Model

- Cross-country growth regression:

$$\Delta \ln Y_i = \alpha \cdot \Delta \ln K_i + \beta \cdot \Delta \ln L_i + \Delta \ln A_i + \varepsilon_i$$

- Law of motion for productivity:

base: $\Delta \ln A_i = \rho + \theta \cdot TI_i^{ini} + \zeta \cdot GAP_i^{ini}$

tradability index

technology gap

catch-up: $\Delta \ln A_i = \rho + \theta \cdot TI_i^{ini} + \lambda \cdot (TI_i^{ini} \times GAP_i^{ini}) + \zeta \cdot GAP_i^{ini}$

- Regression equation (*“tradability catch-up model”*):

$$\Delta \ln Y_i = \rho + \alpha \cdot \Delta \ln K_i + \beta \cdot \Delta \ln L_i + \theta \cdot TI_i^{ini} + \lambda \cdot (TI_i^{ini} \times GAP_i^{ini}) + \zeta \cdot GAP_i^{ini} + \varepsilon_i$$

Capabilities-augmented model:

- Law of motion for productivity

$$\Delta \ln A_i = \rho + \theta \cdot TI_i^{ini} + \varphi \cdot (TI_i^{ini} \times \ln ECI_i^{ini}) + \omega \cdot \ln ECI_i^{ini} + \zeta \cdot GAP_i^{ini}$$

export complexity index

- The same models are estimated using the standard measure for export openness (*Exports/GDP*)

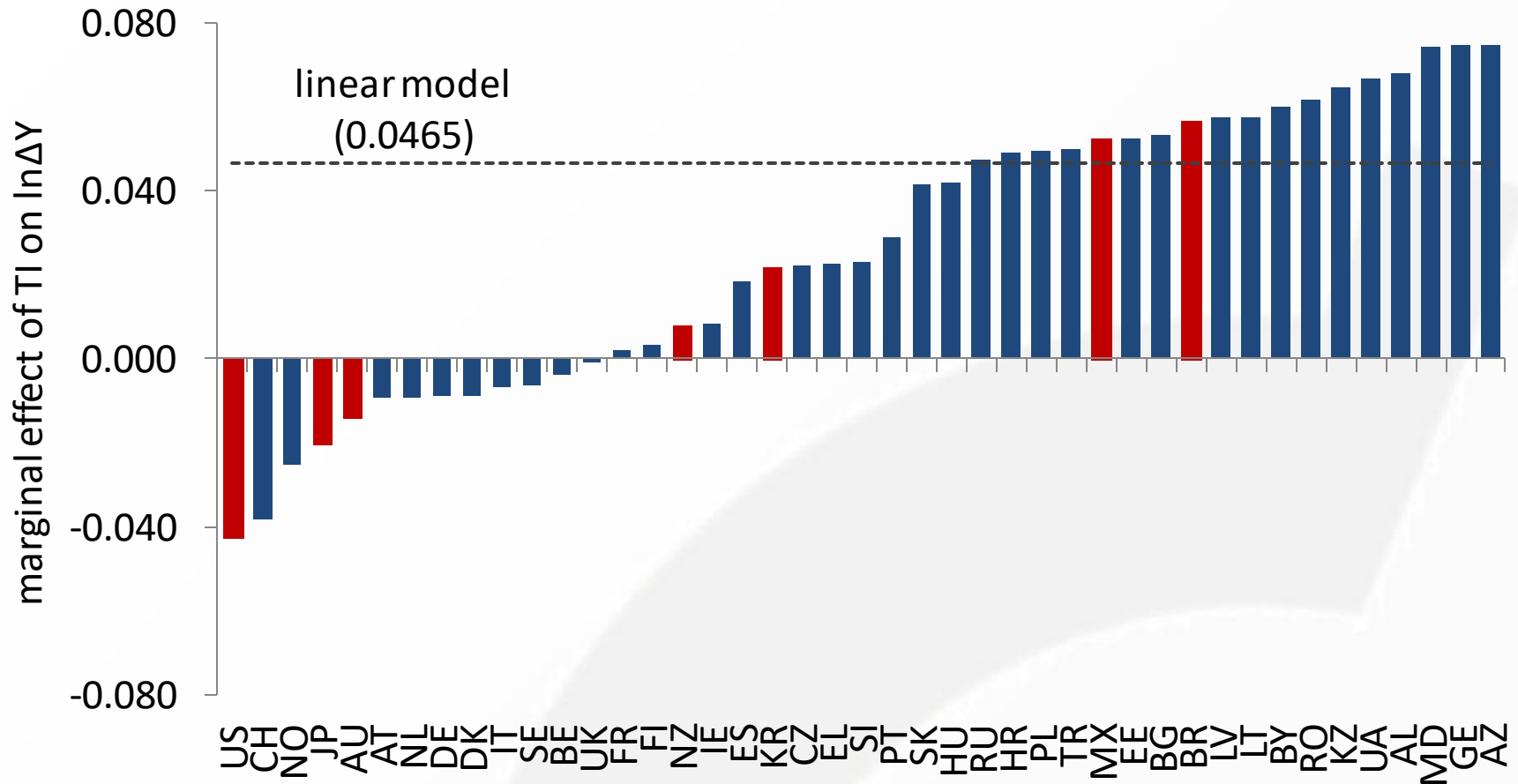
Results

Tradability and economic growth (1)

Dependent variable: $\Delta \ln Y$

	(1)	(2)
	basic model	
$\Delta \ln K$	0.3574 (0.2317)	0.3726 (0.2259)
$\Delta \ln L$	0.2814 (0.2502)	0.2995 (0.2490)
GAP	0.5137*** (0.1759)	0.5943*** (0.1617)
TI	4.6486** (1.9019)	-4.2618 (4.3025)
TI x GAP		12.5083* (6.9273)
$\ln ECI$		
TI x $\ln ECI$		
Obs.	43	43
R-squared	0.5960	0.6232
R-squared adj.	0.553	0.572
F test	8.256	10.67

Predicted growth effects of tradability by country



Tradability and economic growth (2)

Dependent variable: $\Delta \ln Y$

	(1)	(2)	(3)	(4)
	basic model		capabilities-augmented model	
$\Delta \ln K$	0.3574 (0.2317)	0.3726 (0.2259)	0.3670 (0.2404)	0.3662 (0.2394)
$\Delta \ln L$	0.2814 (0.2502)	0.2995 (0.2490)	0.2867 (0.2556)	0.2714 (0.2538)
GAP	0.5137*** (0.1759)	0.5943*** (0.1617)	0.5615** (0.2323)	0.5758** (0.2264)
TI	4.6486** (1.9019)	-4.2618 (4.3025)	4.5912** (1.9060)	3.1757* (1.6343)
TI x GAP		12.5083* (6.9273)		
$\ln ECI$			0.0717 (0.1606)	0.0059 (0.1874)
TI x $\ln ECI$				-10.7010 (9.7936)
Obs.	43	43	43	43
R-squared	0.5960	0.6232	0.5973	0.6090
R-squared adj.	0.553	0.572	0.543	0.544
F test	8.256	10.67	6.999	7.168

Openness and economic growth

Dependent variable: $\Delta \ln Y$				
	(1)	(2)	(3)	(4)
	basic model		capabilities-augmented model	
$\Delta \ln K$	0.3633 (0.2390)	0.3560 (0.2370)	0.3761 (0.2483)	0.3707 (0.2473)
$\Delta \ln L$	0.3167 (0.2737)	0.3174 (0.2838)	0.3263 (0.2829)	0.3274 (0.2874)
GAP	0.7446*** (0.2040)	0.6290*** (0.2102)	0.8019*** (0.2586)	0.7935*** (0.2630)
OPEN	0.0383 (0.1631)	0.5094 (0.4157)	0.0198 (0.1707)	-0.0420 (0.2120)
OPEN x GAP		-1.2514 (1.0065)		
$\ln ECI$			0.1027 (0.1818)	0.1392 (0.2064)
OPEN x $\ln ECI$				0.5215 (0.8375)
Obs.	43	43	43	43
R-squared	0.5425	0.5630	0.5451	0.5477
R-squared adj.	0.494	0.504	0.484	0.472
F test	5.860	5.825	5.483	4.755

Conclusions

Conclusions

- Tradability of output matters for growth
→ countries specialising in more tradable sector enjoy a “structural change bonus” (*Szirmai and Verspagen, 2015*)
- Tradability matters in particular for developing countries
- Tradability reinforces countries’ catching-up processes
- Conventional measure of export openness is a meaningless and irrelevant variable
- Targeted industrial policies in support of tradables sectors warranted
- Potential link to the issue of secular stagnation