Data Restrictiveness and Economic Impacts: Productivity, Services and Innovation

2019-20 Korea-US Policy Dialogue

10 January, Washington DC, GWIKS

Erik van der Marel

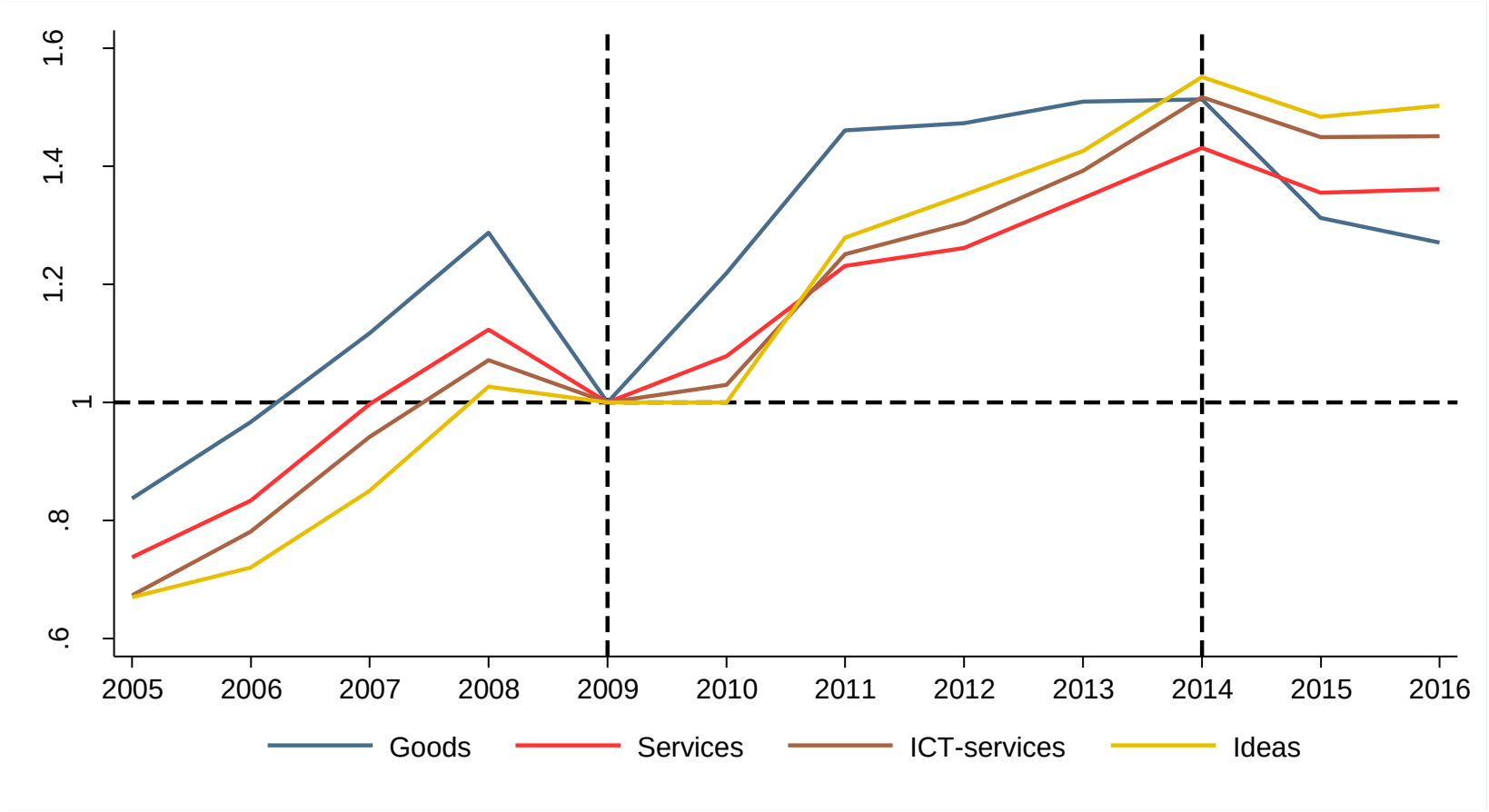
Senior Economist at ECIPE

Univesité Libre de Bruxelles (ULB) - Solvay Brussels School

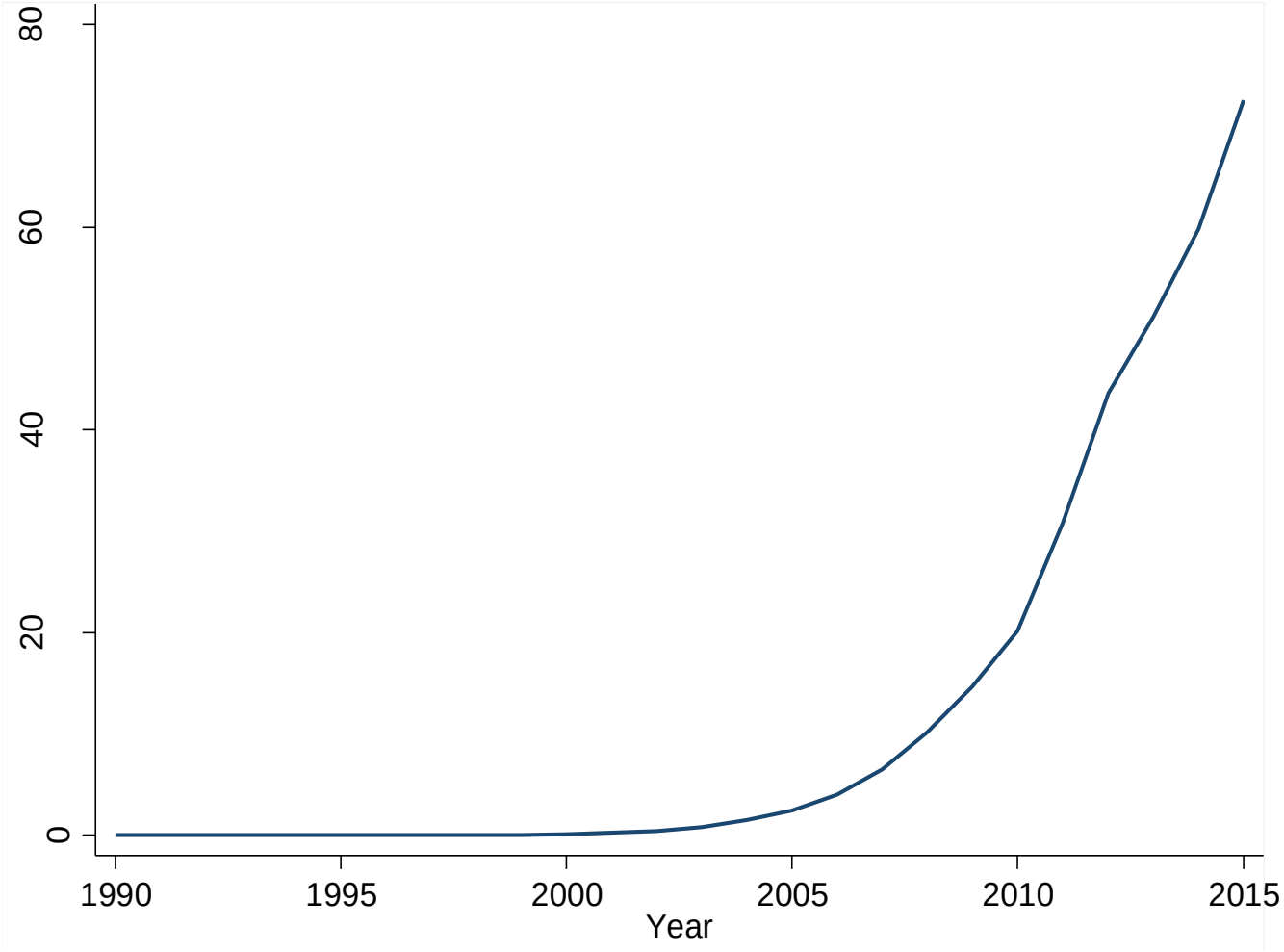
Content

- Restrictions data, technologies & digital trade
- Economic impacts of these digital restrictions

Technology ideas as a flow



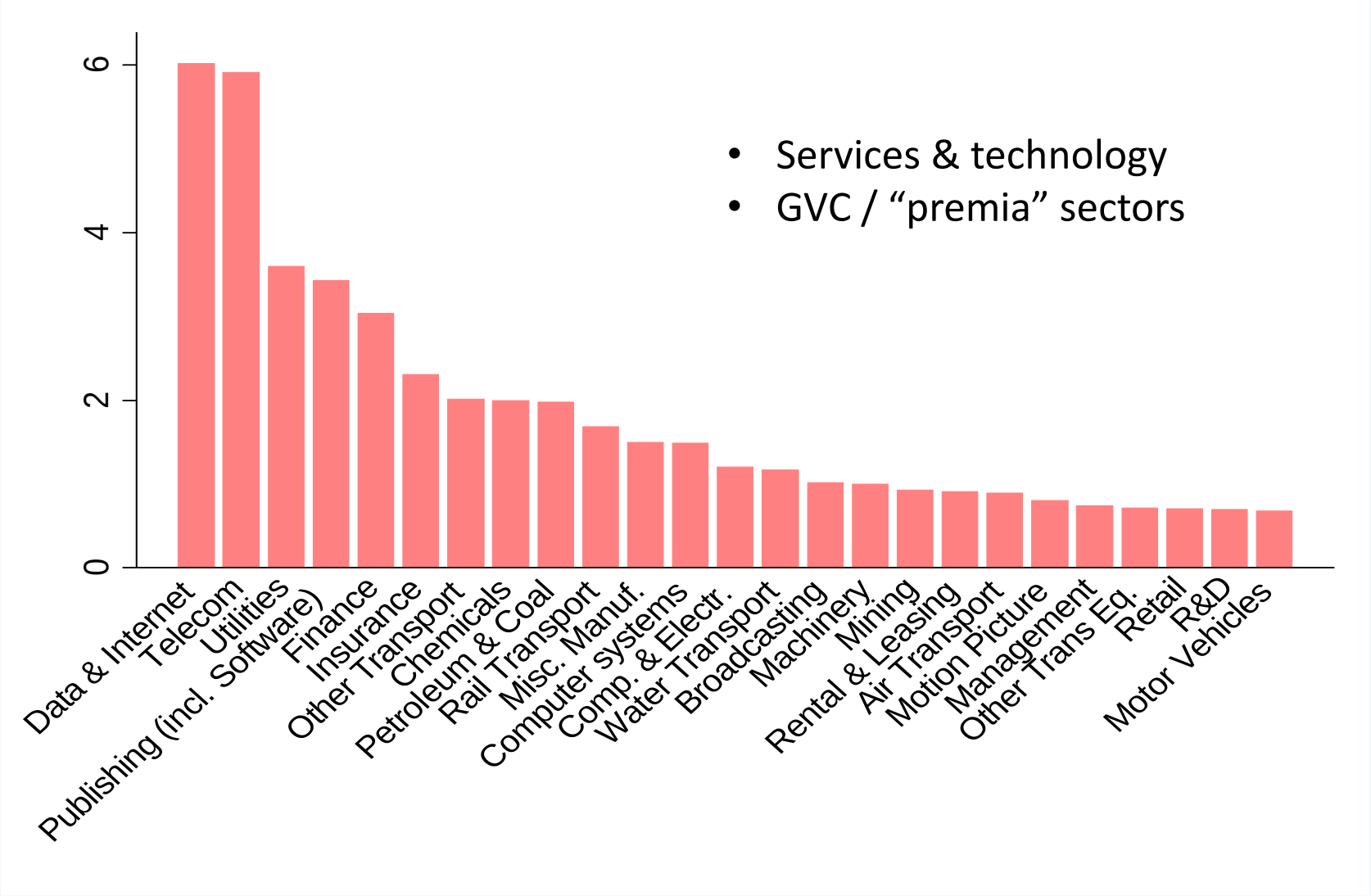
Global data traffic grows



The role of data in globalization

- Contribution of data to GDP > goods (McKinsey)
- Particularly great role in Artificial Intelligence (Goldfarb and Trefler, 2018)

Where are data in the economy?

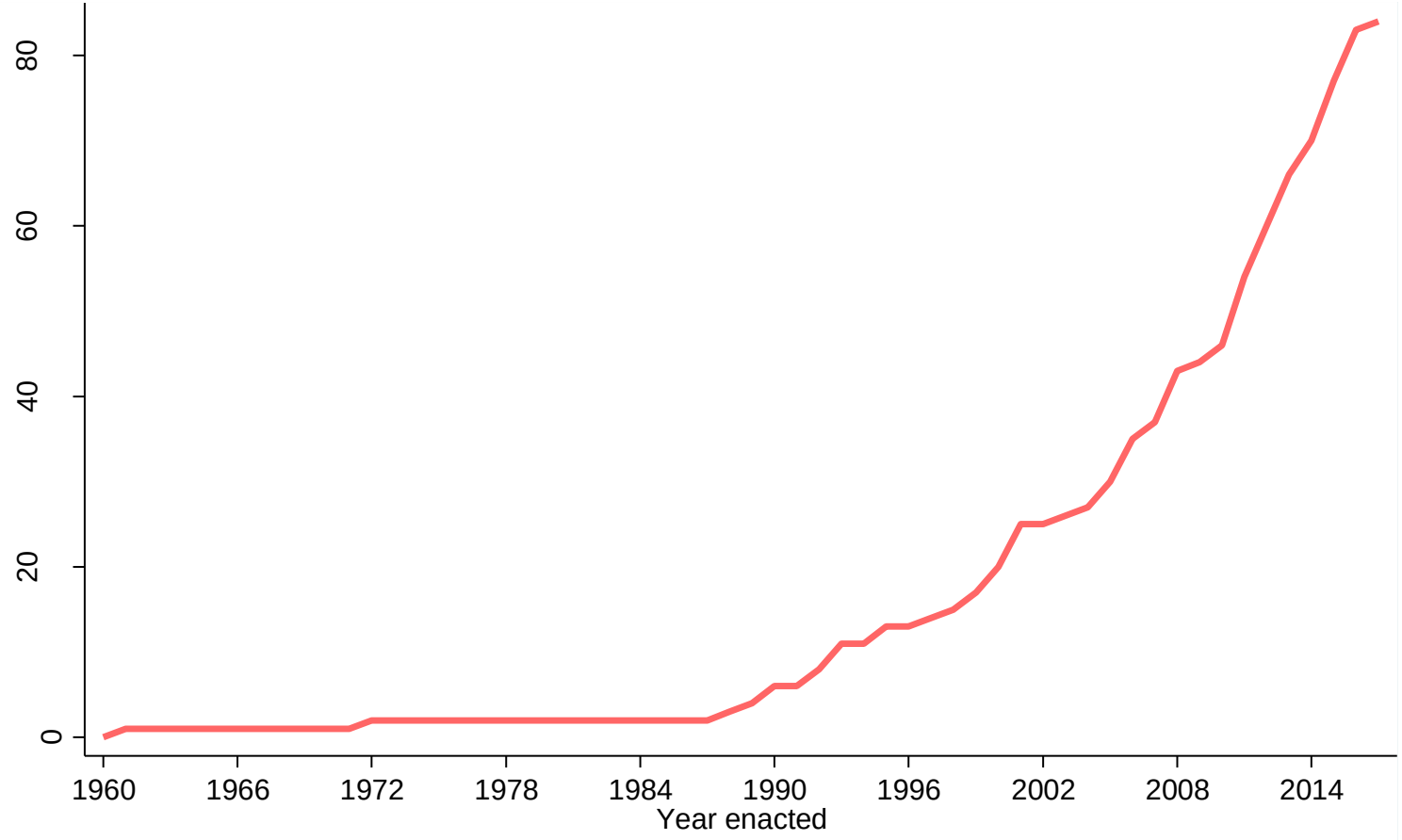


What policies are problematic?

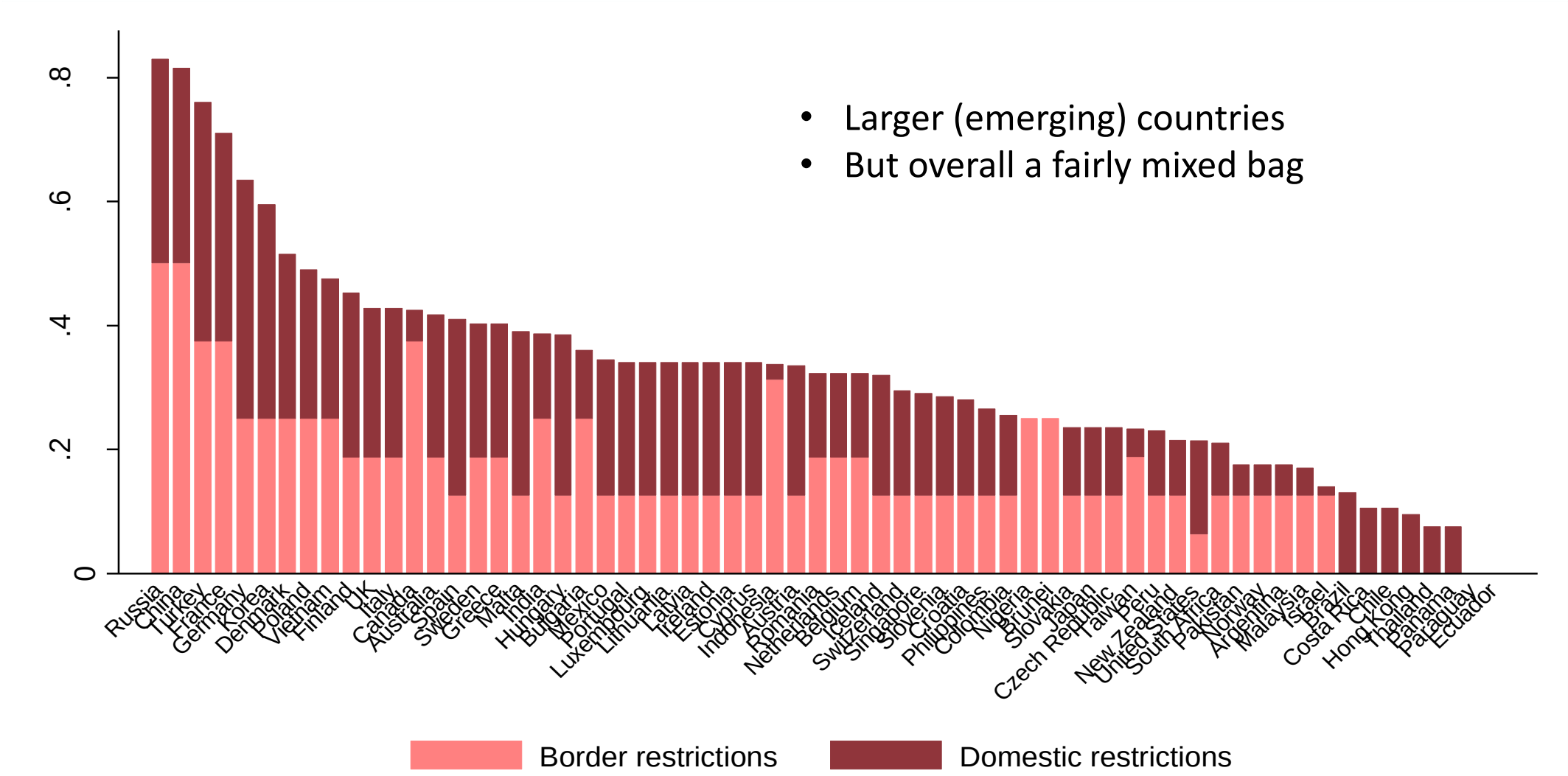
	Internet com services	Cloud-based data processing	Digital content	E-commerce	IoT
Data measures					
Data protection and privacy	x	x	x	x	x
Data localization	x	x		x	x
Cybersecurity measures					
Disclosing source codes		x	x	x	x
Restrictions on cryptography	x	x	x	x	x
Censorship			x		
IPR measures					
Intermediate liability	x		x	x	
Anciliary copyrights	x		x	x	

USITC (2017)

Number of data-related restrictions

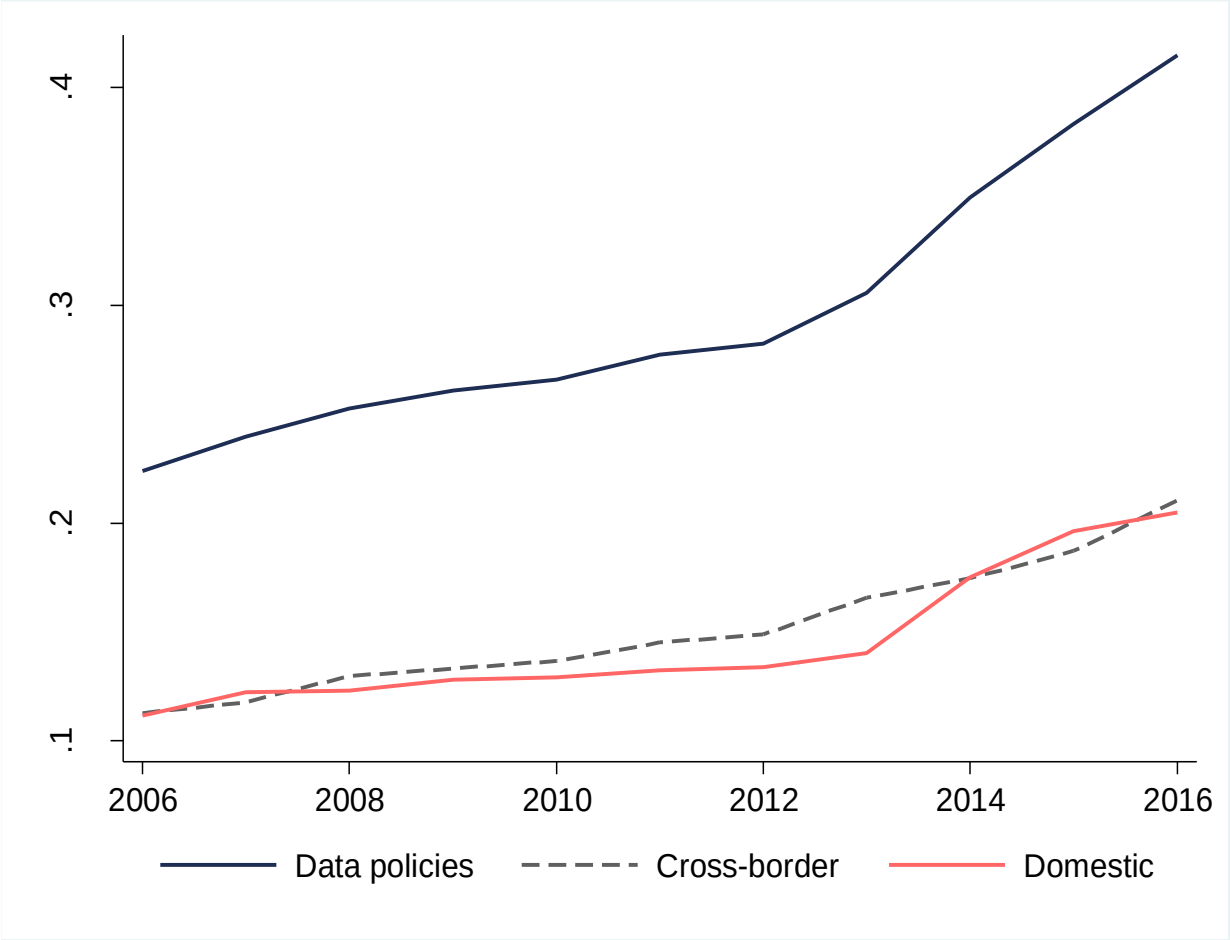


Restrictions in data



- Larger (emerging) countries
- But overall a fairly mixed bag

Global trend in data policies

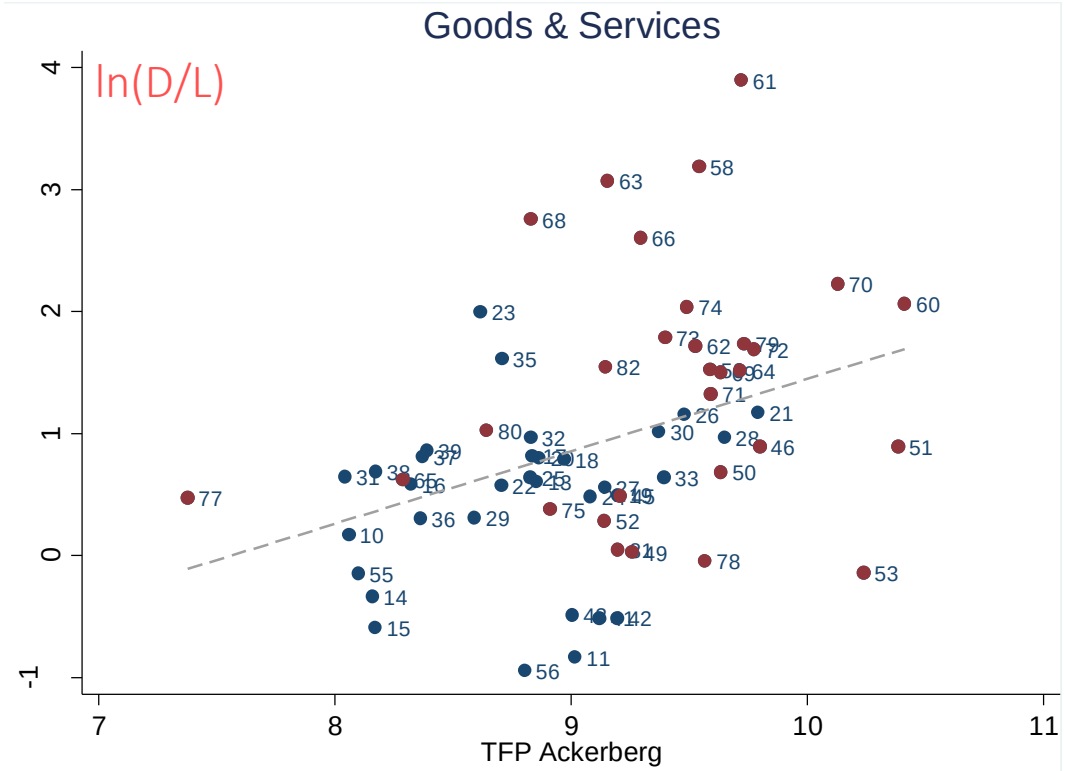


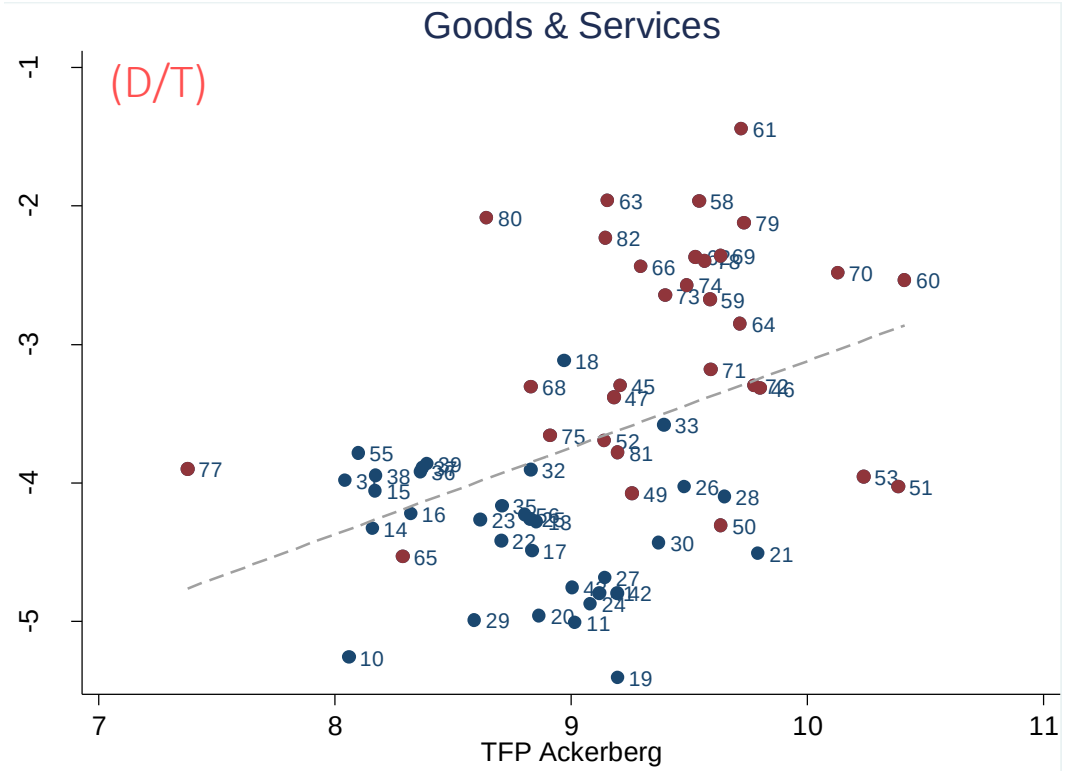
Economic impacts

- On productivity (of local firms)
- On trade in services (over the internet)
- On digital innovation (in East Asia)

On productivity (firm-level)

In all papers, ln(D/L) is preferred and used as part of the identification strategy





On productivity

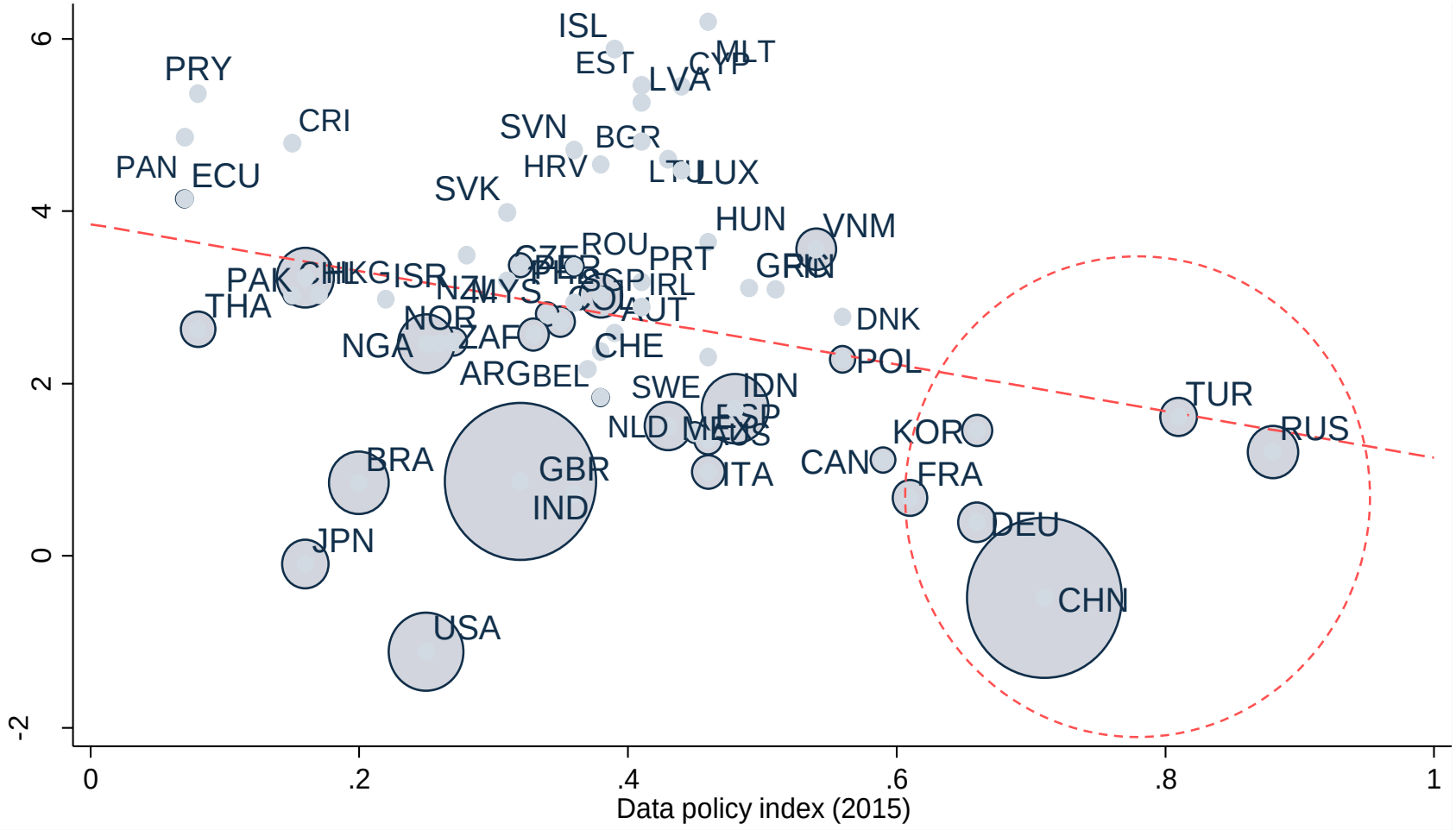
	(1) ACF	(2) L&P	(3) O&P	(4) TFPR	(5) TFPQ	(6) LabPr
ln(D/L) * Data policy CB	-0.305***	-0.311***	0.139	0.047	-0.240***	-0.039
	(0.000)	(0.000)	(0.270)	(0.115)	(0.000)	(0.262)
ln(D/L) * Data policy DOM	-0.340***	-0.506***	-0.385***	-0.015	-0.100***	-0.149***
	(0.000)	(0.000)	(0.000)	(0.158)	(0.000)	(0.000)
FE Country-Year	Yes	Yes	Yes	Yes	Yes	Yes
FE Sector-Year	Yes	Yes	Yes	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3516012	3521289	3521289	3521289	3521289	3521724
R2A	0.866	0.702	0.615	0.131	0.322	0.569
R2W	0.023	0.191	0.008	0.010	0.242	0.022
RMSE	0.444	0.702	1.017	0.776	1.014	0.670

On productivity

- Especially w.r.t. policies for domestic use of data
- Especially on local small and medium sized firms (SMEs)

On trade in services

Top 4 most digital-intense services imports in GDP



Data restrictiveness policy index from DTRI

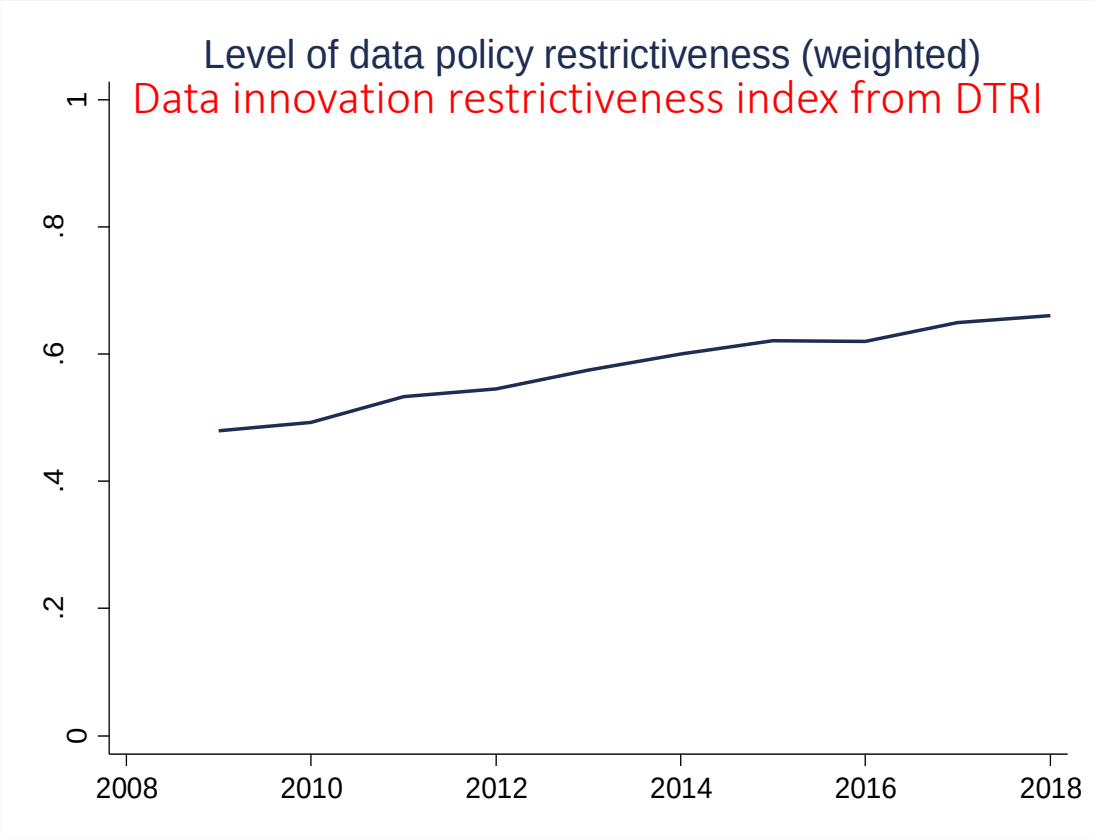
On trade in services

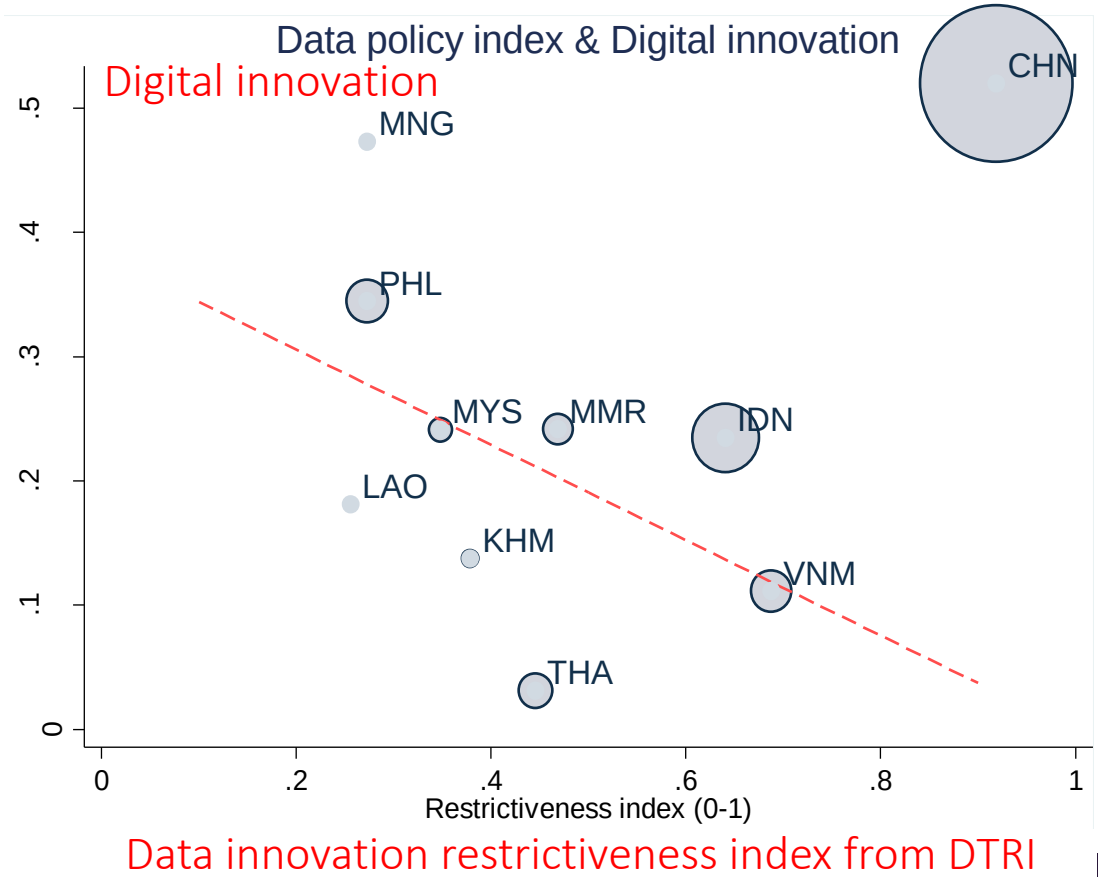
	(1) ln(SM)	(2) ln(SM)	(3) ln(SM)	(4) ln(SM)	(5) ln(SM)	(6) ln(SM)
ln(D/L) * Data policy CB	-2.078***		-1.803**	-1.082***	-1.058***	-1.067***
	(0.007)		(0.019)	(0.003)	(0.003)	(0.003)
ln(D/L) * Data policy DR		-1.614**	-1.066	-0.481	-0.546	-0.543
		(0.028)	(0.155)	(0.236)	(0.183)	(0.185)
STRI	-2.967	-3.662	-3.097	-0.942**	-1.050**	-1.095**
	(0.536)	(0.448)	(0.520)	(0.020)	(0.030)	(0.026)
FE year-country	Yes	Yes	Yes	Yes	Yes	Yes
FE year-sector	Yes	Yes	Yes	Yes	Yes	Yes
STRI classification	M1	M1	M1	ENTIRE	MA&NT	DISCR
Observations	430	430	430	950	886	886
R2A	0.755	0.752	0.756	0.763	0.753	0.753
R2W	0.026	0.014	0.031	0.026	0.027	0.027
RMSE	0.968	0.974	0.967	0.951	0.949	0.948

On trade in services

- Especially w.r.t. cross-border data policies
- On imports over the internet

On digital innovation (in East Asia)





On digital innovation (in East Asia)

	(1) New products introduced	(2) New processes introduced	(3) Licensing of foreign technology	(4) Spent on innovation
Index * ln(D/L)	-0.014	0.121	-0.336***	-0.122
	(0.887)	(0.283)	(0.001)	(0.297)
Observations	9988	8855	9276	8933
LR chi2(10)	1193.96	1072.52	215.74	947.12
No. groups	32	32	24	12
Log likelihood	-4690.1	-5207.8	-4045.7	-3475.1

On digital innovation (in East Asia)

- Especially w.r.t. acquiring licenses of foreign technology
  - Implies impact on “mode” of entering a market through the use of IP
  - Generally tends to affect small firms that otherwise could not enter
- On local firms in East Asian countries

Conclusions

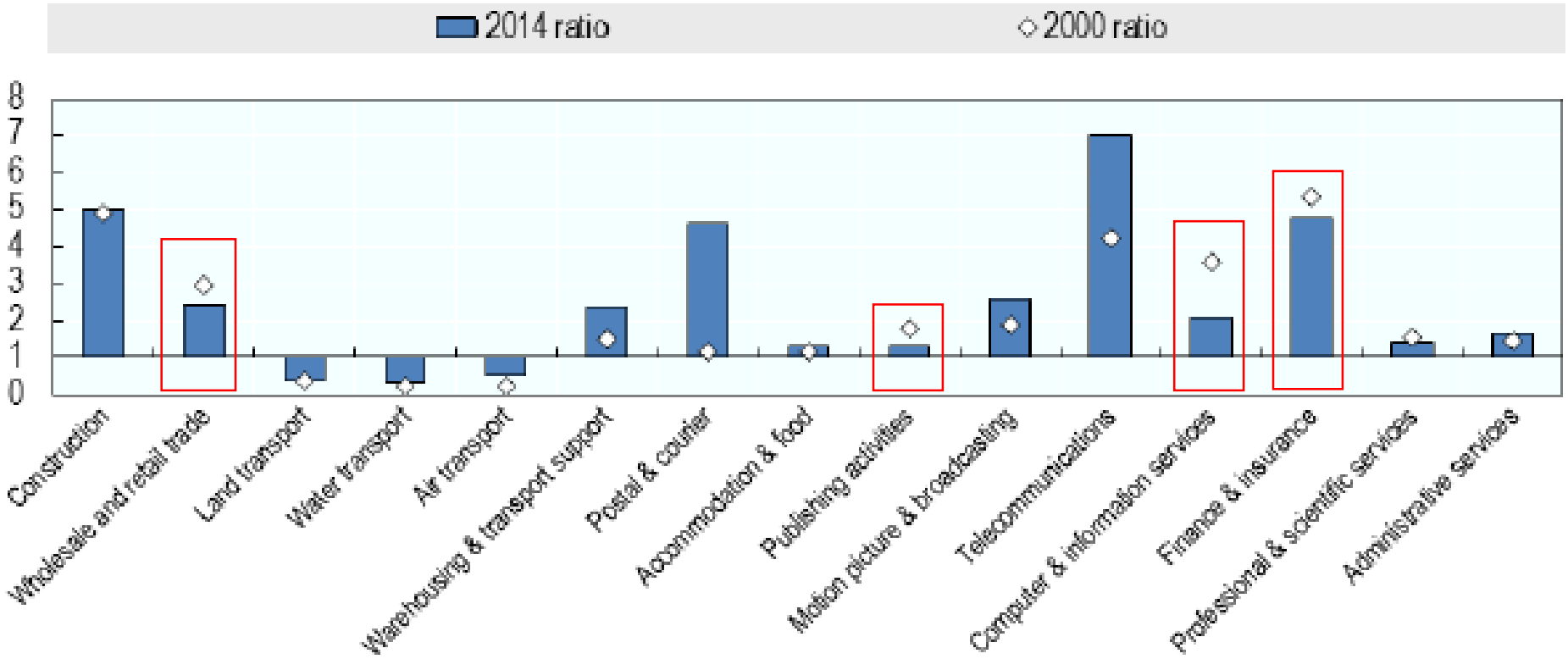
- Digital restrictions matter, especially for intangible trade
- Larger manufacturing-based (middle-income) countries ↑
- However, enabling environment matters too (example EU)
  - How to institutionalize trust and security? (Haskel and Westlake, 2017)

Optional slide

- Optional slides

Data-intense services (Mode 3 / Mode 1; gross terms)

Figure 11. Ratio of mode 3 to cross-border trade in services, by industry, 2000 and 2014



Source: Andrenelli et al (2018); using analytical AMNE database.

Digital enabling environment