Economic Implications of Data Regulation

Balancing Openness and Trust

Andrea Andrenelli, Eddy Bekkers, **Javier Lopez-Gonzalez**, Gabrielle Marceau and Roger So

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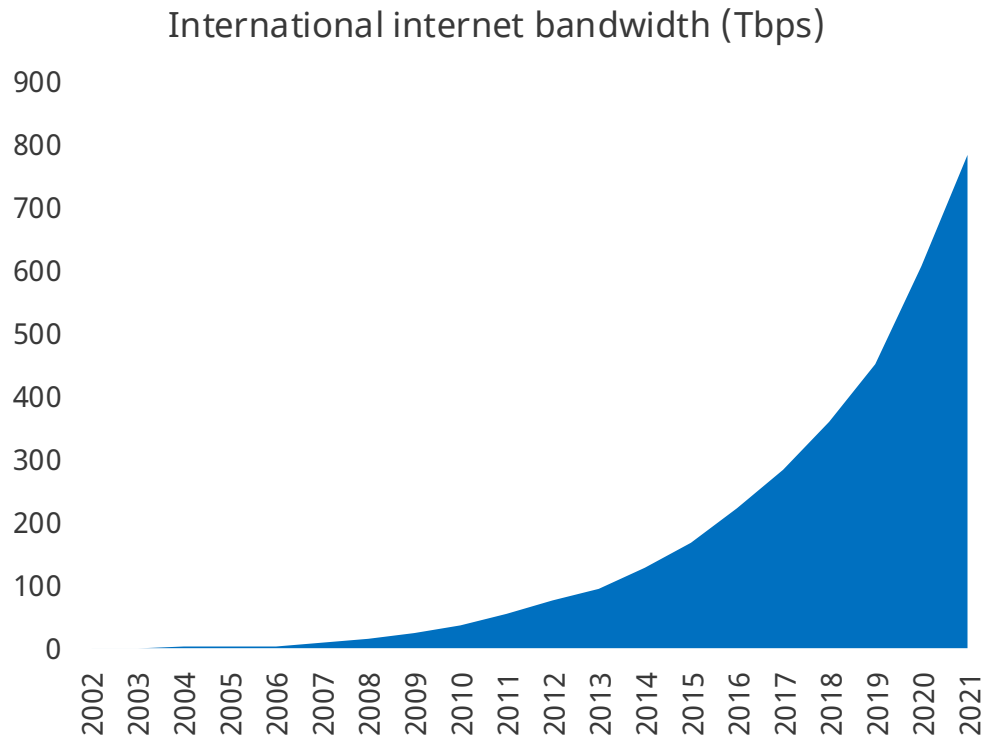
Data flows underpin modern day economic and social interactions

Today, our economies are digitally intertwined; connected by data flows which support:

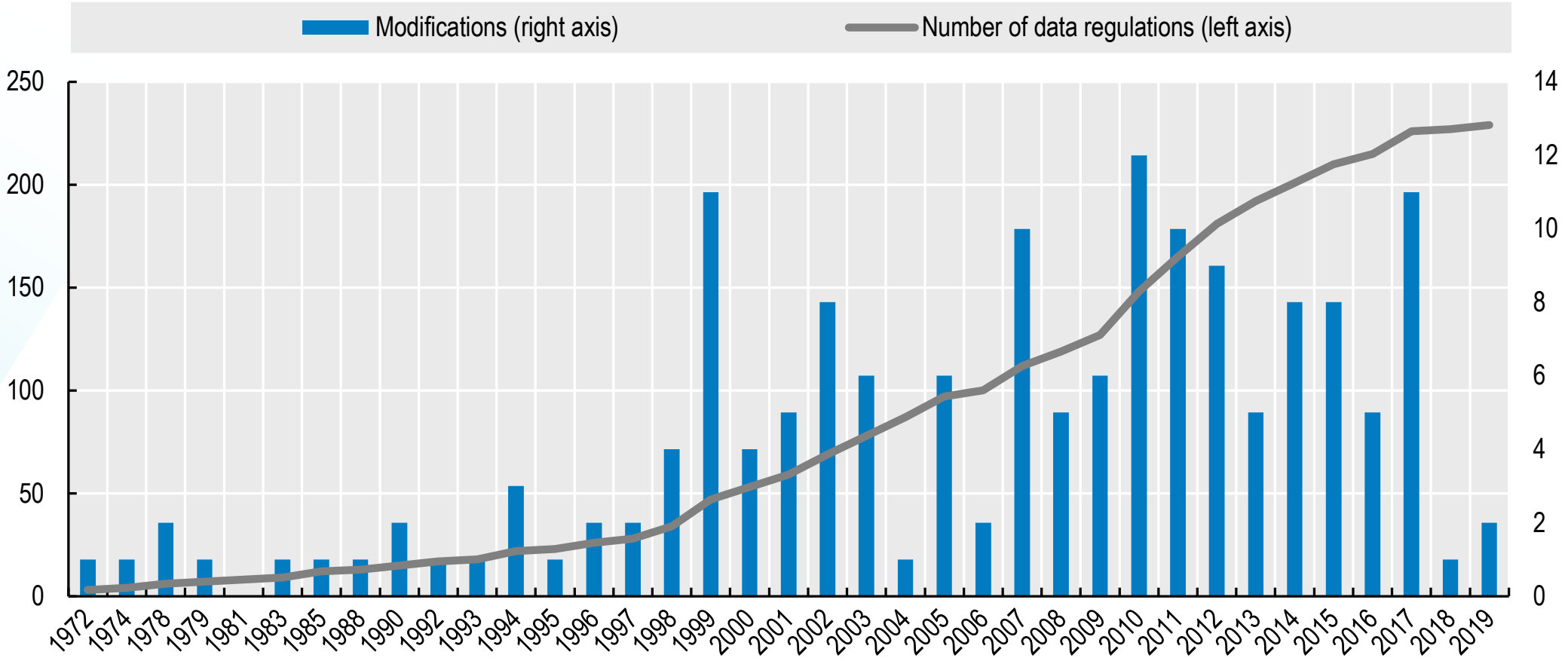
- how we socialise (social networking and global communication);
- how we produce (digitised processes along global supply chains);
- how we trade (digitally enabled trade in goods and services); and
- how we tackle global challenges (COVID-19, the green transition).

… as a result, international internet bandwidth has been growing exponentially



Source: Own calculations based on Telegeography (cumulative international bandwidth in terrabytes)

However, data flows also raise challenges across different policy areas and have led to growing data flow regulation



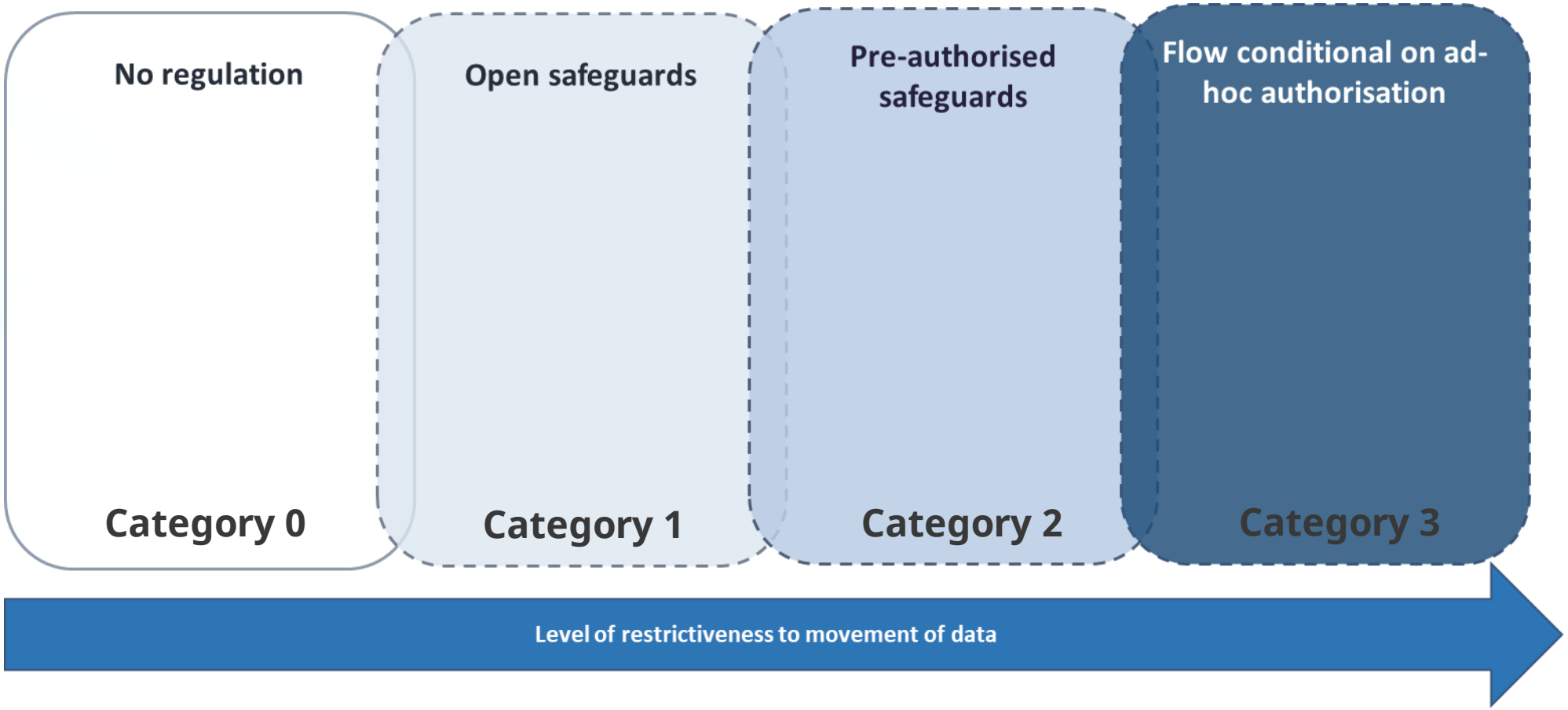
Source: Casalini, F. and J. López González (2019), "Trade and Cross-Border Data Flows", OECD Trade Policy Papers, No. 220, OECD Publishing, Paris, https://doi.org/10.1787/b2023a47-en.

Why regulate data?

Data regulation can apply to different types of data or sectors, reflecting a number of objectives:

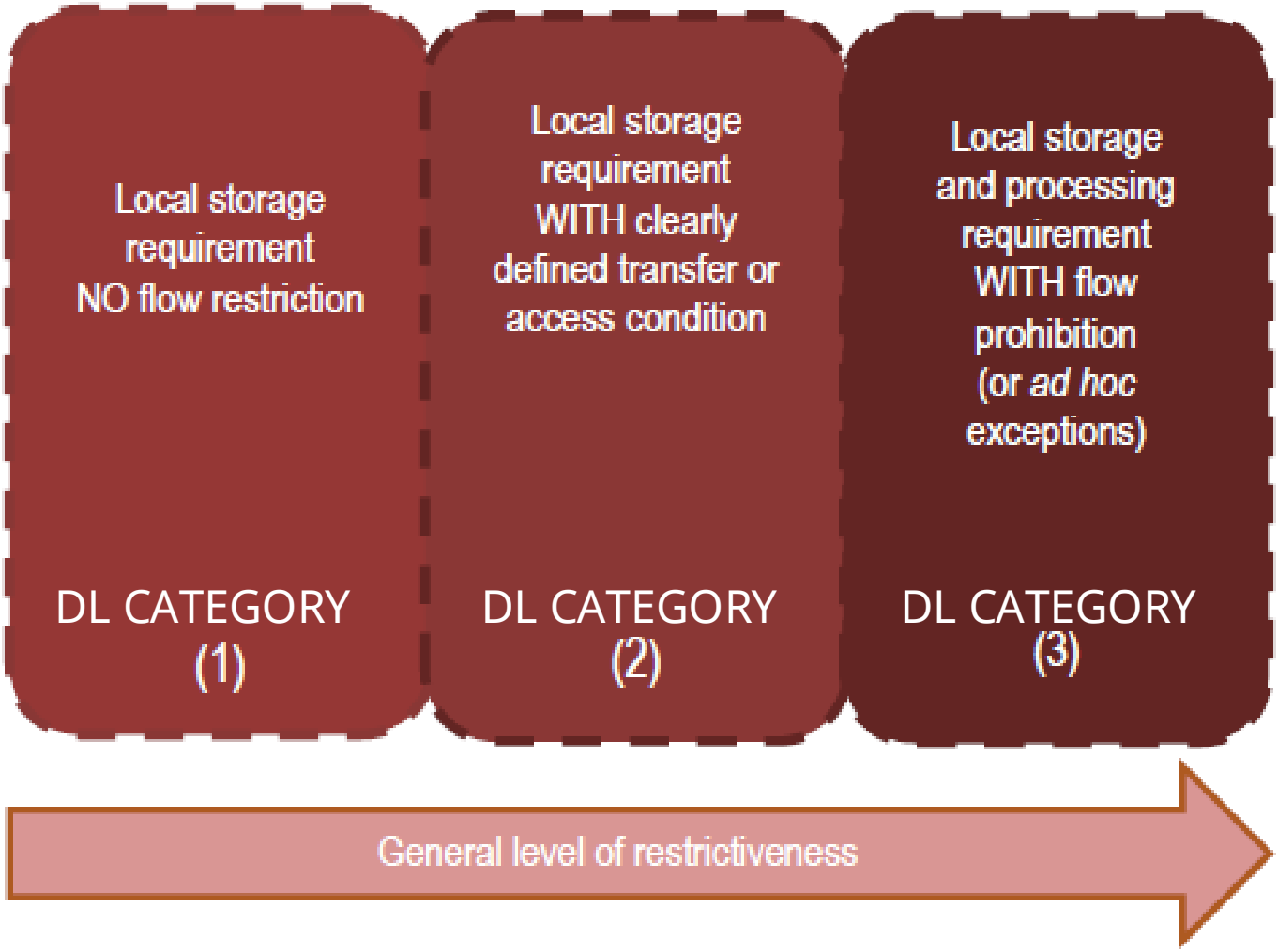
- Much of the debate involves movement of personal data raising concerns about privacy.
- Some aimed at meeting regulatory objectives (access for audit purposes) and involve sector-specific data.
- Others relate to national security, protection of information deemed sensitive.
- Governments also promote local storage and processing with a view to ensuring digital security.
- Others still aim to develop domestic capacity in digitally intensive sectors, a kind of digital industrial policy.

Approaches to data flow regulation are fragmented



Source: adapted from Casalini, F., J. López González and T. Nemoto (2021), "Mapping commonalities in regulatory approaches to cross-border data transfers", *OECD Trade Policy Papers*, No. 248, OECD Publishing, Paris, https://doi.org/10.1787/ca9f974e-en.

So too are approaches to data localisation



The emerging patchwork of regulation creates challenges

Although there are legitimate reasons for diversity in regulation, the landscape that underpins cross-border data flows is becoming increasingly complex.

- For **governments and individuals** there is growing uncertainties related to the applicable rules in any given situation.
- For **firms** challenges relate to their ability to internationalise (more difficult and costly to operate across different markets, affecting SMEs more), AND more difficult to know what level of data protection to afford to consumers in different markets.

The economic implications of this emerging regulatory landscape are not well understood

- Modelling the impacts of data regulation can assist the policy debate by presenting stakeholders with information on the potential and relative opportunity costs associated with different types of data related measures.
- Related literature:
  - Impact of digitalisation on trade →Freund and Weinhold (2002, 2004); Choi (2010); Lin (2015); López-González and Ferencz (2018); Benz, Jaax and Yotov (2022).
  - Impact of digital trade related policies on trade → Herman and Oliver (2022); López-Gonzalez, Sorescu and Kaynak (2023); Bellucci, Rubinova and Piermartini (2023)
  - Impact of data regulation /privacy using CGE → ECIPE (2013); Bauer et. al (2014); Flaig et al (2016)
  - Impact of cross-border data flow regulation → Van der Marel et al. (2016); Ferracane and Van der Marel (2020, 2021); López-Gonzalez, Sorescu and Kaynak (2023); Ferracane et al (2023)

This paper combines methods to identify the trade cost and trust benefits associated with emerging regulatory approaches

This work uses a combination of:

- Insights from a targeted **business questionnaire**
- **Econometric analysis** (structural gravity model); and
- **Mathematical modelling** (the WTO's CGE model the Global Trade Model)

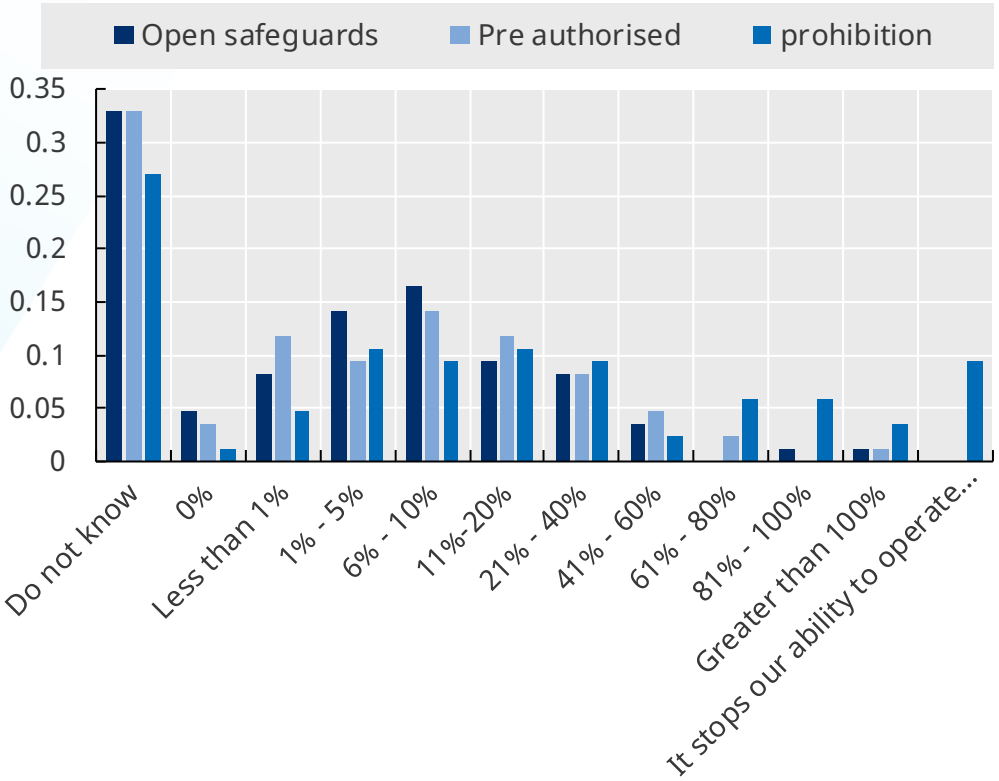
To identify the impact of measures affecting data flows and data localisation on economic activity.

What is new is that it looks at both **trade costs and benefits associated with safeguards (trust)**.

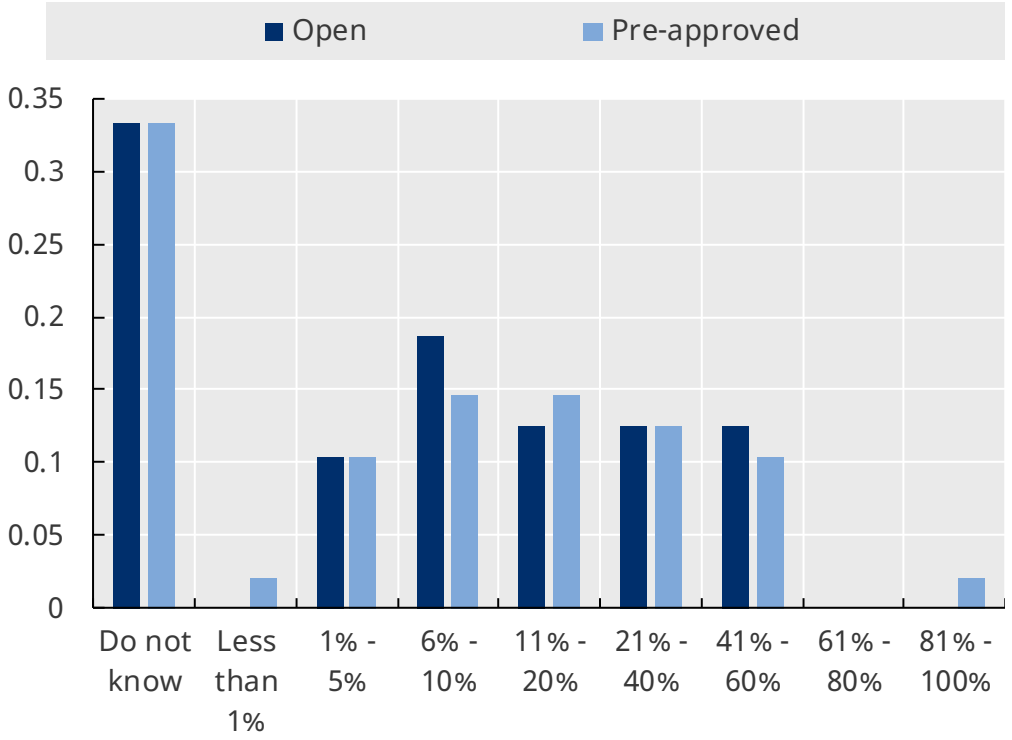
Business questionnaire – data flow regulation has costs but also benefits

Data flow regulation can increase data management costs by:

Cat 1 (9.5%), Cat 2 (11%), Cat 3 (19.5%)



Regulation can also increase sales as a result of higher trust (12.5%-13.5%)



Modelling the economic implications of data regulation

- **Trade costs**: More stringent data flow policies make it more costly for firms to export implying that they need to spend resources → Iceberg cost increase in export costs

  →Size of shock: Gravity model to identify AVE of changes in DSTRI (López-González et al., 2023)

- **Data management costs:** Data localisation policies imply that firms need to spend more resources in the domestic data management sector → Local content requirement

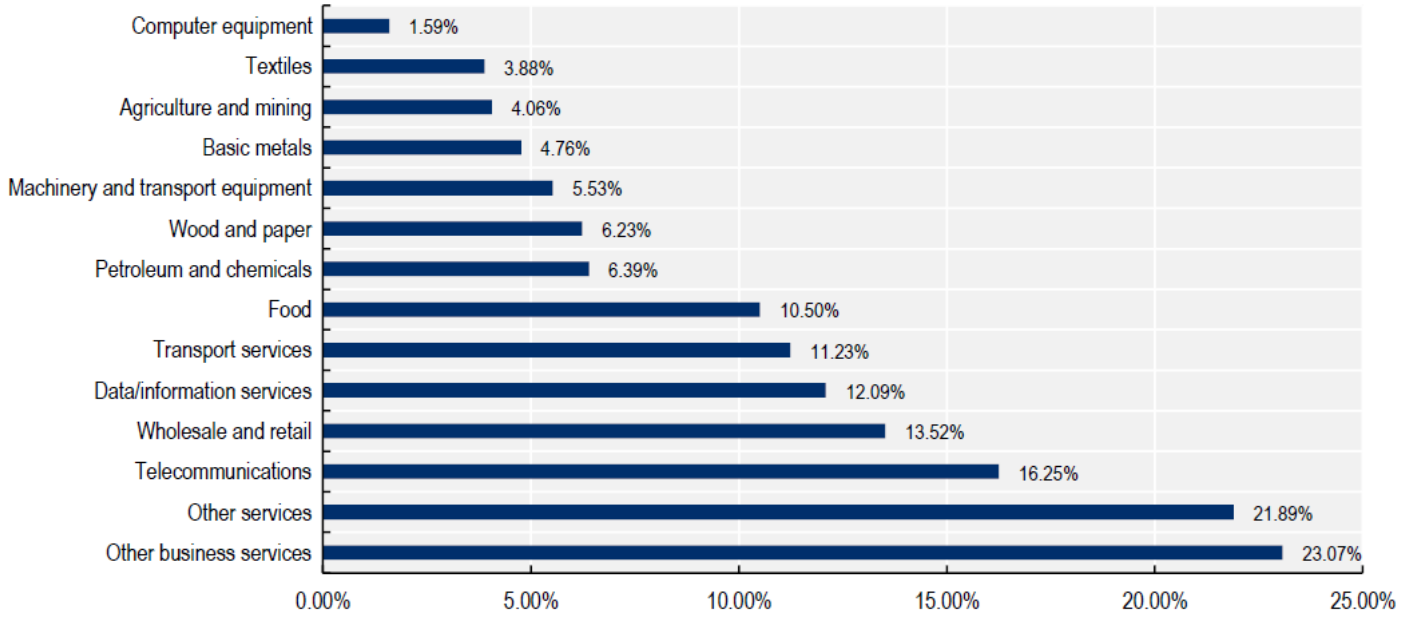
  → Size of shock determined using Business Questionnaire

- **Trust**: Data flow policies with safeguards generate more trust among consumers thus leading to higher demand for products → Willingness to pay (through the utility function – less quantity needed to obtain given level of utility) e.g. trust increases final demand

  → Size of shock determined using Business Questionnaire combined with DSTRI AVE)

Size of trade cost shock

Trade cost increase for selected sectors as a result of a 0.04 point increase in DSTRI



Note: The figure shows by how much export costs increase as a result of a 0.04-point increase in the Digital STRI.
Source: Calculation based on the estimated coefficients reported in Annex B and adapted from López González, Sorescu and Kaynak (2023[35]).

Step1: Calculate elasticity of trade wrt changes to DSTRI

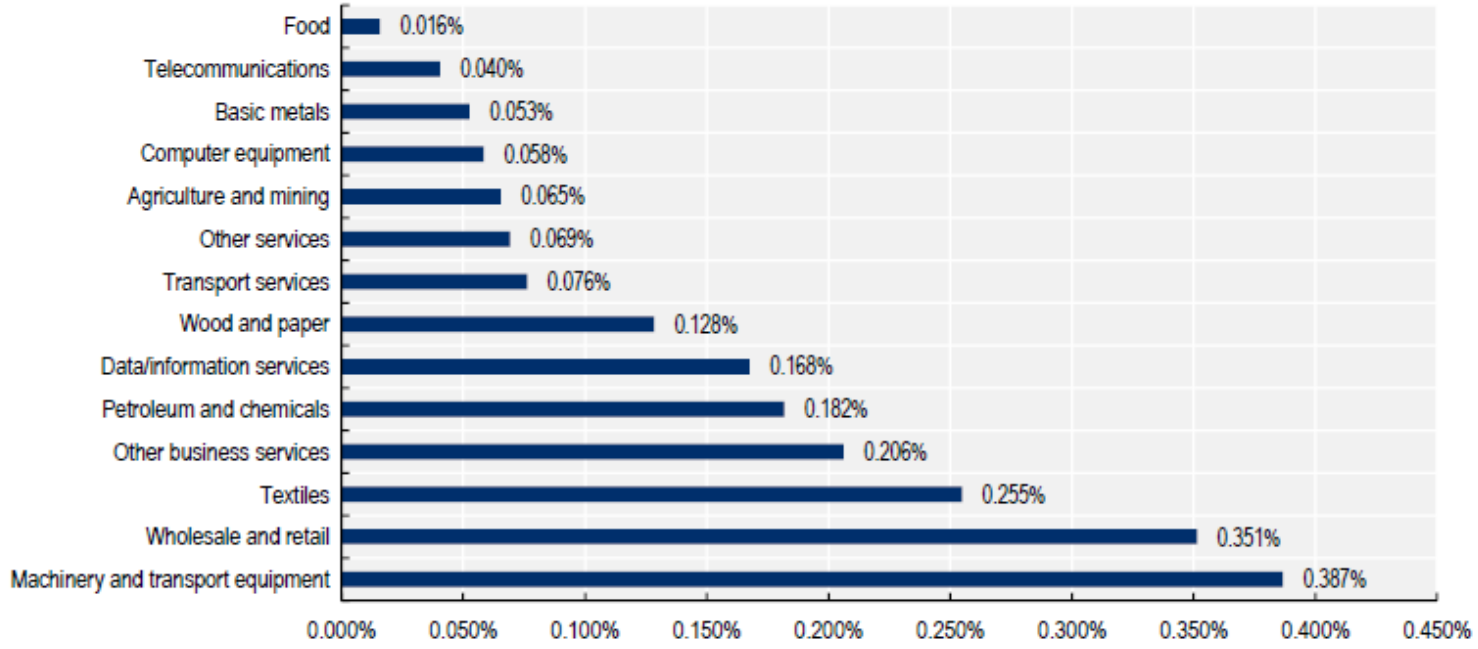
Step 2: simulate policy change using DSTRI simulator (how much would DSTRI change if data flow policies change)

Step 3: calculate changes in iceberg (shown below) and fixed trade costs:

$$AVE_{ik} = \exp\left(-\frac{\Delta DSTRI_i * \beta_{DSTRI_k}}{\theta_k}\right) - 1$$

Size of cost increase arising from a change in data management costs

Data management cost increase for selected sectors as a result of local storage requirements



Note: The figure shows the total cost increase of a change in data management costs per sector because of the requirement to use additional domestic data management services.
Source: Calculations based on the estimated cost increases reported in Figure 3.4 implied by the OECD-WTO Business Questionnaire.

- **Step1:** Extract the total projected cost changes due to data localisation policies from the BQ
- **Step 2:** Attribute the increased costs to more expensive data information services because of a suboptimal use of domestic and imported intermediate inputs ~~using less than optimal imported inputs~~

Identifying the trust element (combination of methods)

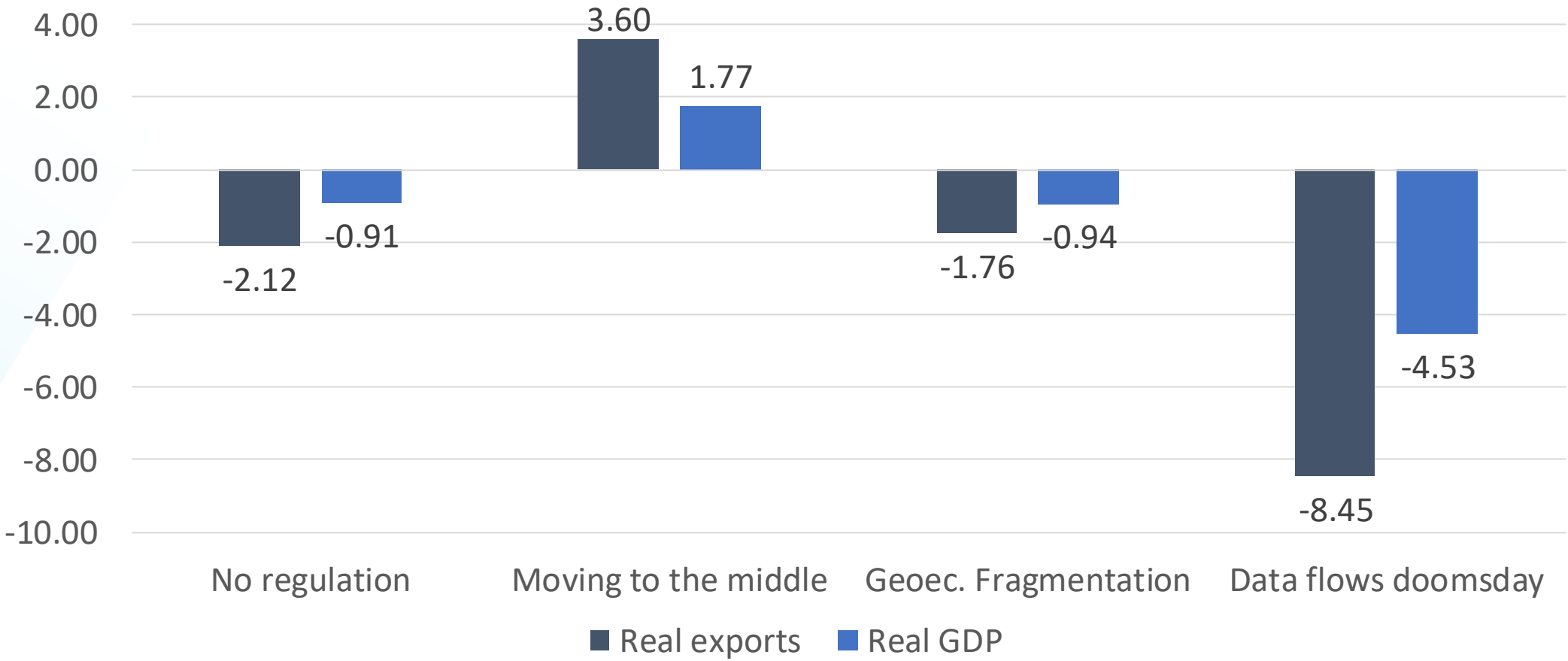
- **Modelling**: We model the trust element through a change in willingness to pay (WTP) in the model
- **Calibration:** We calibrate the change in WTP based on changes in the DSTRI for the different scenarios, combined with the ratio of sales to costs changes in the questionnaire (using a global average to address the limited number of observations in the business questionnaire)
- **WTP shock:** the WTP shock is calculate as:

$$WTP_{ik} = \frac{\widehat{p_{ik}q_{ik}}}{\sigma_k}$$

Stylised scenarios – data flows

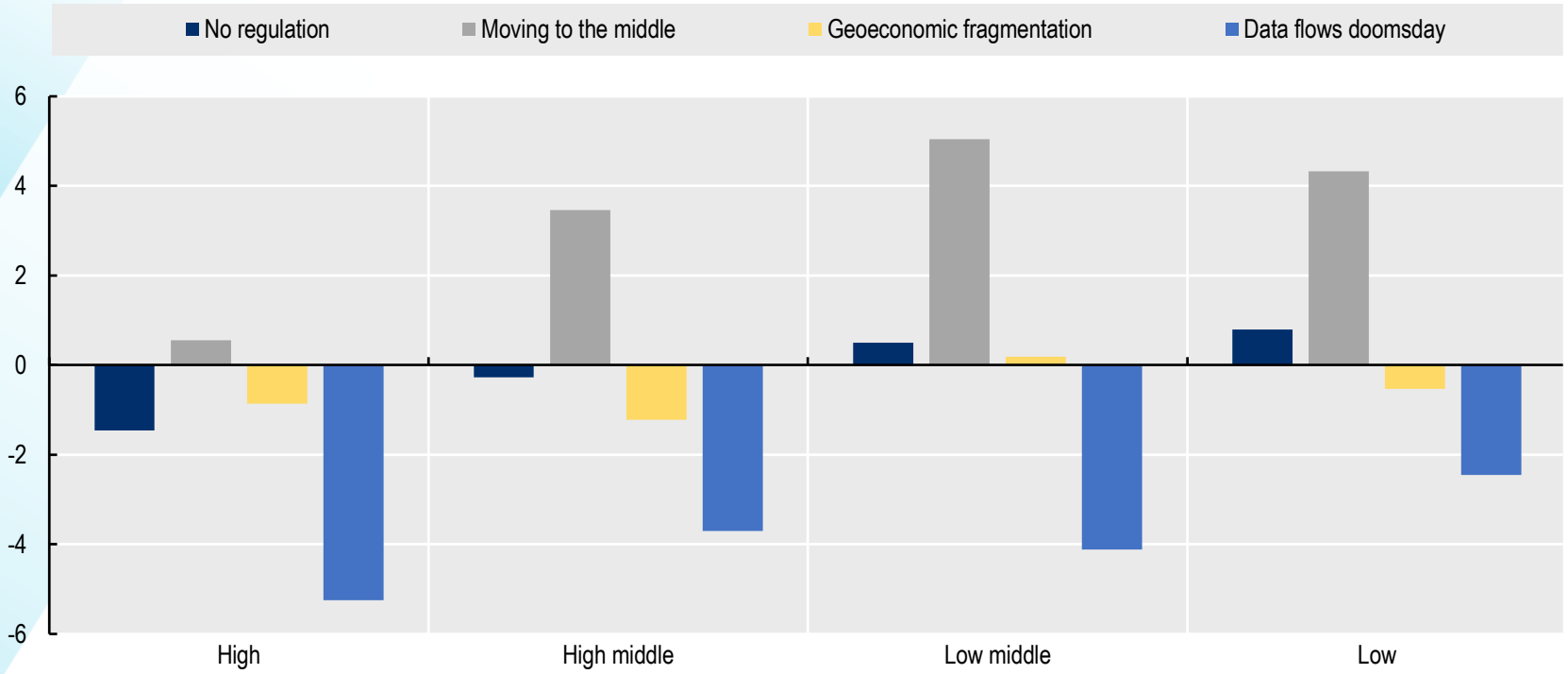
- Scenario 1: **No data flow regulation** (all economies remove data flow regulation)
- Scenario 2: **Moving to the middle** (all economies adopt open or pre-authorised safeguards)
- Scenario 3: **Geoeconomic fragmentation** (all economies impose stringent data flow regulation (ad hoc authorisations) on regions in different geopolitical blocks)
- Scenario 4: **Data flow doomsday –** full fragmentation (all economies adopt ad-hoc authorisation)

Getting it right on data flow regulation matters



For economies at all levels of development

Projected change in real GDP by income group from changes in data flow regulation

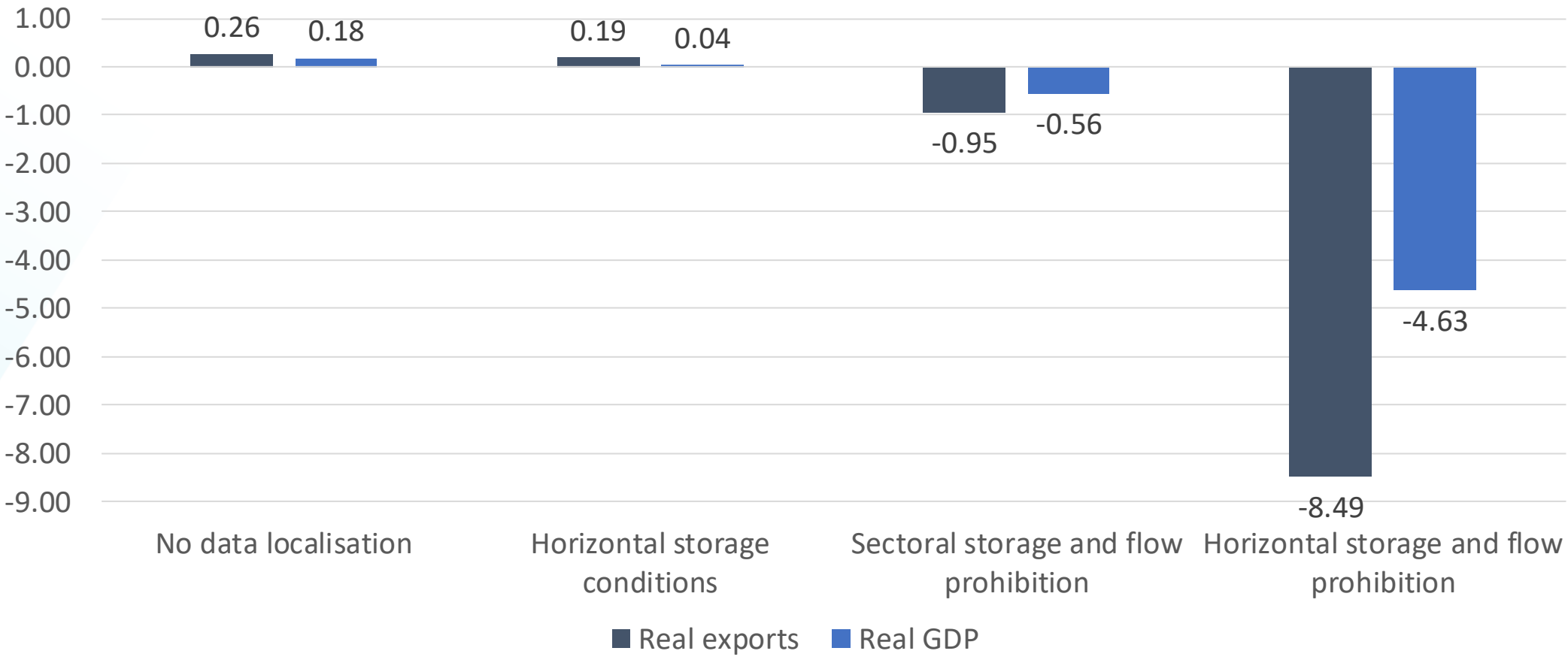


- Benefits of moving to middle particularly important for low-income economies
- Costs of full regulatory fragmentation highest for high-income economies

Stylised scenarios – data localisation

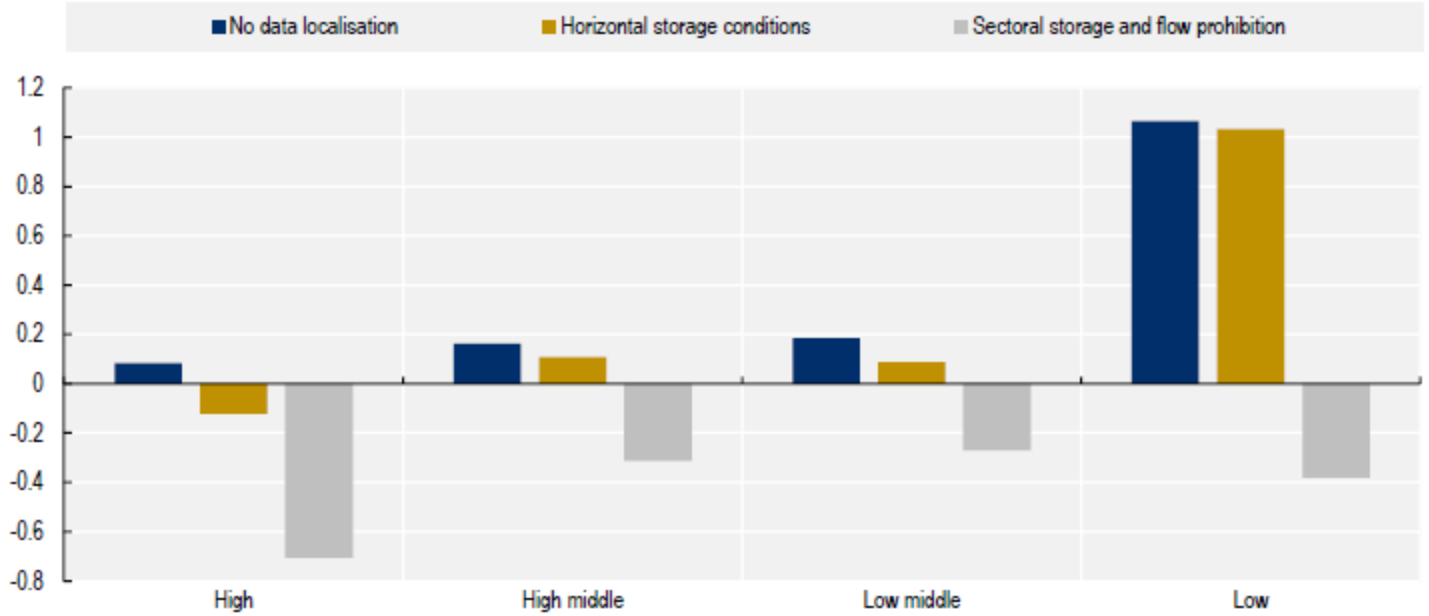
- DL Scenario 1: **No data localisation** (all economies remove existing data localisation measures – while keeping existing data flow policies)
- DL Scenario 2: **Horizontal storage condition** (all economies apply horizontal local storage conditions – no flow restrictions)
- DL Scenario 3: **Sectoral storage and flow prohibitions** (all economies apply sector specific local storage requirements (data management costs) and flow restrictions (trade costs) in financial services, ICT services, and telecommunications services.
- DL Scenario 4: **Horizontal storage and flow prohibition** – (all economies apply local storage combined with flow restrictions across all sectors of the economy. This scenario illustrates the potential impact of full localisation of data.

Impacts of data localisation measures



With marked differences for economies at different levels of development

Projected change in real GDP by income group from changes in data localisation measures



- Benefits of no data localisation or of less restrictive forms of data localization are high for low-income economies
- Costs of moving towards more restrictive forms of DL highest for high income economies

Final thoughts

- The impact of regulation has traditionally been approached from a trade cost perspective, but it is increasingly evident that this may miss some aspects of regulation, especially as it concerns emerging digital policies (national security, privacy etc.).
- This is a first stab at looking at trade cost and trust issues more jointly, but it needs better measures of the role of trust in trade relations.
- It begs a number of questions:
  - Since we are already relatively fragmented in our approaches, the opportunity costs of further fragmentation are, in relative terms, small, but the benefits of integration are rather large.
  - How do we reduce fragmentation, how do we increase integration in this area?

Many thanks for your attention!

OECD/WTO (2025), *Economic Implications of Data Regulation: Balancing Openness and Trust*, OECD Publishing, Paris, https://doi.org/10.1787/aa285504-en.

https://www.oecd.org/en/publications/economic-implications-of-data-regulation_aa285504-en.html