Nowcasting TiVA indicators

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Overview

What have we done?

- Motivation and scope
- Methodological approach

What have we found?

- Performance of the models
- Nowcasting TiVA indicators

Takeaways

What have we done?

Motivation

Issue

- Trade in value added (TiVA) indicators are important for monitoring countries' integration into global supply chains
- But TiVA indicators are published with a 2-3 years lag

Solution

- Nowcast TiVA indicators
- Use machine learning: it is sometimes found to outperform standard nowcasting methods (Chapman and Desai 2021, Hopp 2022)

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Scope

- Nowcast **five TiVA indicators** for **2021-2022**

- Using data on
  - TiVA indicators **1995-2020**
  - Over 170 explanatory variables **1995-2022**

- Coverage
  - 41 countries (37 OECD and China, India, Indonesia, South Africa)
  - Economy-wide and 24 sectors

How do we do it?

1. Collect and pre-process data

2. Test models
   - Gradient boosted trees (GBM), ridge, lasso, linear regression model
   - A "consensus" model simple average of the GBM, ridge and lasso
   - Benchmark: autoregressive model of order 1, as the data are annual

3. Use cross-validation to prevent overfitting

4. Compute RMSEs for one-year ahead predictions, select best models

5. Use best models to nowcast indicators for 2021 and 2022

Model Performance

Nowcasting models outperform the AR1 benchmark

Percentage of instances selected as best model: Domestic value-added shares (EXGR_DVASH)

	Benchmark AR1	GBM	Lasso	Ridge	Consensus	OLS
Economy Wide	7	66	15	7	2	2
Agriculture	27	34	17	7	10	5
Manufacturing	20	71	5	2	2	0
Services	15	20	32	32	0	2

GBM is selected most often as the best model

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Performance varies across countries

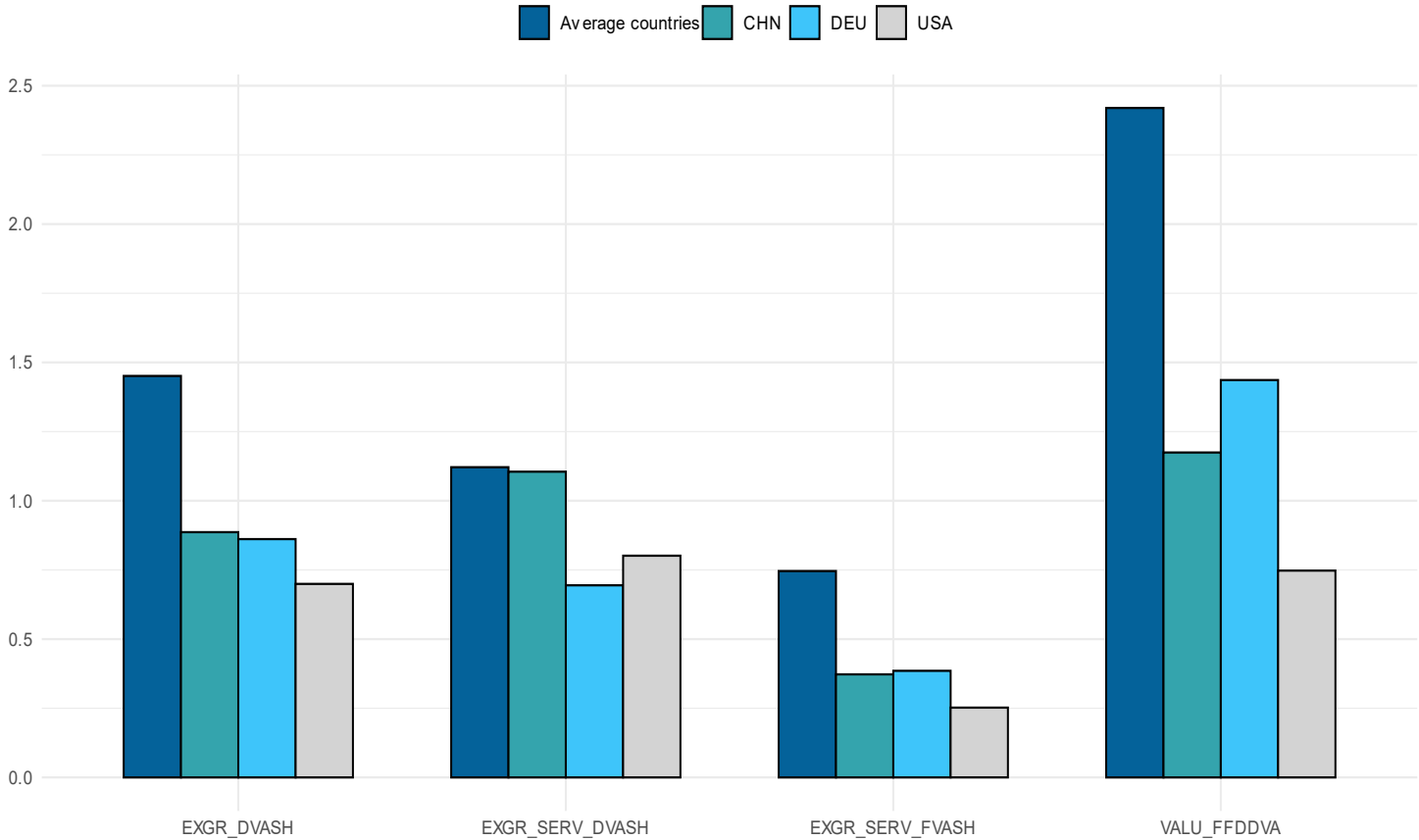RMSEs, EXGR_DVASH, percentage points
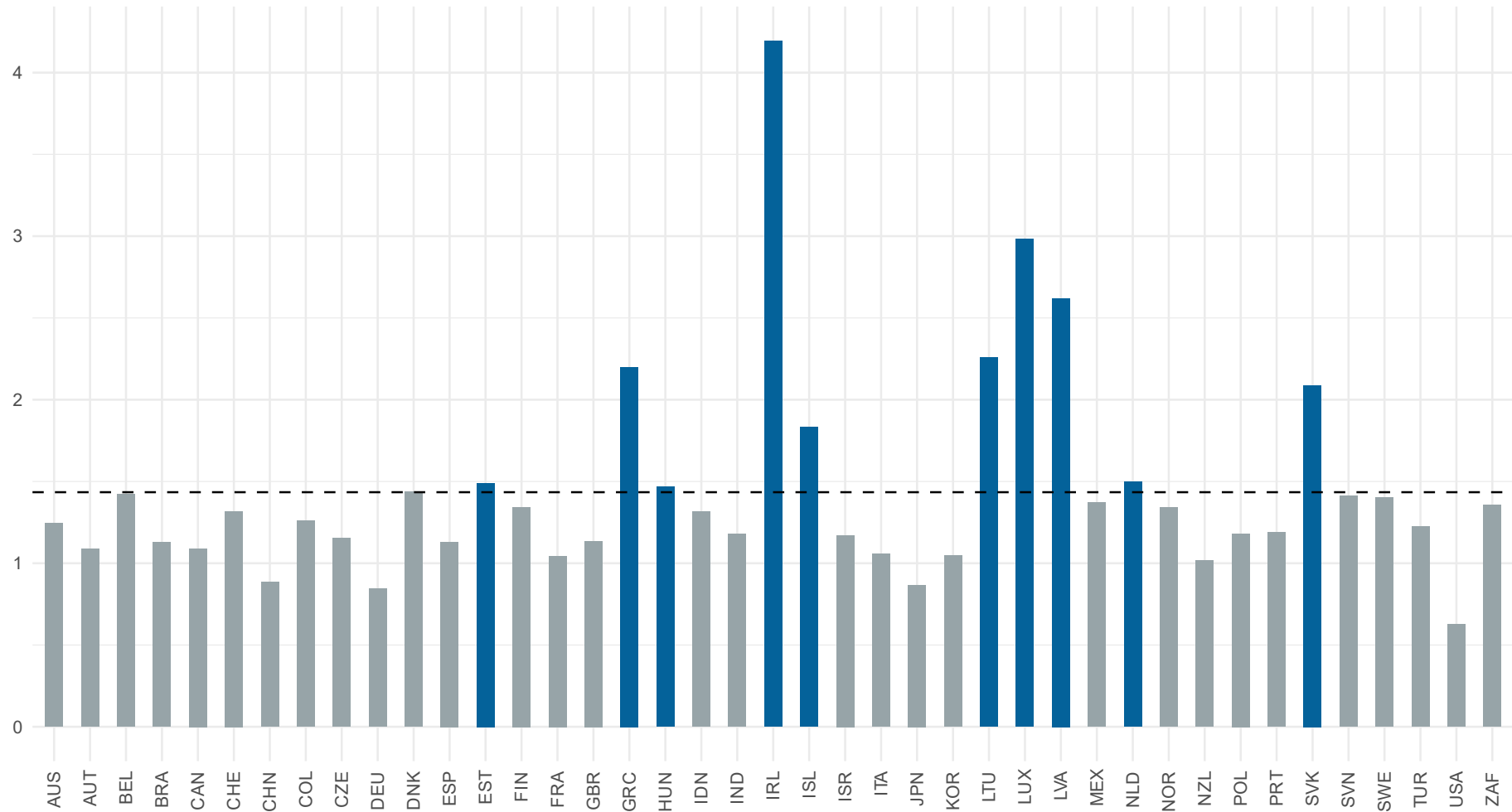
Performance varies across sectors

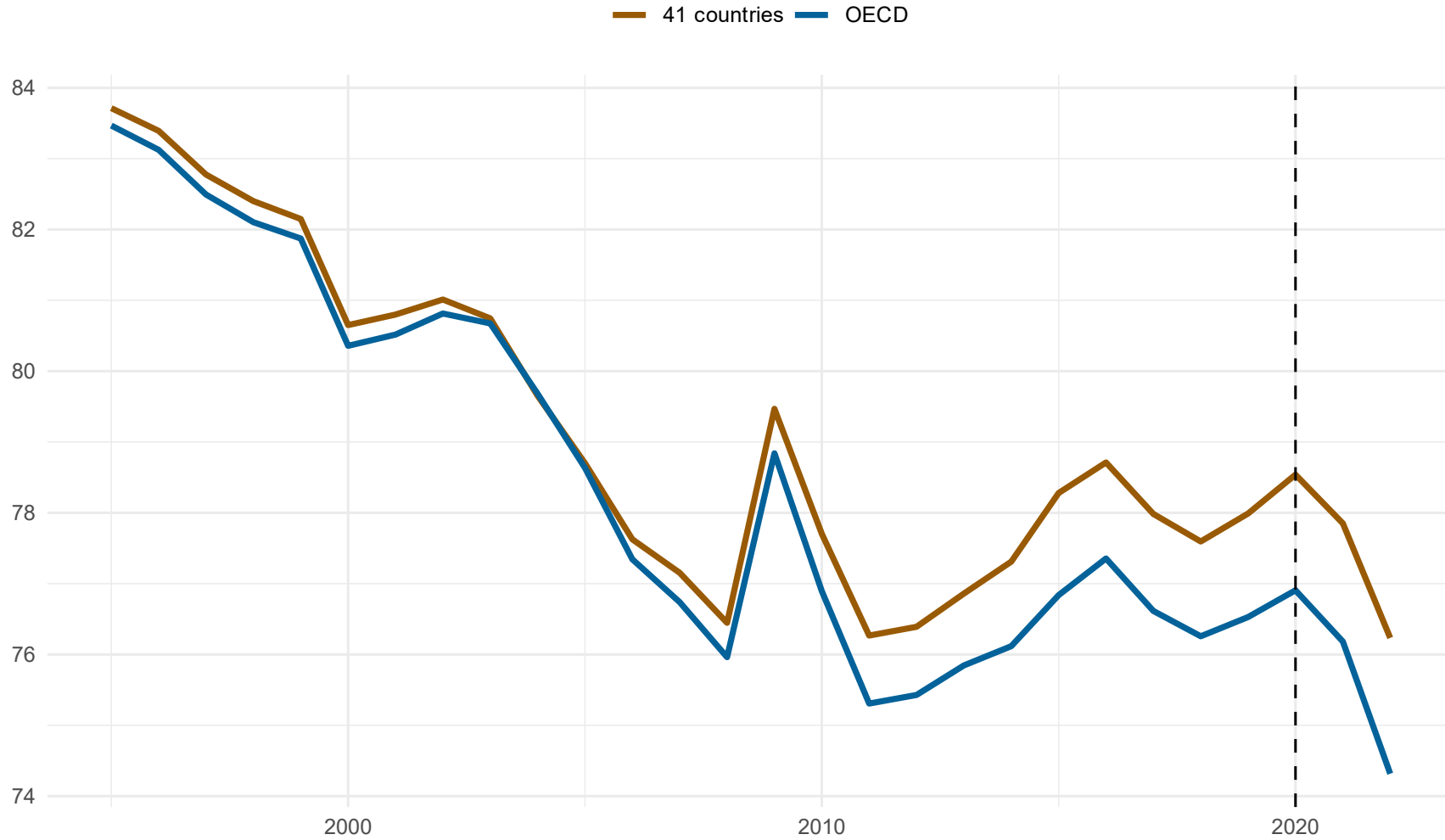RMSEs, EXGR_DVASH, percentage points
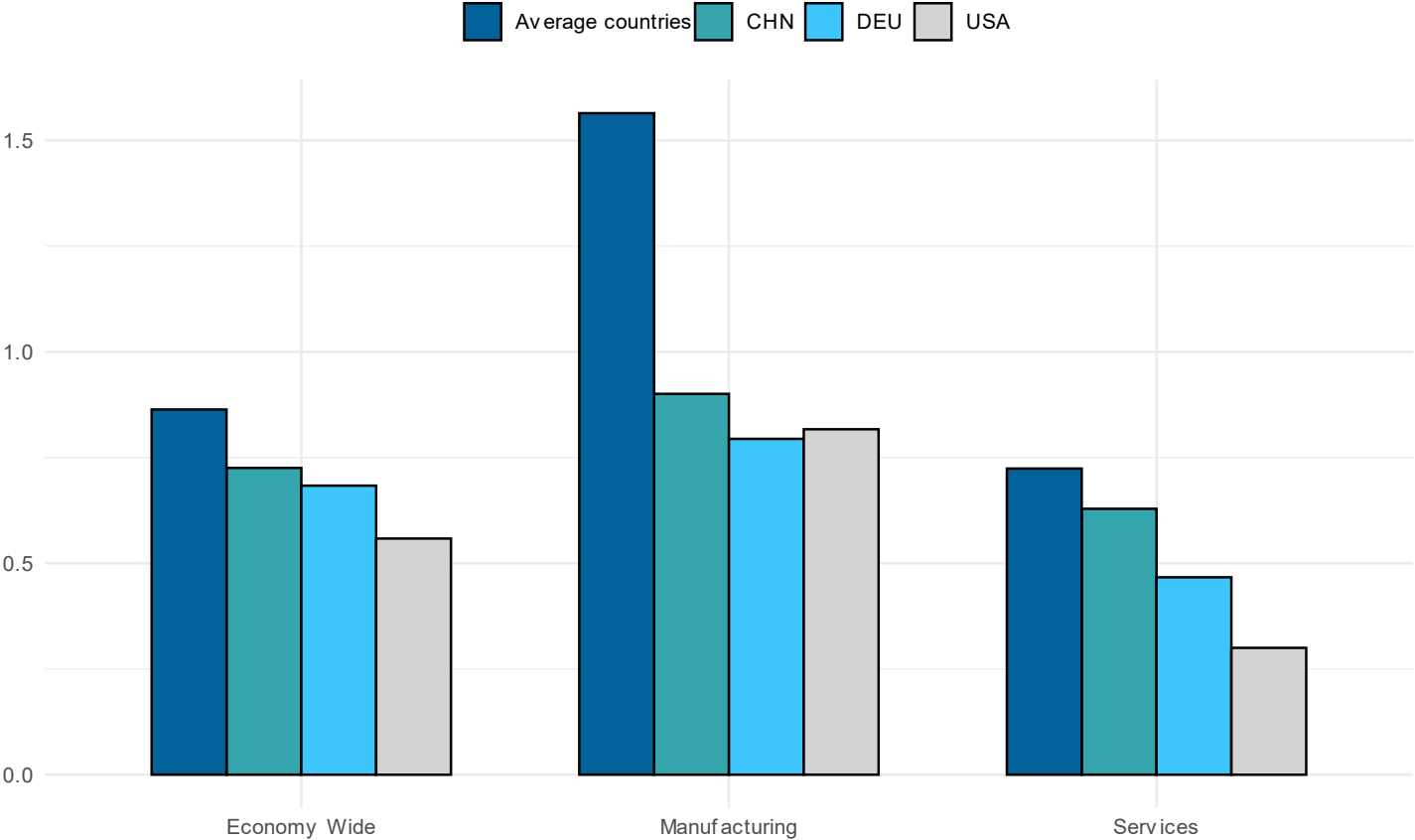
Performance varies across indicators

RMSEs, EXGR_DVASH, percentage points
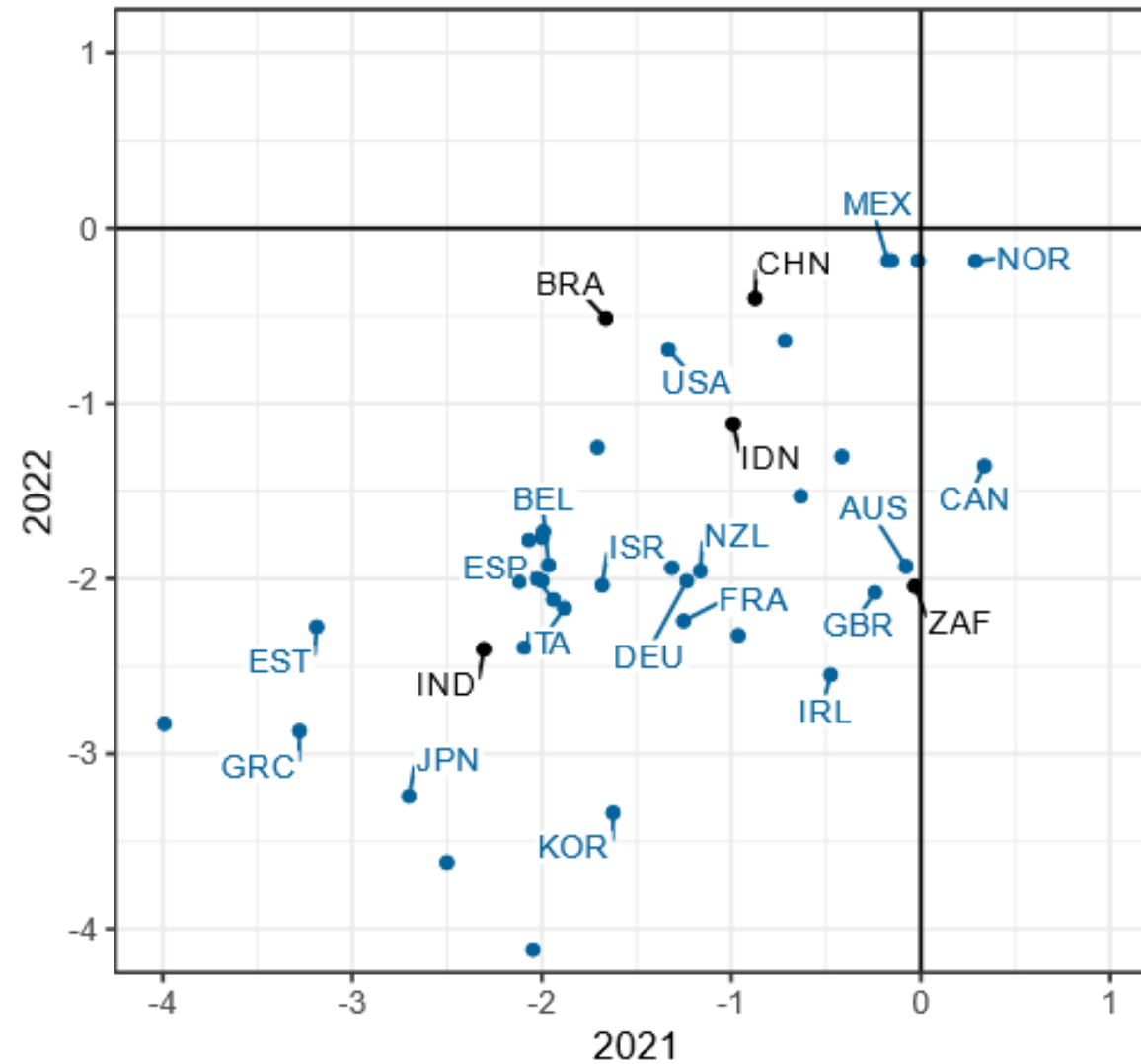
Nowcasting 2021 and 2022

Share of domestic VA in gross exports is estimated to have fallen

Evolution of EXGR_DVASH at the economy-wide level

— 41 countries — OECD

But growth patterns differ across countries

Change in the EXGR_DVASH at the economy-wide level, percentage points

Main takeaways

Key findings

- Nowcasting models add value
- Performance of models differs across countries, sectors and indicators
- Nowcasts of TIVA indicators in 2021-22 reveal a decline in the share of domestic value added in export flows, but patterns differ across countries

THANK YOU

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Data: some examples

	Example variables
National accounts	GDP less imports, Gross value added and Gross Output by industry
International trade Balance of payments	Exports and Imports of Intermediate Goods (BTDIxE), Exports and Imports of Services (TiS), Current Account and components
Business activity	Industrial Production Index Consumer Price Index
Financial indicators	Long term interest rates Real effective exchange rates
Employment	All active people employed (age 15 -64) Employment by industry (ALFS, National Accounts)

Change in the EXGR_DVASH by sector
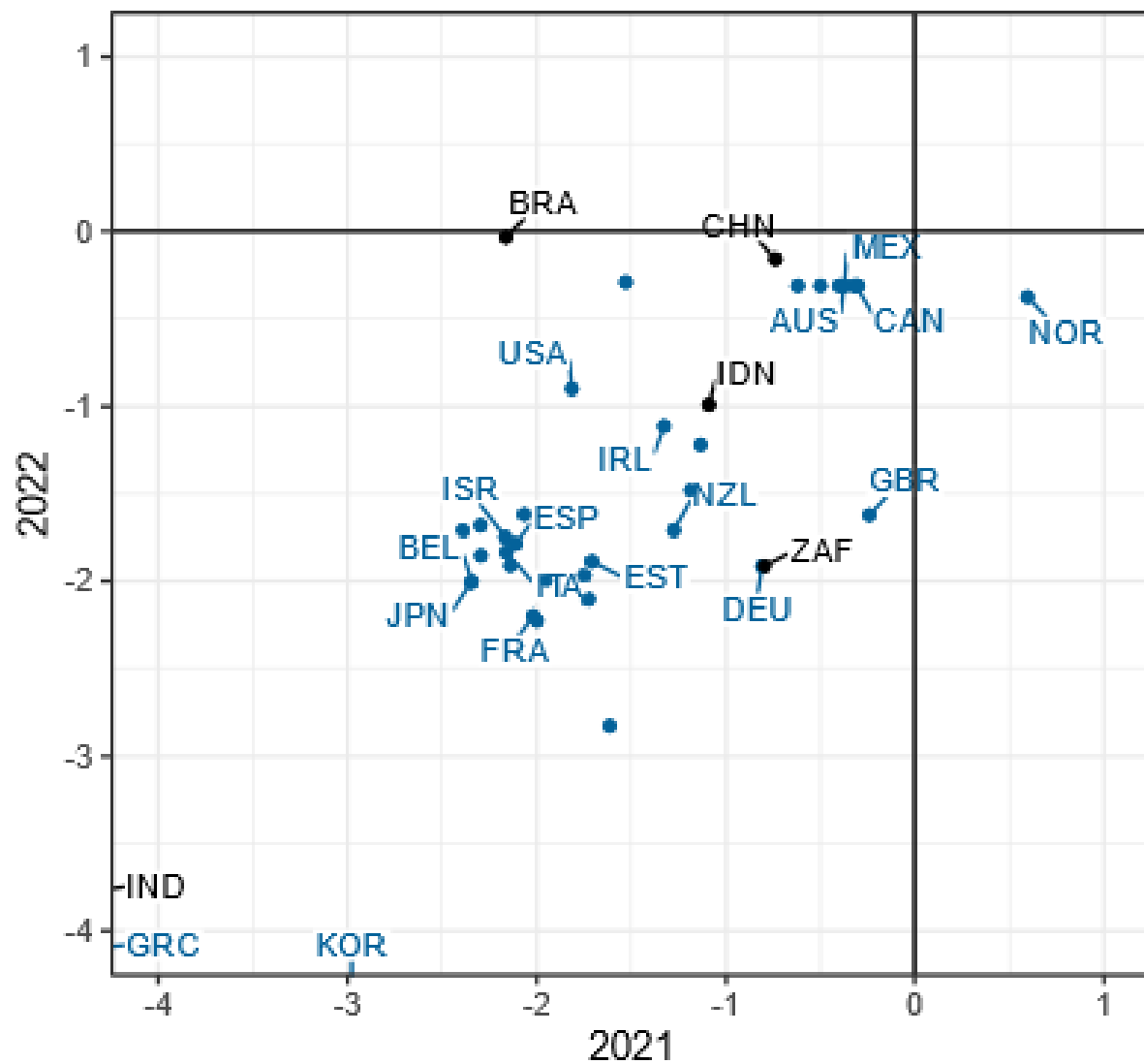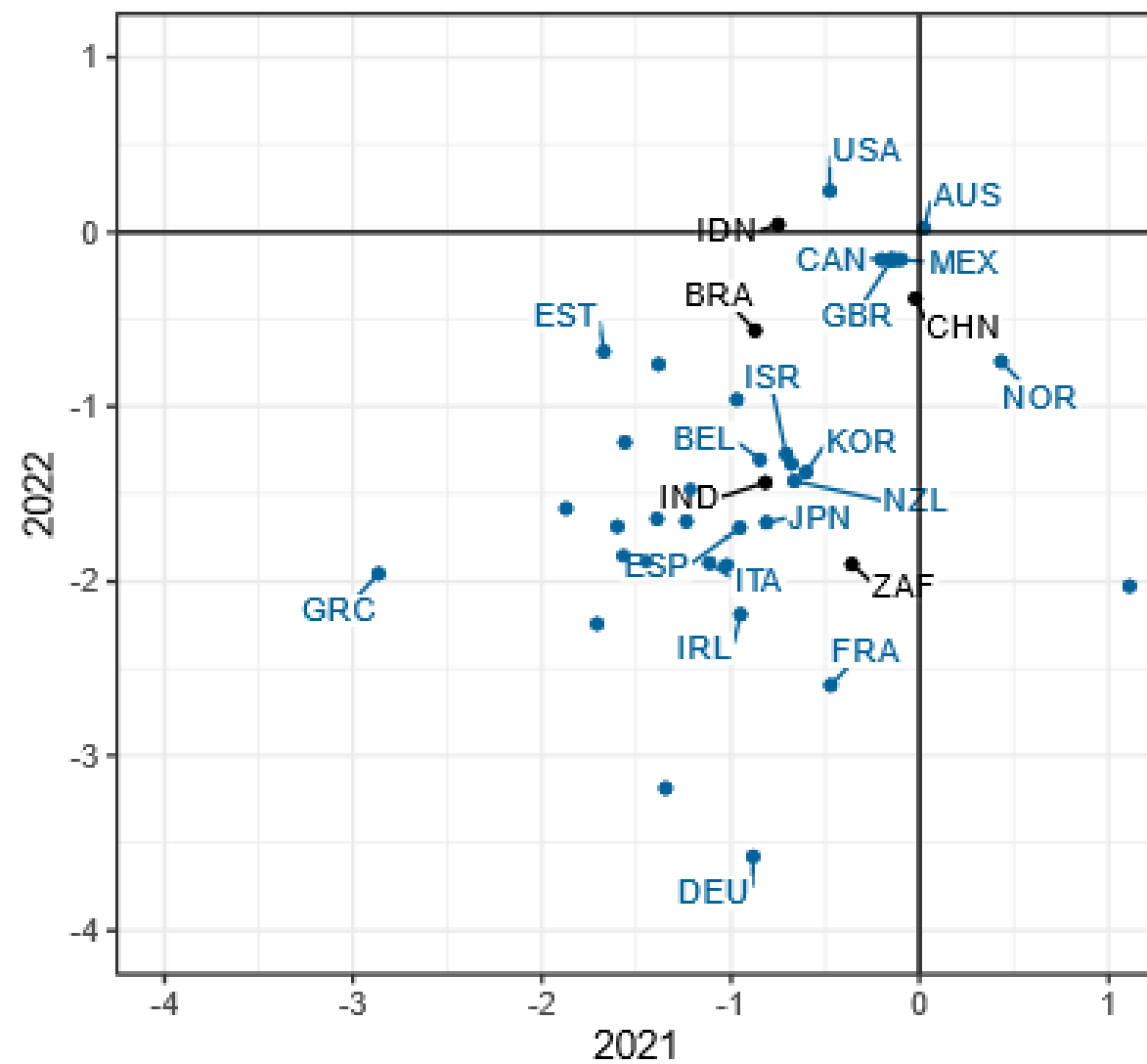
Share of domestic VA in exports at the economy-wide level by region