



Global Linkages in a Fragmented World

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Key questions

- Are global linkages changing, and are these changes driven by fragmentation?
- What would be the economic costs of fragmentation?
- What is the outlook and policy priorities?

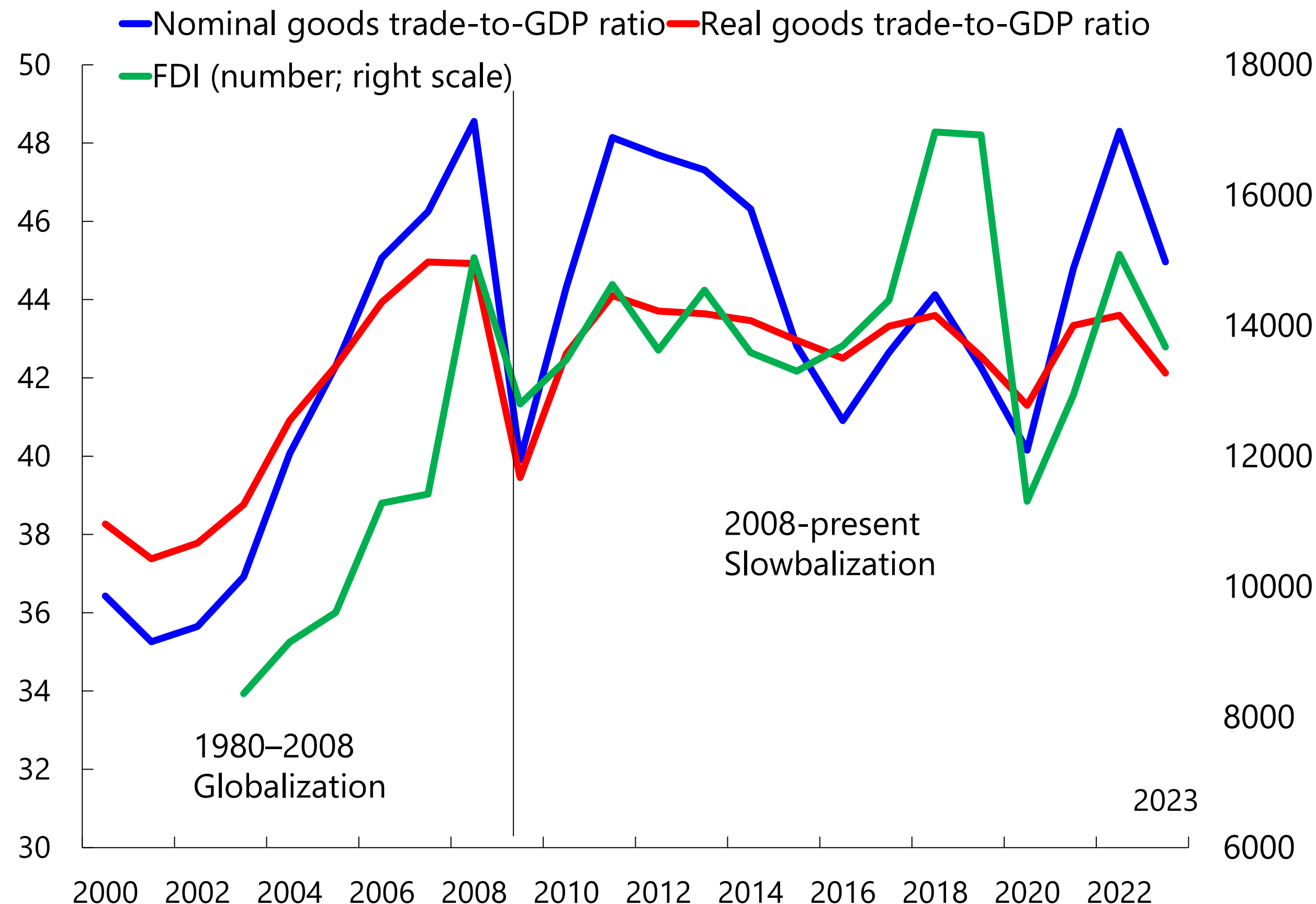
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Underneath broadly stable aggregate patterns, reallocation of trade and investment flows has picked up since 2020

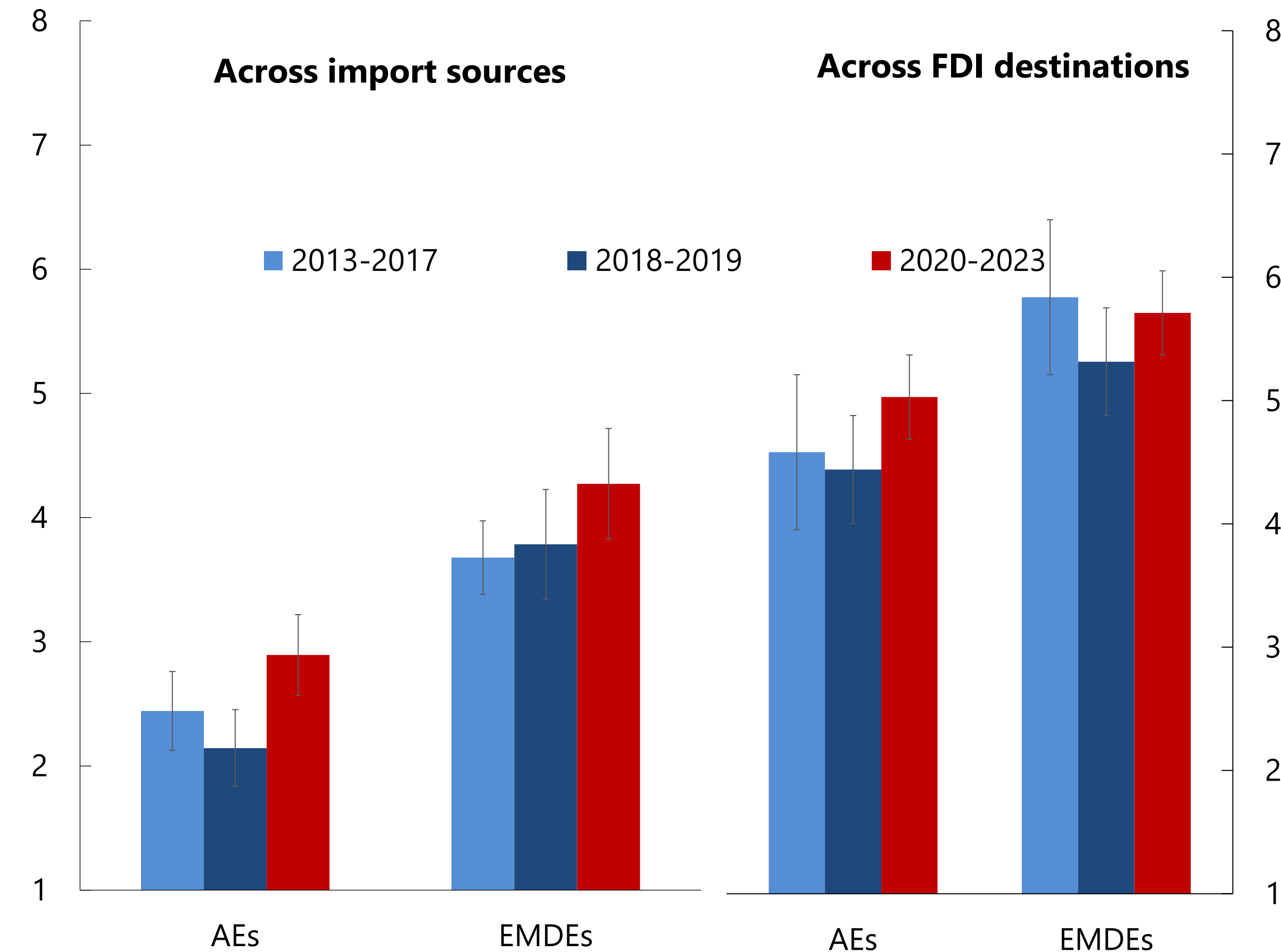
World Goods Trade and FDI 1/

(Percent)



Reallocation 2/

(Number; Lilien index)



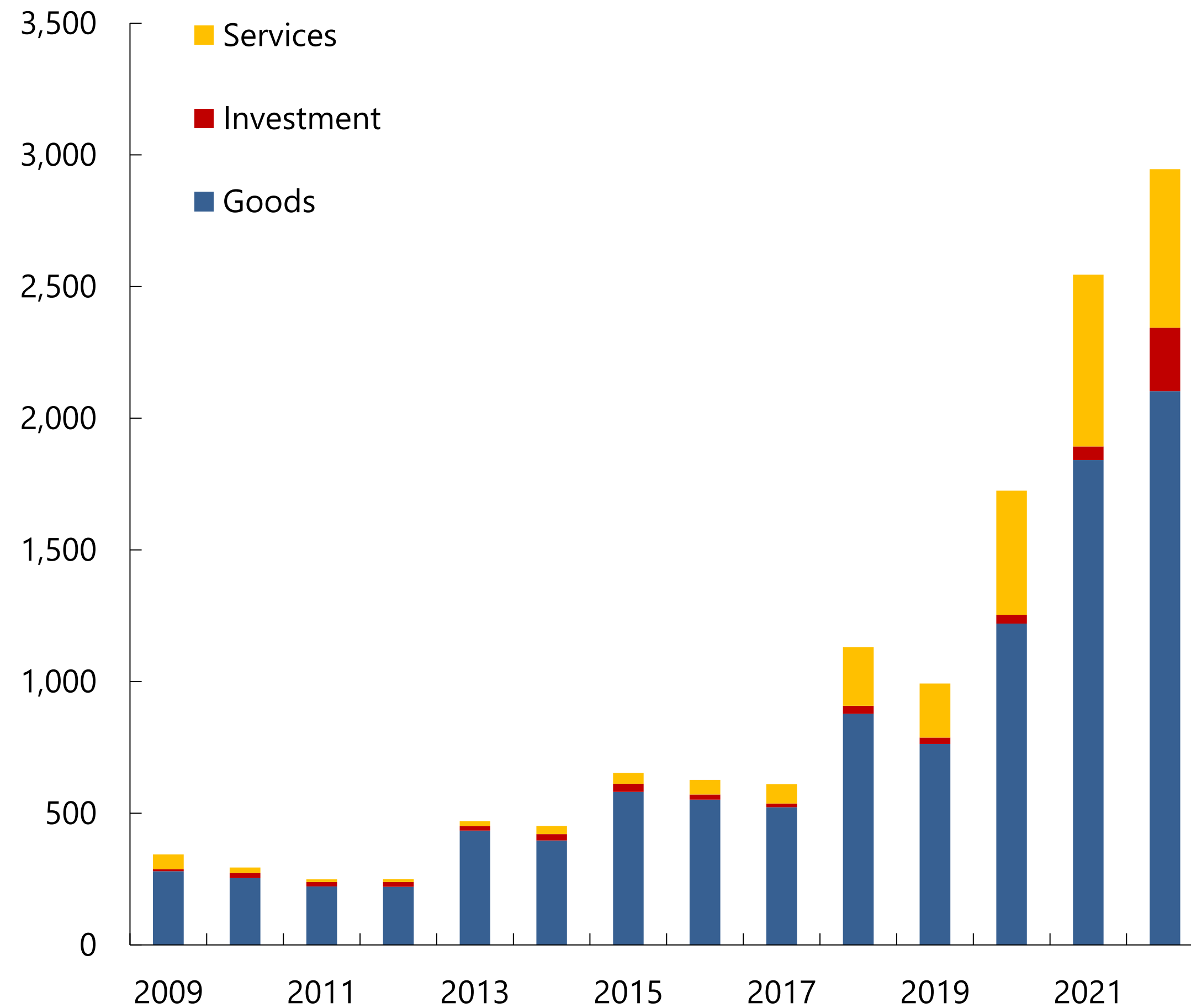
Sources: IMF World Economic Outlook database; Trade Data Monitor; fDi Markets; and IMF staff calculations.

Note: 1/ The real goods trade-to-GDP ratio is rescaled to be equivalent to the nominal ratio in 2015; the value of 2023 FDI is estimated using actual data up to 2022Q3. 2/ The bars show the average Lilien (1982) index of structural change in trade and investment patterns across countries and years, measured as the relative standard deviation of trading partner import growth (or destination country' FDI growth) relative to countries' overall import (FDI) growth. The whiskers are the 90 percent confidence intervals of the estimates.

The sharp increase in policy measures and elevated geopolitical tensions are strongly linked to the reshuffling across trade and FDI partners

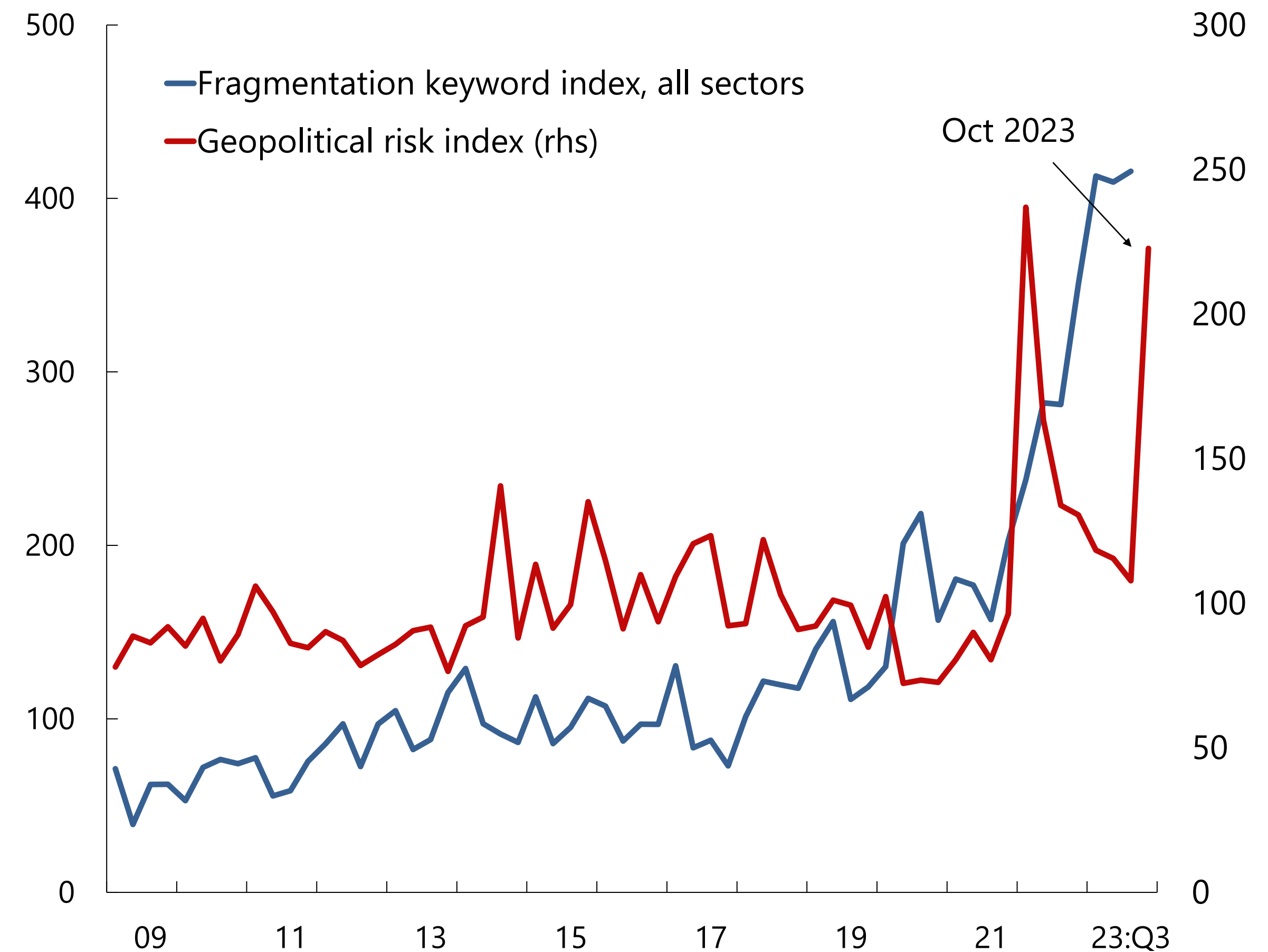
New Trade and Investment Distorting Measures

(Number)



Geopolitical Risk and Fragmentation Keywords in Earnings Calls

(Index, 2013-15=100)



Sources: Global Trade Alert database; Caldara and Iacoviello (2022); Hassan and others (2019); NL Analytics, Inc.; and IMF staff calculations.

Note: New trade and investment distorting measures are defined per the classification from the Global Trade Alert database. Fragmentation indices measure the average number of sentences, per thousand earnings calls, that mention at least one of the following keywords: deglobalization, reshoring, onshoring, nearshoring, friend-shoring, localization, regionalization.

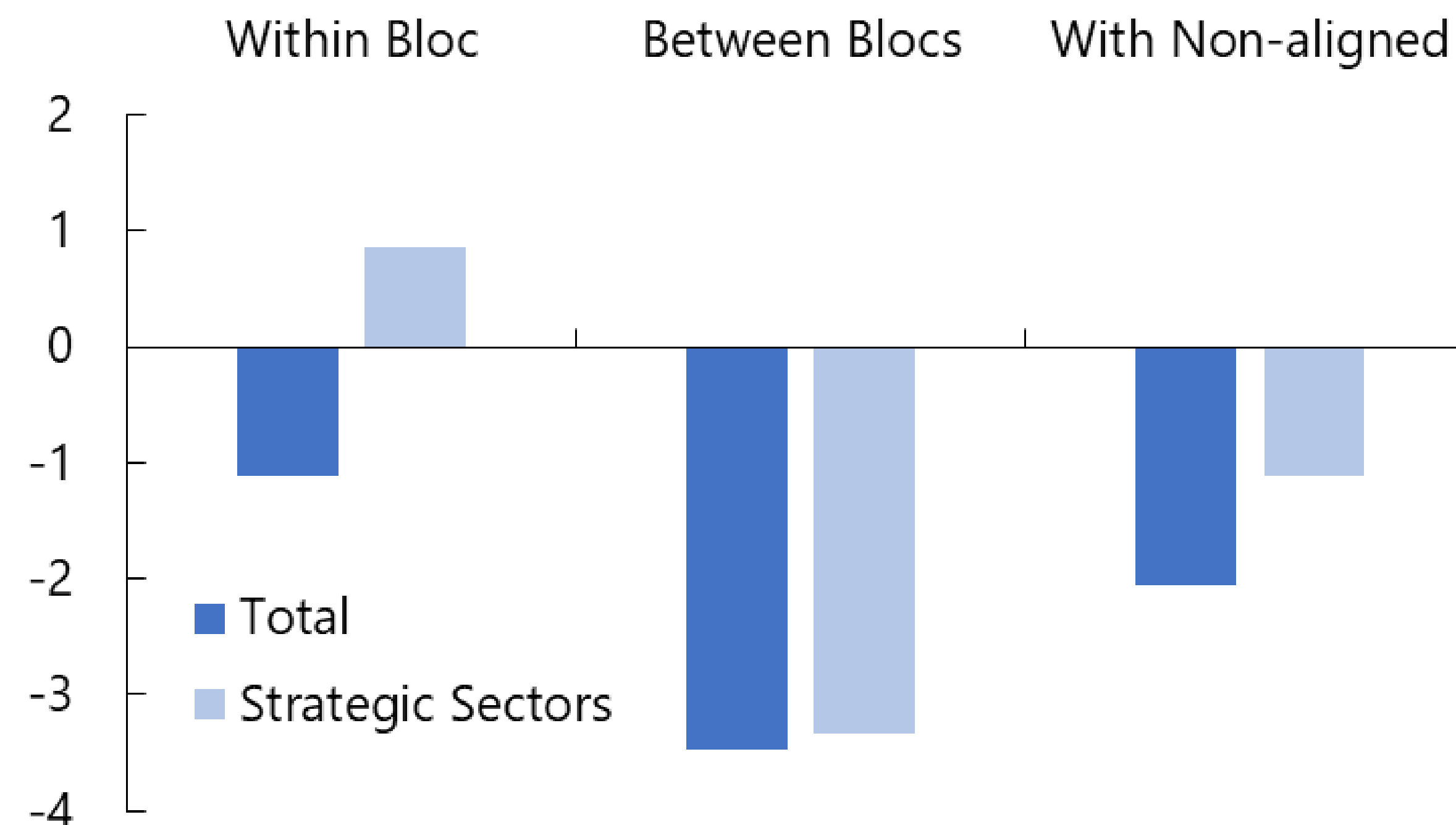
Policies and geopolitical tensions are disrupting trade flows

US Tariffs on Chinese Products and US imports

US Bilateral Imports at the HS6	Level	Growth Rates	
	(1)	(2)	(3)
Targeted Product * China * (Year=2022)	-0.627*** (0.120)	-0.773* (0.310)	-0.559** (0.190)
China * (Year=2022)	0.102 (0.120)	0.084 (0.310)	0.14 (0.190)
Targeted Product * (Year=2022)	0.049 (0.070)	0.112 (0.140)	0.056 (0.100)
N	460,455	251,010	251,010

Change in Trade Growth, 2022Q2-2023Q2 vs 2018Q1-2022Q1

(Percentage points)



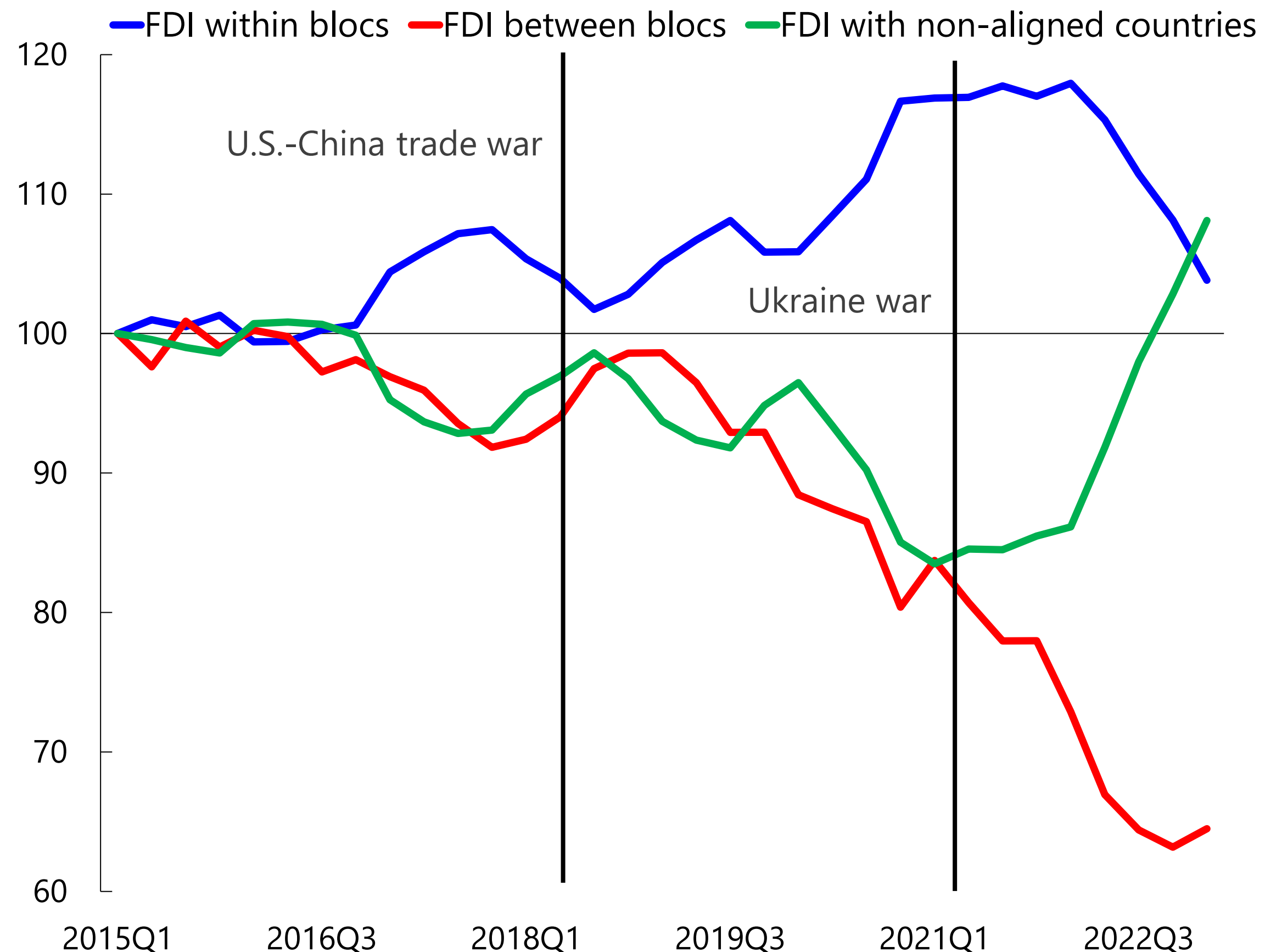
Sources: Trade data monitor; and IMF staff calculations.

Note: In the left chart, bilateral quarterly growth rates are computed as the difference in log bilateral trade, which are then aggregated to using bilateral nominal trade as weights. Strategic sectors include the following HS 2-digit chapters: 28, 29, 30, 38, 84, 85, 87, 88, 90 and 93.

FDI is increasingly flowing to more geopolitically aligned countries

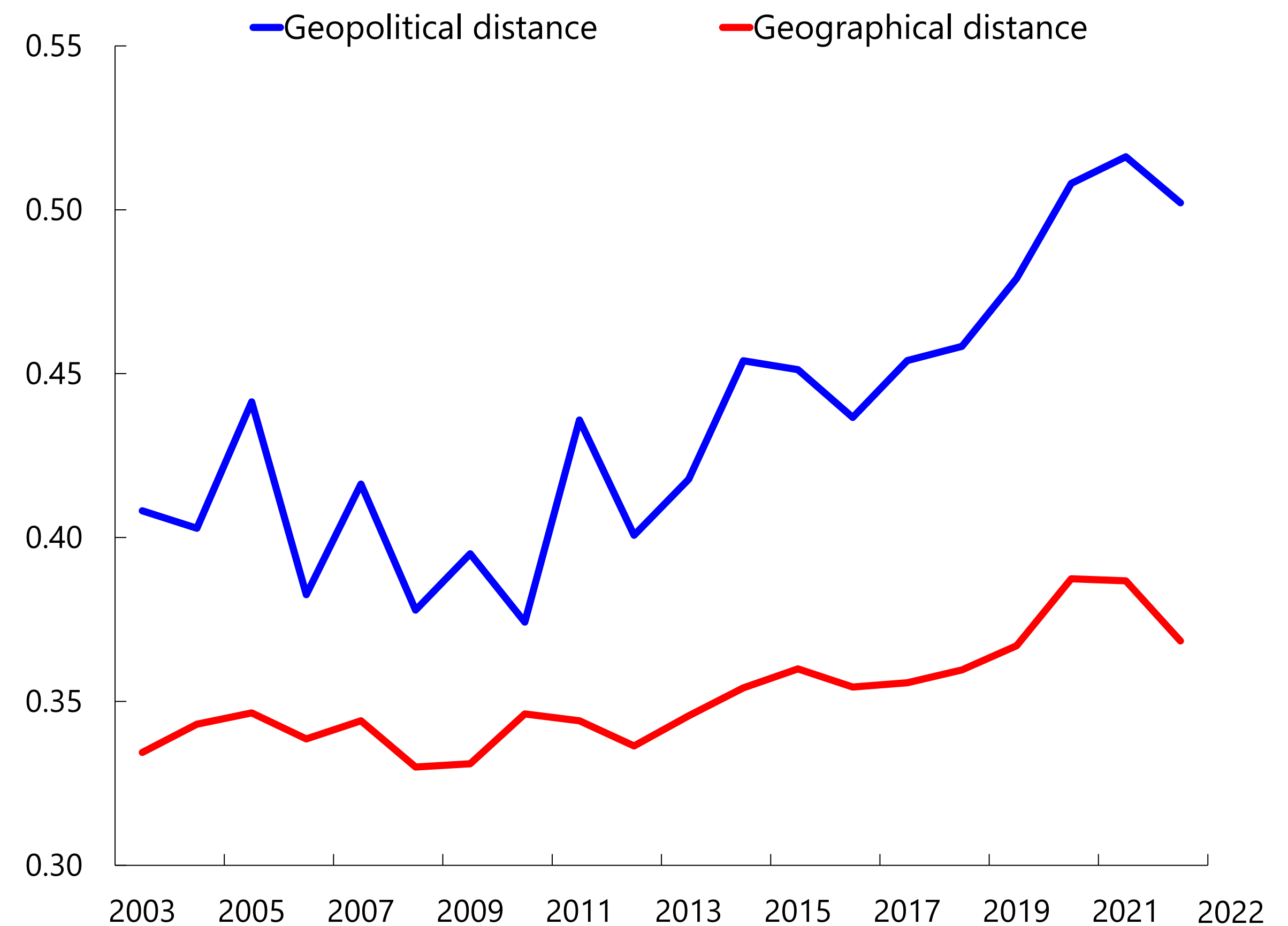
FDI Within and Between Blocs /1

(Index)



FDI Between Geographically and Geopolitically Close Countries /2

(Percent)



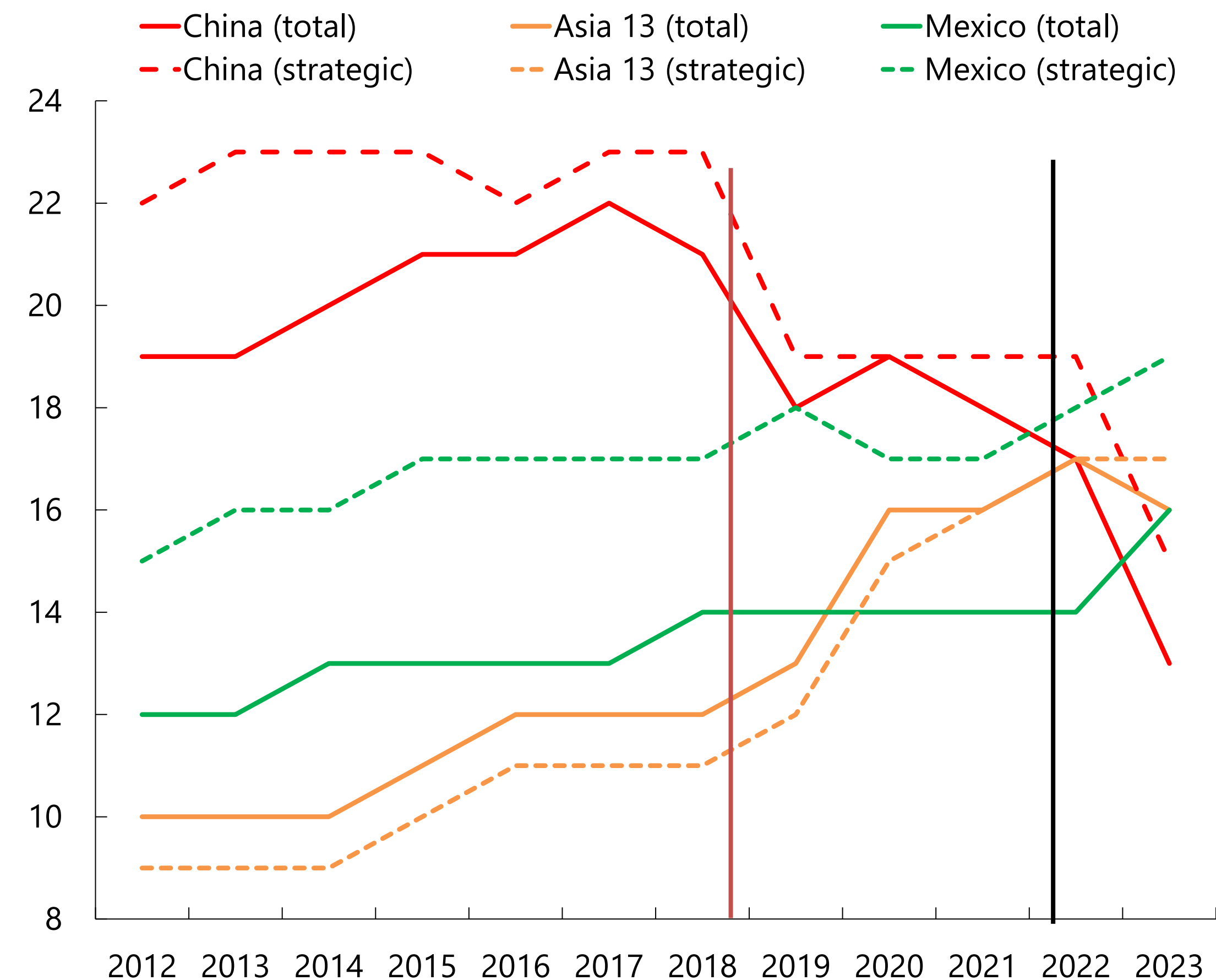
Sources: Bailey, Strezhnev, and Voeten (2017); Centre d'études prospectives et d'informations internationales, Gravity database; fDi Markets; and IMF staff calculations.

Note: /1 The figure plots the number of FDI (4-quarter moving averages) within blocs, between blocs and those involving at least a unaligned country, as a share of total FDI in the quarter. The series are indexed at 100 in 2015q1. Blocs are defined based on the ideal point distance, with a set of countries, similarly distant from both blocs, assumed to be unaligned. /2 The figure shows the annual share of total foreign direct investments between country pairs that are similarly distant (that is, in same quintile of distance distribution), geopolitically and geographically, from the United States.

China has lost ground as a source of US imports and destination of US investment

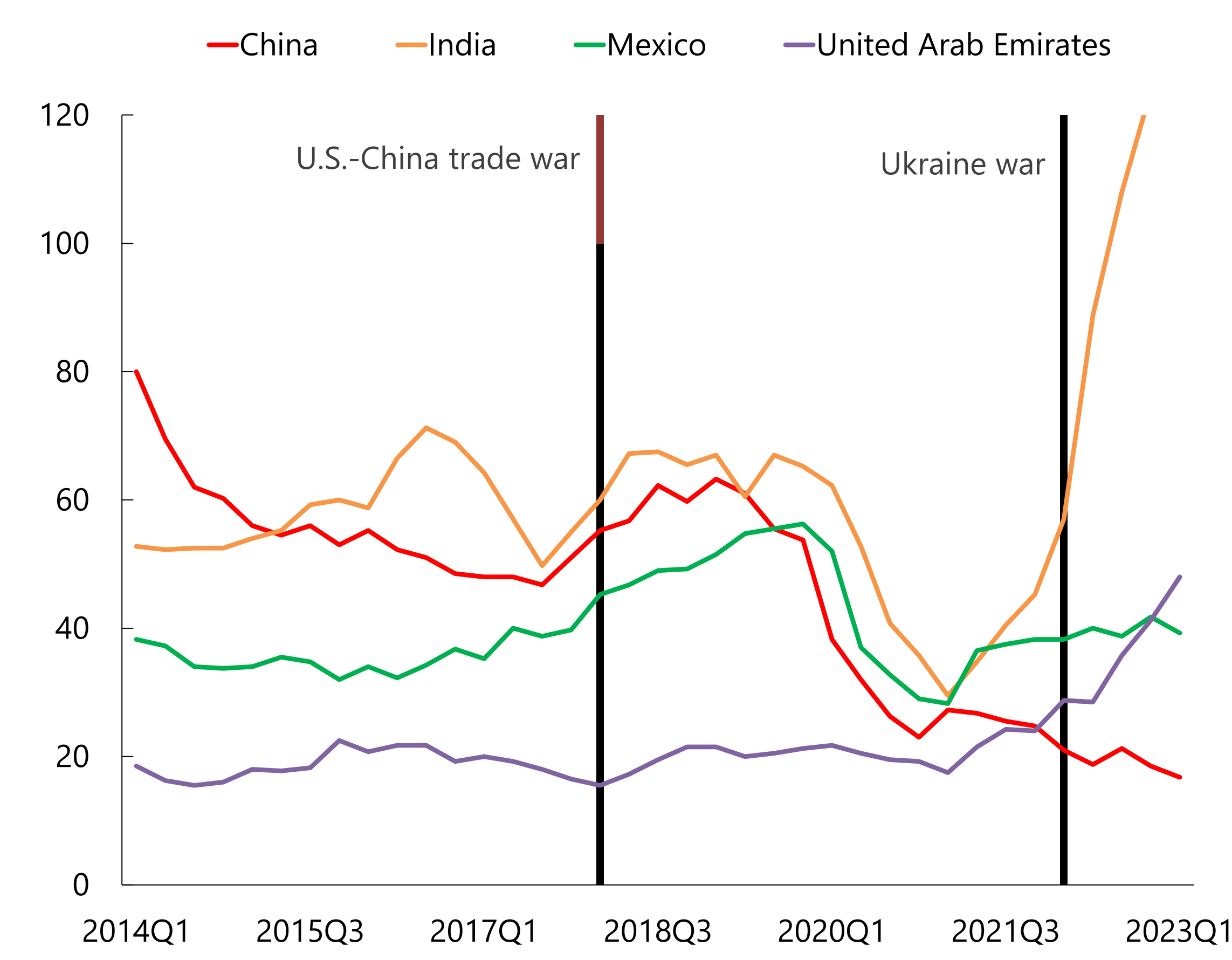
US Imports

(Percent of Total and Strategic Imports)



US FDI

(Count; 4-quarter Moving Average)

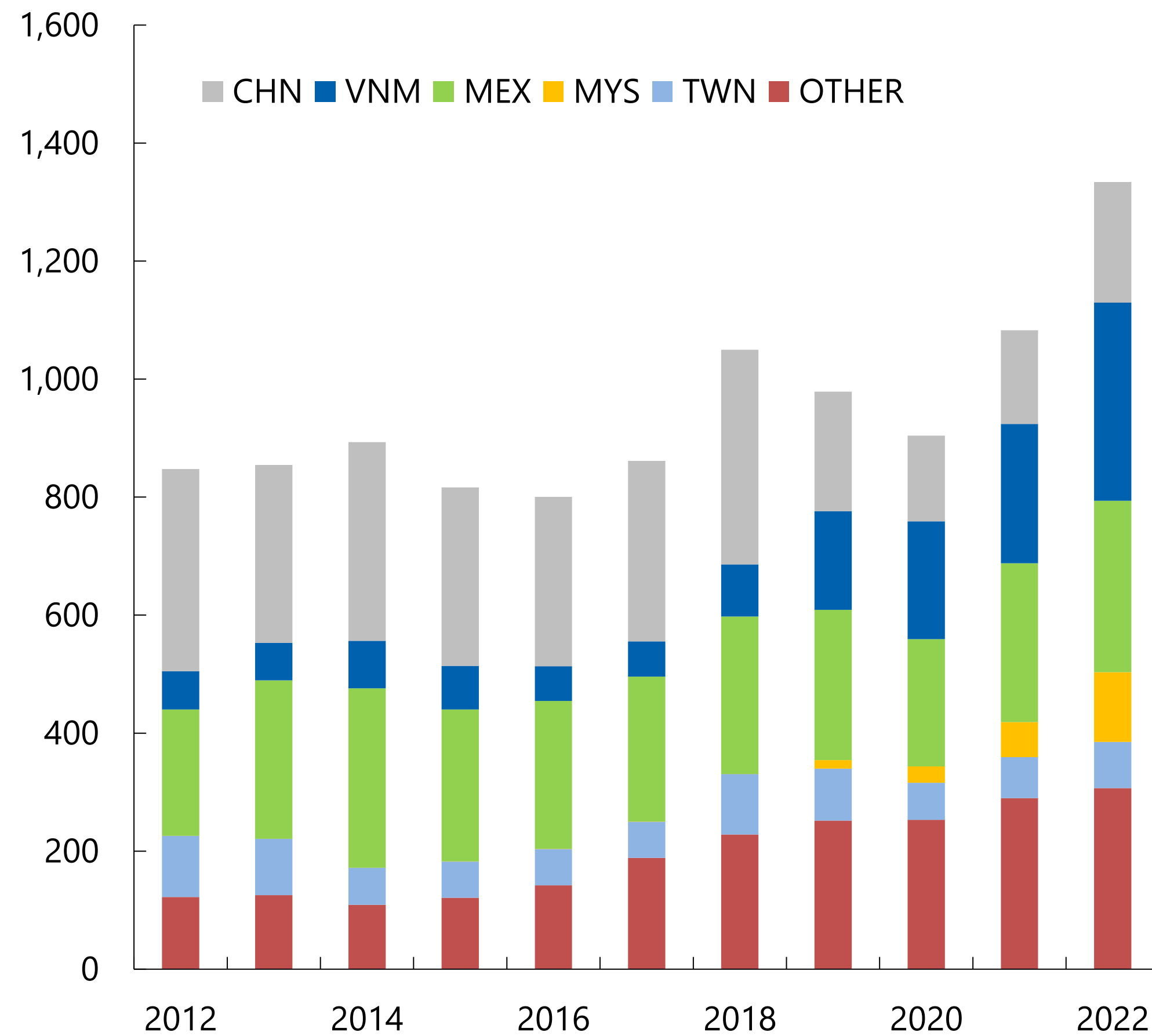


Sources: Trade data monitor; fDI and IMF staff calculations.
Note: In the left chart, strategic imports are defined following Freund et al. (2023) and include the following HS 2-digit chapters: 28, 29, 30, 38, 84, 85, 87, 88, 90 and 93. Asia-13 is defined following Grossman and Helpman (2020) and include: Bangladesh, Cambodia, Hong Kong, India, Indonesia, Malaysia, Pakistan, Philippines, Sri Lanka, Singapore, Taiwan, Thailand, and Vietnam. Data for 2023 are based on the first 2 quarters (and extrapolated to the whole year).

Other countries are filling the gap, often alongside an increase in imports from China

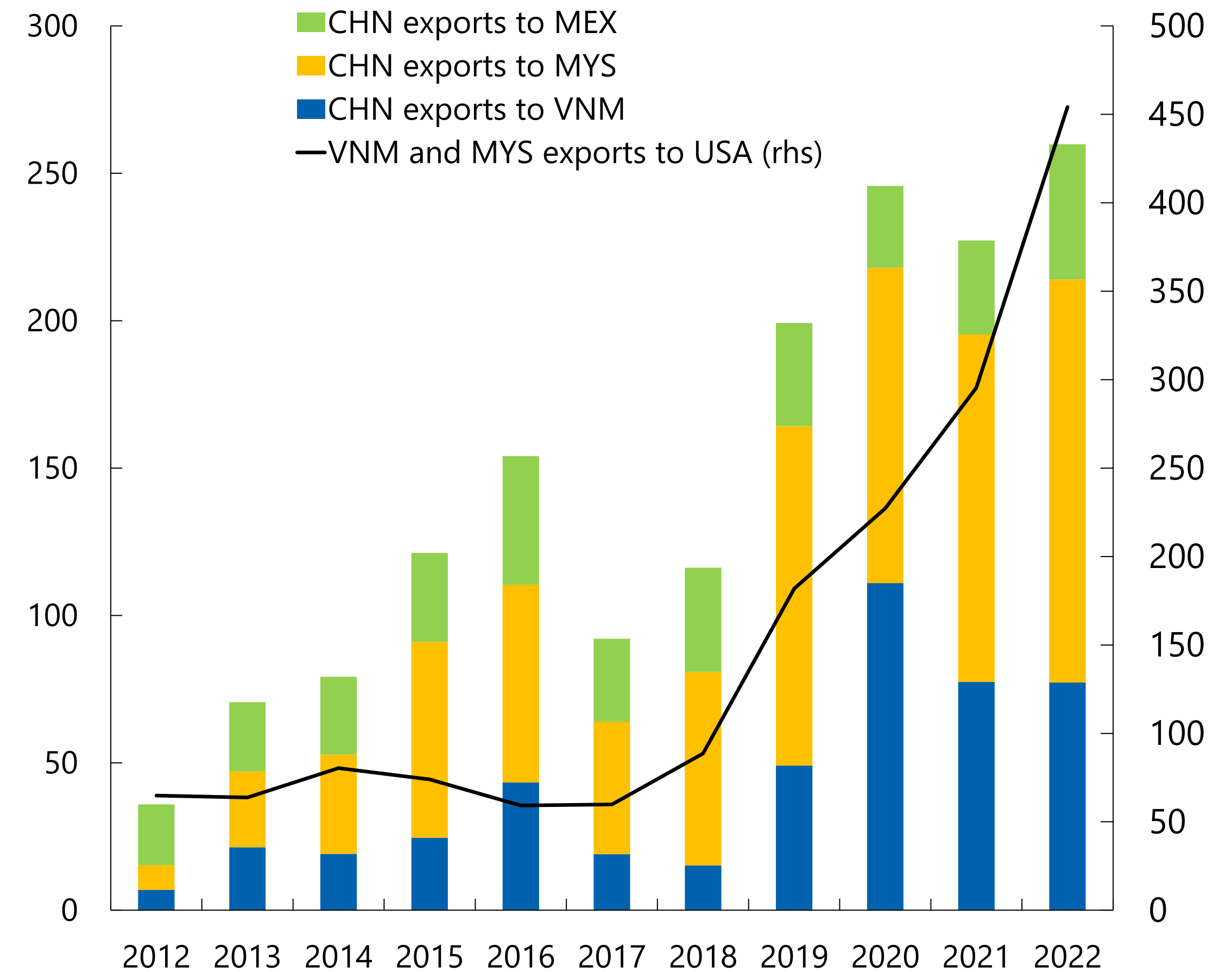
US Imports of EV batteries

(Millions of USD, HS code 850720)



Chinese Exports of EV batteries to Malaysia, Mexico and Vietnam

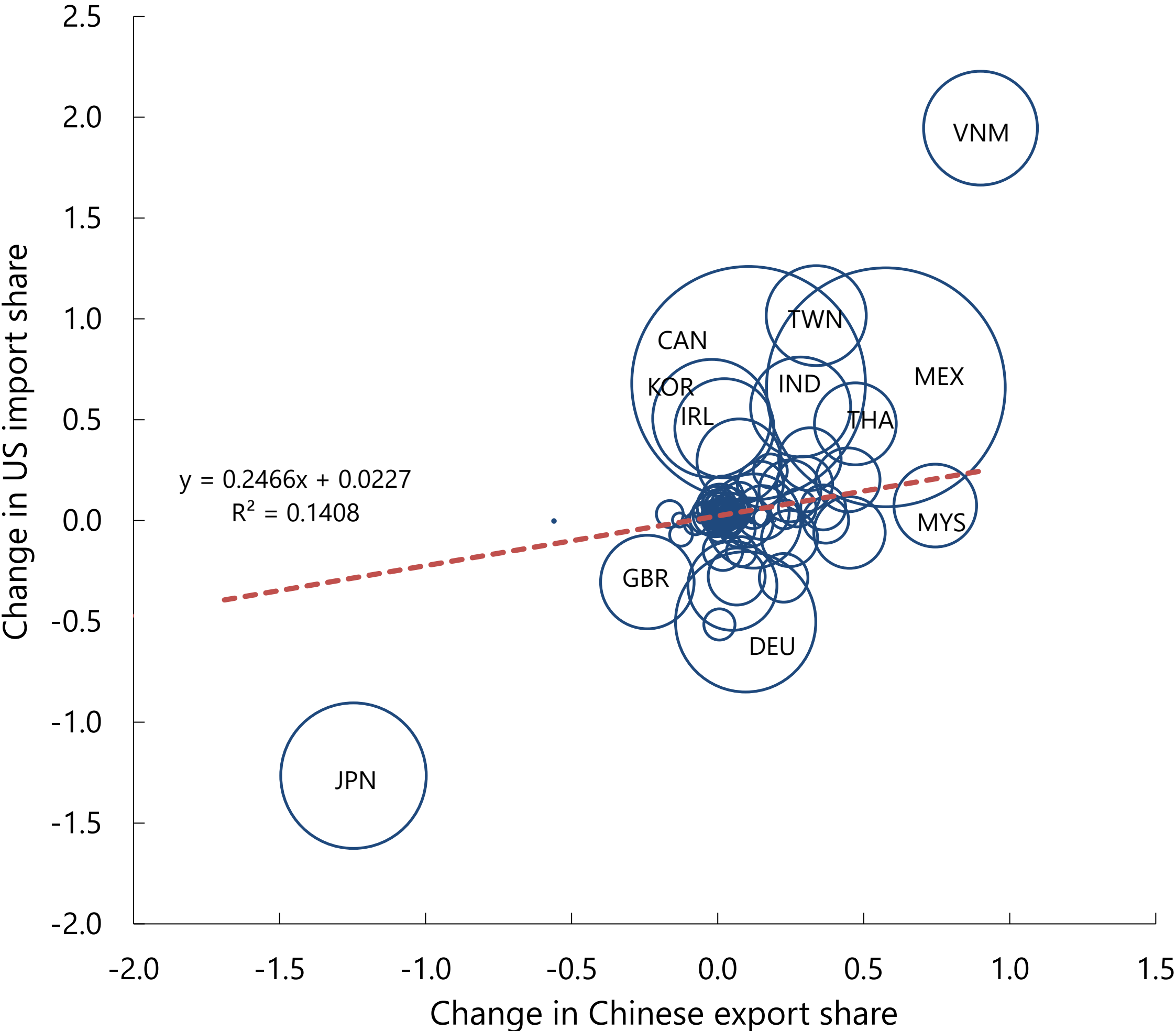
(Millions of USD, HS code 850720)



Countries that have gained market share in US imports have experienced stronger FDI inflows and exports from China since 2017

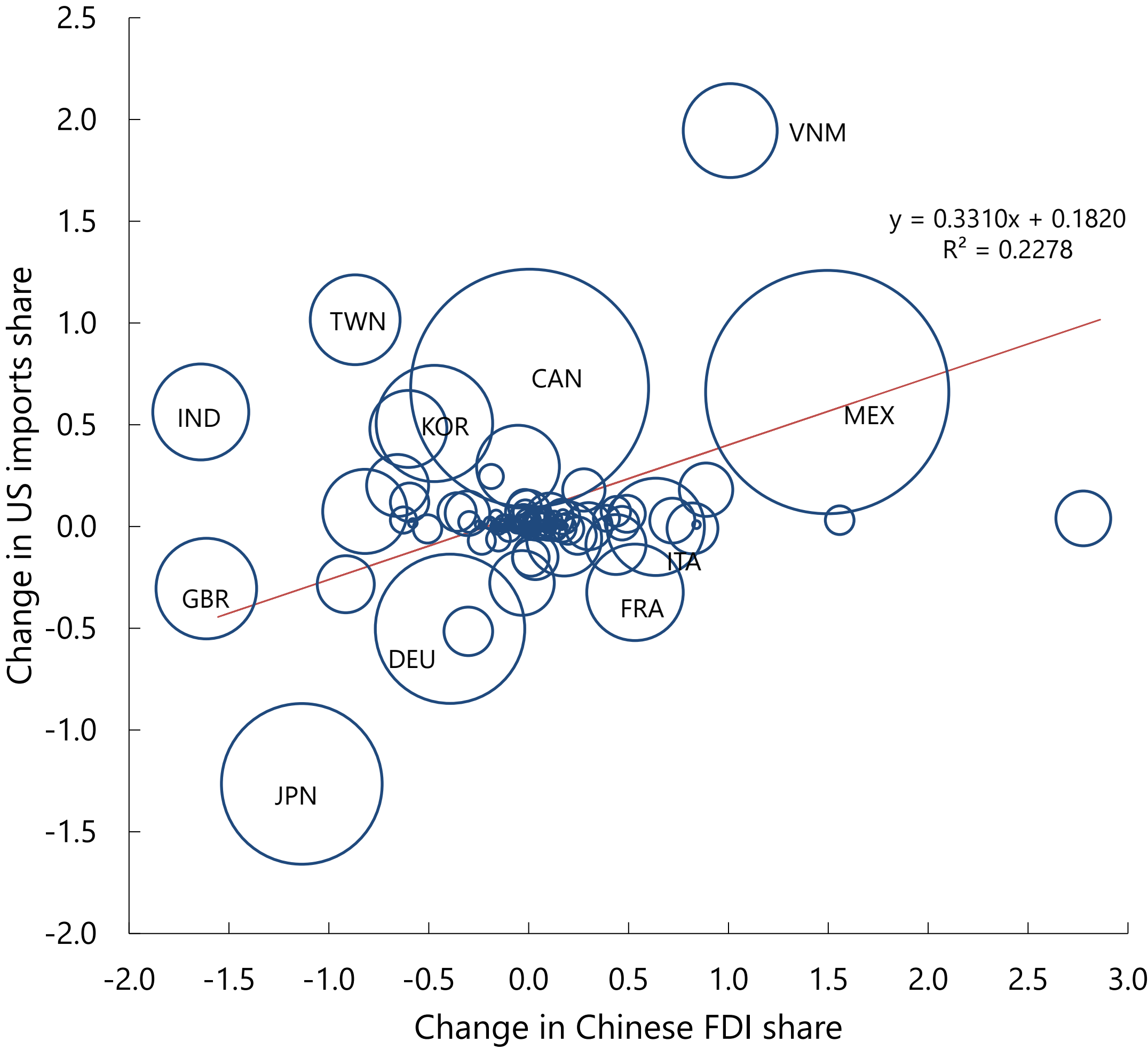
Change in US Import Shares vs Chinese Export Shares

(Percentage Point)



Change in US Import Shares vs FDI from China

(Percentage Point)

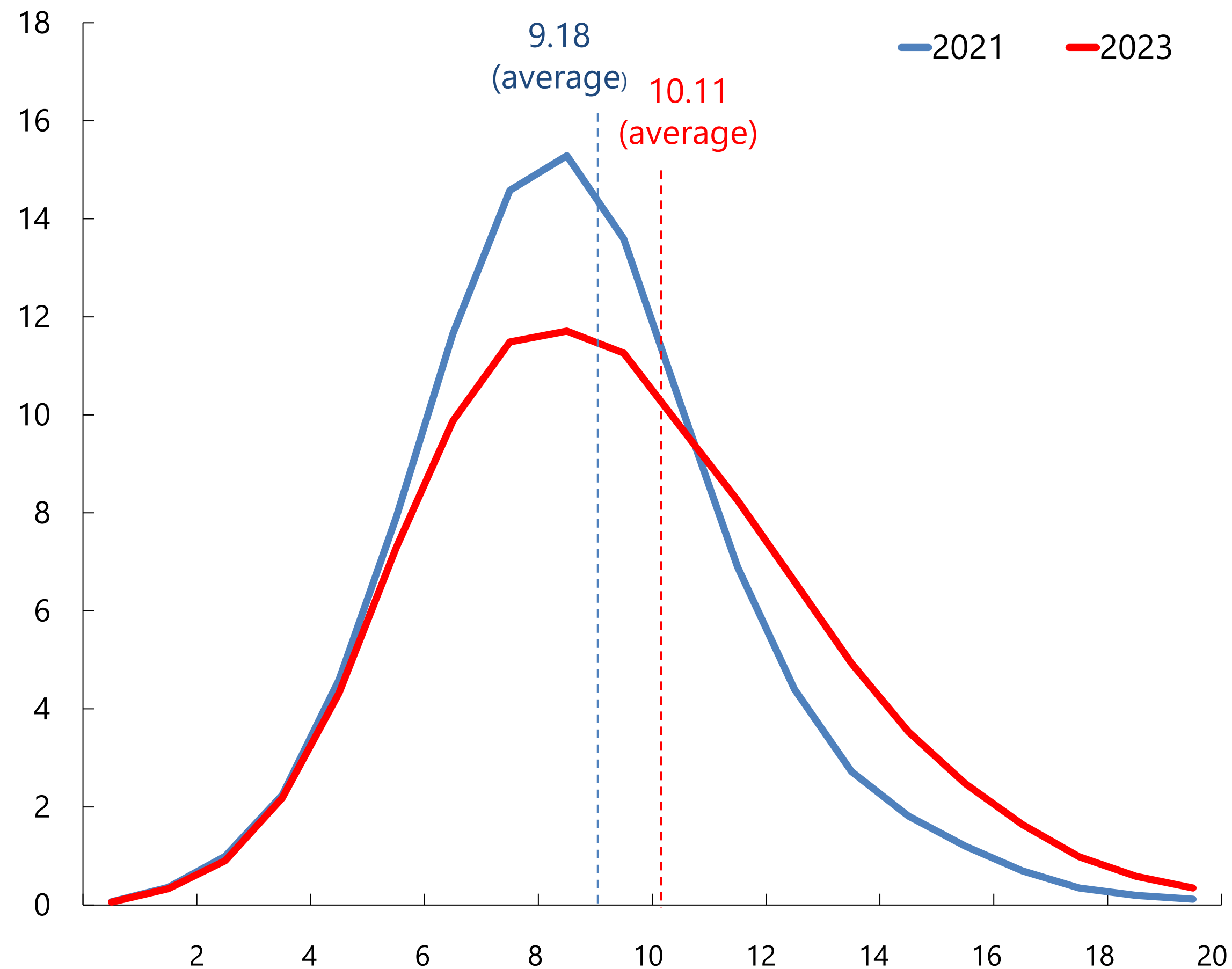


Sources: Trade Data Monitor; fDi Markets; and IMF staff calculations.

Supply chains are lengthening, especially those involving suppliers in China

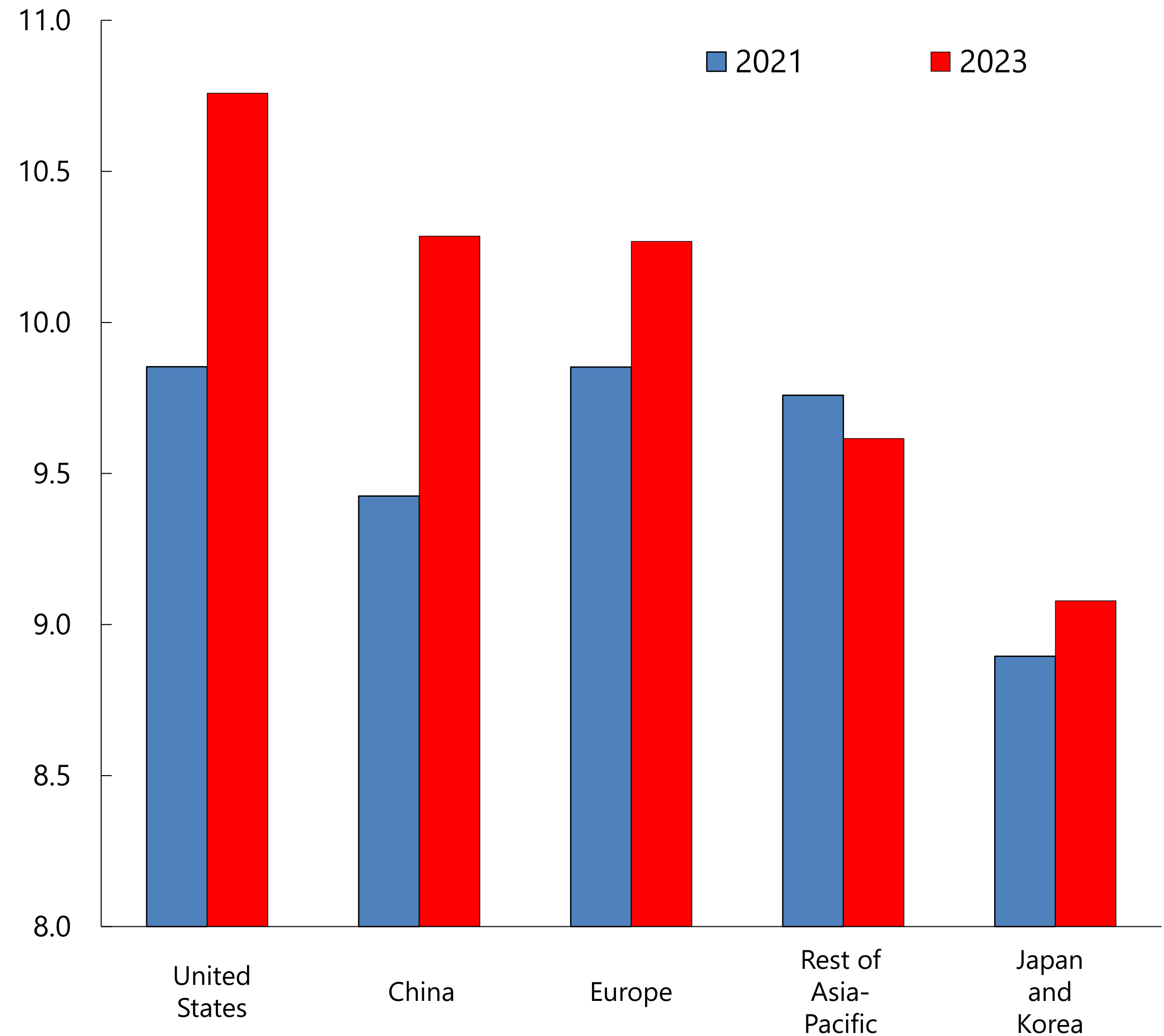
Distribution of Supplier-to-customer Distances for Chinese Suppliers and US Customers

(Percent of Connected Firm Pairs by Distance)



Distance by Location of Supplier

(Number)



Sources: Qiu, Shin and Zhang (2023). "Mapping the realignment of global value chains." BIS Bulletin No. 78.

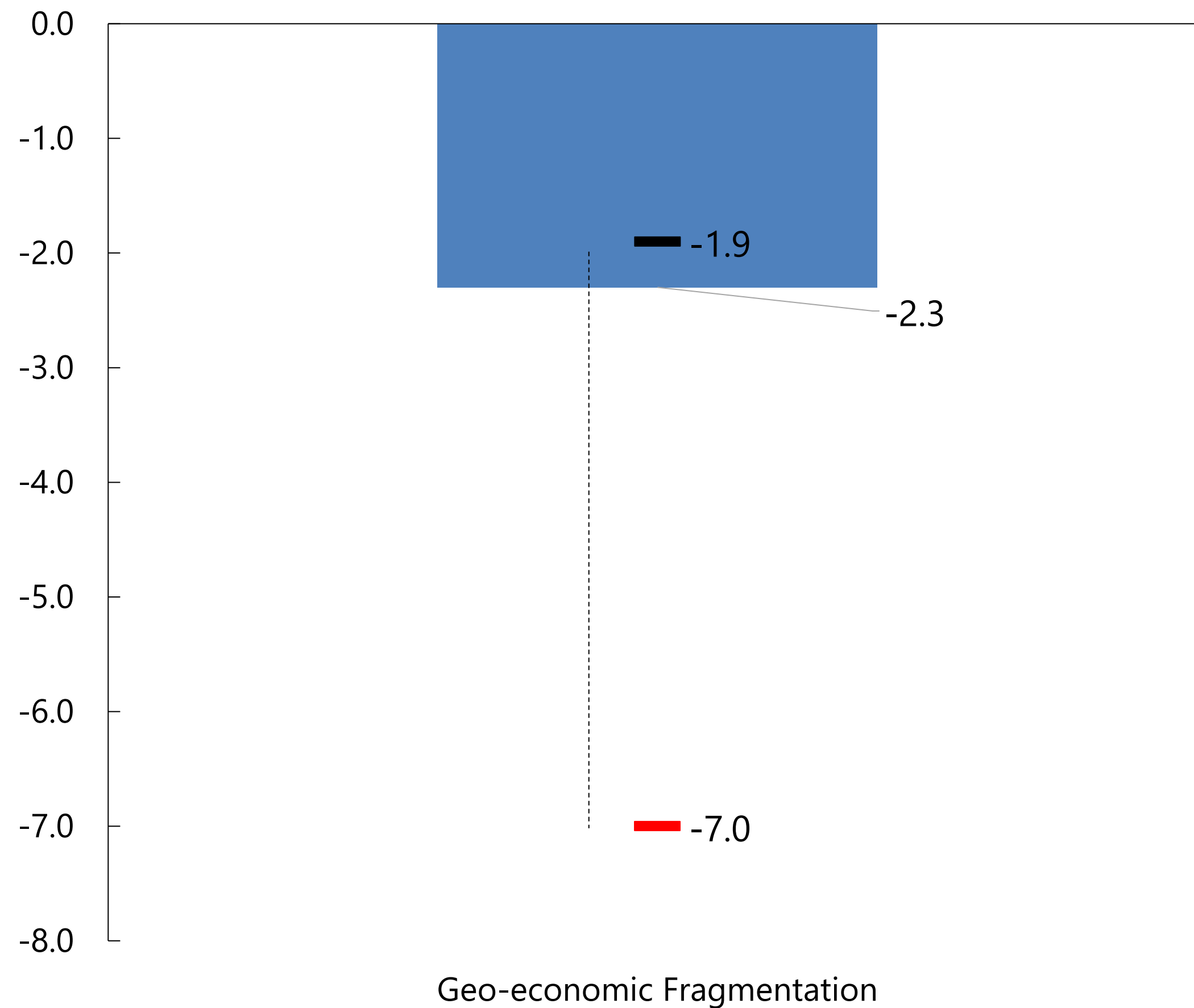
Key questions

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Trade fragmentation

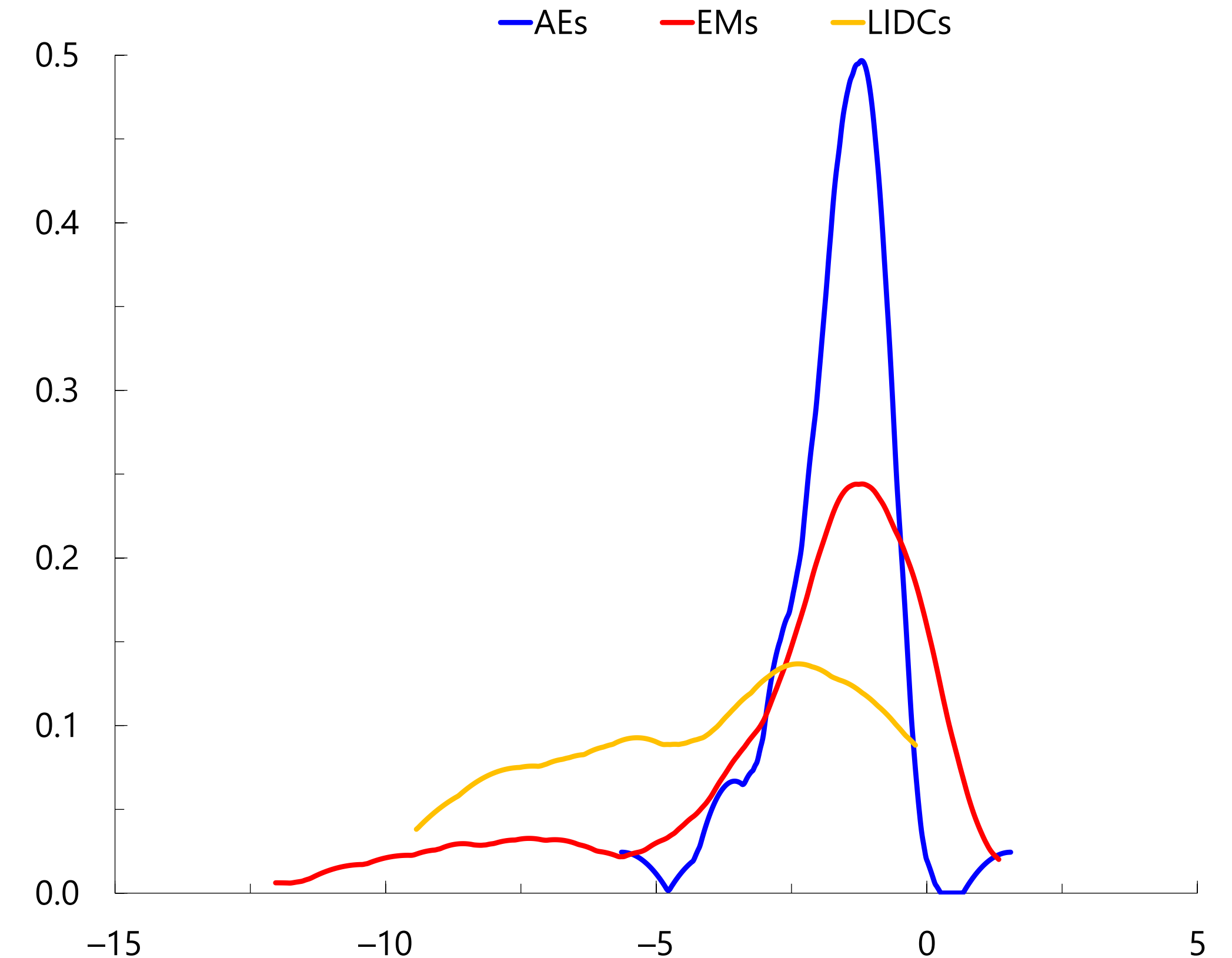
Range of Simulated Global GDP Changes due to Trade Fragmentation

(Percent Deviation from Baseline)



Distribution of Simulated Country GDP Changes due to Trade Fragmentation

(Density of Percent Deviation from Baseline by Country Groups)



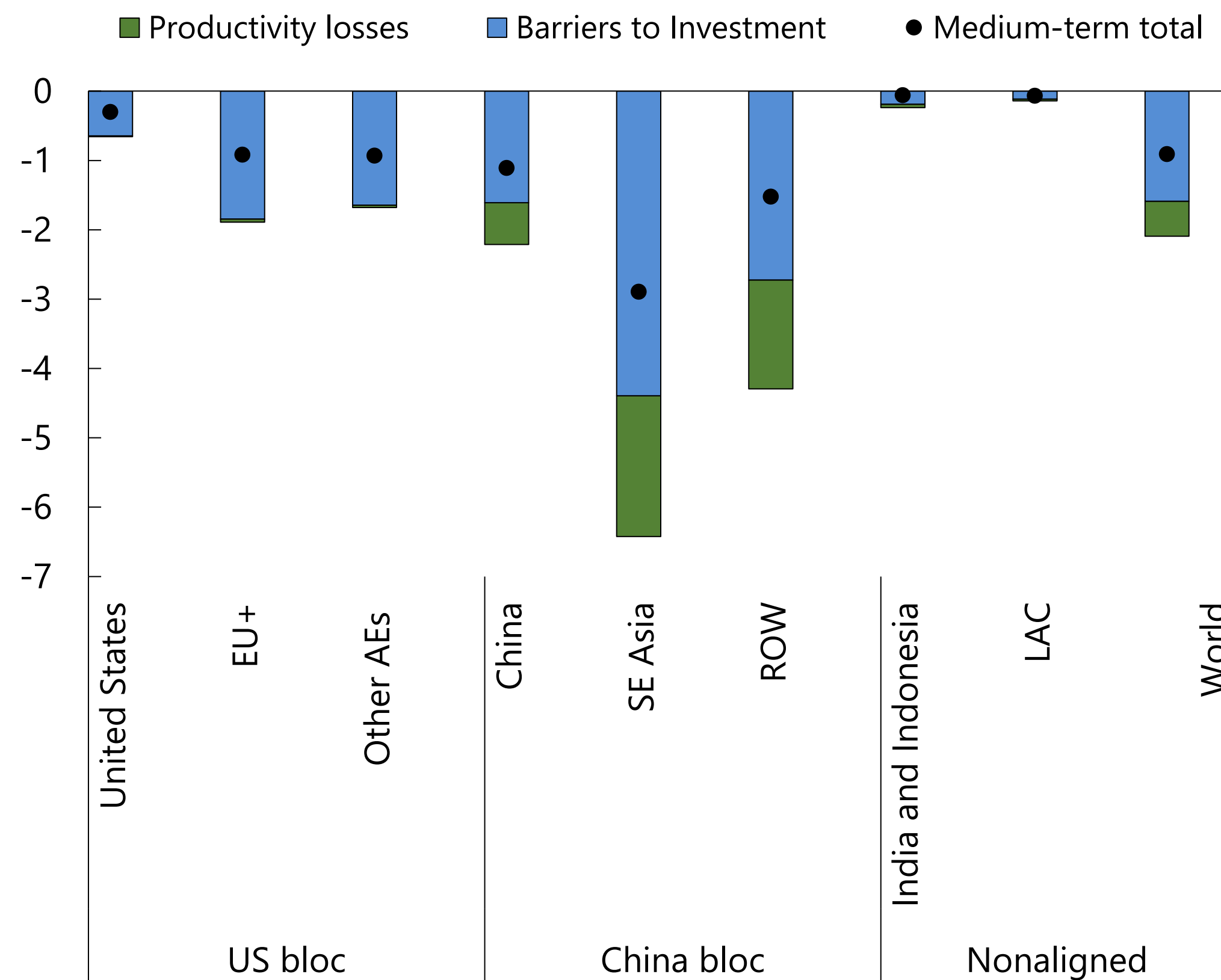
Sources: Bolhuis, Chen, and Kett (2023), and IMF Staff calculations.

Note: Country-level losses are aggregated using weights based on GDP at purchasing power parity. For details, see Bolhuis, Chen, and Kett (2023).

FDI fragmentation

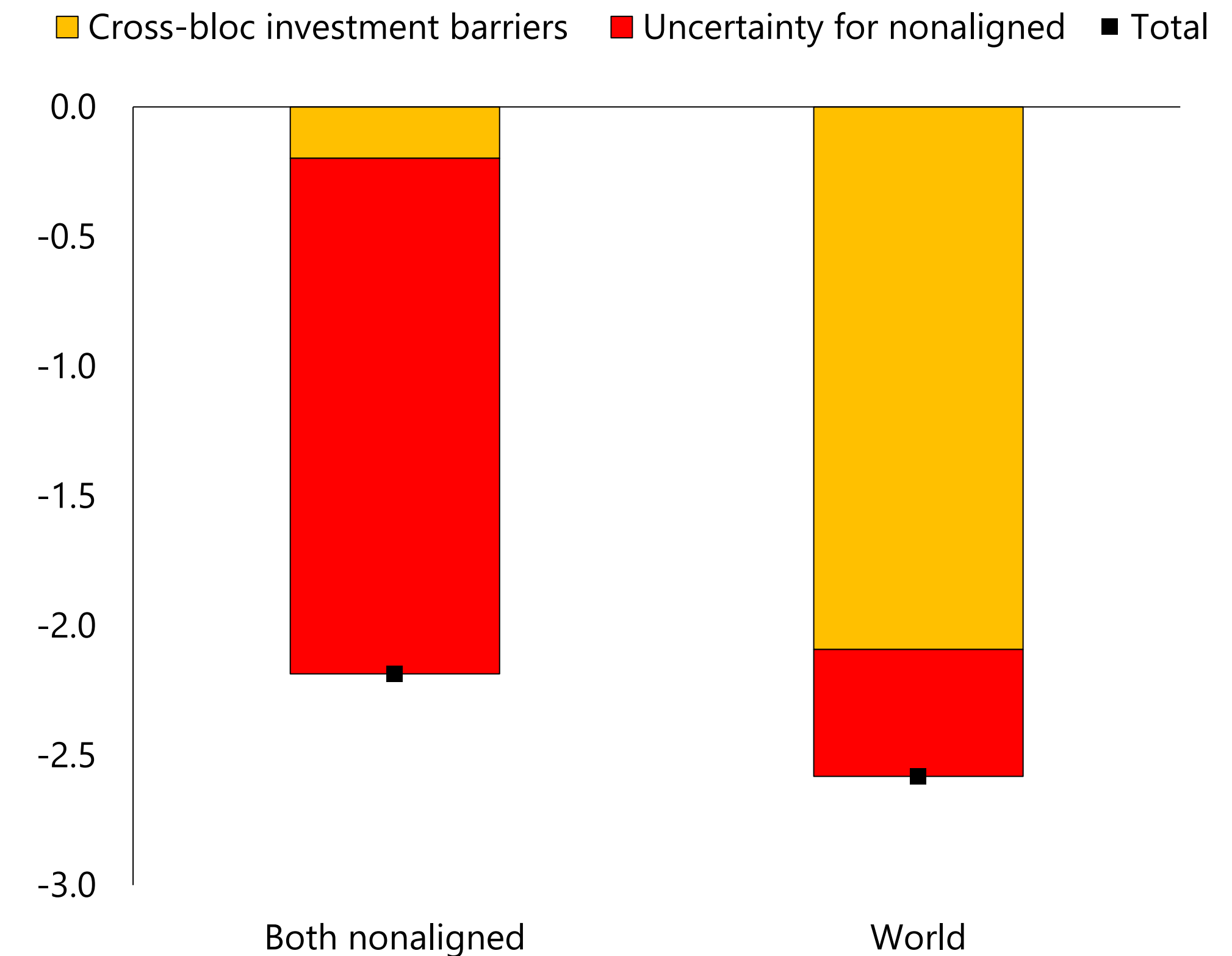
Impact of Investment Flow Barriers on GDP

(Percent Deviation from No-fragmentation Scenario)



The Output Effect of Uncertainty

(Percent Deviation from No-fragmentation Scenario)



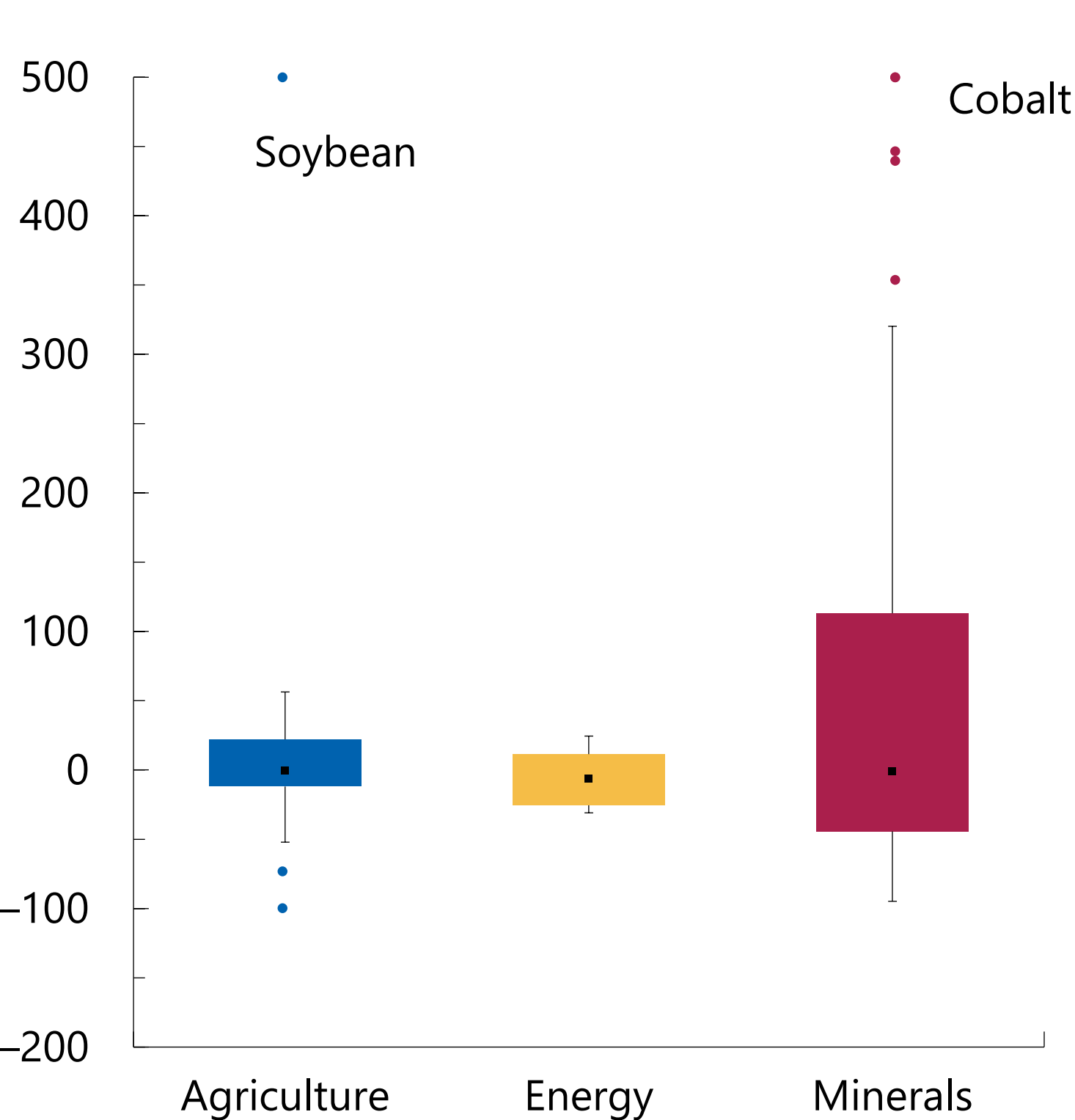
Source: IMF staff calculations.

Note: Baseline fragmentation scenario represents 50 percent decline in investment input flows between China and US blocs and two nonaligned regions (India and Indonesia and Latin America and the Caribbean). AEs = advanced economies; EU+ = European Union and Switzerland; LAC = Latin America and the Caribbean; ROW = rest of the world; SE = Southeast.

Commodities fragmentation

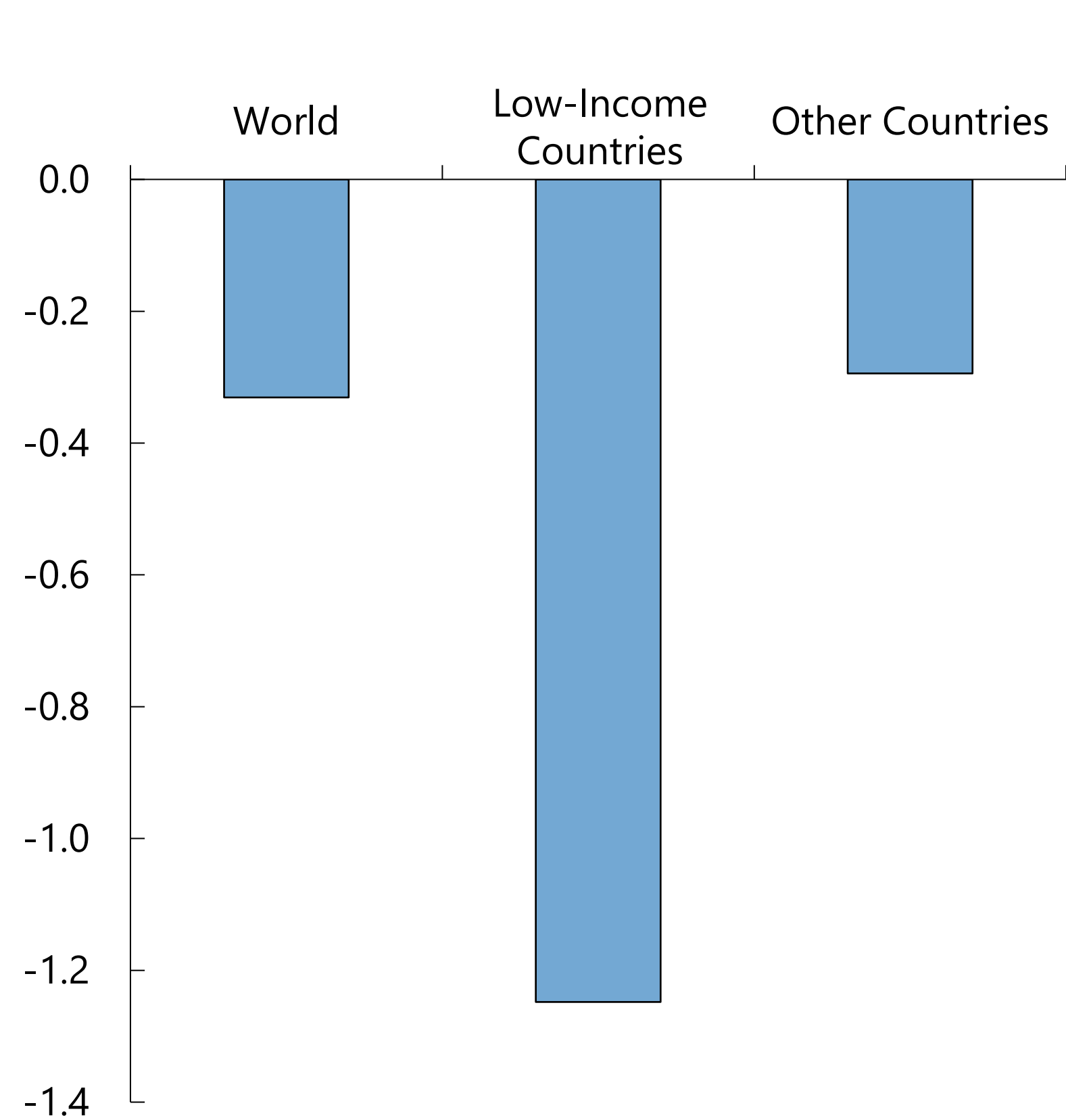
Price Changes Due to Fragmentation in Individual Commodity Markets

(Percent)



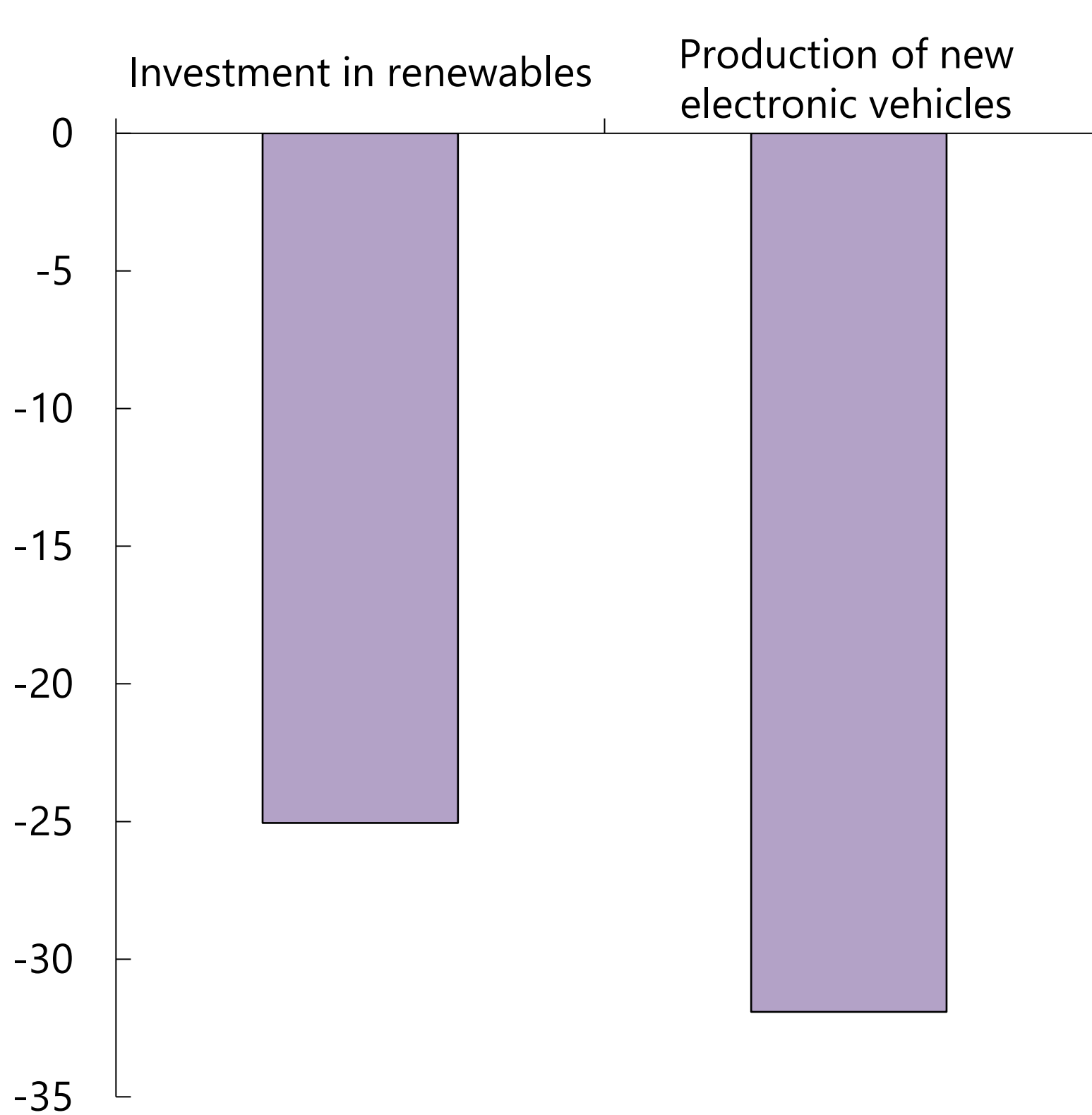
Long-Term Impact on GDP

(Percent Deviation from Baseline)



Fragmentation of Critical Mineral Markets and Energy Transition

(Percent Deviation from Integrated Markets Scenario in 2030)



Sources: Bolhuis, Chen and Kett (2023); Chapter 3 of the 2023 October World Economic Outlook; Alvarez et al. (2023); and IMF staff calculations.

Note: The bars in the middle chart represent the losses in GDP relative to baseline from eliminating trade in all commodities across hypothetical blocs using a multi-country multi-sector trade model augmented to account for the specific features of commodity markets (see Bolhuis, Chen and Kett, 2023). Country-level losses are aggregated using weights based on GDP at PPP. The chart on the right plots simulations produced by the Global Macroeconomic Model for the Green Energy Transition (GMMET). The bars report the change in real investment in renewables and EVs due to fragmentation relative to IEA's net zero emission scenario with integrated copper, nickel, lithium and cobalt markets. Country-level variables aggregated using GHG weights.

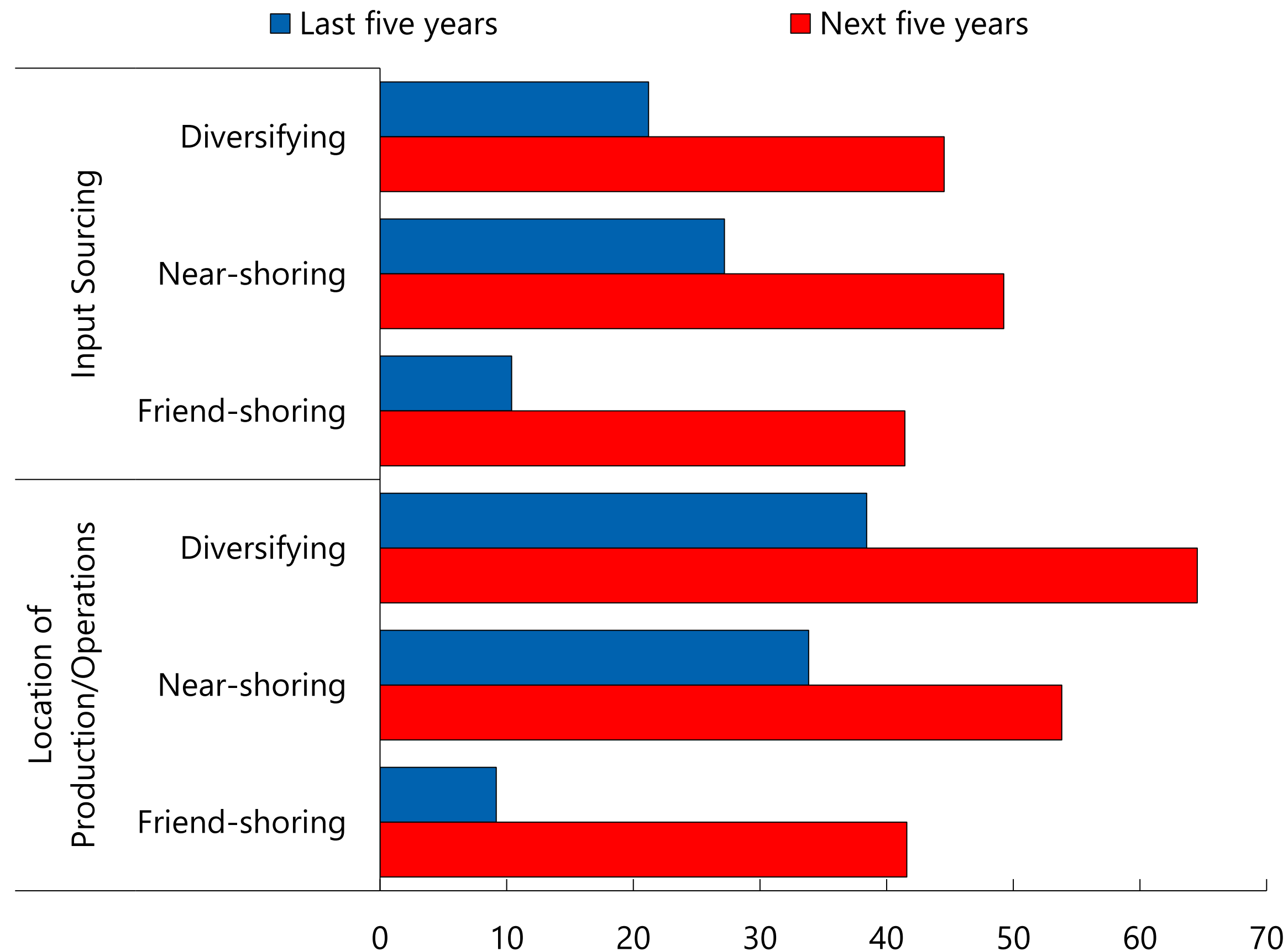
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Global linkages are changing, and this could weigh on trade going forward

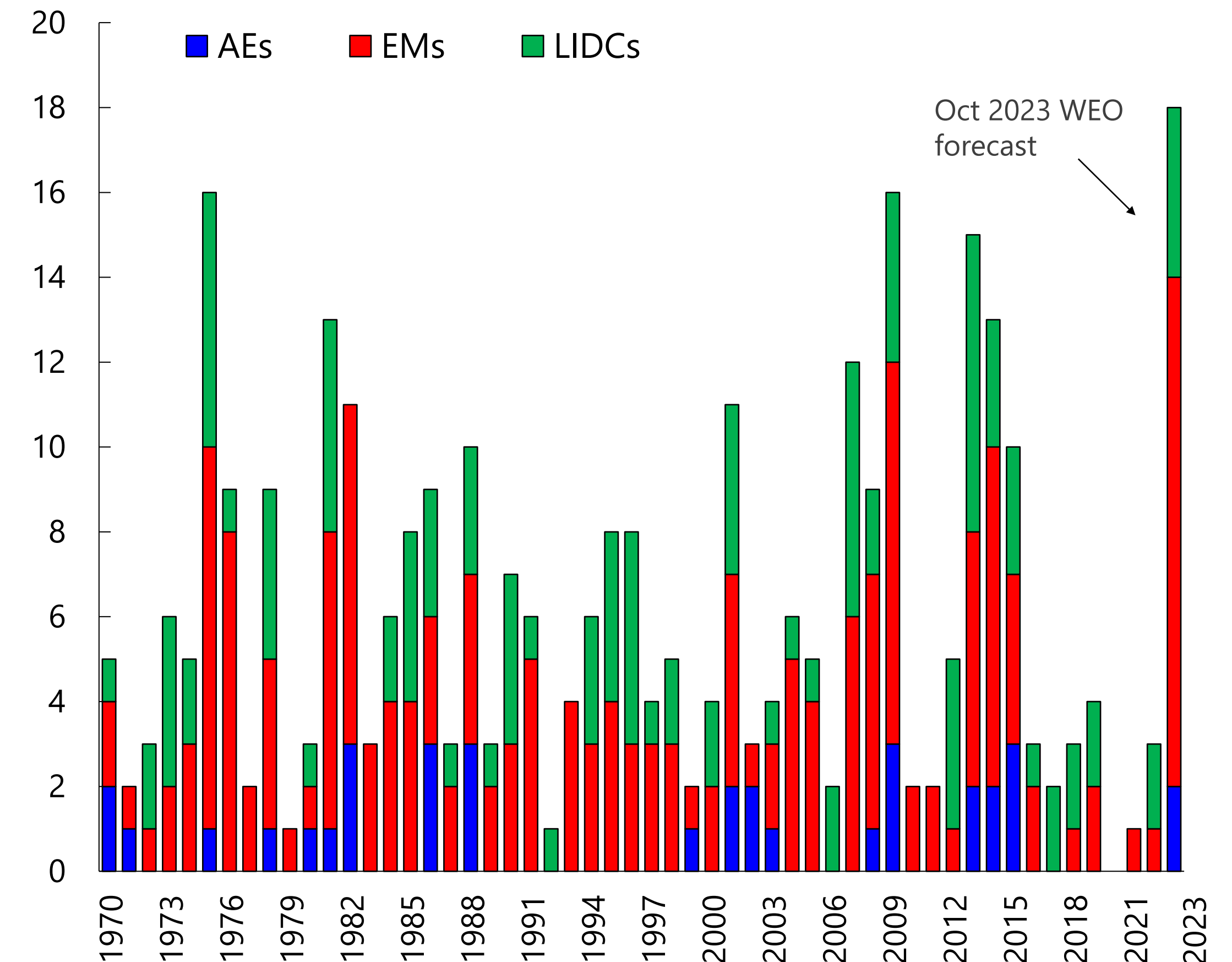
Trends in Input Sourcing and Production Location among Leading Firms in the Euro Area

(Percent of Responses)



Trade Reversals

(Number of Countries Starting a Reversal in Exports)



Sources: Attinasi, Ioannou, Lebasatard, and Morris (2023) "Global production and supply chain risks: insights from a survey of leading companies." ECB Bulletin, November 2023; PWT; IMF, *World Economic Outlook*; and IMF staff calculations.

Note: The left chart is based on an ECB survey of 65 leading firms in the euro area in July-August 2023. For details, see Attinasi et al. (2023). The right chart is based on a balanced sample of 155 countries, 1970-2022, and projections up to 2028.

Policy Implications

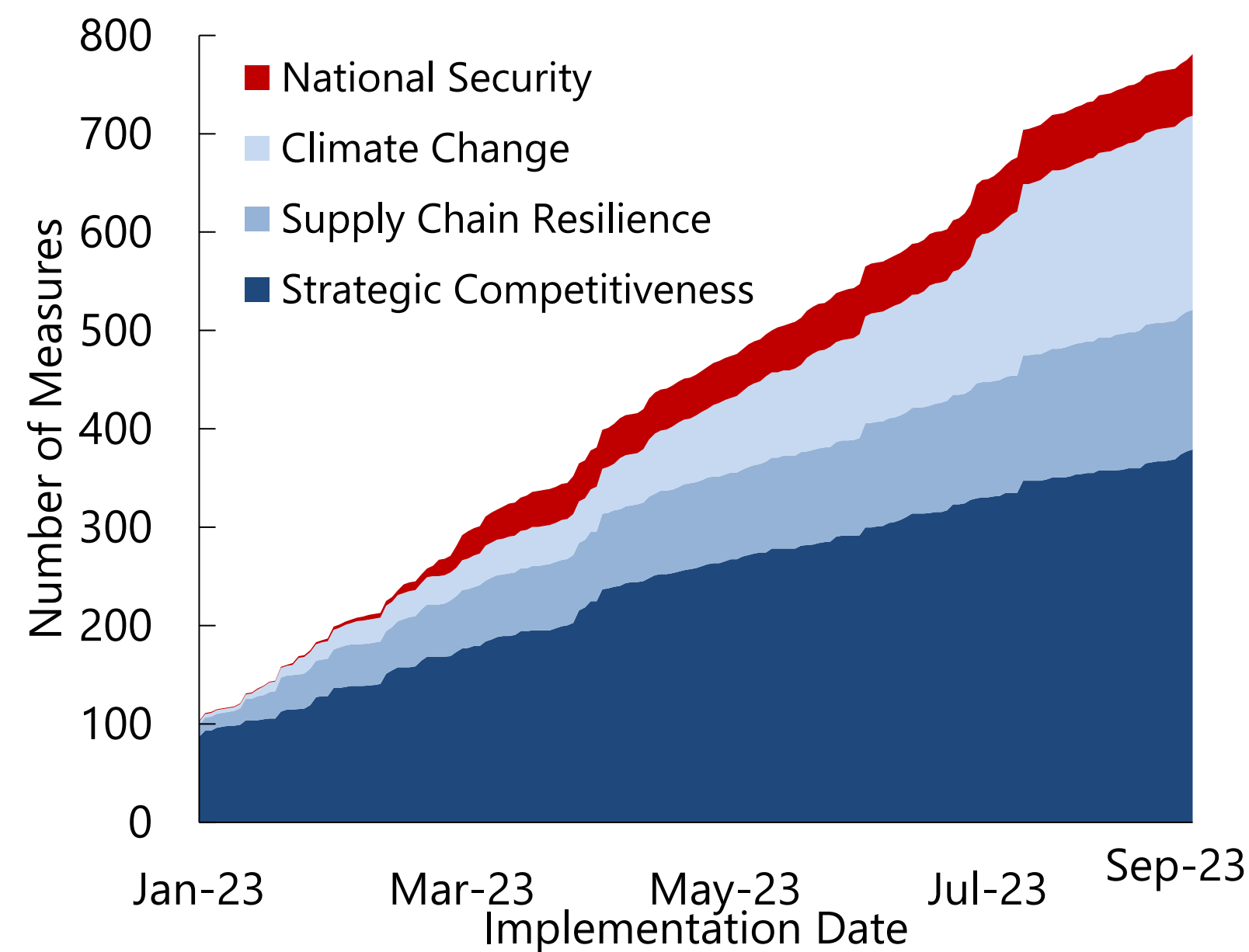
First best: avoid fragmentation

Second best: carefully evaluate the costs and benefits of policy choices

- Are intended outcomes achieved (e.g. stronger supply chains and diversification, national security, green transition)?
- At what economic cost?
- Are there unintended consequences (e.g. distributional effects, cross-border spillovers and spillbacks)?
- Foregone benefits, local and global?

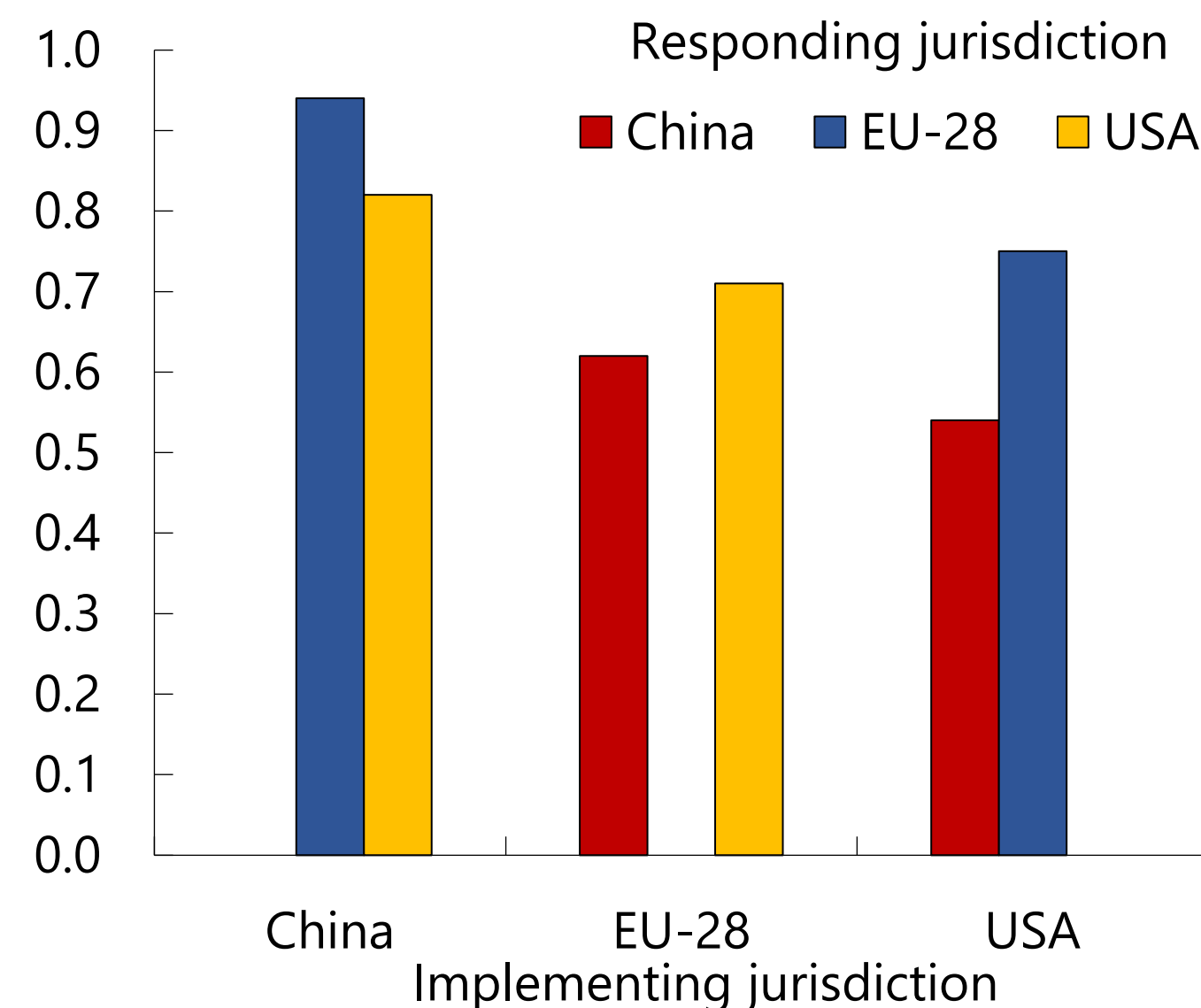
New Industrial Policies by Motive

(Number)



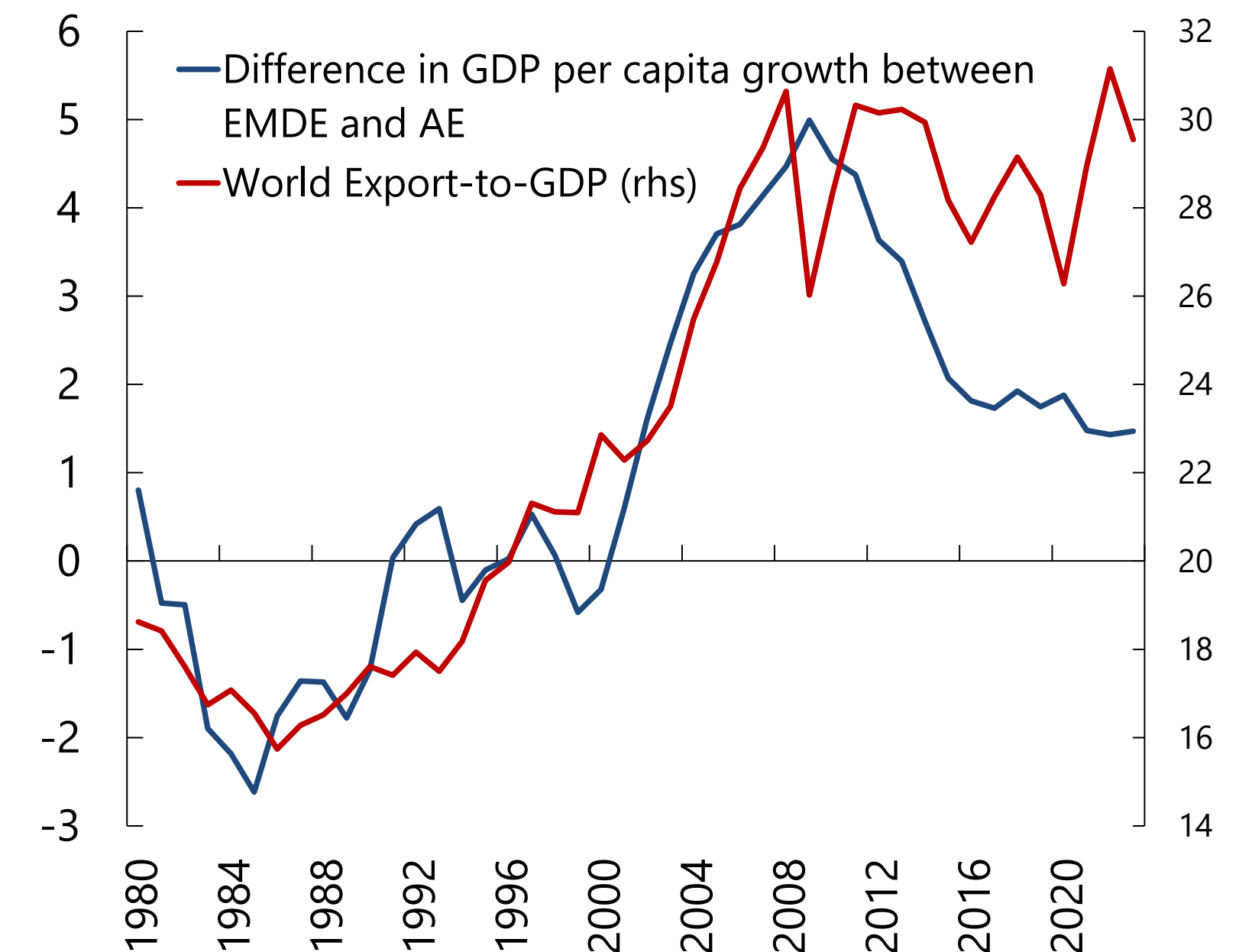
Countervailing Policy Interventions within 12 months of new subsidy

(Probability)



Globalization and Convergence

(percent; 3-year MA)



Sources: Global Trade Alert; Evenett et al. (forthcoming); IMF World Economic Outlook; and IMF staff calculations.

Note: The chart on the right plots the exports-to-GDP ratio and the difference in GDP per capita growth between EMDE and AE. GDP per capita growth is weighted by PPP GDP.