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From Globalization to Regionalization - Assessing Its Potential Economic and Environmental Effects

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**Workshop on Effective Domestic
Policymaking for Stimulating Economic
Upgrading Through Global Value Chains
1-2 March 2022**



Workshop on Effective Domestic Policymaking for Stimulating
Economic Upgrading Through Global Value Chains

**From globalization to regionalization?
Assessing its potential economic and
environmental effects**

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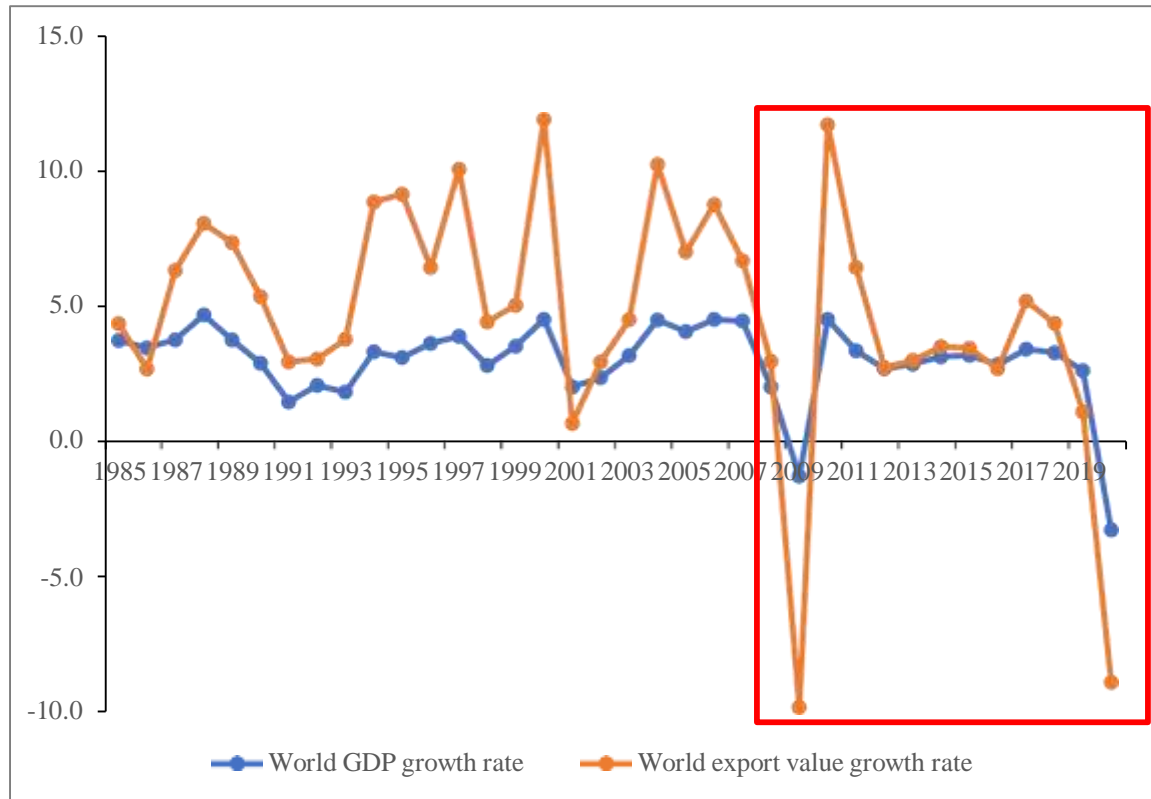
Academy of Mathematics and Systems Science, Chinese Academy of Sciences

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From Hyperglobalization to Slowbalization

Fig. 1 The growth rate of world GDP and exports of goods and services

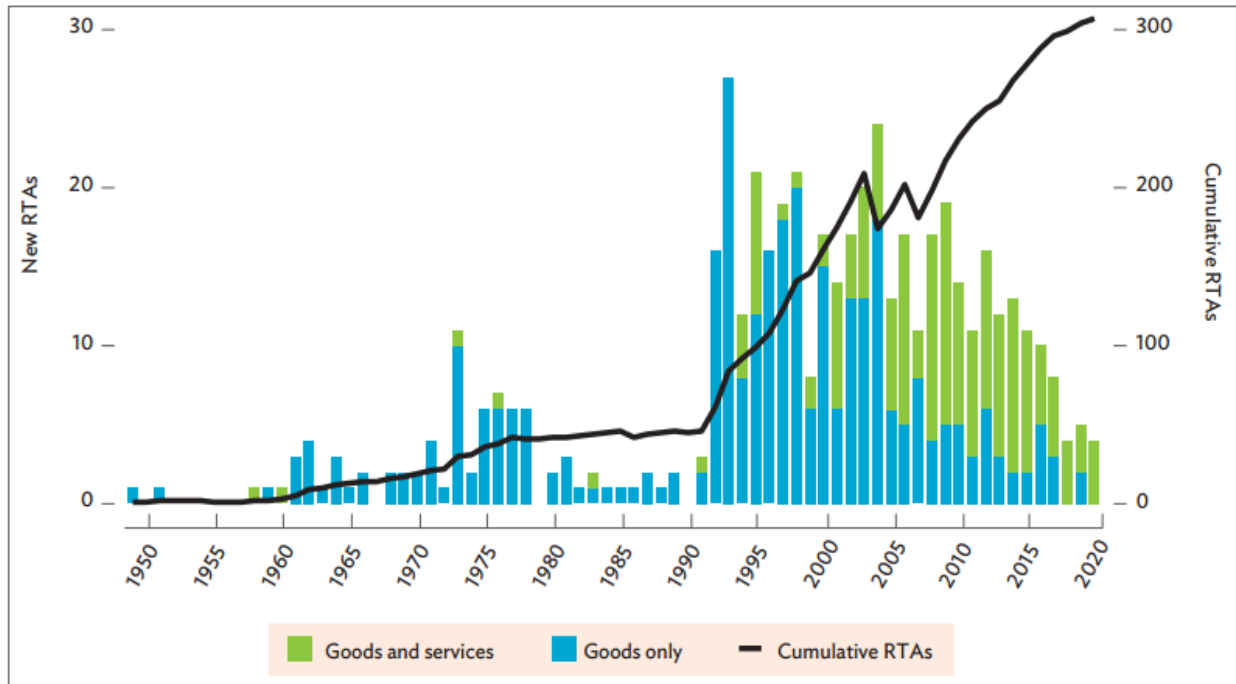


Data source: World Bank.



The Turn Toward Regionalism

Fig. 2 The number of regional trade agreements (RTAs)

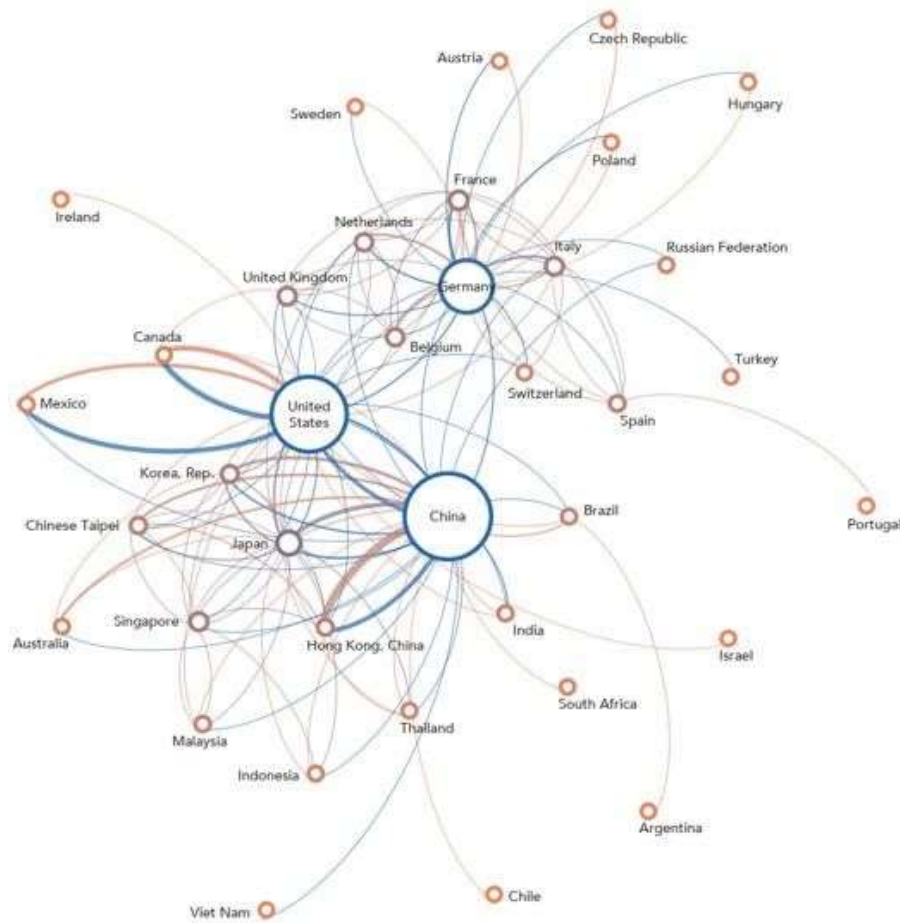


Data source: World Trade Organization. Regional Trade Agreements Database.



Value Chains: More Regional than Globalized

Fig. 3 Trade in components shows three interrelated production hubs



Source: World Bank, IDE-JETRO, OECD, UIBE, WTO. The 2017 GVC development report.



- The withering of globalization but the strengthening of regionalization
 - UN Comtrade statistics: from 2009 to 2017, approximately 95%, 94% and 42% of the growth of imports in Asia, North America and Europe sourced from intra-regional trade.

- What are the potential economic and environmental effects if the globalization process would switch to be more regionalized?



Outline

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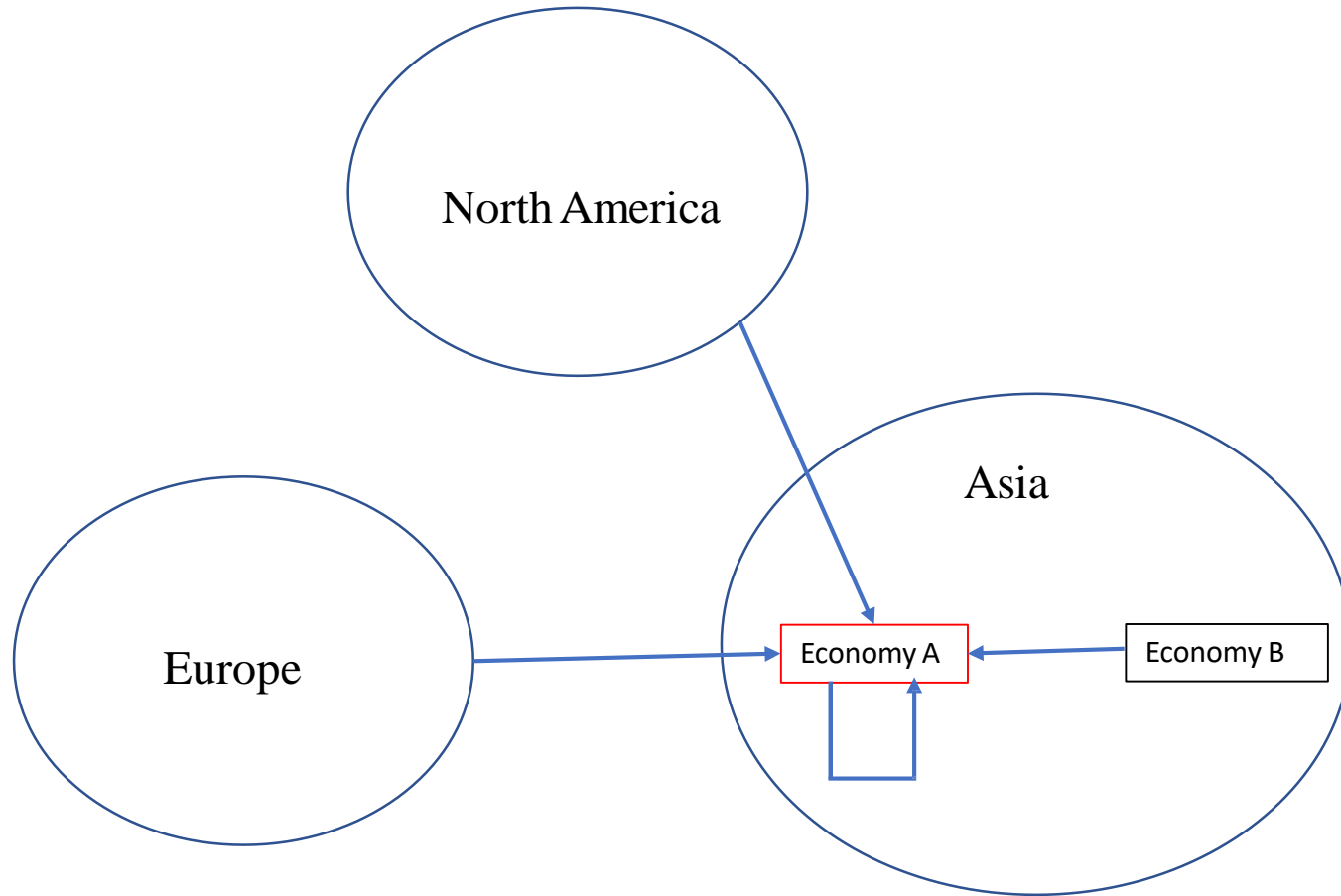
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Implications



A globalized world

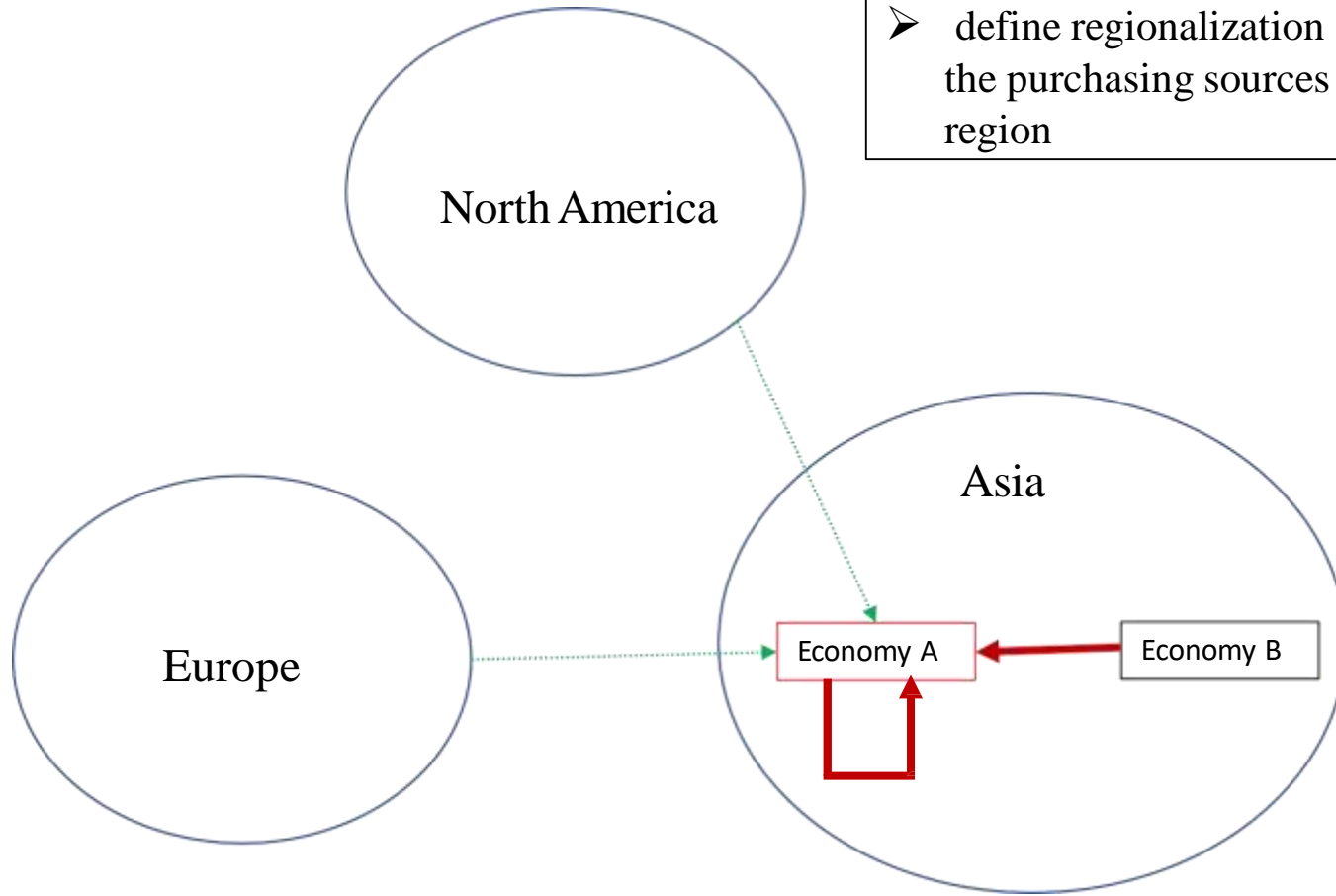


An economy's purchases of intermediate and final products in a globalized world



Regionalization

➤ define regionalization as changing the purchasing sources to a narrowed region



An economy's purchases of intermediate and final products in a regionalized situation



Assessing the effects of regionalization

- Multi-regional input-output model
- We adapt the idea of structural decomposition and decompose the trade in intermediates and final products so that we can separate the effects of changing sourcing economy.

Table 1 The environmental multi-regional input-output framework

			Intermediate use			Final use			
			Region 1	...	Region n	Region 1	...	Region n	Total
			Industry		Industry	Industry		Industry	output
			1, ..., m	...	1, ..., m	1, ..., m	...	1, ..., m	
Intermediate use	Region 1	Industry 1, ..., m	Z^{11}	...	Z^{1n}	F^{11}	...	F^{1n}	X^1
	
	Region n	Industry 1, ..., m	Z^{n1}	...	Z^{nn}	F^{n1}	...	F^{nn}	X^n
Value added			V^1	...	V^n				
Total inputs			X^1	...	X^n				
CO ₂ emissions			E^1	...	E^n				



Assessing the effects of regionalization

- We assess the effects of regionalization by focusing on three regions: Asia, North America, and Europe.
 - The aggregated value-added in these three regions accounted for about 85% of the world GDP since 2015.
 - The three respective regions own relatively independent production factors from external regions, which provides the basis for the formation of the tripartite “North America-Europe-Asia” regionalized economic landscape.
- We conduct *ex ante* scenario analyses by considering two scenarios: complete regionalization and partial regionalization.
 - Complete regionalization: the inter-regional trade among North America, Europe and Asia are completely replaced by intra-regional flows.
 - Partial regionalization: certain regions or industries (resource-intensive, labor-intensive, technology-intensive, and service-based industries) are regionalized.



Findings

- Income gap between developed and developing economies would be widened.
- Complete regionalization would decrease carbon emissions in Asia and Europe, but increase the emissions in North America.

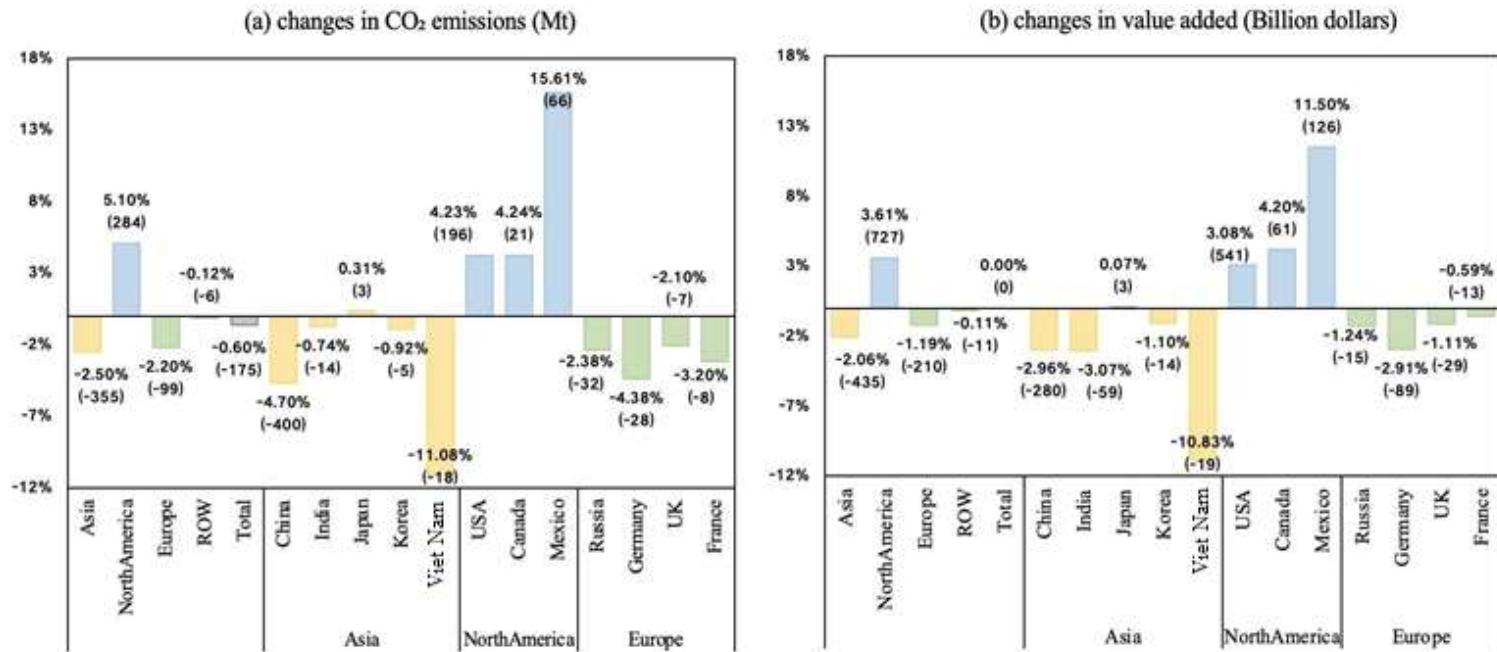


Fig. 4 The effects of complete regionalization on regional emissions and value added



Findings

- In terms of Asia, the regionalization of its supply chains with North America has the largest effects on its emissions and value added. In terms of Europe, its regionalization with North America has larger effects compared with Asia. In terms of North America, its regionalization with either Europe or Asia increases its value added and emission.
- Technology-intensive industries regionalization has the greatest effects on regional value added and emissions.
- The labor-intensive industries regionalization has large effects, significantly reducing value added and emissions in Asia.
- Resource-intensive and service-based regionalization would significantly affect value added and emissions in North America and Europe, but to a less extent in Asia.



Findings for APEC members

Table 2 The effects of regionalization on value added of APEC members (%)

Region	APEC member	SCR-AS&NA&EU	SCR-AS&NA	SCR-AS&EU	SCR-NA&EU	SCR-Resource	SCR-Labor	SCR-Tech	SCR-Service
Asia	PRC	-2.96	-2.59	-0.26	0.05	0.13	-1.16	-2.51	-0.21
	HKC	0.33	0.17	0.19	0.05	0.94	0.09	0.20	-0.39
	CT	-4.52	-3.86	-0.40	0.09	-0.57	-0.44	-3.92	-0.98
	JPN	0.07	-0.89	1.01	0.04	0.56	0.04	-1.59	1.15
	ROK	-1.10	-1.78	0.91	0.07	0.54	-0.12	-3.77	2.27
	INA	-0.06	-0.66	0.64	0.01	0.30	-0.74	-0.12	0.68
	MAS	-1.30	-2.53	1.46	0.06	1.26	-0.22	-3.01	0.98
	PHL	-1.61	-1.76	0.25	0.03	0.58	-0.23	-1.76	-0.42
	SGP	-3.91	0.93	-4.53	0.05	0.00	-0.14	-2.12	-0.94
	THA	-6.15	-4.13	-1.83	0.04	-1.30	-0.65	-2.42	-2.59
VN	-10.83	-7.82	-2.77	0.04	-2.36	-5.97	-3.17	-1.00	
North America	USA	3.08	2.19	-0.01	0.71	0.47	0.62	2.60	0.13
	CD	4.20	2.30	-0.02	1.64	0.29	0.13	3.17	1.10
	MEX	11.50	8.29	-0.01	2.58	1.14	1.24	8.65	3.01
Europe	RUS	-1.24	-0.11	-1.08	-0.13	-2.59	-0.04	0.86	-0.56
	AUS	-0.35	-0.37	0.03	0.01	0.03	-0.04	-0.32	-0.10
Rest of world	NZ	-0.08	-0.09	0.01	0.01	0.02	-0.02	-0.08	0.00
	CHL	-0.30	-0.35	0.03	0.04	0.03	0.00	-0.28	-0.12
	PE	0.06	-0.04	0.01	0.08	-0.04	0.01	0.05	0.01
SUM	SUM	0.82	0.32	0.00	0.45	0.27	-0.02	0.48	0.27

Notes: Data for Brunei and Papua New Guinea are lacking. SCR=supply chain regionalization

- Different regionalization have different effects on value-added of APEC members.
- Complete regionalization would have large negative effects on the value-added of VN, THA, SGP, PRC, CT, ROK and RUS, and have large positive effects on the value-added of economies in North America.
- Technology-intensive industries regionalization has the greatest effects on value-added of APEC members.



Findings for APEC members

Table 3 The effects of regionalization on CO₂ emissions of APEC members (%)

Region	APEC member	SCR-AS&NA&EU	SCR-AS&NA	SCR-AS&EU	SCR-NA&EU	SCR-Resource	SCR-Labor	SCR-Tech	SCR-Service
Asia	PRC	-4.70	-3.94	-0.61	0.07	-0.62	-1.07	-3.19	-1.30
	HKC	-0.04	-0.52	0.53	-0.01	1.36	0.09	-0.27	-0.49
	CT	-4.28	-5.02	1.06	0.13	-1.33	-0.73	-2.61	-0.97
	JPN	0.31	-1.11	1.49	0.04	0.65	0.04	-0.89	0.80
	ROK	-0.92	-2.51	1.84	0.09	0.17	-0.10	-2.94	2.09
	INA	0.33	-1.11	1.49	0.02	0.38	-0.86	-0.32	1.31
	MAS	-0.03	-2.87	3.09	0.05	1.28	-0.12	-3.61	2.78
	PHL	0.12	-1.39	1.59	0.03	0.44	-0.05	-0.75	0.72
	SGP	-6.94	-4.00	-2.61	-0.05	0.04	-0.36	-7.94	-0.06
	THA	-5.13	-4.06	-0.87	0.04	-2.21	-0.28	-1.79	-1.92
VN	-11.08	-8.48	-2.29	0.04	-2.90	-5.61	-3.42	-1.19	
North America	USA	4.23	1.94	0.00	2.04	0.66	0.69	2.40	1.19
	CD	4.24	1.65	-0.03	2.23	-0.25	-0.08	2.84	1.95
	MEX	15.61	10.72	-0.01	4.03	2.83	0.74	10.28	5.60
Europe	RUS	-2.38	-0.10	-1.59	-0.74	-3.14	-0.21	0.29	-0.86
Rest of world	AUS	-0.55	-0.55	0.02	0.02	0.04	-0.05	-0.51	-0.16
	NZ	-0.12	-0.14	0.02	0.01	0.03	-0.03	-0.13	0.00
	CHL	-0.30	-0.33	0.02	0.04	0.03	-0.01	-0.26	-0.12
SUM	SUM	-1.02	-1.43	-0.19	0.64	-0.28	-0.39	-0.82	-0.05

Notes: Data for Brunei, Papua New Guinea, and Peru are lacking.

- Complete regionalization would significantly reduce CO₂ emissions in VN, THA, SGP, PRC, CT, ROK and RUS, and increase CO₂ emissions in economies of North America.
- Technology-intensive industries regionalization has the greatest effects on CO₂ emissions of APEC members.



Implications

- De-globalization is far from a good trend for global economic development. It will widen the economic gap between developed and developing economies.
- If economies still prioritize economic growth to carbon emissions mitigation, Asia and Europe would continue to support globalization, while North America may tend to opt for regionalization, especially the regionalization between North America and Asia.
- Our results also show that if environmental costs are also taken account, the decision could be contrary because the emission in North America will increase substantially in a regionalization situation.



Unprecedented Uncertainties in Future Globalization

- What is currently certain is that globalization faces unprecedented uncertainties. COVID-19, domestic sentiments, and digital technology are restructuring global value chains.
- We stress that complete regionalization among Asia, Europe and North America is still unattractive, and in some instance, unrealistic.
- However, we should also be aware that partial restructuring of supply chains is inescapable, especially in some high-tech industries and industries relevant to domestic security.
- It is almost infeasible for developed economies to move back labor-intensive industries to home economies. However, there is a trend that labor-intensive production activities will be moved from the current world's factory to some least developing economies where labor costs are substantially lower.



Thank you for your attention!

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