

Analysis of CPTPP Expansion Using GDyn and OECD-ICIO

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CPTPP Expansion

- The Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) currently has 12 members (CPT12).
- Five prospective members are grouped as AP5: Costa Rica, Uruguay, the United Arab Emirates, the Philippines, and Indonesia.
- Their accession would expand the agreement from CPT12 to CPT17:

Motivation

- CPTPP expansion would reduce tariffs and may also deepen integration in goods, services, and investment.
- The size of these non-tariff and investment effects cannot be inferred from tariff schedules alone.
- Their economy-wide impacts depend on how trade-cost reductions propagate through global supply chains.
- Investment responses may further amplify the gains through capital accumulation over time.

Research Question and Approach

- What are the dynamic gains from CPTPP expansion when goods, services, and investment integration are added to tariff elimination?
 - How large are these gains for CPT12 and AP5 by 2040?
- We use gravity estimates of trade and FDI effects to calibrate policy shocks.
- We then simulate CPTPP expansion using a recursive dynamic CGE model with global supply chains.

Data Sources

- Trade: OECD Inter-Country Input-Output tables, 2000–2021
 - Bilateral trade flows from exporter i to importer j in sector k and year t
 - Summed over intermediate and final uses
- FDI: IMF Coordinated Direct Investment Survey, 2009–2023
 - Bilateral inward FDI positions from source i to host j in year t
- Policy variables:
 - Bilateral applied tariff rates from the Global Tariff Database (Teti, 2022), aggregated to ICIO goods sectors using import values from BACI as weights
 - RTA dummy variables from the World Bank Deep Trade Agreements Database
 - BIT dummy from the UNCTAD International Investment Agreements Navigator

RTA Variables

- RTAs are first divided into the CPTPP and all other RTAs.
- Other RTAs are then classified by horizontal depth (Hofmann et al., 2017), measured by the number of legally enforceable provisions:
 - Higher-depth RTAs have a depth index of 11 or higher.
 - Lower-depth RTAs have a depth index below 11.
- The cutoff of 11 is the sample median of the depth index. The CPTPP has a depth index of 20, but is treated separately.

Gravity Specification for Trade

- I estimate a sectoral gravity specification using PPML, allowing RTA effects to differ between goods and services.

$$X_{ijkt} = \exp(\alpha_G \text{CPTPP}_{ijt} G_k + \beta_G \text{HigherDepthRTA}_{ijt} G_k + \gamma_G \text{LowerDepthRTA}_{ijt} G_k \\ + \alpha_S \text{CPTPP}_{ijt} S_k + \beta_S \text{HigherDepthRTA}_{ijt} S_k + \gamma_S \text{LowerDepthRTA}_{ijt} S_k \\ + \delta \log(1 + \text{Tariff}_{ijkt}) + \mu_{ijk} + \pi_{ikt} + \psi_{jkt}) \cdot \varepsilon_{ijkt}.$$

- G_k and S_k denote goods and services indicators; μ_{ijk} , π_{ikt} , and ψ_{jkt} denote exporter-importer-sector, exporter-sector-year, and importer-sector-year FEs.
- α_G and α_S capture CPTPP-specific effects on goods and services trade, conditional on other RTAs, tariffs, and FEs.

Gravity Specification for FDI

- I estimate a gravity specification for inward FDI using PPML.

$$\text{FDI}_{ijt} = \exp(\alpha \text{CPTPP}_{ijt} + \beta \text{HigherDepthRTA}_{ijt} + \gamma \text{LowerDepthRTA}_{ijt} + \rho \text{BIT}_{ijt} + \mu_{ij} + \pi_{it} + \psi_{jt}) \cdot \varepsilon_{ijt}.$$

- μ_{ij} , π_{it} , and ψ_{jt} denote source-host, source-year, and host-year FEs.
- α captures the CPTPP-specific effect on inward FDI, conditional on other RTAs, BITs, and FEs.

Effects on Goods and Services Imports

	(1)	(2)	(3)
CPTPP $\times$ Goods	0.1124** (0.0483)	0.0988** (0.0502)	0.0745 (0.0474)
CPTPP $\times$ Services	0.0986 (0.0634)	0.0906 (0.0661)	0.0906 (0.0662)
Higher-depth RTA $\times$ Goods		0.2160*** (0.0216)	0.1245*** (0.0226)
Higher-depth RTA $\times$ Services		0.1359*** (0.0226)	0.1359*** (0.0227)
Lower-depth RTA $\times$ Goods		0.1934*** (0.0341)	0.1561*** (0.0322)
Lower-depth RTA $\times$ Services		0.0853 (0.0522)	0.0853 (0.0523)
Log (1 + tariff)			-3.581*** (0.3143)
Observations	5,639,743	5,639,743	4,752,783

Clustered standard errors at the country-pair level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Effects on Inward FDI

	(1)
CPTPP	0.0391 (0.1020)
Higher-depth RTA	0.1091* (0.0645)
Lower-depth RTA	-0.0377 (0.0851)
BIT	0.0070 (0.0092)
Observations	108,375

Clustered standard errors at the country-pair level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

From Estimation to Simulation

- The estimated CPTPP effects are generally positive, but the statistical evidence is limited.
- With a depth index of 20, the CPTPP lies in the higher-depth range. We therefore use the estimated effects of other higher-depth RTAs as benchmarks for fuller implementation.
- Benchmark effects from other higher-depth RTAs:
 - Goods imports: +13.3%
 - Services imports: +14.6%
 - Inward FDI: +11.5%

CGE Model and Database

- Model:
 - Recursive dynamic GTAP model extended to represent global supply chains (Ianchovichina and McDougall, 2001; Ianchovichina and Walmsley, 2012)
 - Trade structure based on the Armington assumption
 - Capital accumulation and international capital mobility
- Database:
 - GTAP 11 Database, benchmark year 2017 (Aguilar et al., 2023)
 - OECD ICIO tables to distinguish intermediate and final uses (OECD, 2025)
 - Aggregated into 25 regions and 24 sectors

Policy Scenarios

Baseline: Business-as-usual path through 2040 (United Nations, 2024; IMF, 2025)

S1: Tariff elimination

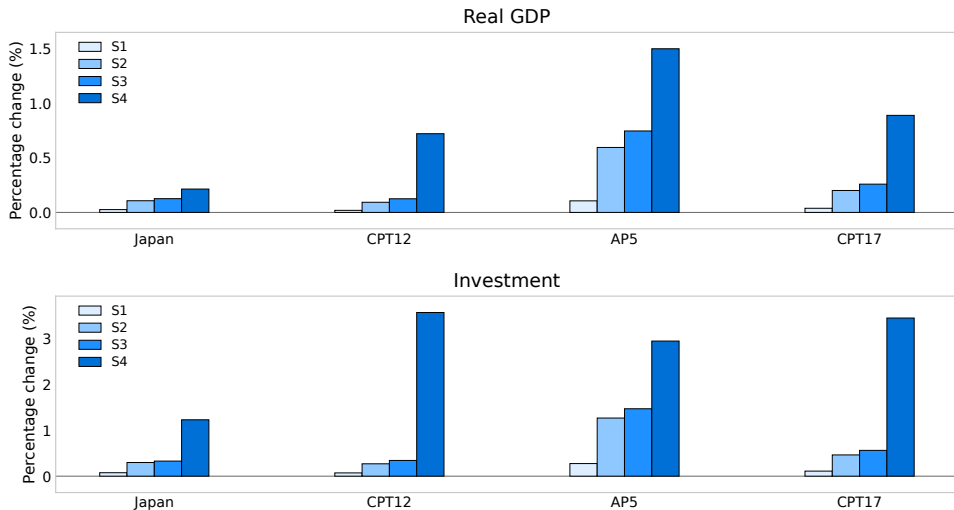
S2: S1 + reductions in goods NTBs

S3: S2 + reductions in services trade barriers

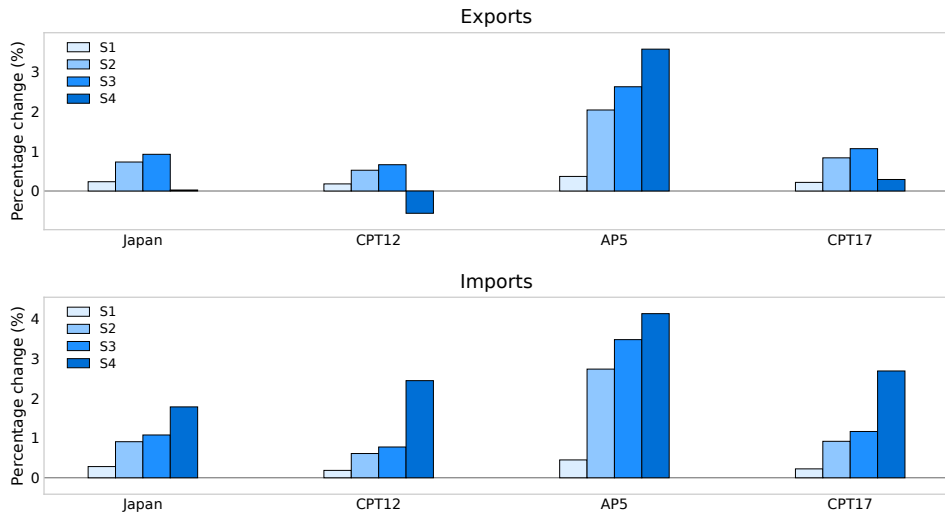
S4: S3 + reductions in investment risk

- Estimated trade effects are converted into bilateral ad valorem equivalent efficiency shocks between CPT12 and AP5.
- Estimated FDI effects are used to calibrate country-specific investment risk shocks for CPT12 and AP5.

Effects on Real GDP and Investment in 2040



Effects on Export and Import Volumes in 2040



Conclusion

- CPTPP expansion generates positive gains for both CPT12 and AP5, with larger percentage gains for AP5 and larger value gains for CPT12.
- Investment-related integration generates the largest additional gains through higher investment and capital accumulation over time.
- The results are obtained in a dynamic framework that captures the propagation of policy shocks through global supply chains.
- Future work should improve the linkage between gravity estimation and CGE simulation and extend the model to represent bilateral FDI flows.