



Bangko Sentral ng Pilipinas

TRADE IN TRANSITION

The Prospects of Developing East Asia
Towards Digital Trade

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Disclaimer: The views expressed in this paper are those of the author and do not represent the official position of the Bangko Sentral ng Pilipinas.

Outline of Discussion

- 1 The Development of APAC**
- 2 The Path to Structural Transformation**
- 3 Innovation in Trade Discourse**
- 4 Empirical Strategy**
- 5 Empirical Results**
- 6 Conclusion and Ways Forward**



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The Research Agenda

Understand the **determinants that shape the modernization of the trade basket** and its impact on policy is essential for aligning **production priorities with each country's stage of development.**

Research Questions:

- What are the determinants to trade in the developing Asia-Pacific region?
- What are the patterns that can be observed in the modernization of a trade basket?
- Are there any evidences of structural transformation and the modernization of the trade basket to trade?



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The Development of APAC

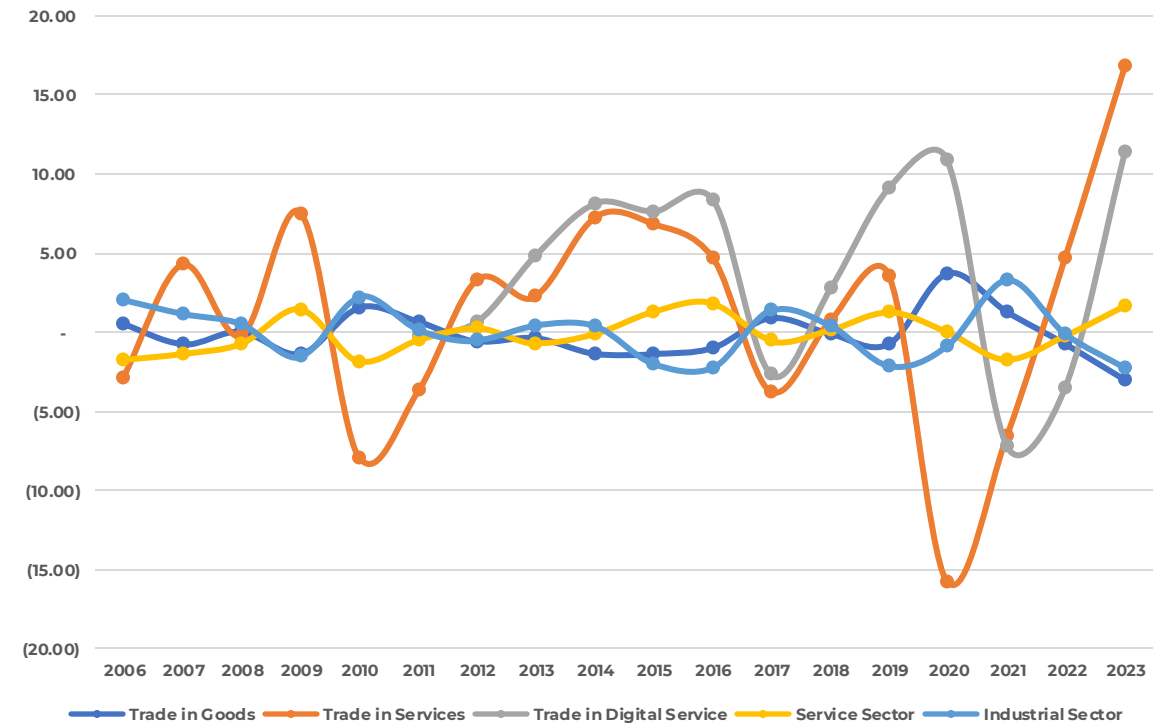
- In the mid-2000s, the World Bank noted that the Asia-Pacific (APAC) region is **undergoing a renaissance**. Gill & Kharas (2007) predicted that the region will **reach 40% of the share of the global economy by 2025**, a global contribution that happened in 1820.
- **Growth has slowed down by 1.5 times**, where the CAGR for the 2000s was a high of 7.65% and subsequently reduced to 4.90% in the 2010s.
- Most APAC economies are considered middle-income countries (MIC); hence, it is imperative to create suitable strategies to **assist in their development towards achieving higher-income status**.
- Garrett (2004) identifies two paths towards development:
 - (1) becoming a competitive **knowledge economy** (*innovation and skills*) or
 - (2) relying on a **low-wage economy** (*cost reduction*)



The Development of APAC

- Compared to other regions, APAC has demonstrated **resilience and sustained global integration in trade**, accounting for 29.90% of global trade in the post-pandemic 2021 – 2023
- **Minimal growth and changes have been experienced in merchandise sector** (i.e., trade in goods, industrial sector) identified for structural transformation
- Services trade growth for 2021 – 2023 is **1.5 times higher than goods trade for the region**, as it reports an increase of 14.14%.
- The growth in the APAC region is far higher than that of the World. However, **the region is not spared from the evidence of a MIT.**

Growth in the Composition Pattern of APAC's Industrial and Service Sector, 2006 – 2023 (%)



Source of Basic Data: UNCTAD (n.d.)

The Path to Structural Transformation

- A key driver of growth in APAC economies has always been participation in international trade, noting it as **a mechanism to facilitate technology transfer and knowledge spillover** (Gill & Kharas, 2007).
- In facilitating this structural transformation journey in APAC, a perspective that must be remembered is the **importance of technological know-how and R&D within the region** (Sawada, 2022).
- Innovation system is an important element for the **catch-up and dictates the gap among countries**. Hence, a key recommendation is to focus on short-cycle time technology (CTT) industries (e.g., IT, engineering, banking) , which is **a stark argument from the Kaldorian Growth Laws**.
- The APAC region is characterized by a successive **series of structural transformations** (Sawada, 2022).
 - Bootstrapping and mimicking the strategies of HICs.
 - “Premature deindustrialization” phenomenon



Innovation in Trade Discourse

- **Reinforcing Cycle of Innovation and Growth:** More specialized countries will generate new ideas and innovations that will introduce more advanced and specialized products in the market.
- **Factory Asia:** The reliance towards the creation and introduction of new products underscores the evidence of regional integration within value chains, as well as the spillover effects from larger and more advanced economies in the region.



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- **Digital Inputs:** Various countries will compete and prepare to produce digital inputs (specifically digital services) as this will be necessary for goods exports in the age of IR 4.0 to supply in the connected value network.

However, APAC MICs cannot catch up because their innovation capability is at the bottleneck (Lavopa & Szirmai, 2018; Lee et al., 2021; World Bank, 2024).



Empirical Strategy

Strategy 1:

The Determinants of the Volume of Trade in APAC

Strategy 2:

Discrete Choice for the Trade Basket in APAC

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$$T_{ijt} = \alpha_0 + \alpha_1 Y_{it} + \alpha_2 Y_{jt} - \alpha_3 D_{ij} + \sum_k \alpha_k A_{kijt} + \gamma_{ij} + \delta_t + \varepsilon_{ijt}$$

- The gravity model of international trade was used to identify the **determinants of the volume of trade for the selected developing APAC countries**.
- The methodology provides **a robust and stable strategy to analyze the bilateral trade interaction**, given the trading behavior of economies (Head & Mayer, 2014; Herman, 2023).
- Building on the theoretical foundation of the constant-elasticity model, **the pseudo-maximum likelihood (PML) models** achieve consistent parameter estimates accounting heteroskedasticity.
- The Poisson and the Negative Binomial Distribution was used to account both **equidispersion and overdispersion**.

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Dependent Variable

Measures the total bilateral **export flows** between country i and country j at time t

Data Coverage:

Reporting: 13 Developing APAC economies

Partner: 140 trading partners

Years: 2005 - 2020

Source:

Goods: BACI International Trade Database at the Product-Level (Gaulier & Zignago, 2010)

Services: OECD-WTO Balanced Trade in Service (BaTIS) Database (Liberatore & Wettstein, 2021).

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Gravity Variables

Y_i and Y_j : Represent the economic mass of countries i and j

D_{ij} : accounts for the geographic distance between country i and country j

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Fixed Effects

δ_t : The time-fixed effects (FEs)

γ_{ij} : The economy-pair FEs to account for
multilateral resistance terms

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Explanatory Variables

Policy Variables

- Contiguity
- Total Trade Agreements
- Intellectual Property Fillings (in log)
- Property Rights Index
- Property Rights Index x IP Fillings

Shocks

- Global Financial Crisis
- COVID-19

Empirical Strategy

	Variable Name	Signs Based on Literature	Poisson Distribution Calculations	Negative Binomial Distribution Calculations
Gravity Variables	Log of GDP of Exporting Country	Positive	0.58***	0.80***
	Log of GDP of Importing Country	Positive	0.52***	0.63***
	Log of Harmonic Distance	Negative	0.28***	16.64**
	Contiguity	Positive	2.26***	2.51***
Policy Variables	Total Trade Agreements	Positive	0.04***	0.05***
	Log of Intellectual Property Fillings	Positive	0.01***	0.04***
	Property Rights Index	Positive	0.02***	0.01***
	Property Rights Index x Intellectual Property Fillings	Ambiguous	0.00***	0.00***
Shocks	GFC Dummy	Negative	-0.25***	-0.09***
	COVID-19 Dummy	Negative	-12.38***	-0.40***

Empirical Strategy

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$$T_{ijt} = \frac{\exp\{\alpha_1 Y_{it} + \alpha_2 Y_{jt} - \alpha_3 D_{ij} + \sum_k \alpha_k A_{kijt}\}}{\sum_m \sum_n \exp\{\alpha_1 Y_{mt} + \alpha_2 Y_{nt} - \alpha_3 D_{mn} + \sum_k \alpha_k A_{kmnt}\}} + \gamma_{ij} + \delta_t + \varepsilon_{ijt}$$

- The second estimation strategy applies the gravity model of international trade within a discrete choice framework. This approach permits the analysis of the costs and benefits of the country's choice that may not be directly observable (Anderson, 2011).
- Incorporating behavioral demand theory and entropy-maximizing principles make the gravity equation a behaviorally valid model for discrete choice.

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Dependent Variable

The category of **export flows** between country i and country j at time t from the set of country pairs m and n

Technological Classification of Exports

- 1 = Primary Products/Low Tech Manufacturing
- 2 = Medium and High Tech Goods
- 3 = Other Services
- 4 = Digital Services
- 5 = Unclassified

Source: Lall (2000) and Liberatore, Avendano, & Choo (2022)

Empirical Results

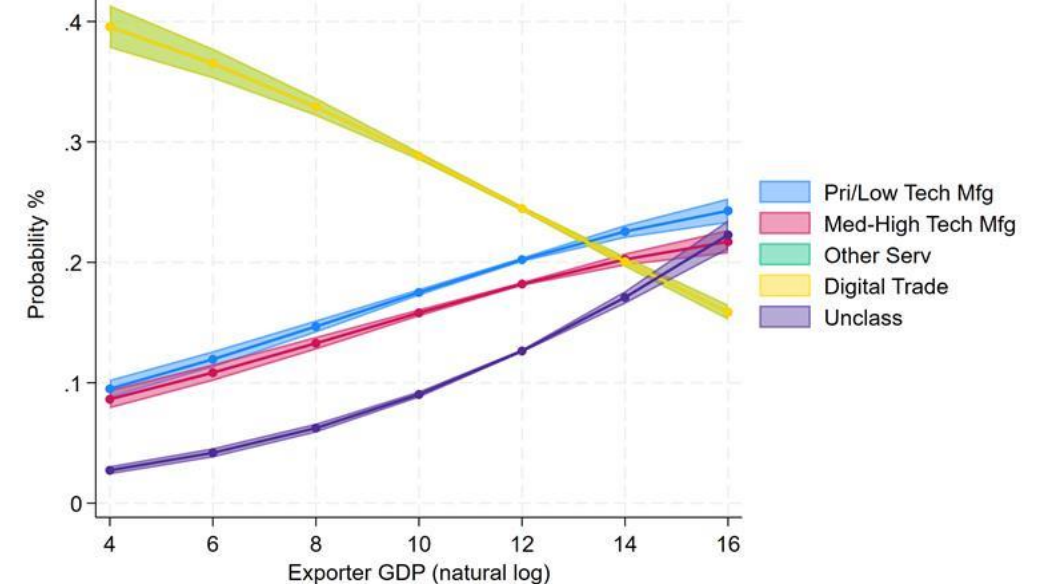
Insight 1: Export Patterns Shift with Economic Development

	Pri. Prod/ Low Tech. Manu (1)	Med.-Hi. Tech Manu (2)	Other Serv (3)	Dig. Trade (4)	Unclass (5)
Log of GDP of Exporting Country	0.0131*** (0.00)	0.0118*** (0.00)	-0.0246*** (0.00)	-0.0246*** (0.00)	0.0242*** (0.00)
Log of GDP of Importing Country	0.0032*** (0.00)	0.0052*** (0.00)	-0.0097*** (0.00)	-0.0097*** (0.00)	0.0108*** (0.00)

Note: *, **, *** indicates statistical significance at the 10%, 5%, and 1%, respectively. (#) are robust standard errors

- There is a **shift in the export basket initially prefers services trade**, whether digital trade or other services.
- Occurs as an increase in the production (or consumption) **reduces the likelihood of exporting services trade by 0.97 – 2.46 percentage points.**
- This shifts the basket to producing more goods, especially unclassified goods, with **an increase of 2.42 percentage points.**

Margins Plot of the Probability of Each Technological Classification of Exports Against Exporter GDP



Source: Author's Calculation

Empirical Results

Insight 2: Goods and Services Differentiates the Impact of Geography

	Pri. Prod/ Low Tech. Manu (1)	Med.-Hi. Tech Manu (2)	Other Serv (3)	Dig. Trade (4)	Unclass (5)
Log of Harmonic Distance	-0.0185*** (0.00)	-0.0186*** (0.00)	0.0295*** (0.00)	0.0295*** (0.00)	-0.0220*** (0.00)
Contiguity	-0.0356*** (0.01)	-0.0245*** (0.01)	0.0344*** (0.01)	0.0344*** (0.01)	-0.0087 (0.01)

Note: *, **, *** indicates statistical significance at the 10%, 5%, and 1%, respectively. (#) are robust standard errors

- **The location variables are confined to traditional gravity literature in the case goods; however, the opposite is true for services.**
- Technological classification of goods has minimized trading, which lead to a **2.20 percentage point reduction for unclassified goods** and **3.56 percentage points for primary products.**
- Distance and contiguity increase the likelihood of exporting digital trade and other services by 2.95 – 3.44 percentage points.



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Empirical Results

Insight 3: COVID-19 ushered Services Trade

	Pri. Prod/ Low Tech. Manu (1)	Med.-Hi. Tech Manu (2)	Other Serv (3)	Dig. Trade (4)	Unclass (5)
GFC Dummy	0.0020 (0.00)	0.0026 (0.00)	-0.0082** (0.00)	-0.082** (0.00)	0.0119*** (0.00)
COVID-19 Dummy	-0.0026 (0.00)	0.0029 (0.00)	0.0126*** (0.00)	0.0126*** (0.00)	-0.0196*** (0.00)

Note: *, **, *** indicates statistical significance at the 10%, 5%, and 1%, respectively. (#) are robust standard errors

- In contrast to the impact of the GFC, COVID-19 gave rise to a more pronounced services export participation, which increased the likelihood by **1.26 percentage points for other services and digital services.**
- Consistent with the **emerging absorptive capacity of the service sector to supplement the delivery of essential services** during the COVID-19 pandemic and the **increasing uptake of digital trade** (UNCTAD, 2022).



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Empirical Results

Insight 4: Innovation Pushes the Country's Technological Goods Trade

	Pri. Prod/ Low Tech. Manu (1)	Med.-Hi. Tech Manu (2)	Other Serv (3)	Dig. Trade (4)	Unclass (5)
Log of Intellectual Property Fillings	-0.0034*** (0.00)	0.0060*** (0.00)	-0.0067*** (0.00)	-0.0067*** (0.00)	0.0108*** (0.00)
Property rights index	-0.0003* (0.00)	0.0009*** (0.00)	-0.0013*** (0.00)	-0.0013*** (0.00)	0.0021*** (0.00)
Property Rights Index x Intellectual Property Fillings	0.0000 (0.00)	0.0001*** (0.00)	0.0001*** (0.00)	0.0001*** (0.00)	-0.0002*** (0.00)

Note: *, **, *** indicates statistical significance at the 10%, 5%, and 1%, respectively. (#) are robust standard errors

- A country's innovation ecosystem has created **a preference and an increase in the likelihood of trading medium and high technology goods.**
- The creation of a strong innovation ecosystem and its safeguard also exhibits a preference towards **introducing new goods in the market that are knowledge or technology intensive, rather than imitations** (Auriol, Biancini, Paillacar, 2023).



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Conclusion and Ways Forward

- The ongoing **digital revolution necessitates a review of the policy landscape** of each APAC country to harness the trade and growth prospects towards mitigating the MIT.
- APAC countries have **alternative growth patterns far from the traditional linear perspective**, as supported by the Kaldorian Growth Laws.
- **Structural transformation is also evident in the discrete choice result**, given the preferences of countries with higher economic means and a more sophisticated economic environment.
- The results can be further validated using the **nested logit and machine learning models** (Rahnasto & Hollestelle, 2024).





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Thank you.

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