Indonesia in the Context of GVCs

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Data and Methodology

ADB Multi-regional Input-Output Tables and the World Input-Output Database
A Stylized Representation of a Multi-Regional Input-Output Table

DATA USED

**ADB MRIO:**
62 economies + RoW
35 industries
2000, 2007-2018

**WIOD:**
43 economies + RoW
mapped to 35 industries
2000-2006

ADB = Asian Development Bank; WIOD = World Input-Output Database
Some Concepts and Methodologies Used

• GVC Income (Timmer et al., 2013)
• Exports Decomposition into Value-Added Terms (Wang, Wei, and Zhu, 2018)
• GVC Participation (Wang, Wei, Yu, and Zhu, 2014)
• Upstreamness (Antràs and Chor, 2013 and 2018; Fally, 2012)
• Revealed Comparative Advantage (Balassa, 1965; Wang, Wei, and Zhu, 2018)
Indonesia’s Production and Value-Added Exports

Domestic Production and Consumption of Intermediates, Value-Added in Final Production, Exports Decomposition: Trade in Value-Added
Indonesia is producing more intermediates for the domestic economy and consuming more intermediates from domestic sources.

The domestic value-added content of Indonesia’s final products rose in the past decade.

Note: Asian Development Bank estimates are based on the methodology of Timmer et al. (2013).

Figure 2. Share of Domestic Value-Added in Total GVC Income, 2000–2017

GVC INCOME:
What is structure of the value-added source of an economy-industry’s final production?

\[ v = \hat{p}(I - A)^{-1}f \]
There are rising contributions of domestic value-added to sectoral GVC incomes across all sectors.

Figure 3. Share of Domestic Value-Added in Total GVC Income, 2000–2017

Note: Asian Development Bank estimates are based on the methodology of Timmer et al. (2013).
Value-added generated in Indonesia accounted for an increasing proportion of GVC incomes in some “factories”.

Figure 4. Indonesia's Share in Other Economies' GVC Income, 2000, 2007, and 2017

Note: Asian Development Bank estimates are based on the methodology of Timmer et al. (2013).
Indonesia’s contributions to other economies’ GVC income were largest in Factory Asia.

Figure 4. Indonesia's Share in Other Economies' GVC Income, 2000, 2007, and 2017

Note: Asian Development Bank estimates are based on the methodology of Timmer et al. (2013).
Gross Trade Accounting: Conceptual Framework

(0) Gross Exports (Goods and Services) (E*)

(1) + (2) + (3)
Domestic Value-Added Absorbed Abroad
(VAX_G)

(4) Domestic Value-Added First Exported then Returned Home (RDV_G)

(6) + (7)
Foreign Value-Added
(FVA)

(5) + (8)
Pure Double Counted Terms
(PDC)

(1) Final Goods and Services Exported
(DVA_FIN)

(2) Intermediate Exports Absorbed by Direct Importer
(DVA_INT)

(3) Intermediates Sent to First Importer and then Re-exported to Third Country
(DVA_INTrex)

(5)
Pure Double Counting from Domestic Sources
(DDC)

(6)
Foreign Value-Added Contained in Final Exports
(FVA_FIN)

(7)
Foreign Value-Added Contained in Intermediate Exports
(FVA_INT)

(8)
Pure Double Counting from Foreign Sources
(FDC)

Domestic Value-Added (DVA_G)

Vertical Specialization (VS)

Note: E* can be at country-sector, country aggregate, bilateral-sector, or bilateral aggregate. Both VAX_G and RDV_G are based on backward industrial linkages.
Indonesia’s gross exports had a generally stable and sizeable domestic value-added content. Moreover, export activity was more bilateral than global.

Figure 6. Decomposition of Gross Exports, Indonesia, 2000–2017

Note: Asian Development Bank estimates are based on the methodology of Wang, Wei, and Zhu (2018).
From 2000 to 2007, GVC-related domestic value-added embedded in intermediate exports from Indonesia increased across all major economic sectors except business services.

Figure 7. Changes in Value-Added Components of Exports, 2000 vs. 2007

Note: Asian Development Bank estimates are based on the methodology of Wang, Wei, and Zhu (2018).
From 2007 to 2017, Indonesia participated less in complex GVCs except in the primary sector.

Figure 8. Changes in Value-Added Components of Exports, 2007 vs. 2017

DVA = domestic value-added

Note: Chart shows countries with the highest levels of domestic value-added involved in GVC-related activities. Node size corresponds to the monetary value (in USD) of DVA that is ultimately involved in GVC-related activities (forward GVC participation). DVA embedded in exports of source country to a destination country defines the edges of the network charts. Line thickness indicates the size of domestic value added produced by the economy that is absorbed abroad. Asian Development Bank estimates are based on the methodology of Wang, Wei, and Zhu (2018).

2007

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Indonesia’s Participation, Position, and Specialization in Global Value Chains

GVC Participation, Position in GVCs: Upstreamness, Specialization in GVCs: Revealed Comparative Advantage
GVC Participation

• Forward Perspective: Decomposition of GDP by Country-Sector
  • Which types of production and trade are GVC activities?
    • A country-sector’s total value-added in production of intermediate exports absorbed by direct importer (Simple GVCs)
    • A country-sector’s total value-added in production of intermediate exports re-export/re-import (Complex GVCs)

• Backward Perspective: Decomposition of Final Goods Production by Country-Sector
  • Which part of final goods production and trade belong to GVCs?
    • Partner country’s value-added in intermediate imports used in the production of domestic used products
    • Domestic and foreign value-added in intermediate imports used in the production of exported products
Trade-related activity as share of value-added and of final goods and services production declined in Indonesia.

Figure 12. Decomposition of Gross Exports, Indonesia, 2000–2017

A. Value-Added Decomposition

B. Final Goods Production Decomposition

Note: Asian Development Bank estimates are based on the methodology of Wang, Wei, Yu, and Zhu (2017).
Indonesia’s participation in GVCs declined between 2000 and 2017.

Figure 13. Decomposition of Gross Exports, Indonesia, 2000–2017

A. Forward GVC Participation

B. Backward GVC Participation

Note: Asian Development Bank estimates are based on the methodology of Wang, Wei, Yu, and Zhu (2017).
Indonesia was more actively engaged in upstream production, and intermediates trade was more bilateral in nature.

Figure 14. Decomposition of Gross Exports, Indonesia, 2000–2017

Indonesia is moving relatively downstream. That is, output is moving closer to final consumers.

Note: Asian Development Bank estimates are based on the methodology of Antràs and Chor (2018) and Miller and Temurshoev (2017).

Revealed Comparative Advantage using Value-Added

• Revealed comparative advantage using domestic value-added through the forward linkage:

\[
NRCA_i^r = \left( \frac{DVA_{F_i}^T}{\sum_{i=1}^{N} DVA_{F_i}^r} \right) \div \left( \frac{\sum_{k=1}^{G} DVA_{F_i}^k}{\sum_{i}^{N} \sum_{k=1}^{G} DVA_{F_i}^k} \right)
\]

• NRCA accounts for the fact that a country-sector’s value-added may be exported indirectly via the country’s exports in other sectors.

• It also accounts for the fact that a country-sector’s gross exports may at least partly carry foreign value-added.
Indonesia’s comparative advantage is concentrated in primary and low-technology manufacturing industries.

Note: Asian Development Bank estimates are based on the methodology of Wang, Wei, and Zhu (2018).
Indonesia specialized in industries of varying positions and degrees of participation.

**Figure 17. Participation, Position, and Specialization, Indonesia, 2000 vs. 2017**

A. 2000

B. 2017

Note: The nodes refer to sectors and the size of each node corresponds to the sector’s revealed comparative advantage based on value-added terms. Only sectors with comparative advantage are labeled with their sector codes (Appendix 2) and colored according to their respective upstreamness values. Comparative advantage sectors with upstreamness values less than 1.5 are colored dark blue. Those with upstreamness values greater than or equal to 1.5 but less than 2.5 are colored light blue. Those with upstreamness values greater than or equal to 2.5 but less than 3.5 are colored green. Finally, those with upstreamness values greater than or equal to 3.5 are colored orange. Asian Development Bank estimates are based on the methodologies of Antràs and Chor (2018), Wang, Wei, Yu, and Zhu (2017), and Wang, Wei, and Zhu (2018).

Backward GVC participation was generally low for all Indonesian industries.

Figure 17. Participation, Position, and Specialization, Indonesia, 2000 vs. 2017

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In general, increases in upstreamness (decreases) were accompanied by increases (decreases) in forward participation.

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Summary and Conclusions
Summary

1. Indonesia’s production and supply of inputs is mostly domestically-oriented.
   • Indonesia is producing more intermediates for the domestic economy and consuming more intermediates from domestic sources.
   • DVA in total GVC income and in total sectoral GVC income is rising.

2. However, Indonesia’s links to other economies, especially Asian economies, are rising.
   • Increasing contribution of value-added in GVC incomes of other economies.
   • More forward links to other Asian economies as captured by DVA_F.
Summary

3. Exports activity is more bilateral than global in nature.
   • Sizeable proportion of DVA_FIN and DVA_INT in exports.
   • Higher share of simple GVCs vs. complex GVCs.

4. Indonesia is moving downstream.
   • Declining upstreamness index, contrary to world trend.
   • Declining forward participation ratio.
5. Indonesia is specializing in industries of different positions and degrees of participation, but specialization is concentrated in primary and low-technology manufacturing industries.
Thank you!