



**RESEARCH PAPER SERIES NO. 2019-06**

**Facilitating Structural Transformation  
through Product Space Analysis:  
The Case of Philippine Exports**

**Connie B. Dacuycuy  
Ramonette B. Serafica**

**Research Paper Series No. 2019-06**

**Facilitating Structural Transformation  
through Product Space Analysis:  
The Case of Philippine Exports**

*Connie Bayudan-Dacuycuy and Ramonette B. Serafica*



Philippine Institute for Development Studies  
*Surian sa mga Pag-aaral Pangkaunlaran ng Pilipinas*

Copyright 2019

Published by  
Philippine Institute for Development Studies

Printed in the Philippines. Some rights reserved.

The views expressed in this paper are those of the authors and do not necessarily reflect the views of any individual or organization.

Please address all inquiries to:

Philippine Institute for Development Studies  
18th Floor, Three Cyberpod Centris - North Tower  
EDSA corner Quezon Avenue, 1100 Quezon City  
Telephone: (63-2) 8877-4000  
Fax: (63-2) 8877-4099  
E-mail: [publications@mail.pids.gov.ph](mailto:publications@mail.pids.gov.ph)  
Website: <https://www.pids.gov.ph>

This research paper is under the Creative Commons Attribution Noncommercial License. It shall not be used for commercial purposes. Anyone can use, reuse, distribute, and build upon this material as long as proper attribution is made.

ISSN 1908-3297  
ISSN 2508-0830 (electronic)  
RP 12-19-600

Editorial and production team:  
Sheila V. Siar, Maria Judith L. Sablan, and Carla P. San Diego

# Table of Contents

List of tables and figures	v
List of acronyms	vii
Abstract	ix
Introduction	1
Product space: Metrics and literature	5
Metrics: Product sophistication	7
Metrics: Proximity	8
Evolution of structural reform and industrial policies in the Philippines	9
The Philippine overall export portfolio	12
Evolution in the product space, 1995 to 2014	12
Export basket and markets, 2014	21
Diversification strategies: Industrial sector	23
Potential short-run diversification strategies	23
Potential medium-run diversification strategy	37
Potential long-run diversification strategy	38
Evolution of the Philippine agricultural products, 1995 to 2014	45
Diversification Strategies: Agricultural sector	50
Potential short-run diversification strategies	51
Potential medium-run diversification strategy	59
Synthesis/Summary and conclusions	61
Creating an enabling environment	64
Enhancing industrial policies	66
Harnessing the potential of the agricultural sector	67
Suggestions for further study	68
References	71
The Authors	75





## List of Tables and Figures

### Table

1	Manufacturing industry, agroprocessing, and services roadmaps for structural transformation, job creation, and poverty reduction	11
2	Evolution of overall export portfolio: Philippines, 1995–2014	13
3	Top and bottom 10 products in the world, first and fifth quintile of <i>PRODY<sub>world</sub></i> , 2014	18
4	Descriptive statistics of exports: Philippines, 2014	21
5	Potential products for diversification in the short run	25
6	Potential products for medium-run diversification	27
7	Potential products for long-run diversification	40
8	Evolution of agricultural export portfolio: Philippines, 1995–2014	46
9	Top and bottom 10 agricultural products in the world, first and fifth quintile of <i>PRODY<sub>world</sub></i> , 2014	47
10	Number of agricultural products in the world market, by <i>PRODY<sub>world</sub></i> quintile	49
11	Potential agricultural products for diversification in the short run	52
12	Potential agricultural products for medium-run diversification	60
13	Potential agricultural products for long-run diversification	60

### Figure

1	Sectoral value-added and employment shares: Philippines, various years	2
2	Overall sophistication of 2014 export basket: selected Asian countries	20
3	Selection of products (product j) for potential diversification in the short run	26
4	Number of short-run products (strategy 1) exported: Philippines	30
5	Total value of short-run products (strategy 1) exported (in USD '00000): Philippines	30

6	Potential markets of the short-run products (strategy 1): Philippines	31
7	Number of countries importing the potential products listed in the short-run strategy 1	32
8	Number of short-run products (strategy 2) exported in various markets: Philippines	35
9	Number of countries importing the potential products listed in the short-run (strategy 2)	36
10	Selection of products for potential diversification in the medium run	37
11	Number of countries importing the potential products listed in the medium-run strategy in the medium run	39
12	Selection of products for potential diversification in the long-run	39
13	Number of countries importing the potential products listed in the long-run strategy	43
14	Number of Philippine agricultural exports and average <i>PRODY</i> of agricultural exports in the world market, by category	50
15	Average <i>PRODY</i> of Philippine agricultural exports, by export and import intensity	51
16	Potential markets of short-run agricultural products (strategy 1)	56
17	Potential markets of short-run agricultural products (strategy 2)	58

## List of Acronyms

ASEAN	Association of Southeast Asian Nations
ARMM	Autonomous Region in Muslim Mindanao
BOI	Board of Investments
CNIS	Comprehensive National Industrial Strategy
CPU	central processing unit
DTI	Department of Trade and Industry
EO	Executive Order
<i>EXPY</i>	overall sophistication of a country's export basket
FAO	Food and Agriculture Organization
FDI	foreign direct investment
FIRe	Fourth Industrial Revolution
GDP	gross domestic product
GII	Global Innovation Index
GVC	global value chain
i <sup>3</sup> s	Inclusive Innovation Industrial Strategy
ICT	infomation and communications technology
IPP	Investment Priorities Plan
IT-BPM	information technology-business process management
LED	light-emitting diode
MENA	Middle East and North Africa
MRCA	imports intensity
MRP	Manufacturing Resurgence Program
NEDA	National Economic and Development Authority
NIP	New Industrial Policy
OECD	Organisation for Co-operation and Development
PIDS	Philippine Institute for Development Studies
<i>PRODY</i>	product sophistication
PUV	public utility vehicle
RCA	revealed comparative advantage
UAE	United Arab Emirates
UK	United Kingdom
UNCTAD	United Nations Conference on Trade and Development
US	United States
WB	World Bank
WTO	World Trade Organization





## Abstract

While the Philippines has a long history of trade liberalization efforts and market-oriented reforms, the country has to yet to see a genuine structural transformation. Recently, there are efforts to transform the global competitiveness of the manufacturing industry through backward and forward linkages to create decent jobs and promote sustainable and comprehensive growth. Given these, it is imperative for the country to chart its short-, medium-, and long-run diversification strategies. This research assesses the sophistication content of the country's current export portfolio and identifies products that result in a more diversified and high value-added mix of export commodities.

Using some metrics from the product space, the paper finds that the average sophistication of products included in the country's export basket has barely improved from 1995 to 2014. It has remained lower than the average sophistication content of exports in the world market. The paper also finds that some of the products in the country's existing export basket has potential forward linkages to goods with relatively higher sophistication content, which in turn has potential linkages to even more sophisticated goods. However, transformation does not happen overnight and requires well-thought-out policies, plans, and priorities. To this end, the paper advocates the implementation of measures outlined in the *Philippine Export Development Plan*. It also identifies other potential actions toward human capital development, innovations, and infrastructure programs.



## Introduction

The Philippines has a long history of trade liberalization efforts and market-oriented reforms<sup>1</sup> although the country has to yet to see a genuine structural transformation. The secular decline in the shares of agricultural value-added—in gross domestic product (GDP)—and employment—in percent of total employment—is a key aspect of economic development (Syrquin 2008). Structural transformation, or the movement of resources out of the agricultural sector into the industrial sector, is a stylized fact observed in economies that grow richer due to increased consumption of manufactured goods. As the economies become even richer, demand shifts to services while employment and output shares decline.

However, the path to development in the Philippines does not conform to these broad patterns. Rather, it is characterized by premature aging (Fabella and Fabella 2012). Indeed, Figure 1 shows that while the agricultural value-added share in GDP has been declining, the share of agricultural employment to total employment remains high at 26 percent. This is in contrast with most developed economies whose agricultural employment share is below 5 percent (Felipe et al. 2016). From 1991 to 2017, employment in the industrial sector fluctuates at a narrow band between 15 and 18 percent while employment in the services sector has been steadily rising at an average of 0.65-percentage points per year. In terms of value-added shares, the shares of the services sector have been increasing starting 1974 at around 34 percent to around 60 percent in 2016. That of the industrial sector is around 31 percent in 1960 and has increased to 38 percent in 1984. In 2016, however, value-added shares of the industrial sector have declined to its 1960 level.

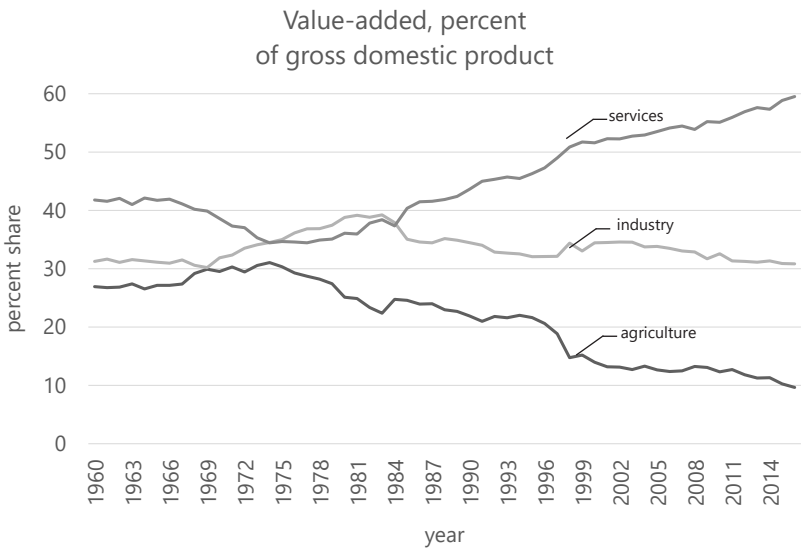
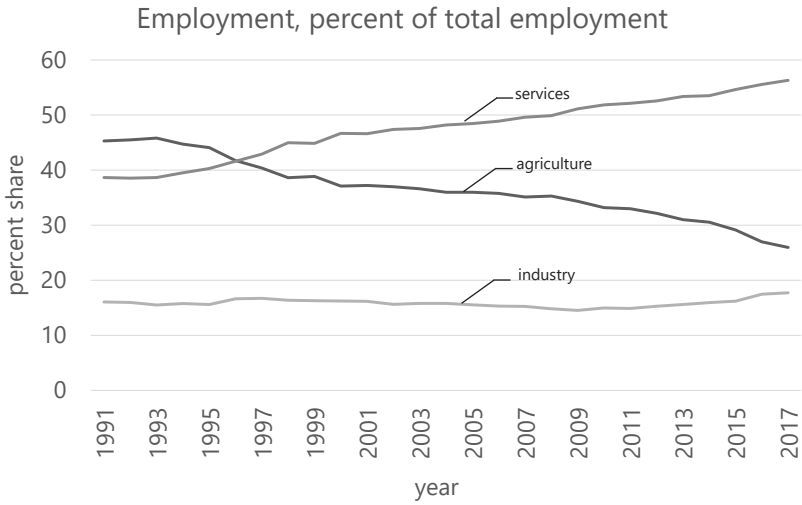
Central to structural transformation is the industrial sector. First, the industrial sector is where most learning and innovation take place (Stiglitz and Greenwald 2014). Moreover, profits from the production of a new good encourages other firms to produce the same good (Hausmann and Rodrik 2003). This results in profit reduction in one firm encouraging it to further innovate and eventually push the country's production and technological boundaries outward.

Second, sophisticated and high value-adding industrial goods are likely to have high services content. Globally, manufacturing and agricultural companies are increasingly engaged in servicification

---

<sup>1</sup> See Aldaba (2014) for a review of the trade reform programs in the Philippines from 1970 to early 2000s.

**Figure 1: Sectoral value-added and employment shares: Philippines, various years**



Source: World Bank-World Development Indicators (various years)

(Kommerskollegium 2012, 2013). This is a process where nonservices sectors in the economy (a) buy and produce more services than before, and (b) sell and export more services, often as a package deal with the good. In the case of manufacturing exports, for example, Lanz and Maurer (2015) find evidence of significant servicification where services value added accounts for almost a third of gross exports of manufacturing industries in developed countries compared to only 26 percent in developing countries.

Third, the development of the agricultural sector is strongly linked to the industrial sector. Hirschman (1958) advocated the development of input market networks to industries and, with his linkage hypothesis, postulated that the best development path lies in selecting those activities where its progress will induce further progress elsewhere (FAO 1997). The agricultural sector is hounded by its low productivity as indicated by its declining contribution to the GDP even while accounting for more than a quarter of the country's total employment.

In addition, several developments at a global scale are unfolding. The Fourth Industrial Revolution (FIRe), or the age where automated production is taking place in the context of scientific and digital breakthroughs, is believed to bring with it challenges to and opportunities for learning. These breakthroughs are thought to usher the world in a new form of globalization, one in which the engagement of the services sector among countries becomes more fluid. These underscore the importance of the industrial sector not only in generating knowledge but also in the development of the agricultural and the services sectors.

Indeed, the importance of the industrial sector has been recognized by the national government. In 2012, the Department of Trade and Industry-Board of Investments (DTI-BOI) has taken a proactive role in steering the country's industrialization through its Investment Priorities Plan (IPP) that promotes the New Industrial Policy (NIP). The NIP aims to transform the manufacturing industry into a globally competitive industry supported by backward and forward linkages to create decent jobs and promote sustainable and comprehensive growth. In addition, the Manufacturing Resurgence Program (MRP), identified as a priority program under the National Budget Memorandum 118, is designed to revitalize the manufacturing sector targeted to account for 30 percent of total value-added and to generate 15 percent of total employment through the implementation of the Manufacturing Industry Roadmap (Aldaba 2014).



Given these efforts towards structural transformation, it is imperative for the country to chart its short-, medium-, and long-run diversification strategies. This research assesses the current export portfolio in the country and discover products, given the country's existing productive knowledge, that result in a more diversified and high value-added mix of export commodities. To do this, this paper uses the metrics in the product space, or the visual representation of the closeness of goods to each other, developed by Hausmann and Klinger (2006), Hausmann et al. (2007), Hidalgo and Hausmann (2009), and Hausmann and Hidalgo (2011). The theory behind this setup is that countries have productive structures made up of different capabilities such as infrastructures, technology, human capital, social networks, and institutions. Goods with similar production requisites are easier and less costly to produce than goods with different production requirements.

Central to the product space is the idea of horizontal specialization, in which countries need to push their technological boundaries in order to produce high value-adding and more sophisticated goods. To a large extent, innovation<sup>2</sup> also has an integral role in the product space since the accumulation of knowledge can result in the production of new goods that require an upgraded version of technologies, skills, investments, and strategies. However, the production of new goods may discourage innovators not only because of the risks and costs but also because, once successful, other firms that did not shoulder as much risks will still share the same benefits. For Hausmann and Rodrik (2003), this is a market failure that necessitates government interventions.

The Philippine government has emphasized the integral role innovation plays in its economy's long-term and inclusive growth through the *Philippine Development Plan 2017–2022* (PDP 2017–2022), which has highlighted the role of innovation in improving sectoral productivity. However, based on the 2018 Global Innovation Index (GII), the Philippines ranked 73rd out of the 126 countries. Compared with the ranking in the 2017 GII, the country has remained in the same spot while its neighbors in the Association of Southeast Asian Nations (ASEAN) region have improved. The Philippines is ahead of Indonesia (85th) and Cambodia (98th) although it is far behind Singapore (5th),

---

<sup>2</sup> Defined by Schumpeter (1934, p. 66) as the "implementation of new strategies that include the introduction of new good, new method of production, opening of new market, the conquest of new source of supply or raw materials, and the carrying out of the new organization of any industry".

Malaysia (35th), Thailand (44th), and Viet Nam (45th). Indeed, several studies in the Philippines emphasize the need for the government to address obstacles to innovations such as high costs and weak linkages between research and development institutions and industries (Llanto and del Prado 2015; Albert et al. 2017).

## **Product space: Metrics and Literature**

Traditional trade theory, such as the Hecksher-Ohlin, explains that the country's pattern of specialization is dictated by its abundant resources. New trade theory, such as the varieties model (Romer 1986) and the quality ladders model (Grossman-Helpman 1991; Aghion-Howitt 1992,) follow the Dixit-Stiglitz (1977) model, which make strong assumptions about the symmetry of goods in terms of demand and cost functions (Hausmann and Hidalgo 2011). However, there are some observations that are not easily supported by these theories. These include the idea that goods have different consequences in economic performance—since specializing in some goods will bring higher growth than specializing in others (Hausmann and Hidalgo 2007)—and more diversified countries tend to export products that are, on average, less ubiquitous (Hausmann and Hidalgo 2011).

Using existing theories, no detailed predictions can be made on the impact of initial specialization on the country's future export portfolio or on the products a country can diversify into, given their existing export portfolio. These led to a new approach in understanding development, which postulates that countries specializing in goods that rich countries produce are likely to grow faster (Hausmann and Hidalgo 2007). To do this, the statistical physics of networks is used to exploit the richness of information in the network of exported goods creating what is now known as the product space (Hausmann and Klinger 2006; Hausmann et al. 2007; Hausmann and Hidalgo 2007, 2011; Hidalgo and Hausmann 2009).

Based on Hausmann and Klinger (2006) and Hidalgo et al. (2007), the product space is a visual representation<sup>3</sup> of how close the goods are

---

<sup>3</sup> The product space has regions where goods are densely connected to many products (core) and regions where goods are sparsely connected with each other (periphery) (Hausmann and Klinger 2006; Hidalgo et al. 2007). Goods that are in the periphery have low sophistication content and are labor-intensive goods like garments, cereals, and tropical agriculture. Machinery and high-technology manufactured goods are in the denser regions of the product space and have high sophistication content. Indeed, the export portfolio of wealthier countries is mostly found in the denser regions of the product space while that of the developing economies is mostly found in the periphery (see for example, Hausmann and Klinger 2006; Hidalgo et al. 2007).

to each other defined by a proximity measure based on their production requisites. In theory, a country has a productive structure defined by capabilities (infrastructures, human capital, and institutions). Horizontal specialization between products sharing similar production structure is less costly compared to specialization between products with different production requirements. For instance, fewer modifications in the production structure are needed when shifting from the footwear business to textiles than shifting from footwear to electronics (Hausmann and Klinger 2006).

In the context of productive structures and capabilities, product sophistication is related to the number of capabilities a product requires while the complexity of a country's economy is related to the set of capabilities locally available (Hidalgo 2009). Countries with many sets of capabilities can produce goods that are sophisticated and their productive structures can accommodate diversification into even more sophisticated products. Therefore, a country's export basket matters in its future development. Given these, product space can provide policy directions related to the country's capabilities and structural transformation efforts.

In the Philippines, there are some studies that use the metrics of product space to analyze the country's export basket. Providing an aggregate view of location of the country's export basket, Usui (2012) has traced the evolution of the country's structural transformation from 1965 to 2008. It was found that, while the country has developed a comparative advantage in some electronics products by 1975, very few Philippine exports can be found in the core of the product space by 2008. This highlights the puzzle why the country's success in electronics has not spilled over to more sophisticated industrial products. Thailand has a comparative advantage in garment products and agricultural products in 1975 but it has been exporting many goods that belong to the denser region of the product space by 2008. Thailand's diversification to sophisticated goods enabled a continuous increase in labor productivity of the industrial sector, and subsequently higher aggregate productivity through absorption of workers into the sector (Usui 2012).

Providing a more specific take on diversification, Bayudan-Dacuycuy (2012) has analyzed if the Philippines will be able to penetrate the core region of the product space given its existing export basket. The study finds that while the Philippines' export basket in 2006 leads to very few sophisticated goods to branch out into, it has the potential to evolve into some high value-added goods. This is corroborated by

Bayudan-Dacuycuy and Lim (2017) who have analyzed the export portfolios of selected ASEAN and developed Asian economies and found that, although limited in product scope, there are prospects for ASEAN economies to converge to the level of export sophistication of developed Asian countries.

### *Metrics: Product sophistication*

The development of the product space has started with Hausmann and Rodrik (2003) with the idea that firms incur costs to produce new products. Cost discovery generates positive externalities when new firms, encouraged by the profits earned by the leader, join the production of the new good. However, this will dissipate profits and firms will innovate, which will ultimately push the country's production and technological boundaries outward.

To quantify the process of cost discovery, Hausmann et al. (2007) assume that each exported good has a productivity level representing the units of output generated by an investment of a given size to construct (a) an index that measures a product's sophistication (*PRODY*) and (2) an index that measures the overall sophistication of a country's export basket (*EXPY*). Taking off from the idea that countries export goods in which they are productive in, Hausmann et al. (2007) use the COMTRADE data to construct *PRODY* and *EXPY*.

The earlier versions of sophistication indices make use of Balassa (1965) revealed comparative advantage (RCA). This is interpreted as a network connecting countries to the products they export. The product's sophistication is constructed as  $PRODY_p = \frac{1}{\sum_c R_{cp}} \sum_c R_{cp} * Y_c$

where  $Y_c$  is the GDP per capita income,  
 $R_{cp}$  is the RCA index, and  
 subscripts  $c$  and  $p$  represent country and product, respectively.

The overall sophistication of a country's export basket is, then, constructed by summing *PRODY* weighted by the RCA,

$$EXPY_c = \frac{1}{\sum_p R_{cp}} \sum_p R_{cp} * PRODY_p$$

*EXPY* and *PRODY* are measures of sophistication that mix information on income,  $Y_c$ , with the information on the network structure,  $R_{cp}$ . These indices are indirect measures of productivity.

Due to the use of income, these indices have been criticized to be circular (rich countries export sophisticated goods and sophisticated goods are exported to rich countries). Later, these indices have been reconstructed so that they make use of the information on RCA alone. Assuming that  $M_{cp} = 1$  if  $R_{cp} > R^*$

where  $R^*$  is a threshold and

$$Y_c = k_c \text{ for all } c,$$

Hidalgo (2009) constructs a diversity measure that conveys the information on the number of products a country makes and is given by  $k_c = \sum M_{cp}$  and a ubiquity measure that conveys the number of countries that export a product and is given by  $k_p = \sum M_{cp}$ . Using these, *PRODY* and *EXPY* becomes  $PRODY_p = \frac{1}{k_p} \sum M_{cp} * k_c$  and  $EXPY_c = \frac{1}{k_c} \sum M_{cp} PRODY_p$ , respectively.

### *Metrics: Proximity*

Highlighting the importance of horizontal specialization, Hausmann and Klinger (2006) have developed a measure called proximity, or the revealed distance between products, which measures the similarity of production requisites of a given pair of goods. In this setting, horizontal specialization between products sharing similar production structure is less costly compared to specialization between products with different production requirements. For example, fewer modifications are needed to the production structure of footwear when moving to textiles than when moving to electronics (Hausmann and Klinger 2006). Formally, the proximity of product  $p$  and  $p'$  is defined as

$$\phi_{pp'} = \frac{\sum_c M_{cp} M_{cp'}}{\max(k_p, k_{p'})}$$

As an illustration, given that 17 countries export wine, 24 export grapes, and 11 export both, all with  $RCA > 1$ , the proximity between wine and grapes is 11/24 (Hausmann et al. 2011). The proximity index is related to the standard measure of similarity like the cluster of products found in Leamer (1984). However, the proximity measure is an outcome-based approach that identifies the similarity of products without making a priori assumptions on how goods are going to be related (Bayudan-Dacuyucy and Lim 2017).



Having comparative advantage in a good means having the right endowments and capabilities. If two goods require the same capabilities, the proximity measure would show up in a higher probability of a country having comparative advantage in both (Hausmann and Klinger 2006). A  $\phi_{pp}$  close to 1 means that the products will be close to each other in the product space. In the above example of products, the  $\phi_{pp}$  for footwear and textile will have values closer to 1 than the  $\phi_{pp}$  for footwear and electronics. Indeed, Hausmann and Klinger (2006) have demonstrated that a country's speed of structural transformation depends on whether its existing exports have, in their vicinity, high value-added goods in the product space.

As illustrated in Hidalgo et al. (2007), the product space has two regions: core (products are densely connected with each other) and periphery (products have fewer connections with each other). Goods that are in the periphery have low *PRODY* and are labor-intensive goods, e.g., garments, cereals, and tropical agriculture. Machinery and high-technology manufactured goods are in the denser regions of the product space and have high *PRODY*. Indeed, the export portfolio of wealthier countries is mostly found in the denser regions of the product space while that of the developing economies is mostly found in the periphery (see for example, Hausmann and Klinger 2006; Hidalgo et al. 2007). For developing economies, the location of their existing export portfolio has two important implications; one, there are few sophisticated products that these economies can potentially diversify into; and two, these economies need to undertake significant transformation in their production structure, including upgrade in their technology, infrastructure, institutions, and human capital, to diversify into sophisticated products.

## **Evolution of Structural Reform and Industrial Policies in the Philippines**

While the failure of the country to reap the benefits of its reforms can be attributed to a host of factors—including political instabilities and financial crises, the general theme, in which the failure is discussed, typically revolves around policies that are either ineffective or delayed. One, the import-substitution strategy in the 1950s did not translate into the use of domestically sourced inputs to replace imported ones. Instead, import-substituting firms remained dependent on imported inputs due to lackluster redistributive efforts, e.g., genuine agrarian

reform, that failed to develop the domestic market (Lim and Bautista 2002). Two, the pace of adjustment and restructuring process has been hampered by the government's failure to implement complementary measures to stimulate the export sector, including the failure to address the exchange rate appreciation early on (Medalla 2002). Reforms toward a market-oriented regime have been hampered by policy reversals as well (Aldaba 2005).

In 2012, the DTI-BOI has taken a proactive role in steering the country's industrialization through its IPP that promotes the NIP. The NIP aims to transform the manufacturing industry into a globally competitive industry supported by backward and forward linkages to create decent jobs and promote sustainable and comprehensive growth. To do this, industrial policies will focus on implementing vertical measures (sector/industry specific) and horizontal measures (cut across sectors to address constraints to growth and on institutionalizing coordination mechanisms to ensure effective program implementation (Aldaba 2014).

The 2014 IPP has four priority investment areas: (1) preferred activities that includes four broad sectors (manufacturing, agribusiness and fishery, services, and infrastructure and logistics) and four specific activities (energy, housing, hospitals, and public-private-partnership projects); (2) export activities that cover the production and manufacture of export products, services exports, and activities in support of exporters; (3) activities with special laws that provide for either the mandatory inclusion of the activity in the IPP and/or the grant of incentives under Executive Order (EO) 226; and (4) Autonomous Region in Muslim Mindanao (ARMM) list, which encompasses priority investment areas that have been determined by the regional BOI of the ARMM in accordance with EO 458.

In addition, the MRP, identified as a priority program under National Budget Memorandum 118, was designed to revitalize the manufacturing sector that targets to account for 30 percent of the total value-added and to generate 15 percent of total employment through the implementation of the Manufacturing Industry Roadmap (Aldaba 2014). Roadmaps were also created to transform traditional farming into a high value-added agribusiness sector and to transform the services sector into a globally competitive sector. Table 1 summarizes these roadmaps.

**Table 1. Manufacturing industry, agroprocessing, and services roadmaps for structural transformation, job creation, and poverty reduction**

	Short-run: 2014–2017	Medium-run: 2018–2021	Long-run: 2022–2025	Updates
<b>Manufacturing</b>	<ul style="list-style-type: none"> <li>- maintain competitiveness of industries with comparative advantage</li> <li>- strengthen emerging products</li> <li>- rebuild existing capacity of industries</li> </ul> <p>Target sectors: automotive, electronics, food, garments, motorcycle, shipbuilding, chemicals, and allied or support industries</p>	<ul style="list-style-type: none"> <li>- shift to high value-added activities</li> <li>- investments in upstream or core sectors</li> <li>- link and integrate industries within the economy</li> </ul> <p>Target sectors: iron and steel and other metals industry, as well as in parts and components</p>	<ul style="list-style-type: none"> <li>- globally competitive manufacturing industry with strong forward and backward linkages</li> <li>- regional and global hubs for production networks</li> </ul>	<ul style="list-style-type: none"> <li>- comprehensive Automotive Resource Strategy Program</li> <li>- aerospace</li> <li>- shipbuilding: support package for roll-on, roll-off maritime industrial parks</li> <li>- eco-PUV modernization: support for local platform and bodybuilding manufacturers</li> </ul>
<b>Agribusiness and fishery</b>	<ul style="list-style-type: none"> <li>- strengthen agroprocessing</li> </ul> <p>Target sectors: rubber, coconut, mangoes, coffee, banana, and other high-value crops</p>	<ul style="list-style-type: none"> <li>- strengthen supply chains further</li> <li>- upgrade commodity clusters</li> </ul>	<ul style="list-style-type: none"> <li>- deepen participation in global value chain</li> <li>- Philippines as an agribusiness regional hub</li> </ul>	<ul style="list-style-type: none"> <li>- convergence among stakeholders in cacao, coffee, and rubber clusters</li> <li>- ongoing roadmap in fruits and nuts cluster</li> </ul>
<b>Services</b>	<ul style="list-style-type: none"> <li>- focus on labor-intensive sectors (tourism, construction, ship repair, and maintenance, repair, and overhaul of aircraft), and infrastructure investments</li> <li>- move up IT-BPM global value chain</li> </ul>	<ul style="list-style-type: none"> <li>- focus on education, design, research and development, finance, infrastructure</li> <li>- engineering and services embedded in manufacturing</li> <li>- human resource development and skills training, innovation ecosystem</li> <li>- Inclusive Innovation Center</li> </ul>	<ul style="list-style-type: none"> <li>- upgrade services, especially manufacturing-related services</li> <li>- Philippines as a regional services hub</li> </ul>	<ul style="list-style-type: none"> <li>- IT-BPM: Roadmap 2018</li> <li>- Logistics and infrastructure construction: Build, Build, Build Program</li> </ul>

PUV = public utility vehicle; IT-BPM = information technology and business process management  
 Source: Aldaba (2014) and Aldaba (2017)

The BOI IPP 2017–2019 has expanded to include manufacturing industrial and consumer goods, including modular housing equipment and parts; processing and commercial production of agricultural, fishery, and forestry products; production of seeds/seedlings; establishment of nurseries/hatcheries, support services, and infrastructure; and the development of creative industries-/knowledge-based services.

The government's industrial policy has evolved from mainly an MRP to the more comprehensive approach incorporating stronger linkages with the services and agriculture sectors (Comprehensive National Industrial Strategy [CNIS]) and, most recently, integrating innovation and inclusiveness in the process, i.e., Inclusive Innovation Industrial Strategy (i<sup>3</sup>S). The underlying framework of i<sup>3</sup>S builds on the CNIS (competition, innovation, and productivity), but puts greater emphasis on innovation. Moreover, inclusive innovation ecosystem is emphasized given the importance of innovation in steering the industrial strategy and, ultimately, in transforming the economy with the emergence of Industry 4.0 (Medalla and Rosellon 2017).

## **The Philippine Overall Export Portfolio**

### *Evolution in the product space, 1995 to 2014*

To describe the evolution of the Philippines' export portfolio, export shares, RCA, and the metric for product sophistication (*PRODY*) were computed using the COMTRADE HS 1992 at the 6-digit disaggregation. Products in the export basket are those that have revealed comparative advantage, or those with  $RCA = 1$ , and are substantially exported, or have at least 0.5-percent share to the country's total exports.

In 1995, the Philippines' export basket consisted of agricultural and animal products, electronics and parts, and chemicals (Table 2). Data processing equipment and computer data storage units accounted for around 10 percent of the country's total exports while integrated circuits, ignition/wiring sets accounted for around 5 percent. Coconut oil, bananas, pineapples, shrimps/prawns, tuna, and raw sugar cane accounted for around 14 percent, while textiles accounted for around 9 percent. In 2005, the export basket consisted mostly of electronics and machineries. While the shares of parts of data processing equipment and computer data storage units to total exports have increased to around 14 percent, integrated circuits accounted for around 32 percent, making

**Table 2. Evolution of overall export portfolio: Philippines, 1995–2014**

	Share to total exports, 1995	PRODY	MRCA
Parts and accessories of data processing equipment, nes	5.55	729	1
Computer data storage units	4.90	831	
Coconut ( <i>copra</i> ) oil crude	4.70	312	
Bananas, including plantains, fresh or dried	3.18	403	
Monolithic integrated circuits, digital	2.37	833	
Copper cathodes and sections of cathodes unwrought	2.35	644	
Transmit-receive apparatus for radio, television	2.02	853	1
Ignition/other wiring sets for vehicles/ aircraft/ship	1.75	806	
Shrimps and prawns, frozen	1.57	488	
Copper ores and concentrates	1.50	493	1
Iron ore, concentrate, not iron pyrites, agglomerated	1.30	477	
Radio reception apparatus	1.25	1089	1
Transistors, except photosensitive, < 1 watt	1.23	927	1
Monolithic integrated circuits, except digital	1.21	896	1
Tuna, skipjack, bonito, prepared/preserved, not mince	1.19	459	
Cameras for 35 mm roll film except single lens reflex	1.12	1550	1
Pineapples, otherwise prepared or preserved	1.07	586	
Men, boys' trousers and shorts, of cotton, not knit	1.01	624	
Brassieres and parts thereof	0.99	693	
Radio receivers, external power, sound reproduce/record	0.98	1079	1
Men, boys' shirts, of cotton, knit	0.92	670	

**Table 2. (continued)**

	Share to total exports, 1995	<i>PRODY</i>	MRCA
Hybrid integrated circuits	0.89	697	
Containers, outer surface plastic or textile	0.88	730	
Basketwork, wickerwork products of vegetable material	0.86	584	
Unrefined copper, copper anodes, electrolytic refining	0.84	539	
Pullovers, cardigans of cotton, knit	0.83	675	
Pullovers, cardigans of manmade fibers, knit	0.76	712	
Footwear, sole rubber, plastics uppers of leather, nes	0.69	771	
Coconut (copra) oil or fractions simply refined	0.69	455	
Men, boys' shirts, of cotton, not knit	0.69	729	
Women, girls' trousers and shorts, of cotton, not knit	0.67	699	
Photosensitive/photovoltaic/LED semiconductor devices	0.66	1098	1
Color television receivers/monitors/projectors	0.65	1035	
Babies garments, accessories of cotton, knit	0.64	680	
Babies garments, accessories of cotton, not knit	0.63	769	
Coconut or copra oil-cake and other solid residues	0.59	354	
Hats and other headgear, knit or crochet	0.53	571	
Raw sugar, cane	0.51	466	1
	Share to total exports, 2005	<i>PRODY</i>	MRCA
Monolithic integrated circuits, digital	22.46	833	1
Monolithic integrated circuits, except digital	10.11	896	1
Computer data storage units	7.43	831	

**Table 2. (continued)**

	Share to total exports, 2005	<i>PRODY</i>	MRCA
Parts and accessories of data processing equipment	6.75	729	1
Hybrid integrated circuits	4.20	697	
Ignition/other wiring sets for vehicles/ aircraft/ship	1.47	806	
Bananas, including plantains, fresh or dried	1.34	403	
Static converters	1.33	1002	
Transistors, except photosensitive, > 1 watt	1.05	740	1
Computer input or output units	1.00	858	
Parts for radio/television transmit/ receive equipment	0.91	827	1
Digital computers with CPU and input-output units	0.80	821	
Copper cathodes and sections of cathodes unwrought	0.72	644	
Parts of electronic integrated circuits	0.72	872	1
Coconut (copra) oil crude	0.71	312	
Video recording/reproducing apparatus, magnetic tape	0.68	798	
Optical devices, appliances and instruments	0.68	1162	
Electrical machines and apparatus	0.65	1057	
Photosensitive/photovoltaic/ LED semiconductor devices	0.54	1098	1
Brake system parts except linings for motor vehicles	0.51	1302	
	Share to total exports, 2014	<i>PRODY</i>	MRCA
Monolithic integrated circuits, except digital	16.59	896	1
Computer data storage units	6.56	831	
Parts and accessories of data processing equipment, nes	5.07	729	1

## Facilitating Structural Transformation through Product Space Analysis

**Table 2. (continued)**

	Share to total exports, 2014	PRODY	MRCA
Nickel ores and concentrates	3.74	706	
Bananas, including plantains, fresh or dried	2.36	403	
Ignition/other wiring sets for vehicles/ aircraft/ship	2.29	806	
Electronic integrated circuits/ microassemblies	2.22	685	
Static converters	2.09	1002	
Photosensitive/photovoltaic/LED semiconductor devices	1.69	1098	1
Transistors, except photosensitive, > 1 watt	1.47	740	1
Computer input or output units	1.32	858	
Parts of line telephone/telegraph equipment	1.09	960	1
Cruise ships, excursion boats, ferry boats	1.09	1021	
Copper ores and concentrates	1.01	493	1
Coconut (copra) oil crude	0.97	312	
Copper cathodes and sections of cathodes unwrought	0.96	644	
Builder's joinery and carpentry of wood	0.86	940	
Electric capacitors, fixed, ceramic, multilayer	0.82	1005	1
Monolithic integrated circuits, digital	0.82	833	1
Nickel oxide sinters, intermediate nickel products nes	0.79	392	
Color television receivers/monitors/ projectors	0.74	1035	
Coconut (copra) oil or fractions simply refined	0.72	455	
Measuring or checking equipment	0.66	981	
Parts of electronic integrated circuits	0.66	872	1
Inductors, electric	0.59	840	1
Electronic printed circuits	0.58	1037	1
Parts for radio/television transmit/ receive equipment	0.57	827	
Spectacle lenses of other materials	0.50	910	1

MRCA = imports intensity; LED = light-emitting diode; CPU = central processing unit, nes = not elsewhere specified

Notes: computed using COMTRADE HS 1992 at the 6-digit disaggregation; the average PRODY of the Philippine export basket in 1995, 2005, and 2014 is 711, 835, and 797, respectively

Source: Authors' computation



it the country's top exports. Banana/plantain and coconut oil, accounting for 21 percent of the total exports, were the only agricultural products that remained in the basket. In 2014, integrated circuits were still the top exports at around 17 percent while the share of data processing equipment and computer data storage units went down to 12 percent. Some products such as semiconductor devices, transistors, cruise ships, inductors, radio receivers/transmitters, and minerals (nickel ores and copper ores) are included in the 2014 export basket.

In addition, imports data were also leveraged to create an index for imports intensity (MRCA)—computed analogous to Balassa's RCA. Table 2 reveals that around 26 percent, 35 percent, and 43 percent of exports in the portfolio were intensively imported in 1995, 2005, and 2014, respectively. In addition, the country's top exports in 2014, such as integrated circuits and parts/accessories of data processing equipment, have high imports intensity.

As to the evolution of exported products in terms of sophistication, Table 3 shows the top and bottom 10 products in the world at the first and fifth quintile of  $PRODY_{world}$ . Transcribing machine has the highest  $PRODY$  at around 2232 and lighter refill fuel has the lowest at 90. Products in the first quintile include agricultural, animal and forest products, chemicals, and garments and footwear. Products in the fifth quintile include chemicals and machinery. The average  $PRODY$  of products in the world market is around 1001.

Looking into the overall sophistication of the country's export basket, Figure 2 shows that the Philippines' overall export basket has a sophistication level similar to Indonesia and Viet Nam and higher than Brunei and Laos but lower than its ASEAN neighbors like Thailand, Singapore, and Malaysia. Among all the countries in Figure 2, East Asian countries have export baskets with the highest overall sophistication.

The average sophistication of products in the country's export basket has barely improved from 1995 to 2014 and has remained lower than the world's average  $PRODY$ , despite increase in average  $PRODY$  (see Table 3). This can be attributed to the high concentration of the export basket into integrated circuits and parts/accessories of data processing equipment (28%) in 2014. In addition, there were relatively sophisticated products in 1995 that were no longer in the export baskets of succeeding years. These include cameras ( $PRODY$  of 1550), radio reception apparatus ( $PRODY$  of 1089), and radio receivers ( $PRODY$  of 1079). This reflects the

Table 3. Top and bottom 10 products in the world, first and fifth quintile of PRODY<sup>world</sup>, 2014

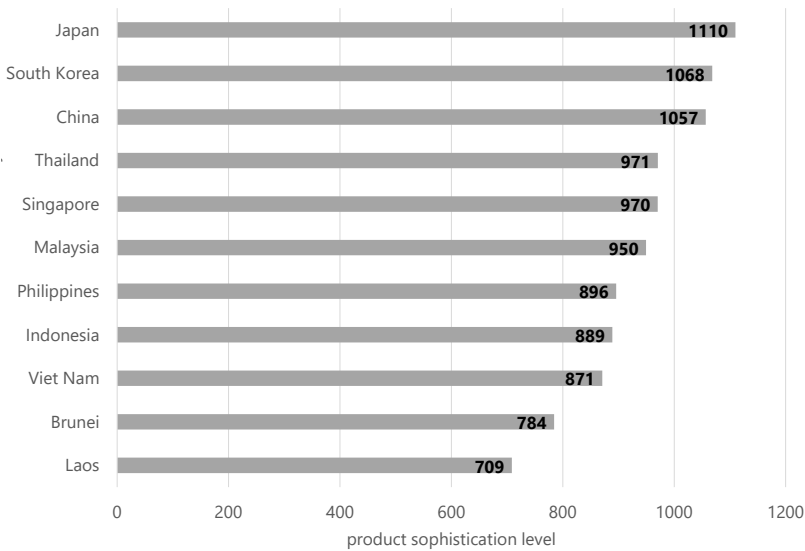
PRODY		PRODY	
Bottom 10, first quintile	Top 10, first quintile	PRODY	
Lighter refill fuels (pack < 300 cc)	90	Men, boys' garments, of material, not knit	791
Petroleum oils, oils from bituminous minerals, crude	185	Ceramic statuettes, ornamental articles, not porcelain	791
Cocoa beans, whole or broken, raw or roasted	259	Sanitary articles of paper, sanitary towels, diapers	790
Natural gas, liquefied	269	Nitrogen	790
Gum Arabic	289	Zinc dust	790
Logs, Keruing/Ramin/Kapur/Teak/Jongkong/Merbau/	297	Ammonia in aqueous solution	790
Coffee, not roasted, not decaffeinated	303	Terry towelling of cotton, width > 30cm	790
Coconut (copra) oil crude	312	Ferro-silicon, < 55 percent silicon	790
Goat or kid skin leather, tanned or retanned	314	Footwear, sole rubber/plastic, upper textile, not sport	790
Lumber, Okoume, Obeche, Sapelli/Sipo/Acajou/Makore	315	Fish-liver oils, fractions, not chemically modified	789
<b>Bottom 10, fifth quintile</b>		<b>Top 10, fifth quintile</b>	
Filament lamps, except ultraviolet or infra-red	1200	Recorded gramophone records	2332
Hand pumps not designed to measure flow	1200	Quartzite, crude or roughly trimmed	2332
Granules of pig iron or spiegeleisen	1200	Transcribing machines	2332
Rubber tube, pipe or, hose not reinforced, no fittings	1200	Cobalt chloride	2332
Rubber articles, inflatable, vulcanized rubber	1200	Turntables with automatic record changing mechanism	2332
Pigments and preparations based on cadmium compounds	1200	Mouth organs (harmonicas)	2166

Table 3. (continued)

Bottom 10, fifth quintile	Top 10, fifth quintile	
Domestic kitchen waste disposers	Pine oil	2006
Vitamin B <sub>3</sub> and B <sub>6</sub> , D- or DL-panthothenic acid, derivative	Pneumatic mattresses, of cotton	2006
Boxes, moulding, for metal foundry	Fluorosilicates of sodium or of potassium	2006
Springs, iron or steel, except helical/leaf	Harmoniums, pipe organs	2006

Note: computed using COMTRADE HS 1992 at the 6-digit disaggregation; average PRODY of products in the world market is 1001; PRODY in the first quintile is 90-790, second quintile is 791-937, third quintile is 938-1063, fourth quintile is 1064-1199, and fifth quintile is 1200-2332  
Source: Authors' computation

**Figure 2. Overall sophistication of 2014 export basket: selected Asian countries**



Note: computed using COMTRADE HS 1992 at the 6-digit disaggregation  
 Source: Authors' computation

development of high-technology gadgets that became better substitutes for these products. Similarly, there were relatively sophisticated products in 2005 that were no longer in the 2014 export portfolio. These include electrical machines and apparatus (*PRODY* of 1057) and brake system parts for motor vehicles (*PRODY* of 1302).

On a more positive note, there were relatively sophisticated products in 2005 that remained in the 2014 export basket. These include static converters (*PRODY* of 1002)—although their shares have not significantly increased—accounting for 1.33 percent and 2.09 percent of the country's total exports in 2005 and 2014, respectively. In addition, static converters are not intensively imported by the country so they have the potential to expand the country's net trade. There are also new and relatively sophisticated products in the 2014 export portfolio. These include photosensitive/photovoltaic/LED (light-emitting diode) semiconductor devices, parts of line telephone/telegraph equipment, electric capacitors, electronic printed circuits, and cruise ships/excursion boats/ferry boats. Among these products, cruise ships/excursion boats/ferry boats are not intensively imported by the country and thus, have the potential to expand the country's net trade.

*Export basket and markets, 2014*

Looking at the full 2014 Philippines' export data, shown in the upper panel of Table 4, products that belong to the lowest two quintiles of the  $PRODY_{world}$  account for almost 72 percent of the country's total exports. Products at the highest two quintiles account for only around 10 percent. Looking at the goods for which the country has comparative advantage in, there are 720 products and around 65 percent of these goods are mostly in the first and second quintiles of the  $PRODY_{world}$  while around 22 percent are in the fourth and fifth quintiles. Products that belong to these quintiles have an average  $PRODY$  higher than the average  $PRODY_{world}$  although these only account for around 7 percent of the total export value. Looking at the country's 2014 export portfolio, around half are in the first and second quintiles. There is one product, photosensitive/photovoltaic/LED semiconductor devices, that belongs to the upper quintile.

**Table 4. Descriptive statistics of exports: Philippines, 2014**

Quintile of $PRODY_{world}$	Number of products	Average $PRODY$ of Philippine exports	Share to total exports
All products			
1	972	646	35.63
2	971	871	36.92
3	972	1001	17.81
4	971	1127	7.38
5	971	1364	2.26
Export with $RCA > 1$			
1	250	653	30.39
2	172	871	35.12
3	144	999	15.47
4	90	1128	5.41
5	64	1353	1.41
Export portfolio ( $RCA > 1$ , export share $\geq 0.5\%$ )			
1	10	556	30.39
2	9	853	35.12
3	8	998	15.47
4	1	1098	5.41
5	0		

RCA = Balassa's revealed comparative advantage

Note: computed using COMTRADE HS 1992 at the 6-digit disaggregation; average  $PRODY$  of products in the world market is around 1001;  $PRODY$  in the first quintile is 90–790, second quintile is 791–937, third quintile is 938–1063, fourth quintile is 1064–1199, and fifth quintile is 1200–2332

Source: Authors' computation

In terms of markets, the top destinations of the remaining agricultural products in the country's export basket (banana/plantain) include mostly Asian countries like Japan, China, South Korea, Singapore, Kuwait, Iran, United Arab Emirates (UAE), and Saudi Arabia. China and Japan are significant markets of minerals. These are the only countries where nickel ores and concentrates are exported to, with the former getting 95 percent of the country's total exports of nickel ores and concentrates. The same markets are top destinations for copper ores and concentrates with China and Japan getting 56 percent and 28 percent of the country's export of the product, respectively. Top destinations for crude copra oil include member-economies of the Organisation for Economic Co-operation and Development (OECD)—the Netherlands, United States (US), Germany, Italy, and Spain—with the Netherlands, US, and Germany, accounting for 81 percent of the country's total exports of crude copra oil. Top markets for refined coconut oil include OECD countries such as US and Canada with the former accounting for 62 percent of the Philippines' total export of the product. In Asia, refined coconut oil is also exported to Japan, Hong Kong, and China.

Markets for integrated circuits are mostly Asian countries. China, Hong Kong, Singapore, Viet Nam, and Malaysia account for around 57 percent of the Philippines' total export of digital monolithic integrated circuits. Export percentage for China, Singapore, South Korea, Malaysia, Thailand, Japan, Hong Kong, and Viet Nam, is higher (around 80%) for nondigital monolithic integrated circuits. Hong Kong, Singapore, China, Japan, Thailand, South Korea, and Malaysia account for 65 percent of the country's total exports of electronic integrated circuits/microassemblies while Malaysia, Singapore, Thailand, Hong Kong, China, Viet Nam, and Japan account for around 94 percent of the country's total export of parts of electronic integrated circuits. OECD countries like Germany, Japan, Netherlands, Canada, and France are also markets for integrated circuits, although their export shares are not as big as the Asian countries.

Around 42 percent of the country's exports of computer data storage units go to China. The rest of the markets are mostly OECD countries like the US, Germany, Japan, Czech Republic, and Poland, as well as developed Asian countries like Singapore, Malaysia, and Hong Kong.

The markets differ for these relatively sophisticated export products, namely static converters, photosensitive/photovoltaic/LED semiconductor devices, cruise ships/ferry boats, color television

receivers/monitors/projectors, and electronic printed circuits. Top destinations of products for static converters are mostly OECD countries with US (35%) and Netherlands (21%) as top markets. Asian countries, like China, Hong Kong, UAE, Singapore, Malaysia, and South Korea are also markets although not as big as the OECD countries. Cruise ships/ferry boats are mainly exported to Marshall Islands, Hong Kong, and Singapore. Color television receivers/monitors/projectors are exported to OECD economies like the US (41%), the Netherlands (19%), and Germany (9%).

Meanwhile, top markets for photosensitive/photovoltaic/LED semiconductor devices, a product that is also intensively imported by the Philippines, are mostly OECD economies with Japan as the biggest market at 53 percent while top markets for electronic printed circuits, another product that is also intensively imported by the Philippines, include China, Hong Kong, Japan, South Korea, Viet Nam, Thailand, North Korea, and Malaysia. Together, these countries account for around 63 percent of the country's total export of electronic printed circuits.

## Diversification Strategies: Industrial Sector

### *Potential short-run diversification strategies*

Given the assumption that the current exports embody in them the country's current production capabilities and that branching out into new products is easier if production requisites of these products are relatively similar with the country's current exports, the starting point to identify the country's short-run diversification strategies is the country's 2014 export portfolio (data are listed in Table 2 and summarized in Table 4 and Figure 3). Out of 4,857 products, the Philippines have export data on 3,464 products, 720 of which have revealed comparative advantage. Out of these 720 products, there are 28 products that are substantially produced. These 28 products account for 59 percent of the country's total export value.

To craft the short-run strategies, some metrics from the product space, such as the proximity and *PRODY*, were leveraged. Since the idea is to improve the current export basket, the selection of potential exports (product *j*) hinges on product *j* being more sophisticated than the existing products in the country's export basket. It also hinges on the similarity of

the country's current production structures to the production requisites of product  $j$ . This implies that less investments are needed to accommodate the production of product  $j$ , and hence, can easily be produced in the short run.

Figure 3 also summarizes the selection of product  $j$ . The proximity data of the 4,857 products in the COMTRADE data are matched to 28 products in the country's 2014 export basket. Product  $j$  needs to be relatively closer to product  $i$ , or those that have proximity of at least 0.55. While a higher proximity value (closer to 1) ensures the similarity in production requisites of product  $j$  to the country's export portfolio, the highest proximity after imposing the requirements of selection discussed above is 0.67 and there are very few products left. There are 65 products that satisfy this requirement. These products are further limited to more sophisticated exports by choosing only those with *PRODY* higher than the *PRODY* of the products in the country's export basket. Imposing this restriction resulted in 48 remaining products. Those that have imports intensity are also eliminated leaving 27 products for potential diversification. Based on these 27 products, there are two potential short-run strategies. The first capitalizes on the 10 products for which the Philippines has revealed comparative advantage in but are not yet substantially produced while the second strategy capitalizes on the 17 products for which the country has no revealed comparative advantage in. These findings are indicative of the fact that the country's export basket is still in the periphery, or in the less connected parts, of the product space. Hence, there are relatively fewer products to branch out to.

Table 5 summarizes some information on the potential products for short-run diversification of product  $j$ .<sup>4</sup> Products for the first short-run strategy have an average *PRODY* of 931 while products for the second short-run strategy have an average *PRODY* of 1075. The average *PRODY* of the country's 2014 export portfolio is 797.

---

<sup>4</sup> See Table 1A in Bayudan-Dacuycuy and Serafica (2018) for detailed information on *PRODY* and proximity of products  $i$  and  $j$ .



**Table 5. Potential products for diversification in the short run**

<b>Strategy 1: Products with RCA=1, close to the production structure of the products in the export basket</b>	<i>PRODY</i>	Share to total exports (%)
Parts and accessories of revolution counters	1127	
Speed indicators, tachometers, stroboscopes	1112	
Electrical resistors fixed, power capacity < 20 watt	1072	
Indicator panels incorporating electronic displays	1023	
Parts of printing machinery and ancillary equipment	1011	
Electrical boards, panels, not equipped	1001	
Objective lenses	971	
Furniture parts	943	
Hybrid integrated circuits	697	
Coconut or copra oil-cake and other solid residues	354	
<b>Strategy 2: Products with RCA=0, close to the production structure of the products in the export basket</b>	<i>PRODY</i>	Share to total exports (%)
Wheels including parts/accessories for motor vehicles	1224	0.0292
Valves for oleohydraulic or pneumatic transmissions	1205	0.0517
Parts of industrial or laboratory furnaces/ovens	1183	0.0002
Woven fabric >85% nylon, polyamide, unbleached/bleached	1182	0.0001
Articles of iron or steel	1140	0.0630
Foil, copper alloy, backed, t < 0.15mm	1118	0.0001
Parts of sewing machines	1106	0.0017
Trailer/nonmechanically-propelled vehicle parts	1085	0.0008
Electrical machines and apparatus	1057	0.1343

**Table 5. (continued)**

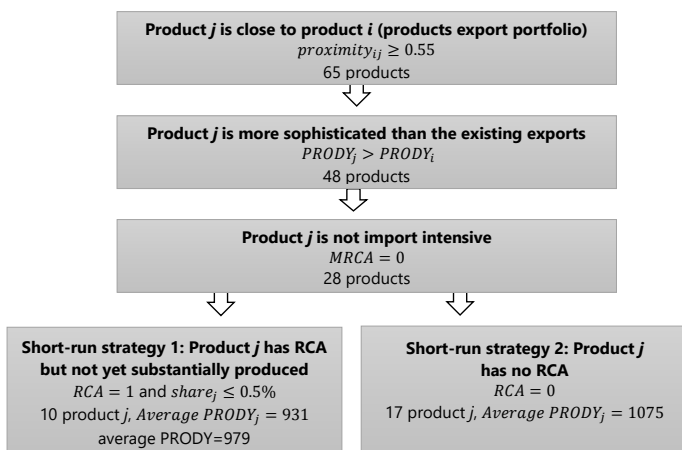
Strategy 1: Products with $RCA=1$ , close to the production structure of the products in the export basket	<i>PRODY</i>	Share to total exports (%)
Doors, windows, frames of iron or steel	1043	0.0007
Weighing machine parts and weights of all kinds	1029	0.0004
Fittings for plastic tube, pipe or hose	1025	0.0099
Sheet, cellular of polymers of styrene	1016	0.0002
Plastic builders' ware	998	0.0230
Aluminum structures and parts, for construction	966	0.0250
Wooden pallets, box pallets, and load boards	952	0.0016

RCA = Balassa's revealed comparative advantage

Note: computed using COMTRADE HS 1992 at the 6-digit disaggregation; average *PRODY* of products in the world market is around 1001; *PRODY* in the first quintile is 90–790, second quintile is 791–937, third quintile is 938–1063, fourth quintile is 1064–1199, and fifth quintile is 1200–2332

Source: Authors' computation

**Figure 3. Selection of products (product *j*) for potential diversification in the short run**



RCA = revealed comparative advantage; MRCA = imports intensity

Source: Authors' representation

**Short-run diversification (strategy 1)**

Products for short-run diversification strategy are products that have RCA, are relatively sophisticated, and are close to the current products in the country's export basket. These are mostly manufacturing goods (upper panel of Table 6) whose average sophistication level is higher than that of the country's 2014 export basket but is still lower than that of the world. These products are identified for short-run strategy since these are already produced by the country and less adjustments in the production structures are needed. In addition, while these products are produced more in the country relative to the world market, each account for less than 0.5 percent of the country's total exports. Hence, the analysis of what these products are and their markets can facilitate achievable diversification objectives in the immediate period.

**Table 6. Potential products for medium-run diversification**

Short-run products	Proximity	Medium-run products
Aluminum structures and parts, for construction (966)	0.62	Illuminated signs, illuminated nameplates (1014)
	0.69	Lock parts, of base metal, (1190)
	0.61	Plastic articles (1008)
	0.66	Trailer/nonmechanically propelled vehicle parts (1085)
	0.63	Gaskets, washers and other seals of vulcanized rubber (1062)
	0.63	Motor vehicle parts (1137)
	0.63	Sheet, cellular of polyurethane (1144)
	0.62	Parts of industrial or laboratory furnaces/ovens (1183)
Doors, windows, frames of iron or steel (1043)	0.62	Parts of industrial or laboratory furnaces/ovens (1183)
Hybrid integrated circuits (697)	0.67	Toilet or kitchen linen, of flax (1047)
Parts of industrial or laboratory furnaces/ovens (1183)	0.62	Gantry and overhead travelling crane on fixed support (1113)
	0.63	Bathroom wares, of plastics (1270)
	0.63	Plans and drawings for architectural use (1073)
	0.62	Newspapers, journals and periodicals, < 4 issues/week (1077)
	0.62	Doors, windows, frames of iron or steel (1043)
Parts of sewing machine (1106)	0.69	Automatic sewing machine, other than book-sewing (1113)
Plastic builders' ware (998)	0.63	Illuminated signs, illuminated nameplates (1014)

## Facilitating Structural Transformation through Product Space Analysis

**Table 6. (continued)**

Short-run products	Proximity	Medium-run products
	0.61	Acrylic and vinyl polymer-based paint, varnish, in water (1007)
Sawdust, wood waste or scrap (945)	0.60	Scarifiers, cultivators, weeders and hoes (1195)
	0.60	Parts of central heating boiler (1140)
	0.60	Domestic iron/steel solid fuel appliances, not cooker (1100)
	0.61	Illuminated signs, illuminated nameplates (1014)
Sheet, cellular of polymers of styrene (1016)	0.63	Locks of a kind used for motor vehicles of base metal (1269)
Speed indicators, tachometers, and stroboscopes (1112)	0.67	Transmissions for motor vehicles (1166)
	0.65	Parts and accessories of revolution counters (1127)
	0.67	Engine, spark-ignition reciprocating, over 1000 cc (1252)
	0.63	Rollers, soil preparation, cultivation machinery (1157)
Trailer/nonmechanically-propelled vehicle parts (1085)	0.63	Parts of central heating boiler (1140)
	0.62	Sheet, cellular of polyurethane (1144)
	0.65	Pneumatic hand tool parts (1277)
Valves for oleohydraulic or pneumatic transmissions (1205)	0.65	Pneumatic power engine/motors, except linear acting (1222)
	0.60	Centrifuges (1100)
	0.65	Color television receivers/monitors/projectors (1035)
	0.63	Locks of a kind used for motor vehicles of base metal (1269)
Wheels including parts/accessories for motor vehicles (1224)	0.69	Parts of household or laundry-type washing machine (1248)
	0.63	Locks of a kind used for motor vehicles of base metal (1269)
	0.63	Yarn > 85 percent other synth staple fibers, single not retail (1241)
	0.62	Sheet, cellular of polymers of styrene (1016)
Wooden pallets, box pallets, and load boards (952)		

Note: computed using COMTRADE HS 1992 at the 6-digit disaggregation; figures in parentheses in the first/third column are the product's *PRODY*; The average *PRODY* of products in the world market is around 1001; *PRODY* in the first quintile is 90–790, second quintile is 791–937, third quintile is 938–1063, fourth quintile is 1064–1199, and fifth quintile is 1200–2332

Source: Bayudan-Dacuycuy and Serafica (2018)

Potential products that the country can branch out into include circuits (hybrid integrated circuits), equipment/devices/parts of electrical nature (electrical resistors fixed, power capacity <20-watt, electrical boards), parts/accessories of electronics (indicator panels incorporating electronic displays), counters and speed measuring equipment (accessories of revolution counters and speed indicators/tachometers/stroboscopes), and others (objective lenses and furniture). Coconut/copra oil-cake is the only agricultural product in the list of products for short-run diversification.

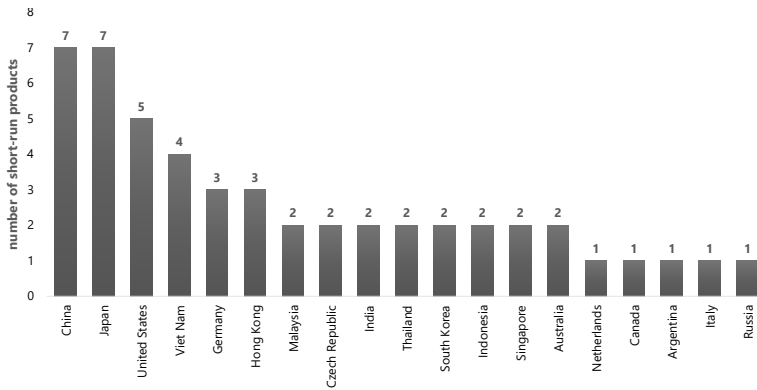
To analyze existing markets, these short-run products are mapped with their top five destinations. Figure 4 shows that the Philippines is exporting these products mostly to OECD economies such as the US, Japan, and Germany, as well as to Asian countries like China, Japan, Viet Nam, and Hong Kong. Out of the 10 products that can be potentially tapped for the first short-run diversification strategy, the country is exporting seven products to China and Japan, five to the US, four to Viet Nam, and three to Germany and Hong Kong. Through exporting these products, the country has received the most from China amounting to USD 2,620 million (Figure 5). The value of exports going to Japan and USA is almost one-half of that of China (around USD 1,440 million and USD 1,190 million, respectively).

To identify markets for potential expansion, imports data, which were limited to the 10 products identified for the Philippines' short-run diversification, were looked at. For each of this product, countries are chosen as potential markets when their MRCA is greater than 1 and the share of their imports to the total imports of the product is substantial (at least 0.5%). Figure 6 summarizes the information on potential markets.

In Asian markets, Viet Nam and Hong Kong are currently importing the most number of products (5) that the Philippines can potentially diversify into. These include coconut/copra oil-cake, electrical resistors, indicator panels incorporating electronic displays, objective lens, and parts/accessories of revolution counters. Thailand and Indonesia are also potential markets for indicator panels incorporating electronic displays, parts and accessories of revolution counters, parts of printing machinery/ancillary equipment, and speed indicators/tachometers/stroboscopes.

In the Middle East and North African (MENA) markets, Israel is a potential destination for electrical board/panels, objective lens, parts of printing machinery/ancillary equipment, and furniture parts while

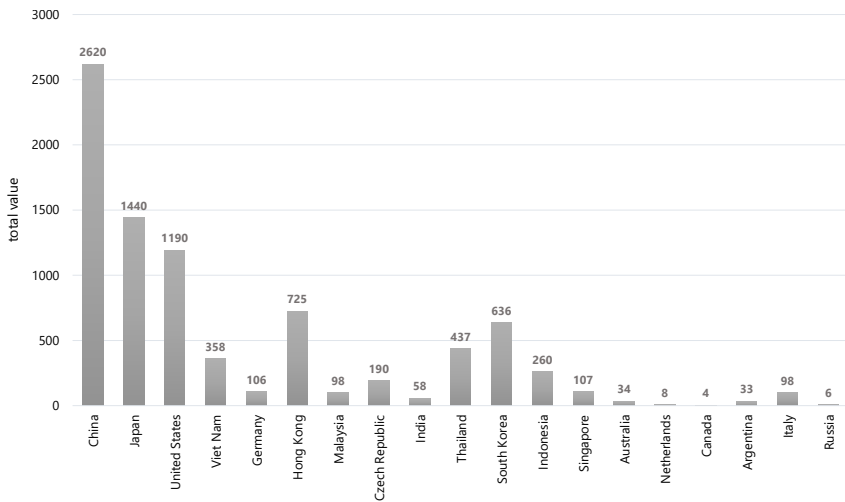
**Figure 4. Number of short-run products (strategy 1) exported: Philippines**



Note: computed using COMTRADE HS 1992 at the 6-digit disaggregation; see Table 2A in the appendix in Bayudan-Dacuycuy and Serafica (2018) for detailed information

Source: Authors' computation

**Figure 5. Total value of short-run products (strategy 1) exported (in USD '00000): Philippines**

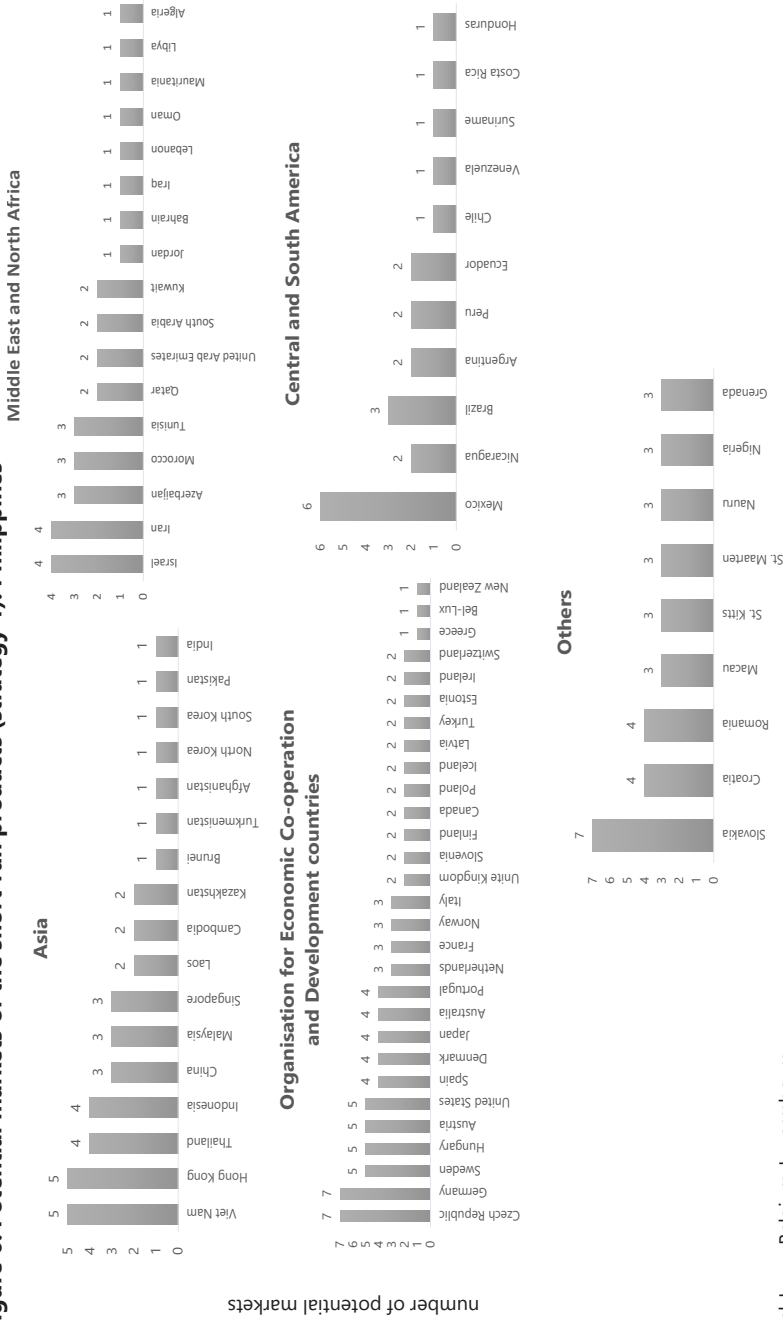


USD = United States dollar

Note: computed using COMTRADE HS 1992 at the 6-digit disaggregation

Source: Authors' computation

**Figure 6. Potential markets of the short-run products (strategy 1): Philippines**



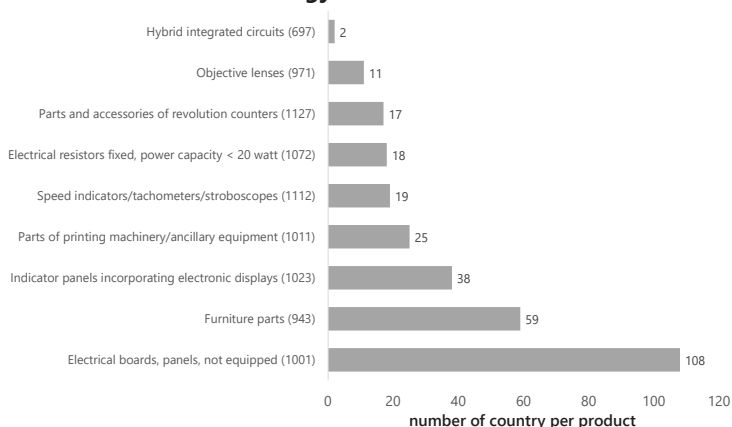
Bel-Lux = Belgium-Luxembourg  
 Note: computed using COMTRADE HS 1992 at the 6-digit disaggregation; see Table 3A in the appendix in Bayudan-Dacuyucy and Serafica (2018)  
 Source: Authors' compilation

Iran is a potential destination for coconut/copra oil-cake, fixed electrical resistors, furniture parts, and indicator panels. Morocco, on the other hand, is a potential market for electrical board panels, hybrid integrated circuits, and speed indicators/tachometers/stroboscopes. Tunisia is a potential market for electrical board panels, fixed electrical resistors, and indicator panels.

OECD countries are also potential markets with Czech Republic and Germany importing the greatest number of the short-run products (7) that the Philippines can potentially diversify into. These two economies are potential destination of fixed electrical resistors, electrical board panels, furniture parts, indicator panels, parts/accessories of revolution counters, parts of printing machinery/ancillary equipment, and speed indicators/tachometers/stroboscopes. Sweden, Hungary, Austria, and the US are intensively importing five short-run goods, which include indicator panels, electrical boards/panels, speed indicators/tachometers/stroboscopes, parts/accessories of revolution counters, and furniture parts.

Looking at the number of countries that intensively import these short-run products, Figure 7 shows that electrical boards/panels are imported by 108 countries. This is followed by furniture parts, indicator panels and parts of printing machinery/ancillary equipment which are imported by 59, 38, and 25 countries, respectively. Among the list of potential goods for short-run diversification, coconut/copra oil-cake is the

**Figure 7. Number of countries importing the potential products listed in the short-run strategy 1**



Note: computed using COMTRADE HS 1992 at the 6-digit disaggregation

Source: Authors' computation



only agricultural product and is imported by 18 countries; objective lens and hybrid integrated circuits have the least number of importing countries.

Out of the 10 potential products for short-run diversification, there are six products with *PRODY* that is at least as high as the average sophistication level in the world. These include equipment/devices/parts of electrical nature (electrical boards/panels and electrical resistors fixed [power capacity <20-watt]), parts/accessories of electronics (indicator panels incorporating electronic displays), counters and speed measuring equipment (accessories of revolution counters and speed indicators/tachometers/stroboscopes), and others (parts of printing machinery and ancillary equipment). Numerically controlled lathes for removing metals are the most sophisticated among these products.

### Short-run diversification (strategy 2)

Another short-run diversification strategy is to look at products that are relatively close to the country's current production structure but for which the country has no RCA in. This short-run strategy leverages the idea that less modifications in the country's existing production structures are needed to produce these more sophisticated products. There are 17 products (lower panel of Table 6) for this strategy.

While the products in the first short-run strategy are mostly equipment/devices/parts of electrical nature, parts/accessories of electronics, counters and speed measuring equipment, and others, potential commodities that can be diversified into through the second short-run strategy are varied. These include part/accessories of instruments/devices/equipment (industrial/laboratory furnaces/ovens and sewing machines), equipment/devices/parts of electrical nature (electrical machines/apparatus and weighing machine parts), minerals (foil and copper alloy, and articles of iron, steel and aluminum) and parts/accessories of motor vehicles (valves for oleohydraulic or pneumatic transmissions, wheels including parts/accessories for motor vehicles, and trailer/nonmechanically-propelled vehicle parts), products related to plastics (sheet/cellular of polymers of styrene, fittings for plastic tube/pipe/hose, and plastic builders' ware), textiles (woven fabric), and others (doors/windows/frames of iron/steel, and wooden/box pallets, and load boards). In addition, most of these products have sophistication indices that are higher than the average *PRODY* in the world. These products

have insignificant shares to the country's total exports, ranging from 0.0001 percent to 0.1343 percent.

Similar to the procedure above, imports data were looked at to identify markets for potential expansion by looking at the countries that intensively import these 16 products. Figure 8 summarizes the information on potential markets of the products classified in the second short-run strategy. In Asian markets, Hong Kong and Thailand import the greatest number of these products. These include clock movements/rough clocks, digital computer central processing unit (CPU) with storage/input/output, electric capacitors, electrical machines and apparatus, lamp and lighting fitting parts, parts of/accessories for flashlights and flashbulbs, sewing machines, watches, and sound reproducing apparatus. Singapore and China are also potential markets.

In the MENA markets, Tunisia, Iran, and Israel are top potential destinations of four products. These are clock movements/rough clocks, electric capacitors, lamp and lighting fitting, and parts of sewing machines for Tunisia; lamp and lighting fitting parts, parts of sewing machines, sound reproducing apparatus, and parts of air conditioners for Iran; and digital computer CPU, electrical machines and apparatus, parts/accessories for flashlights and flashbulbs, and parts for air conditioners for Israel.

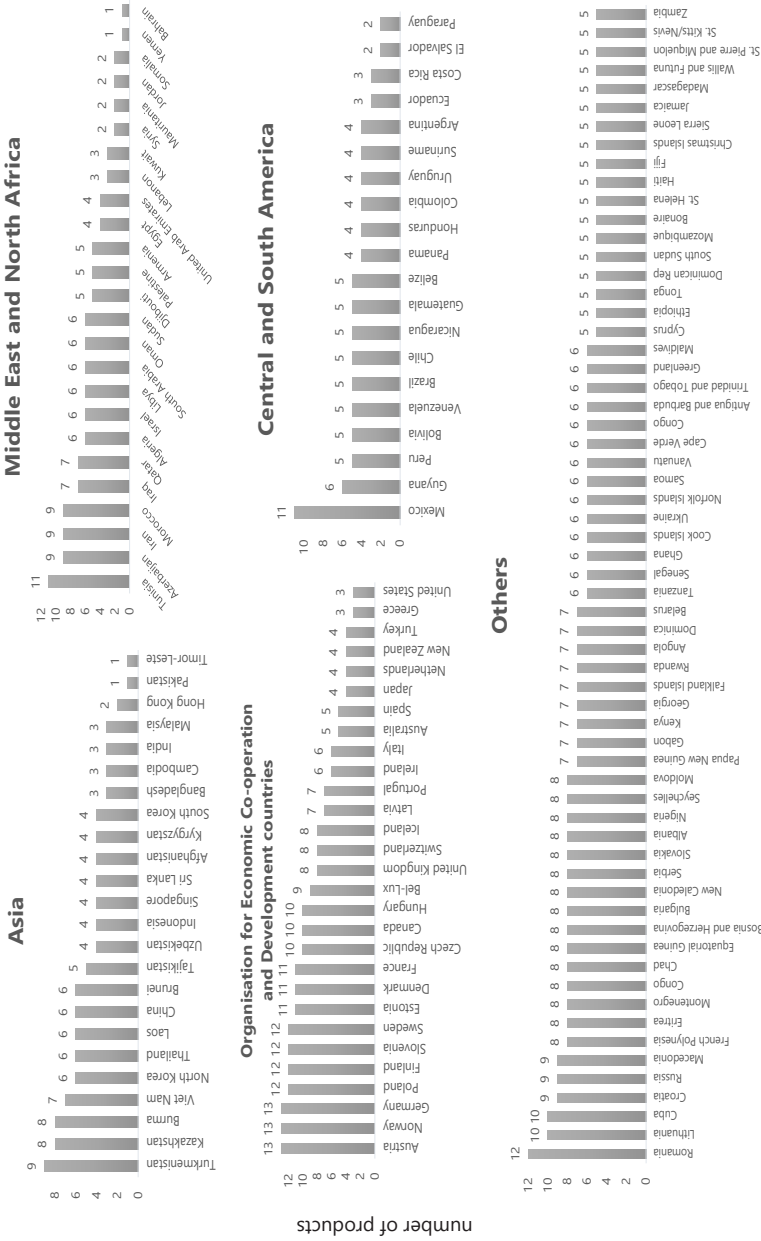
There are also many OECD countries that are potential destinations with Japan importing 8 out of these 13 products. Netherlands, Finland, Germany, and US are importers of 7 products while Czech Republic, Canada, Sweden, and Australia are importers of 6 products.

Among the Central and South American countries, Brazil and Mexico are top destinations while in other markets, Slovakia, Romania, and Bulgaria are importers of around half of the potential products.

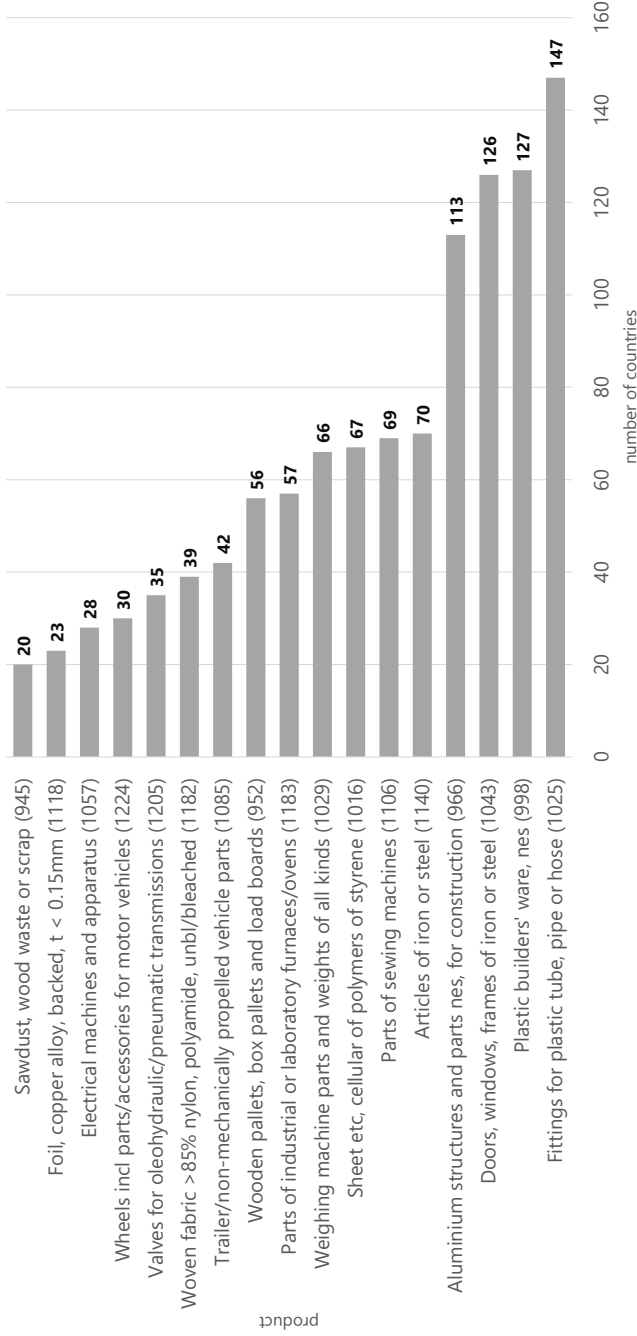
Looking at the number of countries that intensively import these short-run products (Figure 9), parts of sewing machines and lamp/lighting fitting are intensively imported by 69 and 55 countries, respectively. This is followed by parts for air conditioners (47 countries) and fishing reels (42 countries). Parts of watch cases have the least number of importing countries (12) and zinc ores and concentrates (15).

Among the three short-run products that the Philippines is not producing (first three products in Figure 9), radiators and parts have 50 potential destinations. Hot-rolled alloy-steel is imported by 24 countries and molybdenum wire is imported by 17 economies. While these three

Figure 8. Number of short-run products (strategy 2) exported in various markets: Philippines



**Figure 9. Number of countries importing the potential products listed in the short-run (strategy 2)**



nes = not elsewhere specified

Note: computed using COMTRADE HS 1992 at the 6-digit disaggregation; figures in parentheses are the product's PRODY

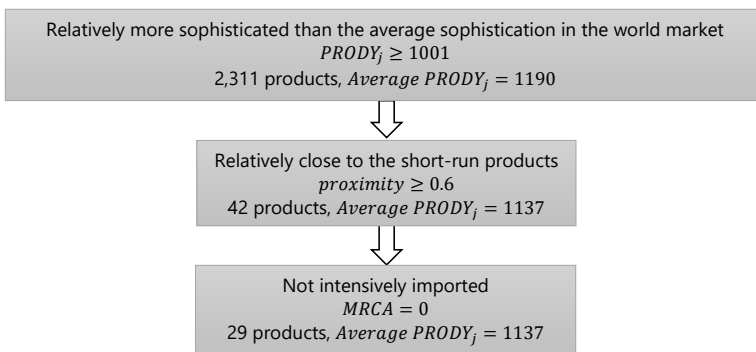
Source: Authors' computation

products are among the most sophisticated in the roster of potential products for the second short-run diversification strategy, majority of the products have sophistication index higher than the average sophistication of products in the world market.

*Potential medium-run diversification strategy*

Once the country has embarked on the necessary adjustments in its production structures to produce relatively more sophisticated outputs in the short run, these products can lead to an even sophisticated export basket in the medium run. Hence, relative to the sophistication of the 27 short-run products, the sophistication index of medium-run products should be as high as the average product sophistication in the world market, have production requisites similar to the production structures of short-run products, and should expand the country’s net trade position. In Figure 10, there are 2,311 products that are more sophisticated than the short-run products, 42 of which require relatively less modifications in terms of production structure (as indicated by the proximity measure). Finally, 29 products will contribute to the expansion of the country’s net trade.

**Figure 10. Selection of products for potential diversification in the medium run**



MRCA = imports intensity  
Source: Authors’ representation

Out of the 27 short-run products, there are 13 commodities for which 29 potential medium-run products are mapped into (Table 6). These include products related to motor vehicles (engines/spark-ignition, gaskets/washers/other seals of vulcanized rubber, motor vehicle parts, trailer/nonmechanically propelled vehicle parts and transmissions for motor vehicles, and locks used for motor vehicles of base metal), agricultural machineries (rollers/soil preparation/cultivation machinery and scarifiers/cultivators/weeders/hoes), home wares/accessories (plastic bathroom wares), machines/appliances or their parts/accessories (automatic sewing machines, centrifuges, color television receivers/monitors/projectors, domestic iron/steel solid fuel appliances, parts of central heating boiler, parts of household/laundry-type washing machines, and parts of industrial or laboratory furnaces/ovens), hand and power tools (pneumatic hand tool parts and pneumatic power engines/motors), and textiles (sheet/cellular of polyurethane, yarn/other synthetic staple fibers, and flax toilet/kitchen linen).

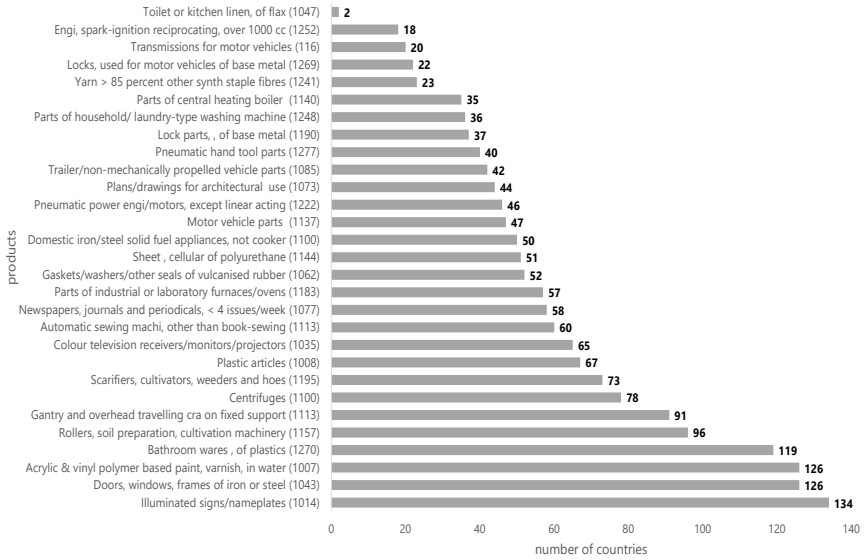
In Figure 11, among the products for medium-run strategy, illuminated signs/nameplates, doors/windows/frames of iron or steel, acrylic/vinyl polymer-based paint/varnish, and plastic bathroom wares have the greatest number of markets. Products related to motor vehicles, such as engines/spark-ignition and locks used for motor vehicles of base metal, are among the medium-run products with the highest sophistication index that have few existing markets. Other products related to motor vehicles, such as motor vehicle parts, trailer/nonmechanically propelled vehicle parts and transmissions for motor vehicles, and textiles, such as yarn and flax, have few existing markets as well.

### *Potential long-run diversification strategy*

Given that the country has further pursued the medium-run diversification strategy above, some potential products can be identified for the long-run strategy. Similar to the medium-run strategy, identification of these products is centered on the idea that the country's export portfolio has to evolve in terms of sophistication. There are 2,227 products that are more sophisticated than the medium-run products and there are 44 products that are relatively closer to the medium-run products in production requisites (Figure 12).

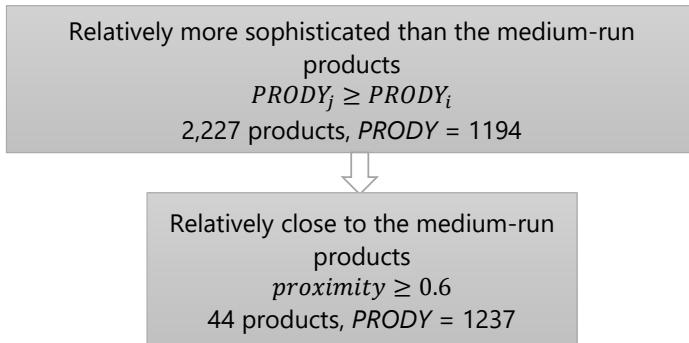
Out of the 29 medium-run products, there are 22 commodities for which 44 potential long-run products are mapped into (see Table 7 for details).

**Figure 11. Number of countries importing the potential products listed in the medium-run strategy**



Note: computed using COMTRADE HS 1992 at the 6-digit disaggregation  
 Source: Authors' computation

**Figure 12. Selection of products for potential diversification in the long-run**



PRODY = product sophistication  
 Source: Authors' representation

## Facilitating Structural Transformation through Product Space Analysis

**Table 7. Potential products for long-run diversification**

Medium-run products	Proximity	Long-run products	
Bathroom wares, of plastics (1270)	0.61	Machinery to reel, fold, cut, pink, textile fabric (1357)	
Centrifuges (1100)	0.61	Drinking glasses of lead crystal (1294)	
	0.60	Parts of centrifuges, including centrifugal dryers (1266)	
Colour television receivers/monitors/projectors (1035)	0.65	Wheels including parts/accessories for motor vehicles (1224)	
Domestic iron/steel solid fuel appliances, not cooker (1100)	0.60	Multiple-walled insulating units of glass (1118)	
	0.60	Presses for particle, fiber board, manufacture (1250)	
Engines, spark-ignition reciprocating, over 1000 cc (1252)	0.60	Railway locomotive parts (1257)	
	0.60	Mowers, powered, lawn, with horizontal cutting device (1350)	
	0.60	Electric resistance welding equipment, automatic (1276)	
	0.69	Engines, diesel, for motor vehicles (1313)	
	0.67	Fuel, lubricating and cooling pumps for motor engine (1259)	
	0.60	Clutches, shaft couplings, universal joints (1272)	
	0.62	Dairy machinery (1180)	
Gantry and overhead travelling cranes fixed support (1113)	0.65	Electrical relays for 60 - 1, 000 volts (1117)	
	0.63	Articles of iron or steel, (1140)	
	0.60	Rubber tube, pipe or hose with fittings (1109)	
Gaskets, washers and other seals of vulcanized rubber (1062)	0.60	Brake system parts except linings for motor vehicles (1302)	
	0.67	Parts for diesel and semi-diesel engines (1092)	
	0.63	Articles of vulcanized rubber, except hard rubber (1091)	
	0.61	Sheet, cellular of polymers of styrene (1016)	
Illuminated signs, illuminated nameplates (1014)	0.60	Rubber tube, pipe, hose textile-reinforced no fitting (1312)	
	0.60	Drive axles with differential for motor vehicles (1246)	
	0.60	Radiators for motor vehicles (1266)	
	0.60	Brake system parts except linings for motor vehicles (1302)	
	0.60	Seats, motor vehicles (1218)	
	0.60	Safety glass (tempered) for vehicles, aircraft (1279)	
	0.67	Aluminum pipe or tube fittings (1204)	
	Lock parts, of base metal, (1190)	0.60	
		0.60	



**Table 7. (continued)**

Medium-run products	Proximity	Long-run products
Locks of a kind used for motor vehicles of base metal (1269)	0.60	Rubber tube, pipe, hose textile-reinforced no fitting (1312)
Motor vehicle parts (1137)	0.63	Glass mirrors, unframed (1405)
	0.62	Parts, accessories, metal shaping machine tools (1203)
	0.65	Rubber tube, pipe, hose textile-reinforced no fitting (1312)
	0.65	Aluminum pipe or tube fittings (1204)
	0.65	Transmission shafts and cranks, cam and crank shafts (1249)
	0.62	Rubber tube, pipe or hose not reinforced, no fittings (1200)
	0.62	Mufflers and exhaust pipes for motor vehicles (1201)
	0.65	Drive axles with differential for motor vehicles (1246)
	0.69	Brake system parts except linings for motor vehicles (1302)
	0.63	Articles of iron or steel, (1140)
	0.65	Radiators for motor vehicles (1266)
	0.70	Intake air filters for internal combustion engines (1143)
	Parts of household or laundry-type washing machines (1248)	0.63
Plastic articles (1008)	0.63	Dish washing machines (domestic) (1373)
	0.63	Bearing parts <sup>1</sup> (267)
	0.61	Articles of iron or steel, (1140)
	0.61	Textile products and articles for technical uses, (1161)
Pneumatic hand tool parts (1278)	0.61	Rubberized woven textile fabric, except adhesive tape (1335)
	0.65	Copper screw hooks and similar articles (1411)
Pneumatic power engines/motors, except linear acting (1222)	0.63	Metal and wire cutting shears (1303)
	0.63	Hot rolled stainless steel sheet, w <600mm, t <4.75 m (1230)
	0.64	Dairy machinery (1180)
	0.62	Textile products and articles for technical uses, (1161)
	0.62	Lard, other pig fat and poultry fat, rendered (1241)
	0.62	Poultry cuts and offal, except livers, fresh or chilled (1160)
	0.69	Electric signal, safety and traffic controls, (1225)
Toilet or kitchen linen, of flax (1047)	0.67	Essential oils of bergamot (1139)
	0.60	Addressing machines, address plate embossing machines (1165)

**Table 7. (continued)**

Medium-run products	Proximity	Long-run products
Toilet or kitchen linen, of flax (1047)	0.60	Articles of leather and composition for technical uses (1194)
Trailer/nonmechanically-propelled vehicle parts (1085)	0.63	Multiple-walled insulating units of glass (1118)
	0.66	Articles of iron or steel, (1140)
Transmissions for motor vehicles (1166)	0.60	Clutches and parts thereof for motor vehicles (1185)
	0.63	Engines, diesel, for motor vehicles (1313)

Notes: computed using COMTRADE HS 1992 at the 6-digit disaggregation; figures in parentheses in the first/third column are the product's *PRODY*; The average *PRODY* of products in the world market is around 1001; *PRODY* in the first quintile is 90–790, second quintile is 791–937, third quintile is 938–1063, fourth quintile is 1064–1199, and fifth quintile is 1200–2332.

Source: Authors' computation

The potential long-run products include products related to (1) motor vehicles (bearing parts, brake system parts except linings for motor vehicles, clutches/parts for motor vehicles, clutches/shaft couplings/universal joints, drive axles with differential for motor vehicles, diesel engines for motor vehicles, fuel/lubricating/cooling pumps for motor engines, mufflers/exhaust pipes for motor vehicles, transmission shafts and cranks, wheels, including parts/accessories for motor vehicles, safety glass (tempered) for vehicles/aircraft, seats for motor vehicles, radiators, intake air filters (for internal combustion engines, and railway locomotive parts), (2) machineries (dairy machinery, dish washing machines [domestic], machinery to reel, fold/cut/pink textile fabrics, mowers/powered lawn, and addressing/plate embossing machines), (3) rubber tubes (tube/pipe/hose not reinforced (no fittings), tube/pipe or hose with fittings, and tube/pipe, hose textile-reinforced no fitting), and (4) electrical-related products (electric-resistance welding equipment, electric signal for safety and traffic controls, and electrical relays for 60–1000 volts).

In addition, the country can further diversify into synthetic textiles and fabrics (rubberized woven textile fabric and textile products/articles for technical uses) and into processed agricultural products (lard/other pig fat/poultry fat, essential oils of bergamot, and fresh/chilled poultry cuts and offal).

Out of the 44 long-run products, 13 are in the fourth quintile of  $PRODY_{world}$  and 31 are in the fifth quintile (Figure 13). Among these products, unframed glass mirrors and copper screw hooks have the

**Figure 13. Number of countries importing the potential products listed in the long-run strategy**

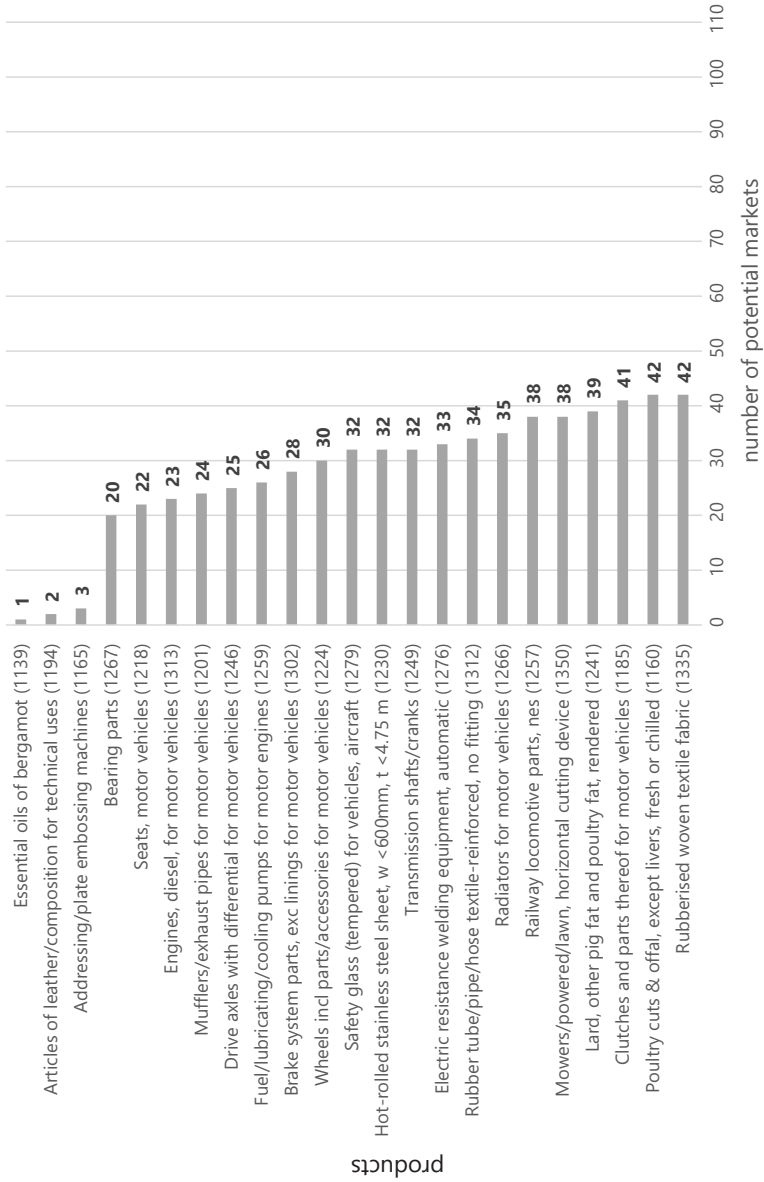
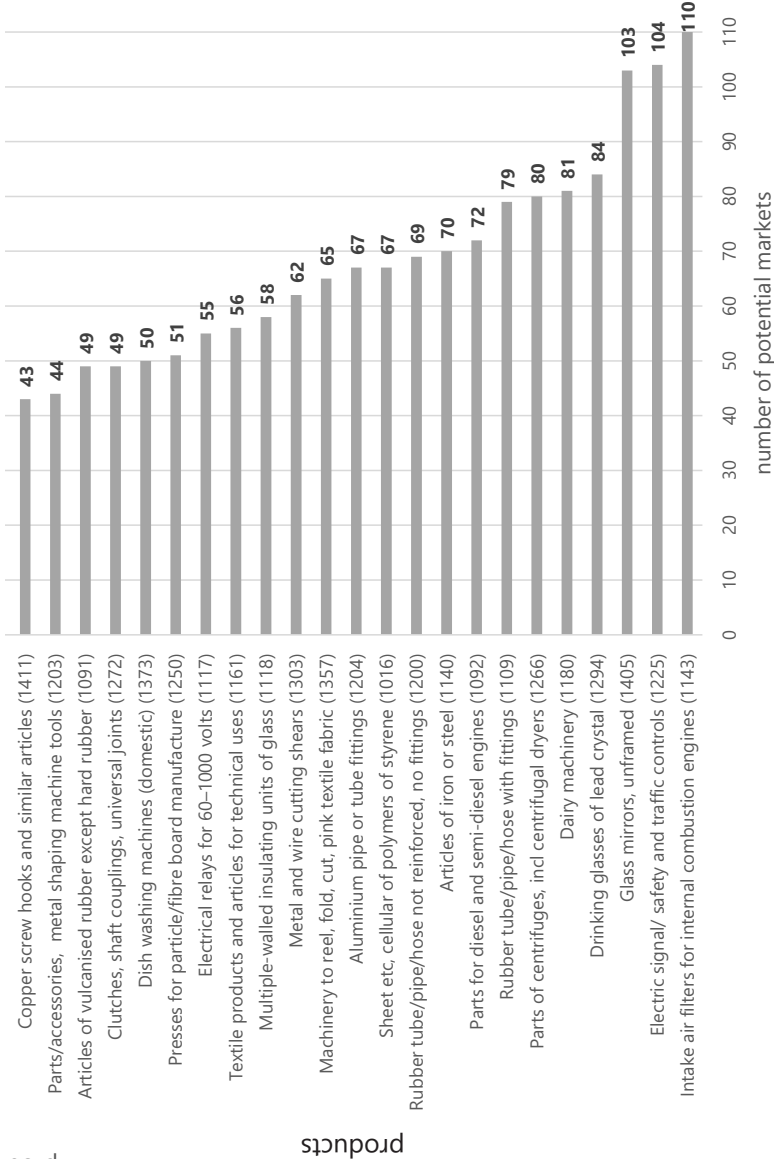


Figure 13. (continued)



Notes: computed using COMTRADE HS 1992 at the 6-digit disaggregation; figures in parentheses are the product's *PRODY*  
 Source: Authors' computation

highest *PRODY* at 1411 while parts of diesel/semi-diesel engines and articles of vulcanized rubbers have the lowest at 1091. Products still having few existing markets include agricultural goods such as essential oils of bergamot, articles of leather, addressing/plate-embossing machines, and products related to motor vehicles such as bearing parts, brake system parts except linings for motor vehicles, drive axles with differential for motor vehicles, fuel/lubricating/cooling pumps for motor engines, mufflers/exhaust pipes for motor vehicles, wheels—including parts/accessories for motor vehicles, and seats for motor vehicles. Products currently imported by several countries include intake filters, electrical signal/safety traffic controls, unframed glass mirrors, drinking glasses of lead crystal, dairy machinery, and parts of centrifuges/centrifugal dryers.

### **Evolution of the Philippine Agricultural Products, 1995 to 2014**

Using the COMTRADE HS 1992 at the 6-digit disaggregation, export shares, RCA, and the metric for product sophistication (*PRODY*) were computed to describe the country's agricultural exports. Products in the export basket are those that have RCA ( $RCA = 1$ ) and are substantially exported, or have at least 0.5-percent share to the country's total exports. In addition, imports data were analyzed to create an index for MRCA, which is computed analogous to Balassa's RCA.

From Table 8, several agricultural products are included in the country's 1995 export basket. These include primary agricultural commodities, i.e., bananas, pineapples, coconut/copra oil-cake, shrimps, and tuna, and commodities that use agricultural inputs, i.e., textiles, footwear, and basketwork. Together, these goods account for around 27 percent of the total agricultural exports in 1995. In 2005, agricultural exports (bananas and copra) account for around 2 percent of the country's export basket while in 2014, 10 percent of the country's overall export basket is contributed by agricultural exports (composed mostly of bananas, copra, and some mining products).

To provide context into the discussion of the sophistication of the Philippine agricultural exports, Table 9 shows the top and bottom 10 products in the world at the first and fifth quintile of  $PRODY_{world}$ . The average *PRODY* in the world market,  $PRODY_{world}$ , is around 1001

**Table 8. Evolution of agricultural export portfolio: Philippines, 1995–2014**

	Share to total exports, 1995	<i>PRODY</i>	MRCA
Coconut (copra) oil crude	4.70	312	
Bananas, including plantains, fresh or dried	3.18	403	
Shrimps and prawns, frozen	1.57	488	
Copper ores and concentrates	1.50	493	1
Iron ore, concentrate, not iron pyrites, agglomerated	1.30	477	
Tuna, skipjack, bonito, prepared/preserved, not minced	1.19	459	
Pineapples, otherwise prepared or preserved	1.07	586	
Men, boys trousers and shorts, of cotton, not knit	1.01	624	
Brassieres and parts thereof	0.99	693	
Men, boys shirts, of cotton, knit	0.92	670	
Hybrid integrated circuits	0.89	697	
Basketwork, wickerwork products of vegetable material	0.86	584	
Pullovers, cardigans of cotton, knit	0.83	675	
Pullovers, cardigans of manmade fibers, knit	0.76	712	
Coconut (copra) oil or fractions simply refined	0.69	455	
Men, boys shirts, of cotton, not knit	0.69	729	
Women, girls trousers and shorts, of cotton, not knit	0.67	699	
Babies garments, accessories of cotton, knit	0.64	680	
Babies garments, accessories of cotton, not knit	0.63	769	
Coconut or copra oil-cake and other solid residues	0.59	354	
Hats and other headgear, knit or crochet	0.53	571	
Raw sugar, cane	0.51	466	1
	Share to total exports, 2005	<i>PRODY</i>	MRCA
Bananas, including plantains, fresh or dried	1.34	403	
Coconut (copra) oil crude	0.71	312	
	Share to total exports, 2014	<i>PRODY</i>	MRCA
Nickel ores and concentrates	3.74	706	
Bananas, including plantains, fresh or dried	2.36	403	
Copper ores and concentrates	1.01	493	1
Coconut (copra) oil crude	0.97	312	
Copper cathodes and sections of cathodes unwrought	0.96	644	
Coconut (copra) oil or fractions simply refined	0.72	455	

Notes: computed using COMTRADE HS 1992 at the 6-digit disaggregation; export goods in the 1995, 2005, and 2014 export basket account for 54 percent, 64 percent, and 59 percent of the total exports, respectively; average *PRODY* of the agricultural products in the Philippines' export basket is 573, 358, and 502 in 1995, 2005, and 2014, respectively

Source: Authors' computation

**Table 9. Top and bottom 10 agricultural products in the world, first and fifth quintile of *PRODY*<sub>world</sub>, 2014**

Bottom 10, first quintile	<i>PRODY</i>	Top 10, first quintile	<i>PRODY</i>
Cocoa beans, whole or broken, raw or roasted	259	Malt extract and limited cocoa pastry cooks products	780
Gum arabic	289	Bulbs, tubers, corms in growth, chicory plants	780
Coffee, not roasted, not decaffeinated	303	Animal products and domestic animal carcass (nonfood)	778
Coconut (copra) oil crude	312	Soya-bean oil-cake and other solid residues	778
Lobsters ( <i>Homarus</i> ) frozen	322	Nutmeg	777
Sheep cuts, bone in, frozen	322	Herrings, frozen, whole	777
Coconut or copra oil-cake and other solid residues	354	Scallops, live, fresh or chilled	777
Sesamum seeds	365	Rasp-, mulberries, (uncooked, steam, boil), froze	776
Arrowroot, salep, fresh or dried and sago pith	380	Cod, frozen, whole	776
Tuna(yellowfin) fresh or chilled, whole	382	Oats	775
Bottom 10, fifth quintile	<i>PRODY</i>	Top 10, fifth quintile	<i>PRODY</i>
Eggs, bird, not in shell not dried	1201	Seed, Kentucky blue grass, for sowing	1330
Poppy seeds	1202	Rabbit or hare meat, offal, fresh, chilled or frozen	1328
Swine cuts, fresh or chilled	1206	Cheese, blue-veined	1327
Residues of starch manufacture and similar residues	1210	Frog legs, fresh, chilled, or frozen	1321
Fructose, chemically pure	1221	Caraway seeds	1310
Bottom 10, fifth quintile	<i>PRODY</i>	Top 10, fifth quintile	<i>PRODY</i>
Egg yolks except dried	1222	Truffles, prepared or preserved, not in vinegar	1309
Chicory, fresh or chilled, except witloof	1230	Egg yolks dried	1283
Opium sap	1233	Swine edible offal, fresh or chilled	1278
Pears, otherwise prepared or preserved	1239	Bellies (streaky) of swine, salted, dried or smoked	1277
Lard, other pig fat and poultry fat, rendered	1241	Plaice, fresh or chilled, whole	1261

Notes: computed using COMTRADE HS 1992 at the 6-digit disaggregation; average is around 1001; *PRODY* in the first quintile is 90–790, second quintile is 791–937, third quintile is 938–1063, fourth quintile is 1064–119, and fifth quintile is 1200–2332.

Source: Authors' computation

and the average *PRODY* of agricultural products in the world market, *PRODY*<sub>agricultural products world</sub> is around 790. Out of the 665 agricultural products, around 77 percent of products are in the lowest two quintiles while around 11 percent are in the highest two quintiles. Kentucky seed for sowing and chilled rabbit/hare meat have the highest *PRODY* at 1330 and cocoa beans have the lowest at around 259.

In Table 10, the average *PRODY* of the Philippines' agricultural products is in the first quintile of the *PRODY*<sub>world</sub> and it has barely improved from 1995 to 2014 (573, 358, and 502 in 1995, 2005, and 2014, respectively). This is likely due to Philippines starting to diversify into circuits and data processing goods, which resulted in streamlined agricultural exports in the early 2000s.

Further, the Philippines is exporting 622 agricultural products in 2014. In Figure 14, the country is exporting the most number of products in the fish/seafood category, around 75 products with an average *PRODY* that is lower than the *PRODY*<sub>agricultural products world</sub>. The country is exporting around 60 products from the cereals/pasta/bread and fruits/nuts categories, which have an average *PRODY* that is lower than the *PRODY*<sub>agricultural products world</sub> as well. However, there is also a big number of exports from the tubers/legumes/vegetables and live animals or / fresh/chilled meats categories, which have average sophistication index higher than *PRODY*<sub>agricultural products world</sub>.

Among the agricultural products, processed meats—which include sausages, meat/cured offal, extracts/juices of meat/fish/aquatic invertebrates, and salted/dried/smoked swine meat, bovine meat, hams/shoulders/swine, and bellies of swine—have the highest average sophistication index of agricultural exports in the world and are least exported by the Philippines. Bran and feeds—which include bran/residues of maize, rice, wheat, and cereal and flour/pellets for animal feeds—are also least exported although they are not as sophisticated as processed meats.



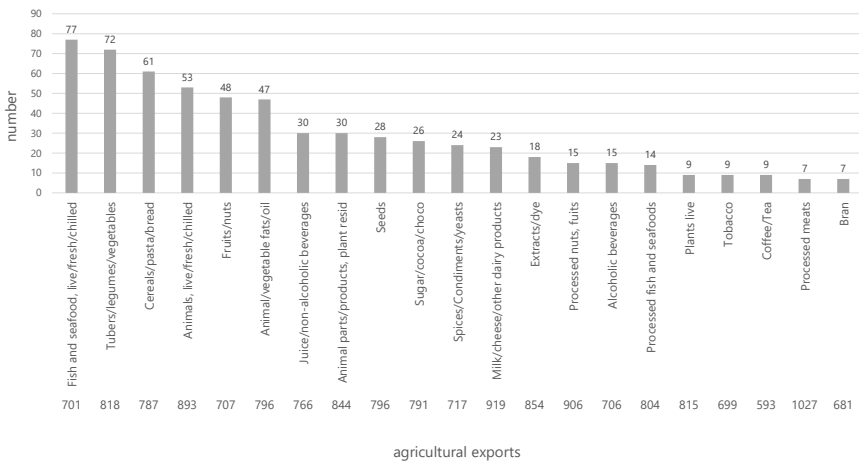
**Table 10. Number of agricultural products in the world market, by *PRODY*<sub>world</sub> quintile**

	Number of agricultural products				
	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Alcoholic beverages	11	4			
Animal parts/ products, plant residual	17	7	7	3	3
Animals, live/fresh/ chilled	20	13	11	8	7
Bran	6	1			
Cereals/pasta/bread	32	19	8	3	1
Coffee/Tea	7	2			
Extracts/dye	8	3	2	3	2
Fish and seafood, live/ fresh/chilled	61	17	7	1	1
Fruits/nuts	35	11	3	1	
<b>Juice/nonalcoholic beverages</b>	<b>16</b>	<b>11</b>	<b>3</b>		
Milk/cheese/other dairy products	7	6	4	2	4
Animal/vegetable fats/oil	26	13	8	2	2
Plants live	6	4	1	1	1
Processed fish and seafood	4	6	4		
Processed meats		2	1	3	1
Processed nuts, fruits	4	3	5	2	1
Seeds	15	10	4	2	3
Spices/Condiments/ yeasts	17	5	1		1
Sugar/cocoa/ chocolate	13	5	6	1	1
Tobacco	6	3			
Tubers/legumes/ vegetables	32	21	11	6	4
<b>Total</b>	<b>343</b>	<b>166</b>	<b>86</b>	<b>38</b>	<b>32</b>

Notes: computed using COMTRADE HS 1992 at the 6-digit disaggregation; average is around 1001; *PRODY* in the first quintile is 90–790, second quintile is 791–937, third quintile is 938–1063, fourth quintile is 1064–119, and fifth quintile is 1200–2332.

Source: Authors' computation

**Figure 14. Number of Philippine agricultural exports and average *PRODY* of agricultural exports in the world market, by category**



Notes: computed using COMTRADE HS 1992 at the 6-digit disaggregation; figures at the bottom are average *PRODY* <sup>agricultural world</sup>; the average is around 790.  
 Source: Authors' computation

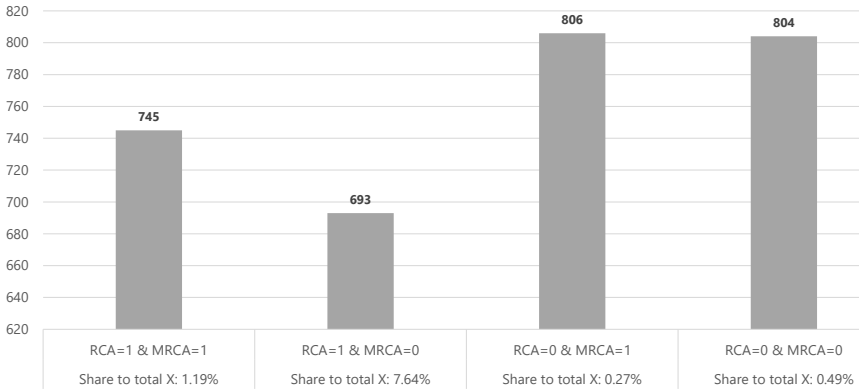
## Diversification Strategies: Agricultural Sector

While government efforts are directed toward the NIP and the MRP, the exports of the agricultural sector need not be left behind since there are agricultural products that have high sophistication content and have the potential to contribute to the agricultural value-added. In fact, the DTI's agroprocessing roadmap for structural transformation, job creation, and poverty reduction includes the strengthening of some agricultural crops in the short run and the transformation of the country as an agribusiness hub in the long run.

Using the Philippine agricultural export data in COMTRADE, Figure 15 shows four categories based on the goods' export and MRCA, their shares to total exports, and the average sophistication of each category. Agricultural products that the country has RCA in have lower sophistication index (*PRODY*s of 745 and 693) compared to agricultural commodities that the country has no RCA in (*PRODY*s of 806 and 804). Those that are intensively exported but not intensively imported by the country, i.e., products with  $RCA = 1$  and  $MRCA = 0$ , have the highest

share to the country's total exports at around 8 percent but have the lowest average sophistication index (*PRODY* of 693).

**Figure 15. Average *PRODY* of Philippine agricultural exports, by export and import intensity**



RCA = revealed comparative advantage; MRCA = imports intensity; *PRODY* = product sophistication  
 Note: computed using COMTRADE HS 1992 at the 6-digit disaggregation; figures at the top of each bar are average *PRODY*s.  
 Source: Authors' computation

### *Potential short-run diversification strategies*

In the short-run, the country can focus on 1,438 agricultural commodities the country has RCA in (Figure 15). Focusing on products with sophistication index higher than the average sophistication index for agricultural products in the world market will ensure improved sophistication content of the agricultural exports. There are 31 products that satisfy this criterion, of which 18 products are intensively exported but not intensively imported ( $RCA=1, MRCA=0$ ) and 14 products are both intensively exported and imported ( $RCA=1, MRCA=1$ ). The first and second short-run strategies will focus on these products.

Commodities that are intensively exported but not intensively imported (strategy 1) include animal parts/products, cereals/pasta/bread, extracts/dye, fish/seafood (live or processed), industrial oil, plants, spices, sugar/cocoa/chocolate, tobacco, and tubers/legumes/vegetables (upper panel of Table 11). Specific commodities that have sophistication index higher than that of the average product in the world market

include horsehair, carp, acid oils, and glycerol. However, countries that intensively import these goods are very few. For example, horsehair—which has the highest sophistication index among all agricultural products—is intensively imported by Morocco and the US while carp is only intensively imported by 12 economies, namely, Austria, Bosnia and Herzegovina, Brunei, Hong Kong, Hungary, Jordan, South Korea, Macau, Poland, Romania, Serbia, and Slovakia.

**Table 11. Potential agricultural products for diversification in the short run**

Strategy 1: Products that are intensively exported and not intensively imported		<i>PRODY</i>	Number of importers
Animal parts/products, plant residual	Horsehair, waste	1608	2
Cereals/pasta/bread	Cereal foods obtained by swelling, roasting of cereal	930	141
	Communion wafers, rice paper, bakers wares nes	840	130
Extracts/dye	Vegetable materials nes, used primarily for plaiting	885	38
Fish and seafood, live/fresh/chilled	Carp, live	1112	12
Oil industrial	Glycerol (glycerine), nes including synthetic glycerol	922	57
	Acid oils from refining	1176	24
	Glycerol (glycerine), crude and glycerol waters and lye	1017	17
Plants live	Foliage, branches, for bouquets, etc. - except fresh	809	35
Processed fish and seafood	Fish prepared or preserved, except whole, in pieces	797	85
	Mollusk and shellfish nes, prepared or preserved	862	34
	Crab, prepared or preserved	826	13
Processed nuts, fruits	Fruit mixtures, otherwise prepared or preserved	998	59
Spices/condiments/ yeasts	Vinegar and substitutes for vinegar from acetic acid	924	78

**Table 11. (continued)**

<b>Strategy 1: Products that are intensively exported and not intensively imported</b>		<i>PRODY</i>	Number of importers
Sugar/cocoa/chocolate	Glucose including syrup of 20–50 percent dry weight fructose	937	43
Tobacco	Cigarette or pipe tobacco and tobacco substitute mixe	811	67
	Products of tobacco, substitute nes, extract, essence	865	45
Tubers/legumes/vegetables	Peas, prepared or preserved, not frozen/vinegar	828	103
<b>Strategy 2: Products that are both intensively exported and imported</b>		<i>PRODY</i>	Number of importers
Cereals/pasta/bread	Cereals, rolled or flaked grains nes	913	62
	Rice flour	909	3
Extracts/dye	Mucilages and thickeners nes	1015	51
	Lac	809	10
	Opium sap	1233	10
	Raw vegetable materials for dyeing or tanning	955	5
Juice/nonalcoholic beverages	Soya sauce	943	87
Animal/vegetable fats/oil	Tung oil or fractions not chemically modified	1526	3
	Processed animal, vegetable oils, industrial preps ne	801	37
	Industrial fatty alcohols	875	8
Processed nuts, fruits	Fruits, nuts, fruit-peel, etc. preserved by sugar	860	91
Seeds	Locust beans and seeds	1010	22
Sugar/cocoa/chocolate	Sugar nes, invert sugar, caramel and artificial honey	943	66
Tobacco	Homogenized or reconstituted tobacco	833	34

nes = not elsewhere specified; *PRODY* = product sophistication

Note: computed using COMTRADE HS 1992 at the 6-digit disaggregation

Source: Authors' computation

Acid oil is intensely imported by 24 countries in Asia (China, India, Indonesia, Malaysia, Singapore, South Korea, and Thailand), MENA (Iran, Saudi Arabia, and Tunisia), OECD (Belgium-Luxembourg, France, Germany, Italy, Japan, Netherlands, Poland, and United Kingdom [UK]), and others (Andorra, Nepal, South Africa, Argentina, Brazil, and Mexico). Likewise, glycerol (glycerine), crude and glycerol waters, and lye are intensively imported by countries in Asia (China, Malaysia, and North Korea), in the OECD regions (Belgium-Luxembourg, Czech Republic, Denmark, Germany, Latvia, and Netherlands), and others (British Virgin Islands, Croatia, Democratic Republic of the Congo, Dominican Republic, Nepal, Rwanda, Ukraine, and Zambia). Commodities such as cereal foods, communion wafers, peas, preserved fish, prepared/preserve fruit mixtures, vinegar, cigarette/pipe tobacco, and tobacco extracts, on the other hand, have more importers.

In terms of the number of potential markets, cereal foods have the most number of importers. Out of the 141 importing economies, there are 8 in Asia (Afghanistan, Bhutan, Brunei, Myanmar, Laos, North Korea, and Timor-Leste), 15 in MENA (Bahrain, Djibouti, Israel, Jordan, Kuwait, Lebanon, Libya, Oman, Palestine, Qatar, Saudi Arabia, Sudan, Syria, UAE, and Yemen), 22 in the OECD regions (Austria, Belgium-Luxembourg, Canada, Denmark, Estonia, Finland, France, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Netherlands, New Zealand, Norway, Portugal, Slovenia, Spain, Sweden, Switzerland, and UK), and 15 in Central and South America (Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panama, Bolivia, Chile, Colombia, Ecuador, Guyana, Paraguay, Suriname, and Uruguay).

Communion wafers/rice paper are imported by 130 countries, of which 8 are in Asia (Afghanistan, Bhutan, Brunei, Myanmar, Kazakhstan, Laos, Timor-Leste, and Turkmenistan), 14 are in MENA (Armenia, Azerbaijan, Bahrain, Djibouti, Iraq, Kuwait, Lebanon, Libya, Oman, Palestine, Qatar, Saudi Arabia, Syria, Yemen), 25 in the OECD regions (Australia, Austria, Belgium-Luxembourg, Canada, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Netherlands, New Zealand, Norway, Portugal, Slovenia, Spain, Sweden, Switzerland, and UK), and 11 are in Central and South America (Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panama, Guyana, Paraguay, Suriname, and Uruguay).

Peas (prepared or preserved) are imported by 101 countries, of which 6 are in Asia (Brunei, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan), 13 are in MENA (Armenia, Azerbaijan, Iraq, Jordan, Lebanon, Mauritania, Oman, Palestine, Qatar, Somalia, Syria, and Tunisia, Yemen), 14 in OECD regions (Belgium-Luxembourg, Canada, Czech Republic, Estonia, France, Germany, Hungary, Ireland, Italy, Latvia, Poland, Slovenia, Spain, and UK), and 9 are in Central and South America (Belize, Guatemala, Honduras, Nicaragua, Panama, Guyana, Paraguay, Suriname, and Uruguay).

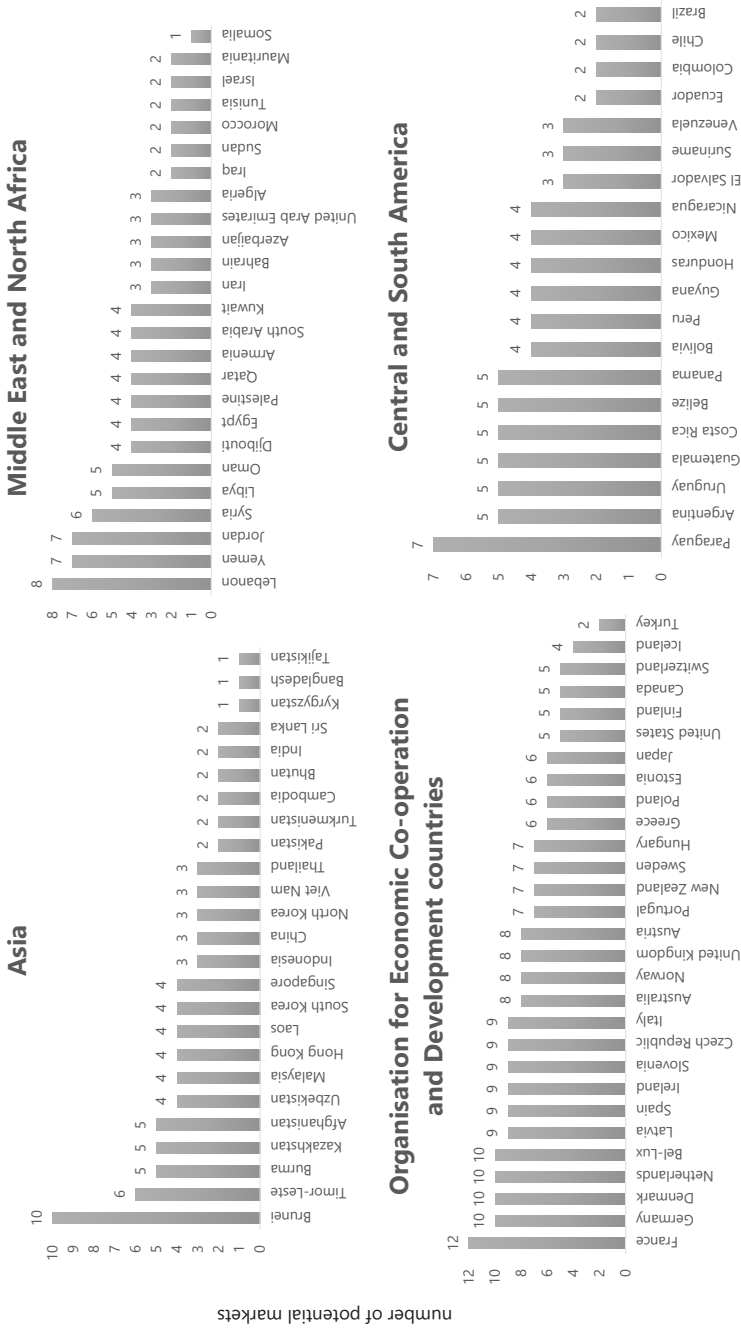
The number of importers and products in the first short-run strategy is summarized in Figure 16. These products have many potential markets in OECD economies, including France, Germany, Denmark, the Netherlands, Belgium-Luxembourg, Latvia, Spain, Ireland, Czech Republic, Italy, Australia, Norway, UK, Austria, Portugal, New Zealand, Sweden, and Hungary. In the MENA region, Lebanon, Yemen, Jordan, and Syria are potential markets for around 8 short-run products. In Asia, Brunei imports the most number of short-run products (10) followed by Timor-Leste, Myanmar, Kazakhstan, and Afghanistan (5).

Also in Table 11, commodities that are both intensively exported and imported (strategy 2) include cereals/pasta/bread, extracts/dye, juice/nonalcoholic beverages, edible oil, processed nuts/fruits, sugar/cocoa/chocolate, and tobacco. Products that have sophistication index higher than the average sophistication of products in the world market include mucilages and thickeners, opium sap, and Tung oil.

Among these, mucilage and thickeners are imported by 51 countries, of which 10 are in Asia (Bangladesh, Myanmar, Indonesia, North Korea, Pakistan, Philippines, Tajikistan, Thailand, Uzbekistan, and Viet Nam), 13 are OECD economies (Australia, Austria, Belgium- Luxembourg, Denmark, Estonia, France, Germany, Ireland, Latvia, New Zealand, Poland, Spain, and Sweden), 3 are in MENA (Algeria, Iran, and Israel), and 14 are in Central/South America (Costa Rica, El Salvador, Honduras, Mexico, Nicaragua, Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Peru, Uruguay, and Venezuela). Opium sap is imported mostly by OECD countries (France, Japan, New Zealand, Spain, and the US) and others (Burkina Faso, Senegal, Zimbabwe) while Tung oil is imported by North and South Korea.

Specific agricultural goods that are intensely imported in a number of countries include preserved fruits/nuts, soy sauce, sugar, and cereals.

Figure 16. Potential markets of short-run agricultural products (strategy 1)



Bel-Lux = Belgium-Luxembourg  
 Note: computed using COMTRADE HS 1992 at the 6-digit disaggregation  
 Source: Authors' computation



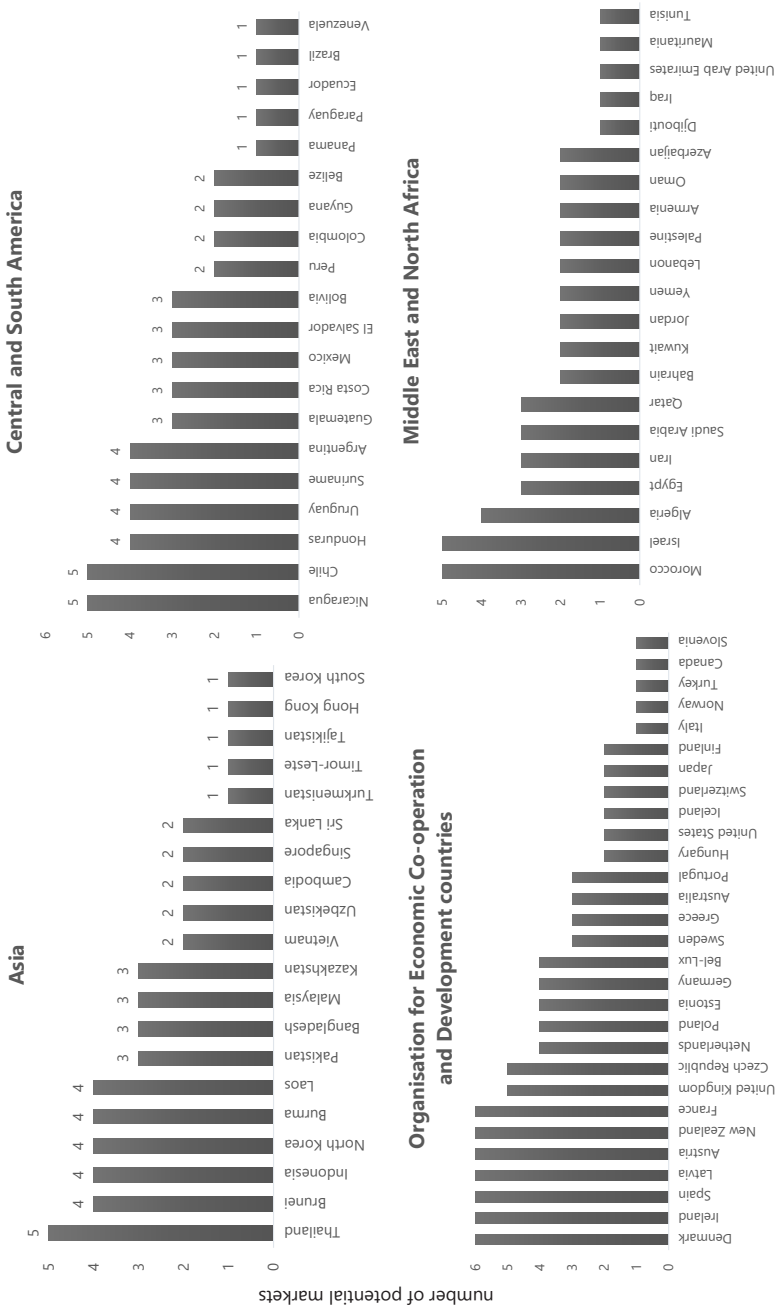
Preserved fruits/nuts are imported by 8 economies in Asia (Brunei, Myanmar, Laos, Malaysia, North Korea, Singapore, Thailand, and Turkmenistan), 9 in Central/South America (Belize, Costa Rica, El Salvador, Nicaragua, Panama, Argentina, Chile, Suriname, and Uruguay), 9 in MENA (Armenia, Azerbaijan, Iran, Israel, Lebanon, Oman, Qatar, Saudi Arabia, and UAE), and 11 OECD countries (Australia, Austria, Czech Republic, France, Germany, Greece, Ireland, Japan, Latvia, New Zealand, and UK).

Markets for soy sauce include 13 economies in Asia (Brunei, Myanmar, Cambodia, Hong Kong, Indonesia, Kazakhstan, Laos, Malaysia, North Korea, Pakistan, Philippines, Thailand, and Timor-Leste), 8 in Central/South America (Belize, Guatemala, Honduras, Nicaragua, Bolivia, Chile, Guyana, and Suriname), 16 OECD countries (Australia, Austria, Canada, Denmark, Estonia, Finland, France, Iceland, Ireland, Latvia, Netherlands, New Zealand, Norway, Sweden, UK, and the US), and 6 in MENA (Bahrain, Israel, Kuwait, Lebanon, Qatar, and Saudi Arabia).

Markets for sugar, on the other hand, include 13 countries in Asia (Bangladesh, Brunei, Myanmar, Indonesia, Malaysia, North Korea, Pakistan, Singapore, South Korea, Sri Lanka, Thailand, and Viet Nam), 8 in Central/South America (Costa Rica, Honduras, Mexico, Argentina, Bolivia, Chile, Colombia, and Peru), 4 in MENA (Algeria, Egypt, Iran, and Yemen), and 14 in the OECD regions (Austria, Belgium-Luxembourg, Denmark, Estonia, France, Ireland, Latvia, Netherlands, New Zealand, Poland, Portugal, Spain, Switzerland, UK) while those of cereals include 4 in Asia (Brunei, Kazakhstan, and Laos), 9 in MENA (Armenia, Azerbaijan, Bahrain, Iraq, Israel, Kuwait, Oman, Palestine, and Qatar), 17 in the OECD regions (Austria, Belgium-Luxembourg, Czech Republic, Denmark, Estonia, Germany, Greece, Iceland, Ireland, Latvia, Netherlands, Poland, Portugal, Slovenia, Spain, Sweden, and UK), and 3 in Central/South America (Nicaragua, Guyana, and Suriname).

The number of importers of products in the second short-run strategy is summarized in Figure 17. These products have many potential markets in OECD economies, including Denmark, Ireland, Spain, Latvia, Austria, New Zealand, France, UK, and Czech Republic, which are importing five to six short-run products. Further, markets in the MENA region include Morocco and Israel, which are both importing five short-run products. In Asia, on the other hand, Thailand imports five short-run products.

Figure 17. Potential markets of short-run agricultural products (strategy 2)



Note: computed using COMTRADE HS 1992 at the 6-digit disaggregation  
 Source: Authors' computation

*Potential medium-run diversification strategy*

Potential products for the medium-run strategy are identified using the short-run agricultural commodities listed above as starting points. The idea of choosing the medium-run products centers on the products' contribution to the improvement of the country's agricultural portfolio  $PRODY_{\text{agricultural products}} > PRODY_{\text{agricultural products world}}$  and on the expansion of the country's net trade position ( $MRCA = 0$ ). In addition, their production requisites need to be similar with the production structures of the short-run products ( $proximity \geq 0.5$ ).<sup>5</sup>

Using these criteria, there are five short-run agricultural products for which eight potential medium-run commodities are mapped into. Majority of these are processed meats although preserved fruits, edible oil, and woven twill are also included. Table 12 shows that the capabilities that could be developed in the production of glycerol, a compound used as sweetener and humectant in pharmaceutical formulations, and lye, a tanning agent to preserve foods, can result in the emergence of new and relatively more sophisticated industries such as processed meats like hams and turkey cuts/offals. The development of Tung oil, a drying oil and used for varnishing, can lead to the capabilities necessary in the production of polyester/cotton fabrics.

The development of the production requisites of preserved fruit mixtures can be further improved so the country can further diversify into other preserved fruits (e.g., strawberries). Similarly, locust beans and seeds can lead to the capabilities of olive oil production. However, the topography of the country is not suited to growing olive trees, which thrive in Mediterranean climates, and is therefore not a viable option for diversification.

*Potential long-run diversification strategy*

Potential long-run products are identified following the selection criteria used for the medium-run. Table 13 shows the four medium-run agricultural products in which the potential long-run commodities are mapped into. The capabilities necessary to produce processed meats such as swine ham/cuts can be further developed to produce other processed meats such as poultry cuts/offal, salted/dried/smoked bellies of swine, and pig/poultry fats. The identified medium-run products can also diversify into chemical compounds that can be used for fertilizers such as ammonium nitrate limestone.

<sup>5</sup> While higher values of proximity indicate that products have more similar production structures, there is only one product that has  $proximity \geq 0.6$ .

**Table 12. Potential agricultural products for medium-run diversification**

Short-run products	Proximity	Potential medium-run products	Number of importers
Cereals, rolled/flaked grains (913)	0.50	Turkey meat, offal prepared or preserved, except live (1083)	72
Fruit mixtures, otherwise prepared or preserved (998)	0.52	Strawberries, otherwise prepared or preserved (1127)	57
	0.58	Turkey cuts and offal, except livers, frozen (1122)	88
	0.50	Swine hams and cuts thereof, prepared or preserved (1103)	71
	0.50	Swine carcasses and half carcasses, fresh or chilled (1050)	23
	0.50	Swine, live except purebred breeding > 50 kg (1256)	21
Locust beans and seeds (1010)	0.53	Olive oil, fractions, refined, not chemically modified (1019)	69
Tung oil or fractions not chemically modified (1526)	0.67	Woven twill >85 percent polyester + cotton, <170g/m <sup>2</sup> printed (1526)	1

Notes: computed using COMTRADE HS 1992 at the 6-digit disaggregation; figures in parentheses are the product's PRODY

Source: Authors' computation

**Table 13. Potential agricultural products for long-run diversification**

Medium-run products	Proximity	Potential long-run products	Number of importers
Swine carcasses and half carcasses, fresh or chilled (1050)	0.62	Pig and poultry fat, unrendered (1054)	50
	0.63	Poultry cuts and offal, except livers, fresh or chilled (1160)	42
	0.68	Ammonium nitrate limestone etc. mixes, pack > 10 kg (1089)	36
Swine hams and cuts thereof, prepared or preserved (1103)	0.61	Bellies (streaky) of swine, salted, dried, or smoked (1277)	73
	0.67	Poultry cuts and offal, except livers, fresh or chilled (1160)	42

Notes: computed using COMTRADE HS 1992 at the 6-digit disaggregation; figures in parentheses are the product's PRODY

Source: Authors' computation

## Synthesis/Summary and Conclusions

Using some metrics from the product space, this research assesses the sophistication content of the country's existing export basket and charts short-, medium-, and long-run diversification strategies that the country can pursue given its current productive knowledge. The following key observations are worth highlighting:

- 1) *Despite the Philippines' long history of trade liberalization efforts and market-oriented reforms, the country has to yet to see a genuine structural transformation.* At present, the services sector accounts for the majority of the country's employment and GDP. Employment in the agricultural sector is still high relative to the agricultural employment in most developed economies today, even after a decline of 26 percent in 2017.

Several programs and policies have been in place to industrialize. This is reflected in the country's diversification into circuits and electronic goods in the early 2000. Hence, the agricultural goods in the export basket have been substantially reduced. Accounting for 27 percent of the total exports in the 1995 export basket, agricultural products account for only 10 percent of the total exports in the 2014 export portfolio.

- 2) *The average sophistication of products included in the country's overall export basket has barely improved from 1995 to 2014 and has remained lower than the average sophistication content of exports in the world market.* This can be attributed to the high concentration of the export basket in integrated circuits and parts/accessories of data processing equipment, which accounted for 28 percent of the country's export basket in 2014. In addition, there are relatively sophisticated exports in 1995, such as cameras and radio receivers, that were no longer part of the country's export basket in the 2000s due the development of high-technology gadgets that became better substitutes for these exports.
- 3) *There are relatively sophisticated products in the country's overall export basket.* These include static converters, photosensitive/photovoltaic/LED semiconductor devices, parts of line telephone/telegraph equipment, electric capacitors, electronic printed circuits, and cruise ships/excursion boats/ferry boats. Among these, static converters, and cruise ships/excursion

boats/ferry boats are not intensively imported by the country. Thus, these products have the potential to expand the country's net trade.

- 4) *The average sophistication content of the agricultural exports from 1994 to 2014 has not improved as well.* In 1995, agricultural exports accounted for around 27 percent of the country's overall export basket. These include primary agricultural commodities, i.e., bananas, pineapples, coconut/copra oil-cake, shrimps, and tuna, and commodities that use agricultural inputs, i.e., textiles, footwear, and basketwork. In 2014, 10 percent of the country's overall export basket were agricultural exports (composed mostly of bananas, copra, and some mining products). These exports have average sophistication indices that are lower than the average sophistication of agricultural products in the world market. This has serious implications not only on the sector's productivity but also, more importantly, on the skills content of 26 percent of the employed population in agriculture (WB various years).
- 5) *Some of the products in the country's overall export basket have potential forward linkages to goods with relatively higher sophistication content.* This, in turn, have potential linkages to even more sophisticated goods. There are two diversification strategies in the short run. The starting points of the first strategy are the existing exports already produced (although not substantially, accounting for less than 0.5% of the country's total exports) by the country and require less adjustments in the production structures. Potential products that the country can branch out into include circuits (hybrid integrated circuits), equipment/devices/parts of electrical nature (electrical resistors fixed, power capacity <20-watt, electrical boards), parts/accessories of electronics (indicator panels incorporating electronic displays), and counters and speed measuring equipment (accessories of revolution counters and speed indicators/tachometers/stroboscopes), among others.

The second short-run diversification strategy looks at products that are relatively close to the country's current production structure but the country has no RCA in. Potential products include part/accessories of instruments/devices/

equipment (industrial/laboratory furnaces/ovens and sewing machines), equipment/devices/parts of electrical nature (electrical machines/apparatus and weighing machine parts), minerals (foil and copper alloy and articles of iron, steel and aluminum), parts/accessories of motor vehicles (valves for oleohydraulic or pneumatic transmissions, wheels including parts/accessories for motor vehicles, and trailer/nonmechanically-propelled vehicle parts), products related to plastics (sheet/cellular of polymers of styrene, fittings for plastic tube/pipe/hose, and plastic builders' ware, and textiles (woven fabric), among others.

- 6) *The agricultural sector can diversify into the production of goods with higher sophistication content as well.* In the short run, the country can focus on improving the production structure of agricultural goods which the country has RCA in but are not yet substantially produced. These include processed fish and seafood, industrial oil, cereals/pasta/bread, animal/vegetable fats/oil, and extracts/dye. In the medium run, the country can diversify into products with much higher sophistication content, majority of which are processed meats, although preserved fruits, edible oil, and woven twill are also included. In the long-run, the country can further branch into processed meats with sophistication content that is at the fifth quintile of  $PRODY_{world}$ . While this portends good news, it presents challenges on how the country can transform its agricultural sector into a sector that is high value-adding. The sector's transformation will definitely not happen overnight and deliberate steps toward the goal is necessary.
- 7) *The identified products in the empirical exercises do not lead to the most sophisticated among the agricultural products in the world.* The country's current exports are in the least connected parts of the product space. Hence, fewer products are available for diversification opportunities. While this is the case, there are relatively high value-adding products that can be developed in the future given the country's current export basket.

These findings imply that the country needs to prioritize investments in human capital development, skills, and infrastructures and

to map out clear and deliberate multistakeholder action plans. Indeed, export success and the ability to attract more and higher quality foreign direct investment (FDI) are closely linked. Lall (2000), however, notes that an FDI-dependent strategy cannot substitute for building domestic capabilities. Successful exporters did not simply adopt a passive FDI strategy but rather employed different strategic choices—from the use of extensive industrial policy, reaching into trade, finance, education, training, technology, and industrial structure as exemplified by Taiwan and Korea—to extensive interventions in factor markets (skill creation, institution building, infrastructure development, and supplier support) as in the case of Singapore.

While this paper has identified specific commodities that can lead to a sophisticated export basket in the future, this paper in no way recommends that the country should only focus on these goods. Rather, the paper assesses the country's prospects and opportunities for economic growth and provides detailed and specific feasible options as starting points. Given that what a country exports matter, it is imperative to assess where it stands and can go because these will influence the government plans and priorities toward the industry.

Provided that correct policies are in place, the industrial sector is likely to produce other sophisticated and high value-adding goods that this paper has not identified. Hence, the message is clear: the country has prospects for structural transformation provided that well-thought-out policies, plans, and priorities are set in motion. Toward this end, some recommendations are listed below.

### *Creating an enabling environment*

**The PDP 2017–2022 (NEDA 2017) rightly identifies the elements of an enabling environment to spur the growth of industries and expand economic opportunities.**

Priority should be given to the following: relaxing restrictive foreign ownership provisions of the constitution and other laws to attract more FDI; enhancing market competition through improving ease of doing business; setting up a national quality infrastructure system to integrate and coordinate standardization, metrology, testing analysis, quality management, certification, and accreditation; and amending



the Consumer Act to increase protection of consumers and harmonize existing law with current and future technological advancements.

**The promotion of competition and innovation must be sustained.**

A national competition policy is needed to provide a holistic and comprehensive framework for competition that will complement the Philippine Competition Act (NEDA 2018). To harness the FIRE for economy-wide upgrading and job creation, further investment in science, technology, and innovation, increased utilization of information and communications technologies (ICTs), and the promotion of lifelong learning, among others, are necessary (Dadios et al. 2018).

**There is a need to implement the measures outlined in the *Philippine Export Development Plan* specifically those aimed to improve the climate for export development and to improve existing trade relations and explore potential trade agreements.**

Some OECD and ASEAN economies are markets for goods in the country's current export basket, e.g., integrated circuits, static converters, and photosensitive/photovoltaic/LED semiconductor devices, color television receivers/monitors/projectors, and crude/refined copra oil.

In terms of the industrial exports, one short-run diversification strategy is to focus on the products that are not yet substantially produced but the country has RCA in. Potential markets for these goods include OECD economies and ASEAN countries. Another short-run diversification strategy is to look at products that are relatively close to the country's current production structure but the country has no RCA in. Potential markets for these goods include OECD economies, ASEAN countries, Brazil, and Morocco.

**The government has big infrastructure programs that will ensure the connectivity of various players from production to consumption and trade. However, the infrastructure projects mostly focus on the development of subways and mass railway transits.**

There is a need for the country to also look into the potential increase in the demands for ports brought about by the importation of construction materials due to the Build, Build, Build program. Development of ports

in key areas will result in a more efficient delivery of inputs to local producers and of goods to international markets.

### *Enhancing industrial policies*

**There is a need to promote an environment that encourages innovations as a way of doing business since innovations are correlated with the firm's productivity and employment growth.**

The type of innovation strategy (simple versus complex) and the innovation mix (product, process, marketing, or organizational) are important drivers of firm's performance. For example, Bayudan-Dacuycuy and Baje (2018) found that marketing or process innovation yields the highest increase in labor productivity while product or organizational innovation yields the highest increase in employment growth. However, complex innovation, or the combination of two or more types of innovation, is a better strategy. In particular, the mix of product-process innovations is a staple strategy to increase labor productivity and employment growth. Marketing (organizational) innovation can be included to this staple strategy to further increase labor productivity (employment growth).

**To facilitate product innovations, there is a need to ensure that process innovations are integrated into the various stages of good production. This will require increased servicification.**

Based on the trade-in value-added data of the OECD, the share of services embodied in the country's manufacturing exports is among the lowest in the region. Moreover, value-added from ICT services and other business services are inadequate compared to patterns observed in other countries (Serafica 2016). Intensive use of services, particularly business services, which include research and development, computer-related activities, and various professional services such as market research, engineering, and other technical activities are especially important for product and process innovation. Moreover, there is evidence of positive correlations between services inputs and productivity but negative correlations between OECD index of services restrictiveness and manufacturing exports per capita (Pasadilla and Wirjo 2014–2015). Thus, to pursue manufacturing upgrading, policy and regulatory reforms in services will need to be prioritized.

**There is a need to ensure horizontal and vertical integrations in order to upgrade the country's production structures and capabilities.**

Similar to the strategies of its now industrialized Asian neighbors, the country needs to attract investments that it can learn from. To translate the knowledge generated through these investments, there is a need to strengthen the link between the industry and the academe. Presumably, this link has simultaneous feedback. On one hand, the quality of the country's human capital attracts a certain quality of investments. On the other hand, the quality of foreign investments in the country can affect human capital through knowledge spillovers and externalities. To this end, the country should assess where it sees itself in the future and chart the path of its human capital development toward this goal.

### *Harnessing the potential of the agricultural sector*

**In the short run, investment priorities should focus on strengthening the production structures of cereals, fruit mixtures, glycerol, and oils due to their forward linkages to more sophisticated agroprocessing industries.**

If the country can upgrade the current production capacities of cereals, fruit mixtures, glycerol, and oils as drying agents, the country will be able to meet the production requisites of processed meats, preserved fruits such as strawberries, and woven twill. To do this, there is a need to ensure that the agricultural sector has strong links with industrial sectors. For example, the sector that produces oils as drying agents in ink/paint/varnish needs to have linkages with the chemical industry in order to develop high value-added textiles/fabrics.

**There is a need to develop the agroprocessing industry to harness the potential of the agricultural sector's contribution to sustainable economic growth and decent employment.**

In 2016, the January round of the Labor Force Survey shows that six percent of the working population in the urban area and four percent in the rural area are employed in agro-industrial manufactured goods (food products, beverages, tobacco products, textiles, wearing apparel, leather, wood products, and paper/paper products). In addition, agroprocessing is also a way to avoid the oftentimes high transportation, handling, and storage costs of primary agricultural products. Since

primary agricultural products are perishable goods, agroprocessing appears to be a sound approach for agricultural exports to reach markets beyond Asia. Potential markets for agro-processed goods include OECD economies and countries from the MENA region.

The 2014 IPP includes high value-added crops as one of the targets, which is a good starting point of the agroprocessing industry since evidence from the product space indicates that processed agricultural goods have relatively high sophistication content than primary agricultural products such as fresh fruits. The agroprocessing industry is part of the manufacturing sector that processes and transforms primary and intermediate products from agriculture, forestry, and fisheries into manufactured goods (FAO 1997). The industry uses various methods to process these agricultural inputs, which can be as simple as smoking or more complex as transforming raw materials into paper or textiles (FAO 1997).

**Assuming that the country is able to create correct incentives and provide adequate support for process and product innovations to take place, the development of the agricultural products identified in the empirical exercises may lead to the emergence of other high value-adding agro-industrial exports.**

For example, vegetable materials used primarily for plaiting have links to more sophisticated textile/fabric/tapestry industries. Raw vegetable materials for dyeing/tanning have links to paper industries. The challenge, therefore, is for the government to take steps that will eventually provide opportunities for the agricultural sector to realize actual linkages with these more advanced and sophisticated industries.

### *Suggestions for further study*

For the short- and medium-term strategies, import intensity was excluded in the selection criteria to focus on products that are likely to improve the country's net trade position. In the context of global value chains (GVCs) however, imports and exports are intertwined (UNCTAD 2013). Thus, limiting the strategy to products with low import content will not maximize the opportunities for GVC participation and upgrading. It is imperative to understand specific GVCs and how they are evolving with various technological disruptions and to tap industry specialists who can help craft appropriate and practical strategies.

Another promising area for study is the application of the product space model to services. Although services data are not as disaggregated as those of merchandise trade, there have been attempts to apply the model to services exports (e.g., Anand et al. 2015 and Stojkoski et al. 2016). Given the importance of services for the Philippines in terms of value added, employment, and trade, analysis of the sophistication and complexity of services exports will be useful in formulating a comprehensive plan that will facilitate structural transformation.



## References

- Aghion, P. and P. Howitt. 1992. A model of growth through creative destruction. *Econometrica* 60(2):323–351.
- Albert, J.R.G., F.M.A. Quimba, R.B. Serafica, G.M. Llanto, J.F.V. Vizmanos, and J.C.A.C. Bairan. 2017. Measuring and examining innovation in Philippine business and industry. PIDS Discussion Paper Series 2017-28. Quezon City, Philippines: Philippine Institute for Development Studies. <https://www.pids.gov.ph/publications/5831> (accessed on April 4, 2018).
- Aldaba, R. 2014. The Philippine manufacturing industry roadmap: Agenda for new industrial policy, high productivity jobs, and inclusive growth. PIDS Discussion Paper Series 2014-32. Quezon City, Philippines: Philippine Institute for Development Studies. <https://pidswebs.pids.gov.ph/CDN/PUBLICATIONS/pidsdps1432.pdf> (accessed on April 4, 2018).
- . 2017. PH manufacturing resurgence program: Journey towards industrialization. Powerpoint presentation during the Manufacturing Summit 2015, November 29. <http://boi.gov.ph/wp-content/uploads/2018/03/Presentation-by-Assistant-Secretary-Rafaelita-Aldaba-Department-of-Trade-and-Industry.pdf> (accessed on October 22, 2018).
- . 2005. Policy reversals, lobby groups and economic distortions. PIDS Discussion Paper 2005-04. Quezon City, Philippines: Philippine Institute for Development Studies. <https://pidswebs.pids.gov.ph/CDN/PUBLICATIONS/pidsdps0504.pdf> (accessed on April 4, 2018).
- Anand, R., K. Kochhar, and S. Mishra. 2015. Make in India: Which exports can drive the next wave of growth? IMF Working Paper WP/15/119. Washington D.C., United States: International Monetary Fund. <https://www.imf.org/external/pubs/ft/wp/2015/wp15119.pdf> (accessed on April 4, 2018).
- Balassa, B. 1965. Trade liberalisation and revealed comparative advantage. *The Manchester School and Social Studies* 33(2):99–123.
- Bayudan-Dacuycuy, C. 2012. The Philippine export portfolio in the product space: Potentials, possibilities and policy challenges. *Economics Bulletin* 32(1):59–66.
- Bayudan-Dacuycuy, C. and J. Lim. 2017. Export sophistication, export-led growth, and the product space: Evidence from selected East Asian economies. *Journal of Asian and African Studies* 52(1):3–20.
- Bayudan-Dacuycuy, C. and L.K. Baje. 2018. Assessing the effects of simple and complex innovation strategies on the performance of firms in the Philippines. PIDS Discussion Paper 2018-09. Quezon City, Philippines: Philippine Institute for Development Studies. <https://www.pids.gov.ph/publications/6139> (accessed on April 4, 2018).

- Bayudan-Dacuycuy, C. and R. B. Serafica. 2018. Discovering the Philippines' potential export portfolio through the product space: Some products and ways forward. PIDS Discussion Paper 2018-17. Quezon City, Philippines: Philippine Institute for Development Studies. <https://www.pids.gov.ph/publications/6488> (accessed on April 4, 2018).
- Dadios, E.P., A.B. Culaba, J.R.G. Albert, V.B. Paqueo, A.C. Orbeta, Jr., R.B. Serafica, A.A. Bandala, and J.C.A.C. Bairan, 2018. Preparing the Philippines for the Fourth Industrial Revolution: A scoping study. PIDS Discussion Paper Series 2018-11. Quezon City, Philippines: Philippine Institute for Development Studies. <https://www.pids.gov.ph/publications/6152> (accessed on April 4, 2018).
- Dixit, A. and J. Stiglitz. 1977. Monopolistic competition and optimum product diversity. *American Economic Review* 67(3):297–308.
- Fabella, R. and M. Fabella. 2012. Development progeria? In *Looking back, moving forward*. Quezon City, Philippines: Business World Publishing Corporation.
- Felipe, J., C. Bayudan-Dacuycuy, and M. Lanzafame. 2016. The declining share of agricultural employment in China: How fast? *Structural Change and Economic Dynamics* 37: 127–137.
- Food and Agriculture Organization (FAO) 1997. The agroprocessing industry and economic development, the State of food and agriculture. FAO Agriculture Series 30. Rome, Italy: Food and Agriculture Organization.
- Grossman, G. and E. Helpman. 1991. Quality ladders in the theory of growth. *Review of Economic Studies* 58(1):43–61.
- Hausmann, R. and B. Klinger. 2006. Structural transformation and patterns of comparative advantage in the product space. Center for International Development Working Paper 128. Massachusetts: Center for International Development at Harvard University.
- Hausmann, R. and C. Hidalgo. 2011. The network structure of economic output. *Journal of Economic Growth* 16(4):309–342.
- Hausmann, R., C. Hidalgo, S. Bustos, M. Coscia, S. Chung, J. Jimenez, A. Simoes, and M. Yildirim. 2011. The atlas of economic complexity: Mapping paths to prosperity. Massachusetts: Center for International Development at Harvard University and Harvard Kennedy School–John Kennedy School of Government.
- Hausmann, R. and D. Rodrik. 2003. Economic development as self-discovery. *Journal of Development Economics* 72(2):603–633.
- Hausmann, R., J. Hwang, and D. Rodrik. 2007. What you export matters. *Journal of Economic Growth* 12(1):1–25.
- Hidalgo, C. 2009. The dynamics of economic complexity and the product space over a 42-year period. Center for International Development Working



- Paper 189. Massachusetts: Center for International Development at Harvard University.
- Hidalgo C, Klinger, B, and Barabasi, A. 2007. The product space conditions the development of nations. *Science* 317: 482–487.
- Hidalgo, C. and R. Hausmann. 2009. The building blocks of economic complexity. Washington, D.C.: Proceedings of the National Academy of Sciences of the United States of America. <https://doi.org/10.1073/pnas.0900943106> (accessed on October 18, 2018).
- Hirschman, A.O. 1958. The strategy of economic development. *American Journal of Agricultural Economics* 41(2):468–469.
- Kommerskollegium. 2012. Everybody in services: The impact of servicification in manufacturing on trade and trade policy. Stockholm, Sweden: Swedish National Board of Trade. <https://www.kommers.se/Documents/dokumentarkiv/publikationer/2012/skriftserien/report-everybody-is-in-services.pdf> (accessed on April 4, 2018).
- Kommerskollegium. 2013. Just add services: A case study on servicification and the agri-food sector. Stockholm, Sweden: Swedish National Board of Trade. [https://www.kommers.se/Documents/In\\_English/Publications/PDF/Just-Add-Services.pdf](https://www.kommers.se/Documents/In_English/Publications/PDF/Just-Add-Services.pdf) (accessed on April 4, 2018).
- Lall, S. 2000. The technological structure and performance of developing country manufactured exports, 1985–98. *Oxford Development Studies* 28(3):337–369.
- Lanz, R. and A. Maurer. 2015. Services and global value chains—some evidence on servicification of manufacturing and services networks. WTO Working Paper ERSD-2015-03. Geneva, Switzerland: World Trade Organization.
- Leamer, E. 1984. Sources of comparative advantage: Theory and evidence. Massachusetts: Massachusetts Institute of Technology Press.
- Llanto, G.M. and F. del Prado. 2015. Does innovation mediate good performance? PIDS Discussion Paper Series 2015-06. Makati City, Philippines: Philippine Institute for Development Studies. <https://www.pids.gov.ph/publications/5467> (accessed on April 4, 2018).
- Lim, J. and C. Bautista. 2002. External liberalization, growth and distribution in the Philippines. Paper presented at the international conference on “External Liberalization, Growth, Development and Social Policy”, January 18–20, Melia Hotel, Hanoi, Viet Nam.
- Medalla, E.M. 2002. Philippines competition policy in perspective. PIDS Discussion Paper Series 2002-25. Makati City, Philippines: Philippine Institute for Development Studies. <https://www.pids.gov.ph/publications/2217> (accessed on April 4, 2018).
- Medalla, E.M., and M.A. Rosellon. 2017. Macroeconomic overview of the Philippines and the new industrial policy. PIDS Discussion Paper Series

- 2017-48. Quezon City, Philippines: Philippines Institute for Development Studies. <https://www.pids.gov.ph/publications/5888> (accessed on April 4, 2018).
- National Economic and Development Authority (NEDA). 2017. *Philippine Development Plan 2011–2017*. Pasig City, Philippines: NEDA.
- . 2018. Socioeconomic report 2017. Pasig City, Philippines: NEDA.
- Pasadilla, G. and A. Wirjo. 2014–2015. Services-manufacturing linkage and the role of policy. *Philippine Journal of Development* 41–42(1-2):81–110.
- Romer, P. 1986. Increasing returns and long-run growth. *Journal of Political Economy* 94(5):1002–1037.
- Schumpeter, J. 1934. *The theory of economic development: An inquiry into profits, capital, credit, interest, and the business cycle*. Leipzig: Duncker and Humblot. Translated from German by R. Opie. Massachusetts: Harvard University Press.
- Serafica, R.B. 2016. Why manufacturing resurgence will mean more services, not less. PIDS Discussion Paper 2016-46. Quezon City, Philippines: Philippine Institute for Development Studies. <https://www.pids.gov.ph/publications/5746> (accessed on April 4, 2018).
- Stiglitz, J. and B. Greenwald. 2014. *Creating a learning society: A new approach to growth, development, and social progress*. New York: Columbia University Press.
- Stojkoski, V., Z. Utkovski, and L. Kocarev. 2016. The impact of services on economic complexity: Service sophistication as route for economic growth. *PLOS ONE* 11(8):e0161633.
- Syrquin, M. 2008. Structural change and development. *International handbook of development economics* 1:203–273, edited by D. Rodrik and M. Rosenzweig. Oxford, United Kingdom: Elsevier.
- United Nations Conference on Trade and Development (UNCTAD). 2013. *Global value chains: Investment and trade for development. World Investment Report 2013*. Geneva, Switzerland: UNCTAD.
- Usui, N. 2012. *Taking the right road to inclusive growth: Industrial upgrading and diversification in the Philippines*. Mandaluyong City, Philippines: Asian Development Bank.
- World Bank (WB). Various years. World development indicators. <http://datatopics.worldbank.org/world-development-indicators> (accessed May 15, 2018).

## The Authors

**Connie Bayudan-Dacuycuy** is a senior research fellow at the Philippine Institute for Development Studies (PIDS). She holds a PhD in Economics from the Kyoto University in Japan. Her research works are in the fields of household, family and gender issues, poverty analysis, and applied economic modelling.

**Ramonette B. Serafica** is senior research fellow at PIDS. She has a PhD in Economics from the University of Hawaii at Manoa and has worked on several researches in the field of services policy and trade in services.







This research assesses the sophistication content of the country's current export portfolio and identifies products that result in a more diversified and high value-added mix of export commodities. Using some metrics from the product space, the paper finds that the average sophistication of products included in the country's export basket has barely improved from 1995 to 2014. It has remained lower than the average sophistication content of exports in the world market. The paper also finds that some of the products in the country's existing export basket has potential forward linkages to goods with relatively higher sophistication content, which in turn has potential linkages to even more sophisticated goods. However, transformation does not happen overnight and requires well-thought-out policies, plans, and priorities. To this end, the paper advocates the implementation of measures outlined in the *Philippine Export Development Plan*. It also identifies other potential actions toward human capital development, innovations, and infrastructure programs.



18th Floor, Three Cyberpod Centris - North Tower  
EDSA corner Quezon Avenue, Quezon City, Philippines  
Tel.: (+632) 8877-4000  
Email: [publications@mail.pids.gov.ph](mailto:publications@mail.pids.gov.ph)  
Website: <http://www.pids.gov.ph>

 [facebook.com/PIDS.PH](https://www.facebook.com/PIDS.PH)  [twitter.com/PIDS\\_PH](https://twitter.com/PIDS_PH)