

GROWTH AND PRODUCTIVITY IN THE PHILIPPINES

WINNING THE FUTURE



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Acknowledgments

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Executive Summary

This report shows that sustaining high growth can only be achieved if the Philippines succeeds in sustaining high Total Factor Productivity (TFP) growth while accelerating capital accumulation.

To achieve the *Ambisyon Natin 2040*, the Philippines needs to triple its income per capita in the next two decades. The *Ambisyon Natin 2040* is the government's plan to transform the country into a prosperous middle-class society free of poverty by 2040.¹ This implies that the Philippine economy needs to grow at an annual average of 6.5 percent in the next 22 years, faster than the average growth of 5.3 percent since 2000—a challenge that only the Asian Tigers² and China have managed to accomplish in the past. Faster economic growth will also need to be shared more broadly to eradicate poverty and improve the living standard of the average Filipino.

This report shows that sustaining high growth can only be achieved if the Philippines succeeds in sustaining high Total Factor Productivity (TFP) growth while accelerating capital accumulation. To achieve the GDP per capita target by 2040, numerous scenarios regarding the potential mix of growth drivers were evaluated. The first key finding is that sustaining high TFP growth will be crucial to achieve the target. Specifically, the Philippines needs to sustain an average annual TFP growth rate of 1.5 percent or higher in the next 22 years, more than double the world average since 2000. Such a high rate of TFP growth will require deep structural reforms to remove constraints and distortions faced by the private sector. The second key finding is that accelerating capital accumulation in the medium term will be essential to reduce current infrastructure and capital constraints to growth. The Philippines can meet the capital accumulation requirement by doubling the growth rate in the physical investment-to-GDP ratio over the next five years through higher private and public investment, which would require the implementation of important reforms that are highlighted in this report.



The top three policy reform areas for sustaining high growth and productivity, prerequisites for achieving *Ambisyon Natin 2040*:

Improve market competition through regulatory reforms.

Evidence shows that restrictive market regulations and high costs of doing business are hindering competition in the Philippine economy. Poor domestic competition protects unproductive firms at the expense of more productive ones. It also reduces incentives for firms to innovate and become more productive. Moreover, limited competition in key sectors has sizeable consequences for the economy beyond the direct effects on individual sectors. For instance, lack of competition and incomplete reforms in the telecommunications industry has led to a lack of investment in backbone infrastructure that undermines the productivity of firms in all service sectors.

¹ The plan represents the collective long-term vision and aspirations of the Filipino people and the government in the next 25 years. It envisions a strongly rooted (*matatag*), comfortable (*maginhawa*), and secure life (*panatag na buhay*) for all Filipinos. According to the government, reaching this long-term goal can be judged on concrete changes in household consumption and asset-ownership, including “owning a house and a car and having the ability to send children to college while maintaining a middle-class lifestyle.”

² The Asian Tigers (or Asian Dragons) are made up of Hong Kong, Singapore, South Korea, and Taiwan.



Improve trade and investment climate policies and regulations.

High logistic costs and non-tariff barriers in the Philippines limit competition and reduce competitiveness. Firm-level evidence shows that although less than 10 percent of Filipino firms export, exporting firms are on average more productive than firms that only focus on the domestic market. In addition, the presence of restrictive regulations and policies on foreign investment have prevented faster growth in foreign direct investment (FDI), limiting knowledge spillover. Although firms with foreign ownership are more productive on average than fully domestically owned firms, the share of Philippine firms with foreign capital is less than 10 percent and declining.

Reduce labor market rigidities and costs.

Restrictive labor regulations, including high firing costs, have led to high informality and an increase in temporary employment in the Philippines. Over 75 percent of total employment is informal across sectors, age, and education levels. The incidence of non-regular employment contracts reached about 40 percent of all wage employment in 2013. Informal and non-regular employment contracts imply not only high job turnover but also less on-the-job training and learning, which is a crucial element for productivity growth.

Top 10 policy actions:

- i. Continue to increase competition in the telecommunications, electricity, and transport sectors
- ii. Strengthen the independence and authority of sector regulators (in the telecommunications, energy, and water sectors in particular)
- iii. Streamline burdensome administrative procedures to start new businesses and pay taxes
- iv. Reduce restrictions on foreign investors (e.g., allow foreign competition in sectors and reduce equity limits)
- v. Minimize the use of controlled prices to reduce market distortions
- vi. Reduce trade costs by improving port and logistics infrastructure
- vii. Lower non-tariff barriers, procedural obstacles in particular
- viii. Pursuing more balanced regulations between employees and employers by lowering the costs and simplifying procedures for hiring and firing workers
- ix. Align the minimum wage with workers' productivity by considering the wage level of the informal sector
- x. Make regular employment contracts more flexible

By creating competitive and flexible markets, poverty alleviation is likely to accelerate through more jobs, higher labor productivity, and lower consumer prices. An equal playing field and a regulatory environment that makes it easy to do business encourage firms to enter the market, invest, grow, create jobs, and innovate, leading to higher productivity. Market competition coupled with flexible a labor market and abundant labor supply allows higher productivity to reduce product prices, which increases workers' real income. As a result of more and higher paid jobs, more people will move out of poverty, helping achieve the *AmBisyon Natin 2040* vision of a society free of poverty.

GROWTH DRIVERS IN THE PHILIPPINES SINCE THE EARLY 1980S – KEY LESSONS LEARNED

The Critical Role of Structural Reforms

The Philippines' long-term growth experience confirms the importance of structural reforms. The reforms initiated in the late 1980s and the 1990s played a key role in the country's growth recovery and subsequent acceleration two decades later. They also highlight the existence of a time lag between the implementation and payoff of reforms, as reforms started to have an impact only in the second half of the 2000s. The growth recovery in the late 1990s was driven by trade openness, gradual financial sector opening and deepening, and infrastructure development that boosted the country's external competitiveness. The cumulative effect of past reforms coupled with prudent fiscal and macroeconomic policies resulted in an impressive acceleration of economic growth in 2010-16.

Importance of Macroeconomic Stability for Growth

Another key lesson from the Philippines' historical growth experience is that macroeconomic stability is a necessary (albeit not sufficient) condition for sustained growth. In the 1980s, the country experienced a debt crisis (1983) and multiple coup d'état attempts (1986-1990), leading to growth contracting by 7.6 percent in 1984-85 and a "lost decade" in terms of economic growth. As a result, GDP per capita fell from US\$1,687 in 1980 to US\$1,572³ in 1999. By contrast, the economic recovery of the 2000s was preceded by a restoration of fiscal discipline and a reduction of inflation. Moreover, growth acceleration in 2010-16 coincided with the continuation of macroeconomic stability and favorable external conditions. Greater macroeconomic stability coupled with the implementation of structural reforms in 2000-16 led to a near-doubling of the Philippines' GDP per capita, from US\$1,607 in 2000 to US\$2,753 in 2016.



Large Scope to Boost Growth through Capital Accumulation

There are untapped opportunities to increase growth through higher capital accumulation. The contribution of capital accumulation to economic growth increased substantially in the Philippines when growth accelerated in 2011-16, contributing more than one-third of growth. Yet, capital accumulation is relatively low in the Philippines compared to peers due to low levels of public investment and FDI. The country's capital per worker is also low, less than half of that of Indonesia and Malaysia. Therefore, there are opportunities for the government to accelerate growth by increasing capital accumulation.

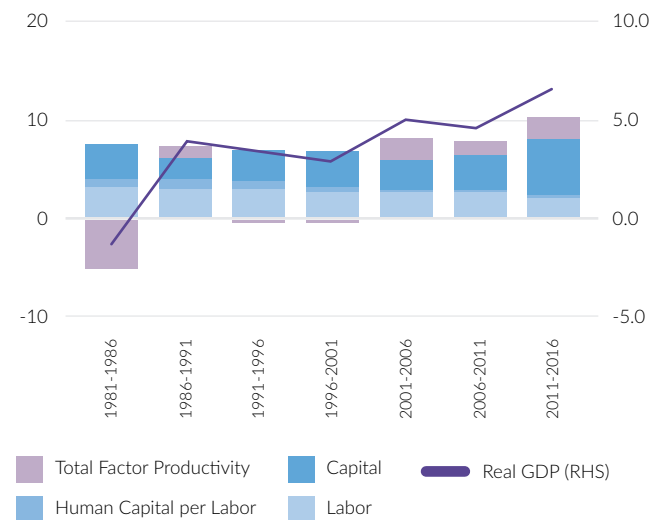
Important Role of Productivity in Accelerating Growth

Sustaining high economic growth in the long term hinges on maintaining high productivity growth through structural reforms. The contribution of total factor productivity (TFP) to economic growth has increased since 2000, mirroring the evolution of the Philippine economy over the last two decades. TFP consistently contributed to growth during the economic recovery and acceleration of the 2000s and 2010s, contributing one-third of growth on average during this period. Furthermore, the contribution of TFP to growth was higher in the Philippines than in regional peers between 1995 and 2010, with the only exception of China. The growth in TFP reflects the implementation of a wide range of structural reforms since the 1990s. While these reforms brought economic growth, they also increased the contribution of TFP to growth.

Although labor productivity growth has accelerated in the Philippines, it remains low compared to that of peers, suggesting an opportunity to increase growth by closing productivity gaps. Labor productivity growth has been consistent with the evolution of the country's TFP growth. It accelerated substantially from an average annual rate of 1.6 percent in 1998-2004 to 3.6 percent per year in 2010-16. However, productivity growth was still lower in the Philippines than in regional peers. For instance, China and Vietnam's labor productivity growth reached 7.6 percent and 4.2 percent, respectively, in 2010-16. As a result, the labor productivity gap remains wide between the Philippines and many regional peers. The country's low labor productivity has been partly caused by historic low levels of capital accumulation, resulting in low capital per worker, which limits labor productivity growth despite higher TFP growth. This represents an opportunity for the Philippines to increase labor productivity growth through higher capital accumulation and sustaining high TFP growth.

Total Factor Productivity's contribution to growth has increased since 2010..

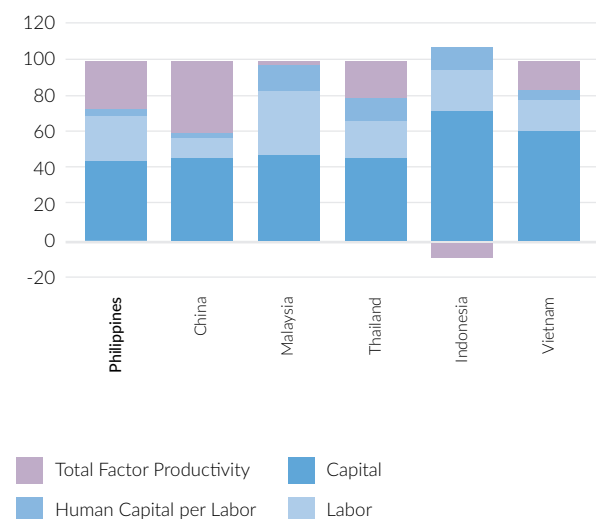
Real GDP Growth and Contributions (Percentage Points)



Source: Staff calculations based on PSA data.

...outperforming many regional peers

Contribution to Growth in the Philippines and Regional Peers, 1995-2010 (Percent)



Source: Staff calculations based on PSA data.

PATTERNS AND DRIVERS OF AGGREGATE PRODUCTIVITY – KEY FINDINGS AND MESSAGES



The rationale for focusing on productivity is threefold. First, productivity growth entails a more sustainable way to increase long-term economic growth compared to capital and labor accumulation, which face diminishing returns to scale. Second, labor productivity has remained the Philippines' main driver of economic growth since 1998, representing 87 percent of per capita value-added growth. Finally, policies aimed at enhancing productivity are also likely to increase investment growth and capital accumulation. This report uses firm-level data to study productivity growth in the Philippines and sheds light on policy directions that could sustain and accelerate productivity growth.

Aggregate labor productivity has grown significantly over the past 20 years. This growth mainly reflects a rise in within-sector productivity growth in manufacturing and services and a small contribution of structural change (i.e., movement of resources from agriculture to other sectors). The contribution of structural change has remained small because most of the labor that moved out of agriculture went to low-end services—a sector with higher average productivity than agriculture but lower average productivity than manufacturing or formal services. The relatively small contribution of structural change to productivity growth in the Philippines makes the country an outlier among regional peers, as structural change played a central role in driving labor productivity growth in countries such as China, Indonesia, Malaysia, and Thailand.

Since within-sector productivity growth has been the main driver of labor productivity in the Philippines, a microeconomic analysis of within-sector productivity dynamics can inform policies that could help the country close the productivity gap with peers.

Manufacturing was the sector with the highest labor productivity growth in the Philippines over the past 20 years, outpacing some regional peers. Labor productivity growth increased from an average of 1.7 percent per year in 1998-2009 to 4.9 percent in 2010-16. This acceleration reflected a transition from textiles, apparel, and paper products to more skill-intensive products such as electronic components and transport equipment. As a result, manufacturing output grew at an impressive average rate of 7.5 percent per year in 2010-16.

There was also a near doubling of labor productivity growth in the service sector in 2011-16. This growth acceleration was led by a rapid rise of labor productivity in formal services such as business process outsourcing and finance. Informal services, while having a lower level of labor productivity than formal services and employing most of the country's unskilled workers (in industries such as wholesale and retail trade) also experienced rapid growth.

In sharp contrast, labor productivity growth in the country's agriculture sector has been low relative to other sectors and regional peers. Between 1998 and 2016, agricultural labor productivity growth averaged 2.1 percent per year in the Philippines, half that of China and Malaysia during the same period. The low productivity in agriculture reflects a host of factors, including a focus of agricultural policy on rice self-sufficiency (which undermines diversification toward higher value-added crops), frequent natural disasters, weakness of institutions that support agriculture, and uncertainties generated by a lengthy and costly agrarian reform that has stymied investment.

There are large regional disparities in labor productivity growth in the Philippines. For example, Luzon's average agricultural labor productivity growth of 4 percent per year in 2011-15 was comparable to that of China—the best

performer in the region. This was in sharp contrast to Visayas where labor productivity decelerated to near zero in the same period. Moreover, Mindanao, the country's largest agricultural region, has experienced only an intermediate level of labor productivity growth. While annual labor productivity growth in manufacturing was an impressive 8.5 percent and 4.9 percent on average in Luzon and Mindanao, respectively, in 2011-15, it declined in Visayas in the same period. Labor productivity growth in Visayas only improved in the service sector, where it tripled in 2006-10 at an annual average rate of 4.8 percent. Labor productivity growth in services also accelerated in Mindanao and Luzon in 2011-15 at an annual average of 3.4 percent and 3.2 percent, respectively.

While labor productivity growth has gradually increased in the Philippines since 1998 and accelerated since 2011, labor productivity remains low compared to that of regional peers. In 2016, the Philippines' aggregate labor productivity was higher than that of Vietnam but less than one-third of Malaysia's, two-third of Thailand's, 69 percent of China's, and 74 percent of Indonesia's. As a result, the country's productivity gap relative to regional peers increased over the past 20 years. While China's level of productivity growth was only slightly higher than that of the Philippines in 1998, China has managed to quadruple its labor productivity, surpassing Indonesia and currently performs almost at par with Thailand. Part of the reason for its labor productivity growth is the Philippines' lower capital per worker relative to regional peers.

Since within-sector productivity growth has been the main driver of labor productivity in the Philippines, a microeconomic analysis of within-sector productivity dynamics can inform policies that could help the country close the productivity gap with peers.

PATTERNS AND DRIVERS OF INDUSTRY – AND FIRM-LEVEL PRODUCTIVITY: KEY FINDINGS AND MESSAGES



There is evidence that policies that provide a conducive environment for firms to grow or export and which welcome foreign equity increase productivity indirectly. Most Philippine firms are small (two-thirds of manufacturing firms and over 80 percent of services firms employ less than 20 workers), not engaged in export activities (less than 10 percent of firms export), and have little access to foreign equity (less than 10 percent of firms have foreign capital). This profile of firms has a bearing on productivity in the Philippines since productivity, whether measured as labor productivity or TFP, is positively correlated with firm size, the share of firm production exported, and foreign capital.

Manufacturing has faced a sizeable but declining misallocation of resources. Productive manufacturing firms face more distortions than less productive firms, resulting in a misallocation of resources that induces a large shortfall of productivity at the industry level. If resources were reallocated efficiently, it is estimated that TFP in manufacturing could be almost double the actual level. Therefore, market reforms aimed at levelling the playing field for firms could have a significant impact on productivity

growth in the Philippines. However, the level of misallocation of resources in the manufacturing sector declined in 2010-2016, as the government implemented various market reforms, including a gradual liberalization of the banking sector and continuous efforts to improve trade. This contributed to a rapid increase in productivity and value-addition in manufacturing during this period, bringing the country's manufacturing productivity more in line with that of regional peers.

In contrast to the manufacturing sector, factor allocation explains only a small part of the productivity in non-manufacturing industries and services. Specifically, factor allocation represents only 12-13 percent of productivity in non-manufacturing sectors and services. Most productivity is determined by within-firm productivity, which is influenced by managerial quality, technology, and innovation. To put this into perspective, the factor allocation explains 51 percent of firm productivity in the United States, which means that most productive firms have larger market shares.

POLICY OPTIONS FOR INCREASING PRODUCTIVITY AND ECONOMIC GROWTH IN THE PHILIPPINES

Government policies that affect how resources are allocated across firms (e.g., allocation of labor and capital) and the efficiency with which firms use resources determine productivity growth. Preferential policy treatment of unproductive firms allows them to remain in operation (or even thrive) and deny market shares to more productive firms that could use the resources more efficiently. Meanwhile, policies that encourage firms to improve their managerial quality, access technology, and innovate, contribute to higher within-firm productivity.

Government policies can therefore be divided into measures that affect the external environment of firms and those that influence firms' internal operations. External factors are mainly related to government policies and market conditions that are outside of the control of individual firms and include:

- the policy environment for competition and private-sector investment;
- trade integration;
- spillover from FDI;
- access to finance and capital allocation; and
- education quality and labor market regulations.

Within-firm determinants are factors that are firm-specific and usually under the control of individual firms, notably innovation and managerial quality.

Improve market competition through regulatory reforms

Strengthening competition is expected to drive productivity growth. Competition can increase productivity by:

- forcing firms to become more efficient to avoid exiting the market;
- ensuring that more productive firms increase their market share at the expense of less productive firms; and
- driving firms to innovate, to develop new products and processes that can lead to improved efficiency.

Market competition is largely determined by regulations that enable or restrict competition.

Restrictive market regulations may be hindering competition in the Philippine economy. Newly available product market regulation data suggest that regulatory restrictions may be limiting competition in key sectors. As a result, competition is perceived to be weak in the Philippines, particularly regarding the extent of market dominance where the country ranks below regional peers.

Limited competition in key sectors of the economy has sizeable implications on output. The effect of regulatory barriers in key service sectors on manufacturing has led to reduced factor allocation efficiency. Results from simulations show that removing restrictions in key service sectors could generate an additional 0.2 percent of GDP per year by increasing the competitiveness of industries that use these services. This is consistent with other findings that demonstrate that restrictions on competition in service sectors have a detrimental effect on productivity across sectors. For example, a duopolistic market structure in the Philippines' telecommunications industry has led to a lack of investment in backbone infrastructure that may be undermining the productivity of firms in all service sectors.

Competition is further undermined by barriers to entry such as the high cost of doing business and limitations for foreign investment in key sectors. The Philippines ranked 171st out of 190 economies on the ease of starting a business in the World Bank's 2017 Doing Business report. Incumbent firms are especially protected by high entry barriers in network sectors. Moreover, investment restrictions for foreign firms limit market contestability, especially in capital-intensive sectors such as infrastructure, and reduce the inflow of FDI. As a result of high entry costs and barriers, unproductive firms do not exit the market, which leads to lower aggregate productivity growth.

Priority policy recommendations in this area include:

- continuing to increase competition in the telecommunications, electricity, and transport sectors;
- strengthening the independence and authority of sector regulators (in the telecommunications, energy, and water sectors in particular);

- streamlining burdensome administrative procedures to start new businesses and pay taxes;
- reducing restrictions on foreign investors (e.g., allow foreign competition in sectors and reduce equity limits); and
- minimizing the use of controlled prices to reduce market distortions.

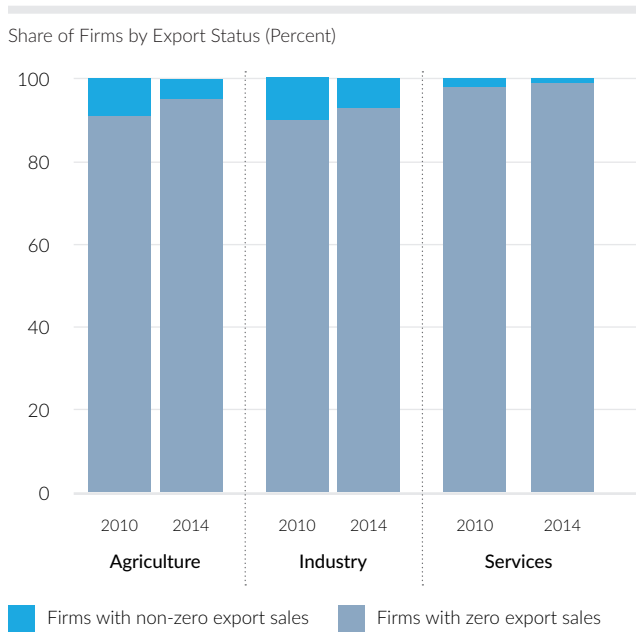
Improve trade and investment climate policies and regulations

While the Philippines has lowered its tariffs, its non-tariff barriers and trade costs remain higher than that of regional peers. The country has a liberalized trade regime, reflected in its low most-favored-nation tariff of 6.3 percent in 2016, the lowest among peers. However, the Philippines’ trade openness, measured as the share of total trade to GDP, declined from 98.7 percent in 1998 to 64.9 percent in 2016.

This was partly due to high trade costs and the presence of non-tariff measures. Trade costs include the burden of government regulations, the quality of infrastructure, and the burden of customs procedures. Non-tariff measures are mostly related to administrative procedures imposed by the government, which have become an increasingly important obstacle to trade in the Philippines.

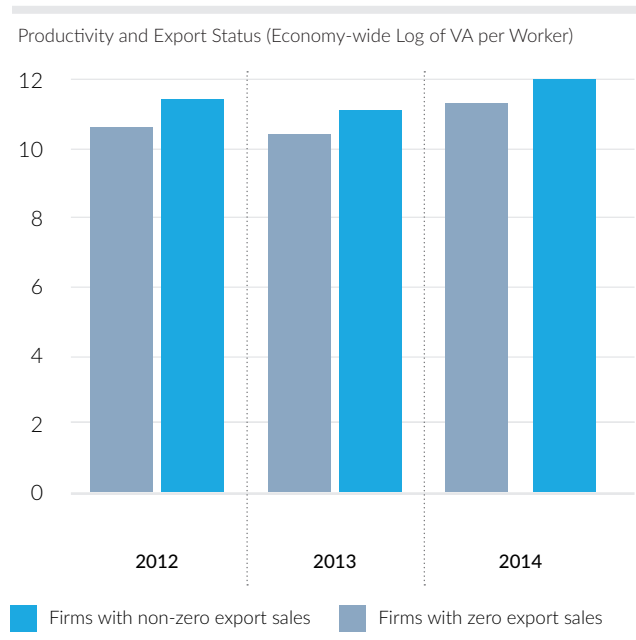
Although the share of exporting firms remains small across sectors, they are on average more productive than firms that focus on the domestic market. Firm-level data show that less than 10 percent of firms in the Philippines are engaged in export activities, and this share has been declining in recent years. Yet, firms that export at least part of their sales abroad are on average more productive than firms that sell only to the domestic market. This is likely because firms that export face more competition in the global market, which likely forces them to become more productive.

The share of firms that export declined in the Philippines in 2010-14.



Source: Staff calculations based on PSA data.

Firms that export are on average more productive than firms that focus on the domestic market.



Source: Staff calculations based on PSA data.

While net FDI in the Philippines has been increasing since 2000, it remains low relative to peers. FDI averaged 1.7 percent of GDP each year in 2011-16, lower than both the structural peer average of 2.2 percent and the regional peer average of 3.2 percent. Moreover, direct equity investment represents less than half of total FDI in the Philippines, and its share has not increased in recent years (0.8 percent of GDP in 2005 and 0.7 percent of GDP in 2016), limiting knowledge spillovers.

Philippine firms with foreign ownership are on average more productive than domestically owned firms. Firm-level evidence shows that less than 10 percent of all firms in the

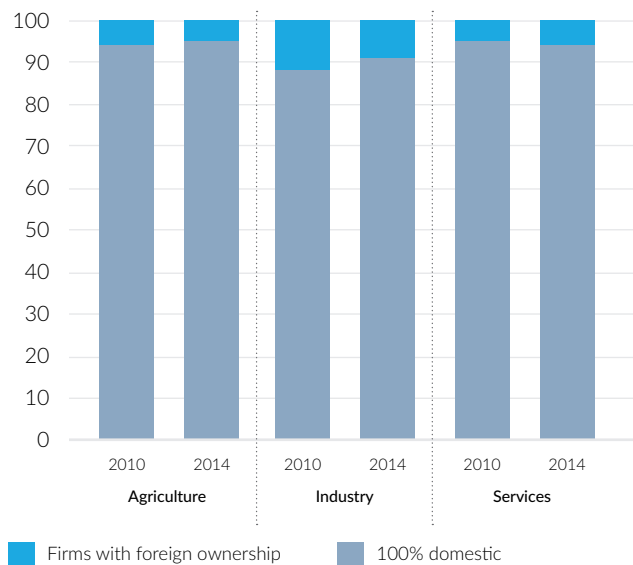
economy have some foreign ownership, with most foreign owners in industry, although their share has declined in recent years. Regardless of the sector, firms with foreign capital are more productive than firms with only domestic capital. In addition, firm productivity tends to increase with more foreign ownership.

Priority policy recommendations in this area include:

- minimizing restrictions on foreign investors;
- reducing trade costs by improving port and logistics infrastructure; and
- continuing to lower non-tariff barriers, procedural obstacles in particular.

Share of firms with foreign ownership remains small.

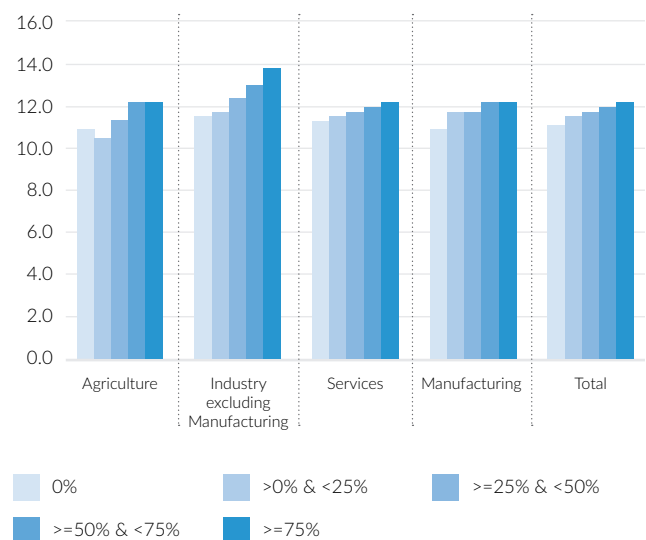
Composition of Firm Ownership by Sector (Percent)



Source: Staff calculations based on PSA data.

Foreign ownership is correlated with higher productivity.

Productivity by Degree of Foreign Ownership and Sector (Log of VA Per Worker, 2014)



Source: Staff calculations based on PSA data.

Create an enabling environment for innovation

The country's innovation infrastructure is of poor quality. In 2017, the World Economic Forum ranked the Philippines 74th out of 137 countries on the availability of scientists and engineers and 75th on the availability and quality of research capital, lower than most peers. Similarly, the availability of information technology infrastructure, such as mobile subscriptions and internet access, was lower in the Philippines than in many regional peers while its cost was higher. Market dominance and business regulations are also not conducive to creating an enabling environment for innovation, as uncontested markets with high profit margins provide little incentives for innovation and productivity growth. Finally, the country's low level of trade openness and FDI limits knowledge spillover.

As a result, Philippine firms underperform their foreign peers in adopting existing technologies. The Philippines ranked 73rd out of 128 countries on the 2017 Global Innovation Index, behind all regional peers. Philippine firms are less likely to adopt existing technologies than firms in peers. For instance, only 8.8 percent of firms in the Philippines have internationally recognized quality certifications and only 11.2 percent of firms use technology licensed from foreign companies, lower than in most peers. In addition, the country only spends 0.1 percent of GDP on research and development, compared to an average of 0.9 percent and 0.4 percent of GDP among regional and structural peers, respectively.

High costs, lack of funds, and market dominance are the top factors that prevent firms from innovating in the Philippines. Firms point to the high cost of innovation as the primary factor that prevents them from engaging in innovative activities in the country, followed by a lack of funds from both within firms and external sources. Market dominance and the lack of qualified personnel are also important factors that hamper innovation, especially among smaller firms.

Priority policy recommendations in this area include:

- increasing human capital suitable for innovation;
- improving the quality and reducing the cost of the country's information technology infrastructure;
- increasing market competition;
- reducing barriers to FDI;

- enhancing government support for innovation; and
- increasing awareness among firms about existing government programs that support innovation.

Reduce labor market rigidities and cost

A flexible labor market supports productivity growth by allowing factors of production to move freely across firms and sectors. In an environment without distortions, firms with high productivity growth would be absorbing labor and capital from firms that are less productive. Evidence shows that the Philippines has more restrictive labor market regulations, and these have likely impeded the efficient allocation of labor to the most productive firms.

Restrictive labor regulations have led to high informality in the Philippines. The Doing Business' ease of hiring and firing index ranks the Philippines as 77th out of 137 countries, which makes the country's labor market more restrictive than that of most peers. In addition, minimum-wage and redundancy costs are very high in the Philippines relative to peers. As a result, informal employment represents over 76 percent of the country's total employment. High informality is present across the age, level of education, and sector of workers. Informal employment does not provide protection to workers and tends to provide less training. As a result, on-the-job training and learning is limited, preventing faster productivity growth.

Moreover, high dismissal costs have led to an increase in temporary employment. The dismissal of an employee with a regular employment contract involves a long administrative process in the Philippines. This has led to an increase in non-regular employment, which reached about 40 percent of all wage employment in 2013. Workers under non-regular contracts have less employment security, receive lower wages, and their turnover is expected to be higher.

Priority policy recommendations in this area include:

- lowering the cost of firing by simplifying dismissal procedures and lowering redundancy costs;
- aligning the minimum wage with workers' productivity by considering the wage level of the informal sector; and
- making regular employment contracts more flexible by linking severance pay with tenure.

THE STAKES: REFORMS TO ACHIEVE THE AMBISYON NATIN 2040

The current administration has adopted a long-term growth vision called *AmBisyon Natin 2040*. It represents the collective long-term vision and aspirations of the Filipino people and envisions the country as a prosperous middle-class society free of poverty by 2040. The government's goals are based on a set of household consumption and asset-ownership targets. For a family of four, this level of consumption translates into an estimated gross monthly income of Php120,000 by 2040.

Central to this long-term vision is high, sustainable, and inclusive economic growth that will depend on sustained productivity growth. The Philippines will need to reach a per capita GDP of about US\$9,350 by 2040 to meet the goals set out in the *AmBisyon Natin 2040*, which is more than three times the current level of US\$2,892. This implies that the Philippine economy needs to grow at an annual average of 6.5 percent in the next 22 years—a challenge that only the Asian Tigers⁴ and China have managed to accomplish in the past.

To evaluate and assess ways to achieve the growth target by 2040, a long-term growth model is used. The model assesses various growth scenarios and the potential mix of growth drivers needed to reach the government's goals. A baseline scenario was created based on the premise that key growth drivers such as labor, human capital, investment, and technology sustain their historical growth rates. Various scenarios were then created relative to this baseline, and growth rates of select variables were adjusted to assess the most realistic combination that will help the country achieve the *AmBisyon Natin 2040*.

The first key finding is that sustaining high TFP growth will be crucial to achieve the GDP per capita target by 2040. Results show that the GDP per capita target can be reached if the

Philippines manages to sustain a TFP growth rate of 1.8 percent per year for decades to come, which is lower than the annual average of 2.2 percent in 2011-16. However, this will be a challenge, as experiences from other countries, such as the fast-growing Asian Tigers and China, show that sustaining high TFP growth for a long period is possible but requires continuous efforts to remove constraints and distortions in the markets.

The second key finding is that accelerating capital accumulation in the medium term will also be critical for achieving the GDP per capita target. This will require the investment-to-GDP ratio to grow by 3.0 percent per year until 2022 (through public and/or private investment) followed by the historical annual rate of 0.8 percent until 2040. This will result in an investment-to-GDP ratio of 33.6 percent of GDP in 2040, higher than the average of many peers. This level of capital accumulation will require a TFP growth rate of 1.5 percent per year to achieve the GDP per capita target by 2040.

This report highlights a number of policies that are essential to sustaining high TFP growth in the Philippines. Primarily, the government needs to improve innovation, market efficiency, education, infrastructure, and governance.⁵ In particular, improving the country's ranking on the innovation index to the level of China would have the largest positive impact on TFP growth, as it would lead to an annual average TFP growth rate of 2.1 percent in 2017-40. Moreover, an improvement on the market-efficiency index to the level of Malaysia would result in an average annual TFP growth rate of 2.0 percent. Finally, improvements on the education, infrastructure, and governance indexes to the level of the best performers in the region would increase TFP growth by an average of 1.8-2.0 percent per year for each determinant (given the rest are held constant).

⁴ Asian Tigers (or Asian Dragons) are made up of Hong Kong, Singapore, South Korea, and Taiwan.

⁵ Voice and accountability, corruption control, government effectiveness, political stability, regulatory quality, and rule of law.

IMPLICATIONS FOR POVERTY REDUCTION



Productivity growth will help to accelerate poverty reduction by creating more well-paying jobs. The poverty reduction that occurred in the Philippines between 2006 and 2016 was driven by an increase in wage income, a movement of labor out of agriculture, and a rise in government transfers and remittances.⁶ An increase in productivity would raise wages and create new jobs, contributing to poverty reduction. Productivity growth in sectors that have low productivity such as agriculture will play a larger role in poverty reduction, as it will primarily benefit the poor and vulnerable population. Furthermore, accelerating structural change (i.e., movement of labor out of agriculture) will also contribute to faster poverty reduction because productivity (and thus wages) are on average higher in non-agriculture sectors.

Improving the link between labor productivity and real wage growth will also be critical to reduce poverty. Real wages have been stagnant in the Philippines despite labor productivity improvements. Aggregate real wages remained flat in 2001-16, with real wages falling in 7 out of 15 years. Meanwhile, labor productivity increased by 57 percent in the

same period. Except for public workers, this pattern of stagnant real wages and increase productivity growth is consistent across employees' level of education, work status (permanent or short-term contracts), and class of work (private household, private establishment, or family operated). It also holds true across sectors (agriculture, industry, or services). Therefore, the government's poverty alleviation policies need to achieve an increase in real wages as a result of increases in labor productivity.

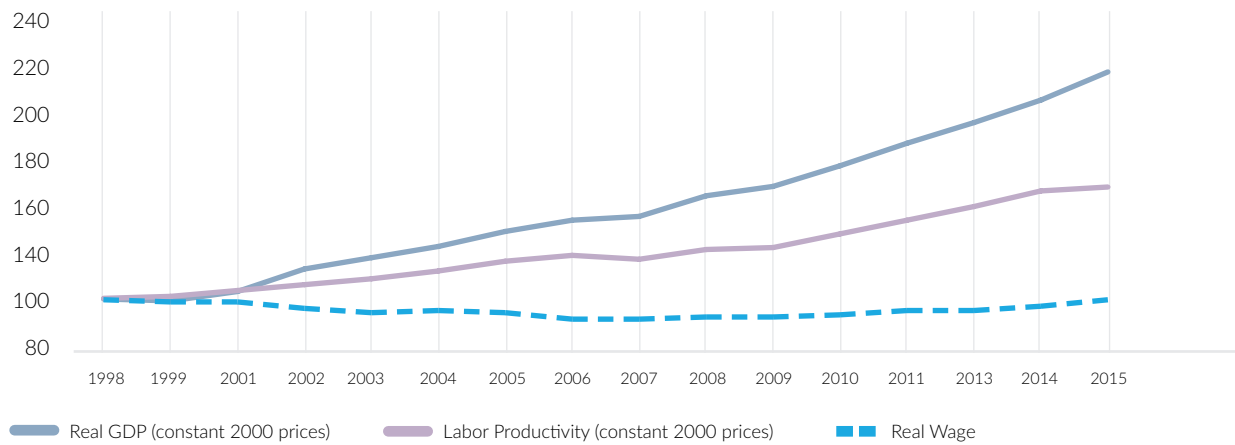
A lack of product market competition is likely contributing to real wage stagnation in the Philippines. There is an abundant labor supply in the country, and the labor market is de-facto flexible due to high informality. However, product markets are not competitive in many sectors, and many markets suffer from high entry costs. As a result, productivity gains are not reflected in the real wage but rather in profit, which is consistent with the increasing share of capital in national income. In addition, there is little incentive for firms to innovate (which would lead to better paying jobs) in uncontested markets with high profit margins.

An inability to create well-paying jobs and lift real wages is likely to further encourage emigration, limiting productivity growth. Productivity growth requires a process of efficiently combining human and physical capital. However, over 15 percent of the Philippines' total labor force emigrates each year, higher than in many peers. More than half of all emigrants are under the age of thirty and hold college

or higher degrees. This human capital flight features a vicious cycle of high emigration due to limited domestic job opportunities, which leads to an insufficient supply of skilled workers for firms to expand and grow. It is therefore crucial for authorities to increase both productivity and real wage growth by encouraging greater market competition.

Real wages have remained flat despite rising GDP and productivity growth.

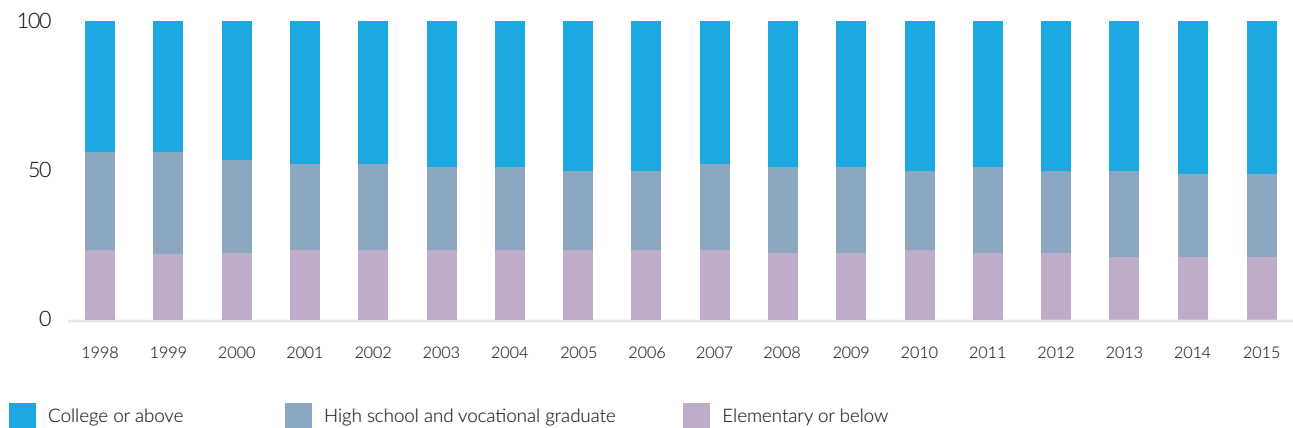
Growth Trends (Year 2001 = 100)



Source: PSA data

A large share of Philippine migrants is highly educated.

Share of Registered Filipino Emigrants by Educational Attainment prior to Migration (Percent)



Source: PSA data

SUMMARY OF KEY POLICY OPTIONS FOR BOOSTING PRODUCTIVITY AND GROWTH⁷

Reforms area	Suggested policy
Improve market competition through regulatory reforms	Continue to increase competition in the telecommunications, electricity, and transport sectors
	Strengthen the independence and authority of sector regulators (in the telecommunications, energy, and water sectors in particular)
	Streamline burdensome administrative procedures to start new businesses and pay taxes
	Reduce restrictions on foreign investors (e.g., allow foreign competition in sectors and reduce equity limits)
	Minimize the use of controlled prices to reduce market distortions
Further improve trade and investment policies and regulations	Minimize restrictions on foreign investors
	Reduce trade costs by improving port and logistics infrastructure
	Reduce non-tariff barriers, procedural obstacles in particular
Create an enabling environment for innovation	Increase human capital suitable for innovation
	Improve the country's information technology infrastructure and reduce its cost
	Increase market competition
	Reduce barriers to FDI
	Enhance government support for innovation
	Increase awareness among firms about existing government programs that support innovation
Reduce labor market rigidities and costs	Pursuing more balanced regulations between employees and employers by lowering the costs and simplifying procedures for hiring and firing workers
	Align the minimum wage with workers' productivity by considering the wage level of the informal sector
	Make regular employment contracts more flexible

⁷ These policy options focus on reforms to boost industry-level and within-firm productivity. These should be complemented by agriculture reforms to boost agriculture productivity and reforms to accelerate structural change.

01

Drivers of Philippine Growth Since the Early 1980s

This chapter provides a historical perspective of the Philippines' growth performance, reviews past growth-enhancing reforms, and identifies the drivers of economic growth. The country has recently emerged as one of the top growth performers in the dynamic East Asia region (Figure 1). To identify and understand the underlying sources of growth in the Philippines, this chapter will perform a growth diagnosis that will quantify the role of structural reforms, stabilization policies, external conditions, and persistence in the country's growth performance.

This chapter also assesses the role of factor accumulations and total factor productivity (TFP) in economic growth. Growth occurs when there is an accumulation of either

capital or labor and/or when these inputs are used more efficiently. Although countries often experience growth through factor accumulation at an early stage of development, it is an unsustainable source of economic growth in the long run since capital and labor face diminishing returns. Therefore, TFP is considered important for long-term growth, and it is associated with how well a country harnesses its physical and human capital through technology adoption, product innovation, the sharing of know-how between firms and sectors, and the mobility of workers. A growth-accounting exercise is also performed to quantify the relative contribution of factor accumulations and TFP to economic growth.

PROGRESS ON ECONOMIC GROWTH AND POVERTY REDUCTION

The Philippines has become a strong growth performer since 2010, as the government implemented business-friendly reforms and the external environment improved. The country's volatile macroeconomic and political environment in the 1980s resulted in low and highly volatile growth rates that averaged 2.5 percent per year in 1980-1997,⁸ much lower than the average of 4.6 percent among structural peers and 7.6 percent among regional peers in the same period.^{9,10,11} However, the Philippines experienced relatively high economic growth between 1998 and 2009, as the government implemented trade, investment, and privatization reforms in the late 1980s and the 1990s. Moreover, economic growth benefited from a commitment by the government to strengthen macroeconomic stability. Favorable domestic and external conditions allowed economic growth to accelerate to an average annual rate of 6.3 percent in 2010-2016, surpassing the average of both structural and regional peers.

While impressive economic growth over the past decades has reduced poverty, progress in poverty alleviation has been slower in the Philippines than in peers. Past economic growth has benefited low-income households more than the average household in the Philippines, as the income of the bottom 40 percent of the population grew by an average of 2.9 percent each year in 2006-16, faster than the annual average of 1.6 percent for the entire population (Figure 3). As a result, poverty incidence in the Philippines fell from 41.7 percent in 2006 to 33.7 percent in 2015. However, the country's rate of poverty reduction was lower than that of most regional and structural peers (Figure 2. Poverty reduction has been slower in the Philippines than in peer countries.). For example, Vietnam lifted 59.2 percent of its population out of poverty in 2002-14, compared to only 9.5 percent in the Philippines in 2000-15. In addition, income inequality has remained stubbornly high in the Philippines, as its GINI coefficient remained at 0.4 in 2015, one of the highest among peers. Nevertheless, the Philippines was one of the most successful countries in reducing income inequality among peers in the last twenty years (Figure 4).

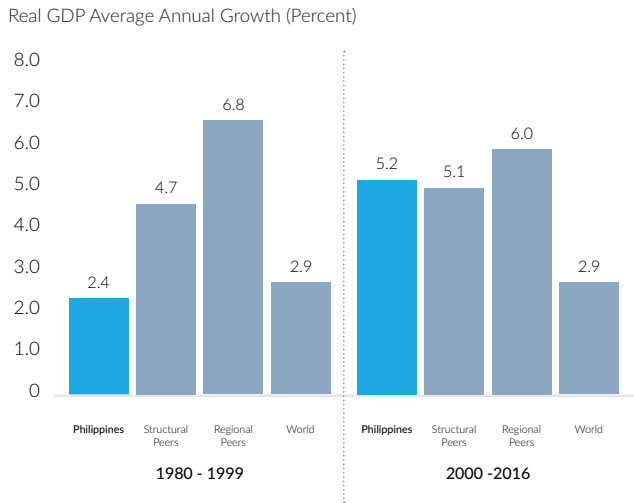
⁸ The Philippines experienced a debt crisis in 1983 that led to an economic contraction of 7.6 percent in 1984-85; multiple coup d'état attempts in 1986-90 that led to the 1991 recession; and the Asian financial crisis in 1997 that resulted in a 0.6 percent contraction in economic growth in 1998.

⁹ Bangladesh, Kenya, Morocco, Pakistan, Sri Lanka, and Vietnam are defined as the Philippines' structural peers based on the following criteria: a) they are lower-middle-income countries; b) their natural resource exports are lower than 20 percent of total exports; c) they score above average on the Natural Disaster Risk Index; d) each country's population is above 20 million; e) they are all oil importers; f) their exports are not concentrated according to the Herfindahl index; and g) they are not landlocked countries, small states, or fragile states. China, Indonesia, Malaysia, Thailand, and Vietnam are identified as regional peers.

¹⁰ The regional peer average, with the exception of China, was 5.0 percent over the same period.

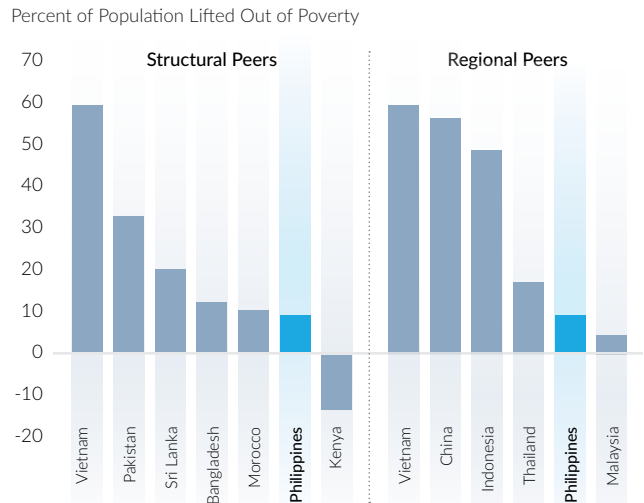
¹¹ The Philippines' growth volatility in the 1980s was five times the average of structural and regional peers, while growth volatility was around the average of structural peers but higher than the average of regional peers in subsequent decades (Figure A1 and A2 in Appendix 1).

Figure 1. While the Philippines' GDP growth has lagged behind that of peers, it has improved over the past two decades.



Source: World Development Indicators (WDI).

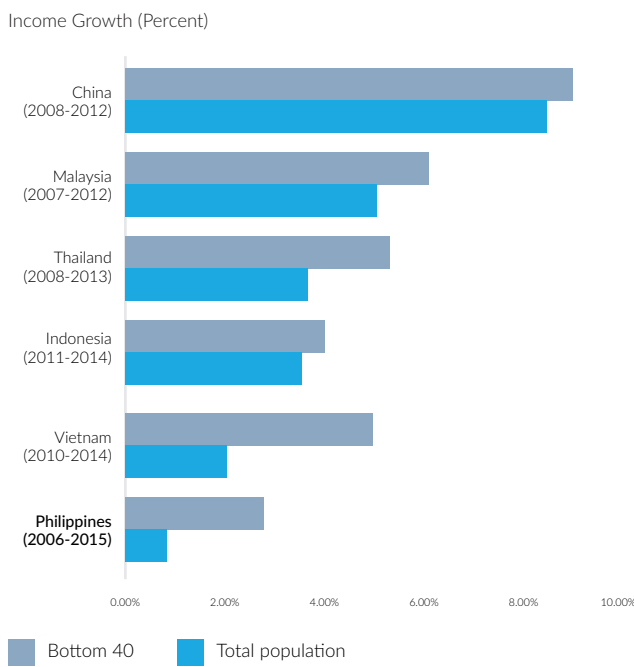
Figure 2. Poverty reduction has been slower in the Philippines than in peer countries.



Source: WDI.

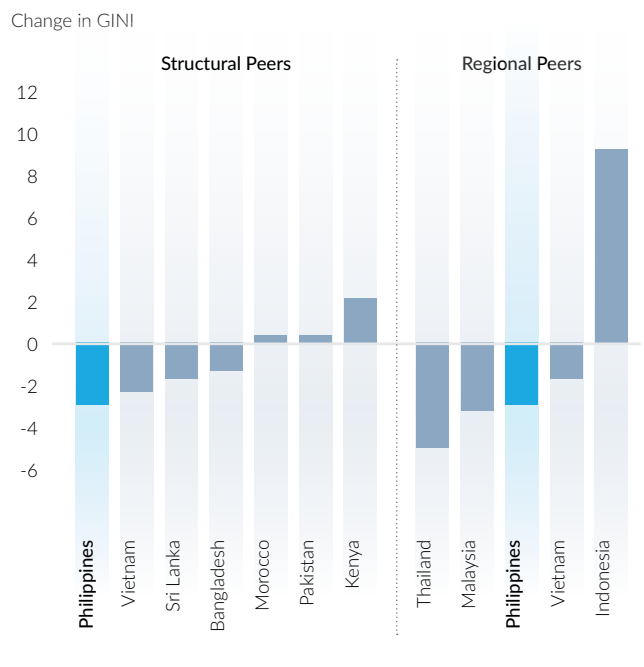
Note: Period coverage varies by country.¹²

Figure 3. While low-income households gained more growth than the average household, income growth of low-income households was faster in peers.



Source: Staff calculations using the EAPOV database.

Figure 4. However, the Philippines was successful in reducing inequality compared to peers...



Source: WDI.

Note: Period coverage varies by country.

¹² Vietnam (2002-14), Pakistan (2001-13), Sri Lanka (2002-12), Bangladesh (2000-10), Morocco (2000-06), Philippines (2000-15), Kenya (1997-05), China (1999-2013), Indonesia (2000-13), Thailand (2000-13), and Malaysia (1997-2009).

GROWTH DETERMINANTS: REFORMS AND EXTERNAL FACTORS

Understanding the drivers of economic growth in the Philippines is crucial for the country to continue to pursue policies aimed at improving long-term growth and shared prosperity. Over the past decade, during a period of relative political and macroeconomic stability, the country successfully pursued policies and reforms that accelerated economic growth and achieved more inclusive growth. To understand the factors that drove economic growth in the Philippines, a regression analysis on a standard neoclassical growth model for a sample of 126 countries covering the period 1970-2015 was performed. It examined if a

country's growth was due to transitional convergence (i.e., the economy's reversion to its own steady state), structural reforms (i.e., outcomes from public policies aimed at changing the structure of the economy), stabilization policies (i.e., outcomes from public policies aimed at stabilizing prices and combating crises), and/or external conditions (i.e., factors outside the domestic economy that impact its performance in both the short and the long run). Box 1 describes the variables used for each determinant of growth in the econometric model.

Box 1. Estimation Method

The econometric model builds on the previous work of Loayza et al. (2005) and Araujo et al. (2014), in which the key econometric equation estimates the change in the natural logarithm of real GDP per capita between two periods related to the lagged level of the natural logarithm of GDP per capita and a set of growth determinants. The set of growth determinants and the variable used as proxy are the following:

Transitional Convergence:

- Real purchasing power parity (PPP) GDP per capita in the previous year.

Structural Reforms

- Schooling: secondary enrolment.
- Financial development: ratio of domestic credit to the private sector as a percent of GDP.¹³
- Trade openness: ratio of exports plus imports over GDP adjusted for a country's population size.¹⁴
- Government burden: ratio of government consumption to GDP.
- Telecommunications infrastructure: number of telephone lines per capita.

- Political institutions: Polity2 score, which measures the degree of political constraints, political competition, and executive recruitment in the country. Higher values denote more democratic institutions.

Stabilization Policies:

- Real exchange rate: the natural logarithm of the GDP price level divided by the nominal exchange rate.
- Inflation: consumer price inflation rate.
- Financial crisis: an indicator of systemic banking crises.

External Conditions:

- Terms of trade growth: the changes in the net barter terms of trade index.
- Commodity export growth index: the change in the International Commodity Export Price Index.

¹³ Using the ratio of domestic credit to the private sector as percent of GDP as proxy for financial development has certain caveats, as the ratio may increase or decrease due to not just structural changes in the economy but also due to fluctuations in the business cycle. To avoid accounting for business cycle fluctuations, 5-year averages are used in the model for all variables.

¹⁴ Using the ratio of total trade over GDP as a proxy for trade openness comes with the caveat that total trade is impacted by several external factors, such as global growth and terms of trade, and other exogenous events which cannot be attributed to a country's policy reforms. To avoid accounting for business cycle fluctuations, 5-year averages are used in the model for all variables.



The Lost Decade: The 1980s

The Philippines experienced subpar economic growth in the 1980s. This was primarily due to the country's long history of macroeconomic mismanagement and political instability that culminated in the 1983 external debt crisis (Figure 5 and Figure 6). The crisis resulted in the Philippines' worst post-war recession, with the economy contracting by 7.3 percent year-on-year in 1984 and 1985. During the 1980s, economic growth in the Philippines averaged 2.0 percent annually, significantly less than the average of 6.6 percent for regional peers and 4.7 percent for structural peers.¹⁵ By contrast, the 1980s was a period of significant progress and economic growth for the countries that were part of the "East Asian Miracle"¹⁶ resulting in the Philippines being left behind in terms of economic growth and poverty alleviation.

In the 1980s, neither structural reforms nor macroeconomic stabilization policies played a role in driving economic growth in the Philippines (Figure 7). During this period, growth was primarily driven by transitional convergence, as the Philippines failed to successfully implement structural reforms and macroeconomic stabilization policies.¹⁷

In fact, overall structural reform policies in the 1980s had a negative impact on growth, as the reduction in government burden and the improvement in infrastructure and trade openness had a limited impact on growth while financial development contributed negatively to growth (Figure 8). This was primarily a result of a weak reform effort and lack of progress in implementing key structural reforms. As the 1980s was a period of severe political and macroeconomic instability, Philippine authorities focused less on structural reform policies (Box 2).

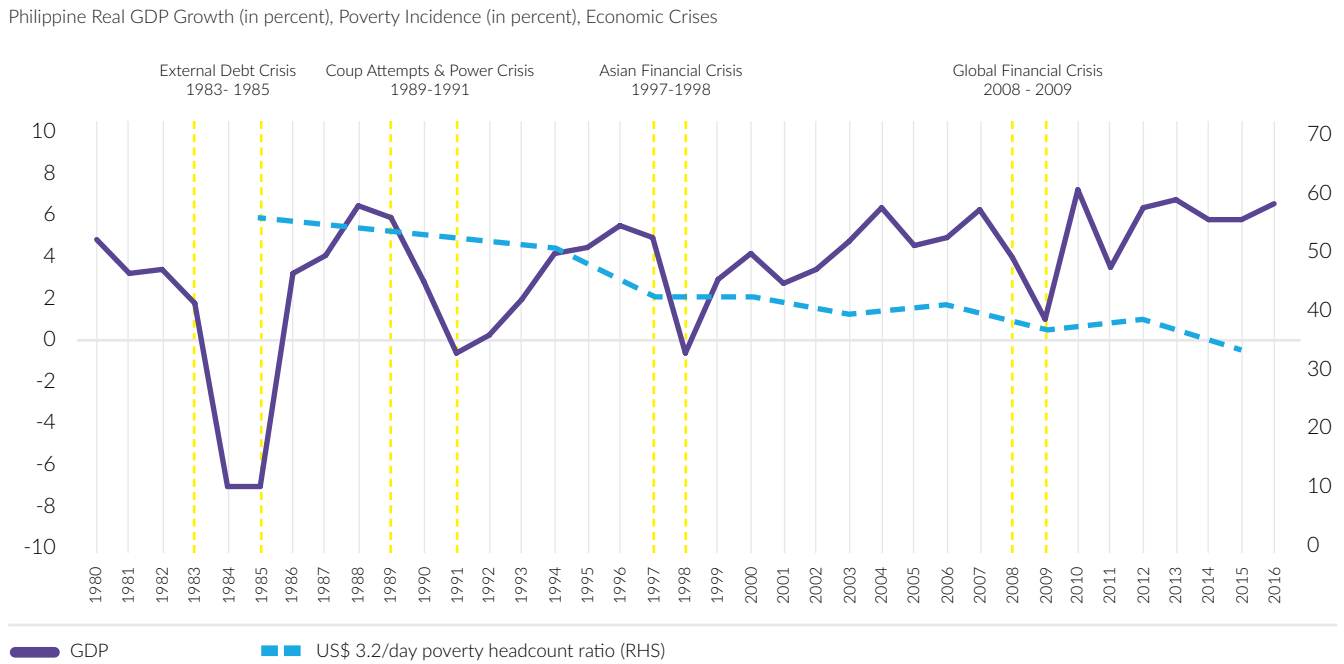
As a result, the Philippines benefited the least from structural reforms to increase economic growth during the 1980s relative to peers. The country's structural reforms had the lowest impact on growth compared to regional peers and the second lowest compared to structural peers (Figure 9). For example, the growth contribution of structural reforms in Malaysia exceeded that of the Philippines by nearly 3 percentage points per year during the 1980s, while structural reforms in the Philippines contributed negative 0.1 percentage points per year in the same period. Moreover, the Philippines' stabilization policies had no impact on growth, whereas some peers did benefit from their stabilization policies (Figure 10).

¹⁵ Using WDI for real GDP growth.

¹⁶ "East Asia Miracles" refers to Hong Kong, Singapore, South Korea and Taiwan.

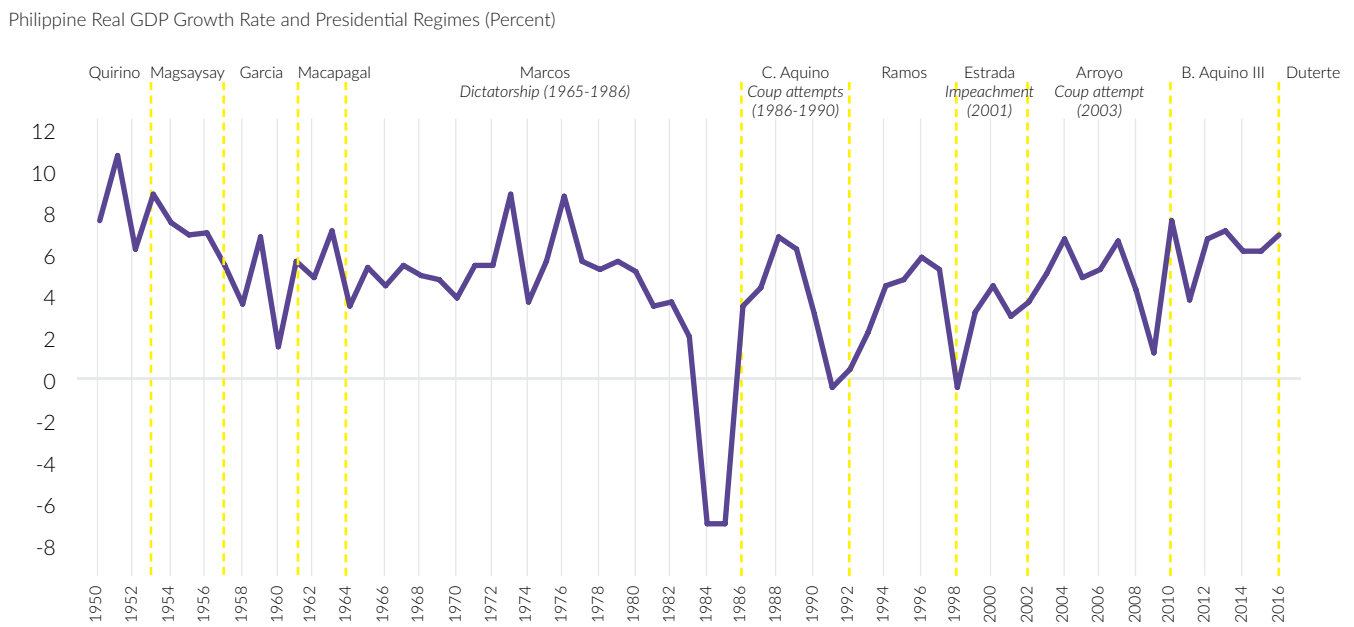
¹⁷ The Philippines' attempts at adopting structural reform policies in the late 1970s and the early 1980s were largely unsuccessful. For example, the Philippine government's initiatives under the International Monetary Fund's Extended Fund Facility was largely unsuccessful in the late 1970s. Further reforms were initiated in the 1980s that targeted trade policy through the Philippines' three-phased Tariff Reform Program (TRP), but it was suspended in 1983.

Figure 5. The Philippines' volatile growth patterns were a product of numerous economic crises..



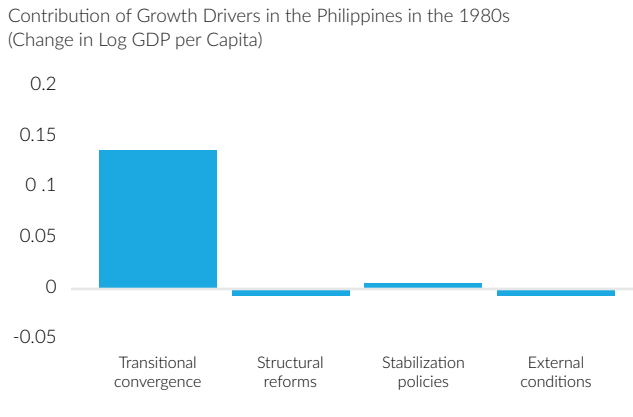
Source: Philippine Statistics Authority (PSA) and WDI.

Figure 6. ...as well as political uncertainty.



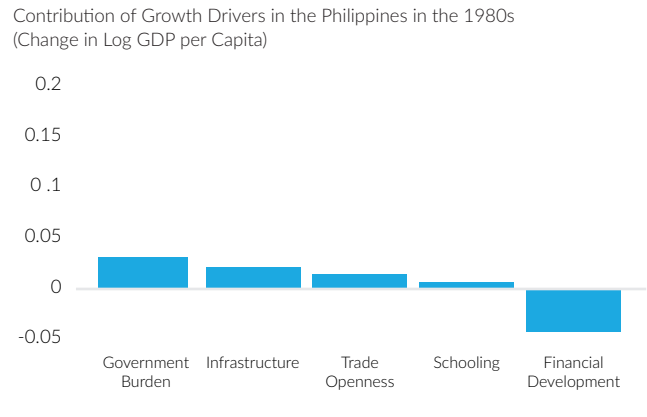
Source: PSA.

Figure 7. Structural reforms contributed negatively to growth in the 1980s.



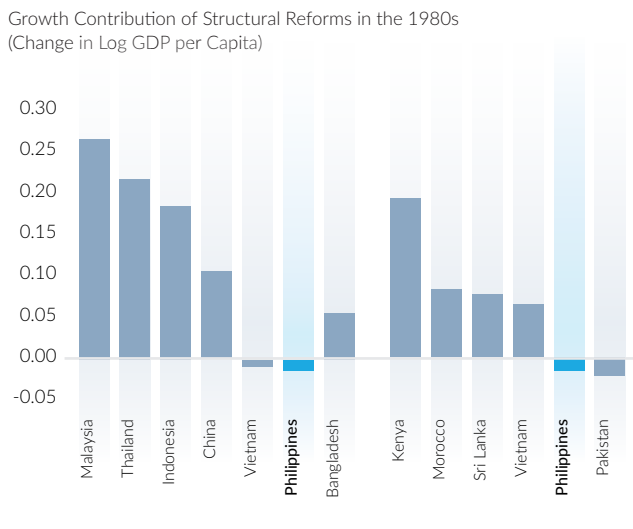
Source: Background paper prepared for this report by Brueckner (2017).

Figure 8. Reduction in government burden, improved infrastructure, and trade openness were the most important reforms in the 1980s.



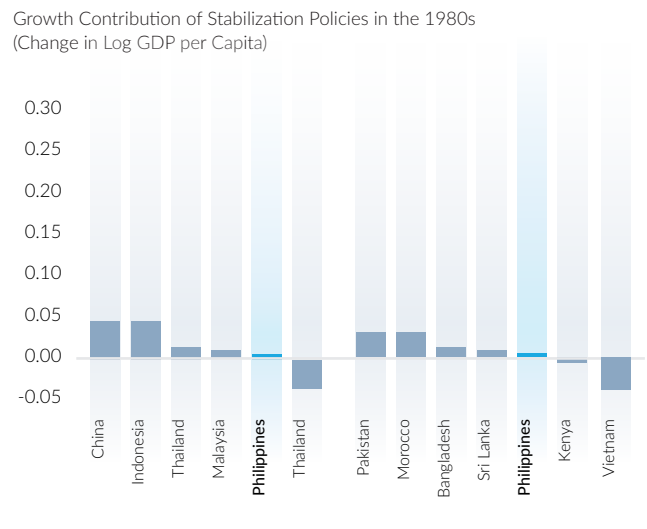
Source: Background paper prepared for this report by Brueckner (2017).

Figure 9. The Philippines lagged behind peers in terms of the contribution of structural reforms to growth in the 1980s...



Source: Background paper prepared for this report by Brueckner (2017).

Figure 10. ...as well as in terms of the contribution of stabilization policies to growth.



Source: Background paper prepared for this report by Brueckner (2017).

Improving Macroeconomic Stability and Initiating Structural Reforms: The 1990s

Growth started to recover in the 1990s. Economic growth in the Philippines accelerated slightly in the 1990s, averaging 2.8 percent per year, compared to an average annual rate of 2.0 percent in the previous decade. Yet, growth was still subpar compared to the average of both structural (4.5 percent) and regional (6.8 percent) peers. The growth acceleration was primarily the result of structural reforms, as the government pursued policies aimed at improving the Philippines' trade and investment openness, domestic competition environment, and financial development (Box 2).

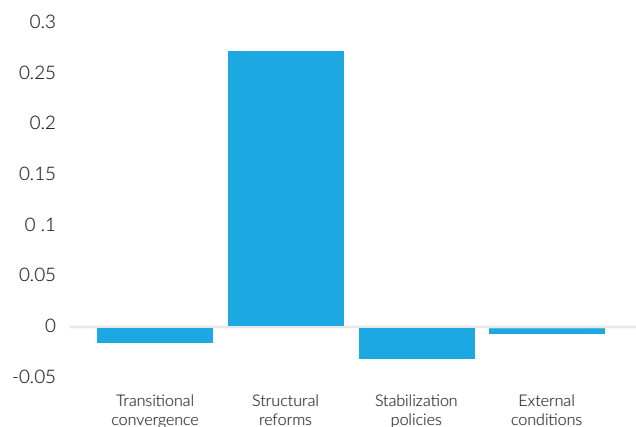
Structural reforms played a key role in the growth recovery of the 1990s, establishing the underpinnings for strong growth in the succeeding decades (Figure 11). During the late 1980s and into the 1990s, the Philippine government pursued reforms aimed at liberalizing the trade regime through the continuation of the country's unilateral tariff reform program (TRP), the TRP II in 1991-95, and the TRP III in 1996-2001. To increase competition in the domestic

economy, the government pursued policies that liberalized foreign direct investment (FDI) in some sectors and opened up several industries to increase competition (e.g., the financial, air transport, oil, power, and telecommunications industries). This led to improvements in infrastructure, financial development, and trade openness (Figure 12). Meanwhile, stabilization policies, transitional convergence, and external conditions had a limited impact on growth during the decade.

The impact of structural reforms on economic growth was smaller in the Philippines than in regional peers, although they had a bigger impact relative to structural peers (Figure 13). While structural reforms had a larger impact on growth in the Philippines during the 1990s compared to the previous decade, growth-enhancing structural reforms benefitted the country less than they did regional peers. Stabilization policies had a negative contribution to growth in both the Philippines and most regional peers, partly because of the Asian financial crisis in 1997, which caused a sharp decline in currency valuations and stock and asset prices, a steep rise in interest rates, and a contraction in the real sector.

Figure 11. Structural reforms boosted growth in the 1990s...

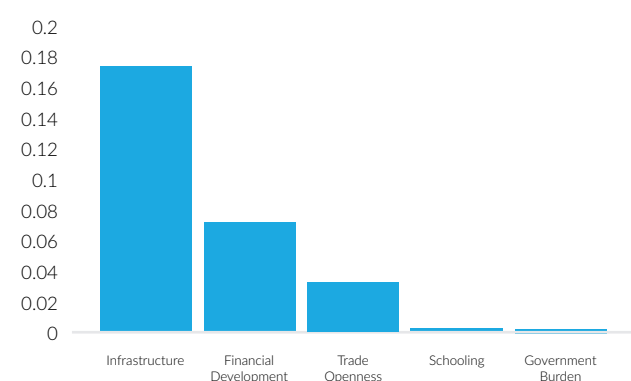
Contribution of Growth Drivers in the Philippines in the 1990s (Change in Log GDP per Capita)



Source: Background paper prepared for this report by Brueckner (2017).

Figure 12. ...especially in terms of infrastructure and financial development.

Growth Contribution of Structural Reforms in the 1990s (Change in Log GDP per Capita)



Source: Background paper prepared for this report by Brueckner (2017).

Box 2. Key Structural Reforms Since the 1980s

The 1980s

- In the mid-1980s to the late 1990s, the Philippines pursued a series of trade liberalization policies through the government's TRP I and Import Liberalization Program¹⁸ that included lowering tariffs and removing import quantitative restrictions to phase out excessive tariff-protection policies.
- The 1987 Constitution established the underpinnings to promote increased competition in the Philippines, declaring that the state shall regulate or prohibit monopolies when the public interest so requires. It was in the 1990s that a number of key industries were opened up to increase competition.

The 1990s

- The liberalization of FDI through Republic Act 7042 (Foreign Investment Act of 1991) allowed foreign equity participation of up to 100 percent for sectors not specified in the country's foreign investment negative list (FINL).^{19,20}
- The implementation of trade policy reforms continued under TRP II and III, which lowered the effective rates of tariffs. To affirm the government's commitment to trade liberalization, the Philippines also signed agreements to join the Association of Southeast Asian Nations Free Trade Agreement and the General Agreement on Tariffs and Trade.

- A number of sectors were opened up to competition such as the financial sector, air transport, power generation, inter-island shipping, and telecommunications industries. Growth and job creation followed the liberalization efforts, demonstrating the economic potential that monopolies and oligopolies had previously suppressed.

The 2000s

- Gradual liberalization of the banking sector with the enactment of the General Banking Law and Republic Act 10641, which allowed the full entry of foreign banks in the Philippines.
- Trade policy reform continued into the early 2000s through the TRP IV.
- The retail trade sector was partially liberalized in 2000 through Republic Act 8762 (the Retail Trade Liberalization Act).
- In 2001, the Electric Power Industry Reform Act (Republic Act 9136) was signed into law, which aimed to remove monopolies in the power industry through the privatization of the National Power Corporation's assets.
- In 2015, the Philippine Competition Commission was established through Republic Act 10667 (the Philippine Competition Act), which was a first step in establishing a comprehensive competition policy framework in the Philippines.

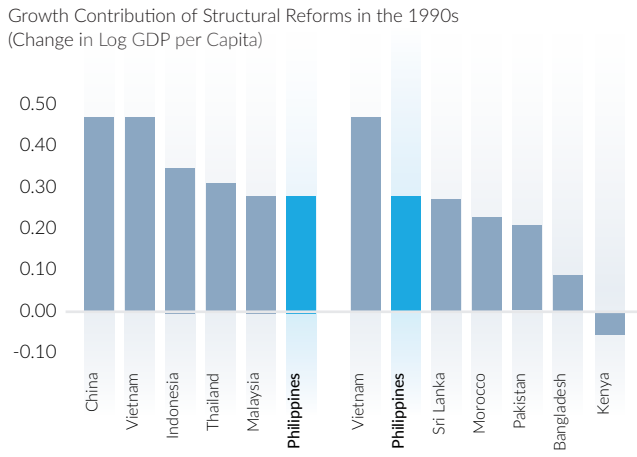
Source: World Bank (2013). "Philippine Development Report: Creating More and Better Jobs," de Dios (2000). "Philippine Economic Growth: Can it Last?" and Aldaba (2013). "Twenty years after Philippine Trade Liberalization and Industrialization: What has happened and where do we go from here" Menrado, A. (2004).

¹⁸ The Marcos Administration first attempted to initiate the trade liberalization program in the early 1980s, but the full implementation of trade policy reforms was suspended due to the 1983 crisis. Upon election in 1986, the Corazon Aquino administration resumed the trade liberalization program.

¹⁹ Republic Act 7042 introduced a foreign investment negative list that explicitly states which areas of the Philippine economy are closed to foreign investment.

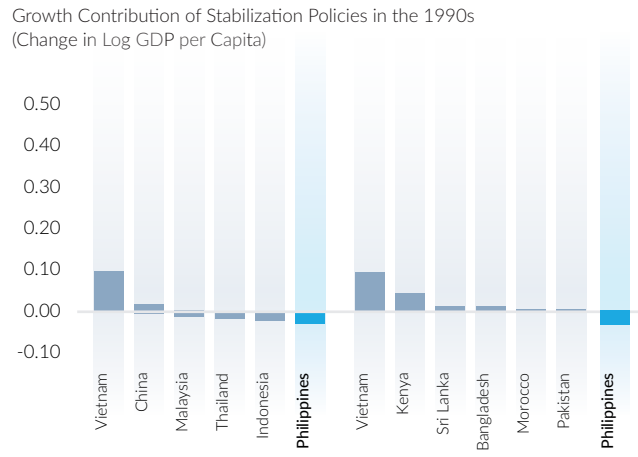
²⁰ The contents of the FINL is updated every two years through an executive order. The latest FINL (Executive Order 184 series of 2015) includes mass media, the practice of professions, and small-scale mining as areas that do not allow foreign equity.

Figure 13. Structural reforms contributed less to growth in the Philippines than in regional peers during the 1990s.



Source: Background paper prepared for this report by Brueckner (2017).

Figure 14. Stabilization policies contributed less to growth in the Philippines than in peers during the 1990s.

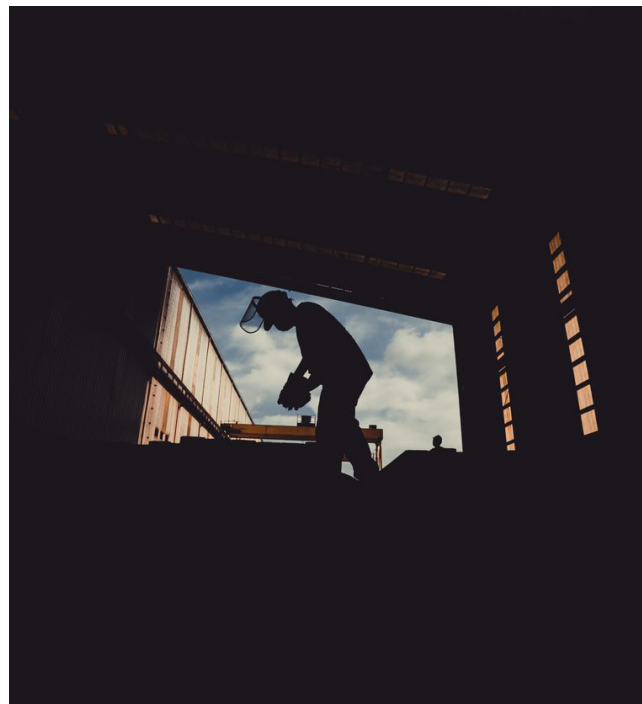


Source: Background paper prepared for this report by Brueckner (2017).

Strong Growth Recovery: The 2000s

The 2000s represented a period of strong growth recovery in the Philippines. Economic growth accelerated to an annual average of 4.5 percent in 2000-10, significantly higher than in the past two decades. During this decade, the Philippines was closing the gap with its structural peers, which grew by an average of 5.0 percent per year. However, the country’s rate of growth was still notably lower than the regional peer average of 6.3 percent per year. The improvement in the Philippines’ growth rate was partly due to the government’s commitment to improve macroeconomic and fiscal stability, including the adoption of tax policies that raised revenue collection and avoided a near fiscal crisis in 2004. In addition, structural reforms initiated in the previous two decades started to have an effect on economic activity, and the continuation of the TRP IV and the liberalization of the banking sector also contributed positively to economic growth.

Structural reforms and transitional convergence were the main drivers of economic growth in the 2000s (Figure 15). Structural reforms accounted for around two-fifths of the economic growth during this decade, which was similar to the growth contribution of transitional convergence. Among structural reforms, the improvement in infrastructure was the most significant in terms of raising GDP per capita

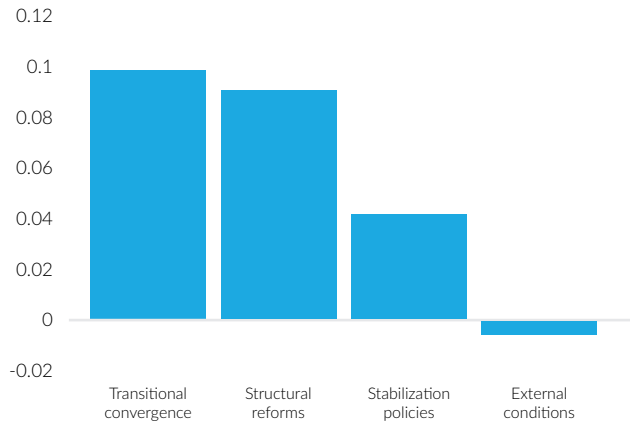


growth, followed by the reduction in government burden (Figure 16). In addition, the government’s commitment to fiscal sustainability and the pursuit of an independent monetary policy led to a stable exchange rate and a relatively low annual inflation rate of 5.2 percent on average in 2000-10.²¹

21 This is compared to the 9.3 average inflation rate between 1990 and 2000, using 2000 base prices. Source: BSP.

Figure 15. Both transitional convergence and structural reforms drove growth in the 2000s.

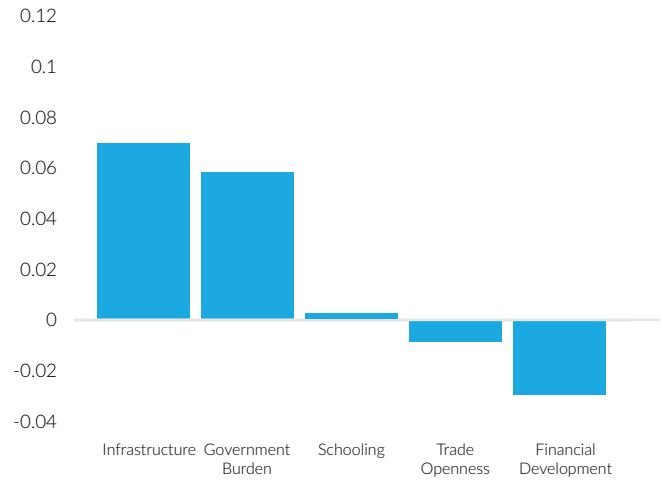
Contribution of Growth Drivers in the Philippines in the 2000s
(Change in Log GDP per Capita)



Source: Background paper prepared for this report by Brueckner (2017).

Figure 16. Improvements in infrastructure and reduced government burden were the main drivers of structural reforms

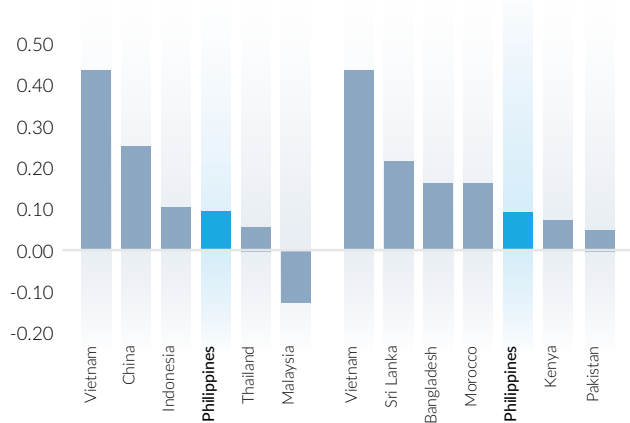
Growth Contribution of Structural Reforms in the Philippines in the 2000s
(Change in Log GDP per Capita)



Source: Background paper prepared for this report by Brueckner (2017).

Figure 17. The contribution of structural reforms to growth in the Philippines was in line with the average of peers in the 2000s.

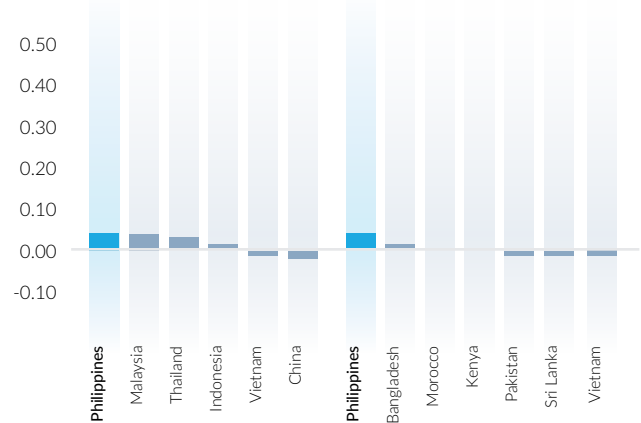
Growth Contribution of Structural Reforms
(Change in Log GDP per Capita)



Source: Background paper prepared for this report by Brueckner (2017).

Figure 18. Stabilization policies contributed more to growth in the Philippines than in peers, although their impact was relatively small.

Growth Contribution of Stabilization Policies in the 2000s
(Change in Log GDP per Capita)



Source: Background paper prepared for this report by Brueckner (2017).

The contribution of structural reforms to growth in the Philippines was in line with the average of peers during the 2000s (Figure 17). Structural reforms lifted economic growth in all regional peers, except for Malaysia. The growth contribution of structural reforms in the Philippines was close to the median of structural peers but lower than that of regional peers. For example, structural reforms contributed 2.5 percentage points of GDP per capita growth each year in China, nearly three times that of the Philippines. However, macroeconomic stabilization policies contributed more to growth in the Philippines than in both structural and regional peers, although their overall impact was small (Figure 18).

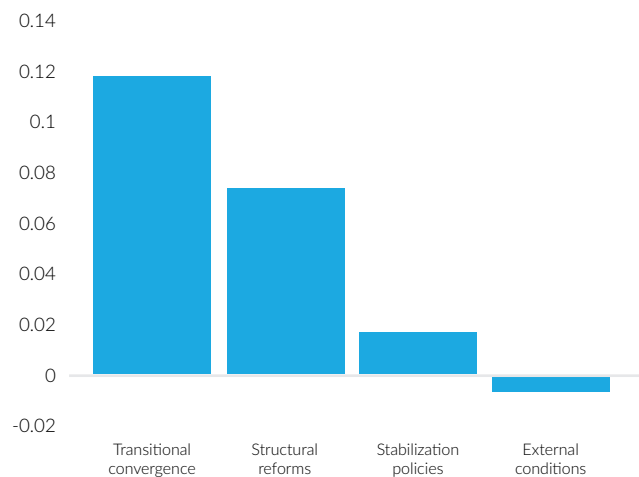
Growth Acceleration: 2011-15

Economic growth in the Philippines accelerated in the 2010s, driven by past structural reforms and sustained

government efforts to improve macroeconomic and fiscal fundamentals. Economic growth averaged 5.9 percent per year in 2011-15, faster than both structural (5.3 percent) and regional (5.4 percent) peers. Growth during this period was supported by the cumulative effects of past structural reforms, improved macro-fiscal fundamentals through prudent fiscal deficit and debt management, an independent monetary policy, and favorable external conditions. Among the key growth drivers, transitional convergence was the main driver of growth during this period (Figure 19). This implies that the country benefited more from past reforms in the 2010s than in the previous decade. During this period, structural reforms led to improvements in infrastructure and financial development and a reduction in government burden, contributing around one-third of economic growth (Figure 20).

Figure 19. Transitional convergence and structural reforms drove economic growth in 2011-15...

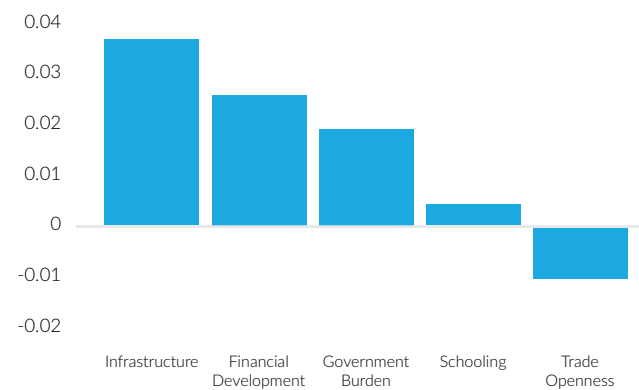
Contribution of Growth Drivers in the Philippines in the 2010s
(Change in Log GDP per Capita)



Source: Background paper prepared for this report by Brueckner (2017).

Figure 20. ...driven by improvements in infrastructure, financial development, and reduced government burden

Contribution of Structural Reforms in 2011-15
(Change in Log GDP per Capita)



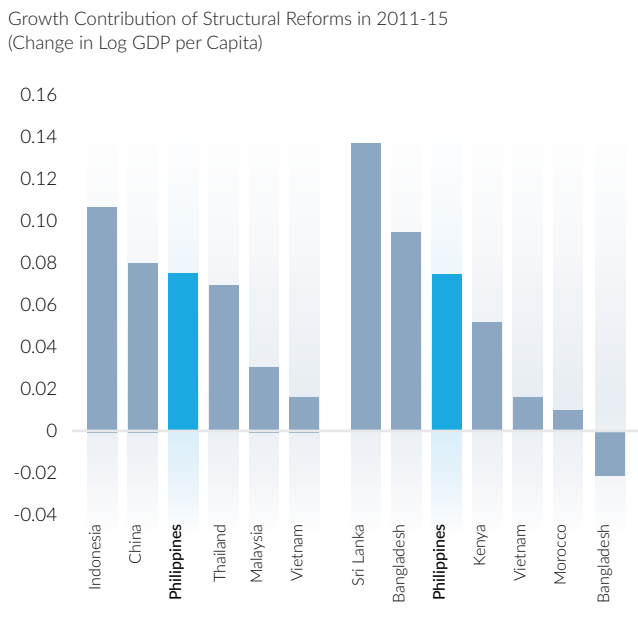
Source: Background paper prepared for this report by Brueckner (2017).

During the 2010s, the contribution of structural reforms to growth was close to the average of peer countries (Figure 21). The growth contribution of structural reforms exceeded that of stabilization policies in both the Philippines and the majority of peers between 2011 and 2015. The contribution of structural reforms to economic growth in the Philippines was close to the median of both regional and structural peers, while the growth contribution of stabilization policies was higher in the Philippines than in the median peer country (Figure 22).

Besides transitional convergence, structural reforms were the main drivers of economic growth in the Philippines over the past four decades. Stabilization policies have also contributed positively to growth since 2000, as the country's macroeconomic and fiscal fundamentals continued to improve, although their contribution to growth was smaller compared to that of structural reforms. The outcomes of both structural reforms and stabilization policies were reflected in the country's productivity growth, which is discussed in the next section.

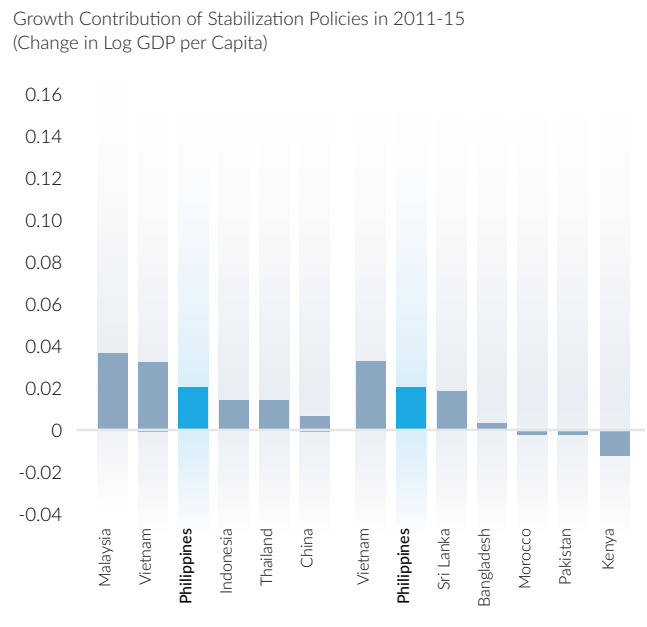


Figure 21. The growth contribution of structural reforms in the Philippines was in line with the peers in 2011-2015...



Source: Background paper prepared for this report by Brueckner (2017).

Figure 22. ...but the impact of the country's stabilization policies was high relative to peers.



Source: Background paper prepared for this report by Brueckner (2017).

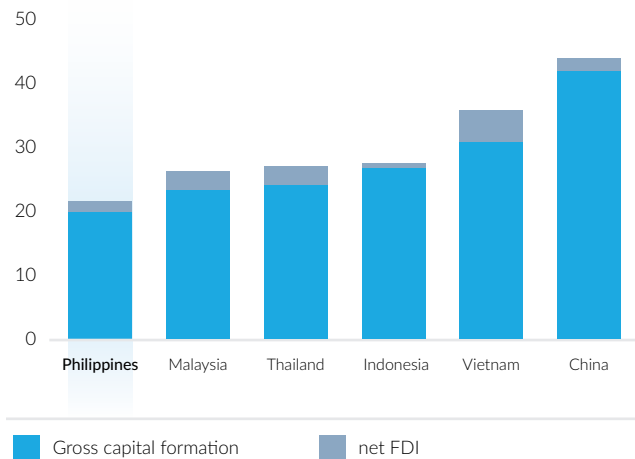
ROLE OF FACTOR ACCUMULATION AND TFP

An analysis of the role of factor accumulation and TFP in economic growth constitutes another method to understand the Philippines' recent economic success. The previous section provided a historical view of the country's past growth performance by assessing the role of structural reforms, stabilization policies, and external factors. Another way to analyze the country's growth drivers is to quantify the relative contribution of factor accumulation and TFP to growth through a growth-accounting exercise. This is complemented by a benchmarking analysis that compares the Philippines to its structural and regional peers. These two analyses combined will not only provide an idea of what factors drove past economic growth but also shed light on potential future growth that will be generated from capital, labor, and TFP. In Chapter 2, TFP growth will be further decomposed to identify if efficiency gains within sectors or better allocation of production factors across sectors have been driving productivity growth.

Capital accumulation has been relatively limited in the Philippines due to low levels of domestic savings and public investment. Gross domestic savings increased only slightly from 14.3 percent of GDP in 1998 to 15.3 percent of GDP in 2016, which is low relative to both regional and structural peers. Similarly, the Philippines had the lowest level of capital accumulation among peers (Figure 23 and Figure 24), which was exacerbated by the equally low inflows of FDI, averaging a mere 1.5 percent of GDP per year in 1998-2015. The low investment rate is mainly driven by the low level of public investment, averaging only 2.5 percent of GDP each year in 1998-2015, compared with an average of 8.6 percent and 3.8 percent per year among regional and structural peers, respectively (Figure 25 and Figure 26). While private investment in the Philippines was similar to the average of peers, it was not enough to compensate for the country's low level of public investment (Figure 27 and Figure 28).

Figure 23. Capital accumulation in the Philippines, as a share of GDP, is the lowest among peers...

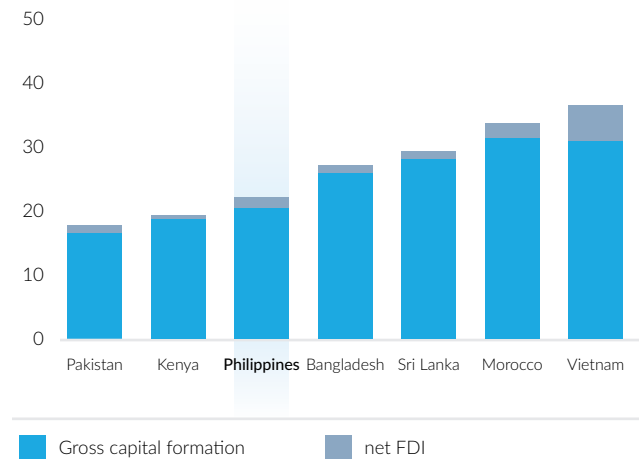
Gross Capital Formation: the Philippines and Regional Peers (percent of GDP, 1998-2005 average)



Source: WDI.

Figure 24. ...and the inflow of net FDI is also low relative to peers.

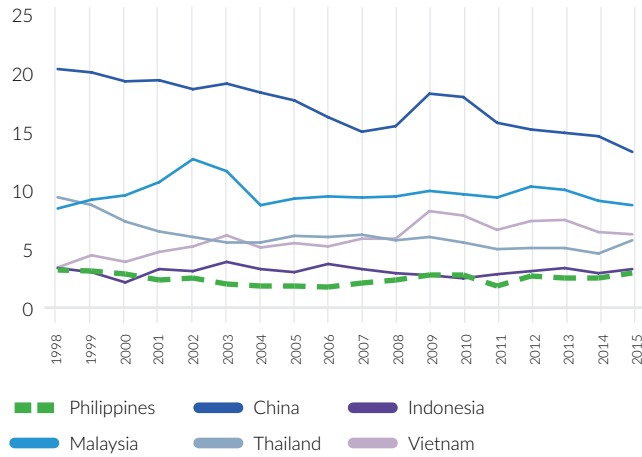
Gross Capital Formation: the Philippines and Structural Peers (percent of GDP, 1998-2005 average)



Source: WDI.

Figure 25. The level of public investment in the Philippines is among the lowest in the region...

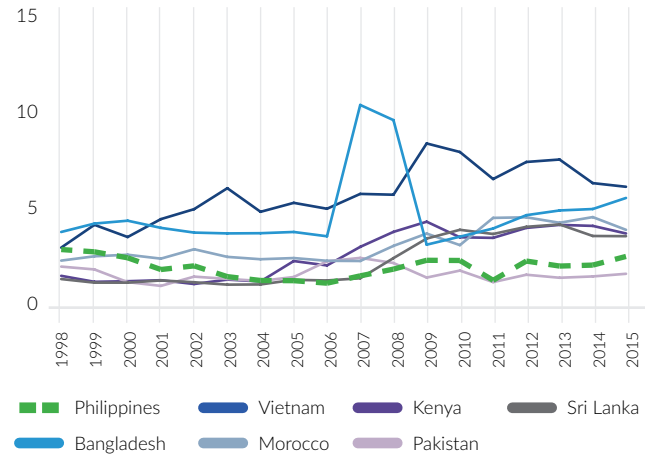
Public Investment in the Philippines and Regional Peers (percent of GDP)



Source: WDI.

Figure 26. ...and significantly low relative to structural peers.

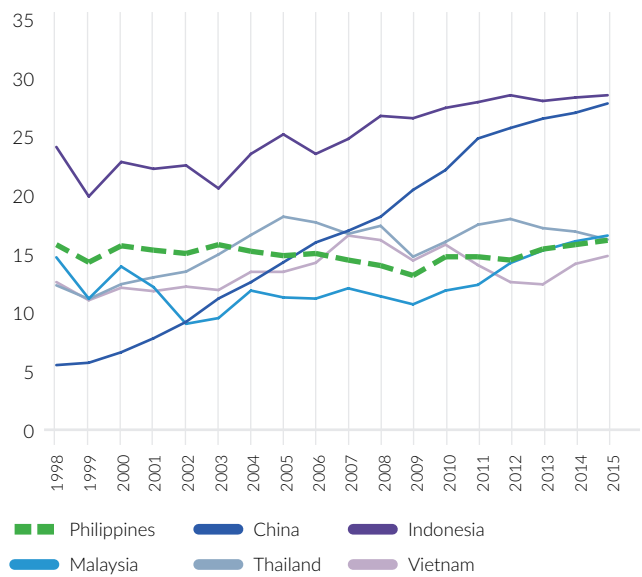
Public Investment in the Philippines and Structural Peers (percent of GDP)



Source: WDI.

Figure 27. However, the level of private investment in the Philippines ranks among the average of regional peers...

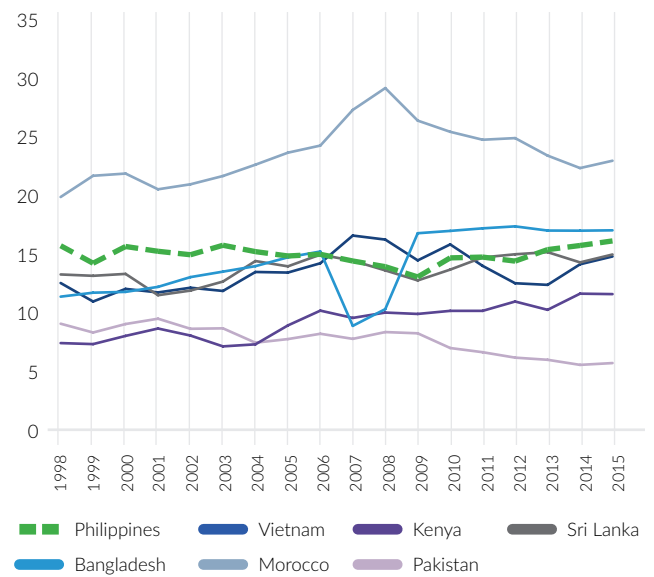
Private Investment in the Philippines and Regional Peers (percent of GDP)



Source: WDI.

Figure 28. ...and structural peers.

Private Investment in the Philippines and Structural Peers (percent of GDP)

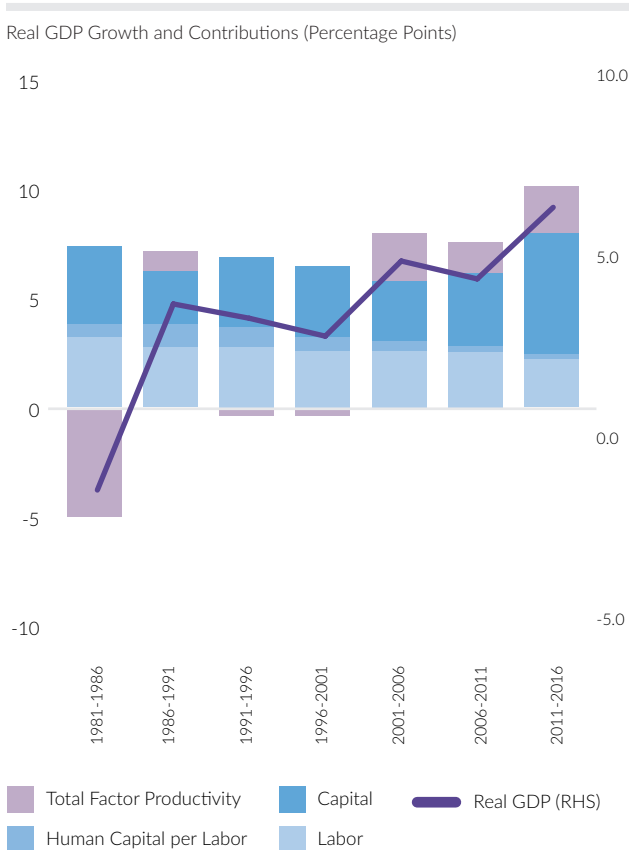


Source: WDI.

Yet, capital accumulation has been the main driver of economic growth in the Philippines since the 1980s. A decomposition of real GDP growth shows that capital accumulation has consistently been the main driver of economic growth in the country, contributing about three-fifths of the growth between 1981 and 2016. By contrast, labor accumulation, defined as the increased labor employed in the economy, contributed 31.3 percent of the

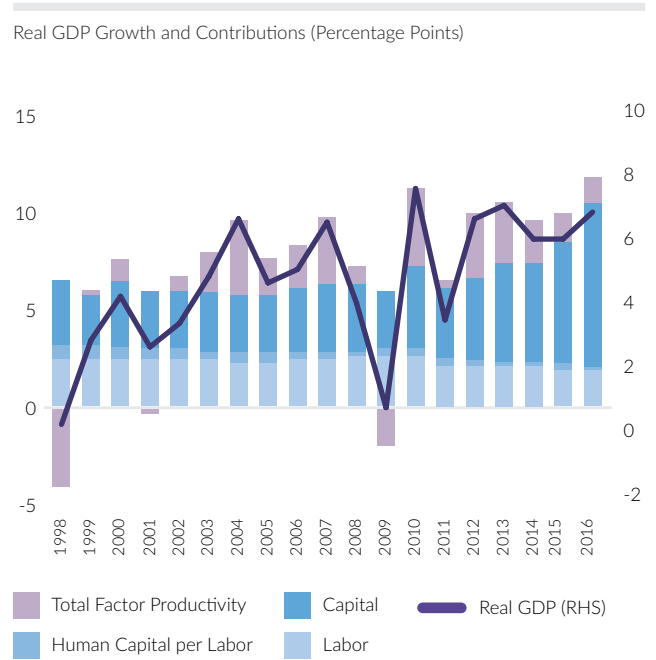
growth in the same period, and its contribution to growth has steadily declined in the past three decades. While the contribution of TFP to growth was negative on average between 1981 and 2000, it has consistently contributed positively to growth since 2002, with the exception of 2009 at the height of the global recession (Figure 29 and Figure 30).

Figure 29. TFP's contribution to growth has increased since 2010...



Source: Staff calculations based on PSA data.

Figure 30. ...after it declined temporarily in 2009 at the height of the global recession.



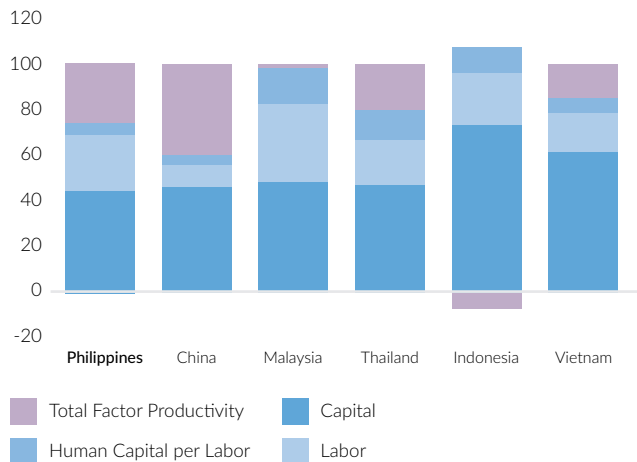
Source: Staff calculations based on PSA data.

The contribution of TFP to economic growth increased in 2000s, mirroring the path of overall economic growth. The country's sharp economic contraction in 1981-86 coincided with not only the historic tail-end of the Marcos dictatorship and a national debt crisis in 1983 but also a significant negative contribution of TFP to economic growth. TFP's contribution to growth quickly rebounded in 1986-91 but again turned negative the decade after

(Figure 29 and Figure 30). Since 2002, however, TFP has consistently contributed positively to growth, averaging a third of growth in 2001-16. Furthermore, the contribution of TFP to growth was higher in the Philippines than in regional (except for China) and structural (except for Sri Lanka) peers between 1995 and 2010 (Figure 31 and Figure 32).

Figure 31. The contribution of TFP to economic growth was higher in the Philippines than in many regional peers...

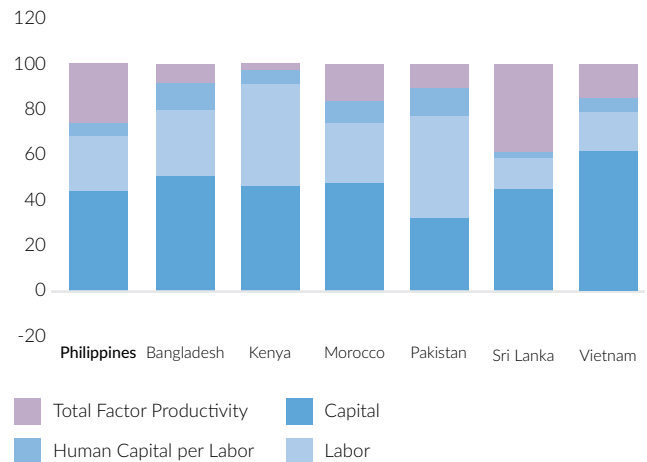
Contribution to growth in the Philippines and Regional Peers, 1995-2010 (Percent)



Source: Staff calculations based on PSA data and WDI.

Figure 32. ...and many structural peers.

Contribution to Growth in the Philippines and Structural Peers, 1995-2010 (Percent)



Source: Staff calculations based on PSA data and WDI.



02

Patterns and Drivers of Aggregate Productivity

This chapter analyzes the drivers of aggregate productivity growth in the Philippines. It begins with an assessment of the production and productivity performance of the country’s three main sectors: agriculture, manufacturing, and services.²² To understand the performance of these sectors, a decomposition of per capita value-added (VA) growth is

performed. The goal of the exercise is to explain the drivers of aggregate productivity growth based on changes in demographics, level of employment, labor force participation, movement of labor across sectors, and within-sector productivity growth. Chapter 3 will then focus on within-sector productivity dynamics at the firm level.

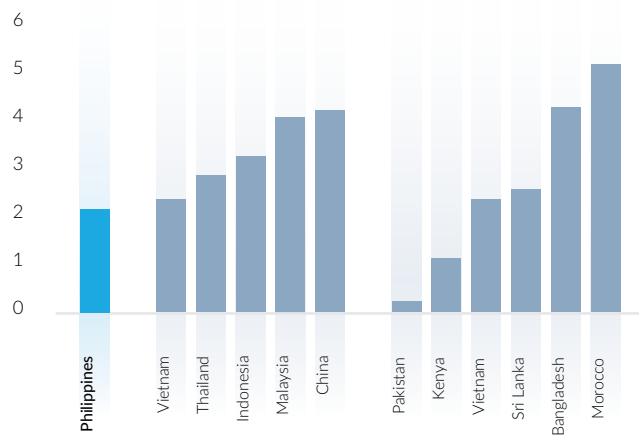
DOMESTIC CONSTRAINTS SLOW PRODUCTIVITY GROWTH IN AGRICULTURE

Despite the Philippines’ recent economic performance, its agricultural sector has underperformed that of regional peers in terms of production and productivity growth. The agriculture sector’s contribution to GDP declined in the Philippines from 14.8 percent of GDP in 1998 to 9.7 percent of GDP in 2016. While gross agriculture output increased by 73 percent between 1990 and 2013, this was considerably lower than in Vietnam and China whose agriculture production more than tripled and doubled, respectively, during this period (Figure 34). In 1998, the Philippines’ agricultural labor productivity, measured as VA per worker, was US\$1,320 (in 2000 constant prices), higher than the

structural peer average of US\$1,093 but less than half of the regional peer average of US\$2780. Between 1998 and 2016, agricultural labor productivity growth averaged 2.1 percent per year in the Philippines, much lower than the regional peer average of 3.3 percent per year (Figure 33). As a result, labor productivity in the country’s agriculture sector remains much lower than the regional peer average. The Philippines’ past agrarian reforms, its vulnerability to natural disasters, and the multitude of institutions involved in providing support to farmers are some of the reasons for the country’s poor agricultural performance (Box 3).

Figure 33. Agricultural labor productivity growth was lower in the Philippines than in regional peers.

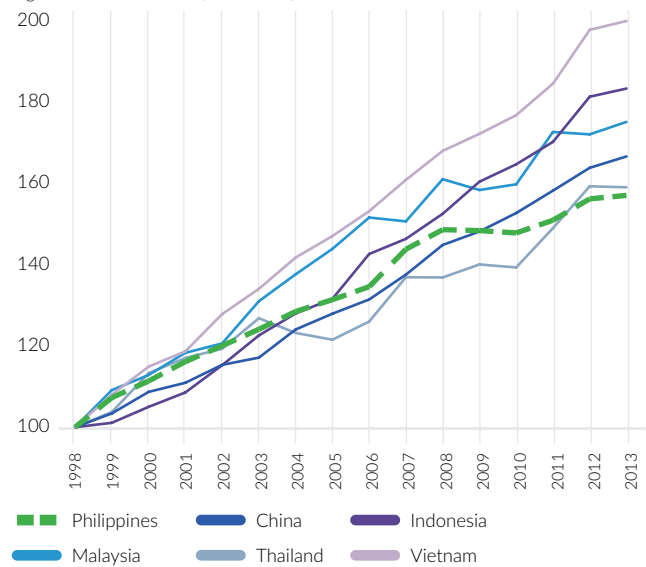
Agricultural Labor Productivity Growth: the Philippines vs. peers, 1999-2016 (Average, Percent)



Source: Staff calculations based on PSA data.

Figure 34. Agricultural output was also lower in the Philippines than in regional peers.

Agriculture VA Growth (1998=100)



Source: Organization for Economic Co-operation and Development (OECD) (2017).

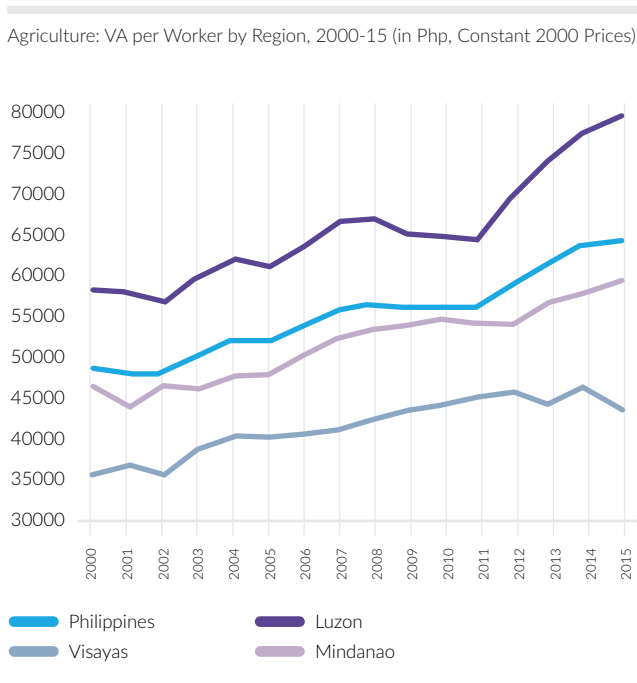
²² Instead of analyzing the industry sector, this chapter focuses on manufacturing, which is the main driver of industry in the Philippines, representing about two-third of the industry’s output between 2010 and 2017.

Agricultural labor productivity growth varies widely across regions. Luzon has the highest labor productivity growth, which accelerated from around 1.0 percent per year in 2001-10 to 4.1 percent per year in 2011-15. During the same period Visayas' labor productivity growth, the lowest among the three main regions, decelerated from an annual average of 2.5 percent in 2001-05 to 0 percent in 2011-15 (Figure 35). There is also a large disparity in labor productivity within regions, especially in Luzon. For instance, agriculture labor productivity in the National Capital Region (NCR) was almost three times the average labor productivity in Luzon in 2015 (Figure 36).

The movement of labor out of agriculture has contributed to overall productivity growth in the Philippines, although the shift has been less prominent than in regional peers.

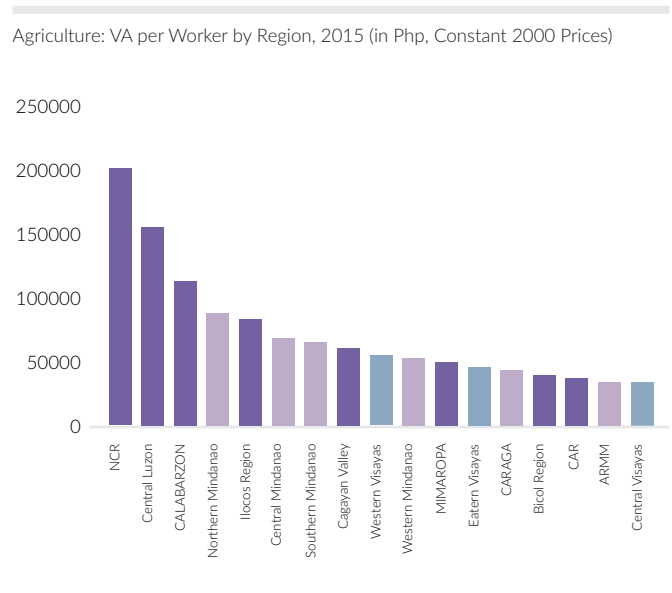
Between 1998 and 2016, the share of employment in agriculture declined from 37.9 percent in 1998 to 26.9 percent in 2016. Since 2012, agricultural employment has declined in absolute numbers, averaging a decline of 2.0 percent per year between 2012 and 2016. Although this structural shift from low-productivity agriculture to more productive sectors was sizeable, it was less pronounced than in most other countries in the region.²³ In the Philippines, all the employment moving out of agriculture went to the service sector, informal services in particular. While labor productivity is higher in the service sector than in agriculture, it is still low relative to peer countries, which limits the positive contribution of the structural shift to economy-wide productivity growth.

Figure 35. Agricultural labor productivity varies across regions...



Source: Staff calculations based on PSA data.

Figure 36. Agricultural output was also lower in the Philippines than in regional peers.



Source: OECD (2017).

Box 3. Reasons for the Philippines' Low Agricultural Output and Productivity

The Philippines' main agricultural policy focused on rice self-sufficiency has prevented the country from diversifying away from crops such as rice and corn. The objectives of its agricultural policy over the past few decades have focused on food security and poverty alleviation through ensuring a stable supply of food, especially rice, at affordable prices. As a result of the government's support to rice producers, agricultural production only increased from 16 percent in 1991 to 22 percent in 2013. During this period, other Asian countries diversified to and increased the production of higher-value crops, resulting in higher agricultural output and productivity.

The country's lengthy and costly agrarian reform has brought uncertainty to beneficiaries and undermined investment. The agrarian reform program started in 1988 and aimed to support social justice and development in rural areas by regulating tenancy, establishing a maximum limit on farm sizes, and supporting family farms. The land-tenure reform distributed more than 6.9 million hectares to small-scale farmers, and about 50 percent of beneficiaries received assistance to improve farm productivity. However, the overall distribution process is incomplete, inter-generational land-transfer arrangements are unresolved, and there is a lack of demand-driven support services, including the timely issuance of collective and individual titles. As a result, there has been limited investment in the agriculture sector, as small farmers lack access to credit and expertise, and there is less incentive for large farms to invest due to uncertainties.

The Philippines' high vulnerability to natural disasters partially accounts for its poor agriculture performance. The El Niño weather phenomenon contributed to an agricultural output loss of 6.8 percent in 1998 and 0.4 percent in 2009-10. In addition, there has been an increase in the severity and intensity of tropical

cyclones in recent years, resulting in annual damages equivalent to 3 percent of total agriculture output in the late 2000s due to typhoons, droughts, and floods. The risk of natural disasters is aggravated by the incidence of poverty, as it hampers the ability of farmers to make decisions and investments that can mitigate the effects of disasters.

A large share of agriculture land is in conflict areas, resulting in lower agriculture output and less investment. Conflict not only result in damages to the capital base and infrastructure as well as casualties, it also redirects resources for reconstruction that could have been used to improve rural infrastructure and support farmers. Moreover, farmers in conflict areas face the possibility of being displaced, losing their crops, having their land destroyed, and even losing their lives. Therefore, farmers have little incentive to invest in new technology or crops, or even expand their current production. Conflict also causes a reallocation of resources, which entails deadweight and unrecoverable losses.

The complex system of institutions involved in the design and implementation of agriculture policy limits the effectiveness and efficiency of support provided to farmers. Although the Agriculture and Fisheries Modernization Act of 1997 integrated all agriculture support into one framework, implementation is divided between four departments, with their sub-units, agencies, and councils as well as numerous government-owned and controlled corporations that were created to implement policies in strategic areas. A fragmented institutional setup results in weak coordination, increases the risk of corruption, reduces the clarity of policy direction and agency roles, and restricts the reach and depth of support provided to the sector.

Source: OECD's *Agricultural Policies in the Philippines* (2017); *Philippines Rising Transition Notes*, World Bank (2016); *Impacts of Natural Disasters on Agriculture, Food Security, and Natural Resources and Environment in the Philippines*, PIDS (2012); and *The Mindanao Conflict in the Philippines*, World Bank (2005).

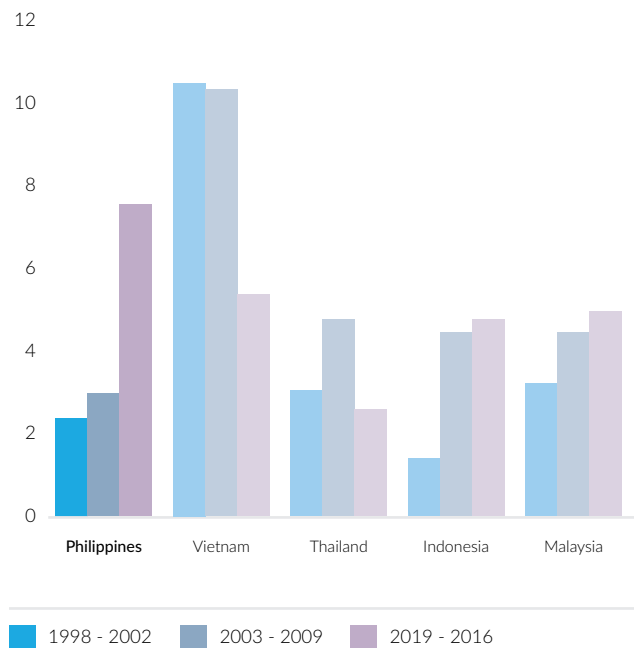
A RESURGENCE IN MANUFACTURING RAISES LABOR PRODUCTIVITY

Growth in the Philippine manufacturing sector accelerated in 2010-16 and outpaced the growth of some regional peers. Between 1998 and 2016, the country’s manufacturing VA (constant 2010 US\$) grew at an annual average of 4.8 percent, outpacing the growth of regional peers such as Thailand and Indonesia. Much of the faster growth happened after the 2009 global recession, with the manufacturing sector growing at an average annual rate of 7.5 percent in 2010-16, much higher than the average of 3.0 percent per

year in 2003-09 (Figure 37). The growth in manufacturing VA was accompanied by slower employment growth in manufacturing at 1.4 percent annually between 1998 and 2016 (Figure 41). As a result, labor productivity in the Philippine manufacturing sector grew at an annual average of 2.9 percent between 1998 and 2016, higher than the annual average of 2.5 percent and 2.3 percent for regional and structural peers, respectively, in the same period (Figure 38).

Figure 37. Growth in manufacturing VA was higher in the Philippines than peers after 2010

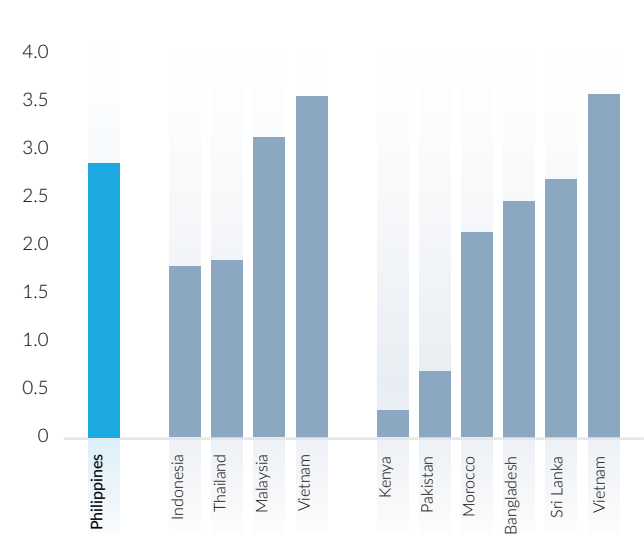
Manufacturing VA Growth: the Philippines vs. Regional Peers (Average Annual Growth, %)



Source: WDI.

Figure 38. Labor productivity in the country's manufacturing sector is above the average of peers.

Manufacturing Labor Productivity Growth Rates: the Philippines vs. peers, 1998-2016 (Average, %)



Source: WDI, ILO, and staff calculations.

Labor productivity growth in the manufacturing sector has accelerated across all regions in the Philippines, except in Visayas (Figure 39). Mindanao has benefitted from strong growth in the manufacturing sector, with labor productivity growth accelerating from an annual average of 3.4 percent in 2006-10 to an average of 8.5 percent per year in 2011-15 (Figure 40). By contrast, manufacturing labor productivity growth fell slightly in Visayas. Labor productivity growth in manufacturing in Luzon, which accounts for nearly 80 percent of the country's manufacturing output, accelerated to an annual average of 4.9 percent in 2011-15, up from an average of 2.1 percent in the previous five years. As a result, the gap in labor productivity between Luzon and Mindanao narrowed over the past fifteen years, although at a much slower pace than between Luzon and Visayas.

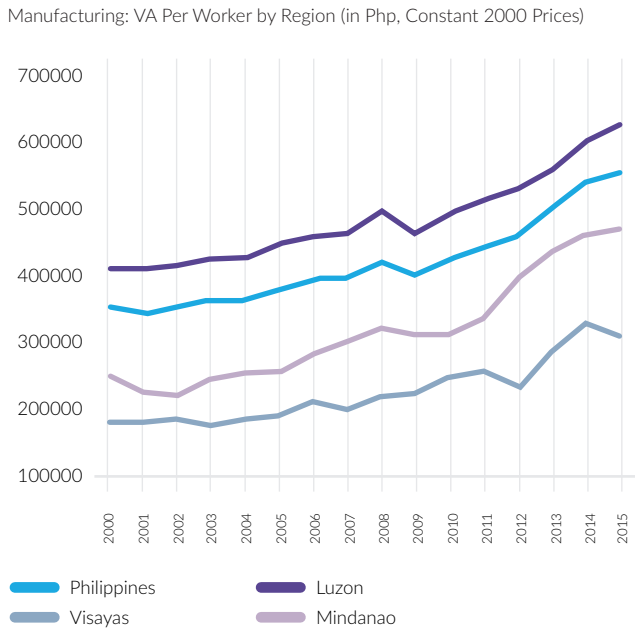
High productivity growth in the manufacturing sector was due to a transition to more skill-intensive products. Between 1998 and 2016, there was a gradual decline in the share of textiles, wearing apparel, and paper products in total manufacturing output, and an increase in the share of telecommunications and transport equipment (Figure 42). In 1998, food manufacture; radio, television, and communication equipment and apparatus; and chemical products represented about half of all manufacturing output in the Philippines. In 2016, the share of these three product lines increased to about two-thirds of the country's manufacturing activities. This resulted in an average of 3.5 percent annual contraction in the exports of articles of apparels in 1998-16, resulting in their share of total exports shrinking from 8.8 percent in 1998 to 1.5 percent in 2016. Meanwhile, the export of electronic components grew by an average of 5.5 percent annually in the same period.

Box 4. The Industry Success of Business Process Outsourcing

The Philippines is a market leader in the global information technology-business process outsourcing (IT-BPO) industry, staying at the forefront of voice-related services. The IT-BPO industry is one of the country's fastest growing sectors, experiencing rapid growth in both revenue and employment generation. Total IT-BPO revenue grew at an annual average of 17.0 percent in 2010-16, reaching US\$22.9 billion (7.5 percent of GDP) in 2016, up from US\$8.9 billion (4.5 percent of GDP) in 2010. This growth momentum is expected to be sustained with revenues estimated to reach US\$38.9 billion by 2022. There has also been a rapid growth in employment in the sector, increasing from 0.5 million workers (1.4 percent of total employment) in 2010 to 1.2 million (2.9 percent) in 2016, and the industry is projected to employ 1.8 million workers by 2022. The Philippines is the top destination for voice-support services, supplanting India in 2011 by garnering more operations and people employed in call centers. The country has the potential to climb up the IT-BPO value chain, competing in higher value-added products and services such as in back-office systems, accounting, animation, and healthcare information management.

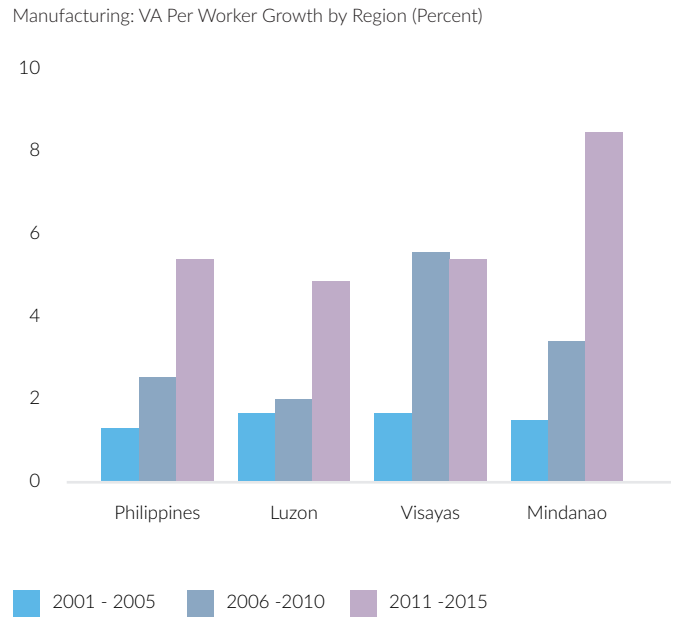
The liberalization of the telecommunications industry in the 1990s helped the Philippines nurture a nascent IT-BPO industry. Telecommunications were deregulated with the break-up of the existing monopoly in the market in 1993, which resulted in more investments and new players in the industry. The liberalization effectively increased competition, resulting not only in improved service delivery but also greater network availability and connectivity. Telecommunications costs went down substantially, including for international direct dialing and internet connections. For example, international direct dialing from the Philippines to the United States decreased from US\$0.50 per minute in 2000 to around US\$0.32 per minute in 2007 and as low as US\$0.05 per minute in 2017. These early market developments supported the emergence of the IT-BPO industry in the Philippines.

Figure 39. Labor productivity growth in manufacturing differs across regions in the Philippines.



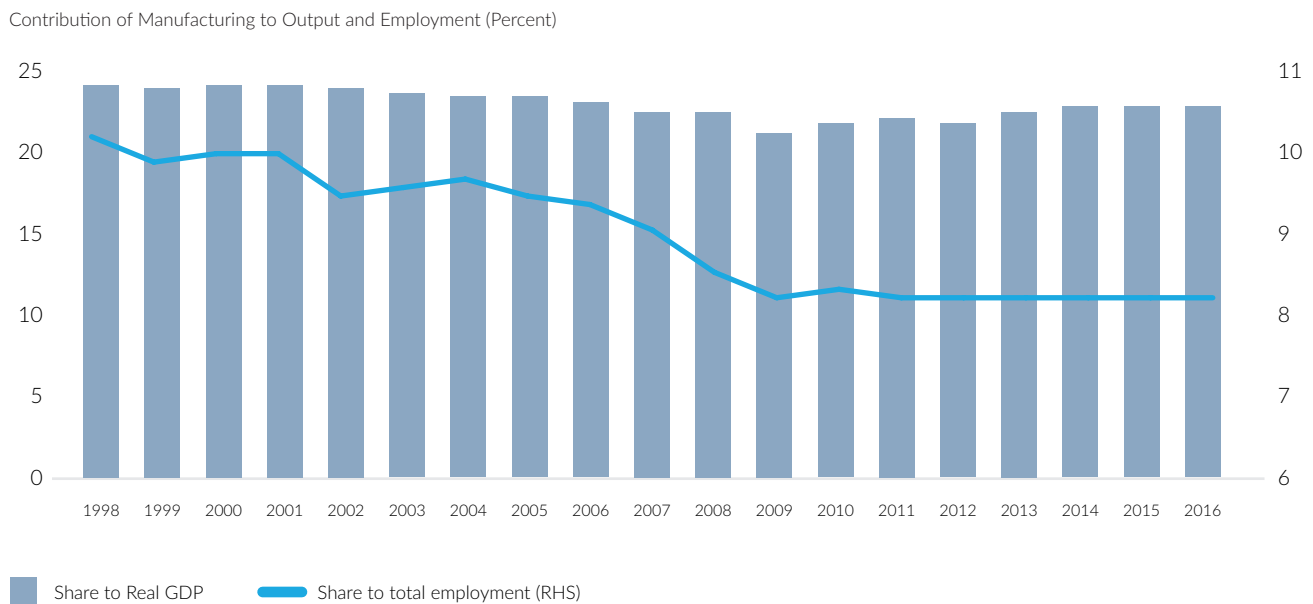
Source: Staff calculations based on PSA data.

Figure 40. Labor productivity growth in Mindanao accelerated in recent years.



Source: Staff calculations based on PSA data.

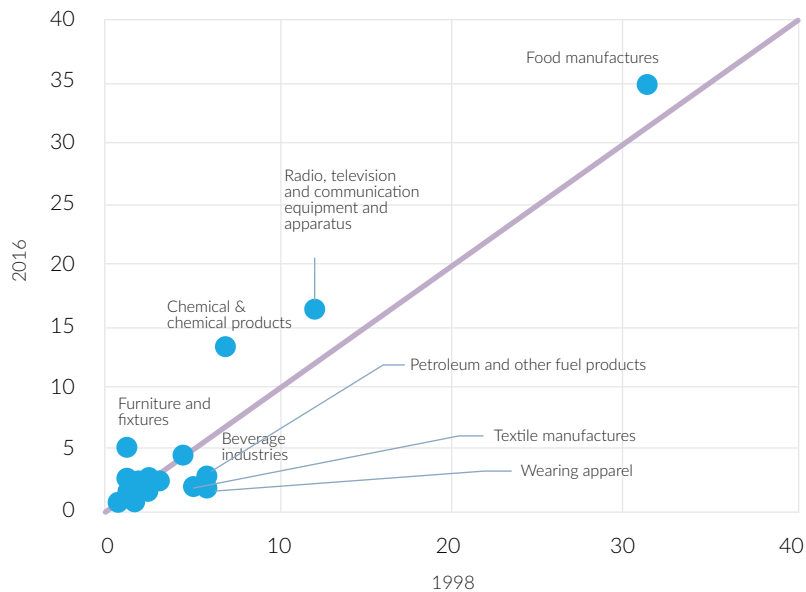
Figure 41. The share of manufacturing in GDP has recovered from an earlier decline.



Source: Staff calculations based on PSA data.

Figure 42. The country's manufacturing sector is transitioning to more skill-intensive production.

Share of Sub-sectors in Total Manufacturing Output (Percent)



Source: Staff calculations based on PSA data.

RAPID LABOR PRODUCTIVITY GROWTH IN THE SERVICE SECTOR DESPITE ITS DUAL NATURE

The Philippines' service sector has experienced rapid growth, and labor productivity in the sector has continued to rise. The contribution of services to total output increased from 50.8 percent of GDP in 1998 to 59.5 percent of GDP in 2016. Moreover, the service sector grew at an annual average rate of 5.7 percent in the same period, more than the agriculture and industry sectors. This rapid growth was driven by both formal and informal services. Formal service sector output growth accelerated from 5.9 percent in 2005-09 to 7.1 percent in 2010-16, while output growth in the informal service sector accelerated from 4.7 percent to 6.3 percent over the same period.

The labor productivity gap between formal and informal services has also been declining. The formal service sector

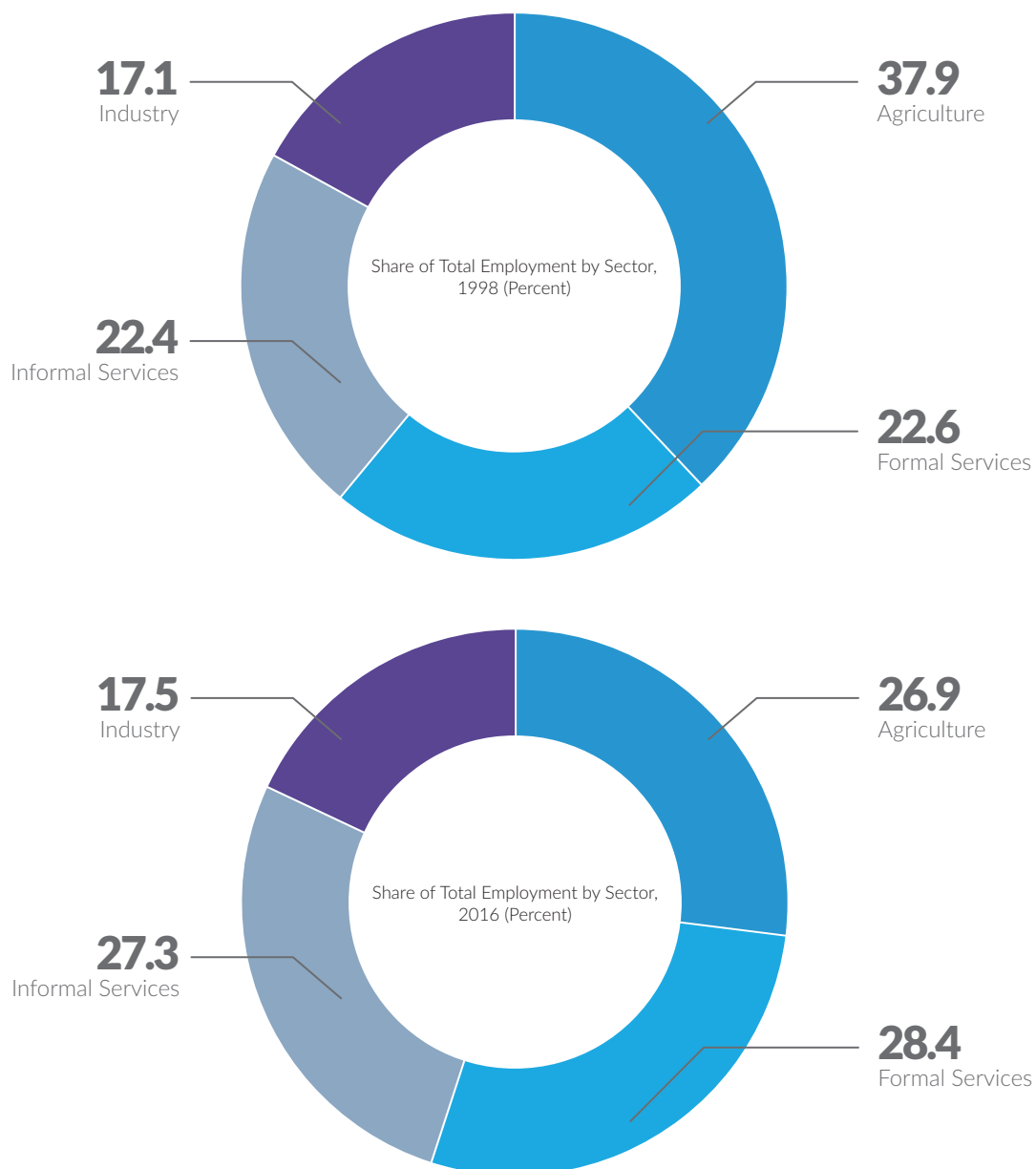
employs half of all workers in the economy and includes finance, real-estate, and other business, including the fast-growing BPO industry (Box 4). Meanwhile, the informal service sector has served as a catch-basin for excess agricultural workers who could not find employment in urban manufacturing or in the formal service sector.²⁴ Between 1998 and 2016, labor productivity in informal services grew at an average annual rate of 2.6 percent, faster than the average annual 1.7 percent in formal services. As result, the ratio of labor productivity between formal and informal services narrowed, from 1.5 times in 1998 to 1.3 times in 2016.

²⁴ The formal service sector includes the following subsectors: finance, real-estate and other business activities (including BPO), public administration, and other personal services. The informal service sector is operationally defined to include the following subsectors: i) wholesale and retail trade and ii) transportation, communication, and storage (TCS). Around 85 percent of TCS workers work in the informal TCS sector, which excludes the whole communications sub-sector, corporate executives, general managers who finished at least high school, supervisors, physicists, engineers, and other professionals. The informal services sector accounts for over half of services sector employment. The report uses this operational definition as a proxy for informality, as the Labor Force Survey does not include variables which are necessary to define the level of informality of employment.

However, there are still large disparities in labor productivity across regions. Labor productivity growth in the Philippines' service sector nearly doubled from an average of 1.8 percent per year in 2006-10 to an average of 3.4 percent in 2011-15. Labor productivity growth was the highest in Visayas, averaging 4.8 percent per year in 2011-15, more than three times the growth rate in 2006-10. Labor productivity

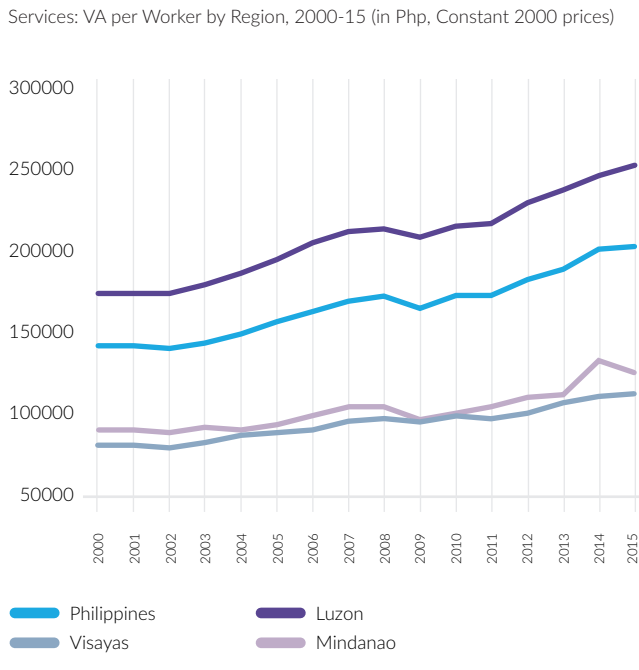
growth in services also accelerated in Mindanao and Luzon, reaching an annual average of 3.4 percent and 3.2 percent, respectively, in 2011-15. Yet, large disparities still exist across regions (Figure 44). For example, VA per service worker in the NCR was Php 203,550 in 2015, compared to a mere average Php 76,243 in the country's other regions (Figure 45).

Figure 43. Employment in the formal and informal services sectors grew in 1998-2016



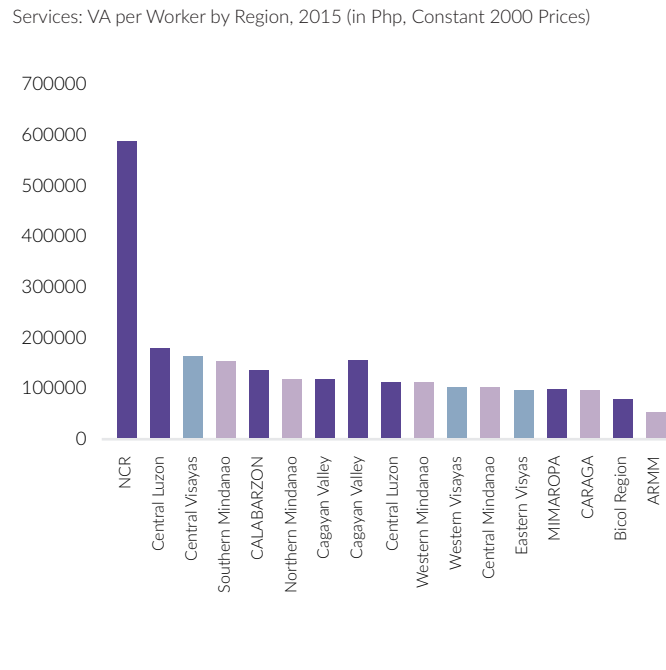
Source: Staff calculations based on PSA data.

Figure 44. Labor productivity growth in manufacturing differs across regions in the Philippines.



Source: Staff calculations based on PSA data.

Figure 45. ... particularly between the NCR and other regions.



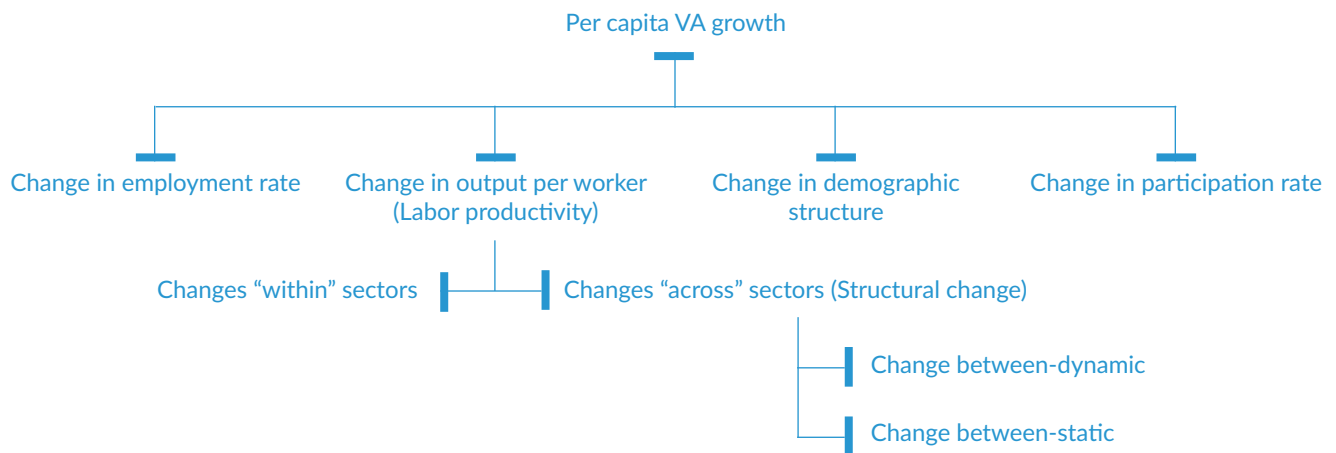
Source: Staff calculations based on PSA data.

LABOR PRODUCTIVITY IS DRIVEN BY SECTOR PRODUCTIVITY GROWTH

Per capita income growth comes from changes in demographics, employment levels, labor force participation, sector-level productivity growth, and movement of labor across sectors (Box 5). Changes in sector-level productivity are often cited as the “within” component, and changes from a reallocation of labor between sectors are often referred to as the “across” component. The latter measures the extent of structural change in the economy (Figure 46). For instance, aggregate productivity can arise from either efficiency improvements within agriculture (i.e., the “within” component), such as the adoption of a new fertilizer, or the movement of labor from agriculture to more productive sectors (i.e., the “across” component), such as manufacturing.

The movement of labor from one sector to another can be further divided into “between-static” and “between-dynamic” components. The between-static component measures whether workers move to sectors with above-average productivity. For instance, if labor transitioned out of agriculture to the financial service sector, which has higher productivity than the economy-wide average, the between-static component would be positive. The between-dynamic component measures whether productivity growth is higher in sectors with an increase in employment. For example, this component would be positive if manufacturing, which is growing faster than the economy-wide average, is absorbing more labor. Both the between-static and -dynamic components measure the aggregate level of allocative efficiency in the economy.

Figure 46. GDP Growth Decomposition



The analysis of per capita VA growth covers the following three periods: 1998 to 2004, 2005 to 2009, and 2010 to 2016. Economic growth in the Philippines started to recover in late 1990s, growing at an average annual rate of 3.6 percent between 1998 and 2004. TFP contributed an average of 1.5 percentage points to growth each year during this period. The country quickly recovered after the near-fiscal crisis in 2005, growing by 4.4 percent on average each year in 2005-09. In this period, TFP contributed an average of 1.3 percentage points to growth each year. After the global financial crisis in 2009, economic growth in the Philippines accelerated to an average annual rate of 6.1 percent in 2010-16, with TFP growth averaging 2.2 percentage points year-on-year. An understanding of the drivers of TFP growth in each of these periods can provide insight into the growth dynamics of TFP.

Labor productivity growth was the main driver of per capita VA growth between 1998 and 2016 (Figure 51). Per capita VA growth accelerated from an annual average of 2.1 percent in 1998-2004 to 2.5 percent in 2005-09 and 4.7 percent in 2010-16. A decomposition of per capita VA growth between labor productivity and the employed labor force reveals that changes in labor productivity were the main drivers of per capita VA growth, contributing 87

percent on average in 1998-2016. Increases in the employed labor force (due to demographic growth in employment and labor force participation) played a minor role throughout the period, contributing an average of 11 percent each year in 1998-2004, 15 percent in 2005-09, and 12 percent in 2010-16.

However, labor productivity growth was lower in the Philippines than in regional peers in the past two decades. Using constant 2011 US\$ in PPP terms, VA per worker in the Philippines reached US\$11,093 in 1998, lower than the regional peer average of US\$15,452 but higher than the structural peer average of US\$9,346 (Figure 47 and Figure 48).²⁵ Labor productivity growth in the Philippines accelerated from 1.6 percent in 1998-04 to 3.6 percent in 2010-16. Despite recent acceleration, the country's labor productivity growth has been lower than that of many peers, widening the gap in labor productivity between the Philippines and regional peers (Figure 49 and Figure 50). This was partly because capital per worker has been much lower in the Philippines than in peer countries. Considering the Philippines' high TFP growth rate in recent years, labor productivity would have likely been higher if capital per worker had been higher.

Box 5. Understanding and Measuring Productivity

Productivity is defined as the efficiency with which inputs (such as labor and capital) are used in the production process. Two measures are often used in the empirical analysis: (i) labor productivity, expressed as output (or VA) per worker; and (ii) TFP, which measures the efficiency of all inputs used in the production process. TFP is usually derived as a residual once the impact of all inputs on output is considered.

To understand the drivers of changes in productivity growth, changes in productivity is decomposed into its sources or components, both at the aggregate/sectoral and firm levels:

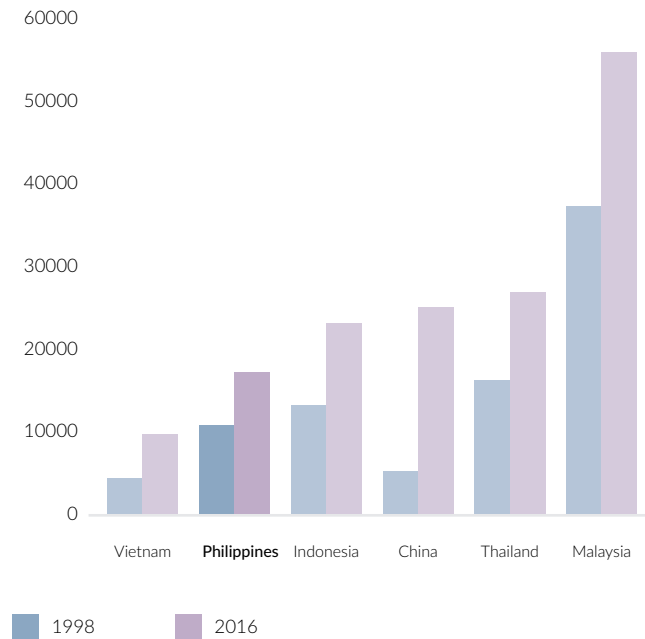
1. The sources of changes in aggregate productivity can be decomposed as follows:
 - **Between-sector change or structural:** measures the contribution of changes in sectoral employment shares between sectors to aggregate productivity growth. It contributes positively (negatively) if high-productivity sectors increase (decrease) their market share.
 - **Within-sector:** measures the average contribution of productivity growth that occurs within each sector. It contributes positively (negatively) to aggregate productivity if productivity increases (decreases) within a sector.

2. Productivity changes within sectors can be decomposed into five subcomponents:
 - **Within-firm:** measures the contribution of productivity growth within surviving firms. It contributes positively (negatively) to sector-level productivity if productivity of surviving firms increases (decreases).
 - **Between-firm:** measures the contribution of labor reallocation across sectors, which is positive (negative) when labor moves from less (more) to more (less) productive sectors. Specifically, it measures whether workers move to sectors with above-average productivity (static reallocation effect).
 - **Cross:** measures the joint effect of changes in employment shares and sectoral productivity growth. It is positive (negative) if workers are moving to sectors that are experiencing positive (negative) productivity growth. This measures whether productivity growth is higher in sectors that expand in terms of employment shares (dynamic reallocation effect).
 - **Entry:** measures the average difference between entering firms' productivity and initial productivity at the sector level. It contributes positively (negatively) to sector-level productivity if entering firms have higher (lower) productivity than the initial sector average.
 - **Exit:** measures the average difference between initial productivity at the sector level and exiting firms' productivity. It contributes positively (negatively) to sector-level productivity if exiting firms have lower (higher) productivity than the initial sector average.

Note: Given data limitations, this report will not study entry and exit dynamics.

Figure 47. Labor productivity in the Philippines is below the average of regional peers...

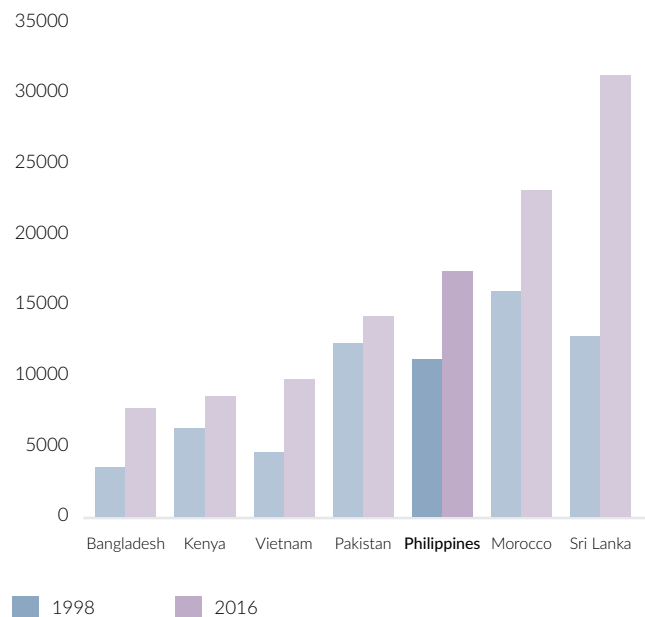
VA per Worker: the Philippines vs. Regional Peers (Constant 2011 PPP \$)



Source: WDI.

Figure 48. ... particularly between the NCR and other regions.

Services: VA per Worker by Region, 2015 (in Php, Constant 2000 Prices)



Source: WDI.

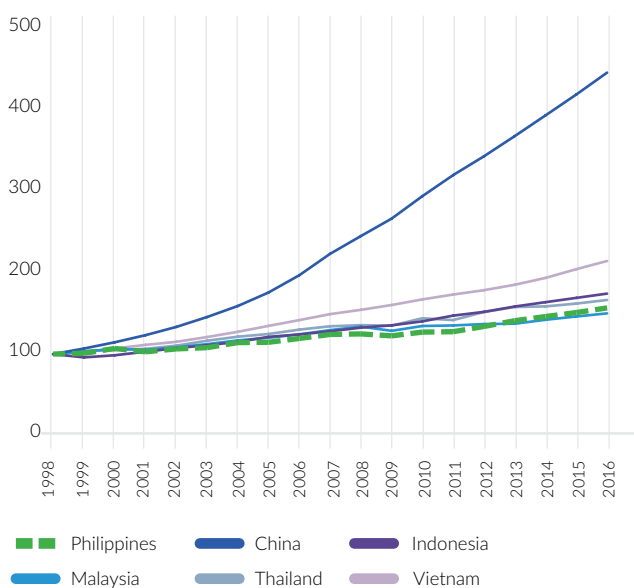
The recent improvement in labor productivity in the Philippines mainly reflects a rise in within-sector productivity growth. Sector-level productivity growth was the main driver of labor productivity growth in the Philippines between 1998 and 2016 (Figure 52). This is reflected in the increased contribution of many individual sectors to aggregate productivity over time. In 1998-2016, mining, transport, communication and storage, utilities, and manufacturing

were the sectors with the highest annual growth in labor productivity. By contrast, real estate, renting and other business activities, and construction experienced negative productivity growth in the same period (Figure 53).^{26,27,28}

The Philippines relies more heavily on within-sector productivity growth than other countries in East Asia, including China, Indonesia, Malaysia, and Thailand.²⁹

Figure 49. The Philippines' labor productivity growth was low relative to peers in the past two decades...

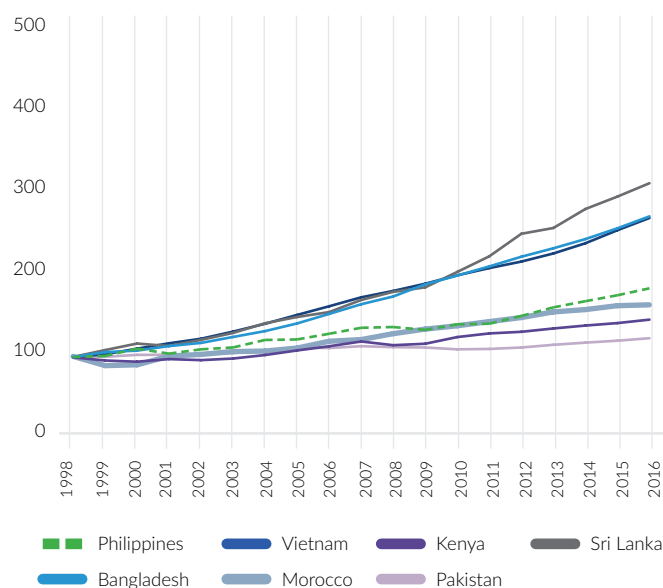
VA per Worker Growth: the Philippines vs. Regional Peers (1998=100)



Source: WDI.
Note: GDP per person employed (constant 2011 PPP\$).

Figure 50. ...widening the gap between the Philippines and its regional peers.

VA per Worker Growth: the Philippines vs. Structural Peers (1998=100)



Source: WDI.
Note: GDP per person employed (constant 2011 PPP\$).

26 National income accounts data are based on the 1994 Philippine Standard Industrial Classification (PSIC). However, labor force survey data from the PSA was reclassified in 2009 with the revision of the 2009 PSIC. In the 2009 PSIC, the "real estate, renting and business activities" was split into three sections. "Real estate" is now represented as a stand-alone section under the 2009 PSIC. The remaining activities were separated into "professional, scientific, and technical activities" and "administrative and support service activities." "Computer and related activities" were previously classified in Division 72 in the 1994 PSIC but are no longer included in this section. Computer repair activities were grouped with repair of household goods in "other service activities," while software publishing and IT activities have been grouped in the new "Information and Communication" category. As a result of these changes, employment data for the real estate, renting, and other business activities subsector from 2012 - 2016 are estimates based on the 2-digit PSIC codes available through the labor force survey. The PSA is currently in the process of updating national income accounts based on the 2012 base year, which will reflect latest industry classifications under the 2009 PSIC.

27 Based on the 1994 PSIC, real estate activities include buying, selling, renting, and operating self-owned or leased real estate such as apartment buildings and dwellings and non-residential buildings; developing and subdividing real estate into lots, etc; development and sale of land and cemetery lots; and operation of apartelles.

28 Based on the 1994 PSIC, renting activities include renting of machinery and equipment without operators and personal and household goods. Other business activities include: i) computer and related activities; ii) research and development; iii) and other miscellaneous business activities such as legal activities, accounting, auditing, market research, etc.

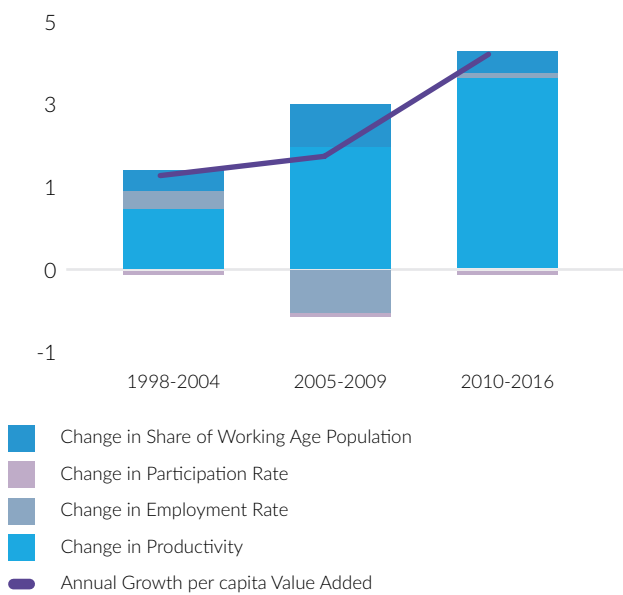
29 EAP April 2017.

Structural changes in the Philippine economy also contributed to labor productivity growth, although at a smaller scale than within-sector productivity growth. The between-static component's (i.e., movement of labor to more productive sectors) contribution to overall labor productivity growth was 46.3 percent in 1998-2004, 18.4 percent in 2005-09, and 30.1 percent in 2010-16. However, the between-dynamic component (i.e., movement of labor

to sectors with increasing productivity growth) contributed negatively to labor productivity in the same period (Figure 52). This was because although the share of employment increased in real estate and renting and other business activities, productivity in these sectors declined. By contrast, productivity increased in manufacturing while its share in total employment declined from 10.2 percent in 1998 to 8.3 percent in 2016.

Figure 51. Per capita VA growth came primarily from increased productivity.

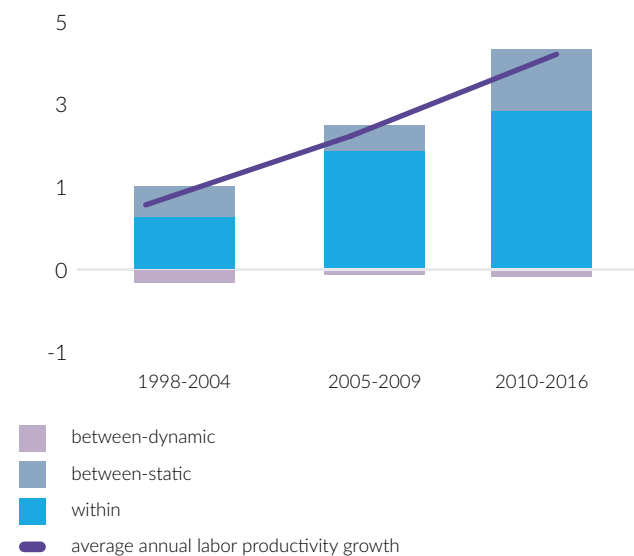
Decomposition of Growth in per Capita VA (Percent)



Source: Staff calculations based on PSA and WDI.

Figure 52. Within-sector productivity growth contributed the most to labor productivity growth.

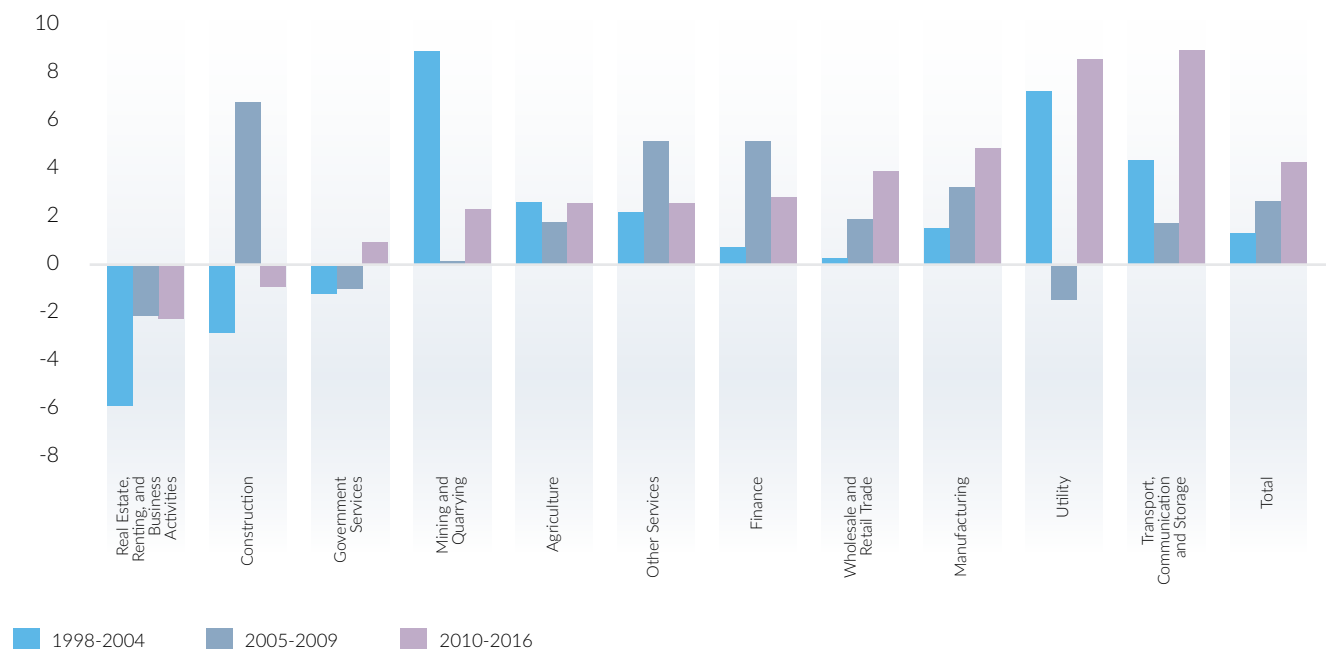
Decomposition of Annual Growth of Labor Productivity (Percentage Points)



Source: Staff calculations based on PSA and WDI.

Figure 53. Most sectors experienced labor productivity growth in 2010-16

Annualized Labor Productivity Growth by Sector (Percent)



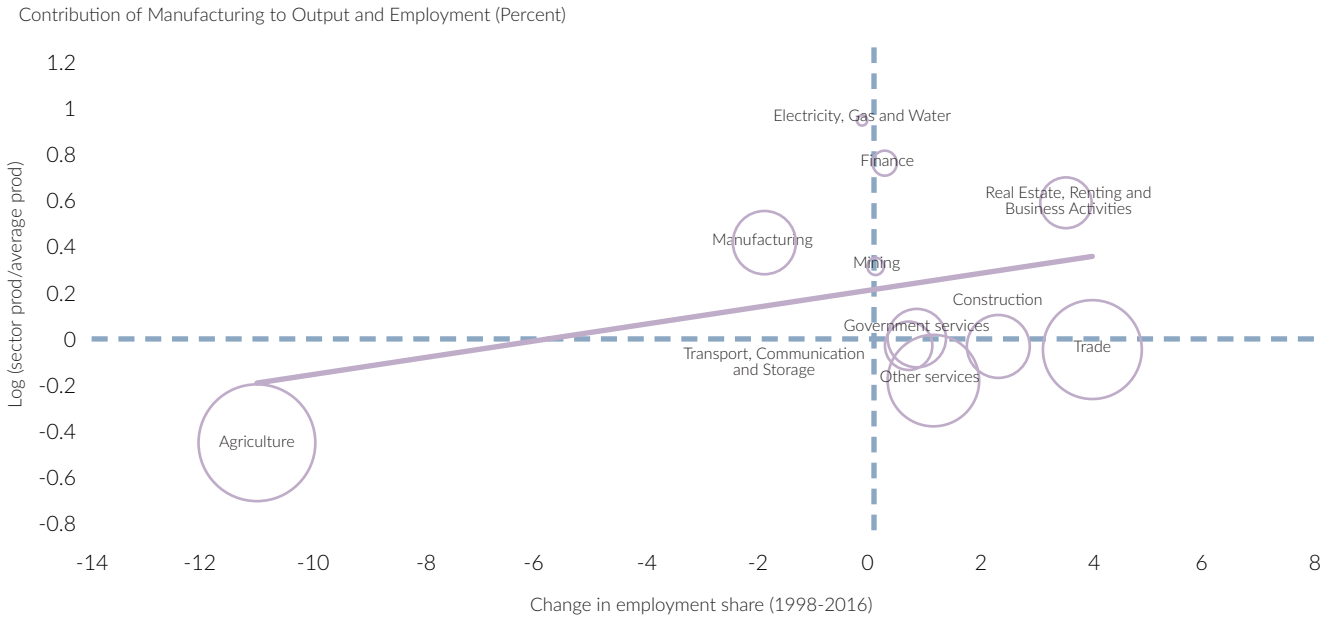
Source: Staff calculations based on PSA data.

The steady shift in employment from agriculture to services underpins the productivity gains from structural change. Figure 54 shows changes in employment shares and the relative productivity of sectors, measured as log of the ratio between sectoral productivity and economy-wide average productivity between 1998 and 2016. For positive gains to occur through structural change, sectors need to be in either the top-right corner (e.g., services) where labor shifts into relatively high-productivity sectors, or in the third quadrant (e.g., agriculture) where labor shifts out of low-productivity sectors. Structural change (i.e., the “across” component) contributed around 0.3 percentage points and 1.1 percentage points per year to labor productivity growth in 1998-2009 and 2010-16, respectively.

The sectoral shift in employment from agriculture to services, and to a lesser extent manufacturing, contributed around 13

percentage points to aggregate productivity growth in 1998-2014. Structural gains occur when (i) labor move to relatively high-productivity sectors or (ii) when labor move out of relatively low-productivity sectors. Productivity in utilities, finance, and real estate, renting, and other business activities is high relative to the economy-wide average productivity. These sectors also gained labor share (example of labor moving to more productive sectors). Moreover, labor moved out of the less productive agriculture sector, increasing aggregate productivity (example of labor moving from less productive sectors). The combined effect of the movement of labor across sectors contributed 13 percent to labor productivity growth in 1998-2014 (Figure 55). The structural change will continue to contribute to aggregate labor productivity growth in the Philippines, as the agriculture sector still employs more than a quarter of all workers in the country (Figure 56).

Figure 54. Labor is transitioning from agriculture to more productive sectors.



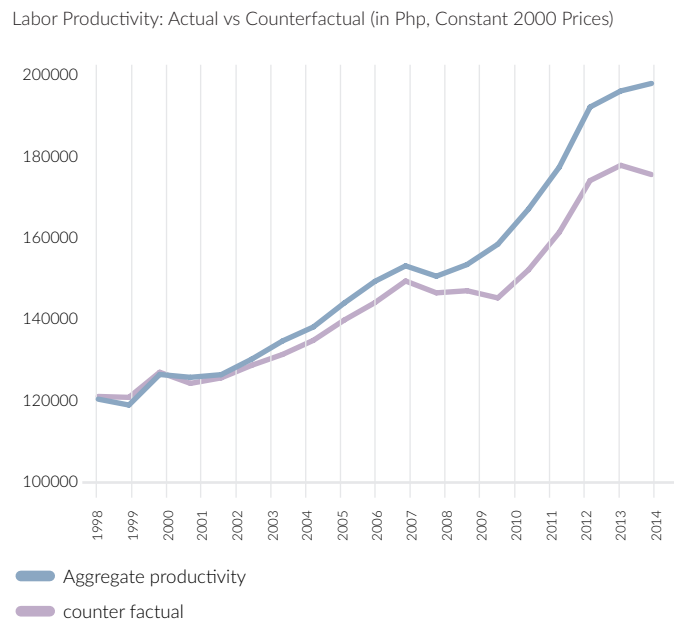
Source: Staff calculations based on PSA and WDI.

Note: The figure plots the logarithm of sectoral VA per worker (relative to the average across all sectors) and the change in the employment share for 11 economic sectors in 1998-2016. The size of the circle reflects the employment share in 2016. On the vertical axis, sectors above zero are more productive than the average sector in the economy. On the horizontal axis, sectors to the right of zero have had increases in their employment shares.

The service sector has contributed the most to per capita VA growth among the three main sectors in the Philippines, and the reallocation of labor to more productive sectors improved after 2010. The contribution of the service sector to per capita VA growth increased from 0.5 percentage points in 1998-2004 to 1.5 percentage points and 2.0 percentage points in 2005-09 and 2010-16, respectively (Figure 57). The intersectoral reallocation (i.e., the “across” component) of labor productivity accelerated and started to contribute more to per capita VA growth after 2010. In terms of within-sector productivity growth, manufacturing, wholesale and retail trade, transportation, and communication and storage have contributed the most to per capita VA growth, while the real estate sector has consistently been the worst performer since 1998 (Figure 58).

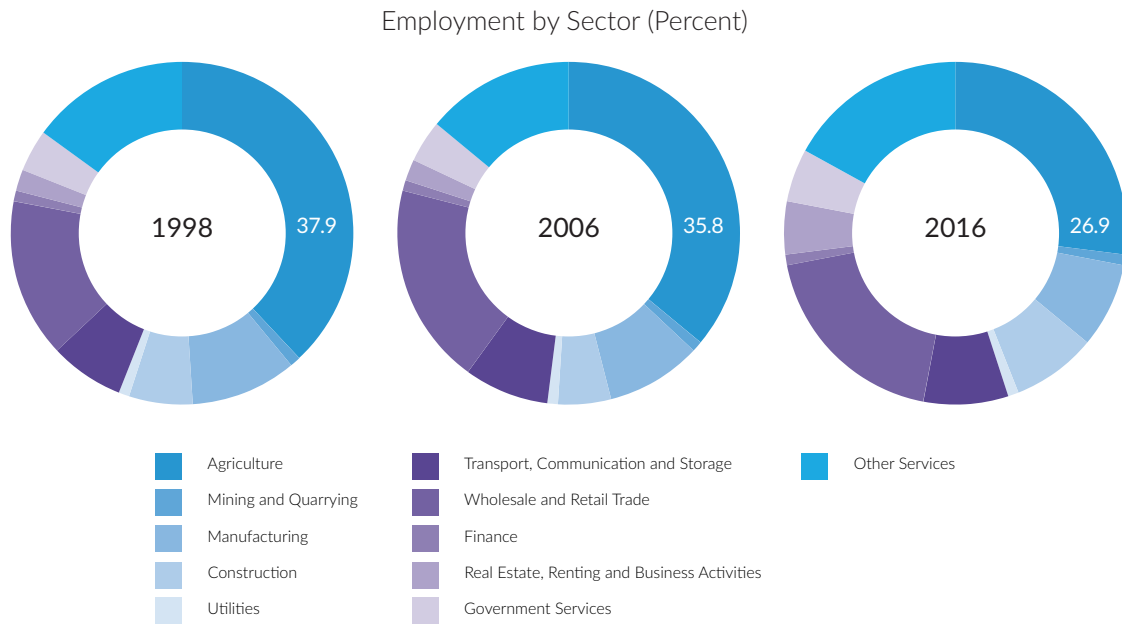
Within-sector productivity growth drove aggregate labor productivity growth in the Philippines between 1998 and 2016. Yet, there was substantial variation in labor productivity growth across sectors, with manufacturing and some formal service sectors experiencing the highest levels of labor productivity growth. The next chapter will examine firm-level evidence to assess the role of factor allocation in within-sector productivity dynamics.

Figure 55. Labor movement across sectors increased labor productivity by 13 percent compared to no labor movement.



Source: Staff calculations based on PSA and WDI.

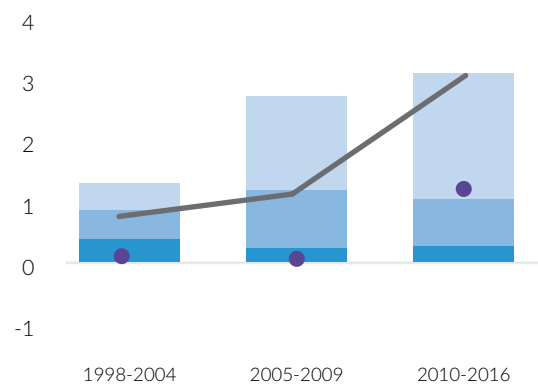
Figure 56. The share of employment in agriculture has been declining since 1998.



Source: Staff calculations based on PSA and WDI.

Figure 57. Among the main three sectors, services contributed the most to per capita VA growth.

Decomposition of per Capita VA Growth
(Change in Productivity by Sector, Percentage Points)

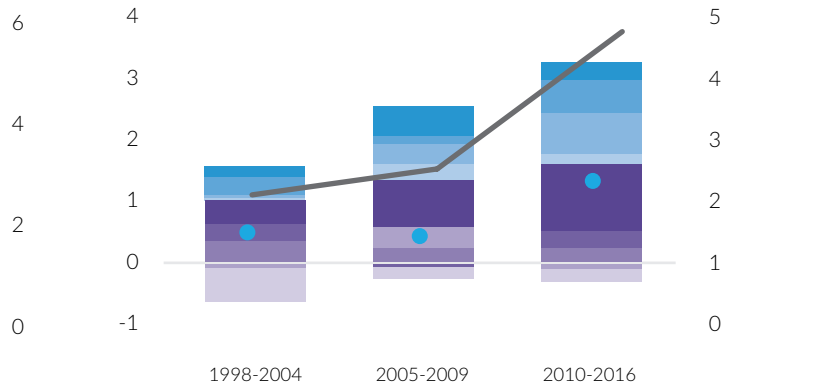


■ Services
■ Industry
■ Agriculture
— Annual Growth per capita Value Added
● Annual Growth per capita Value Added

Source: Staff calculations based on PSA and WDI.

Figure 58. The manufacturing sector experienced significant productivity growth...

Decomposition of per Capita VA Growth (Change in Productivity by Sector, Percentage Points)



■ Manufacturing
■ Utilities
■ Agriculture
■ Mining, Quarrying and Construction
■ Real Estate, Renting and Business Activities
● Intersectoral Reallocation Effect
■ Other Services
■ Transport, Communication and Storage
■ Wholesale and Retail Trade
■ Finance
— Annual Growth per capita Value Added (RHS)

Source: Staff calculations based on PSA and WDI.



03

Patterns and Drivers of Productivity at Industry and Firm Level

Productivity growth in the Philippines has been mainly driven by within-sector productivity growth. To better understand what drives sector-level productivity dynamics, this chapter assess the role of allocative and technical efficiencies in sector productivity growth. Firm performance contributes to aggregate productivity growth through two channels: i) the capacity of markets to efficiently allocate resources across firms (i.e., allocative efficiency) and ii) the evolution of firm productivity (i.e., technical efficiency). Allocative efficiency involves the allocation of resources to the most productive

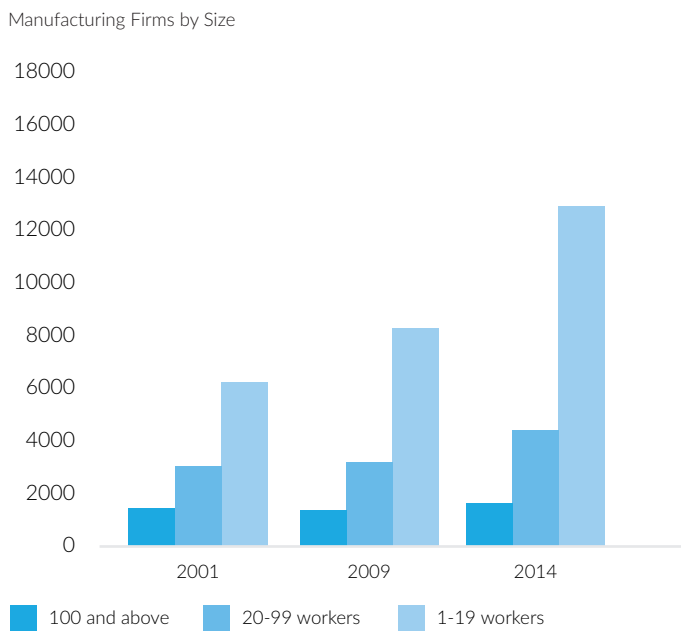
activities and firms, while technical efficiency occurs when firms produce more output from the same level of inputs. To improve overall productivity through a better allocation of resources, resources from firms with low returns on production factors need to flow to firms with high returns in the same or different sectors. While allocative efficiency across sector was analyzed in Chapter 2, this chapter will focus on allocative efficiency between firms within a narrowly defined sector.

FIRM CHARACTERISTICS AND PRODUCTIVITY

The Philippine economy is dominated by small firms that are less productive than medium or large firms.³⁰ In 2014, two-thirds of the country’s manufacturing firms and over 80 percent of services firms employed less than 20 workers (Figure 59 and Figure 60). Yet, small firms are on average less productive than medium or large firms in both manufacturing

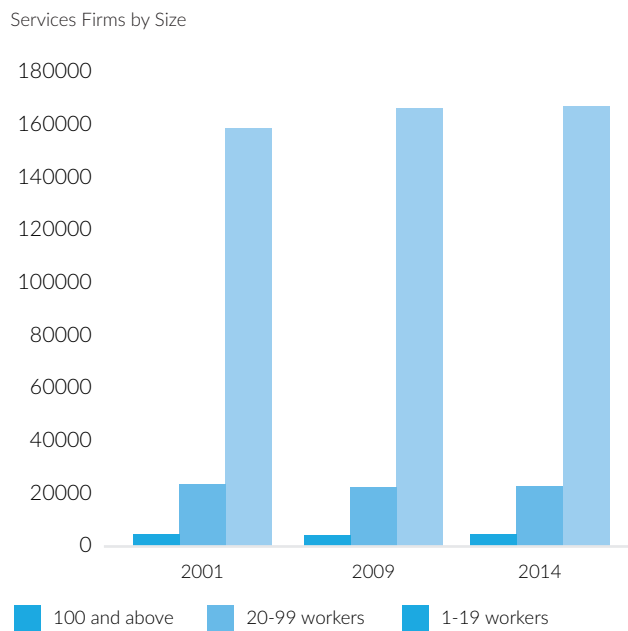
and services (Figure 61 and Figure 62). This is also common in other countries, as larger firms tend to have better access to credit and technology, benefit from economies of scale, and are more resilient to shocks than smaller firms. However, a large share of small firms in an economy can be an indication that firms are suffering from stunted growth.

Figure 59. Most firms are small in the manufacturing sector...



Source: PSA.

Figure 60. ...as well as in the service sector.

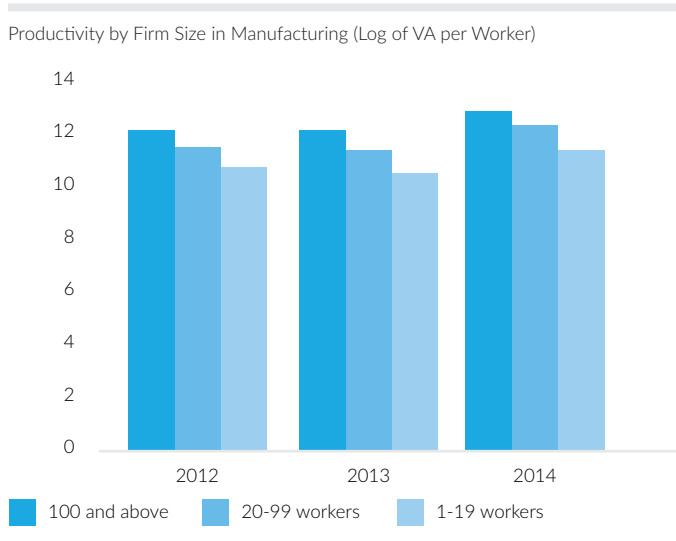


Source: PSA.

The relationship between the age and size of firms differs across sectors in the Philippines. When product and factor markets work efficiently, unproductive firms exit the market while more efficient firms remain and expand. This pattern is observed in the United States where old firms (i.e., firms 40 or more years old) are about eight times larger than firms with less than five years in the market. In the Philippines, the economy-wide ratio of average employment to young firms shows a similar pattern, as old firms are about seven times larger than young firms (Figure 63). However, there are vast

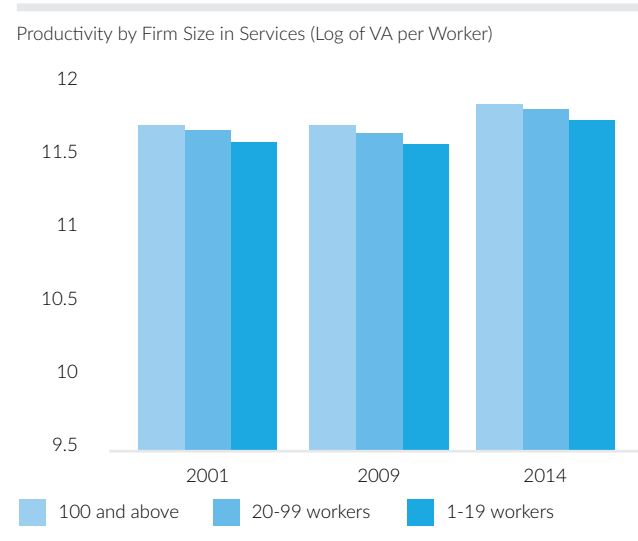
differences across sectors. In manufacturing, for example, old textile firms are on average smaller than younger firms, while old firms in the motor vehicles industry are 21 times larger than younger firms (Table 1). In services, old financial firms are 13 times larger than younger firms, while firms in administrative and supporting services do not seem to grow over time (Table 2). The distinct growth patterns of firms in different sectors could be caused by differences in sectors' product and/or factor market efficiencies.

Figure 61. Large firms are more productive than small or medium firms in manufacturing...



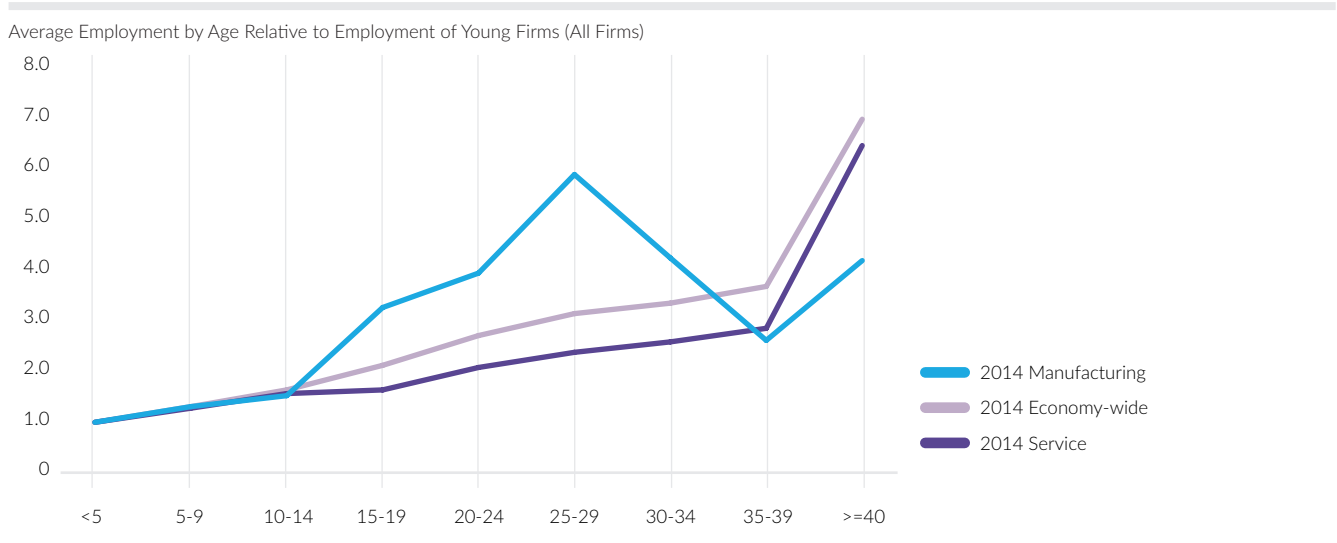
Source: Staff calculations based on PSA data.

Figure 62. ...as well as in services.



Source: Staff calculations based on PSA data.

Figure 63. Firms in the Philippines are growing at a healthy rate.



Source: Staff calculations based on PSA data.

Table 1. Ratio of Average Employment Relative to Young Firms, Manufacturing, 2014

1994 PSIC 2-Digit Industries	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	>=40
Food products and beverages	1	1.8	1.7	5.1	5.2	5.6	7.2	8.4	9.3
Textiles	1	0.4	1	0.8	0.9	0.8	0.7	1	0.9
Wearing apparel	1	1.9	2.2	3.9	3.2	5.5	8.3	1.3	3.7
Tanning and dressing of leather; manufacture of luggage, handbags and footwear	1	0.7	1.2	1.1	0.9	1.2	1.1	0.8	1
Wood, wood products and cork, except furniture; manufacture of articles of bamboo, cane, rattan and the like; manufacture of plaiting materials	1	1.1	1.5	2.7	3.2	1.2	4.6	2.2	1.9
Paper and paper products	1	1.1	0.9	1.2	1.1	1.5	1	0.7	0.7
Publishing, printing and reproduction of recorded media*	1	1	1.9	1.6	4.1	8.2	3.9	7.5	7.5
Coke, refined petroleum and other fuel products									
Chemical and chemical products	1	1.3	1.2	1.8	2	1.2	4.1	3.3	4.4
Rubber and paper products	1	1.9		2.1	1.7	3	1		19.3
Paper and paper products	1	0.6	6	3.1	5.5	5.8	3.6	1.2	5.7
Basic metals	1	1.3	1.5	1.5	3.1	1.7	1.3	2.1	3.1
Fabricated metal products, except machinery and equipment	1	1.4	1.5	3.7	4.7	3	1.7	4.1	3.9
Machinery and equipment, n.e.c.	1	1.9	5.5	4.4	1.5	7.2	1.2	1.9	3.5
Office, accounting and computing machinery	1	1.1	1.6	1.2	2.6				
Electrical machinery and apparatus, n.e.c.	1	0.9	1.8	2.5	2.4	3.4	0.2	0.5	1.1
Radio, television and communication equipment and apparatus	1	1.5	1.6	2.5	2.8	15.2	9.7	4.2	
Medical, precision and optical instruments, watches and clocks	1	0.1	0.3	0.6	0.6	1.3	2.2	0.3	0.1
Motor vehicles, trailers and semi-trailers	1	4.3	28.6	19.5	27.7	17.6	4.5	3.2	21.1
Other transport equipment	1	3.4	3.5	33.5	37.1				
Manufacture and repair of furniture**	1	2.3	1.5	1.6	4.1	4.4	5.5	1	2.9
Manufacturing, n.e.c.	1	1.6	1.8	2.2	1.1	2.5	0.4	1.4	2.3
Manufacturing Sector	1	1.3	1.5	3.2	3.9	5.8	4.2	2.6	4.1

Source: Staff calculations based on PSA data.

Table 2. Ratio of Average Employment Relative to Young Firms, Services, 2014

2009 PSIC Services Sectors	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	>=40
Wholesale and retail trade; repair of motor vehicles and motorcycles	1	1	2	2	2	3	2	3	4
Transportation and storage	1	1	1	1	2	4	2	3	8
Accommodation and food service activities	1	1	1	2	2	1	2	2	2
Information and communication	1	1	2	3	3	3	2	1	6
Financial and insurance activities	1	1	1	2	2	4	6	2	13
Real state activities	1	1	1	2	2	1	2	1	1
Professional, scientific and technical activities	1	1	1	1	2	4	2	1	3
Administrative and support service activities	1	2	1	1	1	1	1	2	1
Education	1	1	1	1	2	3	3	6	7
Human health and social work activities	1	1	1	2	2	1	4	3	12
Arts, entertainment and recreation	1	1	1	1	4	7	2	9	3
Other service activities	1	1	1	2	2	2	3	3	3
Services Sector	1	1	2	2	2	2	3	3	6

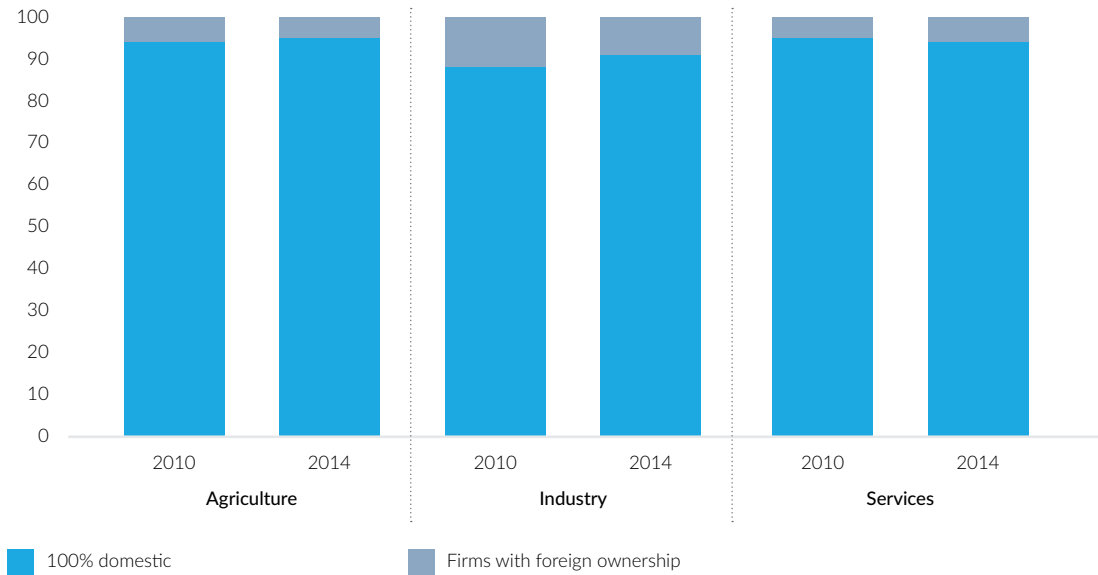
Source: Staff calculations based on PSA data.

The share of firms with foreign capital remains small in the overall economy, although the degree of foreign ownership is relatively high in some services and manufacturing sectors. Less than 10 percent of all firms in the Philippines have some degree of foreign ownership, with most foreign owners in industry (their share has, however, declined in recent years) (Figure 64). Across sectors, firms in manufacturing and services, such as in information communication technologies and professional services that have foreign ownership, receive on average more than 50 percent of their capital from foreign sources (Figure 65).

Firms with foreign ownership are on average more productive than fully domestically owned firms. Between 2010 and 2014, firms with foreign capital were more productive than firms with 100 percent domestic capital (Figure 66). In addition, firm productivity tends to increase with more foreign ownership (Figure 67). For instance, firms in agriculture with between 50 percent and 75 percent foreign capital were substantially more productive than firms with only domestic capital during the same period. This finding is consistent with evidence from other developing countries.

Figure 64. The share of Philippine firms with foreign ownership remains small.

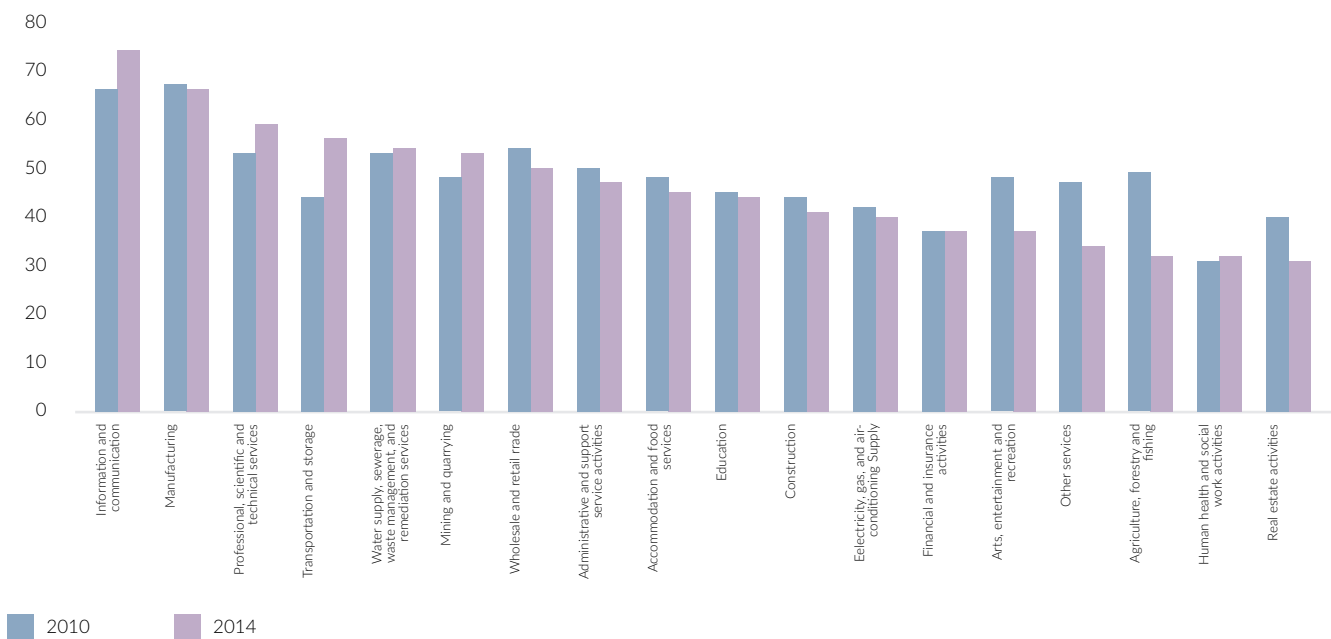
Composition of Firm Ownership by Sector (Percent)



Source: Staff calculations based on PSA data.

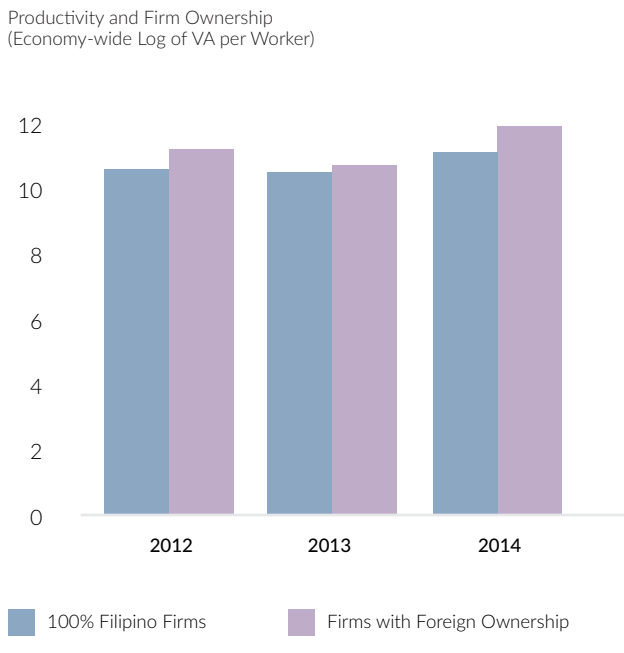
Figure 65. Foreign ownership is high in some services and manufacturing sectors.

Average Foreign Ownership by Sector (Percent)



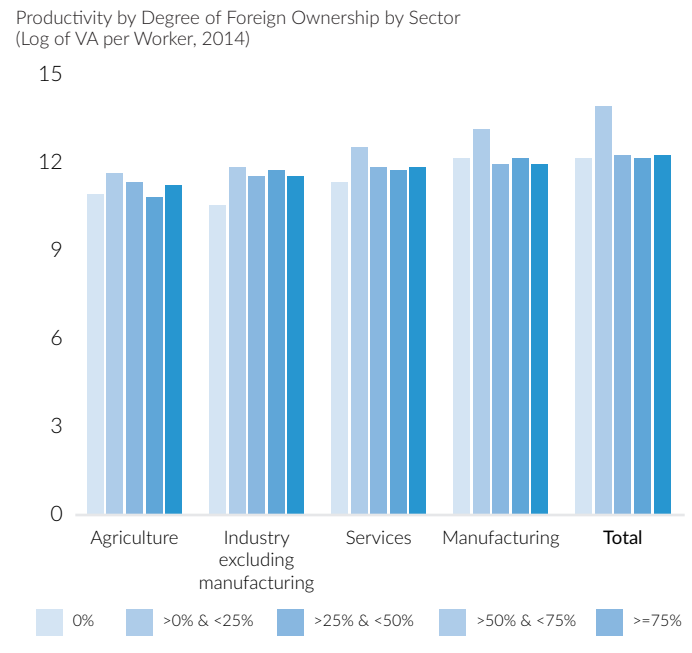
Source: Staff calculations based on PSA data.

Figure 66. Firms with foreign ownership are on average more productive than fully domestically owned firms.



Source: Staff calculations based on PSA data.

Figure 67. Foreign ownership is correlated with higher productivity.

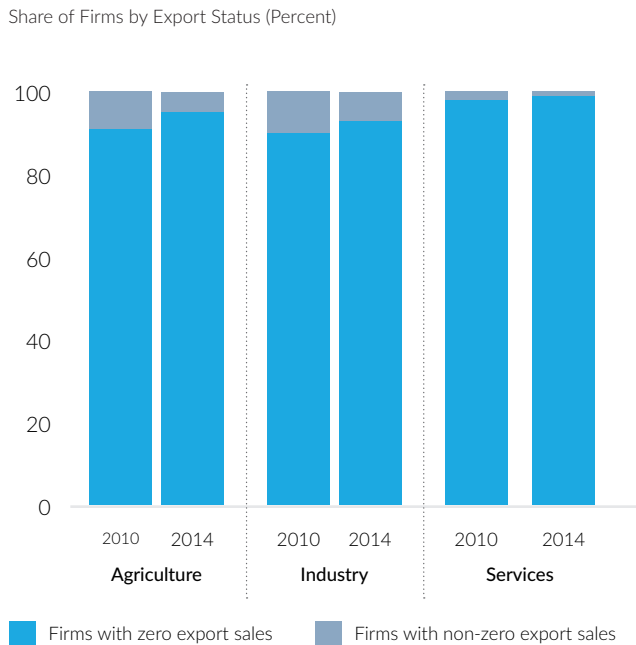


Source: Staff calculations based on PSA data.

While the number of exporting firms remains small across sectors, they are on average more productive than firms that only focus on the domestic market. Consistent with aggregate data, firm-level data show that the share of firms that export remains small in the Philippines (Figure 68). In agriculture, a mere 5 percent of sampled firms exported in 2014, down from less than 10 percent in 2010. A similar trend can be observed in industry: the share of exporting firms declined from 10 percent in 2010 to 7 percent in 2014. The share of export service firms also remains small, declining from 2 percent in 2010 to 1 percent in 2014. Yet, firms that export are on average more productive than firms that focus on the domestic market (Figure 69). This is likely because firms that export face more competition in global markets, which likely forces them to be more productive, a stylized fact presented in many countries.

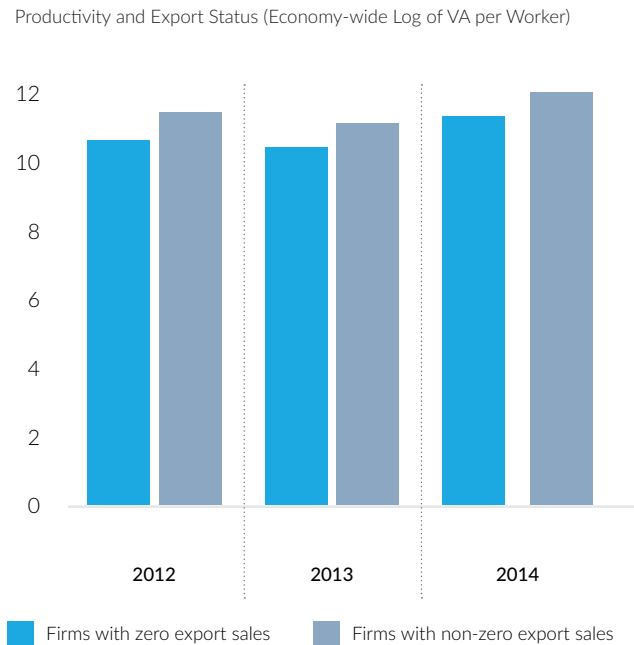


Figure 68. The share of firms that export declined in the Philippines in 2010-14.



Source: Staff calculations based on PSA data.

Figure 69. Firms that export are on average more productive than firms that focus on the domestic market.



Source: Staff calculations based on PSA data.



A better allocation of resources could help expand more productive firms and sectors. While firms that are large, export, and have foreign ownership are more productive than firms that are small, domestically owned, and only focus on domestic market, they represent a very small share of firms in the Philippines. While this is not likely the result of a lack of policies to support specific industries, it might be explained by an inefficient allocation of resources. By removing market distortions, resources for the production of goods and services (i.e., capital and labor) are likely to flow from less productive firms to firms that have a high productivity potential.

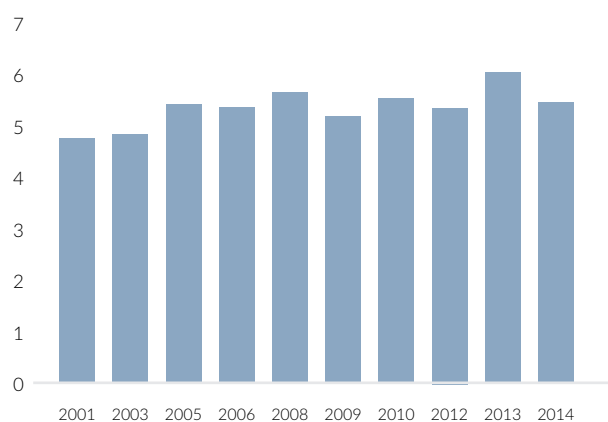
FACTOR ALLOCATION IN MANUFACTURING IS IMPROVING

A misallocation of resources hampers growth and creates inefficient firm dynamics. Resource misallocation is caused by three categories of factors: (i) statutory provisions, including the tax code that varies with firm characteristics, tariffs that only apply to certain categories of goods, and labor and product market regulations that restrict the size of firms or limit their market access; (ii) discretionary provisions granted by the government that favor or penalize specific firms;³¹ and (iii) market imperfections such as the presence of monopolies, market frictions, and the uneven enforcement of property rights. A misallocation of resources can prevent the expansion of productive firms and promote the survival of unproductive ones. It can also discourage firms from investing, growing, and increasing productivity.³²

There are greater differences in the productivity of manufacturing firms in the Philippines than in many other countries. While differences in productivity among firms producing the same products are common around the world,³³ they are particularly high in the Philippines. Philippine firms in the 90th percentile of the productivity distribution were 5.5 times more productive than firms in the 10th percentile in 2014 (Figure 70). This was higher than in both Malaysia (2.2 times in 2010) and China (3.5 times in 2005) (Figure 71).³⁴ This high level of disparity means that some firms can produce much more with the same inputs within the same industry. The disparity could be caused by differences in technology, processes, human capital, or managerial skills. However, this is also a sign of significant disparities in the allocation of production factors (i.e., a misallocation of production factors).

Figure 70. There are large differences in productivity levels across manufacturing firms in the Philippines...

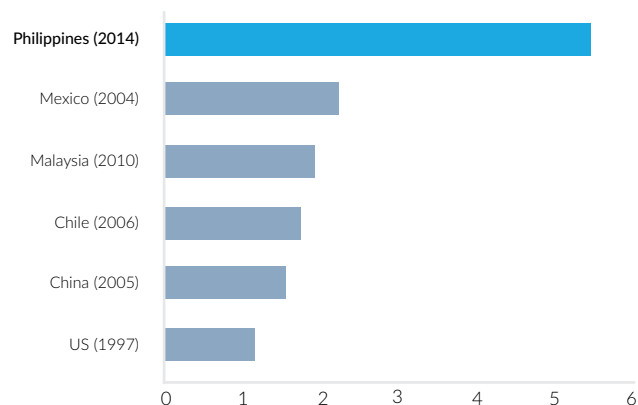
Ratio of Productivity between the 90th and 10th percentile of the Productivity Distribution



Source: Staff calculations based on PSA data.

Figure 71. ...and manufacturing firm productivity dispersion is higher in the Philippines than in many other countries.

Ratio of Productivity between the 90th and 10th percentile of the Productivity Distribution



Source: Philippine data from a background paper prepared for this report using PSA data. Data for other countries are from the Inter-American Development Bank (2010), Hsieh and Klenow (2009), Ha et al. (2017).

Note: The TFPR from the framework of Hsieh and Klenow (2009) is used as a productivity measure.

³¹ Discretionary provisions are often referred to as crony capitalism or even government corruption. Examples include subsidies, tax breaks, low interest rate loans granted to specific firms, an unfair bidding process, preferential market access, or selective enforcement of taxes and regulations

³² Hsieh and Klenow (2014), Restuccia and Rogerson (2017).

³³ Syverson (2011).

³⁴ Magnitudes differences could be partly due to different period covered in comparing countries.



An improvement in factor allocation could lead to higher TFP growth. An industry's overall TFP growth depends not only on the TFP of individual firms but also on the allocation of resources across firms. The difference between TFP in an environment without distortions, where resources are allocated perfectly, and the observed level of TFP is called *misallocation*.³⁵ This means that if firms in an industry have more productive use of labor than other firms in the same industry, the firms with higher productivity should absorb labor from the less productive firms. However, *misallocation* could occur if labor market friction prevents this labor shift though an increase in labor costs. Moreover, misallocation could also take place if unproductive firms receive tax incentives, as these firms would have an advantage over more productive firms that are not benefiting from the incentives. As a result, the unproductive firms would attract capital and labor that could have had higher productivity returns.

Public policies that address the problem of misallocation could yield large productivity dividends in the Philippines. Policy actions that remove distortions in factor (i.e., capital and labor), product, and intermediate goods and services markets could boost overall productivity by increasing the productivity of lagging industries and firms to national average levels. Since the size of misallocation in the country's manufacturing sector was 98 percent in 2014, TFP in manufacturing could be almost double the current level if resources were perfectly allocated.³⁶

Nevertheless, factor allocation in Philippine manufacturing has improved in recent years. *Misallocation* in the sector declined from 180 percent in 2009 to 98 percent in 2014 (Figure 72), which is consistent with positive labor

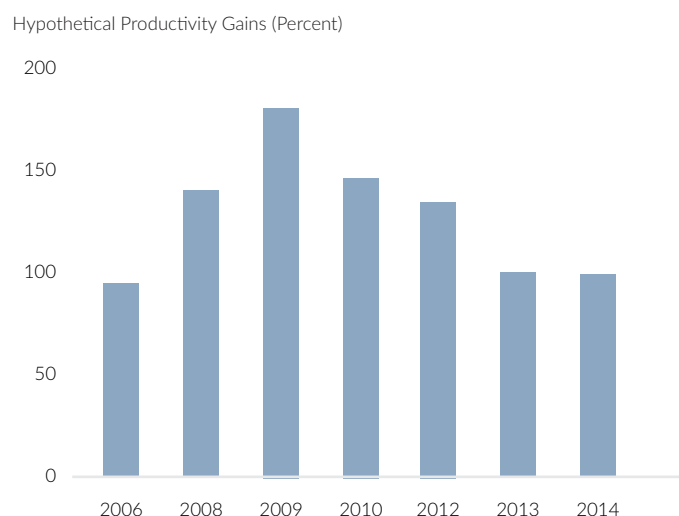
productivity growth at the sector level (discussed in Chapter 2). This also confirms that within-sector productivity growth was driven by both improvements in within-firm productivity growth and improvements in factor allocation across firms in the same sector, which reduced *misallocation*. The declining trend of *misallocation* in manufacturing that started in 2010 was consistent across manufacturing subsectors, suggesting that macroeconomic factors such as macroeconomic stability and the gradual and continuous implementation of structural reforms have been driving the improvement rather than factors in individual subsectors. A comparison with peer countries shows that *misallocation* in the Philippines is in line with that of China in 2005 and Malaysia in 2010 but lower than that of Kenya in 2010 (Figure 73). However, the country's misallocation is relatively high compared with countries in Latin America, as the average misallocation in Latin America was around 60 percent.

Still, productive manufacturing firms face more distortions in the Philippines than less productive firms, preventing faster economic growth. Evidence suggests that productive firms face larger idiosyncratic distortions than less productive firms in manufacturing,³⁷ which means that productive firms are "taxed" at a higher rate in terms of distortions. As a result, productive firms could have expanded their production more if they had acquired more resources. Examples of distortion include preferential market access and preferential tax incentives to certain firms, which lead productive firms to produce below their optimal levels. This could also, however, mean that unproductive firms continue to operate and use resources in the economy, as their output is possibly being subsidized. The constraints faced by productive firms will ultimately worsen the economy's overall productivity growth.

35 Hsieh and Klenow (2009). Details of the framework can be found in annex 3.2.

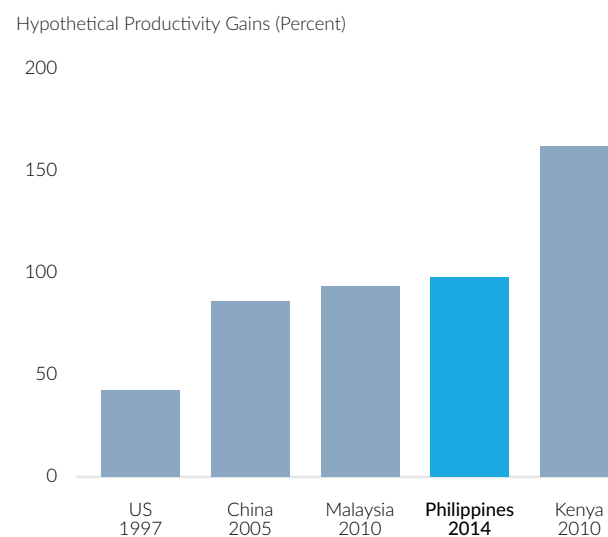
36 For a robustness check, the framework of Bils, Klenow, and Ruane (2017) was used. Results can be found in Annex 3.3.

37 There is a statistically significant positive relationship between firm productivity and firm distortion. Restuccia and Rogerson (2008) argue that productivity losses due to misallocation would be even more significant if distortions are correlated positively with firm productivity.

Figure 72. Misallocation has declined in the Philippines since 2009...

Source: Staff calculations based on PSA data.

Note: Data only include formal firms and sectors with larger than 10 firms. Sectors with less than 10 firms have been removed to results driven by outliers.

Figure 73. ... and is in line with selected regional peers.

Source: Data for the Philippines are based on staff calculations using PSA data, Shieh and Klenow (2009), Nguyen, H., T. Taskin, and A. Yilmaz (2016), Chuah et al (2018).

ROLE OF FACTOR ALLOCATION IN PRODUCTIVITY REMAINS SMALL IN NON-MANUFACTURING SECTORS

The role of factor allocation in firm productivity is small and has been declining in non-manufacturing industries and services. The economy-wide census in 2012, 2013, and 2014 were used to assess the role of factor allocation in firm productivity in non-manufacturing industries and services in the Philippines.³⁸ Sectoral productivity is decomposed into within-firm productivity and between-firm productivity. The latter captures the role of factor allocation and the allocation of resources *across firms* in the same narrowly defined sectors (unlike the “between” component in Chapter 2 that captures allocation of resources *across sectors*). When

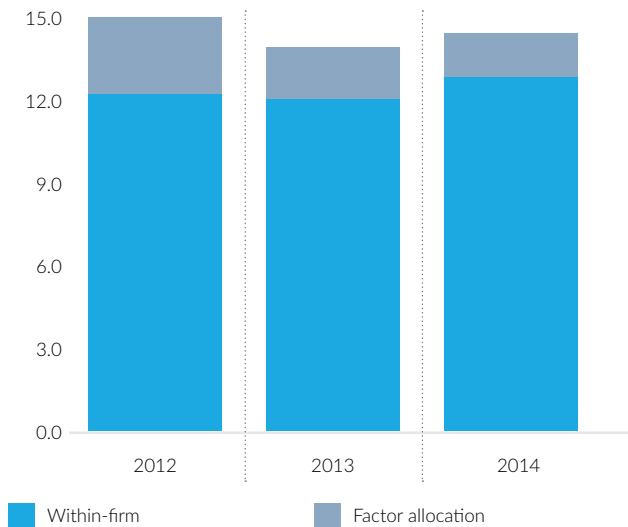
between-firm productivity is positive, more productive firms have higher market shares than less productive firms, resulting in an improvement in factor allocation.³⁹ In the Philippines, factor allocation explained, on average, 12.5 percent of firm productivity in non-manufacturing industries and 13 percent of firm productivity in services in 2012-14 (Figure 74 and Figure 75). Moreover, the size of the factor allocation component declined between 2012 and 2014, suggesting factor allocation has slightly worsened in non-manufacturing industries and services.

³⁸ The reason for adopting a different methodology for services is that Hsieh and Klenow (2009) requires the use of labor shares of corresponding United States' narrowly defined industries. While United States labor shares are available for manufacturing industries, they are not available for services.

³⁹ The OP method is used for the decomposition. This decomposes sectoral productivity into an unweighted average of firm-level labor productivity in the sector and a covariance term capturing the joint distribution of a firm's productivity and its output share. The extent of resource misallocation is inferred by the covariance term, where a positive value indicates that more productive firms have higher market shares. Increases in the covariance term would therefore capture improvements in the allocation of productive inputs (i.e., workers). This is because a larger share of the industry output is correctly concentrated among the most productive firms.

Figure 74. Factor allocation explains only a small part of firm productivity in non-manufacturing industries...

Firm Productivity: Within vs Factor Allocation,
Non-manufacturing Industry (Log of VA per Worker)

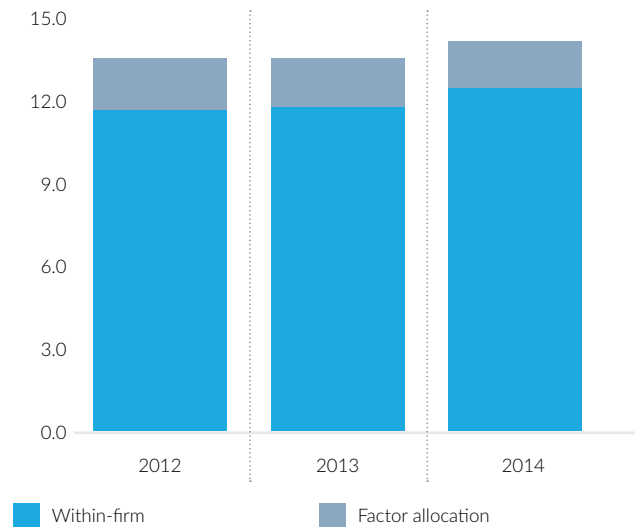


Source: Staff calculations based on PSA data following Olley and Pakes (1996).

Although these methodologies have limitations, evidence suggests that the Philippines can increase productivity growth through better factor allocation. Chapter 1 demonstrated that the contribution of productivity to economic growth has accelerated in recent years. Chapter 2 confirmed that within-sector productivity improvements have been driving aggregate productivity growth. This chapter provided evidence that factor allocation across firms is improving in manufacturing but worsening slightly in non-manufacturing industries and services. Furthermore, there is a large potential to reduce misallocation in the Philippines, suggesting opportunities to further increase

Figure 75. ...as well as in services.

Firm Productivity: Within vs Factor Allocation, Services
(Log of VA per Worker)



Source: Staff calculations based on PSA data following Olley and Pakes (1996).

productivity growth through a better allocation of resources across firms. The two methodologies used to infer the degree of misallocation of resources among firms made strong assumptions and are therefore limited. The first method can only calculate the size of the *misallocation* but not its source, while the second model does not consider the entry and exit of firms. Yet, these are frontier methods for calculating productivity and widely used. The next chapter will discuss ways to further improve allocative efficiency. Moreover, the size of the factor allocation component declined between 2012 and 2014, suggesting factor allocation has slightly worsened in non-manufacturing industries and services.

04

Policy Options for Increasing
Productivity and Economic
Growth in the Philippines

This chapter explores ways to boost productivity growth by closing gaps in technical and allocative efficiencies. External and within-firm determinants of productivity growth are separated following the methodology developed by Syverson.⁴⁰ External factors are mainly related to government policies and market conditions that are outside of the control of individual firms and include:

- the policy environment for competition and private-sector investment;
- trade integration;
- spillover from FDI;
- access to finance and capital allocation; and
- education quality and labor market regulations.



THE REGULATORY ENVIRONMENT LIMITS MARKET COMPETITION

Within-firm determinants are factors that are firm-specific and usually under the control of individual firms, notably innovation and managerial quality. While this categorization has its limitations, as many within-firm factors are also affected by the external environment, it provides a useful tool to gain insights into the main determinants of productivity growth. This chapter analyzes factors that affect firms' productivity dynamics, and it identifies opportunities to improve factor allocation as well as innovation systems to unleash the growth potential of the Philippines. Chapter 5 will use a simulation model to quantify the productivity and growth impacts of these factors.

Market regulations affect productivity growth because they are among the most significant determinants of competition in the economy. Market competition is largely determined by regulations that can either enable or restrict competition. The presence of a regulatory framework that strengthens competition within each industry or in the market as a whole is expected to drive productivity growth through three main channels. First, competition pressures firms to become more efficient to avoid exiting the market.⁴¹ Second, it ensures that more productive firms increase their market share at the expense of less productive firms. As high-productivity firms capture resources and expand, low-productivity firms are forced to exit when they cannot attract or retain factors of production.⁴² Finally, competition drives firms to innovate, to develop new products and processes, which can improve their efficiency. However, the relationship between innovation and competition is not linear.⁴³

Market rules and regulations, however, may be hindering competition in the Philippines. In manufacturing, Philippine markets are more concentrated than those of regional peers, with a higher proportion of monopoly, duopoly or oligopoly markets, which are typically more prone to collusion and abuse of market power (Figure 76). Furthermore, there has been a recent increase in the number of monopolies and

40 Syverson, 2011.

41 Bloom and Van Reenen (2010) examined the links between product market competition and quality of management and found evidence that competition is robustly and positively associated with higher management practice scores.

42 Syverson (2004), Arnold et al (2011).

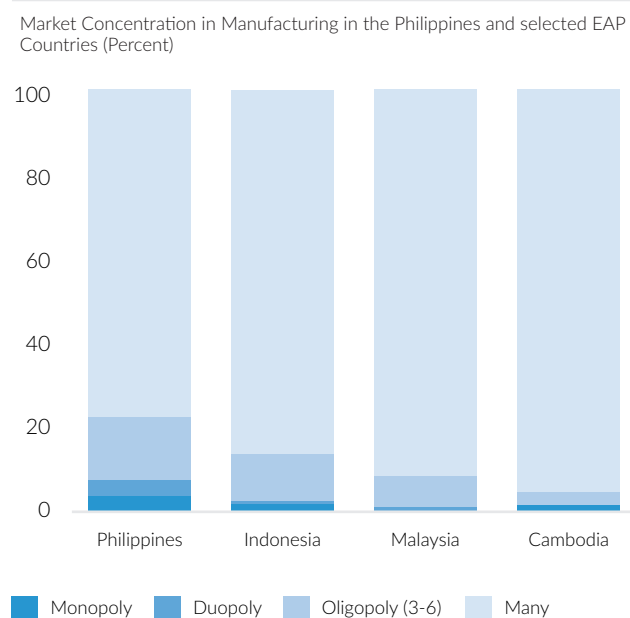
43 Aghion (2005) found an inverted U shape relationship between innovation and productivity. On the one hand, firms aim to innovate to gain a cost advantage, differentiate their products, or bring new products to the market in the presence of competition. On the other hand, the financial incentives for firms to innovate stems from the ability to generate positive returns from innovation, which suggests a need for ex post market power. In this case, intellectual property rights and patents play an important role.

duopolies in the country's manufacturing industry (Figure 77). As a result, market competition is perceived to be weak in the Philippines. The country ranked 114th out of 138 economies on market dominance in the World Economic Forum's 2016-17 Global Competitiveness Report, which was below the average of the countries in the sample and lowest among regional peers (Figure 78). Limited competition affects business risks, especially related to vested interests and unfair competitive practices (Figure 79).⁴⁴

The effect of anticompetitive restrictions in the service sector not only distorts services but also sectors that use services as production inputs, such as manufacturing. To

measure the trickle-down impacts of regulatory barriers to competition in the service sector on manufacturing, input-output linkages were analyzed.⁴⁵ Results suggest that downstream manufacturing sectors, for which the incidence of anti-competitive restrictions in services is higher, tend to have productivity distributions that are more dispersed and skewed to the left, an indication of a potential misallocation of resources (explored in Chapter 3).⁴⁶ This suggests that anticompetitive regulations in service sectors may prevent the allocation of resources to more productive firms, hampering productivity performance at both the firm and aggregate level.

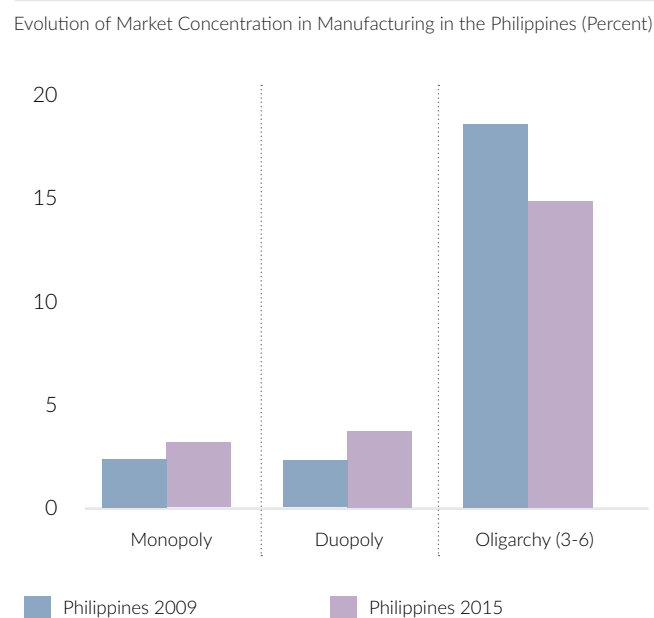
Figure 76. Philippine markets are more concentrated than peers'..



Source: Fostering Competition in the Philippines, 2018.

Note: Regional peers were selected among countries with available information from the World Bank's Enterprise Survey.

Figure 77. ...and they have become more concentrated in recent years.



Source: Fostering Competition in the Philippines, 2018.

⁴⁴ Interpreting concentration measures as an indicator of competition and the extent of dominance demands a complementary analysis of market characteristics, including economies of scale and barriers to entry and rivalry. World Bank (2017a)

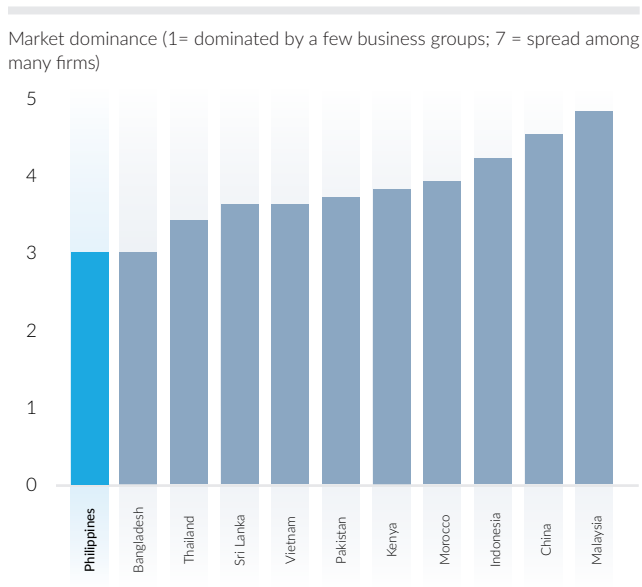
⁴⁵ These knock-on effects capture one channel through which the market environment affects decisions made by firms on resource allocation, and how such decisions affect the share of production and sales of each firm in the market as well as their productivity performance.

⁴⁶ Details of the method can be found in Appendix 3.4.

In addition to sector-specific restrictions, the cost of doing business is high in the Philippines. High entry costs discourage firms from entering markets, dampening the productivity-enhancing effect of creative destruction. In the World Bank's 2017 Doing Business report, the Philippines ranked 171st out of 190 economies on the ease of starting a business. According to PMR indicators, the absence of simplifying tools in the system of licenses and permits raises the complexity of regulatory procedures. Also, barriers in service sectors contribute to the high administrative burden on firms operating in the country.⁴⁷ In addition, incumbent firms are protected by high barriers in network sectors.

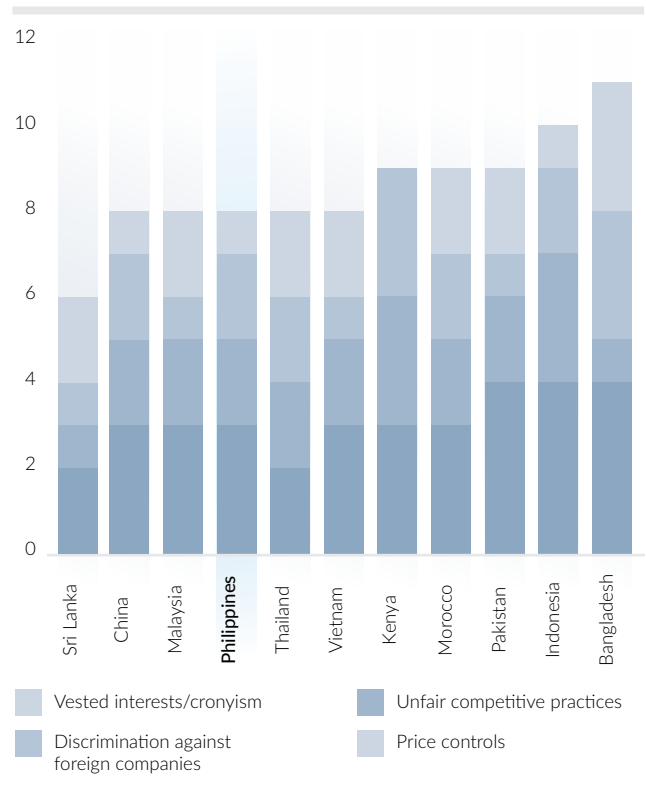
Although the Philippines' Competition Act applies to all firms across sectors, the existence of a forbearance clause that enables the Philippine Competition Commission to exempt specific practices or even sectors from the scope of the law may increase the risk of anticompetitive behavior and economic distortions. Furthermore, high barriers to FDI due to constitutional and legislative limitations for foreign participation in selected sectors and economic activities have led to low levels of FDI in the country. These barriers to entry limit competition and could raise input costs for Philippine firms.

Figure 78. Perceived competition is low in the Philippines...



Source: WEF, 2017-2018.

Figure 79. ...and it is related to vested interests and unfair competitive practices.



Source: Fostering Competition in the Philippines, 2018

Note: The index is constructed by adding the individual values of each indicator in a 0-4 scale.

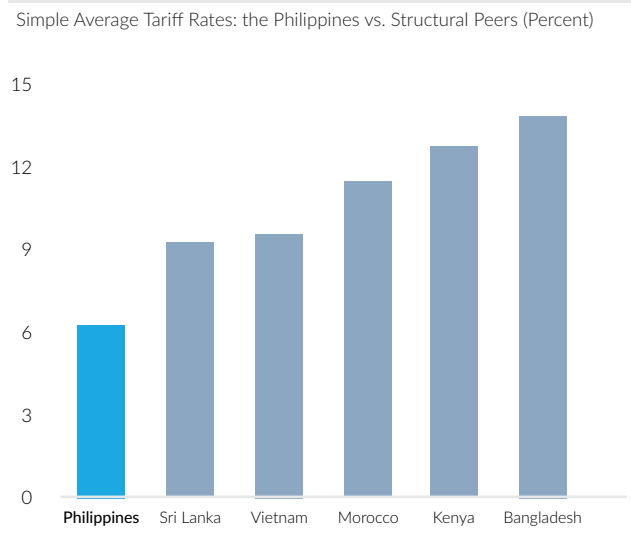
Philippine authorities can accelerate GDP growth by removing restrictions in key service sectors. According to IMF estimates, an improvement in sector-wide PMR indicators of 10 percent could increase TFP by at least 1.3 percentage points.⁴⁸ The World Bank performed a simulation of the Philippine economy and the regulatory environment in the service sector in 2017. It demonstrated that the country could transition from the fourth to the second quartile in terms of PMR indicators if the government lifted 86 restrictions mapped by the PMR indicators.⁴⁹ Moreover, the simulation results showed that a reduction of PMRs in key service sectors (i.e., energy, professional services, transportation, and communications) could add US\$0.6 billion (0.2 percent of GDP) to the annual GDP by boosting competitiveness in downstream industries that use these services.

HIGH TRADE COSTS LIMIT EXTERNAL COMPETITION AND TECHNOLOGY TRANSFER

International trade contributes to productivity growth by increasing competition and facilitating technology adoption. While foreign trade introduces competition in the local market by integrating industries into global value chains, it also provides opportunities for domestic firms to access larger markets, specialize, and achieve economies of scale. Faced with a higher degree of competition, inefficient firms are forced to exit, resulting in a more efficient allocation of resources. The access to foreign markets and global expertise can also increase domestic productivity by allowing domestic firms to access frontier technologies, modern practices, new processes, and management capabilities.

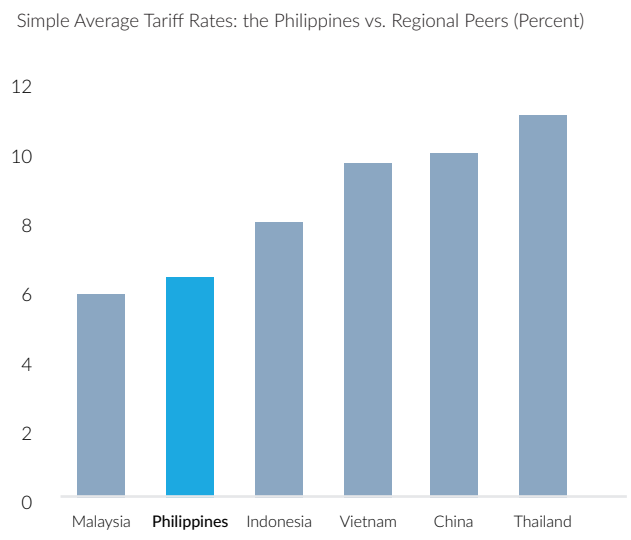
However, the Philippines' level of trade openness has been declining over the past two decades despite its relatively low tariff rates. The country has a liberalized trade regime reflected in its low most-favored-nation tariff of 6.3 percent in 2016, the lowest among structural peers and only slightly higher than Malaysia's among regional peers (Figure 80 and Figure 81). By contrast, its trade openness, measured as the share of total trade to GDP, declined from 98.7 percent in 1998 to 64.9 percent in 2016 (Figure 82 and Figure 83). From being considered a pioneer of trade openness in the late 1990s, the Philippines currently ranks below both Vietnam and Morocco and in line with the average of structural peers. Moreover, it ranks below the average of regional peers.

Figure 80. The Philippines has a liberalized trade regime reflected in its low average most-favored-nation rates among structural peers...



Source: World Integrated Trade Solution (WITS).
Note: Latest data available.

Figure 81. ...as well as among regional peers.



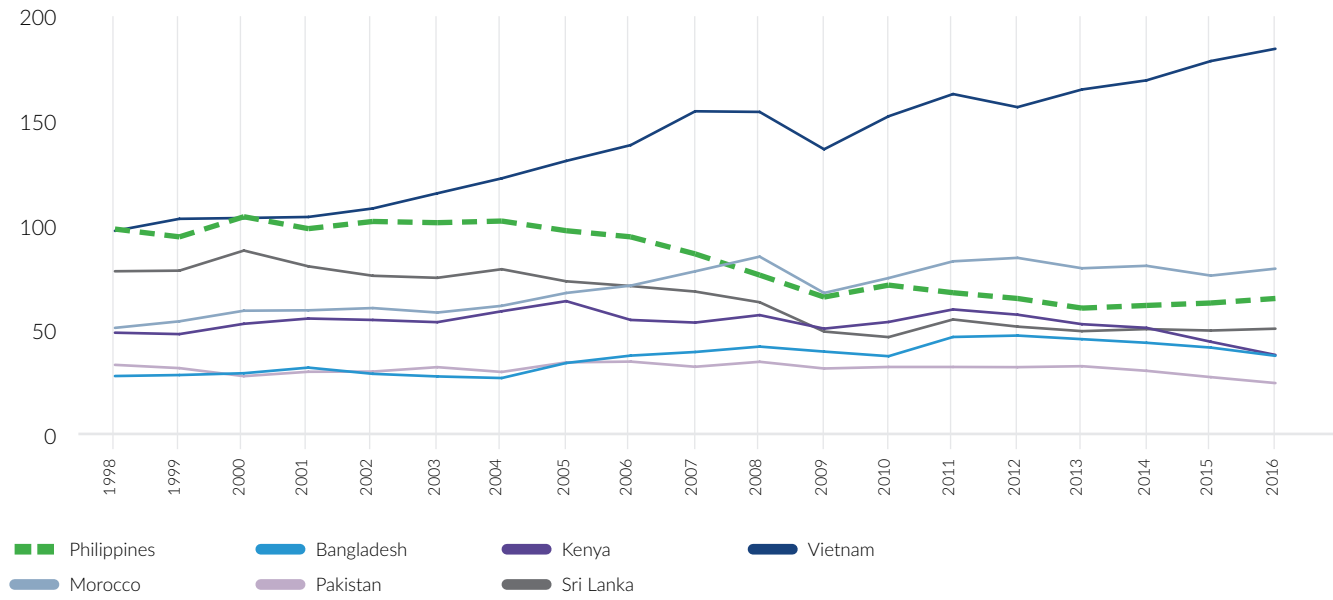
Source: World Integrated Trade Solution (WITS).
Note: Latest data available.

48 IMF et. al (2014)

49 World Bank (2017a)

Figure 82. The Philippines' level of trade openness has been declining...

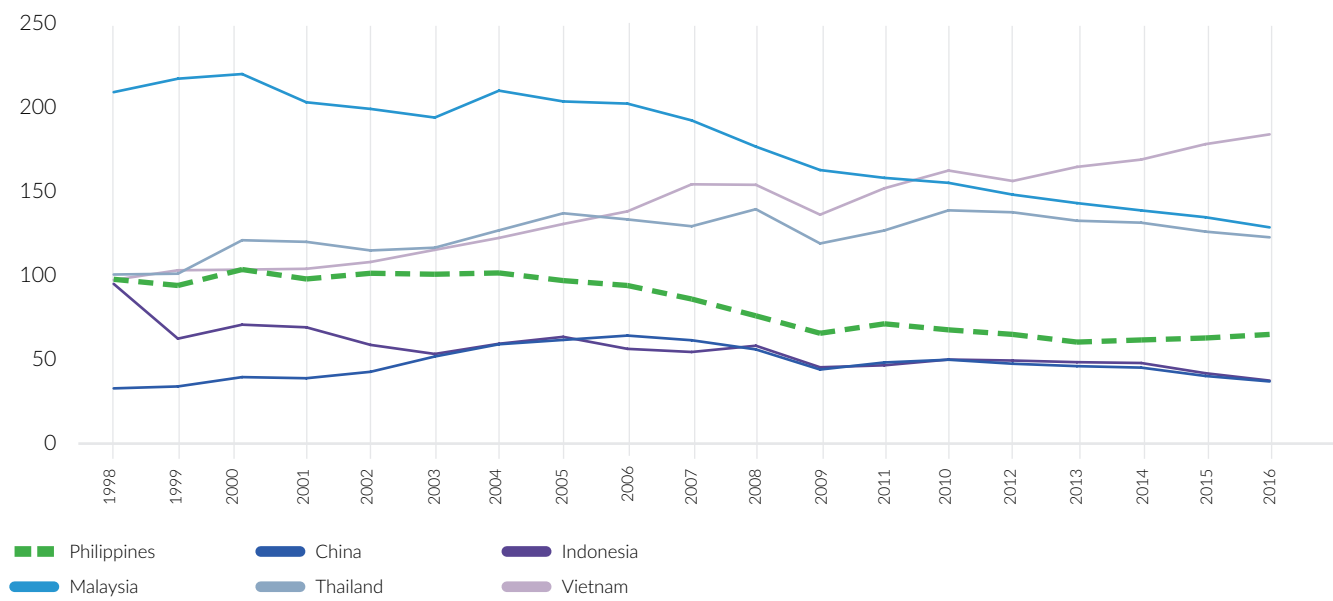
Trade as Share of GDP, the Philippines vs. Structural Peers (Percent)



Source: WDI.

Figure 83. ...to well below regional peers.

Trade as Share of GDP, the Philippines vs. Regional Peers (Percent)

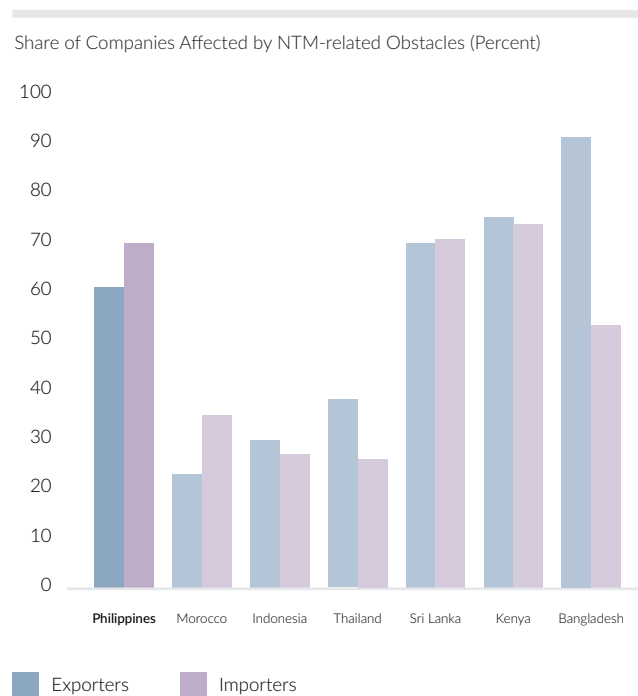


Source: WDI.

The country's export competitiveness is impeded by high trade costs. Trade costs in the Philippines are among the highest in the Association of Southeast Asian Nations, according to the 2016 Doing Business report. Investors in the Philippines pay twice as much to export or import a shipping container as investors in Thailand. In addition, the Philippines ranks lowest among peer countries on the World Bank's Logistics Performance Index,⁵⁰ and it scores especially low on connectivity to international markets. The Global Competitiveness Index shows that trade is affected by the country's government regulations, overall infrastructure quality, and customs procedures.

Non-tariff measures (NTMs) are also high in the Philippines. Besides tariffs, importing and exporting firms need to comply with NTMs, which encompass a wide range of requirements, including technical regulations, product standards, and custom procedures. NTMs have become an increasingly important obstacle to trade in the Philippines. A survey conducted by the International Trade Center in 2015 shows

Figure 84. More Philippine trade companies face NTM-related obstacles compared with companies in peers.



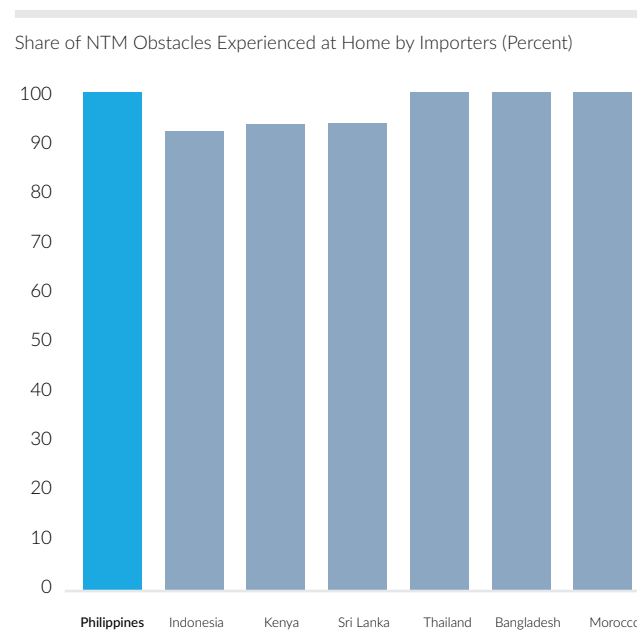
Source: ITC NTM Survey.

Note: Sri Lanka (2010), Kenya (2011), Morocco (2011), Indonesia (2013), Thailand (2014), Bangladesh (2015), and the Philippines (2016).

that 60.7 percent of Philippine exporters and 69.6 percent of importers reported obstacles due to NTMs, relatively high among peers (Figure 84). Furthermore, almost all NTMs faced by Philippine importers are obstacles within the home country, the highest among peers (Figure 85).

Most NTMs are related to administrative obstacles imposed by the Philippine government. Procedural obstacles (POs) refer to practical challenges directly related to the implementation of NTMs, which means that the challenge posed by POs is in the implementation of regulations rather than the regulations themselves. A separation of NTMs into "difficult regulations" and "obstacles related to POs" reveals that 93.5 percent of Philippine exporters and 98.2 percent of importers report POs as the main barriers to trade, the highest rates among peer countries. An "informal or usual high payment" accounted for 44 percent of the complaints among exporters, and "administrative burdens" were the most troublesome for 38 percent of importers.

Figure 85. Philippine importers face more domestic NTMs than importers in peers.



Source: ITC NTM Survey.

Note: Sri Lanka (2010), Kenya (2011), Morocco (2011), Indonesia (2013), Thailand (2014), Bangladesh (2015), and the Philippines (2016).

⁵⁰ The index measures the timeliness of deliveries, the quality of infrastructure assets, logistics quality and competence, and the ability to track and trace shipments.

LOW LEVELS OF FDI LIMIT KNOWLEDGE SPILLOVER

FDI brings not only capital, new technologies, marketing techniques, and management skills to a country but can also increase domestic industries' productivity through knowledge spillover and increased competition. Foreign investors contribute to productivity growth when there is a technology transfer beyond the original scope of the FDI and when there are knowledge spillovers to domestic firms. Knowledge spillovers can take place when local firms improve their efficiency by adopting the technology of foreign firms operating in the local market. Another kind of spillover occurs when the entry of foreign firms leads to more competition in the domestic economy, forcing local firms to use their existing resources more efficiently and/or leverage new technologies to stay competitive.

While the inflow of FDI into the Philippines increased during the last two decades, it remains low relative to many peers. Net FDI in the Philippines increased by 74 percent between 1999 and 2016, the largest increase among structural peers, with the exception of Morocco (Figure 86). However, the level of FDI in the country is still low relative to many regional peers (Figure 87). For instance, net FDI in the Philippines reached 2.6 percent of GDP in 2016, up from 1.5 percent in 1999, while it represented around 4.3 percent of GDP in Malaysia. Moreover, a decomposition of net FDI into direct-equity and inter-company borrowing reveals that direct-equity investment in the Philippines' economic sectors fell from 0.8 percent of GDP in 2005 to 0.7 percent of GDP in 2016 (Figure 88). Most of the increase in net FDI was due to an increase in inter-company investment through debt instruments, which increased from 0.3 percent of GDP in 2005 to 1.7 percent of GDP in 2016.⁵¹

Figure 86. The net inflow of FDI into the Philippines has been increasing...

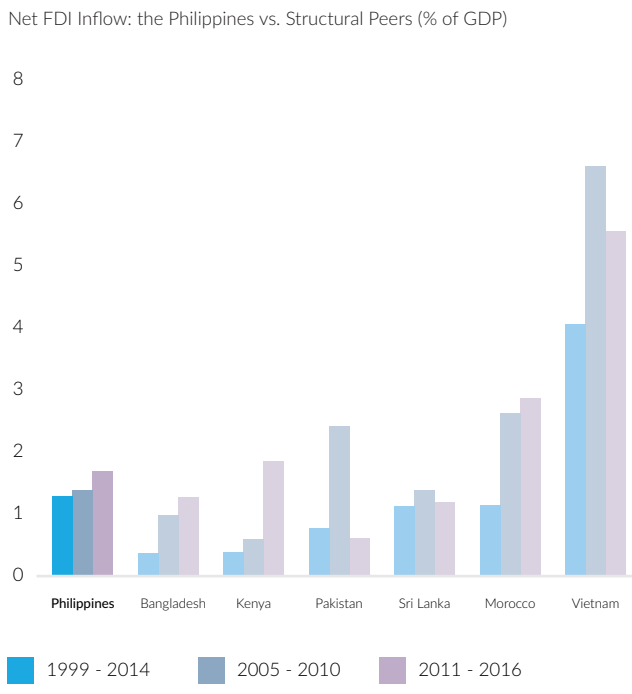
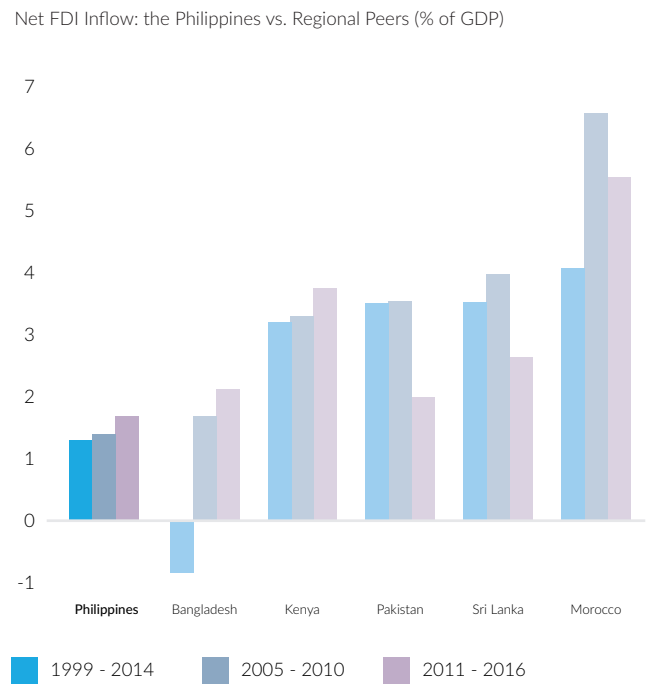
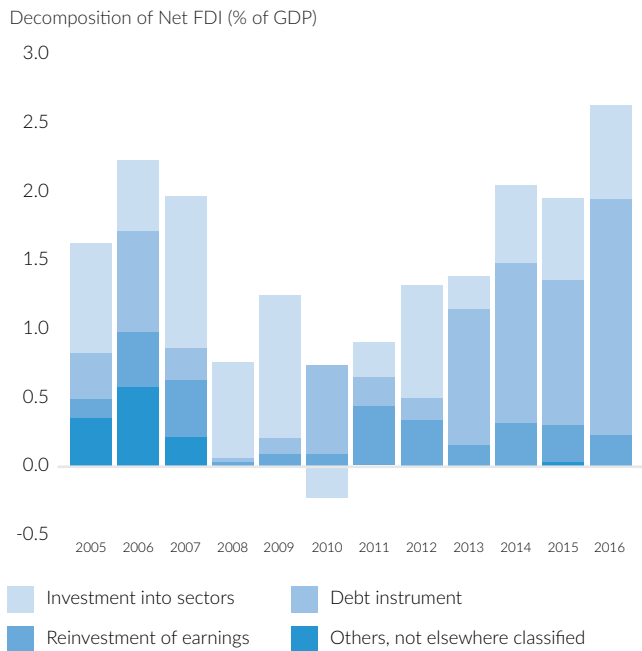


Figure 87. ...but is still low relative to regional peers.



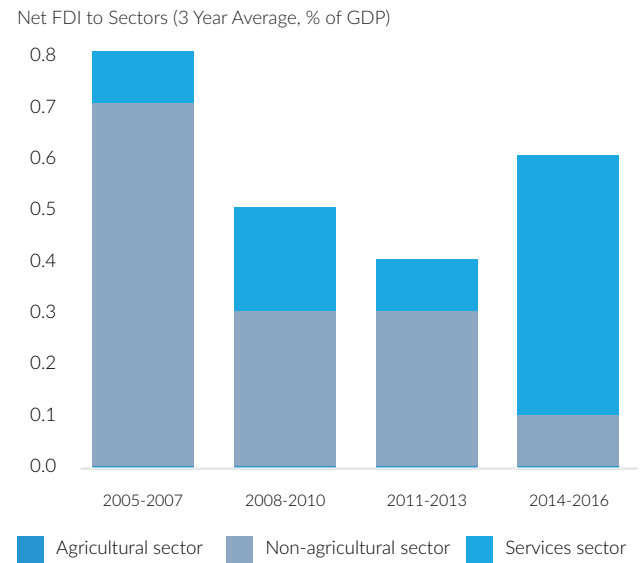
⁵¹ Debt instruments include the borrowing and lending of funds— including debt securities and suppliers' credits—between direct investors and subsidiaries, branches, and associates. Debt instruments include loans, debt securities, financial leases, and suppliers' credit (trade credit and advances).

Figure 88. The level of FDI in the country's sectors remains small...

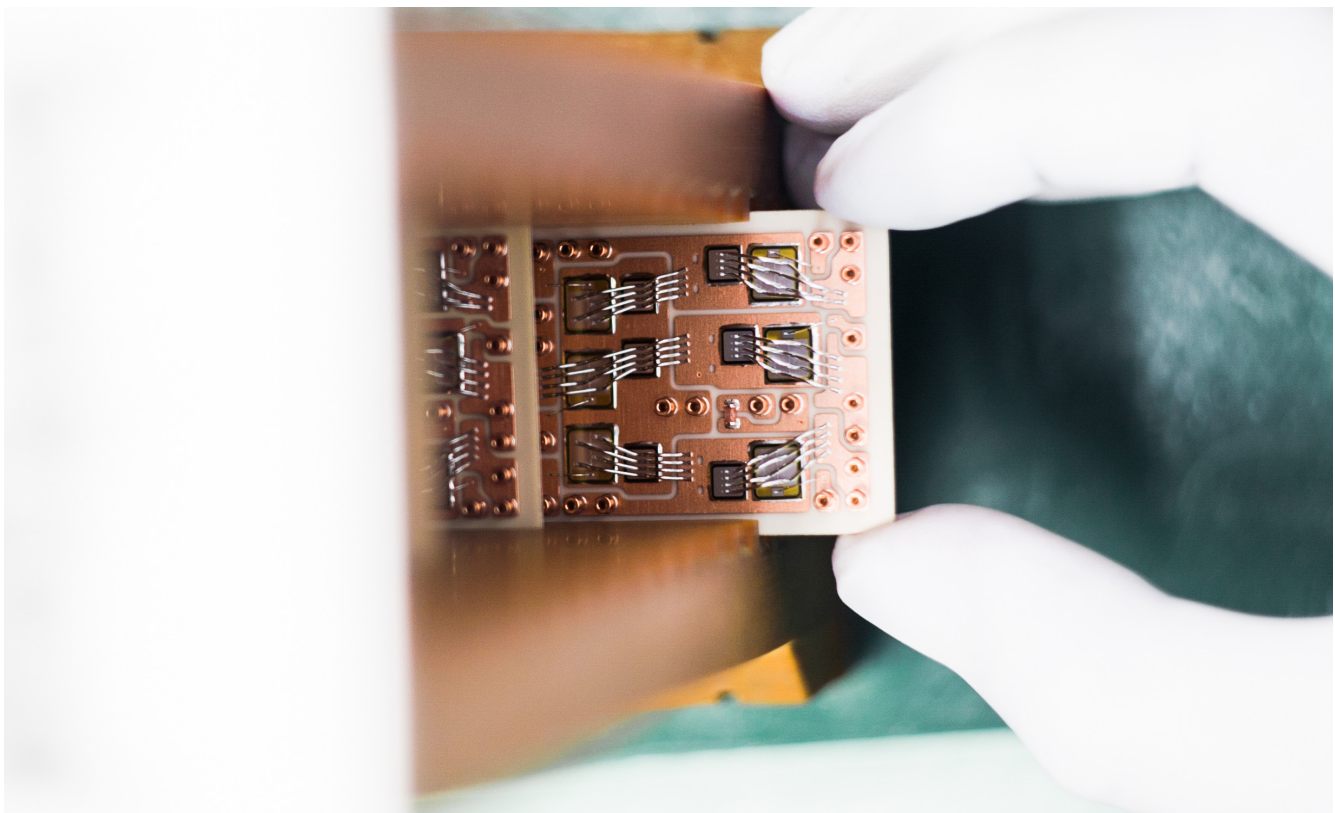


Source: PSA.

Figure 89. ...and most investment was concentrated in the service sector in recent years.



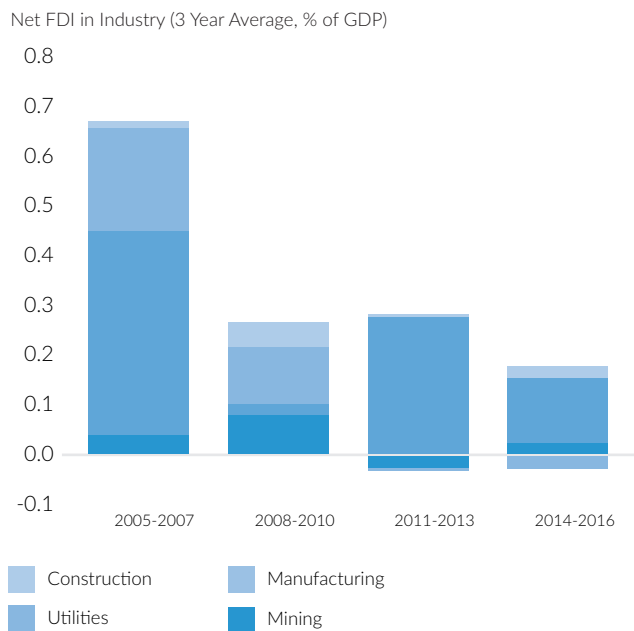
Source: PSA.



Nevertheless, sectors that received FDI experienced the highest productivity growth. Sectors that received FDI in the form of direct-equity investment had either high productivity growth (manufacturing, financial and insurance activities) or high productivity levels (real estate, financial and insurance activities) (Figure 89, Figure 90, and Figure 91). Moreover, firms with foreign ownership were in general more productive than firms with only domestic capital (Chapter 3), suggesting that FDI contributes to productivity growth.

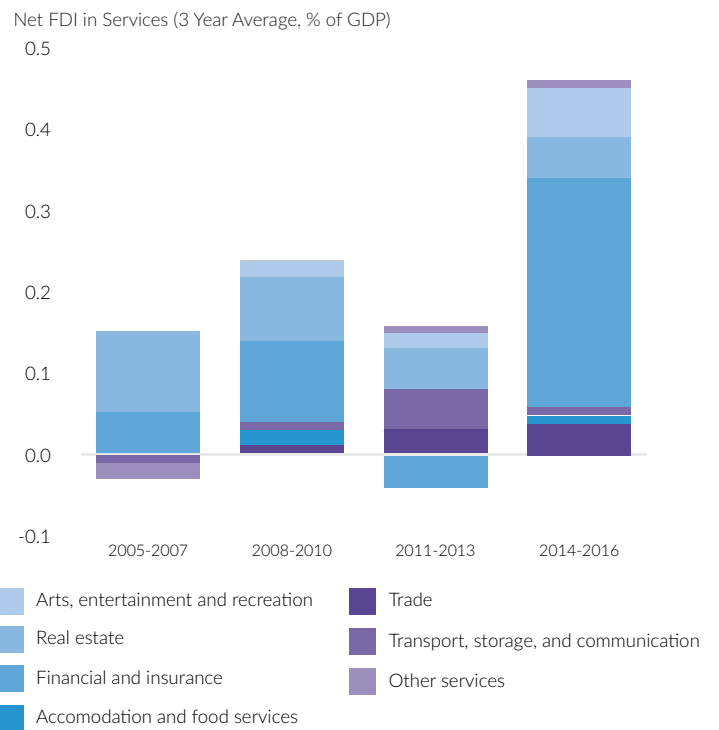


Figure 90. The manufacturing sector received most FDI in industry...



Source: Bangko Sentral ng Pilipinas.

Figure 91. ...and financial services received most FDI in services.



Source: Bangko Sentral ng Pilipinas.

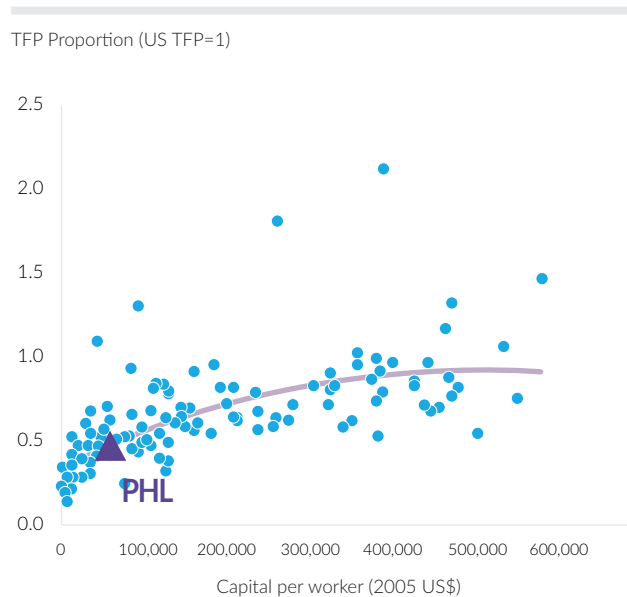
CREDIT FLOWS TO THE MOST PRODUCTIVE SECTORS

A well-functioning financial sector that efficiently allocates credit is paramount for productivity growth. There is a clear positive correlation between an economy's capital per worker and TFP (Figure 92). A country's financial sector affects economic growth through (i) its impact on both human and physical capital accumulation and (ii) its impact on productivity. As intermediaries, financial institutions mobilize savings for investment, facilitate inflows of foreign capital—including FDI, portfolio investment, and remittances—and efficiently allocate resources to the most productive firms and sectors. The financial sector also reduces risk associated with individual projects, which increases capital accumulation and leads to higher long-term economic growth. However, credit does not necessarily go to sectors with the highest productivity growth, but rather to sectors with high

productivity and profit, that are capital intensive, and with contained risk.

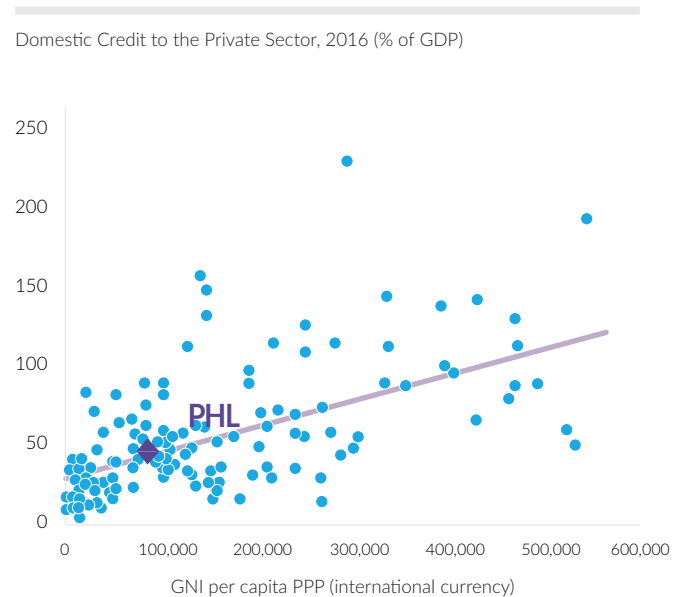
The allocation of credit to the private sector in the Philippines seems adequate given the country's income level but relatively low compared to regional peers. As a percent of GDP, credit to the private sector is at the level predicted by its income level (Figure 93). This indicates that the financial sector is efficient in intermediating funds between savers and borrowers. At 45 percent of GDP, credit to private sector in the Philippines is slightly higher than the average of structural peers (41 percent of GDP) (Figure 94) but substantially lower than the average of regional peers (114 percent of GDP) (Figure 95).

Figure 92. Capital accumulation is positively correlated with TFP.



Source: Penn World Table 9.0.

Figure 93. The level of domestic credit to the private sector is adequate relative to the country's income level.



Source: WDI.

Philippine firms rely less on external funds for investment than firms in peers. Although many firms in developing countries rely heavily on internal funds for investment spending, the level of domestic credit is especially high in the Philippines relative to peers. Less than 7 percent of working capital of the country’s firms is financed by banks, which is half of the share of firms in structural peers and much lower than the 18 percent among firms in regional peers. Even for the country’s large firms, only 11.6 percent of funds used for investment originates from banks, much lower than the structural peer average of 21.6 percent. However, most Philippine firms that apply for a loan through the banking system are approved. Based on enterprise survey data from 2015, over 70 percent of small enterprises had their loan applications approved, and this increased to more than 90 percent for medium-sized firms. Rather than access, this heavy reliance on internal funds seems to be the result of either high costs in the formal banking system or the preference of firms.

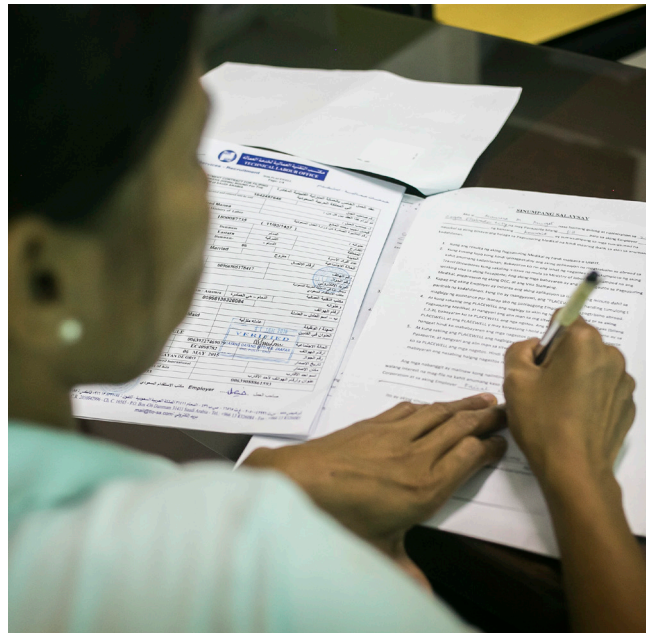
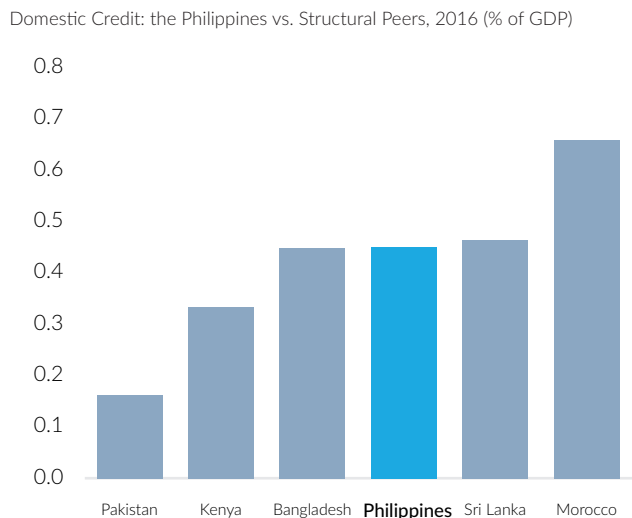
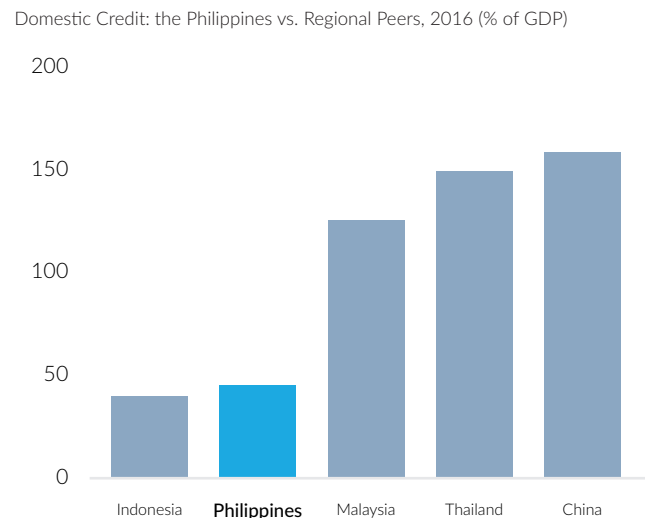


Figure 94. The level of domestic credit in the Philippines is relatively high compared with structural peers..



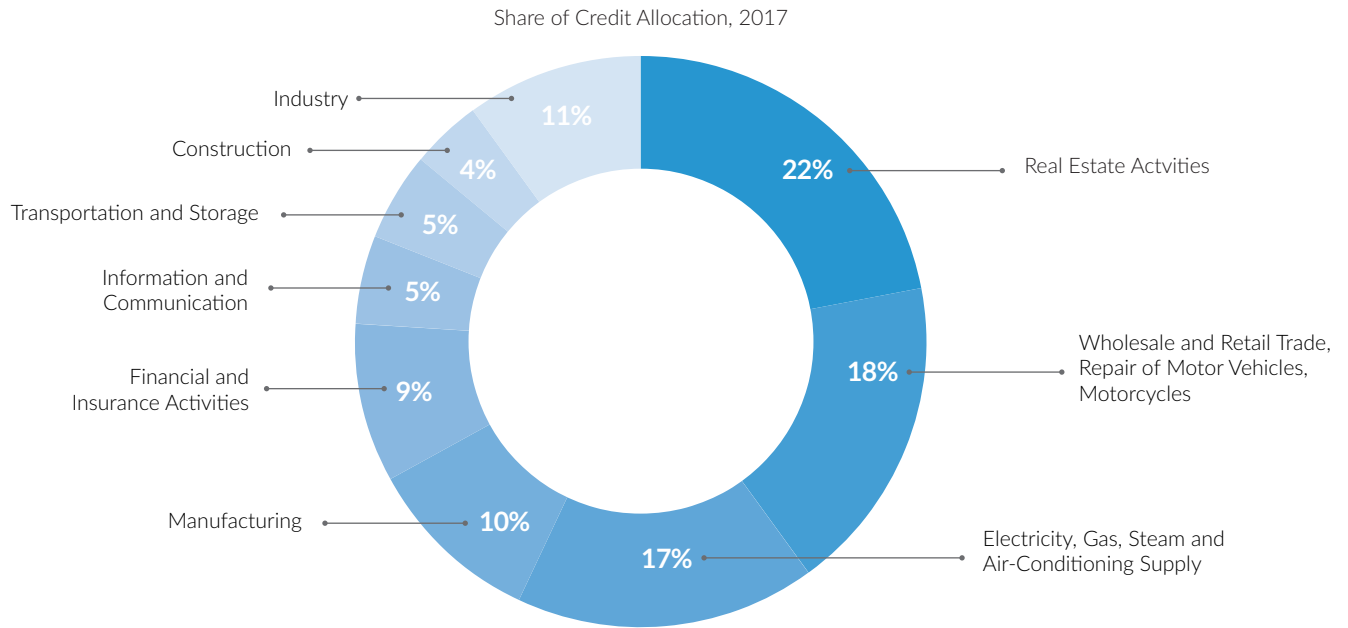
Source: WDI.

Figure 95. ...but relatively low compared with regional peers.



Source: WDI.

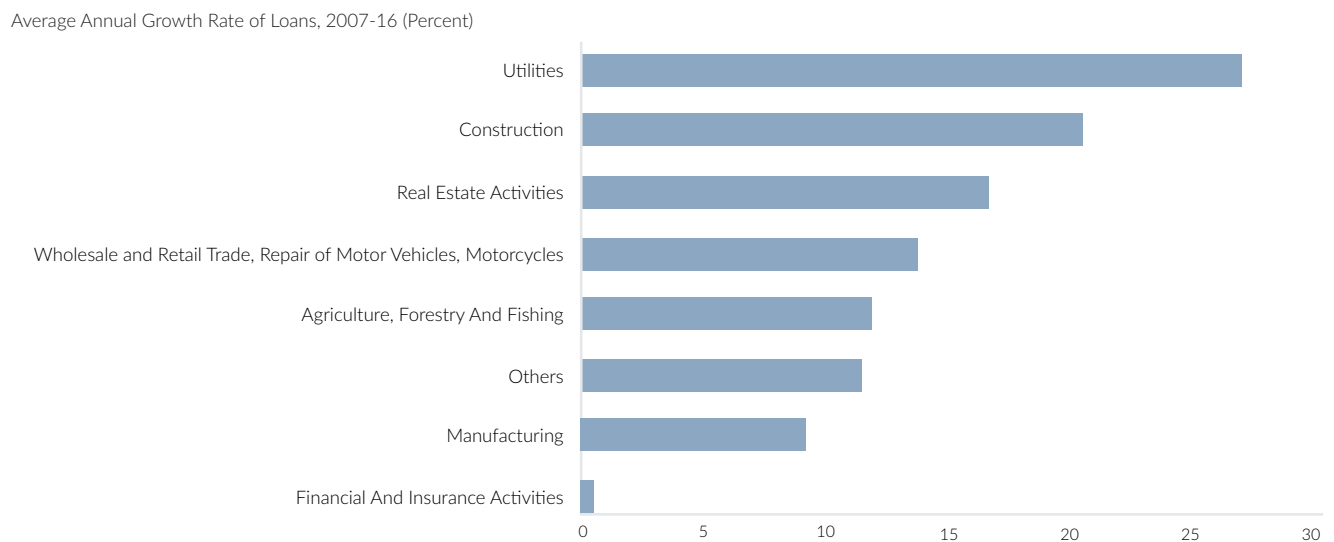
Figure 96. Credit was not allocated to sectors with high productivity growth in 2017...



Source: Bangko Sentral ng Pilipinas.

Note: The allocation of credit was calculated as change of outstanding loans between 2016 and 2017.

Figure 97. ...as credit growth expanded at a faster rate in sectors with relatively low labor productivity growth.



Source: Bangko Sentral ng Pilipinas.

While private-sector credit was allocated to the most productive sectors in 2017, it was not allocated to the sectors with the highest productivity growth. The largest share of outstanding loans—22 percent—was in the real estate sector in the same year (Figure 96). This was the result of an average 16.7 percent annual growth in credit to finance real estate activities in 2007-16 (Figure 97). However, labor productivity in the real estate sector declined by an average of 2.2 percent per year in the same period. Still, the sector's

productivity remained above the economy-wide average (Figure 98). The manufacturing sector received 10 percent of total credit in the same year, and its labor productivity was also above the economy-wide average. By contrast, credit to finance agricultural activities declined in 2017, which was consistent with the below-average productivity performance of the agriculture sector. Overall, a large share of credit in the Philippines is flowing to the most productive sectors in the economy.

Figure 98. Credit was allocated to sectors with high productivity in 2017.

Credit Allocation and Deviation from Average VA per Worker, Ratios



Source: Bangko Sentral ng Pilipinas.

Note: The allocation of credit was calculated as change of outstanding loans between 2016 and 2017.

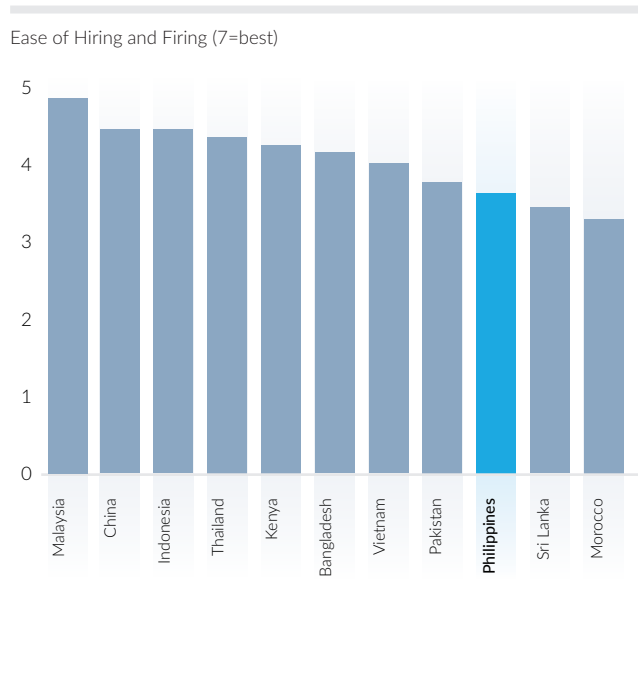
LABOR MARKET RIGIDITIES AND HIGH COSTS LEAD TO HIGH INFORMALITY

A flexible labor market is important to support economic growth and productivity, as it allows factors of production to move freely across firms and sectors. Firms with high productivity growth, in an environment without distortions, would be absorbing more labor and capital from firms that are less productive. However, evidence shows that restrictive labor market regulations impede the efficient allocation of labor to the most productive firms in the Philippines.

Employers find labor regulations in the Philippines more restrictive than in peer countries. On the Global Competitiveness Index, the Philippines ranked 77th out of 137 countries on the ease of hiring and firing, more

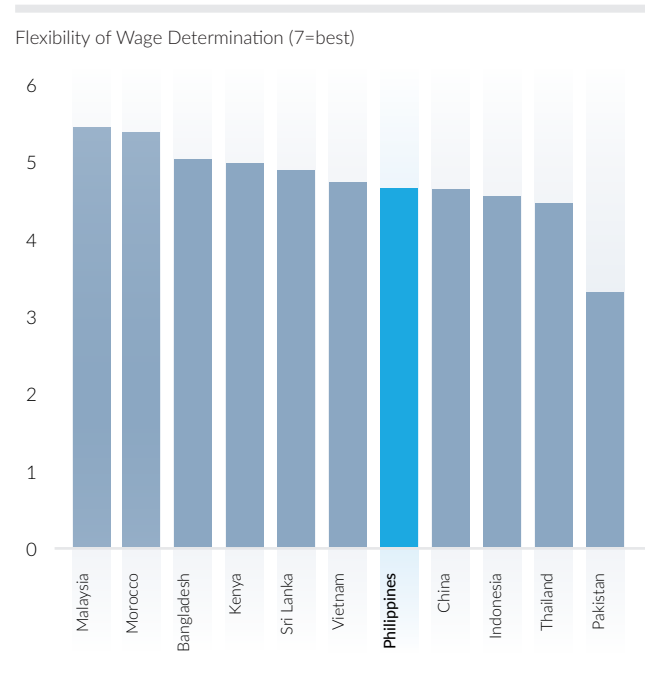
restrictive than in peers (Figure 99). Specifically, the country suffers from long administrative processes for regular employment. In addition, the Philippines ranked 86th out of 137 countries on wage determination, which makes it less flexible than the average of both structural and regional peers (Figure 100). Moreover, the country's minimum wage is considered high by several measures, both relative to Filipino worker productivity and to the minimum wage of other countries with similar income levels.⁵² Finally, redundancy costs are very high in the Philippines, 27 weeks of salary, resulting in a rank of 118th out of 136 countries. Of all the indicators in the index, the ease of hiring and firing has progressed the least in the Philippines since 2007.

Figure 99. Labor regulations in the Philippines are more restrictive than in peers.



Source: World Economic Forum.

Figure 100. Wage determination is also more restrictive in the Philippines compared with peers.



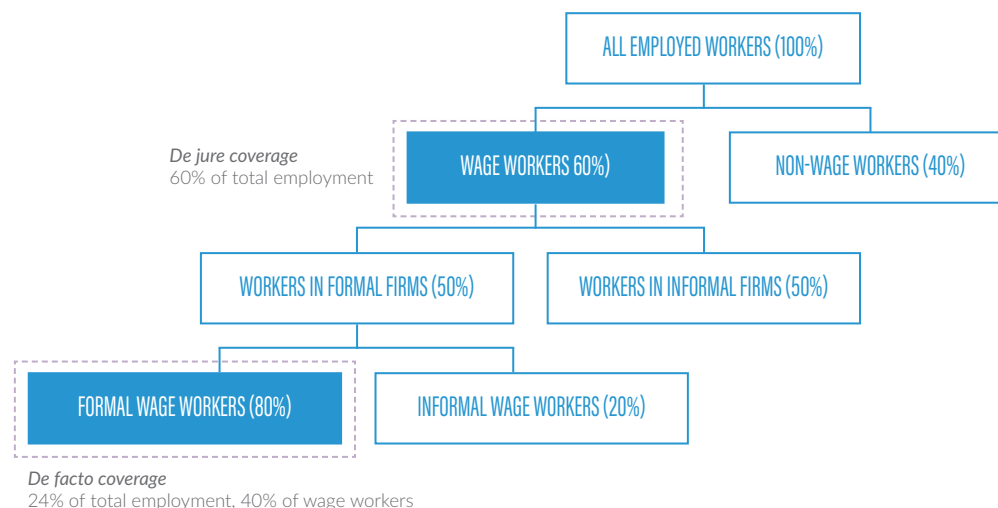
Source: World Economic Forum.

However, labor regulations apply only to a small portion of the economy. Labor regulations in the Philippines apply only to wage workers, which account for 60 percent of all employed workers in the country. Therefore, de jure coverage of worker protection is limited given the high share of non-wage employment in the economy. Additionally, many wage workers are not subject to labor regulations as they are either employed by informal firms or employed informally by formal firms. As result, only about 24 percent of all employed workers and 40 percent of all wage employees benefit from worker protection in the Philippines (Figure 101).⁵³

High dismissal costs have led to an increase in temporary employment, which discourages on-the-job training and learning. The dismissal of an employee

with a regular employment contract involves a long administrative process that includes notices to the employee, hearings, and payment of separation benefits. Furthermore, an employee has the right to contest the validity of the dismissal through a dispute resolution mechanism, which could be lengthy and costly and whose decision often favors the employee. As result of high dismissal costs, the incidence of non-regular employment is increasing and reached about 40 percent of all wage employment in 2013. However, workers under non-regular contracts have less employment security and receive lower wages.⁵⁴ Their turnover is also expected to be higher, and there is less job-training and learning, limiting their contribution to productivity growth.

Figure 101. Informality and non-compliance limit the coverage of worker protection in the Philippines.

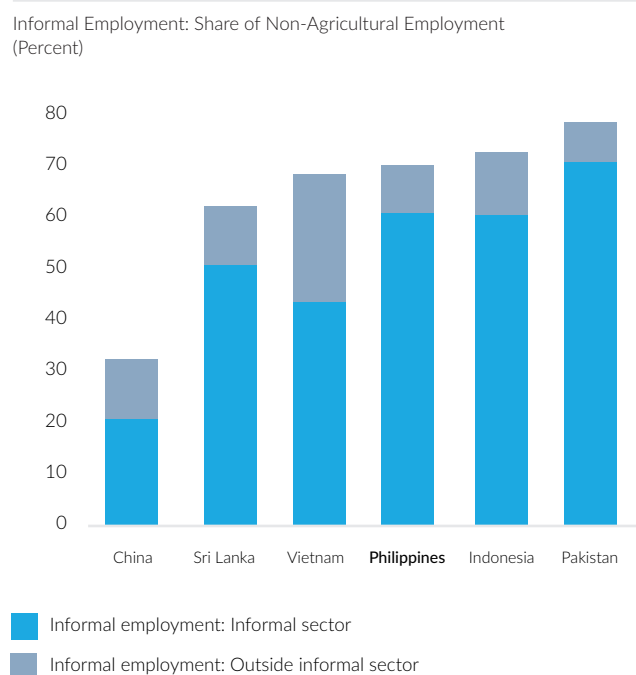


Source: World Bank (2016).

Note: "Workers in informal firms" are defined as workers who reported that their employers are private households or private establishments whose businesses are not registered or do not have fixed locations. Workers are considered as "informal wage workers" if any two of the following conditions are met: employment can be terminated without notice, employers do not pay social insurance contributions, or employment is not based on a written contract.

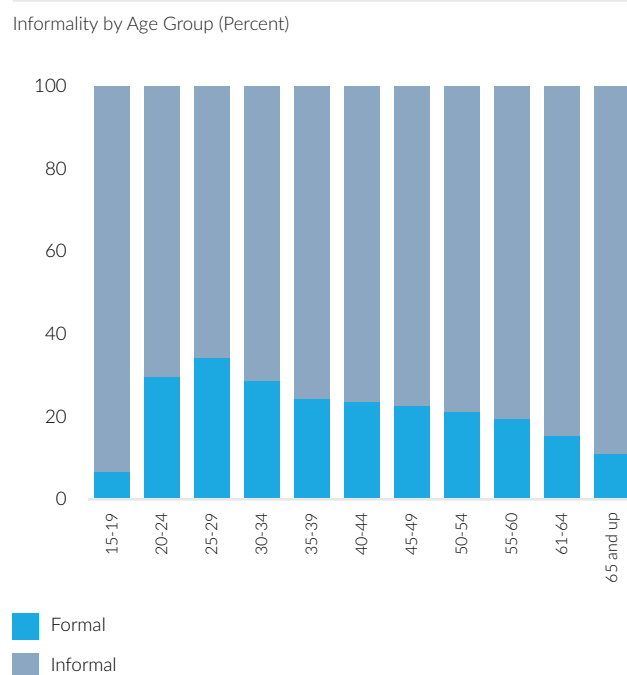
53 World Bank (2016).

54 World Bank (2016).

Figure 102. Informal employment is high in the Philippines...

Source: Informal Sector Survey (ISS) 2008.

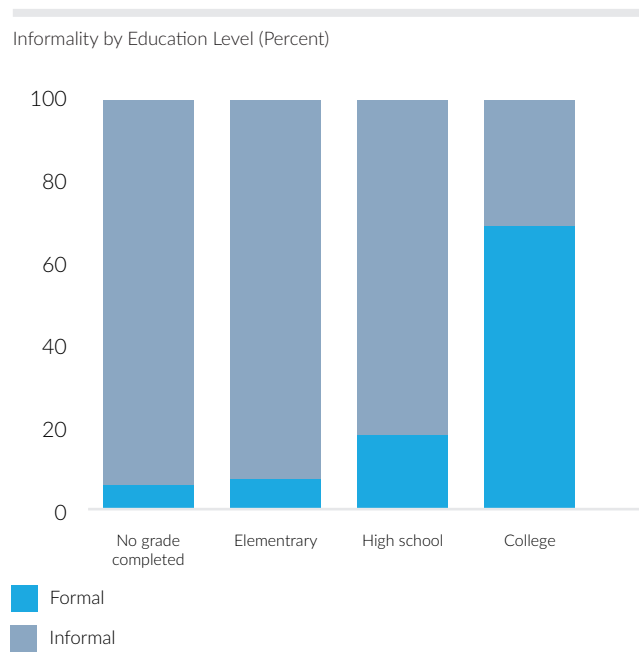
The Philippines' restrictive labor regulations and high labor costs have contributed to the growth of the country's large informal sector. High minimum wages and dismissal costs discourage the formalization of jobs. Informal employment represents 76.3 percent of total employment in the country.⁵⁵ Even excluding the agriculture sector, 66.8 percent of total employment is informal, which is relatively high among peers (Figure 102). Moreover, informality occurs

Figure 103. ...regardless of age level.

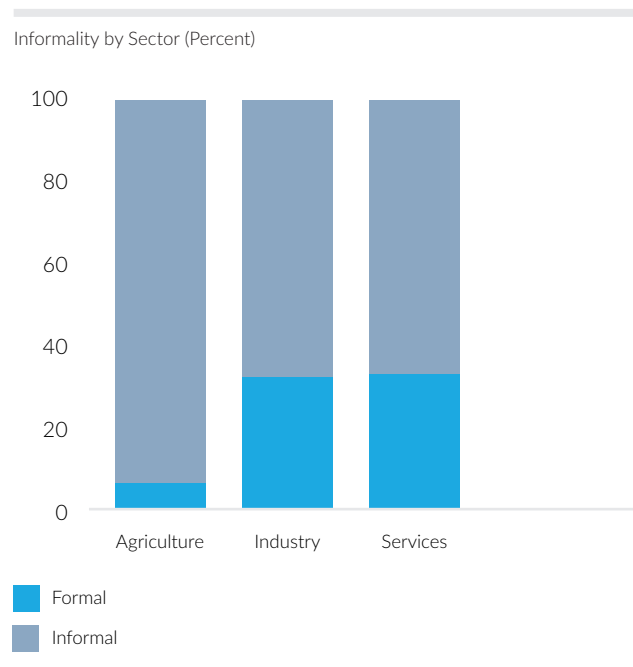
Source: Informal Sector Survey (ISS) 2008.

across age and education groups: around 30.8 percent and 63.2 percent of employed college graduates and undergraduates, respectively, have informal employment (Figure 103 and Figure 104). However, it is especially high among non-college graduates. The country's agriculture sector has the largest share of informal employment at 93.4 percent, followed by industry (67.5 percent) and services (66.6 percent) (Figure 105).

⁵⁵ Informal employment refers to the total number of persons with informal main jobs. A job is informal when it lacks basic social or legal protections or employment benefits and may be found in the formal sector, informal sector, or households. Persons in informal employment include the following types: wage workers, self-employed workers, and unpaid family members. First, wage workers are categorized as formal if they meet at least two of the following three criteria: (1) have a written employment contract, (2) have employer-provided social insurance, or (3) are protected from arbitrary dismissal. Otherwise, they are categorized as informal. Second, self-employed workers are formal if they maintain a proper bookkeeping system. If not, they are classified as informal. Finally, unpaid family members are informal by definition. This definition is based on the World Bank's Philippine Labor Market Review (2016).

Figure 104. Informal employment is also high among non-college graduates...

Source: Informal Sector Survey (ISS) 2008.

Figure 105. ...and even in industry and services.

Source: Informal Sector Survey (ISS) 2008.

A POTENTIAL SKILLS MISMATCH IN SERVICES COULD LIMIT PRODUCTIVITY GROWTH

A well-educated workforce is critical to support productivity growth. Since a middle-income country such as the Philippines is more likely to accelerate productivity growth through technology adoption, creating and maintaining a skilled workforce is necessary to increase the economy's productivity. However, creating a workforce with skilled workers requires not only adequate formal training but also attractive job opportunities to avoid workers leaving the country.

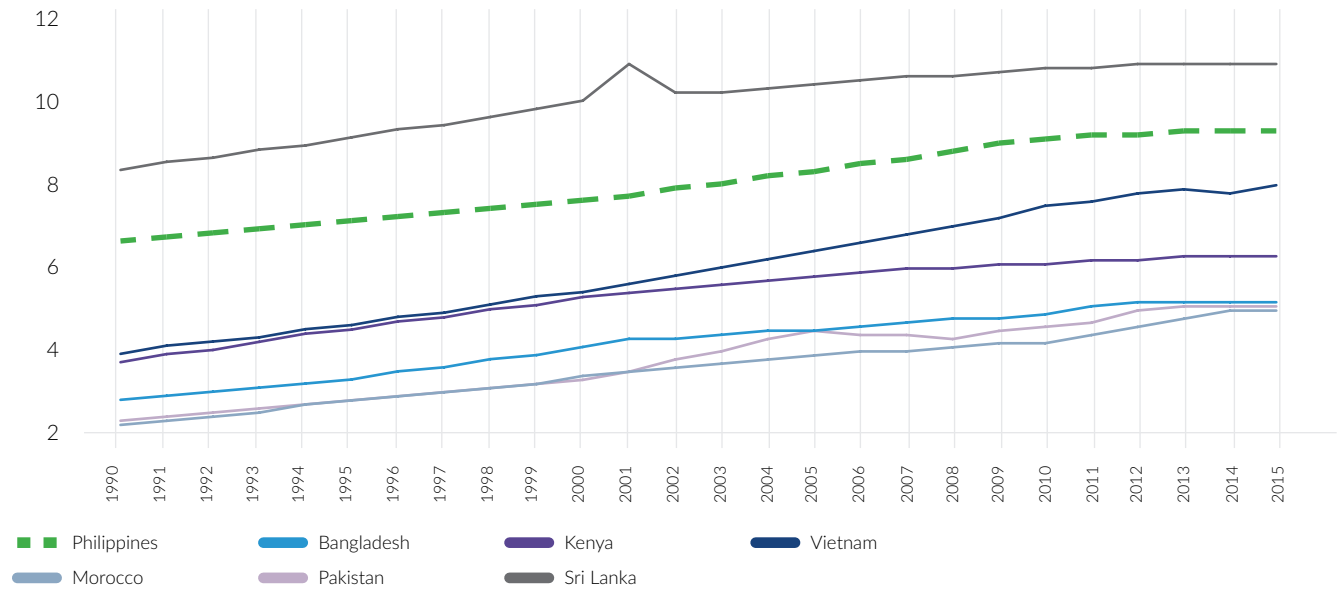
Access to education has been expanding steadily in the Philippines. Primary education reached almost universal enrollment in 2015, and improvement in access to secondary education has been robust. Tertiary enrollment has also risen steadily and reached a gross enrollment rate of 34 percent in 2013, comparatively better than other middle-income countries and regional peers. As a result, average years of schooling in the Philippines reached 9.3 years in 2014, higher than the structural peer average of 6.8 years and only behind Malaysia (10.1 years) among regional peers

(Figure 106 and Figure 107). Moreover, more than half of all employed workers in the country's formal labor market have some tertiary education (Figure 109). In the aggregate, the share of the labor force with tertiary education in the Philippines is high relative to its income level (Figure 108).

However, progress on improving learning outcomes has been slow. An analysis by the World Bank in 2018 found that many students do not retain valuable skills at the country's schools. The Philippines' learning outcomes are the weakest among major countries in East Asia based on international test data from 2013. Although it is likely that education performance has improved since then, results from national achievement tests suggest that there has only been a modest improvement at the primary level and no measurable improvement at the secondary level. While average scores at the primary level have increased modestly over time, they remained almost flat at the secondary education level between 2004 and 2015.

Figure 106. Average years of education in the Philippines is comparable to structural peers...

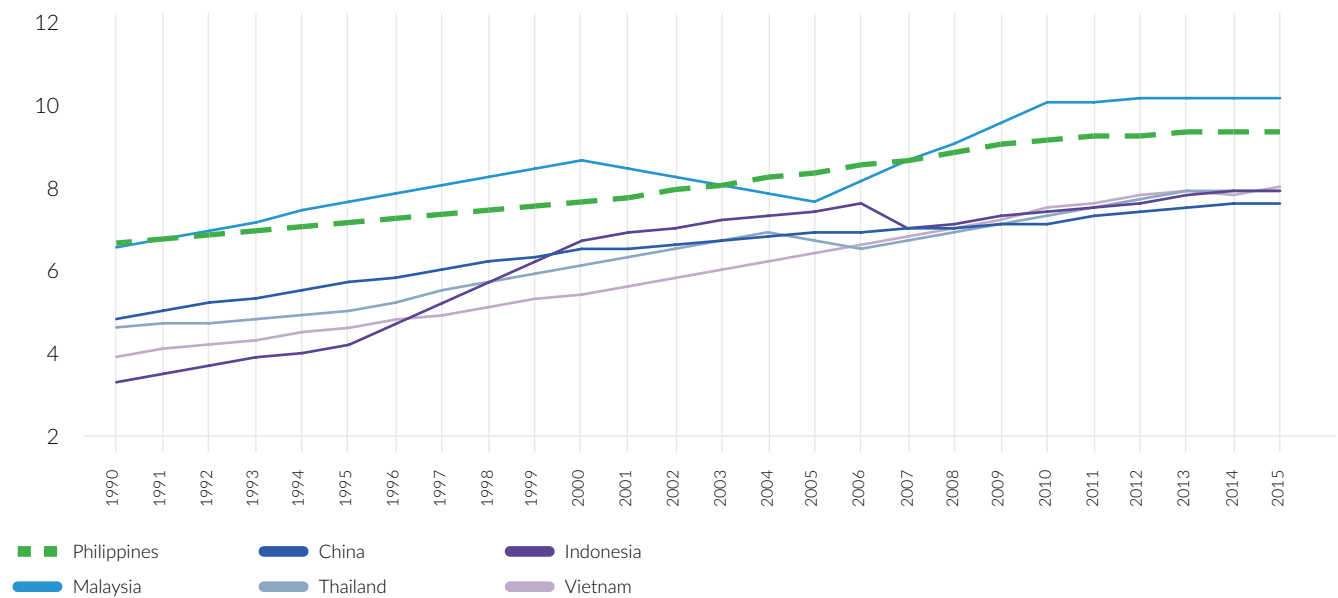
Trade as Share of GDP, the Philippines vs. Structural Peers (Percent)



Source: Human Development Data.

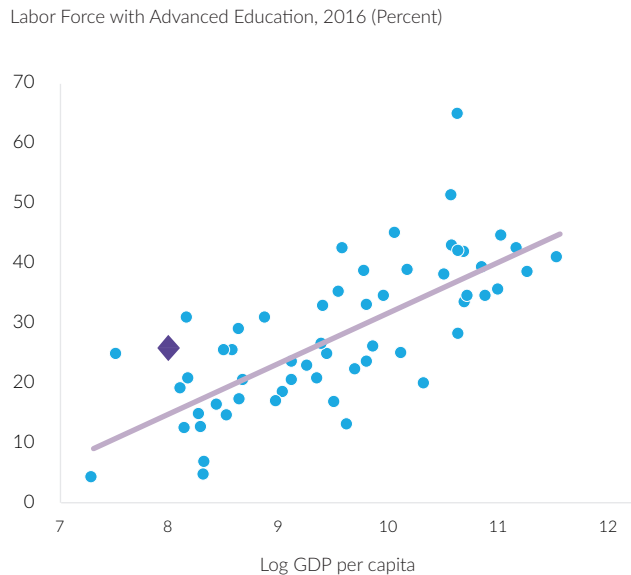
Figure 107. ...and regional peers.

Average Years of Schooling: the Philippines vs Regional Peers



Source: Human Development Data.

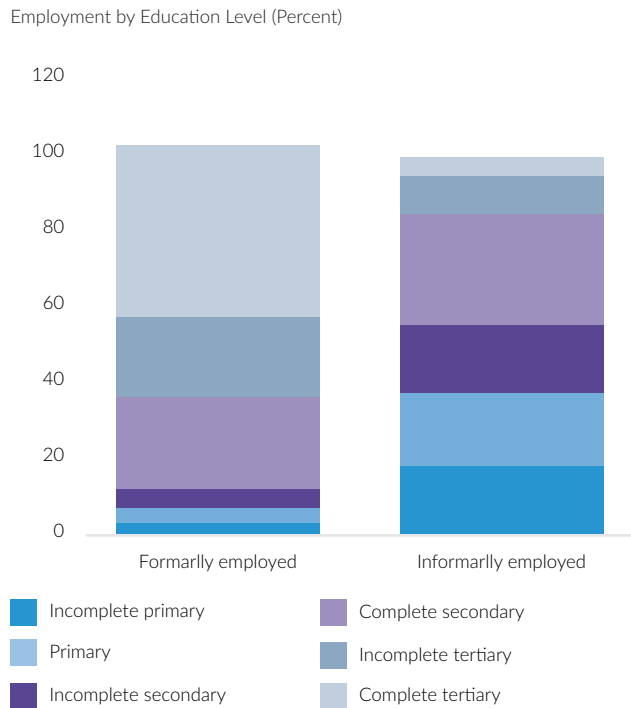
Figure 108. Tertiary enrollment is high relative to the country's income level...



Source: WD.

While workforce skills are not reported as the main obstacle to doing business in the country, a growing skills mismatch in services may be limiting faster productivity growth. Firms did not consider the skills of the country's workforce the main obstacle to doing business in 2015: inadequately educated workers ranked 12th out of 16 obstacles on the World Bank's 2015 Enterprise Survey (Figure 110). Instead, firms reported that corruption, the tax rates, and competition from the informal sector were the main challenges to doing business. Furthermore, Philippine firms were less likely to report workforce skills as the main obstacle to doing business than firms in other countries in the region (Figure 111). However, there has been an increase in firms that reported workforce skills as inadequate, from 7.8 percent in 2009 to 10.1 percent in 2015, mainly in services. Since the Philippines' service sector has been expanding over time, the skills gap, although currently small, is likely to widen and may prevent faster productivity growth in the future.⁵⁶

Figure 109. with more than half of all workers with formal employment possessing a tertiary education.



Source: ISS survey 2009.

Moreover, new types of jobs may require different sets of skills, as technologies such as automation become more affordable and easily accessible. The digital and computing revolution made it possible for machines to perform tasks that were previously reserved for humans, including the application of logic and information to provide a wide-array of goods and services, from automated manufacturing and transportation to accounting and bookkeeping. While neither the current skills mismatch nor the threat of automation is currently a pressing issue in the Philippines, it may become one in the future. Therefore, the country needs to emphasize scientific, mathematical, and communication abilities as well as soft skills, such as perseverance, flexibility, creativity, and team work, to develop the complementary skills needed to derive benefit from future technologies and keep the population employed. Access to the right skills can turn “replacing” technologies into “enabling” technologies for workers.⁵⁷

56 World Bank, 2017a.

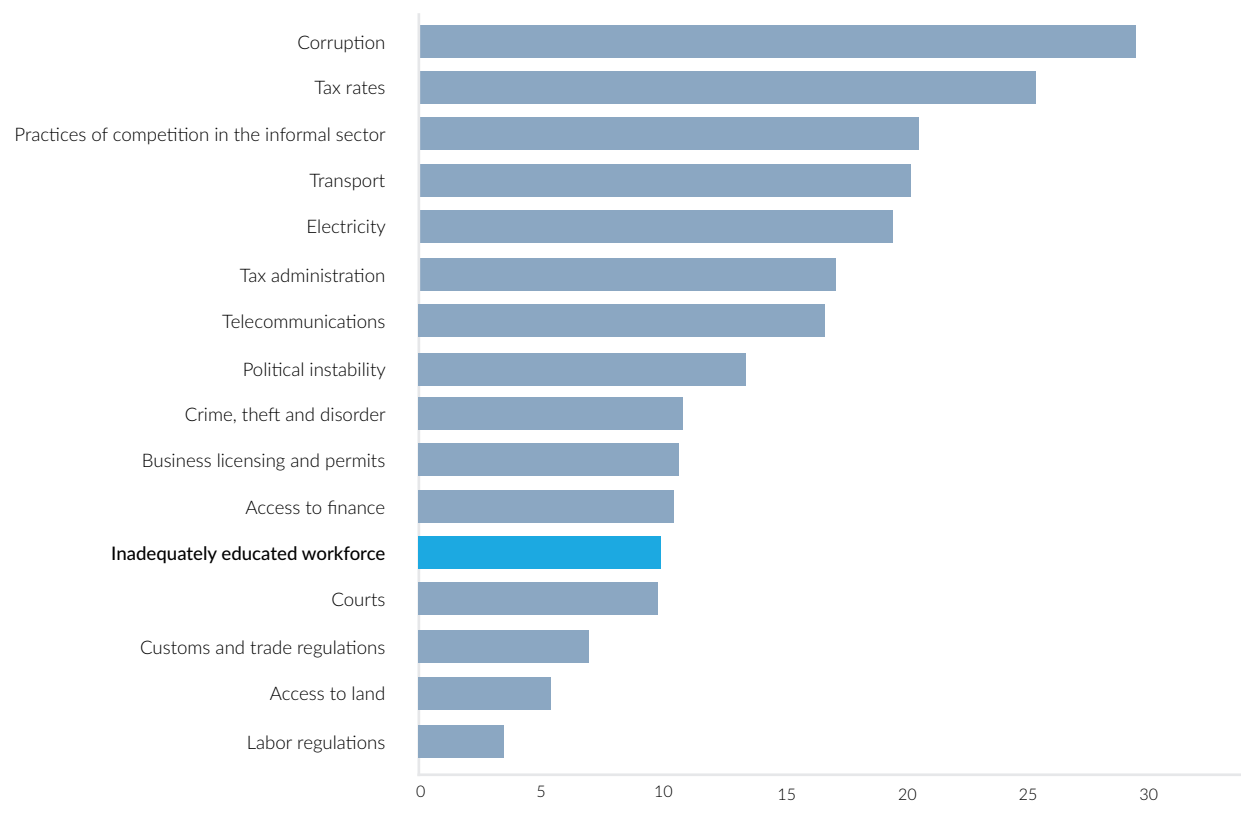
57 Norman et. Al (2018) forthcoming “The Future of Work: Race with, not against, the Machine”

There is also evidence of a shortage of skilled jobs in the country's labor market. The World Bank has found evidence of a shortage of skilled jobs in the Philippines.⁵⁸ About 30 percent of workers with secondary education are often forced to take unskilled jobs and work as laborers.

In addition, more than a third of the country's unskilled manual workers have at least a secondary education degree. This suggests that the scarcity of quality jobs is not caused by an insufficient supply of middle-skilled workers but an insufficient supply of high quality jobs.

Figure 110. Workforce skills are not reported as the main obstacle by firms in the Philippines..

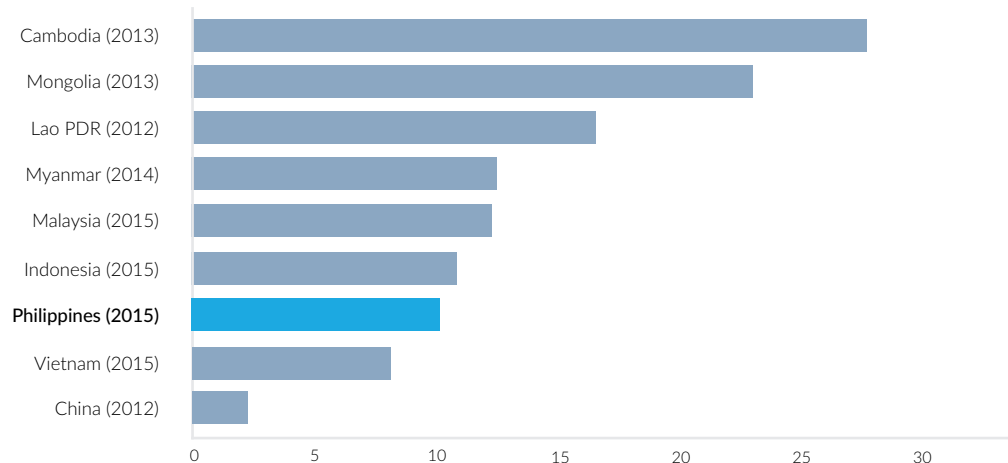
Major Obstacles to Doing Business Identified by Firms (Percent)



Source: Enterprise Survey 2015.

Figure 111. ...even relative to other countries in the region.

Firms in most countries in East Asia identify inadequate skills as a major obstacle to doing business (Percent)



Source: Enterprise Survey 2015.

STAGNANT REAL WAGES AND INSUFFICIENT QUALITY JOBS LEAD TO HIGH EMIGRATION

Real wages have been stagnant in the Philippines despite labor productivity growth. To retain skilled workers in the country, real wage increases need to reflect labor productivity growth. However, this has not happened in the Philippines.⁵⁹ Between 2001 and 2016, the country's real GDP more than doubled, growing by an average of 5.4 percent per year. Labor productivity also increased significantly during this period, with an average annual growth rate of 3.1 percent in 2001-16. By contrast, real wages remained flat in 2001-16, with 7 out of 15 years registering negative growth rates (Figure 112). Except for public workers, this pattern holds across employees' level of education, nature of work (i.e., permanent, short term, or different employer), and class of work (i.e., private household, private establishment, public sector, or family operated).



Figure 112. Real wages have remained flat despite rising GDP and productivity growth.

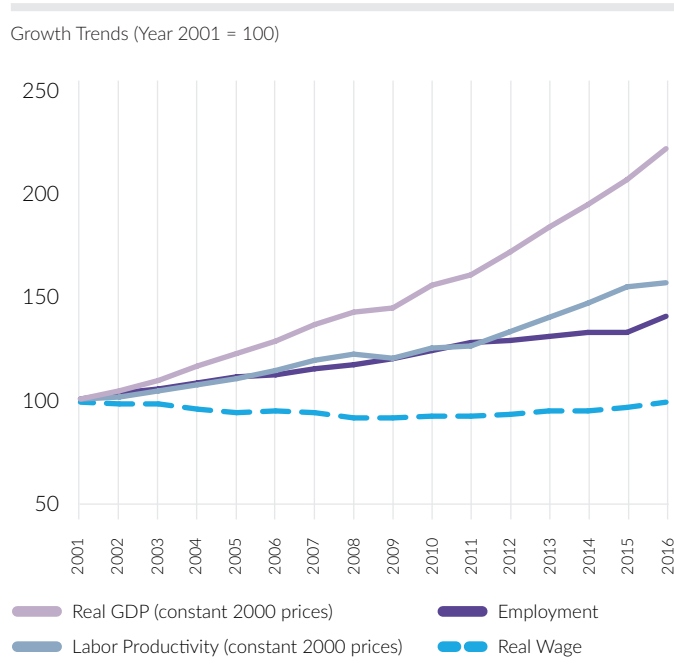


Figure 113. Agriculture experienced minor real wage growth despite its low productivity.

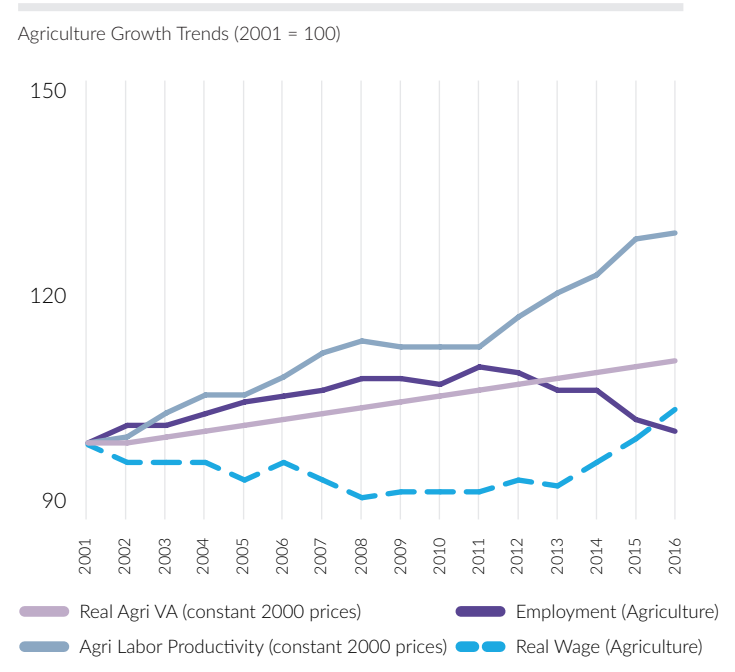


Figure 114. Real wage growth in industry remained flat despite rising productivity...

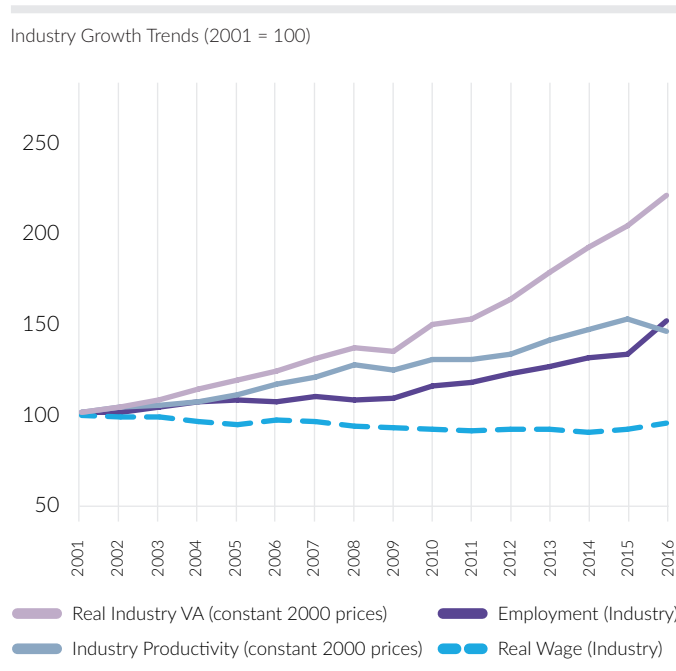
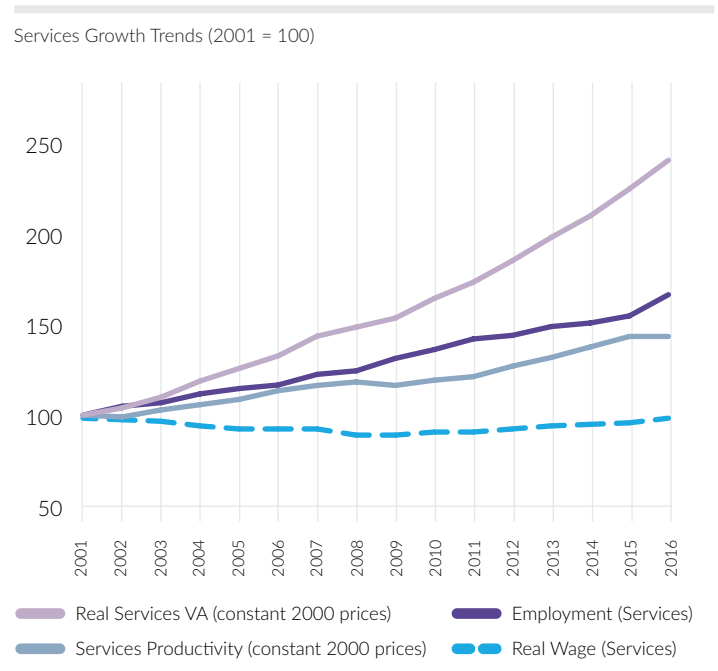


Figure 115. ...and a similar pattern held true in the service sector.





The de-linked growth between real wage and labor productivity is consistent across sectors. Surprisingly, agriculture, the sector with the lowest labor productivity growth, was the only sector that experienced minor real wage growth in 2001-16 (Figure 113). While real wages grew by barely 6 percent in the agriculture sector during this period, they declined by 5 percent in industry and remained flat in services. Within industry, real wages declined in all subsectors (i.e., mining, manufacturing, construction, and utilities) while labor productivity increased, especially in manufacturing and mining. In services, there was a large disparity among subsectors. For instance, real wages in transport, government services, and renting of non-real estate and other business activities increased along with labor productivity. However, trade and finance experienced positive labor productivity growth while real wages declined. In real estate, labor productivity experienced its biggest decline in the services sector while real wages experienced their biggest increase.

Low and stagnant real wages discourage capital investment, preventing faster productivity growth. Capital per worker is positively correlated with higher TFP. However, capital per worker is low in the Philippines compared to regional and structural peers—less than half of that of Indonesia and Malaysia and only higher than that of Kenya in 2011. To sustain and accelerate TFP growth, the Philippines needs to increase capital investment, which may be a challenge in an environment of low labor costs.

Lack of product market competition may be contributing to real wage stagnation. There is a positive relationship between labor productivity growth and real wage growth in

an environment of competitive labor and product markets. This is because competition should result in lower output prices. However, there can be an observed correlation between sectoral productivity gains and real wages or profit when either labor or product markets are not perfectly competitive (Box 5). While the Philippines' labor supply is abundant, and its labor market is somewhat competitive considering its informal sector, product markets are not competitive in many sectors. Market dominance, the presence of monopolies and duopolies, and high entry costs contribute to a lack of competition in many sectors. As result, productivity gains are not always reflected in real wages but rather in profit, consistent with the increasing share of capital in the Philippines' national income.

An example of how lack of market competition contributes to real wage stagnation. Assuming that labor productivity in the trucking industry doubles because of an increase in the size of trucks. If an increase in labor productivity in the industry lead to higher wages for truck drivers, there would be an expected increase in the supply of drivers. With perfectly competitive labor markets and excess labor supply, the wages of truck drivers would in fact remain unchanged, as the inflow of new workers would be driving down wages before the effects of the increase in productivity could materialize in wages. Only if product markets were not competitive would an increase in industry productivity, with industry wages unchanged, lead to an increase in profits. If product markets were competitive, excess profit would attract new firms to enter the market, driving down output prices until excess profits were depleted. In this scenario, firms could expand output with the same costs and sell products at lower prices, which would increase the real wage of workers.

Box 6. A Framework to Analyze Real Wage Stagnation with Rising Labor Productivity

In the long run, labor productivity affects living standards through real wages. In a simple economic model, the relationship between labor productivity growth and the growth of real consumption wages is mediated by changes in the share of national income going to labor and changes in the relative prices of output and consumption goods, which is the labor's term of trade.

$$\Delta \text{Real wage} = \Delta \text{labor productivity} + \Delta \text{labor's share} + \Delta \text{labor's term of trade}$$

Therefore, the gap between real wages and labor productivity growth could be explained by declining labor shares, falling labor's terms of trade, rising earning inequalities, and measurement errors of labor productivity and earnings.

Earning inequalities. If the gap between labor productivity and the median real wage is small while the gap between labor productivity and average real wage is large, there is likely a presence of high earning inequalities. Specifically, large earning inequalities contribute to the rising gap between labor productivity and real wages.

Labor's terms of trade. Labor's terms of trade measures how shifts in the relative prices of consumption goods and output affect the consumption wages of workers. Declining terms of trade means that the price of goods that workers produce is increasing at a slower rate than the price of goods that workers consume. All else being equal, declines in labor's term of trade are bad for workers because they result in lower consumption wages.

Measurement errors. An inaccurate measurement of labor productivity and real wages could happen if: (i) labor productivity is better measured in hours, not workers; (ii) total labor compensation (including non-wage benefits) is not used to calculate nominal wages; and/or (iii) there is a divergence over time between the series used to deflate nominal output (i.e., the GDP deflator) and the series used to deflate nominal wages (i.e., the consumer price index).

Source: Sharpe et al. (2008).

Labor share. The declining labor share can be caused by:

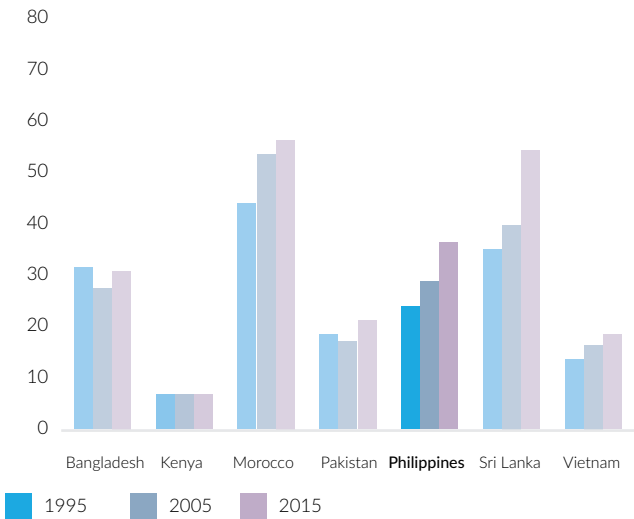
- **Lack of market competition.** In the presence of competitive labor and product markets, there should be no direct relationship between labor productivity growth and the growth in real consumption wages at the sector level. Wages are determined at the level of the total economy, and labor market and labor productivity gains are reflected in lower output prices rather than higher wages in sectors with above-average labor productivity growth. Lower prices benefit all workers rather than only workers in the sector experiencing above-average labor productivity growth.
- **Weak institutional setting for wage bargaining.** In markets with perfect competition and constant returns to scale, wage bargaining has no effect on the labor share. In these markets, there is no excess profit to be shared and labor requests for higher wages will remain either unanswered or will drive the targeted business out of the market. In reality, however, few firms operate in a perfectly competitive market, opening the door to excess profits. This excess profit can, in turn, be shared between the owners of the firm and labor. This is where wage bargaining can play an important role in affecting the labor share.
- **Capital-biased technological change.** Technological change can shift labor and capital shares if the technology is biased in favor of either factor of production. If a new technology is capital biased, it means that the technology allows the use of less labor and more capital at given factor prices, decreasing the marginal productivity of labor at a given ratio of labor to capital.
- **Large labor supply.** A large labor supply reduces the bargaining power of workers.

Stagnant real wages and a lack of quality jobs have contributed to a high rate of emigration from the Philippines. The Philippines has a larger share of emigrants than country peers (Figure 116 and Figure 117). The number of emigrants as share of the total population increased from 3.5 percent in 1995 to 5.3 percent in 2015. This is substantially higher than the regional peer average of 2.4 percent and slightly higher than the structural peer average of 5 percent. Moreover,

migrants as share of the country's labor force increased by 50 percent between 1998 and 2015, from 10 percent to 15 percent (Figure 118). Also, the share of emigrants below the age of thirty has increased over time and is now more than half of all emigrants (Figure 119). If these trends continue, it will be difficult for the Philippines to generate economic growth from its labor force.

Figure 116. More workers in the Philippines emigrate compared with structural peers...

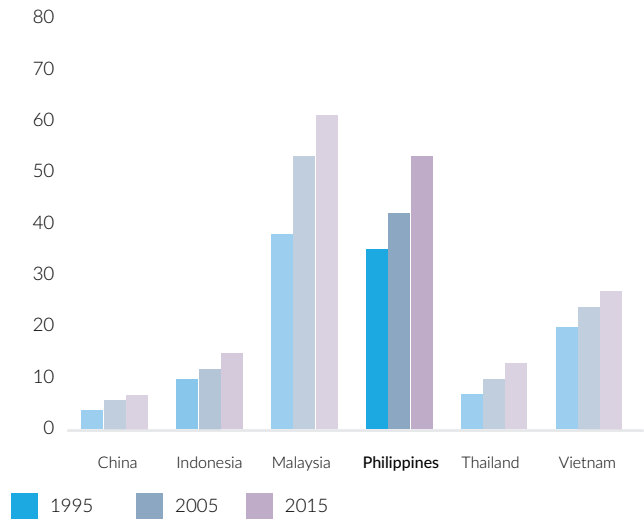
Migrant Stock as Share of the Population: the Philippines vs. Structural Peers (Percent)



Source: United Nations.

Figure 117. ...and its regional peers.

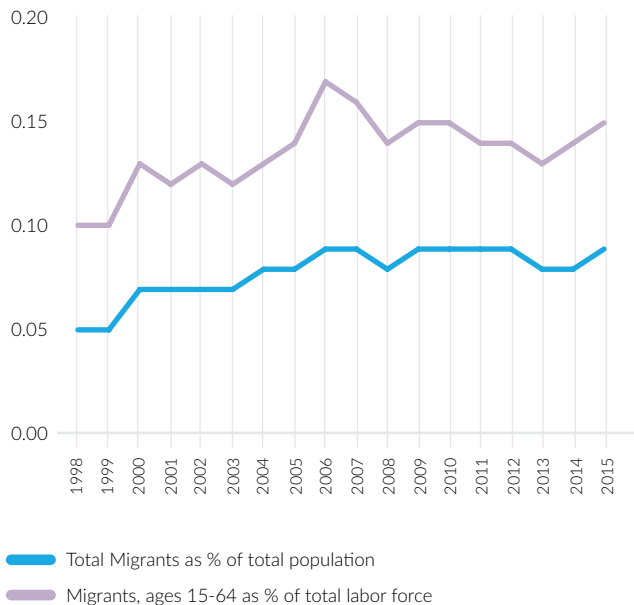
Migrant Stock as Share of the Population: the Philippines vs. Regional Peers (Percent)



Source: United Nations.

Figure 118. The share of migrants in the labor force has been increasing...

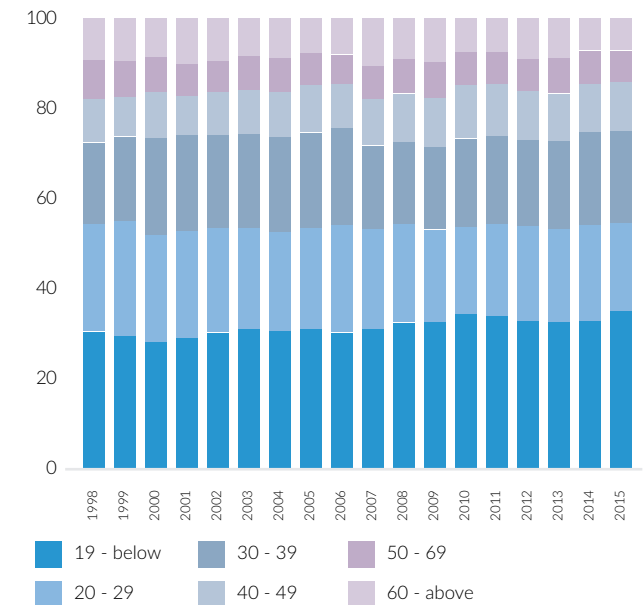
Migrants as Share of the Population and Labor Force (Percent)



Source: Commission on Filipinos Overseas (CFO).

Figure 119. ...especially among the youth.

Share of Filipino Emigrants by Age Group (Percent)

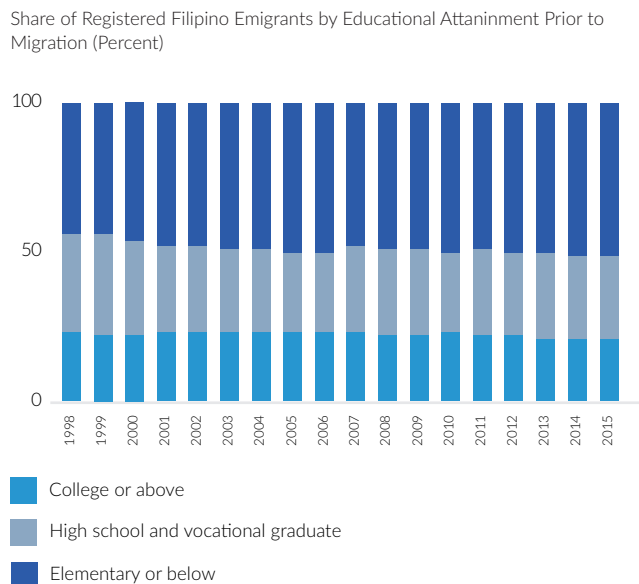


Source: CFO.

The high emigration rate slows the country’s productivity growth. The education profile of emigrants affects a country’s human capital stock. The relative high level of education, including language skills, of Filipino workers increases their employment opportunities outside of the country (Figure 120). A survey conducted by the Organization for Economic Co-operation and Development (OECD) on public policies, migration, and development found that the intention to emigrate increases with the level of education (Figure 121).⁶⁰

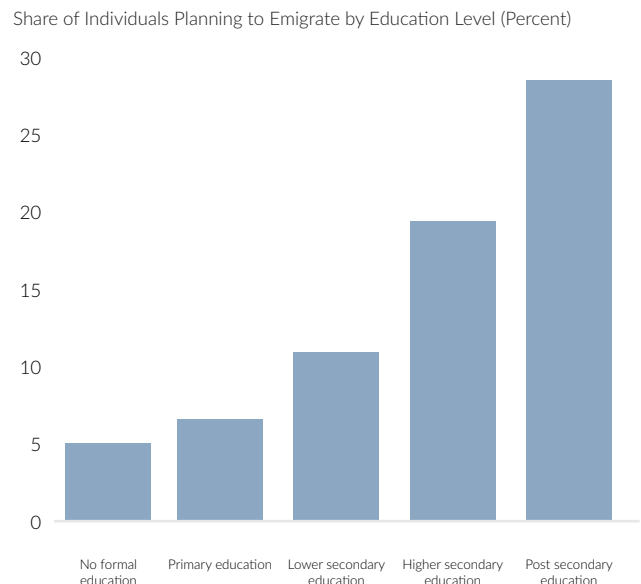
Since productivity growth requires both human and physical capital, the emigration of skilled workers negatively affects firms’ ability to find skilled labor in the economy, preventing them from expanding and innovating. As a result, the Philippines’ human capital flight slows productivity growth, as the country perpetuates in a vicious cycle of emigration due to lack of domestic opportunities, which in turn shrinks the pool of skilled labor in the economy.

Figure 120. A large share of Philippine migrants is highly educated...



Source: CFO.

Figure 121. ...and those planning to emigrate have the highest levels of educational attainment.



Source: CFO.

⁶⁰ The OECD survey found a positive correlation between education and migration intentions after controlling for other relevant individual and household characteristics.

WEAK CAPACITY TO INNOVATE LIMITS PRODUCTIVITY GROWTH

Productivity growth is largely influenced by the capabilities and incentives of firms to innovate. Innovation refers to activities that either expand the technology frontier or absorb and adapt existing technology. The development of new technologies requires access to relevant human capital, continuous investment in research and development (R&D), and well-defined and enforceable property rights. However, innovation in developing countries, including in the Philippines, is mostly done by adopting and diffusing existing knowledge and technologies through international transfers and spillovers.⁶¹

A country's innovation capacity is determined by its innovation infrastructure, the micro-environment, and the quality of linkages between the two. Innovation capacity, defined as an economy's potential to innovate, depends on the level of technological sophistication in the economy, the quality of the country's labor force, the rate of investment, and both public- and private-sector policies that affect the incentives for and the productivity of R&D activities. There are three main elements of a country's innovation capacity: (1) the common innovation infrastructure, (2) the microeconomic environment, and (3) the quality of linkages between the two. First, an innovation infrastructure includes a country's accumulated knowledge stock and talent pool; national investment and policy priorities, such as higher education spending and intellectual property protection; the availability of information technology infrastructure; and openness to competition, which will exert a cross-cutting impact on innovation across sectors.⁶² Second, the microeconomic environment includes the presence of high-quality inputs such as scientists; structures that encourage investment and intense local rivalry, which implies an equal playing field; and pressure and insight from sophisticated local demand. Finally, the absence of strong linkages between the country's innovation infrastructure and the microeconomic environment may cause upstream scientific and technical activities to spill over to other countries instead of domestic industries.

The Philippines' common innovation infrastructure is of poor quality. In 2017, the Philippines ranked 75th out of 137 countries on the availability and quality of research capital and 74th on the availability of scientists and engineers, lower



than most peers (Figure 122). Also, the cost of information technology services is higher in the Philippines than in many regional peers (Figure 124 and Figure 125). Moreover, there is weak international competition in the Philippines' innovation sector, as the country suffers from limited trade openness and low levels of FDI.

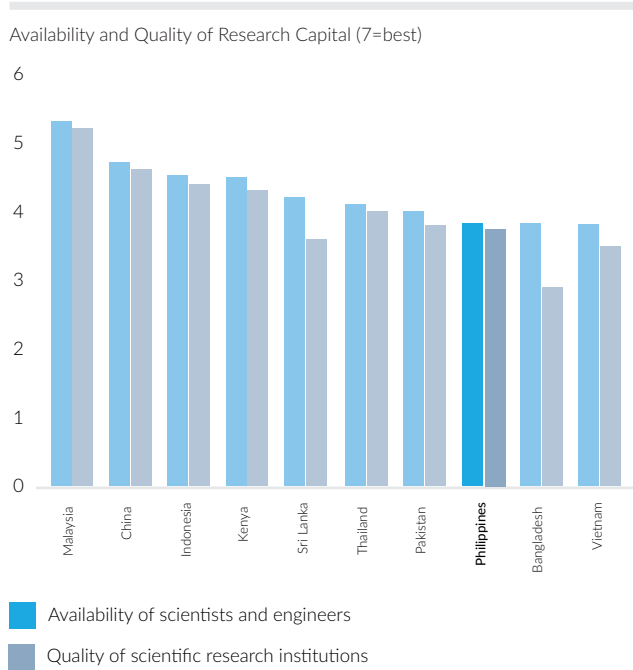
The country could improve its micro-environment and the quality of linkages between common innovation infrastructure. The high level of market dominance and the presence of inefficient business regulations in the Philippines are not conducive for innovation. In addition, the country underperforms many regional peers in the ability to diffuse technology through collaboration between universities and industry (Figure 123).

As a result, Philippine firms lag behind peers in adopting existing technologies. On the 2017 Global Innovation Index, the Philippines ranked 73rd out of 128 countries, behind regional peers such as Thailand (51st), Vietnam (47th), Malaysia (37th), and China (22nd). The country's underperformance in innovation can be partly explained by low spending on R&D, merely 0.1 percent of GDP, compared with an average of 0.9 percent of GDP among regional peers and an average of 0.4 percent of GDP among structural peers (Figure 126). In addition, Philippine firms are less likely to adopt existing technologies than firms in peer countries (Figure 127). For instance, only 8.8 percent of firms in the Philippines have internationally recognized quality certifications and only 11.2 percent of firms use technology licensed from foreign companies, lower than in most peers.

61 Freeman (1987), Lundvall (1992), Nelson and Rosenberg (1993), Metcalfe (1995).

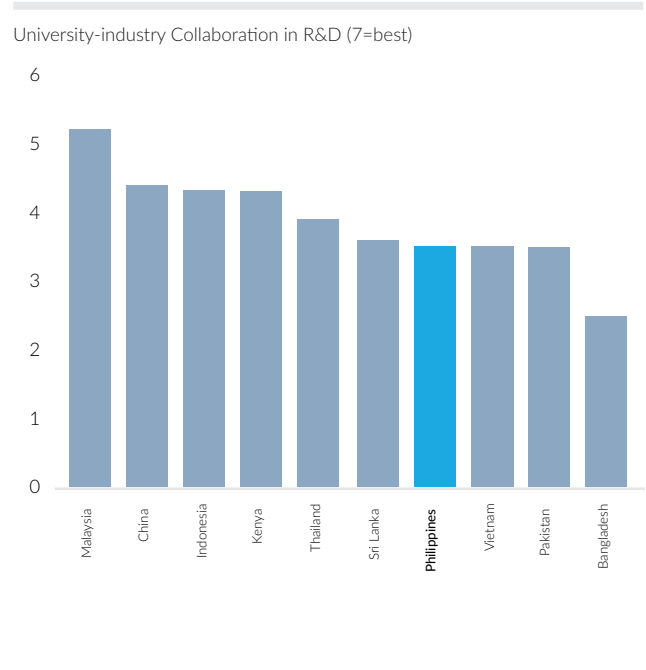
62 Furman and Hayes (2004), Nelson (1993).

Figure 122. The availability and quality of research capital in the Philippines is low.



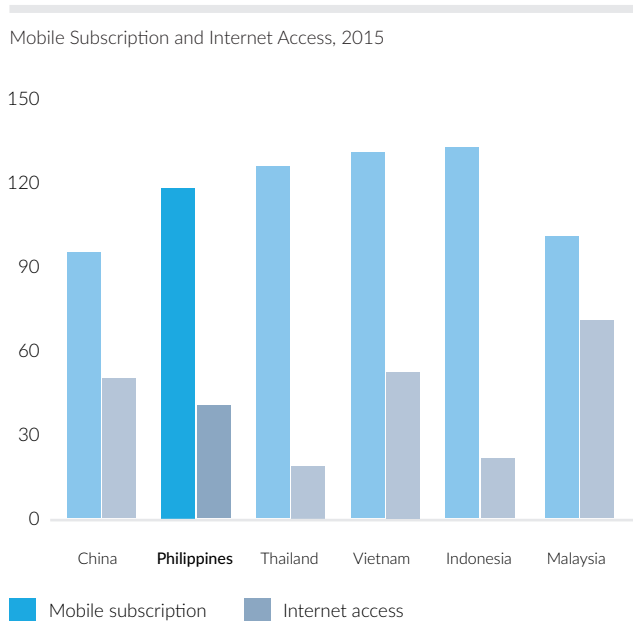
Source: World Economic Forum.

Figure 123. More collaboration between universities and industry could yield better technology diffusion.



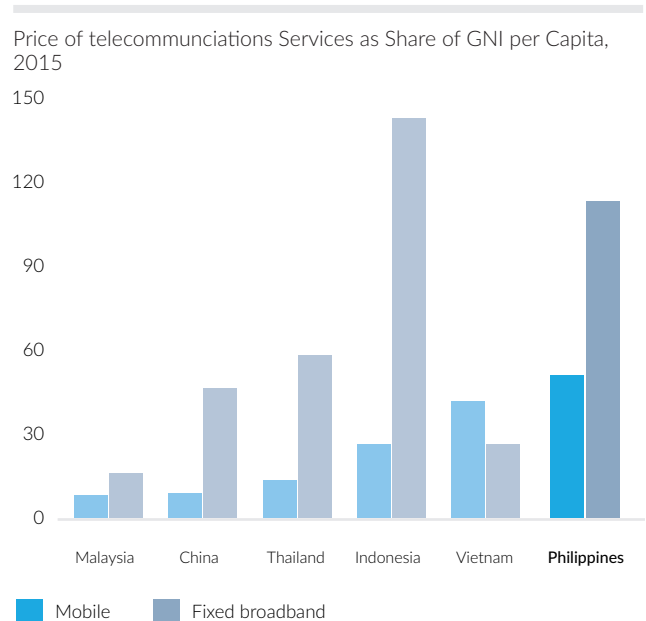
Source: World Economic Forum.

Figure 124. The Philippines lags behind regional peers in the availability of information technology...



Source: Access to telecommunications, International Communication Union (2015).

Figure 125. ...and the cost telecommunications services.



Source: Price of telecommunications, International Telecommunication Union, Measuring the Information Society Report 2016.

Most firms involved in innovation are large firms in the Information and Communication Technologies (ICT) industry. While young and small firms are usually more innovative, large firms dedicate more resources to innovation in the Philippines (Figure 128). The prominent position of large firms in innovation may even be underestimated considering that most micro and small firms in the Philippines are in the informal sector, and many of them are unregistered. ICT is the country's most innovative industry, with more than half of all firms involved in innovation (Figure 129).

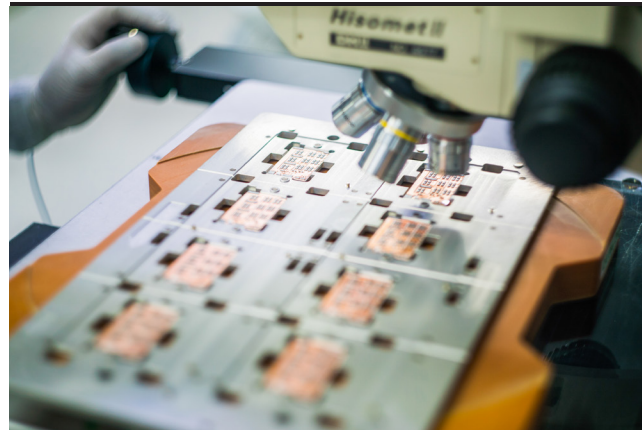
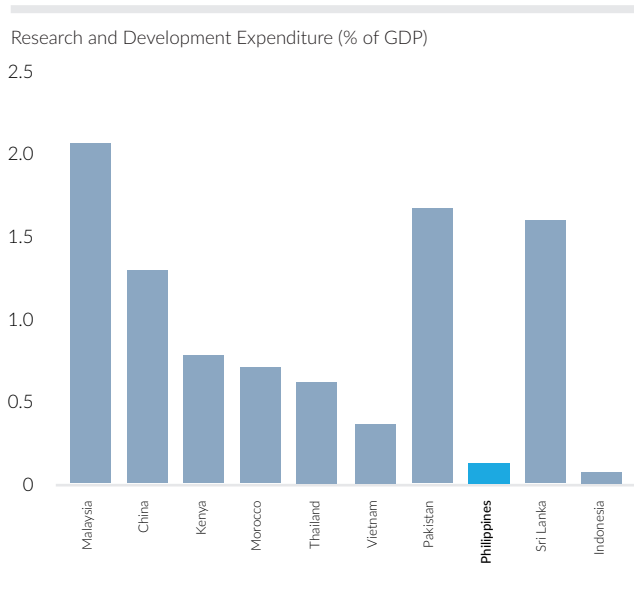


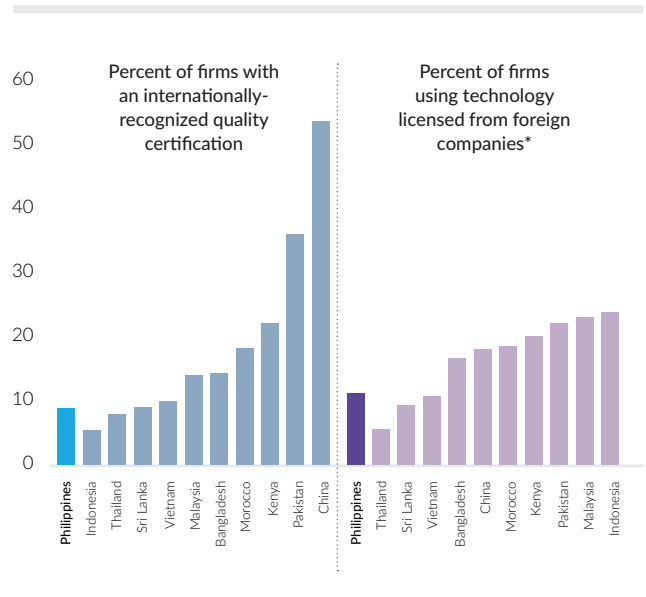
Figure 126. The Philippines allocates little resources to R&D...



Source: World Bank.

Note: Morocco (2010), Kenya (2010), Indonesia (2013), Philippines (2013), Sri Lanka (2013), Vietnam (2013), China (2015), Malaysia (2015), Pakistan (2015), Thailand (2015).

Figure 127. ...and its firms lag behind peers in technology adoption.



Source: Enterprise Survey, World Bank.

Note: Sri Lanka (2011) China (2012), Bangladesh (2013), Kenya (2013), Morocco (2013), Pakistan (2013), Indonesia (2015), Malaysia (2015), Philippines (2015), Vietnam (2015), Thailand (2016).

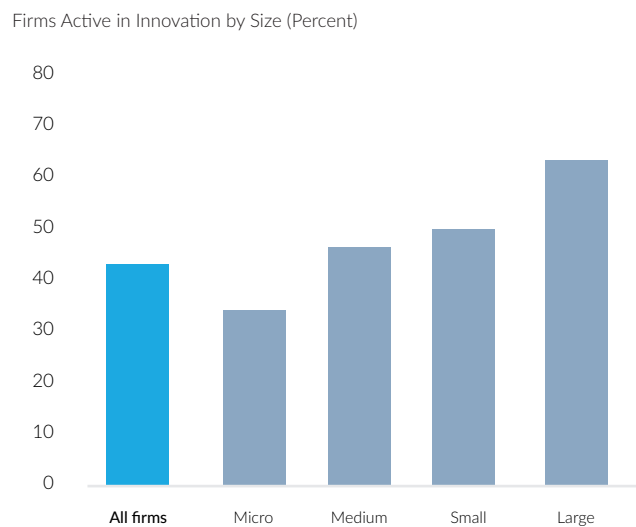
*Only for manufacturing firms.

High costs, insufficient resources, market dominance, and lack of skills are the most prominent factors that prevent firms from innovating in the Philippines (Figure 130). Firms point to the high cost of innovation as the primary factor that prevent them from engaging in innovation activities in the country, followed by lack of funds from within firms and external sources. Moreover, market dominance and lack of qualified personnel are also important factors that discourage innovation, especially among micro, small, and medium enterprises (MSMEs).

The government provides limited support for innovation activities in the private sector, contributing to the low level of innovation in the economy. Merely 3.1 percent of the

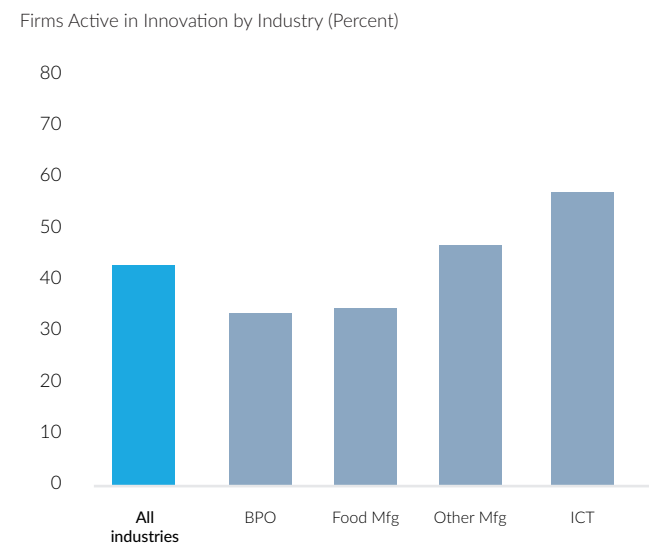
country's firms receive public financial support for innovation (Figure 131). Small and large firms are the main target groups for government support: 4.9 percent of small firms and 3.7 percent of large firms receive some kind of innovation support from the government. Moreover, less than 20 percent of firms are aware of public policies to support innovation (Figure 133). Large firms and firms in the ICT industry are more aware of government support than small firms in the BPO industry (Figure 134). Apart from financial support, the public procurement of advanced technology products, an effective method to foster and support innovation, is at a lower level in the Philippines than in all peers (Figure 132).

Figure 128. Large firms are more likely to engage innovation activities.



Source: 2015 Survey of Innovation Activities, Philippine Institute for Development Studies.

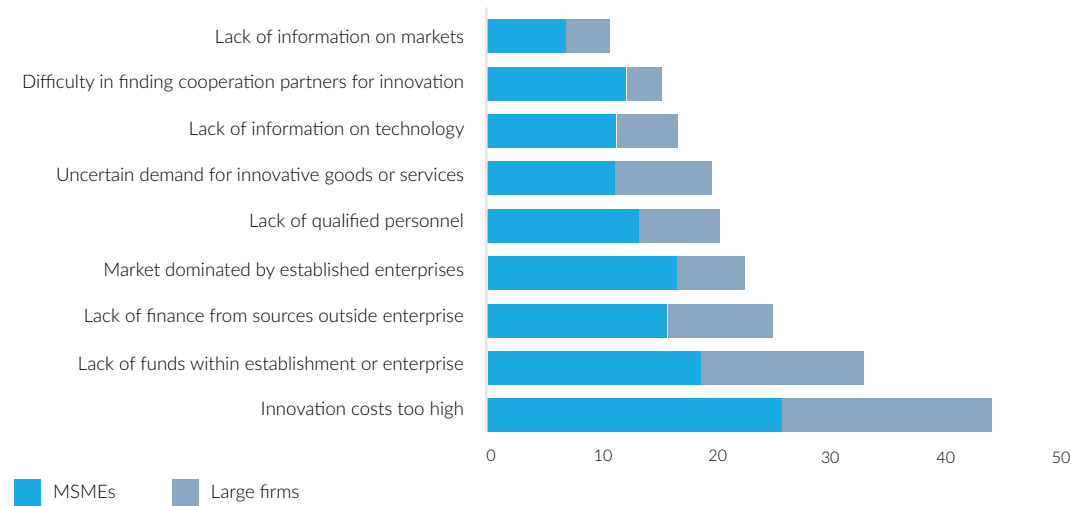
Figure 129. ICT is the most innovative industry while the BPO is the least.



Source: 2015 Survey of Innovation Activities, Philippine Institute for Development Studies.

Figure 130. High costs and lack of funds are the most prominent factors hampering innovation.

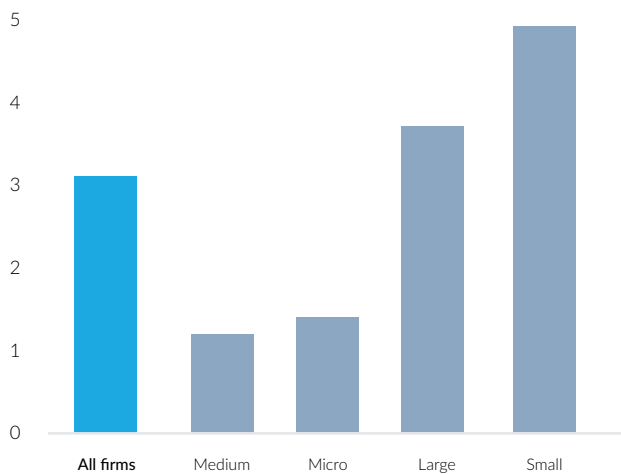
Factors Hampering Innovation Activities (Percent)



Source: 2015 Survey of Innovation Activities, Philippine Institute for Development Studies.

Figure 131. Few firms receive public financial support for innovation.

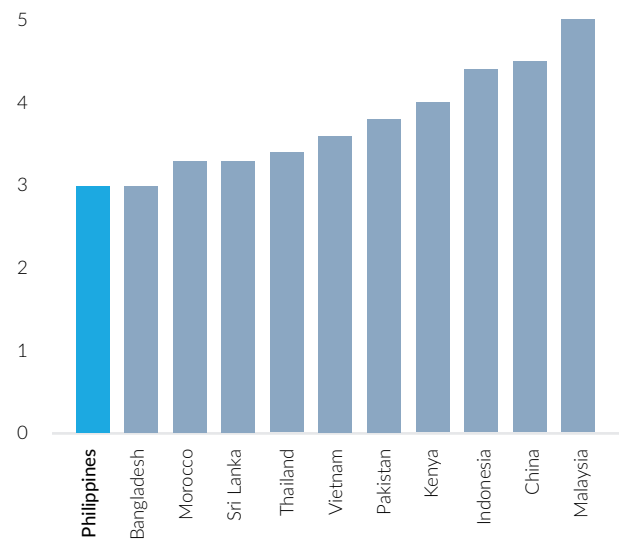
Firms Receiving Public Financial Support for Innovation (Percent)



Source: 2015 Survey of Innovation Activities, Philippine Institute for Development Studies.

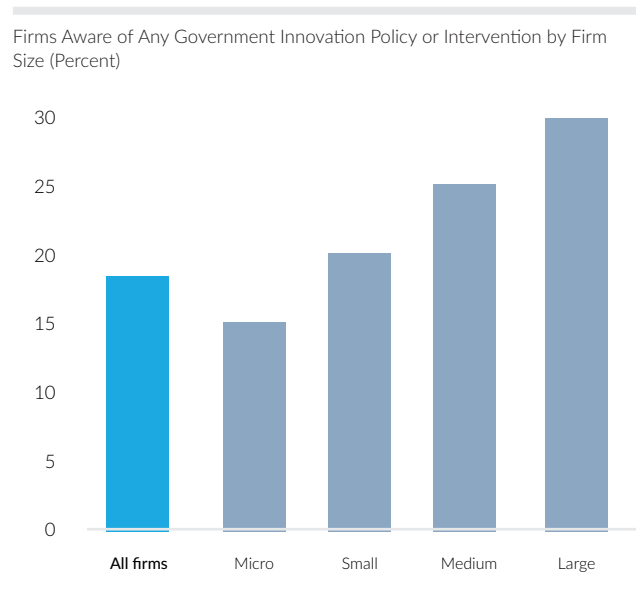
Figure 132. The level of government procurement of advanced technology products is low.

Government Procurement of Advanced Technology Products (7=best)



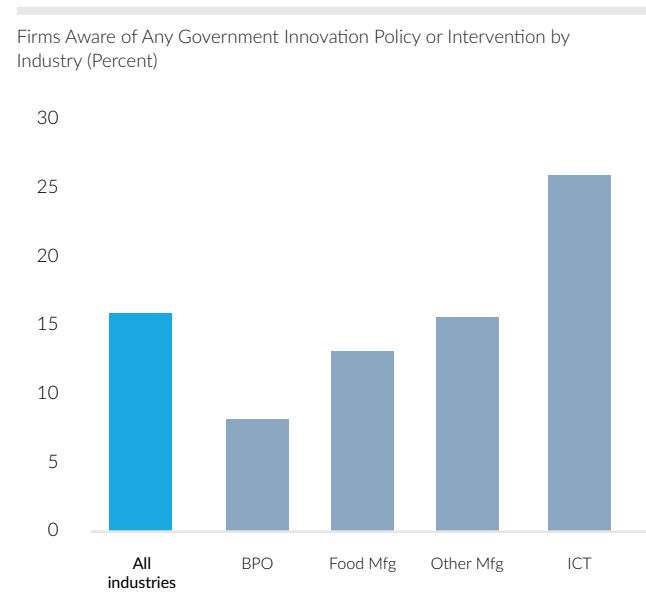
Source: Source: 2017 Global Competitiveness Index Report.

Figure 133. Few MSMEs are aware of the government's innovation policy.



Source: 2015 Survey of Innovation Activities, Philippine Institute for Development Studies.

Figure 134. ICT firms are the most aware of the government's innovation policies while BPO firms are the least.



Source: 2015 Survey of Innovation Activities, Philippine Institute for Development Studies.

Lack of competition hinders productivity growth in the Philippines. While the Philippines' labor market is competitive, and there are abundant skilled workers, real wages have been stagnant. This may be related to a lack of competition in product markets. Stagnant real wages hamper productivity growth by lowering capital intensity, depressing innovation, and encouraging the emigration of skilled workers. Therefore, increasing competition would boost productivity growth in the Philippines.



05

The Stakes: Reforms to Achieve the AmBisyon Natin 2040



The current administration has adopted a long-term growth vision for the Philippines called *AmBisyon Natin 2040*. The vision represents the collective long-term vision and aspirations of the Filipino people and the country in the next 25 years.⁶³ It envisions a strongly rooted (*matatag*), comfortable (*maginghawa*), and secure life (*panatag na buhay*) for all Filipinos, and that families live together in a high-trust society with a strong sense of community. Also, there is access to high-quality education, decent jobs, sustainable incomes, opportunities for entrepreneurship, and an efficient transportation system. The *AmBisyon Natin 2040* also envisions Filipino families living in comfortable homes, with desired amenities and secure ownership, and individuals enjoying work-life balance, financial security, comfortable retirement, and long and healthy lives.

Sustainable and inclusive economic growth is central to the government's long-term vision. Sustaining robust economic growth is a necessary condition for the Philippines to become a prosperous middle-class society free of poverty by 2040. The government's goal is based on a set of household consumption and asset-ownership targets, including owning a house and a car and having enough money to send children to college while maintaining a middle-class lifestyle. For a family of four, this level of consumption translates into an estimated gross monthly income of Php120,000 by 2040, meaning that the Philippines' per capita income needs to triple over the next 25 years. Moreover, the government's strategy calls for growth to be inclusive and distributed across sectors, regions, and income groups. It especially focuses on

increasing opportunities for the poor in order to eradicate poverty by 2040, if not earlier.

The Philippines will need to reach a per capita real GDP of about US\$9,350 by 2040 to meet the goals set out in the *AmBisyon Natin 2040*.⁶⁴ This is a rough target that is aligned with the government's target of tripling per capita income from its current level. Assuming that net factor income from abroad represents 15 percent of gross national income, the per capita GDP of US\$9,350 corresponds to a per capita GNI of US\$11,000, which is nearly the threshold for a high-income country.⁶⁵

Sustaining TFP growth and accelerating capital accumulation will be crucial for reaching the GDP per capita target needed to realize the government's vision. A long-term growth model was used to evaluate the feasibility of the government's vision and ways to achieve the GDP target by 2040. The model assesses various growth scenarios and the potential mix of growth drivers needed to reach the government's goals. A baseline scenario was created based on the premise that key growth drivers such as labor, human capital, investment, and technology sustain their historical growth rates. Various scenarios were then created relative to this baseline, and growth rates of select variables were adjusted to assess the most realistic combination that will realize the *AmBisyon Natin 2040*. The most realistic scenario shows that accelerating capital accumulation in the medium term while sustaining relatively high TFP growth will help the government achieve its long-term vision.

⁶³ *AmBisyon Natin 2040: A Long-term Vision for the Philippines*, Available Online: <http://2040.neda.gov.ph/>. May 3, 2018.

⁶⁴ The base year corresponds to the per capita GDP of US\$2,892 in 2017.

⁶⁵ NFIA totaled about 18.4 percent of GNI in 2000-16. A lower ratio 15.0 percent is assumed in the long term considering the declining trend of remittance growth, coupled with the outlook of fewer Filipinos seeking employment abroad as the domestic economy strengthens.

ACHIEVING THE LONG-TERM GROWTH TARGET

The World Bank's Long-Term Growth Model (LTGM) is used to simulate different growth scenarios. The LTGM is based on the Solow-Swan model, which is a long-term model set within the framework of neo-classical economics (Box 6). As with the Solow-Swan model, investment, savings, and productivity remain the key growth drivers in the LTGM. However, the World Bank's model is extended to include other factors that are important for developing and emerging

economies such as human capital, demographics, and the difference in labor market participation between men and women. Moreover, the baseline LTGM allows for an analysis of the effects of economic growth on poverty alleviation. The World Bank's LTGM has been used for growth simulations and country economy diagnostics in more than twenty developing countries, including in peers such as Malaysia, Bangladesh, and Sri Lanka.

Box 7. A Description of the Long-term Growth Model

The Long-term Growth Model is based on the Solow-Swan model. The economy consists of a single sector that produces output using physical capital K_t and effective labor $h_t L_t$. A_t denotes TFP, which determines the aggregate efficiency of the economy. The relationship between inputs and output is governed by the Cobb-Douglas production function given by:

$$(a) Y_t = A_t K_t^{1-\beta} (h_t L_t)^\beta$$

where β is the aggregate labor share of income, and effective labor is decomposed into human capital per worker h_t and the number of workers L_t . The total number of workers can be written as:

$$(b) L_t = \rho_t \omega_t N_t$$

where ρ_t is the participation rate, ω_t is the working age to total population ratio, and N_t is the total population.

Physical capital next period (K_{t+1}) is formed by undepreciated capital $(1-\delta)K_t$ and new investment I_t :

$$(c) K_{t+1} = (1-\delta)K_t + I_t$$

Investment is funded by either domestic savings S_t or foreign savings via a current account deficit CAD_t :

$$(d) I_t/Y_t = S_t/Y_t + CAD_t/Y_t$$

One can further decompose changes in foreign savings into inbound FDI and changes in total external debt (D_t):

$$(e) \frac{I_t}{Y_t} = \frac{S_t}{Y_t} + \frac{FDI_t}{Y_t} + \frac{D_t}{Y_t} - \frac{D_{t-1}/Y_{t-1}}{(1+g_{y,t}^{pc})(1+g_{N,t})}$$

By combining these, the model can calculate growth that comes from an investment or savings constraint, or it can calculate the required level of investment to meet a growth target. It also calculates changes in the poverty rate, as growth in GDP per capita shifts the income distribution to the right.

(f)

$$g_{y,t+1} \approx gA_{t+1} + \beta(g_{h,t+1} + g_{\omega,t+1} + g_{N,t+1} + g_{\rho,t+1}) + \left[\frac{1-\beta}{K_t/Y_t} \right] I_t - (1-\beta)\delta$$

Headline GDP growth ($g_{y,t+1}$) can be decomposed using a log-linear approximation into different growth fundamentals (Equation A6). Here $g_{x,t+1}$ is the growth rate of factor x from t to $t+1$. Equation (g) is the equivalent formulation for per capita GDP growth, $g_{y,t+1}^{pc} = g_{y,t+1} - g_{N,t+1}$, with the key difference being that population growth adds to headline GDP growth, but subtracts from GDP per capita growth.

(g)

$$g_{y,t+1}^{pc} \approx gA_{t+1} + \beta(g_{h,t+1} + g_{\omega,t+1} + g_{\rho,t+1}) + \left[\frac{1-\beta}{K_t/Y_t} \right] I_t - (1-\beta)\delta + g_{N,t+1}$$

$(1-\beta)/(K_t/Y_t)$ is the marginal product of capital (MPK), or the inverse of the marginal ICOR (mICOR), which determines the effectiveness of investment in boosting growth. An increase in K_t/Y_t for example from excessive investment, will decrease the MPK and increase the ICOR.



The growth analysis uses data that span a four-decade period, ranging from 2000 to 2040. Historical averages between 2000 and 2016 are used as data inputs for key parameters (e.g., initial GDP per capita, labor share of income, depreciation rate, and initial capital-output ratio) and growth rates or ratios of key variables (e.g., initial TFP growth, initial human capital growth, labor market participation rate, demographics, and poverty growth). The growth-simulation exercises begin in 2017 and extend to 2040. Growth targets generally use conservative estimates based on the country's historical averages, and they are compared with peer averages and stylized facts.

A baseline scenario that assumes no reforms and five scenarios with varying key growth drivers were simulated. The baseline scenario assumes that no reforms are instituted, and the economy continues its current growth path. The factors of production—labor, physical capital, human capital, and TFP—grow at their historical average between 2000 and 2016. This is followed by five different growth scenarios. Scenario 1 simulates a successful case of the public “Build, Build, Build” program. Scenarios 2 and 3 simulate the growth needed for human capital and TFP separately to reach the target GDP per capita. Scenario 4 simulates a moderate case where both physical and human capital growth accelerates by an additional 10 percent on top of their historical growth rates. The scenario then finds the corresponding TFP growth rate needed to reach the target per capita GDP. Finally, scenario 5 is a progressive case of Scenario 4 where physical

and human capital growth is an additional 50.0 percent (compared to the 10.0 percent of scenario 4).

Determining the feasibility of the growth paths depends on how attainable the growth of key variables is (Table 3). Reasonable growth thresholds can be determined based on the historical growth experiences of select economies and comparative peers. For example, TFP growth did not exceed 2.0 percent for the 95th percentile across 168 countries in the past two decades. The world TFP growth average was 0.7 percent in 2000-14, and the average TFP growth among the Four Asian Tigers⁶⁶ was 1.8 percent in 1960-90. While there are exceptions, such as China's annual average TFP growth of 2.1 percent in 1980-2010, it is safe to assume that a conservative estimate of the Philippines' average TFP growth rate will not exceed 2.0 percent in the next two decades. In terms of investment-output ratios, China's 45.0 percent of GDP in 2010 was the highest ratio ever recorded. However, the annual average for structural peers was 23.7 percent of GDP in 2000-2016, while the average of regional peers was 29.8 percent during the same period. The Philippines' investment-output ratio was 24.5 percent of GDP in 2016, implying ample room for higher growth. Finally, the average years of schooling varies from an average of 6.5 years among structural peers and 12 years among the Four Asian Tigers. Meanwhile, the average years of schooling internationally is 8.3 years.

Table 3. Historical Growth Averages of Key Growth Drivers

	TFP Growth (2000-2014) in percent	Investment-Output ratio (2016) in percent	Years of schooling
World	0.7	23.2	8.3
East Asia Pacific countries (All)	1.0	31.4	9.3
Structural Peers	1.0	23.7	6.5
Regional Peers	1.5	29.8	8.4
East Asian Tigers	1.8 (1960-1990)	31.9 (1990)	12.0
China	2.1 (1980-2010)	45 (2010)	7.6
Philippines	1.8	24.5	8.5

Source: WDI.

PATHS FOR FUTURE GROWTH

GDP per capita will reach US\$8,615 by 2040 if the economy continues on its current growth path. This is the baseline scenario, which assumes that key economic parameters and growth variables grow at their historical rates since 2000 (Table 4). In this scenario, the investment-to-GDP ratio is projected to grow at an annual rate of 0.8 percent, from 24.5 percent of GDP in 2016 to 30.1 percent of GDP in 2040. The human capital index is estimated to grow by 0.5 percent per year, resulting in an increase in the average years of schooling from 8.5 years in 2017 to 9.4 years in 2040. The TFP growth rate is conservatively set at 1.5 percent annually, which is lower than the rate of 1.8 percent in 2000-16.⁶⁷ However, this TFP growth is higher than the world average of 0.7 percent since 2000 and the East Asia Pacific average of 1.0 percent in 2000-14. Given these assumptions, real GDP is projected to grow at an average rate of 6.2 percent per year between 2017 and 2040. With the relatively high growth rate, real GDP per capita reaches US\$8,615 by 2040, lower than the GDP per capita target. Poverty headcount is

expected to fall from 27.0 percent in 2015 to 3.2 percent in 2040, using the poverty line of US\$3.20 a day.⁶⁸

The administration's infrastructure investment program provides momentum for strong medium-term growth. Scenario 1 simulates the successful delivery of the administration's "Build, Build, Build" program in which the investment-to-GDP ratio grows by 3.0 percent each year to reach 29.2 percent of GDP in 2022.⁶⁹ Assuming that the investment ratio then grows at the historical average of 0.8 percent per year until 2040, the investment-to-GDP ratio will reach 33.6 percent of GDP in 2040, higher than the average of many peers. Under this scenario, real GDP per capita will reach US\$9,237 by 2040, slightly lower than the government's target, implying an annual average real GDP growth rate of 6.5 percent in 2017-40. This scenario requires that TFP grows at 1.5 percent per year, same as the baseline, rather high based on world experience.

⁶⁷ World Bank, East Asia and Pacific Update April 2017.

⁶⁸ The poverty headcount rate assumes a log-normal distribution of income per capita with a constant Gini coefficient. GDP growth shifts the income distribution, resulting in people crossing the poverty line. The growth elasticity of poverty (GEP) is computed as the percentage fall in the headcount poverty rate from a 1 percent increase in per capita income. In this simulation, the Philippines' GEP rises from 1.4 in 2017 to 2.6 by 2040, which explains the low poverty rate in 2040.

⁶⁹ This was the average investment-to-GDP growth rate between 2011 and 2016.

ACHIEVING THE LONG-TERM GROWTH TARGET

Growth in human capital would need to accelerate dramatically if other factors maintain their current growth rates. Scenario 2 assumes that all variables in the baseline scenario are maintained except the human capital index. Human capital is measured as an index directly related to a country's average years of schooling and its returns on education. For the country to reach the US\$9,350 per capita real GDP target, the human capital index would need to

grow by an annual average of 1.1 percent between 2017 and 2040 (scenario 2). This is around twice the historical average of 0.5 percent in 2000-16. This implies the average years of schooling in the Philippines would be around 10.4 years by 2040. This is a rather ambitious target since the East Asia Pacific average was 9.1 years in 2016 and the highest record is held by South Korea with 13 years of education.

Table 4. Historical Growth Averages of Key Growth Drivers

Parameters		Data Source
Depreciation rate	3.6%	PWT 8.1
Labor share	0.5	Conservative estimate, PWT 8.1 (41.1%)
Initial capital-output (2017)	2.2	Conservative estimate, PWT 8.1 (2.7)
Initial GDP/capita (2017)	2892	World Bank staff estimate
Assumptions		
Initial labor market participation rate	67.2%	Labor Force Survey
Initial male participation rate	81.3%	Labor Force Survey
Initial female participation rate	52.8%	Labor Force Survey
Initial population growth rate (2017)	1.6%	PSA estimate
Population growth rate by 2050	0.7%	Staff estimate
Initial headcount poverty rate (as of 2015)	27.0%	WDI poverty line of US\$3.20
Gini coefficient (as of 2017)	46.5%	PovcalNet

The Philippines would need to sustain its current high TFP growth rate if both physical and human capital maintain their current growth rates. Scenario 3 assumes that all variables in the baseline scenario are maintained except for the TFP growth rate. To reach the target per capita real GDP of US\$9,350 in 2040, TFP would need to grow at an average annual rate of 1.8 percent between 2017 and 2040 (Scenario 3). TFP growth in the Philippines accelerated from an annual average of 1.4 percent in 2006-11 to an average of 2.2 percent in 2011-16. Sustaining the 1.8 percent of

TFP growth, however, could be a challenge, considering the world average was below 1 percent in 2000-14. Countries that have managed to sustain high TFP growth include the Four Asian Tigers during their growth expansion years (annual average of 1.8 percent in 1960-90) and China between 1980 and 2010 (average of 2.1 percent). Under Scenario 3, the Philippines' real GDP growth rate reaches 6.5 percent annually in 2017-40, which is about the average of 6-7 percent among the Four Asian Tiger economies for two and a half decades since the 1960s.⁷⁰

Table 5. Alternative Growth Scenarios

Scenario	Baseline	1	2	3	4	5
Objective	To reach US\$9,350 per capita GDP in 2040					
Description		Build, Build, Build	Increasing human capital growth	Increasing TFP growth	10% growth acceleration	50% growth acceleration
Human Capital						
Initial human capital index growth	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
Target human capital growth by 2040	0.5%	0.5%	1.6%	0.5%	0.6%	0.8%
Average years of schooling by 2040	9.4	9.4	10.4	9.4	9.5	9.8
Total Factor Productivity						
Initial TFP growth	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Target TFP growth rate by 2040	1.5%	1.5%	1.5%	2.0%	1.9%	1.5%
Investment						
Initial investment to GDP ratio	0.25	0.25	0.25	0.25	0.25	0.25
Target Investment ratio by 2040	0.30	0.34	0.30	0.30	0.31	0.33
Results						
Real GDP growth (2017-2040)	6.2%	6.5%	6.5%	6.5%	6.5%	6.5%
Real GDP per capita in 2040	8,615	9,237	9,352	9,353	9,351	9,350
Poverty headcount rate in 2040	3.2%	2.6%	2.6%	2.6%	2.6%	2.6%



An acceleration of both physical and human capital growth along with sustained TFP growth could achieve the per capita GDP target by 2040. Given that sustaining a high TFP growth rate would be challenging, an increase in both physical and human capital growth would lower the required TFP growth. To reach the per capita GDP target, Scenario 4 illustrates that a 10 percent increase in the historical growth rates for physical and human capital would lower the required TFP growth rate to 1.7 percent per year. Under this scenario, the average years of schooling would reach 9.5 years and the investment-to-GDP ratio would reach 30.6 percent by 2040. Moreover, Scenario 5 simulates a 50 percent increase in the historical growth levels for both human and physical capital, which would result in an investment-to-GDP ratio of 32.9 and an average of 9.8 years of schooling by 2040. Under Scenario 5, TFP growth would need to grow by 1.5 percent per year to reach the per capita GDP target by 2040.

Sustaining high TFP growth will be crucial for the government to achieve its per capita GDP target. Scenarios 1 through 5 shows that the government can reach its per capita GDP target if the country can sustain TFP growth of 1.5 percent per year until 2040. Otherwise, if the TFP growth rate falls to 0.9 percent per year (the historical average in 1990-2016), per capita GDP growth would slow to an average of 5.3 percent per year in 2017-40, resulting in a per capita GDP of

only US\$7,116 in 2040. This assumes that the investment-to-GDP ratio and the human capital index grow at historical averages. Therefore, it is important that the Philippines maintains or increases its TFP growth rate to reach the GDP target.

Growth volatility can also have a large impact on the likelihood of achieving the growth target. Volatility in economic growth introduces uncertainty into the economy by affecting investment, trade, and asset levels. It also discourages continuity in economic planning, which can even dampen the impact of high average growth of the factors of production. In addition, volatility creates periods of overinvestment and underinvestment that can lower the average return on capital investment.⁷¹ However, volatility needs to be sizeable to have a long-term impact on growth, as business fluctuations do not affect long-term growth. For instance, when a slight volatility shock is introduced into the LTGM while the baseline average growth rates are maintained, GDP per capita reaches close to the baseline level by 2040. Conversely, if volatility becomes excessive, per capita GDP reduces to US\$7,418 in 2040,⁷² which corresponds to an average annual real GDP growth rate of 5.5 percent in 2017-40, compared to 6.2 percent in the baseline scenario.

⁷¹ This is due to the concavity of the production function with respect to capital, which implies that the marginal product of capital is lower in periods of high capital stock than in periods of lower capital stock.

⁷² To introduce a volatility shock to the LTGM, the standard deviation of the growth rates for each of the factors of production is obtained, which is simulated in the model (TFP growth, human capital index growth, and investment-to-GDP ratio growth) and the standard deviation of each variable is multiplied by 3 (the so-called standard deviation factor). The standard deviation factor of TFP growth, HC index, and I/Y are then divided by the average growth rate of each variable. This value is then added and subtracted from the average growth rate of each variable to determine a range of values that will be randomly generated and introduced into the simulation. This provides a non-smooth growth path for the factors of production that simulates an introduction of volatility into the model that is not present in the baseline simulations.

DRIVERS OF TOTAL FACTOR PRODUCTIVITY GROWTH

The importance of TFP as a growth driver highlights the need to understand its determinants. TFP is generally regarded as a residual component of growth that represents economic efficiency and technological improvement. This loose and broad definition, however, impedes a precise understanding of how to improve TFP growth. While Chapter 4 discussed the main factors affecting TFP growth, this section uses a model developed by the World Bank to quantify the relative

contribution of these factors to TFP growth. The model identifies five categories of TFP determinants: innovation, education, market efficiency, infrastructure, and institutions, along with their corresponding indicators. Subcomponent indexes are constructed to represent each of these five categories, and an overall index is set up to represent the five categories combined (Box 7).

Box 8. A TFP Module for the Extended Long-Term Growth Model

A TFP module is set up to predict the TFP growth rate based on TFP determinants. Based on an extensive literature review, the determinants of TFP are identified and classified into five categories: innovation, education, market efficiency, physical infrastructure, and institutions (governance). For each category, a set of subcomponent indexes are constructed based on the most relevant and available empirical indicators using the factor analysis (Table 6). These subcomponent indexes are combined into an overall TFP index using the principal component analysis.

Table 6. TFP Determinants and Related Indicators

Innovation	R&D expenditure, public and private (percent of GDP) Number of patents, residents, and nonresidents (per 100 people) Number of scientific journal articles (per 100 people)
Education	Government expenditure on education (percent of GDP) Proxy for primary education: secondary enrollment rate (gross percentage) Proxy for secondary education: PISA score Proxy for tertiary education: completed tertiary education (percent of population 25+)
Market Efficiency	Goods market: Doing Business index Financial market: IMF Financial development index Labor market: Minimum wage (percent of VA per worker), severance pay for redundancy dismissal (weeks of salary), and share of women in wage employment in non-agricultural sectors
Infrastructure	Fixed telephone and mobile subscription (per capita) Length of paved roads (kilometer per capita) Electricity production (kilowatt per capita) Access to improved water source (percent of population) Access to improved sanitation facilities (percent of population)
Governance	Voice and accountability, corruption control, government effectiveness, political stability, regulatory quality, and rule of law

To measure the relative contribution of the five main determinants of TFP growth, the variation of the TFP growth rate is decomposed to that explained by each determinant across countries over the period 1985–2014. Finally, a model is built to quantify the relationship between the overall determinant index and the change in the growth rate of TFP. The model is as follows:

$$TFP\ growth_{c,t} = \beta_0 + \beta_1 Index_{c,t-5} + \beta_2 Index_{c,t-5} * OECD_c + \beta_3 \ln\left(\frac{GDP}{worker}\right)_{c,t-5} + \theta_c + \delta_t + \varepsilon_{c,t}$$

$TFP\ growth_{c,t}$: annualized TFP growth over t-5 and t

$Index_{c,t-5}$: overall determinant index at t-5

$OECD_c$: 1 if a country has been a member of OECD for more than 40 years; otherwise 0

$GDP_{c,t-5}$: total real GDP (constant 2010 US\$) at t-5

$worker_{c,t-5}$: total number of employed population at t-5

θ_c : country effect

δ_t : time effect

Source: Based on the work of Kim and Loayza (2017).

The determinants of TFP perform better in the Philippines than in structural peers. The country performs better than most structural peers on market efficiency, education, and governance. In the World Bank's 2017 Doing Business report, the Philippines ranked higher than most peers on market efficiency, outranked only by Morocco, while it shared the top rank with Morocco in the Financial Development index. The country is also in the lead in the participation of women in wage employment in non-agricultural sectors. Moreover, the country fares well compared to peers on both secondary and tertiary education enrollment and the Progress for International Student Assessment (PISA), whereas its share of public spending on education is somewhat lower than in some peers. While the Philippines does not score exceptionally well on governance indicators, it still performs better in voice and accountability, government effectiveness, and regulatory quality than many structural peers. The country underperforms structural peers in innovation, but it is in line with the average of structural peers in terms of infrastructure quality.

However, the Philippines underperforms regional peers in term of TFP fundamentals. The country underperforms regional peers in all categories of TFP determinants, except for governance.⁷³ The infrastructure gap is especially wide, as the country performs worse than all regional peers on infrastructure quality. The country also does poorly in terms of innovation, as its R&D expenditures rank the lowest together with Indonesia's. Furthermore, its PISA score and share of public expenditure on education are below the average of countries in the region. The country also performs below the average of regional peers on market efficiency in both the Doing Business report and the Financial Development index.

The Philippines can accelerate TFP growth by raising the performance of the TFP determinants to the average of regional peers (Table 7). The model simulates a one-time shock to the overall TFP determinant index, the underlying subcomponent indexes, or the underlying indicators one at a time. It then compares the results to the baseline scenario where TFP grows at 1.5 percent per year. If the Philippines reaches the regional average of the overall TFP determinant index, TFP will grow at 2.0 percent annually in 2017-40. Among the five determinants, an improvement in the innovation index will lead to the fastest TFP growth. The rest of the determinants have an equal impact on TFP growth. If the indexes for education, efficiency, and infrastructure reach their regional averages, each will push TFP growth to roughly 1.6 percent on average per year in 2017-40 if the rest are held constant.

Moreover, a convergence to regional best practices leads to higher TFP growth. If the Philippines reaches the overall TFP determinant index of Malaysia, its average TFP growth rate will reach 2.8 percent in 2017-40. Although this is an unrealistically high TFP growth, it illustrates that TFP growth can accelerate substantially by improving TFP fundamentals. Among the five determinants, raising the innovation index to the level of China will have the largest positive impact on TFP growth, as it leads to the annual TFP growth rate of 2.1 percent on average over 2017-40. Also, improving the market-efficiency index to the level of Malaysia's will result in an average annual growth of 2.0 percent in TFP in 2017-40. Raising the level of the education, infrastructure, and governance indexes to the best practices in the region will lead to an average annual 1.8-2.0 percent growth in TFP for each determinant if the rest are held constant.

The Philippines needs to sustain its high TFP growth to reach the targets set out in the *AmBisyon Natin 2040*. Although the country has experienced high TFP growth in the past decades, sustaining these levels for two more decades could be challenging. Experiences from other countries, such as the fast-growing Asian Tigers and China, show that sustaining high TFP growth for a long period is possible but requires continuous reforms to remove constraints and distortions in the markets. Given that the Philippines' TFP fundamentals could be further improved, closing the gap with regional peers will be important to sustain high TFP growth. However, it will require substantial efforts to remove market imperfections to improve market competition, infrastructure, and human capital as well as to create an enabling environment for innovation.

Global technological progress could also change the Philippines' growth path by affecting the country's growth model. The technology revolution is inevitable and includes advancements in big data and analytics, automatization, system integration, etc. Countries, including the Philippines, will have to adapt to new technologies and work methods. Whether these will enhance or deter economic growth will depend on how a country reacts to the opportunities and challenges posed by them. For a successful transition, the Philippines needs to first address pending issues in its business environment, infrastructure, and institutions to improve competitiveness. It also needs to lower trade and logistics costs to improve connections with the rest of world. The Philippines will then need to support the creation of new business models in the economy and new skills for the digital economy, especially in the export service sector since it is particularly susceptible to automation.

73 The regional average of the governance index was pulled down by China and Vietnam.

Table 7. Impact of TFP Determinants on Average TFP Growth in the Philippines

TFP Determinants	Indicators	Average TFP Growth if indicator reaches	
		Best Practice among Regional Peers (%)	Regional Average (%)
Innovation	R&D Expenditure	1.9	1.6
	Number of patents (Per 100)	1.6	1.5
	Number of scientific and technical journals published (/100 people)	1.6	1.5
Education	Government expenditure on education (% of GDP)	1.6	1.5
	Secondary enrolment rate (% of relevant population)	1.6	NA
	Tertiary completion rate (% of population aged 25 and above)	1.6	NA
	PISA score, average across math, science, and reading	1.8	1.6
Efficiency	World Bank Doing Business scores	1.6	1.5
	IMF Financial Development Index	1.7	1.6
	Women in wage employment in the nonagricultural sector	1.5	NA
Infrastructure	Fixed telephone (per 100 persons)	1.6	1.5
	Mobile subscription (per 100 persons)	1.5	1.5
	Electricity production (kw per 100 persons)	1.6	1.5
	Paved road (km per 100 persons)	1.6	1.5
	Access to improved sanitation facilities (% of population)	1.6	1.5
	Access to improved water source (% of population)	1.5	1.5
Institutions	Control of corruption	1.6	1.5
	Government effectiveness	1.6	1.5
	Political stability	1.6	1.5
	Regulatory quality	1.6	1.5
	Rule of law	1.6	1.5

Source: NA means that the Philippines performs better than the regional average.





Conclusion



The Philippines has experienced impressive economic growth in the last two decades. Since the early 2000s, the country's per capita GDP growth accelerated partly as a result of past structural reforms and the government's commitment to macroeconomic and fiscal stability. Continuing efforts to strengthen macroeconomic fundamentals along with favorable external conditions and the cumulative effects of structural reforms have positioned the Philippines as one of the strongest growth performers in the East Asia Pacific region.

The country aims to continue its growth success by tripling its income per capita by 2040 through the government's growth plan *AmBisyon Natin 2040*. The plan represents the collective long-term vision and aspirations of the Filipino people and envisions the Philippines as a prosperous middle-class society free of poverty by 2040. Central to this long-term vision is high, sustainable, and inclusive economic growth that will depend on sustained productivity growth. This implies that the Philippine economy needs to grow at an annual average of 6.5 percent in the next 22 years—a challenge that only the Asian Tigers and China have managed to accomplish in the past.

Accelerating capital accumulation and sustaining high TFP growth are essential to achieve the government's goals. Simulations show that given the Philippines' current low level of capital accumulation, increasing capital accumulation in the medium term will greatly contribute to economic growth. However, a faster pace of capital accumulation will need to be accompanied by sustaining high TFP growth rates. Yet, sustaining high TFP growth for a long period is only possible with continuous efforts to remove constraints and distortions in the markets.

This report highlighted a number of key policies that are crucial to sustaining high TFP growth in the Philippines. These policies include: i) improving market competition by eliminating restrictions on foreign vis-à-vis domestic investors; ii) streamlining burdensome administrative procedures for existing and new businesses, starting a new business, and paying taxes; iii) shortening the FDI negative list; iv) reducing limits on foreign equity; v) easing non-tariff barriers (especially POs); vi) lowering labor market rigidities through reducing the cost firing by simplifying dismissal procedures and lowering severance pay; vii) making regular employment contracts more flexible by linking severance pay with tenure; viii) and aligning the minimum wage with productivity by considering the wage level of the informal sector. Moreover, the government needs to remove distorting policies (i.e., rice subsidies) and invest in human capital if it is to increase labor productivity of the agriculture sector. Removing these policies will likely boost agriculture output by diversifying away from rice to higher output crops. Also, investing in human capital will encourage more movement of labor out of agriculture, accelerating structural change.

Poverty alleviation is likely to accelerate with more competitive and flexible markets. Creating an equal playing field and simplifying business regulations encourage firms to enter the market and invest, grow, and innovate, leading to higher labor productivity. Market competition coupled with a flexible labor market and abundant labor supply allows higher productivity to reduce product prices, which raises the real incomes of workers. As result of more and higher paid jobs, more people will be able to move out of poverty, helping the government achieve the *AmBisyon Natin 2040* and realize its vision of a society free of poverty.

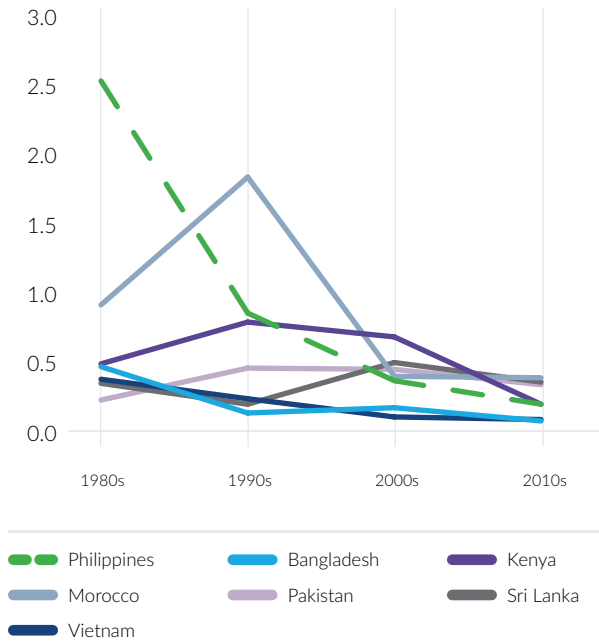


Appendices

APPENDIX 1. GROWTH VOLATILITY

Figure A1

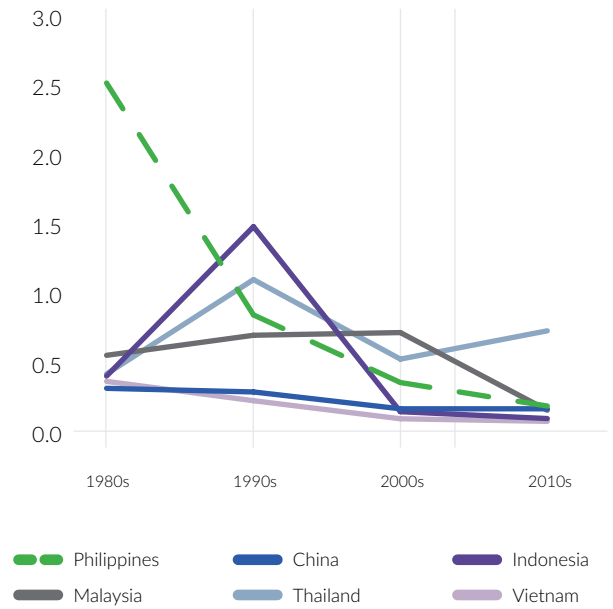
Growth volatility: Philippines vs structural peers (coefficient of variaton)



Source: WDI

Figure A2

Growth volatility: Philippines vs structural peers (coefficient of variaton)



Source: WDI

APPENDIX 2. DATA FOR FIRMS' PRODUCTIVITY DYNAMICS.

Both the CPBI and ASPBI are confined to the formal sector of the economy and as such excluded the informal sector. The CPBI and ASPBI describe the formal sector as comprised of the following: corporations and partnerships, cooperatives and foundations, single establishment with employment of 10 or more, and single proprietorship with branches. Hence, the census and survey covered only the following economic units: all establishments with total employment (TE) of 10 or more, and; all establishments with TE of less than 10, except those establishments which are single proprietorship in terms of legal organization, single establishment in terms of economic organization, and are engaged in economic activities classified per the 2009 Philippine Standard Industrial Classification (PSIC).

There are 18 industrial sectors within the scope of CPBI (2012) and ASPBI (2010, 2013, and 2014). These sectors, classified under the 2009 PSIC are: Agriculture, Forestry

and Fishing, Mining and Quarrying, Manufacturing, Electricity, Gas, Steam and Air Conditioning Supply, Water Supply; Sewerage, Waste Management and Remediation Activities, Construction, Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles, Transport and Storage, Accommodation and Food Service Activities, Information and Communication, Financial and Insurance Activities, Real Estate Activities, Professional, Scientific and Technical Activities, Administrative and Support Service Activities, Private Education, Human Health and Social Work Activities, Arts Entertainment, and Recreation, and Other Service Activities.

In 2010, the ASPBI revealed a total of 148,266 firms in the formal sector while in 2012, CPBI registered a total of 219,184 firms. In 2013 and 2014, ASPBI recorded 225,244 and 226,682 establishments in the formal sector, respectively. PSA uses the annually updated List

of Establishments (LE) as the frame from which to draw the sample establishments. According to the 2012 List of Establishments, there were 945,000 establishments in operation nationwide. Out of this number, 72 percent or 680,400 establishments belong to the informal sector and only 28 percent or 262,800 establishments made up the formal sector, which served as the frame for the 2012 CPBI. The ASPBI 2014 used the 2014 LE showing a total of 944,500 registered establishments. About 266,257 establishments (28 percent) belong to the formal sector of which 231,000 (87 percent) comprised the establishment frame. This frame was used to draw the sample establishments for the 2014 survey. The 2013 LE estimated a total of 941,000 establishments, of this, about 28.0 percent or 263,000 establishments belong to the formal sector of which 87.0 percent or 229,000 establishments comprised the establishment frame for the 2013 survey.

Panel data on manufacturing is obtained from the manufacturing sector census and surveys in 2001, 2003, 2005, 2006, 2008, 2009, 2010, 2012, 2013 and 2014, and economy-wide census (2012) and surveys (2013 and 2014). The manufacturing sector data consist of individual firms belonging to 23 manufacturing industries classified according to the 2-digit Philippine Standard Industrial Classification (PSIC) 1994. To standardize the classification of firms by manufacturing industries across the ten waves, the census and survey data in 2010, 2012, 2013, and 2014 which are based on PSIC 2009 codes are converted into PSIC 1994. The economy-wide panel data, which use PSIC 2009 to classify sectors, consist of individual firms belonging to 18 large sections⁷⁴ comprising the 3 economic sectors.⁷⁵ The PSA survey years before 2006 included firms that are classified as informal⁷⁶, which are removed from the dataset for consistency. Hence, only formal sector firms are included in the analyses. Table A.1. shows the number of manufacturing firms and all firms. PSA uses stratified systematic sampling method to identify the sample establishment. Selection of sample establishment for the 2012 CPBI was done using stratified systematic sampling with 3-digit or 5-digit PSIC serving as industry strata

and employment size as the second stratification variable. Similarly, 2013 and 2014 ASPBI utilized stratified systematic sampling with 5-digit PSIC serving as the industry strata and employment size as the second stratification variable. In 2014, for establishments with Total Employment of 20 and over, the 17 administrative regions serve as the geographic domains while the 5-digit level (sub-class) of the 2009 PSIC serves as the industry domain.

High response rates were recorded for 2012 CPBI and 2010, 2013 and 2014 ASPBI. In 2010, 95.1 percent of sample establishments responded, while 92.5 percent (54,869 out of 59,303 establishments) responded in the 2012 census. In 2013 and 2014, the response rate for all establishments was 90.7 percent (27,752 out of 30,583 establishments) and 87.48 percent (31,696 out of 36,231 establishments), respectively.

Treatment of data

Firms with zero capital stock, investment and compensation are removed from the sample with the assumption that firms cannot operate without any capital or labor. After the data cleaning and trimming process, the original manufacturing sector dataset which consist of 485,813 observations will be trimmed to 152,925 observations, while the original economy-wide dataset which consists of 671,166 observations will be trimmed to 374,085. The main trimming of the manufacturing sector dataset occurs at the dropping of informal sector firms especially during the earlier years of the surveys, while in the economy-wide dataset, the main trimming occurs during the cleaning process. After trimming and cleaning process and normalization of the distribution of firms, 332,888 of the observations in the manufacturing sector dataset have been dropped out from the estimation process, while 297,081 observations have been dropped from the economy-wide dataset.

⁷⁴ Section A Agriculture, Forestry, and Fishing, Section B Mining and Quarrying, Section C Manufacturing, Section D Electricity, Gas, Steam and Air Conditioning Supply, Section E Water Supply; Sewerage, Waste Management and Remediation Activities, Section F Construction, Section G Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles, Section H Transportation and Storage, Section I Accommodation and Food Service Activities, Section J Information and Communication, Section K Financial and Insurance Activities, Section L Real Estate Activities, Section M Professional, Scientific, and Technical Activities, Section N Administrative and Support Service Activities, Section P Education, Section Q Human Health and Social Work Activities, Section R Arts, Entertainment, and Recreation, and Section S Other Service Activities. Note that Section O Public Services are not included in the available data provided by the Philippine Statistics Authority.

⁷⁵ 3 large economic sectors: Agriculture (Section A), Industry (Sections B to F), and Services (Sections G to S). See footnote 2 for details.

⁷⁶ As per PSA, an informal sector firm is a single establishment and a single proprietor with less than 10 employees. A single establishment is an establishment which has neither branch nor main office. It may have ancillary unit/s other than main office, located elsewhere. (PSA CPBI/ASPBI Questionnaire)

Tables A.1, A.2, A.3 show the number of manufacturing firms and all firms in the original dataset, after dropping informal firms and cleaning.

The firms in the census frame report data on gross output, value added, percentages of export sales, material expenditures, energy expenditures, salaries, employees' benefits, number of employees, investments, book values, and ownership structure.

Table A1. Number of firms before dropping informal firms

	Number of manufacturing firms	Number of economy-wide firms
2001	119,360	Not available
2003	118,259	Not available
2005	108,559	Not available
2006	18,431	Not available
2008	15,718	Not available
2009	16,440	Not available
2010	15,777	Not available
2012	24,327	219,201
2013	24,440	225,284
2014	24,502	226,681

Table A2. Number of firms after dropping informal firms, but before trimming and cleaning

	Number of manufacturing firms	Number of economy-wide firms
2001	114,332	Not available
2003	18,250	Not available
2005	16,527	Not available
2006	16,136	Not available
2008	13,582	Not available
2009	14,959	Not available
2010	13,990	Not available
2012	22,640	207,215
2013	24,423	220,525
2014	24,154	222,083

Table A3. Number of firms after dropping informal firms, and trimming and cleaning

	Number of manufacturing firms	Number of economy-wide firms
2001	6,589	Not available
2003	8,377	Not available
2005	9,237	Not available
2006	8,361	Not available
2008	6,874	Not available
2009	6,977	Not available
2010	7,109	Not available
2012	9,315	172,285
2013	10,410	101,487
2014	10,288	100,313

APPENDIX 3. HSIEH AND KLENOW (2009) FRAMEWORK

The conceptual idea of allocation efficiency was translated into an empirical framework by Hsieh and Klenow (2009). In their framework, they argue that the overall TFP of an industry depends not only on the TFP of individual firms, but also on how resources are being allocated across firms. In their framework, in a frictionless environment, perfect allocation or rezsources implies that two firms within a narrowly defined industry should be able to employ resources up to the point where they attain the same marginal revenue products. Any dispersions in marginal revenue products among firms operating within a narrowly defined industry will imply misallocation of resources in the industry. Note that while the approach quantifies the overall extent of misallocation, it is silent about which factors could be behind the misallocation.

Consider an economy with many sectors, denoted s . Final output Y is produced in each country using a Cobb-Douglas production technology:

$$Y = \prod_s Y_s^{\theta_s} \quad (1)$$

where θ_s is the value added share of sector s and $\sum_{s=1}^S \theta_s = 1$.

Each sector's output Y_s is the aggregate of the individual firms' output Y_{si} , using the CES technology:

$$Y_s = \left[\sum_{i=1}^M Y_{si}^{\frac{\sigma-1}{\sigma}} \right]^{\frac{\sigma}{\sigma-1}} \quad (2)$$

where Y_{si} is the differentiated product by firm i in sector s and σ is the elasticity of substitution across firms within the sectors.

Each firm produces a differentiated product with the standard Cobb-Douglas production function:

$$Y_{si} = A_{si} L_{si}^{1-\alpha_s} K_{si}^{\alpha_s} \quad (3)$$

where A_{si} stands for firm-specific productivity; L_{si} is the firm's labor; K_{si} is the firm's capital; and α_s is the industry-specific capital share. Note that the assumption in this framework is that firms in the same narrowly defined sector—that is, the 3-digit The Philippines Standard Industrial Classification (PSIC)—have the same production function.

Each establishment maximizes current profits:

$$\pi_{si} = (1 - \tau_{Ysi}) P_{si} Y_{si} - w_{si} L_{si} - (1 + \tau_{Ksi}) R K_{si} \quad (4)$$

where $P_{si} Y_{si}$ is the firm's value added (which is the firm's revenue minus the cost of intermediate inputs); and w_{si} and R are the cost of one unit of labor and capital, respectively. The term τ_{Ysi} denotes firm-specific output distortions that reduce firms' revenues. Many factors could contribute to output distortions, ranging from transportation costs to discriminatory tax regimes to subsidies. These factors could reduce output for a given set of inputs. The firm-specific "capital" distortions, which raise the cost of capital (relative to labor), are denoted as τ_{Ksi} . Credit market imperfections such as preferential access to finance and labor market frictions could contribute to different "capital" distortions τ_{Ksi} across firms. Therefore, an increase in usage of capital is indicative of relative distortions in the labor markets.

Hsieh and Klenow (2009) differentiate the two productivity measures: TFPQ, which captures "physical productivity"; and TFPR, which captures "revenue productivity":

$$TFPQ_{si} = \frac{Y_{si}}{L_{si}^{1-\alpha_s} K_{si}^{\alpha_s}} \quad (5)$$

$$TFPR_{si} = \frac{P_{si} Y_{si}}{L_{si}^{1-\alpha_s} K_{si}^{\alpha_s}} \quad (6)$$

In an absence of distortions, TFPR should not vary across firms within each sector. In other words, in the absence of distortions, more capital and labor should be allocated to firms with higher physical productivity (TFPQ) to the point where their higher output results in a lower price, P_{si} , which also results in the $TFPR_{si}$ equalizing across firms i . Any dispersions of TFPR across firms within a sector imply distortions. A firm with TFPR higher than the sector average suffers from the effects of distortions. On the contrary, it is common for TFPQ to vary across firms because different firms may have different productivity levels.

From the revenue data, we can also derive

$TFPRQ_{si}$ as:

$$TFPRQ_{si} = A_{si} = \kappa \frac{(P_{si} Y_{si})^{\frac{\sigma-1}{\sigma}}}{K_{si}^{\alpha_s} (\omega L_{si})^{1-\alpha_s}} \quad (7)$$

Equation (7) shows that TFPQ is calculated from \mathbf{P}_{si} , which contains elements of distortions, and \mathbf{k} is normalized to 1.⁷⁷

$$\mathbf{P}_{si} = \frac{\sigma}{\sigma-1} \frac{(1+\tau_{ksi})^\alpha}{A_{si}(1-\tau_{ysi})^\alpha} \left(\frac{R}{\alpha_s}\right)^\alpha \left(\frac{\omega}{1-\alpha_s}\right)^{1-\alpha_s} \quad (8)$$

Hsieh and Klenow (2009) choose the elasticity of substitution, $\sigma=3$, and $R=10$, assuming a real interest rate of 5% and a depreciation rate of 5%. Capital share, α_s , and labor share, $(1-\alpha_s)$, are taken from the United States manufacturing sectors, where firms are assumed to operate in an environment of minimal distortions. Therefore, the shares of capital and labor of firms in the United States represent an efficient utilization of resources. Any deviations of the U.S. capital-labor shares suggest distortions.

Distortions represented by the output and capital wedges can be measured as follows:

$$1-\tau_{ysi} = \frac{\sigma}{\sigma-1} \frac{w_{si}L_{si}}{(1-\alpha_s)P_{si}Y_{si}} \quad (9)$$

$$1+\tau_{ksi} = \frac{\alpha_s}{1-\alpha_s} \frac{w_{si}L_{si}}{RK_{si}} \quad (10)$$

Firm i 's wage bill is represented by $w_{si}L_{si}$, and $P_{si}Y_{si}$ represents the firm's value added. Both values are taken from the census data. Rewriting equation (10) to equation (11) shows that the relative utilization of factors will be affected by distortions in the capital market and $\frac{1-\alpha_s}{\alpha_s}$, the labor-capital ratio in the less distorted (United States) environment.

$$(1+\tau_{ksi}) \frac{1-\alpha_s}{\alpha_s} = \frac{w_{si}L_{si}}{RK_{si}} \quad (11)$$

If firm i 's actual labor-capital ratio $\frac{w_{si}L_{si}}{RK_{si}}$ is higher than the less distorted labor-capital ratio, this implies that firm i may be facing difficulties in accessing capital (relative to hiring labor), and thus that firm i uses less than the optimal level of capital. In other words, firm i has a positive capital wedge τ_{ksi} .

Hsieh and Klenow (2009) show that without distortions, \mathbf{TFPR}_{si} is proportional to the product of the marginal revenue product of labor and capital:

$$\mathbf{TFPR}_{si} \propto (\mathbf{MRPK}_{si})^{\alpha_s} (\mathbf{MRPL}_{si})^{1-\alpha_s} \quad (12)$$

where \mathbf{MRPK}_{si} is the marginal revenue product of capital for firm i in sector s and \mathbf{MRPL}_{si} is the marginal revenue product of labor for firm i in sector s .

Rewriting equation (12):

$$\mathbf{TFPR}_{si} = \frac{\sigma}{\sigma-1} \left(\frac{R}{\alpha_s}\right)^\alpha \left(\frac{\omega}{1-\alpha_s}\right)^{1-\alpha_s} \frac{(1+\tau_{ksi})^\alpha}{1-\tau_{ysi}} \quad (13)$$

Equation (13) implies that in the absence of distortions (that is, $\tau_{ksi}=0$ and $\tau_{ysi}=0$), TFPR will be the same for all firms " i " within a sector " s ." Using this equation, we can deduce that a firm with higher τ_{ksi} and/or higher τ_{ysi} also has a higher TFPR.

The industry level $\overline{\mathbf{TFPR}}_s$ is:

$$\overline{\mathbf{TFPR}}_s = \left(\frac{\sigma}{\sigma-1} \frac{R}{\alpha_s \sum_{i=1}^M \left(\frac{1-\tau_{yi}}{1+\tau_{ki}}\right) \left(\frac{P_{si}Y_{si}}{P_{Yi}}\right)}\right)^\alpha \left(\frac{\omega}{1-\alpha_s \sum_{i=1}^M \left(\tau_{ysi}\right) \left(\frac{P_{si}Y_{si}}{P_{Yi}}\right)}\right) \quad (14)$$

When there are no distortions (that is, $\tau_{ksi}=0$ and $\tau_{ysi}=0$) for all i , the right-hand side of equation (14) equals the right-hand side of equation (13), which also means that TFPRs are equalized for all i .

Rewriting equation (14):]

$$\ln \mathbf{TFPR}_s = \frac{\sigma}{\sigma-1} \ln \left(\sum_{s=1}^M \mathbf{TFPQ}_{si}^{\sigma-1}\right) - \frac{\sigma}{2} \text{var}(\ln \mathbf{TFPR}_{si}) \quad (15)$$

where M is the number of s sectors, and distortions in allocation show up in the var (variance) of revenue productivity \mathbf{TFPR} across s firms, while \mathbf{TFPQ} is determined by technology.

The estimation of firm i 's productivity or \mathbf{TFPQ}_{si} exploits the market structure based on the CES aggregator. It takes the form:

$$\mathbf{A}_{si} = \frac{(P_{si}Y_{si})^{\frac{\sigma-1}{\sigma}}}{(L_{si})^{1-\alpha_s} K_{si}^{\alpha_s}} \quad (16)$$

The efficient industry's productivity level (when all marginal products are equalized) is:

$$\overline{\mathbf{A}}_{si} = \left(\sum_{i=1}^M \mathbf{A}_{si}^{\sigma-1}\right)^{\frac{\sigma}{\sigma-1}} \quad (17)$$

From equations (13), (14), (16), and (17), we can calculate the ratio of the actual TFP in the economy to the efficient level of TFP as:

$$\frac{Y}{Y_{\text{eff}}} = \prod_{s=1}^S \left[\sum_{i=1}^M \left(\frac{A_{si}}{\overline{A}_{si}} \frac{\overline{\mathbf{TFPR}}_s}{\mathbf{TFPR}_{si}}\right)^{\sigma-1} \right]^{\frac{\sigma}{\sigma-1}} \quad (18)$$

APPENDIX 4. MEASURING DISTORTIONS WITH MEASUREMENT ERRORS

This section provides a robustness check to the baseline Hsieh and Klenow framework. Hsieh and Klenow (2009) for the first time provided an empirical framework to estimate misallocation. The framework relies on a few key assumptions. The first key assumption is the use of CES aggregation of differentiated products in the same narrowly defined industry. This assumption of the market structure allows among other things the derivation of quantity productivity (TFPQ) in the absence of input and output quantity. In addition, firms in the same industry have constant mark-up. Thus, any variation of TFPR in this framework is attributable to resource misallocation. In practice, variation of TFPR in general could be due to variation of mark-up (reflecting changes in demand or quality), or measurement errors. Hsieh and Klenow (2009) is our working framework in this chapter because of two reasons. The first reason is we do not observe input nor output prices and quantity to estimate quantity productivity (TFPQ). The second reason is that since Hsieh and Klenow is so widely used, we could contrast our finding to those in other studies.

Bils, Klenow and Ruane (2017) propose a method that exploits the panel structure of the data to correct for potential measurement errors in revenue and inputs in the Hsieh and Klenow framework. Bils, Klenow and Ruane (2017)

argue that observed revenue (\hat{R}_i) and inputs (\hat{I}_i) could be subject to measurement errors:

$$\hat{I}_i = I_i + f_i$$

$$\hat{R}_i = R_i + g_i$$

where f_i and g_i are measurement errors, and R_i and I_i are true revenue and inputs. Note that they assume the measurement errors take the additive form.

The growth rate of observed TFPR will reflect the growth rate of measurement error as well as the growth rate of true distortions τ_i :

$$\Delta TFPR_i = \Delta \tau_i + \Delta \left(\frac{\hat{R}_i}{\hat{I}_i} \right) - \Delta \left(\frac{I_i}{R_i} \right)$$

Bils, Klenow and Ruane use the panel structure to estimate the true distortion τ_i .

In this section, we provide the estimation of potential productivity gains after we correct for measurement errors. Column 3 of Table A4 reveals that after the correction of measurement errors, the estimated misallocation (and hence potential productivity gains from eliminating misallocation) in the Philippines is lower.

Table A4. Potential productivity gains

	Potential productivity gains (Hsieh and Klenow, 2009)	Potential productivity gains (Bils, Klenow and Ruane, 2017)
2006	94.1	82.16
2008	139.51	71.19
2009	180.04	74.41
2010	145.78	71.14
2012	133.88	88.74
2013	99.48	59.81
2014	98.35	63.30

APPENDIX 5. COMPETITION IN SERVICE SECTORS AND ITS IMPACT ON DOWNSTREAM USERS: AN INTRODUCTORY ANALYSIS FOR THE PHILIPPINES

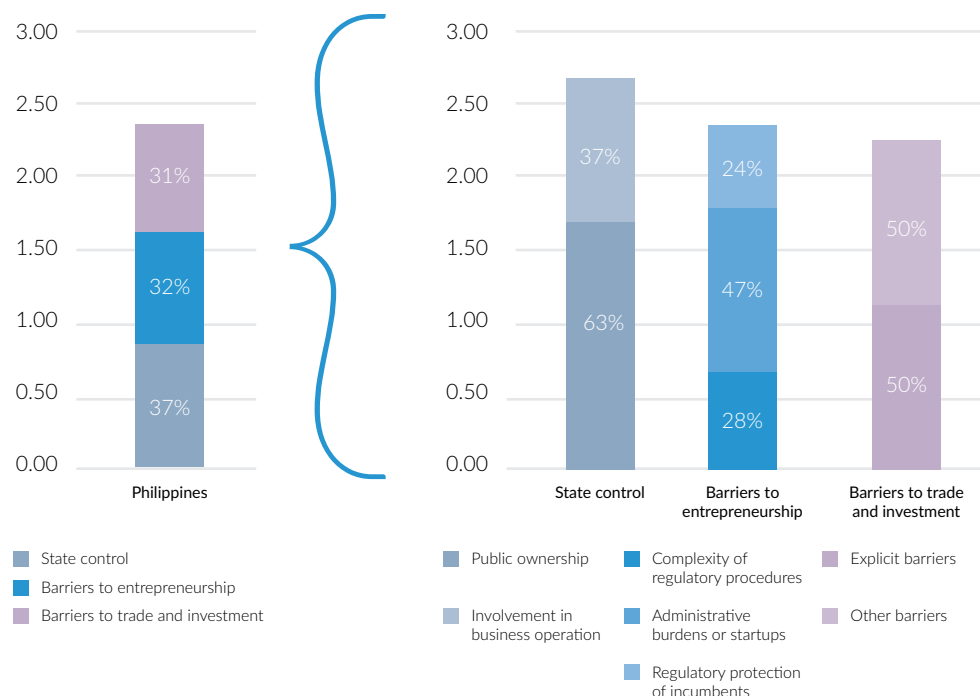
Focusing the analysis of competition-growth linkages within industry level tends to underestimate the total effect of competition as a driver of firm or aggregate productivity enhancement. This is because the overall incentives to improve productivity in a given sector are also affected by the level of competition in upstream sectors; those that sell intermediate inputs necessary to production. Conway and Nicoletti (2006) highlight that higher input prices raise the costs of entry for new firms in downstream sectors while influencing the cost structure of the incumbent firms, as well as the allocation of resources both within and across firms; all these factors affect the productivity of firms. Bourles et al (2013) highlight two main channels through which competition in upstream sectors can influence productivity performance of downstream users. Through the direct channel, fiercer competition in services can generate downstream productivity gains, as final good producers get access to cheaper/higher quality intermediate inputs. Through the indirect channel, stronger upstream competition can encourage downstream firms to reallocate the resources they saved (with lower price inputs) towards productivity-enhancing activities such as innovation, technology adoption, workers' training, and managerial practices. The same authors estimate the impact of intermediate goods market imperfections on downstream productivity for a panel of OECD countries and find evidence that anticompetitive regulation have curbed productivity growth, and more strongly so for observations that are close to the frontier.

The extent to which public policies promote or inhibit competition in several areas of product markets is captured by the economy-wide Product Market Regulation (PMR) indicator. This indicator is constructed through a bottom-up approach and encompasses three key components: state control, barriers to entrepreneurship and barriers to trade and investment. New available PMR data suggests that

significant regulatory restrictions might be limiting competition in key sectors of the Philippines economy. A decomposition of the economy-wide PMR score of the Philippines shows a similar influence from all three PMR sub-indicators (state control, barriers to entrepreneurship, and barriers to investment and trade) with a slightly heavier weight on state control restrictions. While state control (37 percent) in the Philippines contributes to restrictiveness more than barriers to entrepreneurship (32 percent) and barriers to trade and investment (31 percent). Overall, the three areas where product market regulation in the Philippines seems to create the most significant restrictions to competition are public ownership, administrative burdens to start up and barriers to trade and investment. (Figure A3)

The economy-wide PMR indicator is accompanied by a set of sectoral indicators in service sectors capturing the stringency of regulation in seven network sectors (electricity, gas, telecom, post and air, rail and road transports) – grouped in an indicator called ETCR – and professional services (legal, accounting, engineering and architecture services).⁷⁸

Drawing from these PMR sectoral indicators, the current note aims at shedding light on the status of competition in service sectors and its impacts on downstream users in the Philippines. It is structured in two main parts. The first part computes the regulatory impact indicator which is designed to capture the potential knock-on effects of anticompetitive regulations in key upstream sectors on downstream users and brings first insights between these effects and firm productivity distribution at sector level. The second part aims at quantifying the potential benefits of increased competition in services in the overall Philippine's economy.

Figure A3. Decomposition of PMR Score for the Philippines

Source: The Philippines Product Market Regulations (PMR) questionnaire.

Part 1. Computing the Regulatory Impact Indicator for the Philippines.

Drawing from the methodology presented in Egert and Wanner (2016) and using PMR data collected for Philippines in 2017, this section estimates the Regulatory Impact indicator. This indicator measures the trickle-down impacts of regulatory barriers to competition in non-manufacturing sectors on all Philippine's manufacturing industries through input-output linkages. It is worth clarifying here that the word impact in this case does not mean impact on performance of downstream users; it measures how important regulation in services is for other sectors of the economy.

The overall impact of these knock-on effects is a function of both the restrictiveness of regulations in key upstream non-manufacturing sectors and the extent to which the outputs of these sectors is used as inputs in other sectors. Following this approach, the Regulatory Impact indicator for Philippine's downstream sector k in 2017 is computed as follows:

$$\text{RegIMPACT}_{k,2017} = \sum_{j=1}^n \text{REGNMI}_{j,2017} \cdot w_{j,k}$$

where REGNMI is the degree of regulatory restrictiveness in the non-manufacturing sector j , $w_{j,k}$ denotes the total intermediate inputs of sector k from non-manufacturing sector j . The REGNMI indicators comprise the two sets of PMR sectoral indicators already detailed: the Energy, Transport and Communication Regulation (ETCR) indicators as well as the regulatory indicators for professional services. The input-output weights used for the Philippines is for 2012, the latest year available.

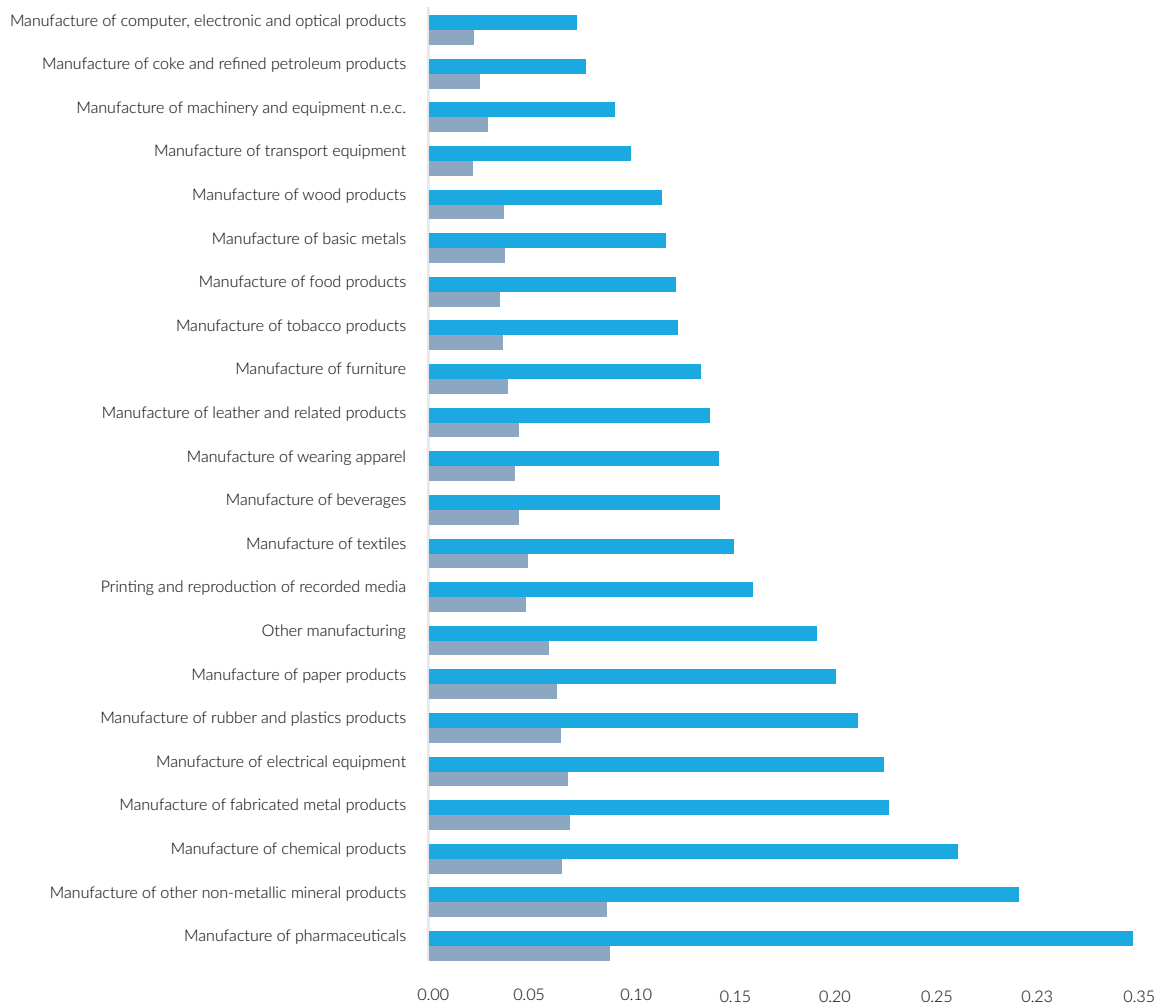
Figure A4 shows a comparison of two sets of REGIMPACT indicators: the narrow definition of the indicator – which includes only the ETCR – and the broader definition – which includes ETCR and professional services.

Two results are noteworthy. First, the broad based REGIMPACT indicator is usually much higher than the indicator using ETCR only, which reflects the importance of professional services as suppliers of intermediate inputs for manufacturing sectors. Second, the “broad” knock-on effect is the highest for Manufacturing of Pharmaceuticals, followed by Manufacture of other non-metallic mineral products and Manufacture of chemical products. At the other

extreme of the spectrum, the knock-on impact is the lowest in Manufacture of computer, electronic and optical products. Overall, the cross-sector variation is considerable: the incidence of anticompetitive regulation in energy, transport and communications and professional services is almost 5 times higher for Manufacture of pharmaceuticals when compared with Manufacture of computer, electronic and optical products.

In principle, these knock-on effects capture one channel through which the market environment affects decisions made by firms on resource allocation, and how such decisions affect the share of production and sales of each firm in the market, as well as their productivity performances. As already mentioned, by affecting input factor dynamics, regulation in service sectors can impact the aggregate productivity performance of a downstream sector by influencing both the entry cost in the sector-user as well as the cost structure of its existing firms.

Figure A4. Knock on effects of regulatory restrictiveness to competition in services across manufacturing users (using Philippines IO weights)



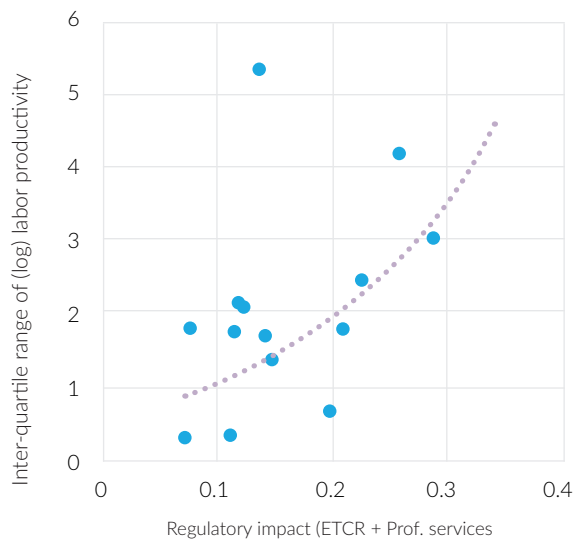
ETCR + Prof. Serv.

ETCR only

To assess how these knock-on effects, caused by anticompetitive regulations in service sectors, are associated with productivity performance in downstream sectors, the 2015/16 Philippines Enterprise Survey (ES) is employed and two statistical moments of the firm productivity distribution, for each manufacturing-downstream sector, are analyzed: dispersion and skewness. Firm-level productivity is defined as revenue per employee⁷⁹, while the dispersion

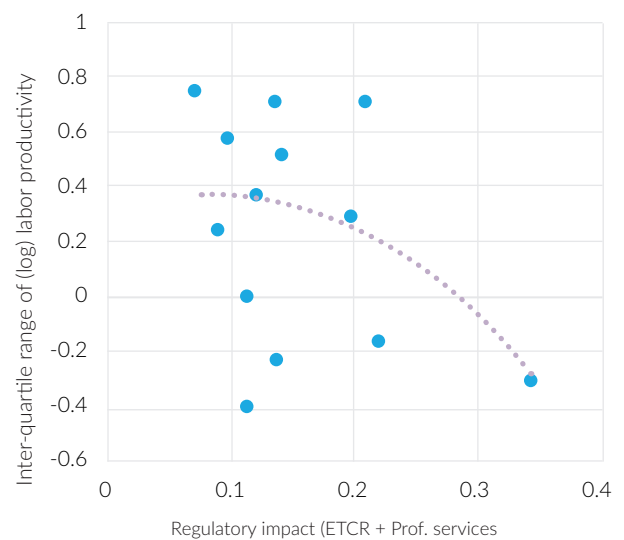
and skewness measures of the firm productivity distribution are computed for each manufacturing sector in the ES. Dispersion is measured by the inter-quartile range (defined as the difference between the 75th and 25th percentile) and provides information on how stretched (or squeezed) the productivity distribution is, while the skewness measures how symmetric the distribution is.

Figure A5. Knock-on effects of regulatory restrictiveness to competition in key services sectors and productivity dispersion of firms in downstream manufacturing sectors



Note: IQR estimations of labor productivity distribution at sector level are adjusted by ES sampling weights

Figure A6. Knock-on effects of regulatory restrictiveness to competition in key services sectors and productivity skewness of firms in downstream manufacturing sectors



Note: Skewness estimations of labor productivity distribution at sector level are adjusted by ES sampling weights

⁷⁹ Because the ES data does not contain firm (product and inputs) prices, the measure of productivity used reflects more a proxy of market performance than true physical efficiency. Therefore, differences in revenue labor productivity across firms will not exclusively reflect differences in firm’s technical efficiency but also differences in terms of the market structure in which firms operate and differences in relative prices paid for inputs.

Figure A5 plots, for each downstream (manufacturing) sector, the computed regulatory impact (on the x-axis) against the estimated dispersion of firm productivity distribution, adjusted by ES sampling weights. Only sectors with statistically significant estimated dispersions are plotted. Results suggest that downstream sectors where the incidence of anticompetitive regulations in services are higher have greater productivity dispersion. It is worth stressing however that this correlation does not necessarily imply causality. In fact, productivity dispersion is not determined only by policy distortions; the recent literature on the underlying causes of productivity dispersion stresses that policy distortions are not necessarily the only factor explaining productivity heterogeneity at firm level, even in narrowly defined sectors (see for instance, Foster et al (2016) and Brown et al (2016)). Other factors like differences in mark-ups, adjustment costs, and product and factor price distortions might be at play (De Loecker, 2011).

Figure 6 plots the same knock-on effects for each manufacturing sector against estimated skewness of firm productivity distribution. Again, skewness values are adjusted by ES sampling weights. A negative skewness value shows that the tail on the left side of the probability density function is longer than on the right-hand side, which suggests that a large proportion of firms with low productivity levels survive in the market, compared to the proportion of firms with high productivity. Results for Philippines suggest that higher knock-on effects of anticompetitive regulations in services on downstream sectors are associated with lower and negative skewness, which suggests that less efficient firms are surviving in these sectors. Again, this correlation result does not necessarily imply causality.

Overall, the results for the Philippines suggest that downstream manufacturing sectors for which the incidence of anticompetitive restrictions in services are higher tends to have productivity distributions that are more dispersed and skewed to the left, which can be taken as an indication of potential resource misallocation. This suggests that anticompetitive regulations in service sectors might be in fact acting as a form of friction that prevents instantaneous allocation of resources to the firm with the highest productivity in downstream sectors, therefore hampering productivity performance at firm level and at aggregate level.

Part 2. Quantifying the potential benefits of increased competition in services to the overall Philippine's economy

The analysis presented at World Bank (2017) suggests that just by concentrating on key reforms in service sectors, the Philippines could move from the fourth to the second quartile in terms of PMR overall restrictiveness among the countries in the data set. A simulation based on enhancing the regulatory environment in the service sector would imply lifting 86 restrictions mapped by the PMR indicators. In network industries, these would include limiting SOE presence (electricity generation, parcel and courier postal services, railways and water transport of freight and passengers and operation of road, railways and maritime infrastructure) and reducing barriers to entry (implementing vertical separation and regulating third party access in electricity, and requiring unbundling of the local loop in telecom); eliminating price regulation for domestic air transport; developing efficient pricing mechanisms in the telecom sector (regulating local loop unbundling prices and international wholesale/retail roaming rates); and eliminating FDI restrictions in utilities. In professional services, these would focus on enabling a more dynamic environment by allowing inter-professional cooperation as well as advertising; facilitating entry for domestic and foreign providers, reducing the number of exclusive tasks and eliminating price regulation.

In this scenario, a significant share of the restrictions to be lifted constitute rules that discriminate and protect vested interests as per the MCPAT effect-based categorization followed by rules that reinforce dominance or limit entry. From the 86 restrictions identified, 42% belong to the state control pillar, 29% to the barriers to entrepreneurship and the other 29% to the barriers of trade and investment. Taking into account the MCPAT classification, 42% of the lifted restrictions belong to the rules that discriminate and protect vested interest, 35%, to the rules that reinforce dominance or limit entry and 23%, to the rules that are conducive to collusive outcomes or increase costs to compete in the market.

Figure A7. Share of 86 identified restrictions according to MCPAT classification

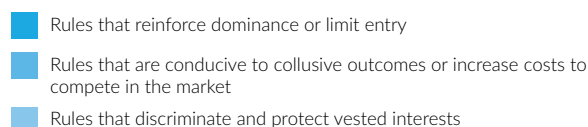
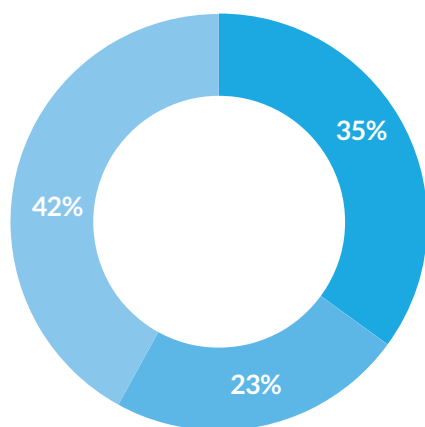
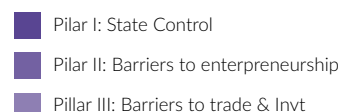
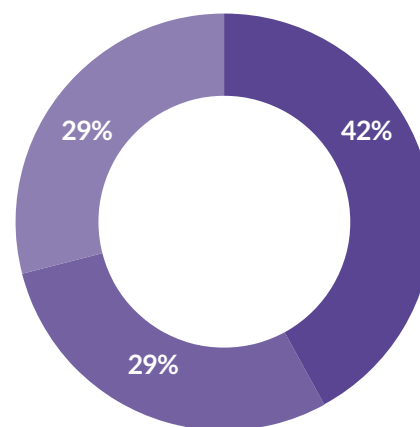


Figure A8. Share of 86 identified restrictions according to PMR classification

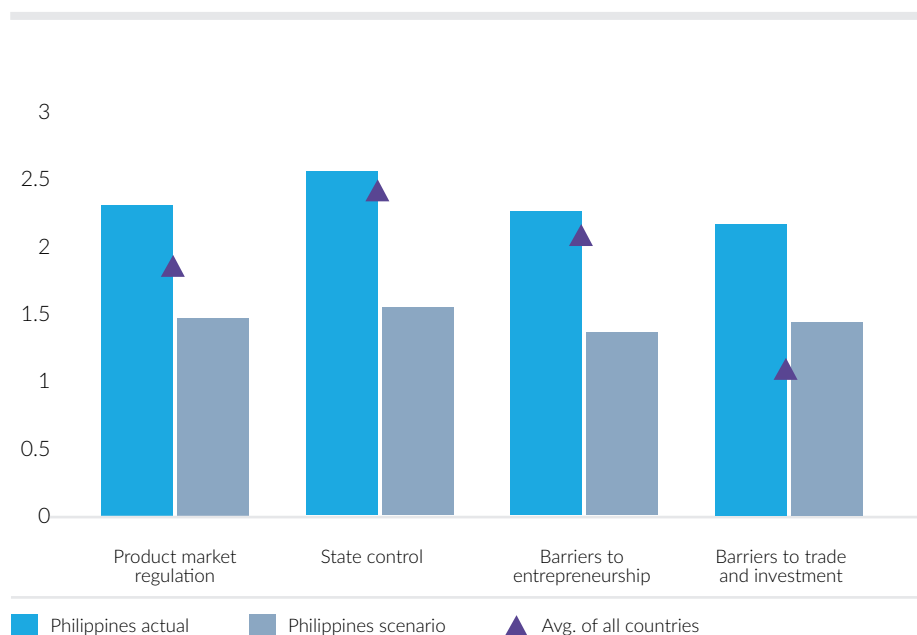


Source: OECD PMR database.

By implementing this set of reforms in the service sectors, the overall PMR score for the Philippines would be reduced by 37.24% with the higher advance within the barriers to trade and investment pillar. In fact, as shown in Figure A9, the score of barriers to entrepreneurship would be reduced by 39.42%, the state control score would be reduced by 39.03%, and the score of barriers to trade and investment would decline by 32.83%.

Lowering the PMR indicator along the lines of the above simulation could have a positive impact in the

growth of the overall economy. The literature suggests that a drop of 10% in the sector-wide PMR would imply an increase in total factor productivity by at least 1.3 percentage points (IMF et al., 2014). For maximum effectiveness of the reform process, it is important to address competitive restrictions in the economy as a whole as proposed in the above simulations. Concentrating on some specific areas (e.g. addressing trade barriers without tackling the level of direct state participation in the economy) would prevent the Philippines from obtaining the full benefits of the envisaged measures.

Figure A9. PMR score (pre- and post-reform)

Source: OECD-WBG PMR database.

The full effect of the suggested reforms could increase the Philippines' annual GDP growth rate by at least 0.2 percent (Table A5). Pro-competitive reforms in all the service sectors (energy, professional services, transportation, and telecommunications) could grow the country's annual GDP by 0.2 percent and add US\$0.6 billion to the annual GDP.

Table A5. Expected Impact of reforms of key sectors on GDP

Sector for reform	Effect of reform on growth in downstream industries with above average service intensity			
	Estimated impact on annual value added ^{1/}	Expected impact on GDP measured at market prices 2015 ^{2/}		Number of service intensive markets
		(bill. PHP)	(bill. USD)	
Across energy, professional services, transport, and telecommunications ^{3/}	0.20%	26.8	0.6	91

1/ Calculations based on the Input-Output (I-O) table 2006, which includes information on 240 specific markets. Impact calculations are the additional value added as percentage of the GDP at current local prices of 2006, generated by improvements in a specific sector.

2/ We assume the structure of the economy remain constant, meaning that the estimated impact of changes in selected sectors on GDP 2006 were the same in 2015. The official exchange rate of 45.5 PHP/USD is used.

3/ Following the results of Barone and Cingano (2011), the estimate assumes a multiplier effect of 0.75pp in downstream sectors which have above average intensity across all named service sectors due to reforms across these selected sectors.

Source: PSA (I-O table 2006), World Development Indicators, Barone and Cingano (2011)



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