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Outlook for the Philippine economy and agroindustry to 2030: The role of productivity growth

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The basic sectors of an economy are agriculture, industry, and services. Of these sectors, agriculture plays an important role in reducing poverty. This is because the said sector employs more than two in every three poor workers in the country today (Briones 2016). However, its labor productivity is lower relative to that of the other basic sectors. In 2016, for instance, its share in the gross domestic product (GDP) plunged to 8.8 percent although still employing as much as 29 percent of all workers. Clearly, a more inclusive set of policies is needed to secure the participation of agriculture-dependent households in the economy.

This *Policy Note* presents projections for the Philippine agriculture in the context of the growth of the economy and agroindustry. It highlights the productivity trends triggering the expected trajectory of economic growth of the country and the extent this growth depends on current policy priorities of the government.

The agriculture sector today

The growth in agriculture has significantly lagged behind that of the other basic sectors. Over the period of 2011–2016 alone, the average growth in agriculture was at merely 2 percent, while industry and services sectors grew at an average of 7 percent. This poor performance is worrisome in view of the rising food needs of a growing population, the precarious state of the country's natural resource base, and the adverse impacts of climate change (Thomas et al. 2015).

In the long run, economic growth ultimately depends on supply factors. Expansion of supply involves increases in primary inputs (labor and capital) and technological progress, as measured by the growth in the total factor productivity (TFP). Meanwhile, the labor supply depends on the population growth (labor force participation being constant), while capital accumulation

depends on the savings out of current income. On the other hand, growth in TFP depends on innovation, or the adoption of new technologies and systems, and closure of technical efficiency gaps. As a source of overall growth in the long run, this growth in TFP shows greater potential than the growth in factors of production.

However, the policy support, especially to agriculture, appears to be biased toward raising private returns to capital, rather than in boosting TFP. In 2012–2014, agricultural price support and input subsidy were estimated to be as large as 25 percent of the value of the agricultural production. Meanwhile, the general support for public goods, which is more closely associated with productivity enhancement, merely accounted for 4 percent (OECD 2017). In fact, the current budgetary priorities continue to emphasize input subsidies for credit, farm machinery, irrigation services, agricultural insurance, and seeds.

This study aims to implement an updated set of projections for the Philippine agriculture in the context of the growth of the economy and of agroindustry, based on direct and indirect impacts of TFP growth. The latter is applied differentially to agriculture, industry, and services. Projections are obtained from a computable general equilibrium model.

Table 1. Assumed productivity growth for the basic sectors, reference scenario

	2014	2015	2016	2017	2018–2030
Agricultural sectors	-2.00	-2.00	-2.75	2.75	1.00
Industry sectors	1.50	2.00	2.50	2.50	2.50
Service sectors	2.00	2.20	2.50	2.50	2.50

Note: From 2016 onward, resource-based sectors, namely C_AgriServ, C_Forest, and C_Captur, exhibit zero productivity growth across all scenarios.
Source: Author's model

Framing the scenarios

The scenarios to be analyzed are as follows:

- Reference. Identifies the productivity trends that will sustain the growth patterns observed since 2010, which reflect targets set in the current Philippine Development Plan (PDP)
- Productive agriculture. Refers to the same as reference scenario, except productivity in agriculture accelerates, to match that of industry and services
- Climate change. Refers to the same as reference scenario, except agricultural productivity remains flat owing to worsening impacts of climate change and other resource constraints
- Productive industry-services. Refers to the same as reference scenario, except productivity in industry and services accelerates by half a percentage point per year.

The assumptions for productivity growth for the remaining scenarios are shown in Table 1 and are aligned with estimates in the literature, namely, Feenstra et al. (2015) and Aba et al. (2016). The replication of the 2014–2016 data and expected trends in the reference case is also used to tune model parameters. The productivity growth in agriculture was negative in 2014–2016 owing to climate shocks, intensified by the El Niño of 2014–2015. Meanwhile, agriculture is expected to recover its productivity in 2017 to at least its 2015 level. However, trend growth in agricultural productivity is only 1 percent per year. Meanwhile, the productivity growth in industry and services accelerated from 2014 to 2016, after which it remains at trend to 2030.

The resulting sectoral gross value-added (GVA) growth rates for the reference scenario are shown in Table 2. The official data on the growth of GDP

Table 2. Growth rates of the basic sectors, official data and reference scenario (%)

	Official Data				Reference Scenario				Subsidy
	2014	2015	2016	2010–2016	2014	2015	2016	2017–2030	2017–2030
Agriculture	1.70	0.10	-1.30	1.00	1.90	0.20	-0.70	1.98	2.32
Industry	7.80	6.40	8.40	7.50	8.60	5.30	8.40	8.18	8.16
Services	6.00	6.90	7.40	6.70	5.50	7.60	6.90	6.73	6.73
GDP	6.10	6.10	6.90	6.30	6.10	6.10	6.60	6.91	6.90

GDP = gross domestic product
Source: Author's model

are closely replicated by the reference scenario. The expected growth of GDP over the period 2017–2030 is 6.91 percent, which continues the GDP growth of 2016; this exceeds the average for 2010–2016, and is within range of the government's target of 7–8 percent.

Official data on the growth of agriculture GVA are closely replicated by the reference scenario, except it understates the contraction of agriculture in 2016. Growth is about 2 percent annually; though pessimistic, the projection is above the six-year average for the basic sector. Productivity growth of about 1 percent annually translates to GDP increase of double that pace. Industry and services are somewhat replicated (with deviations below 1-percentage point); expected growth in industry GVA and services GVA is 8.2 percent and 6.7 percent, respectively. In contrast to agriculture, relatively modest productivity increases (less than 3%) drives a rapid pace of sector value added.

The reference scenario incorporates a zero subsidy. To test the growth implications of a subsidy on capital in agriculture, an alternative reference scenario is posited with a capital subsidy for agriculture equal to 5 percent off the cost of capital, except for rice, where the subsidy is increased to 10 percent (in view of self-sufficiency targets). The subsidy is applied from 2018 onward.

The resulting growth rates are shown in the last column of Table 3. The growth in agriculture accelerates moderately to 2.2 percent per year. Spending on subsidy begins at HP P47 billion in 2018, rising to PHP 50 billion in 2030. These figures are within the range of annual budget estimates of the Department of Agriculture for subsidized credit under the Duterte administration (Simeon 2017).

These expanded outlays slow down the rate of the capital formation, hence the other sectors suffer a mild growth slowdown. However, due to the far bigger share of these sectors in the economy, the overall GDP growth falls slightly. As expected, subsidies are of dubious value in terms of promoting growth and are set to zero in all of the scenarios.

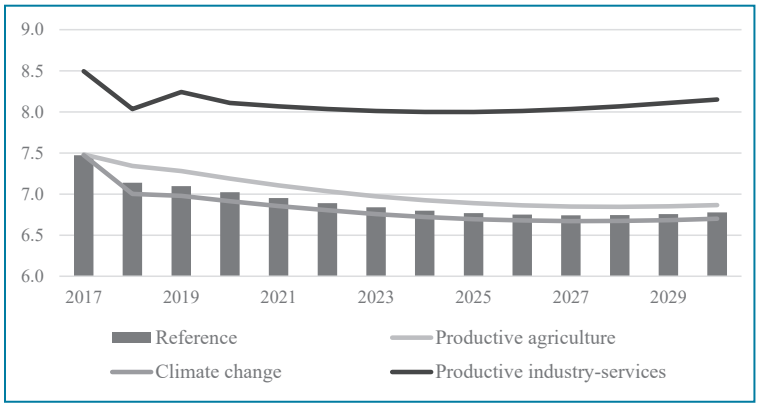
Under productive agriculture, the technical progress in agriculture is matched to that of industry-services. However, under climate change scenario, productivity growth is driven down to zero. Meanwhile, for productive industry-services, the technical progress in industry and services sectors is given a 0.5 percentage point boost.

Table 3. Assumed productivity growth rates for the AMPLE-CGE sectors, by scenario, 2017–2030 (%)

	Productive Agriculture	Climate Change	Productive Industry-Services
Agricultural sectors	2.5	0	1.0
Industry sectors	2.5	2.5	3.0
Service sectors	2.5	2.5	3.0

AMPLE = Agricultural Model for PoLicy Evaluation; CGE = computable general equilibrium
Source: Author's model

Figure 1. Scenarios for growth in GDP (%)



GDP = gross domestic product
Source: Author's model

Results

Economy-wide growth

Official growth targets are achievable under trend rates of GDP growth. Projections for GDP growth by scenario are shown in Figure 1. Given TFP growth rates posited in Table 3, the reference scenario finds a TFP growth of about 7.5 percent initially, slowing down slightly to 6.8 percent by 2030. This is somewhat below the 7–8 percent band, but well within the neighborhood of the official growth target.

Small increment in TFP growth for industry-services leads to large increment in GDP growth, contrasting with the impact of TFP growth in agriculture. The economy-wide growth trajectory is largely unaffected by TFP trends in agriculture, even by the climate change scenario. However, GDP growth is sharply elevated by faster TFP growth in industry-services, peaking at 8.5 percent in 2017 but maintaining an 8.0–8.5 percent band over the scenario horizon.

Agriculture

Overall growth in agriculture resembles the trend in agricultural TFP growth. Extrapolating from the TFP trends inferred from 2010 to 2016, the weak growth in agricultural GVA is attributable to low TFP growth. Hence, if trend in TFP growth continues, we may expect agricultural GVA growth to remain in the 1–2 percent growth range.

Faster TFP growth in industry and services has no significant impact on the growth trajectory of agriculture. Surprisingly, the changes in TFP growth trends in industry-services have no significant impact on trends for agricultural growth. In fact, the higher TFP growth in industry-services slightly decreases that of agricultural GVA (about 0.2 percentage point) due to reallocation of resources (labor and capital) from agriculture to industry-services (Figure 2).

Industry, service, and agroindustry

Industry will lead in growth performance, with service remaining at an average pace. Both sectors largely unaffected by changes in agricultural productivity. The growth of industry begins at an outstanding 9-percent clip in 2017 but tapering off to around 8-percent average pace in 2025 onward (Figure 3). Meanwhile, the growth of services begins at 7 percent and adjusts slightly down to 6.5 percent in 2030. The trends remain mostly unchanged whether an acceleration or deceleration of productivity growth occurs in agriculture.

Growth in industry-service GVA rises significantly with a small increment in productivity growth. With just a 0.5-percentage point addition in TFP growth, the growth of industry GVA rises sharply to 11 percent by 2019 and staying at above 9.5 percent by 2030 (Figure 4). Similarly, the growth of service GVA accelerates to nearly 8.5 percent, before falling off to about 7.5 percent by 2030.

Acceleration in agricultural TFP growth has a modest impact only on agriculture-related industry growth, compared to accelerated industry-service TFP growth. Under the reference scenario, the growth rate of agriculture-related industry GVA averages only 3.52 percent, far slower than the pace of overall industry growth. Beginning with over 6 percent growth in 2017, the industry cluster slows down to just about 3 percent-growth in 2019, slightly accelerating to 3.62 percent by 2030 (Figure 5). The share of agriculture-related industry in GDP is 8.6 percent in 2016, falling to merely 4.3 percent by 2030.

The faster productivity growth of agriculture likewise boosts the growth of the agriculture-related industry, stabilizing its growth pace at about 5 percent per year. On the other hand, the adverse climate change depresses agriculture-related industry growth down to about 2 percent. This study has noted no sharp change in trajectory with faster industry-service growth, compared to the reference scenario although the trajectories begin to diverge at around 2027 when growth rates under the productive industry-services scenario become noticeably faster.

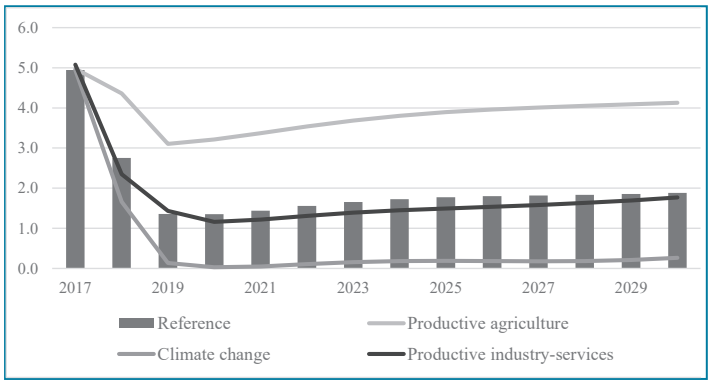
Conclusion

At the economy-wide level, the modeling exercise finds that sustaining productivity growth for industry-service, at recent trend rates, suffices to reach PDP growth targets. This holds despite weak TFP growth for agriculture, as the sector currently accounts for just under a tenth of GDP.

Meanwhile, varying the rate of TFP growth in agriculture impacts strongly on agriculture itself, but hardly affects growth prospects of the industry-services sectors. Conversely, the TFP growth in the latter sectors strongly impacts on the sectors themselves, as well as overall GDP, but not on agriculture. In short, the scenario analysis finds little support for strong indirect impacts.

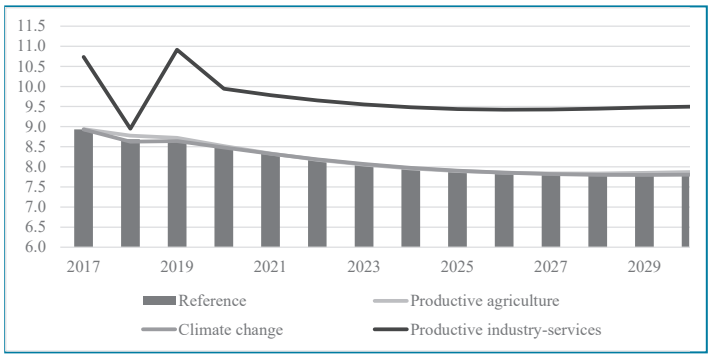
The analysis spotlights the necessity of boosting productivity growth, as opposed to devoting

Figure 2. Scenarios for growth in agricultural GVA (%)



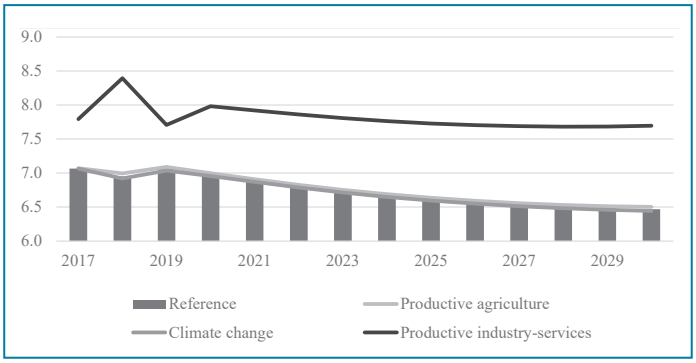
GVA = gross value added
Source: Author's model

Figure 3. Scenarios for growth in industry GVA (%)



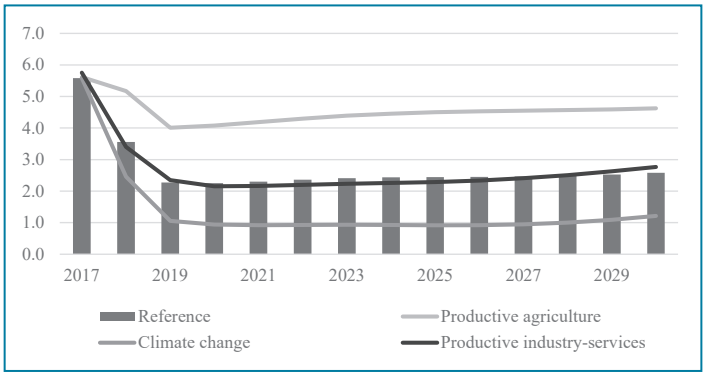
GVA = gross value added
Source: Author's model

Figure 4. Scenarios for growth in service GVA (%)



GVA = gross value added
Source: Author's model

Figure 5. Scenarios for growth in agriculture-related industry GVA (%)



GVA = gross value added
Source: Author's model

resources toward artificially increasing returns to investments, even in a key sector such as agriculture. While going into the specifics of TFP growth is beyond the scope of this paper, it may argue that the TFP is generally not increased by price support policies for agriculture, nor by subsidies on private goods, contrary to the current thrust of agricultural policy. Elements for accelerating TFP growth are instead: research and development, innovation, adoption of technology, improved practices and systems, public goods (e.g., transport infrastructure).

The value chain strategy aims at remedying the sparsity of forward and backward linkages between agriculture and other basic sectors. For as long as these subsidies for private goods are avoided, and more cost-effective mechanisms pursued, e.g., cluster-based approach, establishing agricultural value chains may yet be a viable strategy for inclusive growth.

References

Aba, P., D. Maglanoc, and E. Garoy. 2016. Measuring growth residual: Empirical evidence on total factor productivity test and Solow growth model. Paper presented at the 13th National Convention on Statistics, October 3–4, Mandaluyong City, Philippines.

Briones, R. 2016. Growing inclusive businesses in the Philippines: The role of government policies and programs. PIDS Discussion Paper No. 2016-06. Quezon City, Philippines: Philippine Institute for Development Studies.

Feenstra, R.C., R. Inklaar, and M.P. Timmer. 2015. The next generation of the Penn world table. *American Economic Review* 105(10):3150–3182.

Organisation for Economic Co-operation and Development (OECD). 2017. *Agricultural policies in the Philippines*. Paris, France: OECD Publishing.

Simeon, L.M. 2017. Farmers now get easy access to credit – DA. *The Philippine Star*. http://www.philstar.com/business/2017/06/25/1713306/farmers-now-get-easy-access-credit-da (accessed on October 1, 2017).

Thomas, T., A. Pradesha, and N. Perez. 2015. Agricultural growth and climate resilience in the Philippines: Subnational impacts of selected investment strategies and policies. Project Policy Note No. 2. Washington, D.C.: International Food Policy Research Institute.

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