Growth, Poverty, and Food Policy in the Philippines: Lessons for the Post-COVID-19 Era

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ABSTRACT

The Philippine economy's growth has accelerated since 2010, outperforming its Asian peers in the current decade. However, poverty reduction is comparatively weak in response to growth, suggesting that growth has been less inclusive than expected. Poverty in the Philippines is still largely a rural phenomenon despite the country's rapid urbanization. Our primary objective is to reexamine how much the national food policy has influenced the poverty-reducing effects of economic growth using the more recent national household-level data from 2000 to 2021. The longer-term data, including a period of mobility relaxation following long lockdowns upon the onset of the COVID-19 pandemic, allow us to revisit the growth-poverty conundrum in the Philippines. We focus on the more recent decade of relatively sustained growth compared to earlier studies on the subject. We use Engel food shares as a proxy for household welfare and consider the differential welfare effects of food price changes across segments of the population. We show that economic growth in recent years would have been strongly pro-poor if not for the misguided set of policy tools chosen to achieve the food self-sufficiency goal. The government's move to dismantle the quantitative restriction regime on rice imports in favor of tariffs is a step in the right direction.

Keywords: poverty reduction, food policy, Philippines
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INTRODUCTION

The onset of the COVID-19 pandemic and the government's measures to contain the disease abruptly halted the growth momentum of the Philippine economy in early 2020. The downturn was preceded by a remarkable period of comparatively rapid growth, averaging 6.3 percent a year in the 2010s. The pre-crisis growth for the decade placed the country among the fastest-growing economies in the world, resulting in unprecedented upgrades in its credit and investment ratings starting in 2013. Moreover, unlike in earlier decades of boom-bust growth (1980s–2000s), improvement in key macroeconomic fundamentals accompanied, for the most part, the growth during the first two decades of the current millennium (World Bank 2020).

However, during the growth episode, the response of poverty reduction to growth appears broadly and comparatively weak. Poverty has declined only slightly, suggesting that growth has been less inclusive than expected. In contrast, earlier studies point to the relatively robust response of poverty to growth by other Asian countries at comparatively similar stages of economic development (Balisacan and Fuwa 2004; Fuwa, Balisacan, and Bresciani 2015; Hill, Balisacan, and Dela Cruz 2022). These suggest that besides growth, other factors matter in poverty reduction.

We focus on the impact of food policy on households' poverty profiles during recent episodes of economic growth. Since food constitutes a high proportion of the consumption spending of low-income households, changes in food prices are expected to have differential effects on household welfare. Before 2020, food prices have risen faster than those for nonfood consumer goods. In particular, the upward pressure on the domestic price of rice, the country's staple, has been linked to the government's goal of national self-sufficiency, pursued mainly through quantitative restrictions (QRs) on rice imports. Earlier studies (Clarete 2000; David 2003; Roumasset 2000; Balisacan and Sebastian 2006; Tolentino 2002; Briones 2016; among others) show that this policy was costly to society, harming consumer welfare and promoting wasteful rent-seeking activities. In 2019, the government abolished the QRs, replacing them with a tariff of 35 percent on rice imports.

In this paper, we aim to reexamine the effect of the pursuit of a national food policy of self-sufficiency on poverty using the more recent national household-level data from 2000 to 2021. The longer-term data, including a period of mobility relaxation following long lockdowns upon the onset of the COVID-19 pandemic, allow us to revisit the growth-poverty conundrum in the Philippines. Our hypothesis is that the national food policy of self-sufficiency, which has recently undergone serious reform (Official Gazette of the Philippines 2019b; 2019a), has been crowding out the supposed positive effects of rapid growth on poverty reduction.

To this end, we examine the impact of food price changes on the pattern of poverty reduction during growth episodes. Using Engel food shares as a proxy for household welfare, we employ a simple simulation that allows us to generate differential welfare effects across types of households. Our primary questions of interest are: To what extent has food policy mattered in the evolution of poverty since 2000? What were the differential welfare effects of food policy? What is the way forward for rice policy?

Despite income growth, we show that the average share of food in total household expenditure has changed little from 2000 to 2018, thus confirming the narrative derived from the poverty and wage data trends.

STYLIZED FACTS AND REVIEW OF RELATED LITERATURE

Growth and Poverty Nexus

A broad consensus has long been established that growth is good for the poor (Balisacan and Fuwa 2004; Chen and Ravallion 2004; Demery and Squire 1996; Dollar, Kleineberg, and Kraay 2016; Dollar and Kraay 2002; Fields 1989; Nguyen

and Pham 2018; Ram 2007; Thorbecke 2013; Warr 2000; 2005). However, "that growth is good for the poor" is *ceteris paribus*, especially regarding initial conditions. Considerable differences in responses of poverty reduction to growth exist across countries, and the extent to which economic growth eases poverty largely depends on income inequality. Herein lies the debate on the causal direction of the issue of economic growth, poverty reduction, and income distribution (see the discussions in Mcknight 2019; Young 2019).

From the 1990s to the 2000s, the Philippine economy was characterized by slow growth and poverty reduction. Poverty in the country showed a low growth elasticity compared with its neighboring countries. The growth elasticity of poverty is computed by regressing the log of the headcount poverty index on the log of real per capita income. Using World Bank data, Fuji (2013) estimated the growth elasticity of poverty for the Philippines to be -1.85 in 1990–2000 and -1.27 in 2000–06, while that of Indonesia, Thailand, and Vietnam are -2.60, -5.15, and -2.13, respectively in 1990–2000 and -1.85, -4.55, and -3.04, respectively in 2000–06. Using subnational (provincial)-level data in the Philippines from 1988 to 1997, Balisacan and Fuwa (2004) obtained a comparable estimate of -1.63 for the Philippines. Notwithstanding some favorable initial conditions (e.g., the country's demographic "sweet spot" owing to its comparatively young population), the persistently high inequality accompanied by a spurt of growth rather than sustained growth appeared to explain the weak response of poverty to growth. Certainly, high-income inequality in the Philippines has not come from a vacuum. It is partly a colonial legacy and partly an outcome of institutions and policies preventing, hindering, or limiting the participation or access of the broad segments of the population to opportunities, including human capital formation and labor mobility.

While the growth from the 1980s to the 2000s had been slow, the Philippine economy has been one of the fastest-growing emerging economies in Asia in the past decade (see Table 1). The average growth of 6.3 percent in 2010–19 is the highest 10-year average since the mid-1970s. With the positive and sustained dynamism shown by the economy, poverty reduction is the expected outcome. However, during this period of high growth in the country, the growth elasticity of poverty in the Philippines is -0.29 relative to its peers in Southeast Asia and the broader region of Asia, with -0.72 and -0.85, respectively.[1] Wage data also behaved differently, indicating serious concerns about such outcomes and the sustainability of growth itself. From 1998–2018, real wages hardly changed even though average labor productivity increased (World Bank 2018). Absolute deprivation (poverty) remained high in 2015 at 6.7 and down to 2.7 in 2018.

Table 1. GDP growth rates in developing Asia

Area	1980s	1990s	2000s	2010s
ASEAN 5				
Indonesia	5.8	4.3	5.1	5.4
Malaysia	5.9	7.2	4.8	5.3
Philippines	**2.0**	**2.8**	**4.5**	**6.4**
Vietnam	4.5	7.4	6.6	6.3
Singapore[a]	7.8	7.2	5.4	4.9
South Asia				
India	5.7	5.8	6.3	6.7
Pakistan	6.9	4.0	4.5	4.0
Bangladesh	3.5	4.7	5.6	6.8
Thailand	7.3	5.2	4.3	3.6
China	9.7	10.0	10.4	7.7
Developing Asia[b]	7.5	7.9	8.8	7.2

Source of basic data: 1980–2019, World Development Indicators (WDI) of World Bank

[a]A developed country; [b]Developing Asia's (East Asia excluding high income) data include up to 2018 only (WDI).

To be sure, income-based measures of absolute deprivation, such as those based on the Philippines' official national poverty lines and the World Bank's international poverty lines for low-income countries, show significant poverty reduction in recent years of rapid economic growth. For example, based on the World Bank's

1 The growth elasticity of poverty is computed by regressing the log of the headcount poverty index on the log of real per capita income (constant 2018 USD) for 2010–19, using World Bank data.

international poverty line at PPP[2] USD 2.05 a day, Philippine poverty significantly declined to 5.6 percent in 2015 from 6.7 percent in 2012 and further down to 2.7 percent in 2018 (World Bank n.d.). Nonetheless, as noted above, the growth elasticity of poverty reduction was, on average, comparatively weaker in the Philippines than in other countries at broadly comparable levels of development. Moreover, the broad, albeit simple, household welfare measure employed in this paper suggests a less robust growth-poverty narrative. Evidently, there remains scope for enabling a stronger response of poverty reduction to growth.

Economic Growth and Food Consumption Patterns

A well-known stylized fact of development is that food as a share of household consumption expenditures tends to decline with per capita income. This pattern is robust in both cross-sectional and time-series household data and at local, regional, and global levels. In examining the driving forces behind this stylized development pattern, Anderson (1986) identified the fundamental role of household preferences—the universally increasing preference for nonfood relative to food purchases as per capita incomes rise.

Nevertheless, across countries, substantial variation exists in household responses to income changes, partly depending on demographic composition and the initial income level. Demand for staples—rice in the Philippines and many countries of Asia and Africa—tends to shift less in response to income changes than the demand for other food commodities like meat and fruit. However, at some point in the development process, food share eventually falls with income, even as demand for food variety increases. This has been documented in the case of China (Huang, Yang, and Rozelle 2010) and other recent studies (Hasan 2016; Sabirova and Khasanova 2015; Tian, Yu, and Klasen 2018).

Interestingly, food consumption patterns in the Philippines appear not to conform to these stylized patterns, at least based on recent data (Balisacan 1994; Ravago, Balisacan, and Sombilla 2018). At best, the evidence from cross-sectional and time-series data is mixed. Despite the significant increase in GDP since 2000, food as a share of household spending decreased only marginally between 2000 and 2021, ranging from 53 to 48 percent (Table 2). The three-year average household expenditure growth has also stagnated, hovering around -12.0 to 2.8 percent.

2 Purchasing power parities (PPPs) are the rates of currency conversion that try to equalize the purchasing power of different currencies, by eliminating the differences in price levels between countries (https://www.oecd.org/en/data/indicators/purchasing-power-parities-ppp.html).

Table 2. Economic growth and households' expenditure

Category	2000	2003	2006	2009	2012	2015	2018	2021
Mean food expenditure share (%)	53.2	51.40	49.80	50.80	51.20	49.30	49.14	48.10
3-year growth (%)		-1.80	-1.60	1.00	0.40	-1.90	-0.16	-1.04
Mean household real expenditure (PHP) 2018 = 100	2,349	2,224	2,246	2,308	2,258	2,355	2,386	2,100
3-year growth (%)		-5.32	0.99	2.76	-2.17	4.30	1.32	-11.99
3-year real GDP growth (%)		12.30	17.80	12.80	19.20	20.70	21.80	2.10

Source of basic data: FIES (PSA various years)
Notes: Authors' calculation
The country's GDP contracted by 9.5 percent in 2020, the worst economic performance since 1945.

Table 3. Three-year change in consumer price index (%)

	2000	2003	2006	2009	2012	2015	2018	2021
Food	16.80	6.73	18.59	24.50	12.36	10.50	11.85	8.95
Nonfood	27.90	12.55	17.50	12.32	12.01	5.26	8.45	8.94

Source of basic data: Consumer Price Index, PSA OpenSTAT Database (PSA 2006)
Note: Percent change in CPI is computed between three years shown, e.g., value for 2006 is CPI percent change between 2003 and 2006.

What could explain this conundrum? At least two arguably fundamental factors could be involved (Ravago, Balisacan, and Sombilla 2018). First, economic growth during the period was accompanied by comparatively high-income inequality, making growth highly exclusive. As noted earlier, household consumption pattern varies systematically with household income. High-income inequality heightens the contrast, with the consumption patterns of the very rich differing widely from those of the poor and near-poor, who comprise most of the population. Second, food prices increase more rapidly relative to those of other consumer goods. Changes in food prices relative to other consumer goods could further explain the marginal changes in food expenditure accompanying increases in per capita GDP. Consumer food prices have risen faster than nonfood prices in recent years, especially after 2007 (Table 3). The ramifications of high food prices on the incidence of poverty are especially notable in 2009 and 2015; for these periods, food inflation was recorded at almost twice the inflation recorded by nonfood items.

The National Food Policy

As indicated in the various Philippine development plans since the 1970s, the country's national food policy has the multifaceted—albeit conflicting—goals of protecting poor consumers from high prices, increasing the price incentives for small farmers, achieving food security, and raising productivity to enhance farming's contribution to economic growth and development. In practice, the policy has focused largely on rice and involved buying *palay* from producers at high (above-market) prices and selling rice to consumers, especially in urban areas, at low (below-market) prices. The other goal of the policy is to achieve national self-sufficiency in rice. This goal has its roots in the early 1970s in the wake of global food production shortfalls, which precipitated high world rice prices. The combination of the availability of high-yielding rice varieties ushered by the Green Revolution, long-term declines in global fertilizer prices, substantial investment in irrigation development, and generous credit subsidies made it possible for the country to achieve its self-sufficiency goal in the mid-1970s. The country even became a marginal rice exporter toward the end of the 1970s up until the early 1980s (Balisacan and Ravago 2003). Production growth significantly slowed in the 1980s, falling short of the requirements of the country's rapidly rising population. Self-sufficiency has remained elusive to this day.

Before the rice trade reform in 2019, the National Food Authority (NFA), an attached agency of the Department of Agriculture, was either empowered to monopolize rice importation or to implement a QR regime for rice imports when the private sector was allowed to import. NFA also regulated domestic rice trade and was provided with subsidy outlays by the national government for its "buy high, sell low" operations. The national self-sufficiency policy put pressure on the NFA to restrict the volume of imports, driving domestic rice prices above their comparable border prices, and the gap widened over time. NFA used this higher level of domestic prices as the basis for its "sell low" prices for consumers.

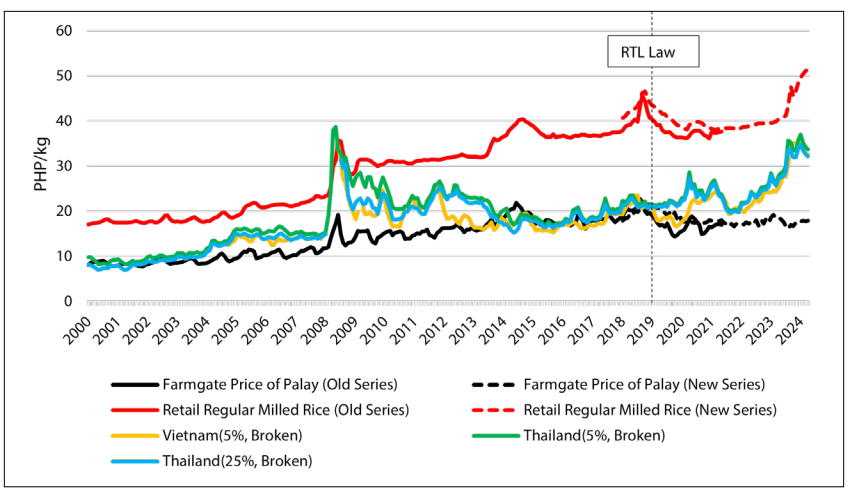
This practice persisted even when the country acceded to the World Trade Organization (WTO) in 1995. The Philippines had committed to opening its agricultural trade by abandoning QRs and converting them into equivalent tariff protection. However, the accompanying domestic

law specifically exempted rice from tariffication. The WTO granted the country "special treatment" on rice from 1995 to 2005, thus keeping the policy on rice in its status quo under NFA. Citing local producers' lack of readiness to compete globally, the Philippines requested an extension up to 2012, when yet another extension was applied for and approved as a waiver until 2017. Moreover, in each negotiation round, the country had to make some concessions to obtain agreement from the other member countries (details of these concessions are discussed in Briones 2019b).

Clearly, the national food policy and the ensuing practices of NFA resulted in two consumer prices, the higher actual domestic prices and the relatively "lower" NFA prices. However, the "buy high, sell low" rhetoric was merely a "rope-a-dope" strategy meant to be symbolic due to its popular appeal. This shadowboxing tactic could not persist. On one hand, the professed policy of "sell low to the poor" actually had little consequence on the poor's welfare because NFA rice accounts for only about 11 percent of their rice purchases (owing partly to high subsidy leakage to the nonpoor). On the other hand, the "buy high from farmers" policy also had little impact on poor farmers since total NFA purchases are too small (averaging only 5%–7% of total production) and due to the high leakage of the price-support subsidy to large farmers and likely traders as well.

In the 1990s leading to the 2000s, there were numerous studies recommending sector reforms (Clarete 2000; David 2003; Roumasset 2000; Tolentino 2002; Balisacan and Sebastian 2006; David, Intal, and Balisacan 2009). The policy regime—a near monopoly of NFA on rice trade, high import tariffs, and QR on rice imports—had resulted in inadequate supplies and kept domestic prices artificially high above comparable world (border) prices by 50–100 percent (Clarete 2015; World Bank 2015). As a result, Filipinos pay much more for their staple than their counterparts in other Southeast Asian countries (Figure 1). Even rice farmers have mostly not benefited from the NFA support price since they do not produce a marketable surplus. But even when they had a marketable surplus, the more influential large farmers tended to capture the benefit from the

Figure 1. Trends of rice prices in domestic and world markets



Source of basic data: World prices are from World Bank Commodities Price Data (The Pink Sheet); domestic retail and farm gate *palay* prices are from Philippine Statistics Authority (PSA).

Notes: *Palay* is an unmilled rice grain; 25% broken rice is a standard grade of rice, where grains are broken during milling. The 2008 spike was due to the global food crisis. World prices were converted from USD per ton using Bangko Sentral ng Pilipinas monthly exchange rates. Old series is based on the retail price survey of selected agricultural commodities, which was discontinued in February 2021. The new series is based on the retail price survey, which is used in the computation for the monthly consumer price index.

NFA procurement, representing only a small part of total rice production. In any case, the "buy high, sell low" policy cum QR on rice imports approach to pursuing rice self-sufficiency proved to be a costly way of providing income transfers to the poor and securing the availability of rice at the national level (Briones, 2016; Cororaton and Yu 2019). For every PHP 1.00 given to the poor, the government spent about PHP 2.00 (Roumasset 2000). For every USD 1.00 saved for not importing rice, the country used domestic resources worth USD 2.60 to save that dollar by producing the rice locally.

Filipinos have not enjoyed the benefits of falling world rice prices since 2010, as domestic prices remained effectively high during this period. As previously mentioned, the high food prices and their implications for poverty were especially notable in 2013 and 2015. Largely because of NFA's posture to restrict imports tightly despite dwindling rice inventory, domestic rice prices rose sharply by as high as 15 percent in the second half of 2013 (Figure 1).

High rice prices have effectively reduced the purchasing power of the incomes of Filipinos, particularly the poor, whose rice expenditure accounts for about 20 percent of their total household expenditures (Ravago, Balisacan, and Sombilla 2018). This means that to meet their staple requirement, the poor would have to cut down on other consumption, such as education and health care. Malnutrition could set in for the poor whose limited food budgets were almost entirely used up by the costly rice staple, thus leaving little or nothing to purchase vegetables and protein-rich foods needed for good nutrition. Despite its comparatively remarkable economic growth in recent years, the Philippines is also one of the few Asian countries that has failed to achieve the Millennium Development Goal on halving poverty by 2015.

There had been attempts to reform the country's food policy, particularly in the grain sector. In 2000, the Philippines obtained the Grain Sector Development Program loans from the Asian Development Bank to address the policy, institutional, and investment constraints hampering productivity, food security, and poverty alleviation. The design and formulation of the loan took 10 years, and the final form was consistent with the then newly passed law on agriculture modernization in 1997. However, political economy forces took precedence (Tolentino 2002), and by 2004, it was clear that legislation reforms to replace rice QR with tariffs and the restructuring of NFA would take a backseat. In 2008, another rice crisis struck Asia. Calls for rice self-sufficiency echoed through the chambers of congress amidst the crisis. Given this recent experience, the newly installed government administration in 2010 further articulated the rice self-sufficiency policy. In 2010, the new leadership at the Department of Agriculture aimed for zero imports by 2013, then made an adjustment and targeted 2016 instead (Clarete 2018). This target has never been achieved.

The resurgence of high food prices, particularly rice prices, made the government miss its inflation target for 2018. This alarmed the monetary and fiscal authorities as high inflation seriously threatened macroeconomic stability. Renewed concern about artificial rice shortages brought about by the restricted rice importation regime and the alleged "prevalence of corruption and cartel domination" in the rice industry sparked an unprecedented move by the government. In February 2019, through Republic Act 11203, the government dismantled the QR regime on rice imports and established a tariff system for rice importation. Proponents and development scholars considered this development a major "game changer" for the country's food economy.

The law set the tariffs at 35 percent for imports from ASEAN[3] countries, 40 percent from non-ASEAN countries if imports are below 350,000 MT, and 180 percent if imports are from non-ASEAN countries and above 350,000 MT. It also substantially reduced NFA's functions, limiting it only to the procurement and management of buffer stock for emergency purposes. The agency would no longer control the licensing of importers and traders. Moreover, the law provided for the

3 Association of Southeast Asian Nations

allocation of PHP 10 billion annually for the Rice Competitiveness Enhancement Fund (RCEF), a facility for enhancing farm productivity and competitiveness by providing seed, mechanization, credit, and extension services.

In the next section, we present the conceptual framework for assessing the impact of the food policy before 2019 on household welfare and poverty.

CONCEPTUAL FRAMEWORK

In section 2, we discussed how the "misguided" self-sufficiency policy of the national government had resulted in higher food prices. We now examine the effect of changes in food prices on the welfare of various population segments. To this end, we need a measure of welfare that respects the differences in family size and the scale economies in the production and consumption of goods and services. Typically, in poverty assessment, especially in developing countries, household income and expenditure are proxy measures for household welfare. A household is deemed poor if its total expenditure or income is less than the predetermined poverty line or threshold. In the case of the Philippines, the poverty threshold is defined as the minimum income requirement one person needs to cover basic food and nonfood items.

However, using income measures is likely to misrepresent household welfare because it ignores family size, composition, and scale economies. The per capita income measure is an improvement, but it overrepresents large households, a characteristic of poor households in many developing countries. Thus, it may overestimate aggregate poverty (Balisacan 1992).

For our analysis, we employ food share in the family budget as a proxy measure of household welfare. In particular, we exploit the well-known Engel food share equation linking food share and welfare level for households with different demographic characteristics while taking into account relative prices and fixed effects. The proposition is based on two empirical regularities. First, higher income or expenditure is associated with lower food share for households with the same demographic characteristics. Second, more children are associated with higher food share for households with the same income.

Following Deaton and Muellbauer (1980), the Engel cost function of household h with demographic characteristics x^h is

$$c(u^h, p^h, x^h) = \mu(x^h)\phi(u^h, p^h) \quad (1)$$

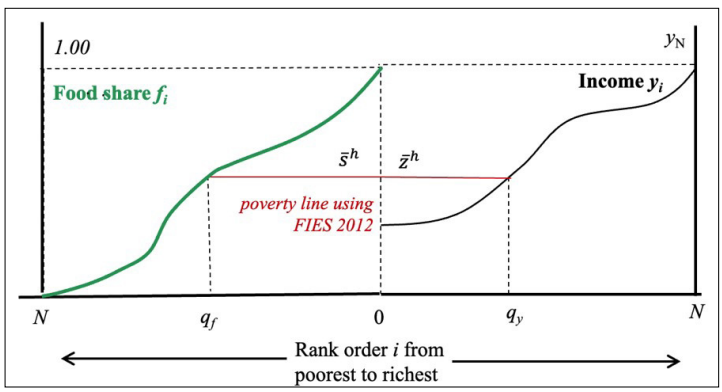
where $\mu(x^h)$ is the number of adult equivalents of household h and $\phi(u,p)$ is the per capita cost function, which is that for the reference household $[\mu(x^h) = 1]$. Simply put, the cost function of any household h with demographic characteristics x^h is just the reference household's expenditure function adjusted by the number of adults in the households.

Taking the log form and differentiating it with respect to the price of food (p_f), we obtain the Engel food share equation:

$$s_f^h = \frac{\partial lnc(u^h,p^h,x^h)}{\partial lnp_f} = \frac{\partial[ln\mu(x^h)+ln\phi(u^h,p^h)]}{\partial lnp_f} \quad (2)$$

$$s_f^h = \frac{\partial ln\phi(u^h,p^h)}{\partial lnp_f} = w(u^h,p^h) \quad (3)$$

Figure 2. Food-share-based poverty line



Moreover, assuming prices are constant, food share is directly related with household utility, thus making it a good indicator of household welfare (w). Conceptually, this "Engel value" is a reasonable approximation of household welfare, with rising food shares indicating deterioration of welfare (Deaton 1986).

Using the national Engel shares as a proxy for household welfare, we construct a poverty line based on the food share expenditures of the poor, identified based on income. Figure 2 illustrates the idea. The right panel is a typical illustration of measuring poverty, where $\bar{z}^h$ is the per capita income poverty threshold or the minimally acceptable level of per capita household income. The poverty line touches the income y-schedule at person index q_y. This shows that q_y of the N individuals in the population are poor, and N-q_y are nonpoor.

Extending the line $\bar{z}^h$ over the left panel, we have $\bar{s}^h$ or the food share poverty threshold. This is the minimally acceptable share of food on the household's budget. In an analogous manner, the food share poverty line touches the food share f-schedule at person index q_f. This shows that q_f of the N people in the population are poor, and N-q_f are nonpoor. We then simulate changes in food prices and their effect on household expenditure to understand better the long-term effects of the country's national food policy.

DATA AND EMPIRICAL METHODS

Poverty Incidence Based on the National Engel Share

To calculate the incidence of poverty based on the national Engel share, we start, for reference, with the national per capita income poverty threshold to identify households on the brink of poverty. We define "households on the brink of poverty" as those whose income is one percent below and above the income poverty threshold. The average share of food expenditure of these households then becomes our corresponding food-share poverty threshold; that is, $s^h \geq \bar{s}^h$, which we will hold fixed for the period covered by the analysis.

Once the threshold is identified, we compute the incidence of poverty (P_f) based on food share. This is given by:

(4)

$$P_f = \frac{N_f^P}{N}$$

where N is the household population and N_f^P is the number of poor households whose food share expenditure is greater than or equal to the food-share poverty threshold, that is, $s^h \geq \bar{s}^h$.

Changes in Households Real Expenditure Due to Price Change

Since our goal is to examine the differential welfare effects of food price changes across population segments, we calculate changes in household real expenditure under varying scenarios of price changes. We compare the actual real expenditure with three counterfactual scenarios across income deciles of households. The consumer price index (CPI) is an indicator of the change in the average prices of a fixed basket of goods and services commonly purchased by households relative to a base year. Using the CPI, we simulate three counterfactual scenarios of changes in households' real expenditure arising from price changes. The first counterfactual assumes there are no increases in food prices. The second uses the decile-specific share of food and nonfood expenditure as weights. The purpose is to adjust the deflator using the Engel food share. The third counterfactual scenario assumes the same decile-specific share as weights but assumes that food prices are fixed.

The following equations give the actual and counterfactual scenarios:

Real expenditure: (6)

$$Exp_i^R = \frac{Exp_i^N}{CPI_t}, \quad i = 1, \ldots, 10; t = year$$

Actual: (6.1)

$$CPI_t^{Actual} = \alpha CPI_t^F + (1-\alpha)CPI_t^N$$

Counterfactual 1: (6.2)

$$CPI_t^{C1} = \alpha \overline{CPI_t^F} + (1-\alpha)CPI_t^N$$

Counterfactual 2: (6.3)

$$CPI_t^{C2} = \beta_{it} CPI_t^F + (1-\beta_{it})CPI_t^N$$

Counterfactual 3: (6.4)

$$CPI_t^{C3} = \beta_{it} \overline{CPI_t^F} + (1-\beta_{it})CPI_t^N$$

Equation (6) is the real expenditure for each decile i, computed as the total household current expenditure deflated by the consumer price index (CPI_t). The households' consumption patterns are determined by assigning weights to the commodity groups/subgroups that reflect how households allocate resources to meet their needs (PSA 2006). The weight is a value attached to a commodity or group of commodities to show the relative importance of that commodity or group of commodities in the market basket. For our purposes, we take the broadly defined basket of goods for food and nonfood, where α is the weight assigned for the food basket in Equation (6.1). The CPI for food and nonfood is denoted by CPI_t^F and CPI_t^N, respectively. Thus, to get the actual real expenditure, we substitute Equation (6.1) to Equation (6).

We substitute Equation (6.2) to Equation (6) to get the real expenditure for the first counterfactual scenario. The CPI_t^{C1} uses the same weights as in Equation (6.1) but assumes there are no increases in food prices, i.e., $\overline{CPI_t^F} = \overline{CPI_{2000}^F} = 45.70$.

Equation (6.3) is substituted to Equation (6) to get the real expenditure for the second counterfactual scenario. The CPI_t^{C2} uses the decile-specific share of food expenditure as weights for food (β_{it}) and nonfood ($1 - \beta_{it}$). The purpose is to adjust the deflator using the Engel food share. Lastly, Equation (6.4) is substituted to Equation (6) to get the real expenditure for the third counterfactual scenario, with the same weights as Equation (6.3) but again assumes that food prices are fixed.

Data

We use the Family Income and Expenditure Survey (FIES), a nationwide survey of households conducted every three years by the Philippine Statistics Authority. Specifically, we used the dataset for the years from 2000 to 2021. The dataset from 2003–15 used the same master sample based on the 2000 Census of Population and Housing (PSA 2003) with 17 administrative regions as the analysis domain. The sample size ranges from 38,000 to 42,000 households. While it used the same master sample, each data set is only a cross-section because only a part of the master sample is kept for the succeeding survey years. The 2018 and 2021 FIES adopted the 2013 Master Sample Design based on the 2015 Census of Population. The sample size is larger, with approximately 180,000 sample households.

The FIES is the primary data source for two broad indicators of household welfare: current income and current consumption expenditures. The Philippine government uses current income in its poverty estimates primarily because it is simple, transparent, and easily understood by the wider public.

In our estimation, we applied sampling weights to adjust for disproportionate sampling and nonresponse in the FIES dataset. This ensures that our estimates of the total number of households and population are consistent with the PSA's "high assumption" population projection. Appendix Table 2a supplies the summary statistics of the key variables used from the FIES.

RESULTS AND DISCUSSION

Food Share and Income-Based Poverty Incidence

Using the 2012 FIES as a reference year, we use the national per capita income poverty threshold, $\bar{Z}^h$ = PHP 18,935 (PSA 2016), to identify households on the brink of poverty. These households have incomes one percent below and above the income poverty threshold (see Figure

Figure 3. Reference households for the food-share poverty line

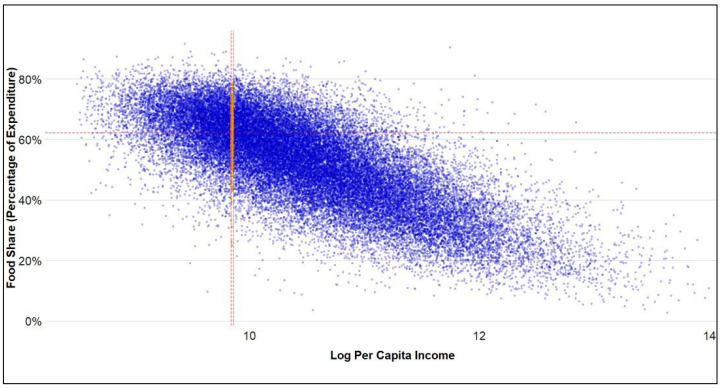
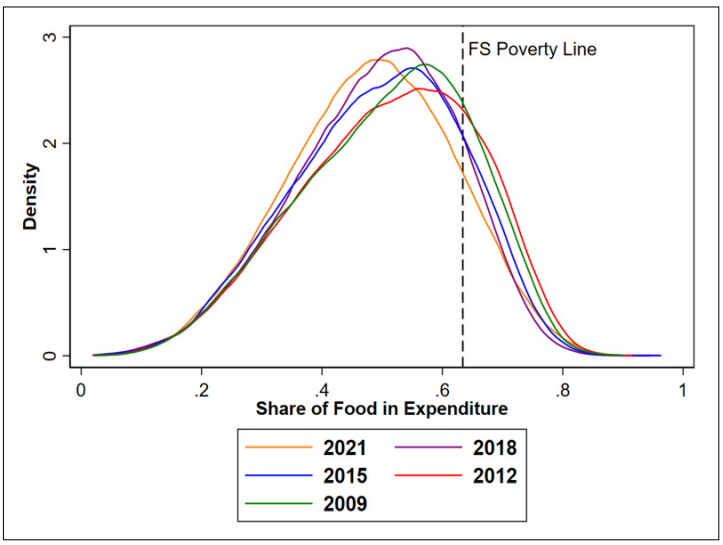


Figure 4. Food share poverty incidence



3). The mean food expenditure share of these households becomes our basis of the food-share poverty line, i.e., $\bar{S}^h = 0.62$.

The choice of reference year is arbitrary so long as the same food-share poverty line is used across years for comparability. We broadly defined food expenditure share using the FIES to include expenditure on food and beverage (both alcoholic and nonalcoholic). The poor households based on this measure are then identified as those having a food expenditure share greater than or equal to 62.2 percent. As noted earlier, income measures of poverty are unable to measure the welfare impacts of economies of scale in household consumption, as well as the ability of households to smoothen consumption over time. Following Meyer and Sullivan (2012), we compare the characteristics of households that would only be included as poor by the food share measure versus those that would only be classified as poor by the income measure, while holding poverty rates constant at 20 percent for the reference year. The full comparison table is available in Appendix Table 1. The families categorized as poor exclusively by the food share measure seem to include more financially vulnerable households. These are households that are less likely to have electricity, have roofs that are less likely to be made of strong materials and more

likely to be made of light or mixed components, are less likely to be connected to the community water system but are more likely to have dug wells as main water sources, and are less likely to own appliances such as televisions, cellphones, motorcycles, and stoves.

Figure 4 presents a picture of the evolution of poverty incidence across years based on food expenditure share using kernel density estimation. The food-share poverty line is drawn with a straight dashed line. The area to the right of this poverty line and under the curve represents the poor segments of the population. In the picture, 2012 has the highest poverty incidence, while 2021 has the lowest poverty incidence.

However, Figure 4 highlights a possible issue with intertemporal comparisons of poverty incidence using food shares. Almost all poverty lines cross at least twice, meaning a given year may exhibit an increase or decrease in poverty incidence depending on where poverty lines are drawn. The poverty distributions fail the first-order test of dominance (Davidson and Duclos 2000). Intertemporal poverty rankings would be contingent upon the delineation of poverty thresholds.

Differential Effects of Food Prices on Households' Welfare

Our primary interest is the extent to which food policy matters in the evolution of poverty. Given the limitations of comparing intertemporal poverty incidence, we examine the differential effects of food prices on the welfare of the various population segments. We implemented Equation (6) using the total household current expenditure from FIES. Equation (6.1) is the deflator used to obtain the real expenditure using the national CPI (BSP 2019; PSA 2006). The weight $\alpha = 37.7$ is the weight assigned for the food and beverage basket in the reference year 2018. This is the actual real expenditure with which we compare our three counterfactuals. CPI_t^{C1} is the Counterfactual 1 CPI from Equation (6.2), which used same weight $\alpha = 37.7$ for food and beverage but assumes there are no increases in food prices, i.e., $\overline{CPI_t^F} = \overline{CPI_{2000}^F} = 45.70$ for all FIES years. CPI_t^{C2} is the Counterfactual 2 CPI from Equation 6.3, which uses the decile-specific food expenditure shares as a weight for food (β_{it}). This is computed as a mean food share expenditure for each decile for each FIES year. CPI_t^{C3} is the Counterfactual 3 CPI from Equation 6.4 that also uses the decile-specific food expenditure shares as weight for food but assumes that CPI for food is kept constant. The results of the computed households' real expenditure per decile are presented in appendix tables 2b to 2e.

Given the results, we compare the growth of households' real expenditure across deciles and across years under the actual and three counterfactual scenarios. Figure 5 presents a picture of the effect of changes in food prices on the welfare of households across income segments. Recall that the three-year percent change in food CPI was at its highest in 2009 at 24.5 percent, and nonfood inflation is at 12.32 percent (see Table 3). The growth of real expenditure in 2009 would have greatly benefited the least well-off households had food prices been managed. Figure 5, panel c, shows real expenditure growth is higher under Counterfactuals 1 and 3, where food prices are assumed constant. The real expenditure growth in 2009–12, actual and under Counterfactuals 1 and 2, is negative for the lower 50 percent of the population (Figure 5, panel d). The bottom 20 percent bear the brunt of the high food prices. In contrast, when nonfood prices increased in 2003, where the three-year percent change in nonfood CPI was 12.55 percent (Table 3), the higher income segment of the population was more adversely affected (Figure 5, panel a).

Furthermore, we can look at the welfare impact of a relatively high vs low inflationary environment during low to high GDP growth periods. In Table 2, the period from 2003–06 exhibited relatively moderate three-year GDP growth (at 17.8%), but three-year food inflation jumped from 6.73 percent in 2003 to 18.59 percent in 2006. Consequently, Figure 5 shows that growth during this period benefited the households in the higher deciles, while the real expenditures of the least well-off households contracted (Figure

Figure 5. Effect of food price changes on the growth of real expenditure, by decile

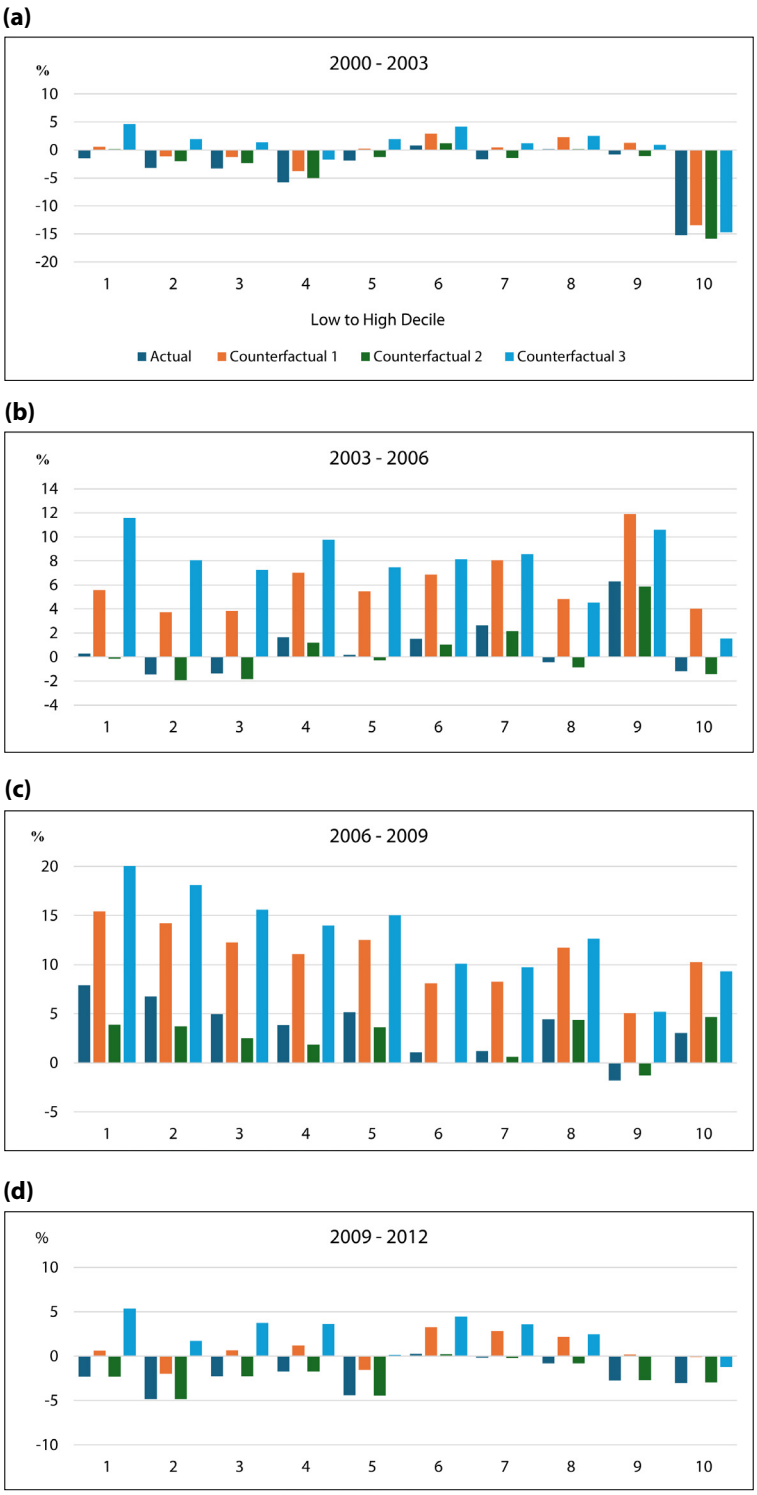
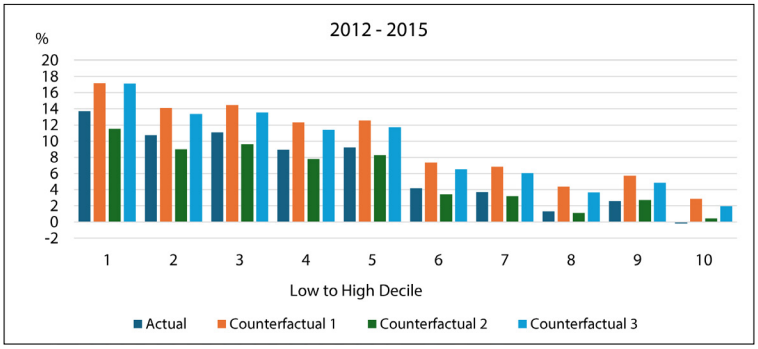
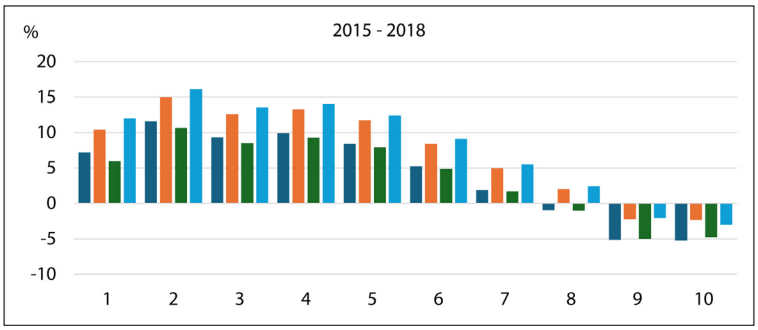


Figure 5 continued

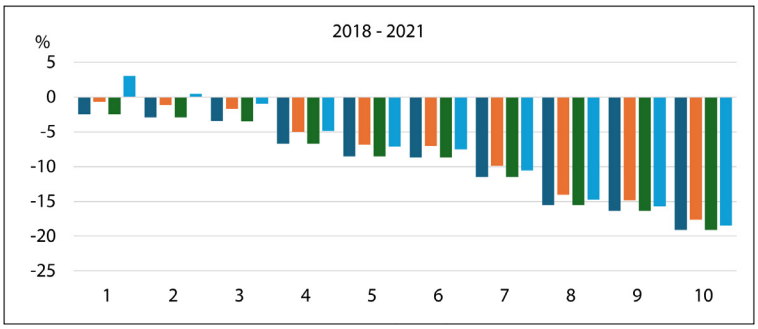
(e)



(f)



(g)



Source of basic data: PSA (various years)

Notes: The actual scenario uses the national CPI. Counterfactual 1 uses the same weight as the national CPI but assumes no food price increases. Counterfactual 2 uses the decile-specific food and nonfood expenditure shares as the weights. Counterfactual 3 uses the same weights as Counterfactual 2 but assumes no food price increases. See Equations (6).

Authors' calculation

5, panel b). In contrast, the periods 2012–15 and 2015–18 exhibited high GDP growth during periods of relatively slower inflation. In this case, the growth of real expenditure was much higher in the lower decile households, exhibiting much more pro-poor growth across all scenarios (Figure 5, panels e and f). Lastly, the period from 2018 to 2021 exhibits an interesting case study. As a result of the COVID-19 pandemic and the subsequent economic shutdowns, three-year real GDP growth was stifled to only 2.1 percent, but three-year inflation slowed down to below single digits at less than 9 percent, the lowest since the 2000–03 period. Figure 5 panel g shows that the low growth but low inflation environment disproportionately impacted the real expenditure of the most well-off households. Interestingly, the real expenditure of the bottom 20 percent of households may have increased had food prices been maintained during this period.

Across all panels, we can observe that real expenditures of households in the lower deciles would have been even higher if food inflation were controlled, especially when compared to those in the higher deciles (see Counterfactual 2 against Counterfactual 3).

WHAT IS THE WAY FORWARD FOR RICE POLICY? LESSONS FOR THE POST COVID-19 ERA

More than a year after the tariffication law had been enacted, farmgate prices of *palay* or unhusked rice plummeted. Retail prices fell from PHP 50 to PHP 34–36 a kilo as of February 2020. Inflation stabilized in the succeeding years. In 2019, the government collected PHP 12.3 billion in rice tariff payments, which subsequently rose to approximately PHP 30 billion by 2023. The winners are the rice consumers and the government. Importers who have shifted to importing rice, particularly higher value rice, are also counted as winners (Clarete 2019). While there are winners, there are also losers, namely farmers with a significant surplus, seed traders, millers, and traders who have yet to learn the business of importing rice. These special interest groups have fought hard to maintain the status quo. A few months after the passage of the law, they called for its reversal, citing the huge drop in farmgate prices compared with retail prices. Calls to repeal the Rice Tariffication Law and reinstate the QR regime were further revived in 2023 and 2024. Special interest groups were citing volatility of domestic markets as a result of the spike in the world prices of rice due to supply chain disruptions caused by the COVID-19 pandemic; this, along with India's export ban resulting in a surge in international rice markets that passed through to domestic markets. There were birthing pains since the tariffication as full liberalization came as a one-time shock to the rice market. While the tariffication law was not without problems (Clarete 2019), going back to a QR regime would be even more problematic.

Nonetheless, measures and policy instruments can be invoked to address them (Clarete 2019). The tariffication law provides for a RCEF to be funded for six years, which aims to use tariff collections to compensate farmers through direct cash transfers and productivity-enhancing programs such as the provision of seeds, mechanization, expanded access to credit markets, and extension services. Given proper strategies, there is enormous potential to increase productivity and make the rice sector globally competitive. This has significant potential impacts on the general population, most notably the poor, that depend on it for their livelihood and food. With the RCEF program due for an extension, efforts must be made to ensure that funding goes to the most efficient productivity-enhancing programs. As such, this can provide an opportunity for rice farmers to become more globally competitive. Competition in the sector will greatly shrink margins. However, restraints to competition in the rice value chain, especially in marketing, may still exist. In pursuing their own interests, the wholesalers/millers segment of the market who have been receiving high excess profit (Briones 2019a) would want to maintain the status quo, including maintaining traditional barriers to entry. Competition among rice importers should close the gap between border and wholesale

prices. However, persisting calls for reversing the law create uncertainty in the business environment and deter potential entrants.

Furthermore, policymakers and market players must adapt to the changes in the policy environment brought about by the accelerated digital adoption due to the COVID-19 pandemic. The e-commerce development for rice and agricultural farmers should be accelerated to ensure continued income for small farmers. Farmers must be given wider access to financing to ensure that they can continue adopting new technologies into their production and marketing efforts. These measures provide benefits that would go well beyond the pandemic.

CONCLUDING REMARKS

The observation that economic growth in the Philippines has been less inclusive than the country's peers in Asia directly runs counter to the long-established nexus between growth and poverty reduction. Growth, even by itself, is pro-poor; high food prices is not. The government's pursuit of rice self-sufficiency, mainly by imposing QRs on rice imports, has proved costly to consumers and the whole economy. The policy has raised domestic rice prices above their competitive levels, substantially reducing consumer welfare, particularly among the poor, including farmers who are net food buyers. Because rice accounts for a much larger proportion of total household expenditures for the poor than for the nonpoor, the policy has been broadly antipoor. Indeed, the past decade saw the policy substantially diminishing the otherwise strongly pro-poor impact of economic growth, making growth seemingly exclusive, i.e., disproportionately beneficial for the top-income groups.

To be sure, self-sufficiency in the country's staple is not necessarily a misplaced policy objective. Such an objective in many food-importing countries, including the Philippines, reflects political-economy considerations (Anderson 1986; Timmer 1997). The common narrative is that food, particularly rice, is a political commodity. The policy simply reflects the balance of influence in the political market, particularly in favor of strong nationalist sentiment for self-sufficiency. From this perspective, the policy issue is not so much about the desirability of the self-sufficiency goal but the set of policy tools or instruments chosen to achieve the goal. Raising domestic prices through QRs on imports to stimulate local production has been very costly to social welfare and the economy. Over the years, the QRs—not just in rice but also in other key commodities, including sugar, onion, and meat—have effectively stunted the key development objectives of poverty reduction and efficient structural transformation of the economy. They have also created or induced economically unproductive rent-seeking activities in the agriculture and food sectors. There is also the long-term threat from persistently high incidence of early child malnutrition and stunting due to unduly high food prices, whose long-term effects on the economy will manifest in lower workforce productivity in decades ahead.

The government's decision to dismantle the QR regime in rice imports and put in its stead a tariff regime—partly prompted by the serious threat that the government would miss its inflation target, causing upward pressure on interest rates, owing to the high food inflation—is a move in the right direction. The decision also recognizes that raising farm productivity is the most efficient and sustainable way to increase production and farmers' income. This will require policy measures and institutional mechanisms to enhance farmers' access to improved farming technologies, appropriate irrigation systems, connectivity infrastructure, working capital, disaster-related risk reduction opportunities, and input and product markets.

Beyond tariffication, the NFA would need to be reoriented toward managing buffer stocks for emergencies. The private sector would need to be assisted in building efficient logistics, particularly transport and storage facilities. Robust competition policy enforcement against cartels and abusive dominant players in agricultural markets must also be part of the strategy to foster productivity growth and consumer welfare.

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Appendix Table 1. Comparison of dimensions of poverty

FIES 2012 Variable	Identified Poor Only by Income Measure	Identified Poor Only by Food Share Measure	Diff	pvalue
Household Characteristics				
Total expenditure	82,942.52	99,415.85	16,473.34	0.0000
Total expenditure per capita	14,869.62	24,268.92	9,399.31	0.0000
Major income: wage or salaries	0.44	0.45	0.02	0.1484
Major income: entrepreneurial activities	0.32	0.41	0.09	0.0000
Major income: other sources of income	0.24	0.14	-0.11	0.0000
Agriculture household	0.45	0.45	-0.01	0.5362
Urban	0.18	0.22	0.04	0.0000
Household size	5.80	4.48	-1.32	0.0000
Household Head Employment				
With employment	0.88	0.89	0.02	0.0170
Occupation: government worker	0.08	0.09	0.02	0.0096
Occupation: professionals	0.00	0.00	0.00	0.7054
Occupation: technicians	0.01	0.00	-0.00	0.3970
Occupation: clerks	0.01	0.01	-0.00	0.6793
Occupation: service worker	0.03	0.03	0.00	0.9478
Occupation: agri sector	0.37	0.38	0.00	0.6550
Occupation: trading	0.06	0.07	0.01	0.0212
Occupation: factory worker	0.04	0.05	0.01	0.0176
Occupation: laborers and unskilled	0.29	0.26	-0.03	0.0090
Worked for private household	0.02	0.02	0.00	0.3016
Worked for private establishment	0.41	0.38	-0.03	0.0083
Worked for government	0.03	0.03	-0.00	0.9974
Self employed without any employee	0.49	0.49	-0.00	0.8838
Employer in own family business	0.05	0.07	0.03	0.0000
Worked with pay in own family business	0.00	0.00	-0.00	0.3126
Worked w/o pay in own family business	0.00	0.01	0.00	0.0093
Household Head Demographics				
Education: none completed	0.40	0.39	-0.02	0.1694
Education: at least elementary graduate	0.60	0.61	0.02	0.1694
Education: at least high school graduate	0.21	0.22	0.01	0.5064
Education: at least college graduate	0.05	0.04	-0.00	0.7830
Age	48.45	50.41	1.96	0.0000
Household Amenities				
With electricity	0.76	0.72	-0.04	0.0001
Household Roof Materials				
Strong	0.66	0.62	-0.04	0.0002
Light	0.25	0.27	0.03	0.0046
Salvaged	0.01	0.01	0.00	0.2148
Mixed but mostly strong	0.06	0.06	-0.00	0.6687
Mixed but mostly light	0.02	0.03	0.01	0.0189
Mixed but mostly salvaged	0.00	0.00	0.00	0.0066

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Appendix Table 1 continued

FIES 2012 Variable	Identified Poor Only by Income Measure	Identified Poor Only by Food Share Measure	Diff	pvalue
Water Source				
Own use faucet, community water system	0.15	0.16	0.01	0.2720
Shared, faucet, community water system	0.15	0.13	-0.02	0.0109
Own use, tubed/piped deep well	0.09	0.09	-0.00	0.8451
Shared, tubed/piped deep well	0.26	0.22	-0.04	0.0000
Tubed/piped shallow well	0.04	0.04	0.00	0.4282
Dug well	0.12	0.19	0.07	0.0000
Protected spring, river, stream	0.09	0.07	-0.02	0.0003
Unprotected spring, river, stream	0.04	0.02	-0.01	0.0005
Lake, river, rain, and others	0.03	0.04	0.01	0.1861
Peddler	0.02	0.03	0.01	0.0003
Wall Type				
Strong	0.45	0.44	-0.01	0.4353
Light	0.37	0.39	0.02	0.1104
Salvaged	0.01	0.01	0.00	0.6095
Mixed but mostly strong	0.11	0.09	-0.02	0.0060
Mixed but mostly light	0.06	0.06	0.01	0.1901
Mixed but mostly salvaged	0.00	0.01	0.00	0.2487
Tenure Type				
Own house and lot	0.63	0.66	0.03	0.0061
Rent house/room including lot	0.01	0.02	0.01	0.0060
Own house, rent lot	0.02	0.02	-0.00	0.4759
Own house, rent-free lot with consent	0.25	0.22	-0.03	0.0030
Own house, rent-free lot without consent	0.03	0.03	0.00	0.4978
Rent-free house and lot with consent	0.06	0.05	-0.01	0.0232
Rent-free house and lot without consent	0.00	0.00	0.00	0.5479
Not applicable	0.00	0.00	0.00	0.7629
Toilet Type				
None	0.10	0.08	-0.02	0.0163
Water sealed, sewer septic tank, exclusive	0.46	0.47	0.01	0.5224
Water sealed, sewer septic tank, shared	0.10	0.10	0.00	0.4743
Water sealed, other depository, exclusive	0.08	0.07	-0.01	0.2563
Water sealed, other depository, shared	0.04	0.04	-0.00	0.5021
Closed pitt	0.12	0.13	0.00	0.8091
Open pitt	0.07	0.08	0.00	0.5725
Others	0.02	0.03	0.01	0.0175
Appliances and Vehicles				
Television	0.82	0.76	-0.06	0.0000
Refrigerator	0.22	0.21	-0.02	0.3255
Air conditioner	0.01	0.01	-0.01	0.1828
Personal computer	0.03	0.03	-0.01	0.4160
Cell phone	0.87	0.81	-0.07	0.0000
Car	0.00	0.01	0.01	0.0750
Motorcycle	0.24	0.16	-0.07	0.0000
Washing machine	0.15	0.14	-0.02	0.2587
Stove	0.07	0.04	-0.03	0.0050

Appendix Table 2a. Summary statistics

2000	Count	Mean	SD	Min	Max
Total expenditure	39,615	118,002	182,675	3,763	6,189,500
Total food expenditure	39,615	51,499	41,687	1,404	1,155,320
Total nonfood expenditure	39,615	66,503	148,236	684	5,034,180
Food share	39,615	0.5	0.15	0.04	0.95
Total income	39,615	144,039	226,867	4,273	8,441,242
Per capita income	39,615	32,14	53,811	1,325	2,385,886
2003	**Count**	**Mean**	**SD**	**Min**	**Max**
Total expenditure	42,094	123,691	125,785	3,502	3,896,407
Total food expenditure	42,094	53,290	34,645	2,050	580,158
Total nonfood expenditure	42,094	70,401	98,811	1,166	3,504,915
Food share	42,094	0.51	0.14	0.01	0.90
Total income	42,094	147,888	252,311	3,086	32,300,000
Per capita income	42,094	36,390	65,855	1,257	8,064,012
2006	**Count**	**Mean**	**SD**	**Min**	**Max**
Total expenditure	38,482	147,183	149,694	4,111	4,242,148
Total food expenditure	38,482	60,889	39,978	1,867	801,142
Total nonfood expenditure	38,482	86,294	118,613	1,250	3,687,796
Food share	38,482	0.50	0.14	0.01	0.94
Total income	38,482	172,734	208,886	5,295	7,919,100
Per capita income	38,482	42,823	61,679	1,576	2,495,499
2009	**Count**	**Mean**	**SD**	**Min**	**Max**
Total expenditure	38,400	175,551	171,297	9,250	4,108,871
Total food expenditure	38,400	74,808	46,272	3,848	673,465
Total nonfood expenditure	38,400	100,743	135,817	2,019	4,017,770
Food share	38,400	0.51	0.14	0.02	0.90
Total income	38,400	206,179	305,699	8,007	30,400,000
Per capita income	38,400	52,104	96,703	2,381	10,100,000
2012	**Count**	**Mean**	**SD**	**Min**	**Max**
Total expenditure	40,171	192,540	188,326	6,593	3,017,150
Total food expenditure	40,171	82,500	52,399	306	744,236
Total nonfood expenditure	40,171	110,040	147,556	1,830	2,470,903
Food share	40,171	0.51	0.15	0.03	0.92
Total income	40,171	234,615	272,784	5,201	8,652,144
Per capita income	40,171	58,583	79,026	2,979	3,231,120
2015	**Count**	**Mean**	**SD**	**Min**	**Max**
Total expenditure	41,544	214,816	198,418	9,988	3,394,720
Total food expenditure	41,544	89,997	54,624	2,947	827,565
Total nonfood expenditure	41,544	124,818	158,407	2,362	3,086,717
Food share	41,544	0.49	0.14	0.03	0.96
Total income	41,544	266,962	304,334	11,285	11,800,000
Per capita income	41,544	67,622	85,842	3,345	2,572,904

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Appendix Table 2a continued

2018	Count	Mean	SD	Min	Max
Total expenditure	147,717	238,641	203,685	11,788	7,099,135
Total food expenditure	147,717	101,547	56,366	2,671	786,287
Total nonfood expenditure	147,717	137,094	165,121	2,622	6,934,384
Food share	147,717	0.49	0.13	0.02	0.95
Total income	147,717	313,348	426,195	12,973	71,800,000
Per capita income	147,717	82,078	115,021	4,501	14,400,000
2021	**Count**	**Mean**	**SD**	**Min**	**Max**
Total expenditure	165,029	228,796	196,229	8,794	7,641,695
Total food expenditure	165,029	97,508	60,016	2,939	1,984,454
Total nonfood expenditure	165,029	131,288	155,339	2,095	6,704,533
Food share	165,029	0.48	0.14	0.02	0.96
Total income	165,029	307,190	332,221	10,374	16,800,000
Per capita income	165,029	84,948	99,213	5,409	9,691,285

Source of basic data: Philippine Statistics Authority (PSA), Family Income and Expenditure Survey (FIES). We used *rfactor* (raising factor) as the probability weight in FIES datasets.
Note: Food share is share of food in total expenditure.

Appendix Table 2b. Actual: Households' real expenditure and growth, by decile

	Real Expenditure (Per Thousand PHP)								Growth						
Decile	2000	2003	2006	2009	2012	2015	2018	2021	2000–2003	2003–2006	2006–2009	2009–2012	2012–2015	2015–2018	2018–2021
1	95.6	94.2	94.5	101.9	99.6	113.2	121.3	95.6	-1.50	0.28	7.89	-2.30	13.70	7.15	-2.45
2	116.1	112.4	110.7	118.2	112.5	124.6	139.0	116.1	-3.22	-1.46	6.76	-4.85	10.75	11.62	-2.91
3	131.0	126.7	125.0	131.1	128.2	142.4	155.6	131.0	-3.30	-1.37	4.96	-2.27	11.09	9.29	-3.44
4	149.9	141.3	143.6	149.1	146.6	159.8	175.6	149.9	-5.77	1.65	3.85	-1.71	8.99	9.90	-6.69
5	165.9	162.8	163.1	171.5	164.0	179.1	194.2	165.9	-1.86	0.18	5.18	-4.42	9.24	8.41	-8.52
6	188.7	190.2	193.0	195.1	195.6	203.7	214.4	188.7	0.78	1.50	1.06	0.25	4.16	5.22	-8.67
7	224.3	220.6	226.4	229.1	228.7	237.2	241.6	224.3	-1.63	2.64	1.18	-0.17	3.69	1.88	-11.50
8	272.1	272.6	271.4	283.5	281.1	284.8	282.1	272.1	0.17	-0.44	4.46	-0.83	1.32	-0.96	-15.56
9	346.6	343.8	365.4	358.8	349.0	358.1	339.7	346.6	-0.81	6.30	-1.80	-2.74	2.60	-5.13	-16.36
10	660.4	559.8	553.1	570.0	552.8	551.8	522.9	660.4	-15.24	-1.20	3.06	-3.01	-0.19	-5.23	-19.07

Source of basic data: FIES, PSA, various years. Actual scenario uses the national CPI as provided in Equations (6) and (6.1).
Note: Authors' calculation.

Appendix Table 2c. Counterfactual 1: Households' real expenditure and growth, by decile

	Real Expenditure (Per Thousand PHP)								Growth						
Decile	2000	2003	2006	2009	2012	2015	2018	2021	2000–2003	2003–2006	2006–2009	2009–2012	2012–2015	2015–2018	2018–2021
1	95.6	96.2	101.6	117.2	118.0	138.2	152.6	151.6	0.60	5.57	15.41	0.63	17.17	10.40	-0.68
2	116.1	114.8	119.0	136.0	133.2	152.1	174.9	172.9	-1.16	3.74	14.20	-2.00	14.12	15.01	-1.15
3	131.0	129.4	134.3	150.8	151.8	173.8	195.7	192.4	-1.24	3.83	12.28	0.66	14.47	12.60	-1.69
4	149.9	144.3	154.4	171.5	173.6	195.0	220.8	209.8	-3.76	7.01	11.10	1.23	12.31	13.24	-5.00
5	165.9	166.3	175.4	197.3	194.2	218.6	244.2	227.5	0.23	5.46	12.51	-1.56	12.56	11.70	-6.86
6	188.7	194.2	207.5	224.4	231.7	248.7	269.6	250.7	2.93	6.85	8.11	3.26	7.34	8.42	-7.01
7	224.3	225.3	243.5	263.5	271.0	289.5	303.9	273.9	0.47	8.05	8.24	2.82	6.85	4.97	-9.89
8	272.1	278.4	291.8	326.0	333.0	347.7	354.8	305.0	2.30	4.81	11.75	2.14	4.41	2.05	-14.03
9	346.6	351.1	392.9	412.7	413.4	437.1	427.3	363.9	1.31	11.90	5.05	0.17	5.73	-2.26	-14.84
10	660.4	571.7	594.7	655.6	654.9	673.6	657.7	542.0	-13.43	4.01	10.25	-0.11	2.85	-2.35	-17.60

Source of basic data: FIES, PSA, various years. Counterfactual 1 uses the same weight as in the national CPI but assumes no food price increases as provided in Equations (6) and (6.2).
Note: Authors' calculation.

Appendix Table 2d. Counterfactual 2: Households' real expenditure and growth, by decile

	Real Expenditure (Per Thousand PHP)								Growth						
Decile	2000	2003	2006	2009	2012	2015	2018	2021	2000–2003	2003–2006	2006–2009	2009–2012	2012–2015	2015–2018	2018–2021
1	101.2	101.3	101.1	105.1	102.6	114.5	121.3	118.3	0.12	-0.16	3.89	-2.33	11.55	5.98	-2.46
2	121.5	119.0	116.8	121.1	115.2	125.6	139.0	135.0	-2.02	-1.92	3.73	-4.86	9.03	10.67	-2.91
3	136.2	133.0	130.6	133.9	130.8	143.4	155.6	150.2	-2.31	-1.83	2.51	-2.28	9.62	8.51	-3.44
4	155.0	147.2	148.9	151.7	149.1	160.7	175.6	163.8	-5.01	1.18	1.88	-1.74	7.77	9.26	-6.70
5	170.5	168.4	167.9	174.0	166.2	179.9	194.2	177.6	-1.26	-0.27	3.62	-4.46	8.25	7.91	-8.52
6	192.8	195.2	197.2	197.2	197.6	204.4	214.4	195.8	1.21	1.03	0.01	0.21	3.45	4.87	-8.67
7	227.7	224.5	229.4	230.7	230.3	237.7	241.6	213.8	-1.42	2.17	0.59	-0.20	3.21	1.67	-11.50
8	274.3	274.7	272.3	284.2	281.8	285.0	282.1	238.2	0.14	-0.87	4.38	-0.83	1.12	-1.02	-15.56
9	346.2	342.4	362.5	357.9	348.2	357.6	339.7	284.1	-1.09	5.87	-1.28	-2.72	2.71	-5.01	-16.36
10	649.3	546.2	538.5	563.6	546.8	549.3	522.9	423.2	-15.87	-1.41	4.65	-2.97	0.45	-4.80	-19.07

Source of basic data: FIES, PSA, various years. Counterfactual 2 uses the decile-specific food expenditure shares as the weight for food as provided in Equations (6) and (6.3).
Note: Authors' calculation.

Appendix Table 2e. Counterfactual 3: Households' real expenditure and growth, by decile

	Real Expenditure (Per Thousand PHP)								Growth						
Decile	2000	2003	2006	2009	2012	2015	2018	2021	2000–2003	2003–2006	2006–2009	2009–2012	2012–2015	2015–2018	2018–2021
1	101.2	105.9	118.2	141.9	149.6	175.1	196.2	202.2	4.68	11.58	20.08	5.39	17.12	12.01	3.05
2	121.5	123.8	133.8	158.0	160.7	182.3	211.7	212.7	1.93	8.04	18.11	1.71	13.38	16.16	0.49
3	136.2	138.0	148.0	171.1	177.5	201.5	228.9	226.7	1.34	7.25	15.61	3.74	13.54	13.56	-0.96
4	155.0	152.3	167.2	190.5	197.5	220.0	250.9	238.7	-1.71	9.76	13.99	3.64	11.39	14.04	-4.86
5	170.5	173.8	186.7	214.8	215.2	240.4	270.2	250.9	1.91	7.47	15.04	0.15	11.70	12.40	-7.12
6	192.8	201.0	217.3	239.2	249.9	266.2	290.5	268.7	4.21	8.13	10.09	4.48	6.52	9.10	-7.51
7	227.7	230.5	250.3	274.6	284.5	301.7	318.3	284.8	1.23	8.56	9.73	3.60	6.04	5.52	-10.53
8	274.3	281.2	293.9	331.0	339.3	351.6	360.1	307.0	2.51	4.51	12.64	2.49	3.63	2.43	-14.76
9	346.2	349.3	386.2	406.3	406.4	426.2	417.3	351.8	0.90	10.58	5.21	0.00	4.87	-2.08	-15.69
10	649.3	553.7	562.2	614.6	607.1	619.0	600.6	489.5	-14.71	1.53	9.32	-1.22	1.96	-2.99	-18.49

Source of basic data: FIES, PSA, various years. Counterfactual 3 uses the decile-specific food expenditure shares as the weight for food but assumes no increases in food prices as provided in Equations (6) and (6.4).
Note: Authors' calculation.