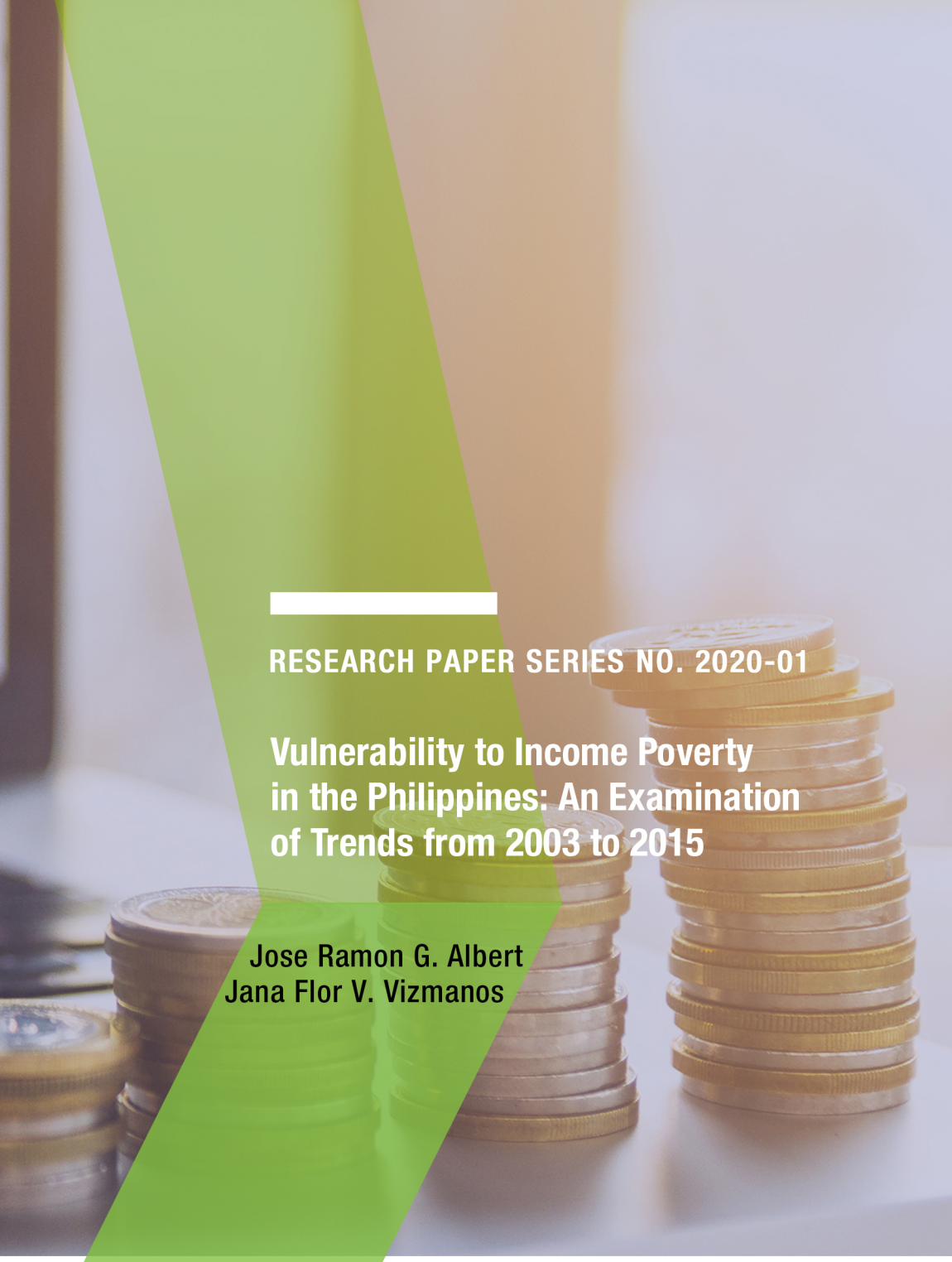

RESEARCH PAPER SERIES NO. 2020-01

Vulnerability to Income Poverty in the Philippines: An Examination of Trends from 2003 to 2015

Jose Ramon G. Albert
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PIDS

Research Paper Series No. 2020-01

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

Published by
Philippine Institute for Development Studies

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Website: https://www.pids.gov.ph

ISSN 1908-3297
ISSN 2508-0830 (electronic)
RP 03-20-600

Editorial and production team:
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List of Acronyms

4Ps	*Pantawid Pamilyang Pilipino* Program
APIS	Annual Poverty Indicator Survey
ARMM	Autonomous Region in Muslim Mindanao
CALABARZON	Cavite, Laguna, Batangas, Rizal, and Quezon provinces
CAR	Cordillera Administrative Region
CRED	Centre for Research and Epidemiology of Disasters
CSO	civil society organization
CSWDO	City Social Welfare and Development Office
DAP	Development Academy of the Philippines
DSWD	Department of Social Welfare and Development
EM-DAT	Emergency Events Database
FIES	Family Income and Expenditure Survey
GDP	gross domestic product
GEP	growth elasticity of poverty
GRDP	gross regional domestic product
GSIS	Government Service and Insurance System
IDS	Institute of Development Studies
IPCC	Intergovernmental Panel on Climate Change
LFS	Labor Force Survey
LGU	local government unit
MIMAROPA	Mindoro, Marinduque, Romblon, and Palawan provinces
MSWDO	Municipal Social Welfare and Development Office
NAPC	National Anti-Poverty Commission
NCR	National Capital Region
NEDA	National Economic and Development Authority
NGA	national government agency
OFW	overseas Filipino workers
OLS	ordinary least squares
OSCA	Office of the Senior Citizens Affairs

PDP	Philippine Development Plan
PHP	Philippine peso
PIDS	Philippine Institute for Development Studies
PSA	Philippine Statistics Authority
SDGs	Sustainable Development Goals
SocPen	Social Pension for Indigent Senior Citizens
SOCCSKSARGEN	South Cotabato, Cotabato, Sultan Kudarat, Sarangani and General Santos
SPOFS	social protection operational framework and strategy
SSS	Social Security System
SUCs	state universities and colleges
UNICEF	United Nations Children's Fund
UNU-EHS	United Nations University – Institute for Environment and Human Security
USD	United States dollar
WB	World Bank

Abstract

As reflected in the *Philippine Development Plan 2017–2022* and the United Nations Sustainable Development Goals, poverty reduction is at the heart of the development agenda both nationally and globally. Since the measurement of poverty is ex post, public interventions are typically directed at helping those who have been identified as poor. The government, however, must consider the dynamics of poverty in public policymaking and broaden the scope of poverty assessments. A critical dimension to poverty dynamics is vulnerability, which conceptually pertains to the risk to future poverty. Some of the poor are likely to be poor in the future; some nonpoor may also become poor if idiosyncratic and covariate risks to future poverty are not addressed. Thus, risk resilience management strategies are critical. This study continues previous work on estimating the vulnerability level of households to income poverty using a modified probit model based on income and other poverty correlates data sourced from the Family Income and Expenditure Survey, as well as the country's official poverty lines. Past model specifications are improved by including data on price and climate shocks to welfare, as well as by generating individual assessments for urban and rural areas before combining the cross-section results, rather than using a common specification nationally as done previously. The vulnerability assessment in this study provides inputs to forward-looking interventions that build the resilience of households for preventing or reducing the likelihood of future poverty. The study emphasizes the importance of using both poverty and vulnerability estimates in programs and identifies differentiated actions for those highly vulnerable and relatively vulnerable to poverty.

Introduction

The Sustainable Development Goals (SDGs), a set of 17 goals that the Philippines and 192 other UN member-states have committed to attain by 2030, identifies a shared vision of, by, and for all nations of the world a better future for the people and its planet by promoting prosperity, peace, and partnership (UN 2015). SDG1, the first of the 17 global goals (as the SDGs are also referred to) urges to "end poverty in all its forms everywhere", making poverty reduction critical to the sustainable development agenda. Poverty is also highly prominent in the country's public policy agenda, with poverty reduction being mainstreamed with economic growth targets in the most recent *Philippine Development Plan 2017–2022* (NEDA 2017). The National Anti-Poverty Commission (NAPC) espouses a comprehensive, universal, and transformative social policy, including a rights-based approach, to ensure that reaching zero (poverty) becomes the cornerstone of the country's development policies (NAPC 2018). The NAPC also takes cognizance that poverty has many faces, including vulnerabilities stemming from risks to welfare such as uncertainties from lack of decent work and educational attainment of household members, insecurity from land tenure and lack of productive assets, imperfect and asymmetric information on opportunities, food insecurity, uncertain access to public goods, and asset damages from disasters and violence.

Recognizing that management of poverty policies and programs is more effectively done using poverty data has intensified data use not only for describing poverty conditions but also for targeting of interventions, as well as for evaluating the impact of public policy, programs, and projects on poverty. Many developing countries like the Philippines release official poverty statistics by (a) examining a welfare indicator (typically either income- or consumption-based data), (b) setting poverty lines[1]—which when compared with values of the welfare data help differentiate the poor from the nonpoor, and (c) aggregating

[1] Poverty lines represent the minimum per capita income required by a household to meet its food and nonfood basic needs. The food component of the poverty line (also called the food threshold) is estimated for urban and rural areas of each province by putting a cost to representative one-day food menus. The per capita per day food cost obtained from the menu is multiplied by 365 to get the annual food threshold. The menus serve as an artifice for determining the cost of basic food requirements which meet 100-percent adequacy of the recommended dietary allowance for protein and energy (2,000 calories per person per day) and 80-percent adequacy of other nutrients. The nonfood component of the poverty line is then indirectly estimated to be the ratio of the food threshold to Engel's coefficient, the latter estimated as the average share of food expenditures to total basic expenditures of households within a ± 10-percentile band of the food threshold.

the poverty data into summaries (such as poverty incidence) that can compare welfare conditions across time and space. The official welfare indicator in the Philippines is based on per capita income, sourced from the triennial Family Income and Expenditure Survey (FIES) conducted by the Philippine Statistics Authority (PSA). Poverty, however, is not just monetary deprivation, but also capability and optimism deprivation. Regardless of whether the official welfare indicator chosen is based on income or consumption, or even a nonmonetary metric (e.g., quantity of food consumed), poverty is measured ex post by countries. In consequence, poverty assessments[2] that put a face to the poor and identify their needs focus on examining whether households are currently poor or were poor in the past. Targeting of interventions, such as the government's conditional cash transfer program *Pantawid Pamilyang Pilipino* Program (4Ps) (Orbeta and Paqueo 2016) and the noncontributory pensions for elderly indigents in the Social Pension (SocPen) program (Velarde and Albert 2018) are likewise using data that determine ex-post welfare conditions to determine program eligibility. Impact evaluation studies of poverty interventions that measure counterfactuals (i.e., what would have happened to beneficiaries and nonbeneficiaries in the absence of the intervention), are also based on ex-post conditions of households.

Measuring poverty ex post has its merits (with the effects of past government interventions being measured with actual data). Poverty, however, is dynamic, such that the poor exit poverty and the nonpoor can slide into poverty. Bearing this in mind, the underlying processes that contributed to observed poverty conditions or, to clarify, the reasons for poverty persistence were assessed—including the risks households face in terms of future poverty. Nonpoor households themselves that have not accumulated enough assets and fall into poverty may find it difficult to escape poverty, just like persistently poor households. Poor households that are at risk of staying poor, as well as nonpoor households that are likely to become poor need to be capacitated in managing risk resilience. Thus,

[2] In the Philippines, official poverty statistics have been generated by the Philippine Statistical System since 1987; these statistics are released every three years whenever data is available from the triennial Family Income and Expenditure Survey (FIES) conducted by the Philippine Statistics Authority (PSA). In recent years, the PSA has produced more frequent poverty statistics, including first semester poverty data sourced from the 2012 FIES, the 2015 FIES, as well as from recent rounds of the *Annual Poverty Indicator Survey (APIS)*. While the 2013, 2014 and 2016 APIS have largely made use of the FIES income module, there are still comparability issues making the first semester poverty data sourced from the FIES and APIS incomparable (Albert et al. 2015).

poverty stakeholders ought to identify not only households that are poor ex post, but also households that are expected to be poor ex ante (Dercon 2001). The latter are households said to be vulnerable to (future) poverty.

This study aims to (a) obtain estimates of vulnerability rates for 2003, 2006, 2009, 2012, and 2015 based on per capita income data and official poverty lines, (b) profile households that are vulnerable to income poverty, with special attention to demographic and socioeconomic characteristics, and (c) provide policy recommendations for building resilience to welfare risks for households and communities, among others. The study reviews conditions on the macroeconomy and poverty situations in the period 2003–2015. Further, the paper also reviews the literature on vulnerability, including the conceptual framework for measurement of vulnerability. The paper then describes the underlying approach for the vulnerability measurement used in the study and provides the resulting triennial estimates of the proportion of households vulnerable to income poverty for the period 2003–2015. Using panel[3] data pertaining to households interviewed during the 2003, 2006, and 2009 FIES, the study estimates household vulnerability rates in 2003. These estimates manage to predict fairly well whether or not these household would be poor in 2006 and 2009. The paper also provides a comprehensive profile of vulnerable households. Finally, the paper describes the policy issues linked to the results of this study. Policy implications, particularly on social protection programs and systems, such as 4Ps and SocPen, are also discussed in the study.

Macroeconomy, Poverty, and Vulnerability

During the period 2003–2015, the Philippines had an average of 5.5-percent annual growth in gross domestic product (GDP), but this growth was not inclusive as it did not translate into substantial poverty reduction. The World Bank (2018, p. 1) has described the lackluster poverty reduction in the country: "Despite the generally good economic

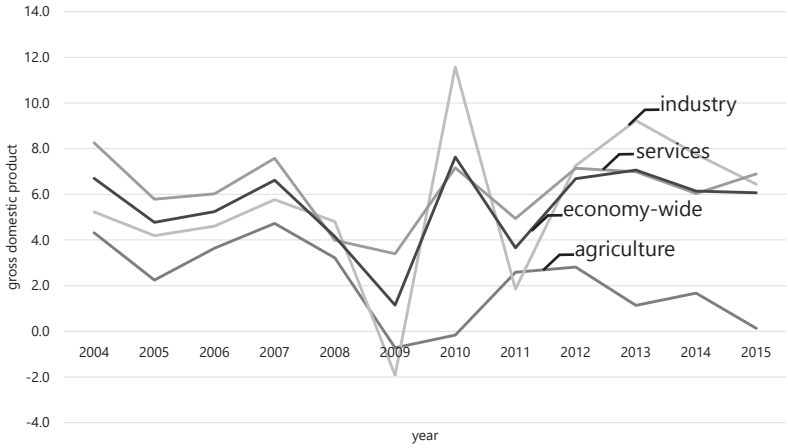
[3] The FIES is a rider to the Labor Force Survey (LFS). The July 2003 LFS sample was interviewed for the 2003 FIES and the January 2004 LFS. The second of four replicates of the July 2003 round of the LFS covering 10,500 households was targeted for interview not only for the July 2003 LFS, 2003 FIES, and January 2004 LFS, but also for the 2006 FIES and 2009 FIES (as well as the July 2006 LFS, January 2007 LFS, July 2009 LFS, and January 2010 LFS). A total of 6,529 households included in the 2003 FIES were successfully interviewed in both the 2006 and 2009 FIES. Weights for these panel data in this report were adjusted for attrition.

performance, poverty remains high and the pace of poverty reduction has been slow compared with other East Asian countries." Aggregate poverty incidence roughly stood still at about a fourth of the population from 2003 to 2012, dropping only in 2015 to over a fifth (21.6%) of the population. Economic growth from 2003 to 2012 averaged at 5.2 percent per year, but it was also not broad-based across major sectors.

While all major sectors had positive growth in output from 2003 to 2012, the agriculture sector, which most of the poor are dependent on for their livelihood, was outpaced in its average annual growth (2.5%) by the industry (4.8%) and services (6.0%) sectors (Figure 1). Historically, the Philippines has always been dominated by the services sector, and in recent decades, the agriculture sector has been shrinking in terms of its position in both total output as well as total employment (Albert et al. 2015).

Across the period 2003–2015, all regions experienced positive growth in the gross regional domestic product (GRDP), but at varying performances. The National Capital Region (NCR)—the region with the least poverty incidence among the country's regions—was not among the top three performers during the period 2009–2015. The poorest regions, such as Region VIII (Eastern Visayas) and the Autonomous Region in Muslim Mindanao (ARMM), had the least economic growth in the same period. From 2003 to 2009 (when the PSA used a different

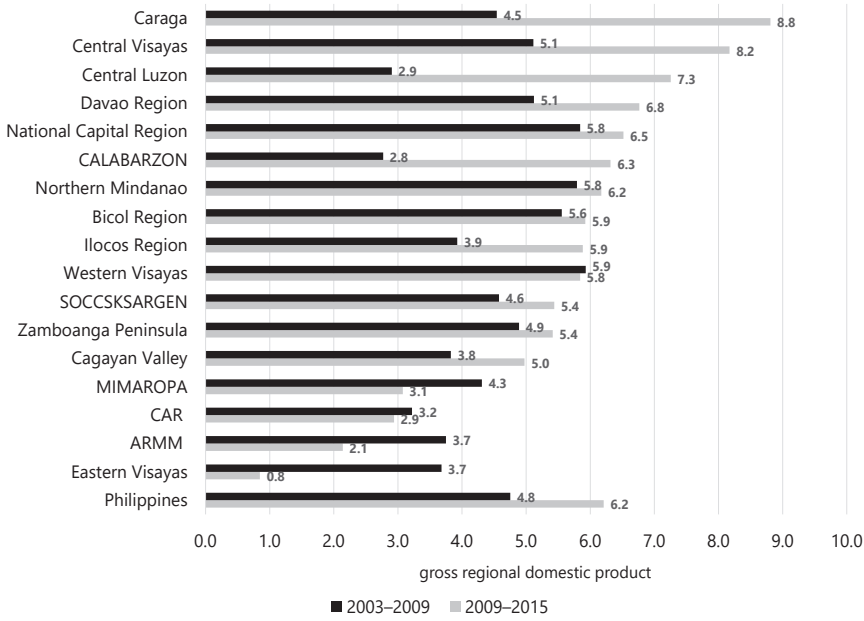
Figure 1. Growth in gross domestic product by major sector: Philippines, 2003–2015



Source: Philippine Statistics Authority (PSA) (multiyear)

base year from that of the latest GRDP data), these two regions were also among the bottom five regions in economic performance (Figure 2).

Figure 2. Gross regional domestic product growth (in %) by region: Philippines, 2003–2015



CALABARZON = Cavite, Laguna, Batangas, Rizal, and Quezon provinces; SOCCSKSARGEN = South Cotabato, Cotabato, Sultan Kudarat, Sarangani and General Santos City; MIMAROPA = Mindoro, Marinduque, Romblon, and Palawan provinces; CAR = Cordillera Administrative Region; ARMM = Autonomous Region in Muslim Mindanao
Note: The period 2003–2015 is broken into 2003–2009 and 2009–2015 due to breaks in the gross regional domestic product data series in their base years.
Source: PSA (multiyear)

According to Kraay (2004), growth in average incomes across countries explains 70 percent of the variation in poverty reduction. The remainder is explained by changes in the distribution, as well as changes in the growth elasticity of poverty (GEP)[4]. Further, cross-country data suggest that a 1-percent increase in incomes reduces poverty by

[4] The GEP refers to the percentage reduction in poverty rates associated with a percentage change in mean per capita income.

2.5 percent on average globally, by 0.6 percent in the most unequal countries, and by as much as 4.3 percent in the most equal ones (Ravallion 2013).

Balisacan and Fuwa (2004) estimated GEP in the Philippines at 1.6 percent. Reyes and Tabuga (2011) yielded estimates of 1.4–1.8 percent for all regions in the country, and 1.6–2.0 percent for regions with less inequality. Using GRDP, Reyes and Tabuga (2011) even yielded much lower estimates of 0.2–0.4 percent. Table 1 provides an independent estimation using recent national accounts data and official poverty rates (and the respective percentage changes in these data). While all of these GEP estimates vary considerably, they are all rather low compared with the global average performance (2.5%) estimated by Ravallion (2013). The country's low GEP between 2006 and 2015 suggests that despite the country's economic growth during this period (especially in rather recent years), poverty has not been considerably reduced, in part because the incidence of growth has not been propoor. High income inequalities have prevented economic growth from benefiting the entire income distribution, especially low-income classes, thus minimizing the effects of economic growth on reducing income poverty.

As pointed out by Albert et al. (2015), during the period 2003–2009, when the Philippines had an average of 4.8-percent growth in GDP and when growth did not translate into poverty reduction, the proportion of Filipinos in subsistence[5] poverty was over 10 percent.The subsistence

Table 1. Growth elasticity of poverty: Philippines, 2006–2009, 2009–2012, and 2012–2015

	2006	2009	2012	2015
Official poverty headcount	26.60	26.30	25.20	21.60
Per capita gross domestic product (GDP) (in PHP)	54,225.58	58,198.60	65,337.06	74,832.64
Total percent change in		2006–2009	2009–2012	2012–2015
(a) official poverty headcount		-1.1%	-4.0%	-14.4%
(b) per capita GDP		7.3%	12.3%	14.5%
Growth elasticity of poverty		-0.15	-0.32	-0.99

PHP = Philippine Pesos
Source: Authors' calculations based on official poverty statistics and National Income Accounts of the Philippine Statistics Authority

[5] Subsistence poverty rate refers to the proportion of persons (or families) whose per capita income is lower than the food poverty line. This may be viewed as the proportion in extreme poverty.

poverty rate reduced from 10.4 percent in 2012 to 8.1 percent in 2015 (Table 2). In 2015, extremely poor Filipinos, whose incomes were not even enough to meet the subsistence poverty line (i.e., the food component of the poverty line), account for two-fifths of all the total poor in rural areas, while in contrast, the extremely poor constitutes three-tenths of the urban poor.

Following the definition of Albert et al. (2018) of low-income[6], 7 in every 20 persons—both the urban and rural populations—are low income but not poor. A more detailed profile of those in the low-income but not poor category show similarities to that of poor Filipinos (Albert et al. 2018). An examination of the current latest publicly available microdata from the FIES (PSA 2015a) suggests that 36.8 percent of Filipinos were low income but not poor (an increase of 2.5-percentage points from 2012). These low income nonpoor persons may be viewed as being at high risk of falling into poverty (than those who are nonpoor and not low income). Further, among the poor, the extremely poor are more likely to be poor in the future than the poor who are not extremely poor (as well as the nonpoor).

Although aggregate poverty rates have roughly been unchanged in the period 2003 to 2015, especially from 2003 to 2012, panel data

Table 2. Distribution of the poor and low-income nonpoor Filipinos (in '000s) across urban and rural areas: Philippines, 2012 and 2015

Poverty Status		2012			2015		
		Urban	Rural	Total	Urban	Rural	Total
Poor	Subsistence poor	1,725	8,086	9,811	1,432	6,975	8,407
	Poor but not subsistence poor	3,424	10,511	13,935	3,359	10,663	14,022
	Total poor	5,149	18,597	23,746	4,791	17,638	22,429
Nonpoor	Low income	13,109	19,138	32,247	14,830	23,679	38,509
	Not low income	23,006	15,065	38,071	26,037	18,000	44,037
	Total nonpoor	36,115	34,203	70,318	40,867	41,680	82,547
Total		41,264	52,800	94,064	45,658	59,318	104,976

Source: Authors' calculations based on 2012 and 2015 Family Income and Expenditure Survey conducted by the Philippine Statistics Authority

[6] There are many ways to define the low income. Albert and Raymundo (2016) defined low-income households as nonpoor households whose per capita income is less than twice the poverty line. Further, persons belonging to low-income households are themselves considered low income.

analysis of FIES households from 2003 to 2009 suggests that some poor households have exited poverty, and some nonpoor households (roughly equal to the poor that have exited poverty) have fallen into poverty (Table 3)(see also Albert et al. 2015). During this period, the proportions of households that have exited poverty are roughly equal to those nonpoor that have fallen into poverty. This is a main issue behind weak poverty reduction as when some move out of poverty, they are replaced by others who become poor but were not poor before. Further, near-poor households[7] that are not poor but with incomes less than 1.5 times the poverty threshold are expected to be more vulnerable to income poverty than the nonpoor who are not from the near-poor.

So far, there are only a few studies looking into the vulnerability of Filipino households to income poverty either by examining movements in and out of poverty among households using panel data (e.g., Tabunda and Albert 2002; Reyes et al. 2010; Reyes et al. 2011;

Table 3. Poverty transition matrix (in % of households in 2003): 2003–2009

Poverty Status 2003	Poverty Status 2009				
	Food-poor	Poor but Not Food-poor	Near Poor*	Rest of Households	Total
Food poor	3.04	2.52	1.19	1.24	7.99
Poor but not food poor	2.27	3.45	2.16	3.98	11.86
Near-poor*	1.12	2.70	1.97	4.46	10.24
Rest of households	1.12	4.11	4.93	59.75	69.91
Total	7.55	12.78	10.24	69.42	100.00

Note: * = households with per capita income greater or equal to the poverty line but less than 1.5 times the poverty line
Source: Authors' calculations based on microdata of panel data from 2003, 2006, and 2009 Family Income and Expenditure Survey (FIES) conducted by the Philippine Statistics Authority

[7] While the near-poor may be defined in several ways, the idea is always about being slightly beyond the poverty threshold. In this report, the near-poor is defined as those having per capita income less than 1.5 times the poverty line.

Albert et al. 2015) or by estimating vulnerability levels using models on cross-sectional data (Chaudhuri and Datt 2001; Albert et al. 2008; Albert and Ramos 2010; Mina and Imai 2016).

Public policy interventions to assist segments of society that are vulnerable to income poverty require an assessment of the conditions households face. This includes an examination of the multifarious constraints that households face to improve their livelihood, e.g., the extent of their access to productive resources which will increase their assets and long-term wealth, as well as their resilience to risks. Being poor and vulnerable are direct consequences of a household's income prospects, degree of income volatility from its exposure to idiosyncratic shocks (i.e., household-level shocks) and covariate shocks (i.e., community and national level shocks), and ability to mitigate the impacts of such shocks. Poor households may face the risk of remaining in poverty, and even falling deeper into it leading to perpetual poverty, especially if they may not have enough capacity and opportunities to secure better income and wealth prospects. Vulnerability is interesting in its own right, but it also has important implications for economic efficiency and long-run welfare of households. Those under a constant threat of poverty often engage in less risky and less profitable behavior than those who are not vulnerable to poverty (Eswaran and Kotwal 1990; Rosenzweig and Binswanger 1993; Dercon 1996). In the presence of credit constraints, shocks to welfare can lead poor households that are vulnerable to future poverty into a poverty trap (Morduch 1994). When poor people face a survival constraint, they may respond to negative shocks by adjusting consumption to defend or smooth their asset value and ensure their survival (Zimmerman and Carter 2003). In the Philippines, between 2003 and 2008, households with income shocks choose not to send their kids to school as a coping strategy (Albert and Ramos 2010).

Poverty is like a disease, not only carrying a stigma, but also requiring interventions given its harm (Chaudhuri 2003; Singh and Singh 2008). Approaches to poverty can be either curative (i.e., alleviating the conditions of the poor and/or helping them exit poverty, just like treating the sick), or preventive (i.e., protecting those vulnerable from the risks and harmful effects of poverty by building the resilience of the vulnerable, just like treating those at risk of getting sick). In the Philippines, government-initiated social protection programs,

such as the 4Ps and SocPen of the Department of Social Welfare and Development, were communicated as poverty reduction programs but are actually meant to build the resilience of the poor. For instance, cash transfers will not generally help in changing their poverty status but will only reduce the poverty gaps (i.e., the difference between the poverty thresholds and the poor's income) among the 4.4 million 4Ps beneficiaries and the indigent elderly among the 3 million SocPen beneficiaries. An examination of the 2013 Annual Poverty Indicator Survey data suggests that 4Ps has reduced the national poverty gap rate from 9.1 percent to 8.2 percent and also led to a drop in both total poverty and food poverty by 1.4-percentage points each (Acosta and Velarde 2015).

Households in the Philippines are quite heterogenous, but they may be clustered by interrelated socioeconomic dimensions of welfare. Key shocks and sources of vulnerability affecting households include those relating to labor and employment shocks (e.g., the loss of job of the household's breadwinner), price shocks (especially spikes in food prices), demographic-, reproductive-, and health-related shocks (such as the death or illness of a household member, especially the main income earner), and shocks from natural disasters (whether in the form of costs to livelihood or loss of life and assets).

In the hazard-exposure-vulnerability model of the Intergovernmental Panel on Climate Change (IPCC) (2007), vulnerability is nuanced in terms of disaster risk. This framework shows that population exposure and vulnerability, together, can turn a natural hazard into a natural disaster. Essentially using this IPCC model, the Philippines ranks third globally in being risk-prone, according to the latest World Risk Index[8] of the Institute for Environment and Human Security of the United Nations University (UNU-EHS 2017).

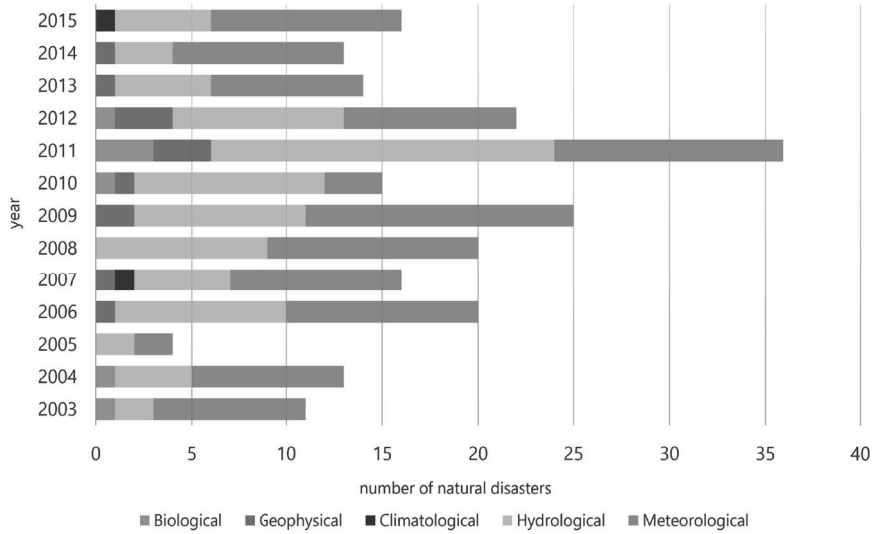
An examination of the Emergency Events Database (EM-DAT) of the Centre for Research on the Epidemiology of Disasters (CRED) shows that between 2003 and 2015, EM-DAT data suggest that the

[8] The World Risk Index is a composite index of risk computed for 171 countries worldwide on the basis of the following four components: (a) Exposure to natural hazards such as earthquakes, hurricanes, flooding, drought, and sea-level rise; (b) Vulnerability as measured by infrastructure, nutrition, living conditions, and economic circumstances; (c) Coping capacities as measured by indicators on governance, preparedness and early warning measures, access to health care and social and material security; and (d) Adapting capacities with respect to impending natural events, climate change, and other challenges.

Philippines had 225 natural disasters[9] (Figure 3). These disasters have resulted in 21,519 deaths and injured more than 172,000 persons in the country.

In 2009 alone, CRED[10] suggests that "the Philippines suffered immensely from natural disasters, as it was struck by two important disasters in 2009: tropical storm *Ondoy* (Ketsana), which affected 4.9 million victims, including 501 deaths, and typhoon *Pepeng* (Parma), which affected 4.5 million victims, including 539 deaths. Typhoon *Kiko* (Morakot) also affected the Philippines, with over 94,000 victims, including 26 deaths, but had worse impact on Taiwan and China.

Figure 3. Number of natural disaster events, by type of disaster: Philippines, 2003–2015



Source: Authors' calculations based on data from EM-DAT: The Emergency Events Database (https://www.emdat.be)

[9] CRED defines disaster as "a situation or event which overwhelms local capacity, necessitating a request for external assistance at a national or international level; an unforeseen and often sudden event that causes great damage, destruction and human suffering" (Below et al. 2009, p. 16). For a disaster to be recorded in the EM-DAT database, it has to meet one or more of the following four criteria: (a) 10 or more people are killed; (b) 100 people or more are reportedly affected; (c) a state of emergency is declared; and (d) an international call for assistance is issued.

[10] See *2009 Annual Disaster Statistical Review* compiled by the CRED (available at https://www.preventionweb.net/files/14382_ADSR2009.pdf)

Taiwan saw 10 percent of its population—or a total of 2.3 million victims including 630 deaths—affected by typhoon Morakot" (Vos et al. 2010, p. 11).

Globally, the country led in the frequency of occurrence of natural disasters with its experience of 25 disaster events in 2019 (Vos et al. 2010). Many of these natural hazards were quite intense, making the Philippines rank third across the world, next to India and Indonesia, in terms of natural-disaster-caused mortality with its 1,307 disaster-related deaths in 2009. The Philippines lies in the typhoon belt with more or less 18 to 20 typhoons visiting the country annually. It is also situated in the Pacific Ring of Fire, which makes the country rather highly disposed to natural hazards, particularly climatological hazards (typhoons), hydrological hazards (floods and tsunamis), and geophysical hazards (landslides, volcanic eruptions, and earthquakes). Aside from natural disasters, the country also experiences person-made disaster arising from insurgency, transportation accidents, and industrial accidents. The extent of exposure to natural and person-made disasters vary across the country, with some regions being more prone to certain disasters. For instance, Bicol is among the regions most visited by typhoons and with the most number of persons affected by storms—although the movements of storms in recent years has started to shift south (Thomas et al. 2012). ARMM, on the other hand, has the most reported events of armed conflicts arising from insurgencies.

Over the years, a number of studies have provided various approaches in defining and measuring vulnerability to monetary poverty (e.g., Calvo and Dercon 2005; Fujii 2016). Further, just as poverty has monetary and nonmonetary dimensions, vulnerability is likewise multidimensional. Brown (2017) points out that there are many faces or senses of vulnerability and that it is possible to be vulnerable yet able to cope or avoid harm. This, however, suggests risk. Further, vulnerability can connote a universal sense, i.e., a shared human vulnerability, which may not only be viewed as a fundamental feature of the human condition but also connected to individual circumstances (personal, economic, social, and cultural).

Vulnerability has both intrinsic and instrumental characteristics as welfare cannot only be limited to the present but also involves prospects of future well-being (Dercon 2001). Box 1, taken from Dercon (2001), provides a framework for analyzing vulnerability to poverty.

Box 1. A framework for analyzing vulnerability to poverty

Assets	Incomes	Well-being/capabilities
• human capital and labor • physical/financial capital • common and public goods • social capital	• returns to activities and assets • returns from asset disposal • savings, credit, and investment • transfers and remittances	Ability to obtain • consumption • nutrition • health • education
Examples of risk (assets) • loss of skills due to ill health or unemployment • land tenure insecurity • asset damage due to climate, war, and disaster • uncertain access to common and public goods • loss of value of financial assets	Examples of risk (incomes) • output fall due to climatic shocks, disease, and conflict • collapse of output prices • reduced returns on financial assets • uncertain cash flow during production • weak contract enforcement; wages not paid • imperfect information about opportunities	Examples of risk (well-being/capabilities) • price risk in food markets • food availability/ rationing • uncertain quality of public provision in health and education • imperfect information on how to achieve good health and nutrition

Source: Dercon (2001)

This framework on vulnerability to poverty also shows the importance of asset accumulation for building risk resilience among vulnerable households. Household assets can be bought at good times and sold during difficult conditions to smooth consumption over time, thus mitigating risks to welfare conditions (Carter and Zimmerman 2000; Zimmerman and Carter 2003). In the discussion of the natural and social rootedness of vulnerability, Farrington et al. (2002) pointed out that the basic tools applying development policy are either weak, absent, or co-opted by uncivil society where vulnerability is greatest. Further, some geographical areas in a country are nonviable hinterlands[11], facing recurring natural disasters, and/or chronic political instability.

While there are many frameworks on vulnerability, the concept, in essence, refers to exposure to contingencies and stress, as well as difficulties in coping with them. Fujii (2016) categorized approaches

[11] According to Farrington et al. (2002, p. 30), "there is a growing readiness to assume that there are no 'sustainable livelihoods' in marginal areas, since the local economy is simply 'not viable'. This classification is becoming common in referring to the hinterlands in Latin America where neo-liberal policies suggest that it is acceptable not to invest limited finances, as people are assumed to be better off migrating or finding different livelihoods, rather than remaining on their failing farms."

to vulnerability measurement into three: (a) the welfarist approach—which provides explicit specification of a utility or welfare function (Elbers and Gunning 2003; Ligon and Schechter 2003); (b) the expected poverty approach—where vulnerability relates to how likely it is for an individual to fall into poverty in a given time horizon (Ravallion 1988; Chaudhuri and Datt 2001; Chaudhuri et al. 2002; Chaudhuri 2003); and (c) the axiomatic approach—which derives a vulnerability measure from a set of axioms that identifies the properties an ideal vulnerability measure would satisfy (Calvo and Dercon 2005; Calvo and Dercon 2007). These approaches are, however, not necessarily mutually exclusive. In this study, the expected poverty approach developed by Chaudhuri (2003) involving a modified probit model for predicting the probability of a household falling into poverty is used.

Methodology

The previous section provided a review of trends on the macroeconomy and poverty, as well as literature discussing conceptual underpinnings regarding vulnerability measurement. Vulnerability is ex ante, i.e., forward looking and thus, strictly speaking, is unobservable as far as households are concerned. Poverty, on the other hand, is observable based on an examination of monetary or nonmonetary welfare indicators in relation to a "poverty line". Vulnerability assessments are always rooted in an explicit modelling of intertemporal household behavior to predict vulnerability status. Preferably, this should be undertaken with panel data. However, since panel data are scarcely collected, the model proposed by Chaudhuri (2003) involves an examination of cross-sectional data on household (and community) characteristics that put households at risk of experiencing future poverty. This model allows for the estimation of the chance of a household being poor in the future.

Vulnerability estimation under expected poverty

Chaudhuri (2003) provided a methodology for measuring vulnerability using data sourced from cross-sectional surveys, and illustrated this for several countries, including the Philippines (Chaudhuri and Datt 2001) and Indonesia (Chaudhuri et al. 2002). Several studies on Philippine data, e.g., Albert et al. (2007) as well as Albert and Ramos (2010), have adapted the Chaudhuri methodology to estimate vulnerability using income per

capita data, and official poverty lines. The use of income over expenditure data in these studies is largely on account of income being the official welfare indicator in the country. Further, income is observed to be more volatile over expenditure, but for a number of reasons.

Chaudhuri (2003) defined the vulnerability level of a household h at time t as the probability that the household will find itself at time $t+1$:

$$V_{ht} = Pr(Y_{h,t+1} \leq Z_h) \qquad (3.1)$$

where

$Y_{h,t+1}$ is the household's welfare indicator at time $t+1$ and

Z_h is the poverty line for the household (as official poverty thresholds vary across provinces, and by urban and rural location).

While vulnerability level is not directly observable—since it represents expectation of the household's welfare conditions in the next time period $t+1$—it may, however, be possible to arrive at a reasonable estimate of the level of the welfare indicator by building a model of the poverty determinants to predict the welfare conditions of the household in the next time period. As earlier pointed out, while this study follows Chaudhuri (2003), which illustrates vulnerability estimation using expenditure data, income per capita data was used instead. Per capita income of household h is modeled as

$$ln\ Y_h = X_h \beta + \varepsilon_h \qquad (3.2)$$

where

X_h represents a bundle of observable household and community characteristics that serve as explanatory variables of per capita income;

β is a vector of parameters; and

ε_h is a mean-zero disturbance term that captures idiosyncratic factors (shocks) that contribute to different per capita income levels for households that are otherwise observationally equivalent.

In addition, the variance of the disturbance term is assumed to be given by

$$\sigma^2_{e,h} = X_h \theta \qquad (3.3)$$

The set of covariates listed in Box 2 are variables on household characteristics including number of young members (aged below 15 years), proportion of household members who are adults (aged 15 years and above), and characteristics of the household head—educational attainment, age, and occupational characteristics, and household ownership of various assets and amenities—including use of electricity. To allow for spatial heterogeneity, indicator variables pertaining to the regions where the households reside were also part of the covariates. Furthermore, community shocks, e.g., price shocks, and experience of strong climate hazards at the provincial level were also used in the model as these are sources of household welfare risks.

Box 2. Variables used for estimating vulnerability

hh_employed	Number of working members in household (HH)
prodep	Proportion of young dependents in the HH
hoh_age	Age of head of household (HOH) in years
hoh_hgc_1	Indicator variable on highest grade completed of HOH = none
hoh_hgc_2	Indicator variable on highest grade completed of HOH = some elementary to elementary graduate
hoh_hgc_3	Indicator variable on highest grade completed of HOH = some high school to high school graduate
hoh_hgc_4	Indicator variable on highest grade completed of HOH = some college and beyond
hoh_male	Indicator variable on HOH being male
hoh_kb1	Indicator variable on employment sector of HOH = Agriculture
hoh_kb2	Indicator variable on employment sector of HOH = Industry
hoh_kb3	Indicator variable on employment sector of HOH = Services
hoh_kb4	Indicator variable on employment sector of HOH = None
selfemployed	Indicator variable on HOH being self-employed
hh_spousemp	Indicator variable on spouse of HOH being employed
hoh_empsec1	Employment of HOH: Agriculture and self-employed
hoh_empsec2	Employment of HOH: Agriculture and employed by others
hoh_empsec3	Employment of HOH: Industry and self-employed

Box 2. (continued)

hoh_empsec4	Employment of HOH: Industry and employed by others
hoh_empsec5	Employment of HOH: Services, self-employed
hoh_empsec6	Employment of HOH: Services, employed by others
own_hl	Indicator variable if HH owns or has owner-like possession of its residential house and lot (own_hl = 1, if yes; own_ hl=0, if no)
Electricity	Indicator variable if the HH has electricity (electricity = 1, if yes;
electricity = 0, if no)	
region1	Indicator of residing in Ilocos Region
region2	Indicator of residing in Cagayan Valley
region3	Indicator of residing in Central Luzon
region4	Indicator of residing in Bicol Region
region5	Indicator of residing in Western Visayas
region6	Indicator of residing in Central Visayas
region7	Indicator of residing in Eastern Visayas
region8	Indicator of residing in Western Mindanao
region9	Indicator of residing in Northern Mindanao
region10	Indicator of residing in Southern Mindanao
region11	Indicator of residing in Central Mindanao
region12	Indicator of residing in NCR
region13	Indicator of residing in CAR
region14	Indicator of residing in ARMM
region15	Indicator of residing in Caraga
region16	Indicator of residing in CALABARZON
region17	Indicator of residing in MIMAROPA
strong_roof	Indicator variable of residence made of strong materials
strong_walls	Indicator variable of walls of the house made of strong materials
Incprice	Indicator of severe increase in prices
Decprice	Indicator of severe decrease in prices
Storm	Indicator of experienced a severe tropical storm (signal #3)

NCR = National Capital Region; CAR = Cordillera Administrative Region; ARMM = Autonomous Region in Muslim Mindanao; CALABARZON = Cavite, Laguna, Batangas, Rizal, and Quezon provinces; MIMAROPA = Mindoro, Marinduque, Romblon, and Palawan provinces
Source: Authors' representation

Following Chaudhuri and Datt (2001), the parameters β and θ in equations (3.2) and (3.3) were estimated using a three-step feasible generalized least squares procedure suggested by Amemiya (1977):

- Equation (3.2) is estimated using ordinary least squares (OLS). The residuals from the estimated regression in equation (3.2) are subsequently used to estimate

$$\hat{e}^2_{OLS,h} = X_h \theta + \eta_h, \tag{3.4}$$

which allows us to have a measure of the idiosyncratic variance for each household.

- The predictions from equation (3.4) are then used to transform the equation

$$\frac{\hat{e}^2_{OLS,h}}{X_h\hat{\theta}_{LS}} = \frac{X_h\theta}{X_h\hat{\theta}_{LS}} + \frac{\eta_h}{X_h\hat{\theta}_{LS}}. \tag{3.5}$$

This transformed equation is estimated using OLS to obtain $\hat{\theta}_{FGLS}$. Note that $X_h\hat{\theta}_{FGLS}$ is a consistent estimate of $\sigma^2_{e,h}$, and thus the estimates of the standard deviation

$$\hat{\sigma}_{e,h} = \sqrt{X_h\hat{\theta}_{FGLS}} \tag{3.6}$$

can afterward be used to transform equation (3.2) as

$$\frac{ln\, Y_h}{\sqrt{X_h\hat{\theta}_{FGLS}}} = \frac{X_h}{\sqrt{X_h\hat{\theta}_{FGLS}}}\beta + \frac{e_h}{\sqrt{X_h\hat{\theta}_{FGLS}}}. \tag{3.7}$$

- OLS estimation of equation (3.7) yields an estimate of β, denoted as $\hat{\beta}_{FGLS}$. The standard error of $\hat{\beta}_{FGLS}$ can be obtained by dividing the reported standard error by the standard error of the regression. Using the estimates $\hat{\beta}_{FGLS}$ and $\hat{\theta}_{FGLS}$ obtained, the expected log per capita income can be estimated as

$$E\left(\ln \hat{Y}_h \mid X_h\right) = X_h\,\hat{\beta}_{FGLS} \tag{3.8}$$

and the variance of the log per capita income as

$$Var\left(\ln \hat{Y}_h \mid X_h\right) = \hat{\sigma}^2_{e,h} = X_h\hat{\theta}_{FGLS} \tag{3.9}$$

for each household *h*. This assumes that the covariates do not change from one time period to the next.

By assuming that income per capita is log-normally distributed, these estimates can be used to form an estimate of the probability that a household with the characteristics X_h will be poor, i.e., the probability level of the household's vulnerability. Letting Φ(.) denote the cumulative distribution function of the standard normal distribution, this estimated probability will be given by

$$\hat{v}_h = \Pr\left(\ln \hat{Y}_h < \ln Z_h \mid X_h\right) = \Phi\left[\frac{\ln Z_h - X_h \hat{\beta}_{FGLS}}{\sqrt{X_h \hat{\theta}_{FGLS}}}\right]. \quad (3.10)$$

After generating estimates of the probability of being poor in the future, it is then important to choose a vulnerability threshold. Following Chaudhuri (2003), two natural thresholds for the vulnerability estimates were considered—the observed national poverty rate and a threshold of 50 percent. The rationale for choosing the former is that it is possible to determine a household that is more likely than the typical household to be poor in the next period, while a threshold of 50 percent would enable the identification of a household having at least an even chance of being poor in the next time period. Using these two thresholds, households are operationally defined to be

- **highly vulnerable**, if the vulnerability level is greater than 50 percent;
- **relatively vulnerable**, if the household is vulnerable but not highly vulnerable;
- **vulnerable**, if the predicted vulnerability level is greater than the national poverty rate (i.e., if the household is either highly vulnerable or relatively vulnerable); and
- **not vulnerable**, if the predicted vulnerability level is less than or equal to the national poverty rate.

Estimation issues

As Chaudhuri and Datt (2001) pointed out, substantive issues arise in the implementation of the procedure outlined in the previous section. The observed welfare indicator may have measurement errors. In this case, income has the tendency to be biased downward especially in urban areas, which can lead to biases in estimating the mean of the squared residuals

in (3.1), which then leads to biased estimates of (3.3) and (3.4). These will ultimately result in biased estimates of the variance of income, log-income, and vulnerability. To correct these, multiplicative adjustment can be done to the estimated variances. This is by ensuring that the predicted median income is the actual median income for each of the areas estimating a separate set of regressions, which, in this case, are urban and rural areas. Another but rather minor issue is that the possibility of having nonpositive estimates of the variance $\sigma^2_{e,h}$, i.e., $X_h\hat{\theta}_{FGLS}$. In practice, there were only two nonpositive estimates out of the 42,094 observations in 2003. Hence, data on these were excluded in the analysis.

According to the sampling design of the FIES, particularly for the survey rounds from 2003 to 2012, the FIES has four replicates. Further, sample households for one of the replicates of the 2003 FIES were also interviewed for the 2006 FIES and the 2009 FIES forming a panel data. The FIES panel data for 2003, 2006, and 2009 provide useful information on the change in living conditions of households across time from 2003 to 2009, especially in the wake of the global financial and economic crisis in 2008. This panel data can validate the empirical results of estimating household vulnerability to income poverty in 2003—since the data include actual poverty status of households in 2006 and 2009.

Empirical Findings

The overall picture of household poverty and vulnerability in the country based on the 2003 FIES and the methodology is shown in Table 4. The estimated vulnerability levels—i.e., probability of being poor in the future—averages 28 percent for all households and 51 percent for poor households in 2003. Although 20 percent of households were poor, the rate of household vulnerability is 55 percent across the country. While 6 percent of the poor are not vulnerable, 45 percent of the nonpoor are vulnerable. Not all the poor are vulnerable: the bulk (66%) of the vulnerable are nonpoor. Further, not all the nonvulnerable are nonpoor—3 percent of the nonvulnerable households are poor.

Table 5 shows that 19 out of 20 poor households in 2003 were classified as vulnerable. Among the low-income households that are not poor in 2003, about 18 percent and 53 percent are highly vulnerable and relatively vulnerable, respectively. Among other households that are not in the lower income, i.e., those with incomes more than twice the poverty threshold, about 7 out of 10 are not vulnerable, as of 2003.

Table 4. Household poverty and vulnerability: Philippines, 2003

	All	Observed Poor?		Vulnerable?		Highly Vulnerable?	
		No	Yes	No	Yes	No	Yes
Fraction observed poor	0.20	0.00	1.00	0.03	0.34	0.11	0.59
Vulnerability							
Vulnerability level: mean	0.28	0.22	0.51	0.12	0.54	0.34	0.65
Fraction vulnerable	0.55	0.45	0.94	0.00	1.00	0.45	1.00
Fraction relatively vulnerable	0.37	0.36	0.39	0.00	0.67	0.45	0.00
Fraction highly vulnerable	0.18	0.09	0.54	0.00	0.33	0.00	1.00

Source: Authors' calculations based on 2003 Family Income and Expenditure Survey conducted by the Philippine Statistics Authority

Table 5. Household vulnerability and household income group status: Philippines, 2003

Vulnerability Status	Income Group (2003)			
	Poor	Low Income but Not Poor	Not Low Income	All Households
Highly vulnerable	54.5	17.8	3.6	18.4
Relatively vulnerable	39.1	53.1	24.3	36.7
Not vulnerable	6.4	29.1	72.1	44.9
Total	100.0	100.0	100.0	100.0

Source: Authors' calculations based on 2003 Family Income and Expenditure Survey conducted by the Philippine Statistics Authority

Since 6,517 households in the 2003 FIES were also interviewed for the 2006 FIES and 2009 FIES, vulnerability estimates in 2003 may have predicted the household poverty status in 2006 and in 2009, especially as the poverty status of households interviewed in the 2003-2006-2009 FIES panel was observed. Note that appropriate panel data weights needed to make the panel nationally representative across the years are not directly available from the PSA. In this report, post-stratified panel weights have

been computed adjusting the household weights within the per capita income deciles of the survey waves to account for attrition biases across the income distribution. From 2003 to 2009, the overall attrition rate of the panel was 38 percent, but the attrition rate was lower (35%) in the bottom seven per capita income deciles compared to the richest three per capita income deciles (44%). Consequently, since FIES is designed to have reliable sampling domains at the regional level, the panel weights made use of income decile post-stratifications at the regional level.

Since households were likely to have gotten affected by the global financial and economic crisis that started in 2008, an investigation of the actual poverty status of the households in 2006 and 2009 using the 2003-2006-2009 FIES panel would help validate the vulnerability estimates derived in this study.

Findings from panel data

As shown in Table 6, among the panel households that were poor in both 2006 and 2009, three-fifths (60.7%) were identified as highly vulnerable and another third (34.9%) were relatively vulnerable in 2003. Among households that were poor in either 2006 or 2009, but not both, half or more were classified as relatively vulnerable. Four-fifths (79.9%) of households that were not low income in both 2006 and 2009 were classified not vulnerable in 2003.

Table 6. Vulnerability status of households in 2003 by income groups: Philippines, 2006 and 2009

Income Groups in 2006 and 2009	Vulnerability Status in 2003		
	Highly Vulnerable	Relatively Vulnerable	Not Vulnerable
Poor in both 2006 and 2009	60.7	34.9	4.3
Poor in 2006; low income but not poor in 2009	37.2	50.3	12.5
Poor in 2006; not low income in 2009	27.5	50.7	21.9
Low income but not poor in 2006, poor in 2009	24.7	56.6	18.7
Low income but not poor in both 2006 and 2009	16.2	53.6	30.2

Table 6. (continued)

Income Groups in 2006 and 2009	Vulnerability Status in 2003		
	Highly Vulnerable	Relatively Vulnerable	Not Vulnerable
Low income but not poor in 2006, others in 2009	8.0	42.0	50.1
Not low income in 2006, poor in 2009	15.6	56.3	28.1
Not low income in 2006; low income but not poor in 2009	6.1	37.0	56.9
Not low income in both 2006 and 2009	2.2	18.0	79.9
All households	17.8	35.5	46.7

Source: Authors' calculations based on 2003, 2006, and 2009 Family Income and Expenditure Survey conducted by the Philippine Statistics Authority

Considering the vulnerability status of households in 2003, nearly half (47.4%) of households identified as highly vulnerable in 2003 were poor in both 2006 and 2009, and more than a quarter (28.1%) experienced poverty either in 2006 or 2009 but not both (Table 7). Among the relatively vulnerable households in 2003, about two-thirds (65.4%) were low income and possibly poor in either 2006 or 2009 or both. Four-fifths (81.4%) of not vulnerable households in 2003 were not low income in both 2006 and 2009. These results on the panel data suggest that the vulnerability estimation model of Chaudhuri (2002) employed in this study has very strong predictive power of identifying the future poverty status of households.

Table 7. Household income groups in 2006 and 2009, by vulnerability status in 2003

Income Groups in 2006 and 2009	Vulnerability Status in 2003			
	Highly Vulnerable	Relatively Vulnerable	Not Vulnerable	All Households
Poor in both 2006 and 2009	47.4	13.6	1.3	13.9
Poor in 2006; low income but not poor in 2009	14.3	9.7	1.8	6.8

Table 7. (continued)

Income Groups in 2006 and 2009	Vulnerability Status in 2003			
	Highly Vulnerable	Relatively Vulnerable	Not Vulnerable	All Households
Poor in 2006; not low income in 2009	1.5	1.4	0.5	1.0
Low income but not poor in 2006, poor in 2009	8.6	9.9	2.5	6.2
Low income but not poor in both 2006 and 2009	16.7	27.6	11.8	18.3
Low income but not poor in 2006, others in 2009	3.7	9.6	8.7	8.1
Not low income in 2006, poor in 2009	0.6	1.0	0.4	0.6
Not low income in 2006; low income but not poor in 2009	2.8	8.6	10.1	8.3
Not low income in both 2006 and 2009	4.5	18.6	63.0	36.9
Total	100.0	100.0	100.0	100.0

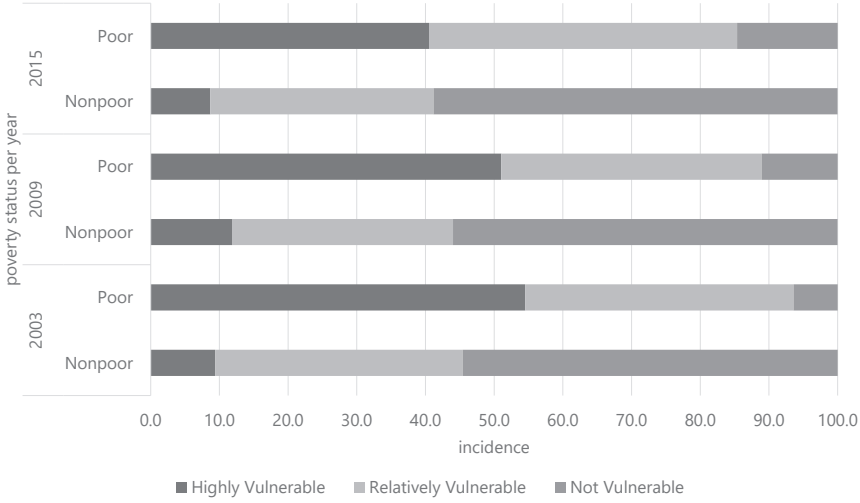
Source: Authors' calculations based on 2003, 2006, and 2009 Family Income and Expenditure Survey conducted by the Philippine Statistics Authority

Overall trends in vulnerability

In the period 2003–2015, the proportion of households in the Philippines vulnerable to income poverty was around double to triple the corresponding official estimates of households in poverty (Figure 4).

Household vulnerability rates, however, steadily declined from 55.1 percent in 2003 to 48.5 percent in 2015. Among poor households, the proportion found to be highly vulnerable to income poverty also decreased from 54.5 percent in 2003 to 40.5 percent in 2015. This shows that the degree of high vulnerability among Filipino households has concomitantly decreased with poverty rates in the country across the years. Even high-vulnerable status among poor households has decreased considerably on account of increased resilience to risks in household welfare. The latter likely resulted from improved targeting of public interventions meant to assist poor households—including social assistance transfers and safety nets, coupled with increased human capital, as well as improved wage incomes and wealth accumulation arising from labor migration out of the agriculture sector—and increased remittances from

Figure 4. Incidence of household vulnerability by poverty status: Philippines, 2003, 2009, and 2015



Source: Authors' calculations based on 2003, 2009, and 2015 Family Income an Expenditure Survey conducted by the Philippine Statistics Authority

domestic and overseas sources among low-income and poor families (Albert et al. 2018; WB 2018).

The overall percentage of households that are relatively vulnerable also decreased, however at substantially lesser rates from 36.7 percent in 2003 to 34.5 percent in 2015. This shows that the increase in the proportion of poor households that are relatively vulnerable offsets the decline in the proportion of relatively vulnerable nonpoor households. As of 2015, about three-fifths (58.8%) of nonpoor households are classified as not vulnerable to poverty, but the bulk of vulnerable households continue to be nonpoor households (71%). In 2015, about one-seventh (13.9%) of households throughout the country were highly vulnerable and about a third (34.9%) were relatively vulnerable. Thus, as of 2015, about half (48.5%) of Filipino households are vulnerable to income poverty, a third of which are highly vulnerable.

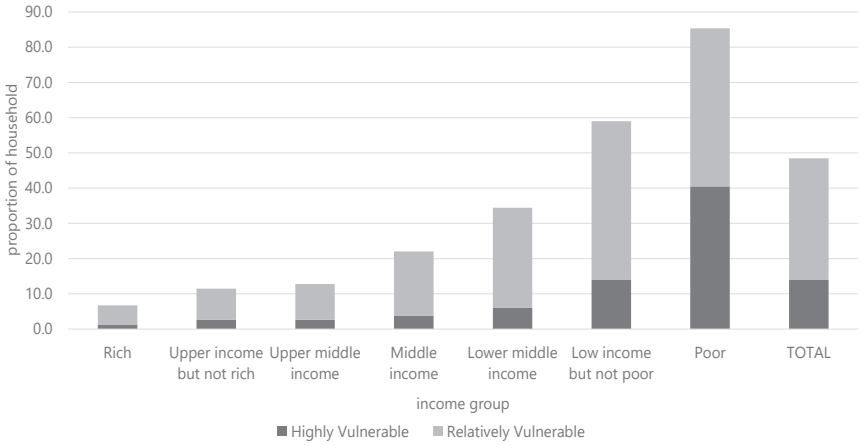
Although the proportion of the poor deemed highly vulnerable decreased from 2003 to 2015, the vulnerability of nonpoor has been steady, as the nonpoor were less exposed to welfare risks and had better

access to resources and welfare. Armed with better incomes, either from wages or steady income sources, the nonpoor are less sensitive to the impacts of various crises with better abilities (than the poor) to cope with them and better capacity (than the poor) to adapt to potential risks and repeated setbacks. It is also worth noting that, among the poor, the proportion of the relatively vulnerable had less variability than the proportion estimates of the highly vulnerable from 2003 to 2015. The relatively vulnerable and highly vulnerable may be vulnerable for different reasons, e.g., income volatility for the former, and low long-term income prospects for the latter. While the government may be reducing the vulnerabilities of the highly vulnerable from their low endowments with targeted social assistance interventions, e.g., 4Ps income transfers, there is a lack of effective ex ante interventions for reducing risks faced by the relatively vulnerable proportion or insuring them against such risks. Too little attention has been given to reducing those who are not "income poor" when actually some of the "near poor" may easily fall into income poverty.

Since vulnerability and poverty are both conceptually tied to income, their incidence is also dependent on the position of households in the per capita income distribution. In particular, Figure 5 illustrates that the incidence of poverty vulnerability decreases as Filipino households move up the income ladder. Note that the income classes used in this study follow those proposed in Albert et al. 2018 for defining the middle-income classes in the Philippines, i.e., dividing per capita income distribution using thresholds based on multiples of the official poverty line. In 2015, the vulnerability rate of lower middle-income households is registered to be about half that of low income but nonpoor households. Upper income households are practically not highly vulnerable with only 5 percent of them considered relatively vulnerable, as of 2015.

As of 2015, the rural population is more vulnerable than its urban counterpart, with vulnerability rates at two-thirds (69.3%) of all households in rural areas compared to two-fifths (40.4%) of urban households. Although vulnerability is a largely rural phenomenon, the proportion of highly vulnerable households in rural areas has declined by 7.1-percentage points from 27.6 percent in 2003 to 20.5 percent in 2015 (Table 8).

Figure 5. Proportion of households that are highly vulnerable and relatively vulnerable, by income groups: Philippines, 2015



Source: Authors' calculations based on 2015 Family Income and Expenditure Survey conducted by the Philippine Statistics Authority

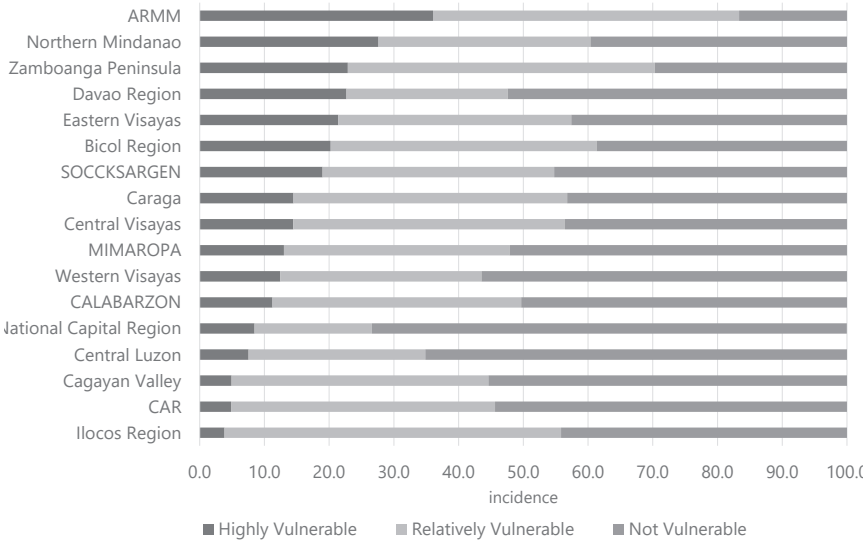
Table 8. Vulnerability status of households in urban and rural areas: Philippines, 2003, 2009, and 2015

Year	Area	Highly Vulnerable	Relatively Vulnerable	Not Vulnerable
			(in %)	
2003	Rural	27.6	48.7	23.7
	Urban	14.8	26.0	59.2
	National	21.2	37.5	41.3
2009	Rural	27.1	40.9	32.0
	Urban	16.9	26.2	56.9
	National	22.6	34.4	43.1
2015	Rural	20.5	48.8	30.7
	Urban	15.5	24.9	59.6
	National	18.3	38.4	43.3

Source: Authors' calculations based on 2003, 2009, and 2015 Family Income and Expenditure Survey conducted by the Philippine Statistics Authority

Across the regions, ARMM is the most vulnerable region (83.3%) with more than two-fifths of households being highly vulnerable (Figure 6). Ilocos Region has the lowest proportion of households (3.8%) that are highly vulnerable, but as much as 52 percent of its households are relatively vulnerable—putting it in the middle ranking as far as vulnerability rate is concerned. NCR (26.6%) and Central Luzon (34.9%) are the only regions with overall vulnerability rates below 35 percent. Persistent conflicts in Mindanao, especially in ARMM, coupled with tenacious natural disasters, including climate types in disaster-prone regions, have put these regions into much higher vulnerability levels than NCR and nearby regions. The lack of peace and security or the frequency of natural hazards yield physical damages and economic losses, aside from weakening human capital. The confluence of conflict/disaster prevalence and weak governance also significantly affects investments necessary for economic activity that, in turn, reduces opportunities for income mobility in these conflict/disaster-prone regions.

Figure 6. Incidence of household vulnerability by region: Philippines, 2015



ARMM = Autonomous Region in Muslim Mindanao; SOCCSKSARGEN = South Cotabato, Cotabato, Sultan Kudarat, Sarangani and General Santos; MIMAROPA = Mindoro, Marinduque, Romblon, and Palawan provinces; CALABARZON = Cavite, Laguna, Batangas, Rizal, and Quezon provinces; CAR = Cordillera Administrative Region
Source: Authors' calculations based on 2015 Family Income and Expenditure Survey conducted by the Philippine Statistics Authority

Vulnerability of basic sectors

Republic Act 8425 or the Social Reform and Poverty Alleviation Act provided the government's framework for social protection and defining poverty. The law also identifies 14 basic sectors that require focused intervention for poverty alleviation, namely, (1) farmer-peasant, (2) artisanal fisherfolk,(3) workers in the formal sector and migrant workers, (4) workers in the informal sector, (5) indigenous peoples and cultural communities, (6) women, (7) differently abled persons, (8) senior citizens, (9) victims of calamities and disasters, (10) youth and students, (11) children, (12) urban poor, (13) cooperatives, and (14) nongovernment organizations. Among these 14 sectors, PSA has obtained estimates of poverty for 9 of the 14 basic sectors making use of merged Labor Force Survey (LFS)-FIES data. The basic assumption here is that individuals belonging to poor households are themselves considered poor. While, in practice, there are intrahousehold differences, this assumption is made to yield poverty estimates for the corresponding populations of these basic sectors. Table 9 shows the vulnerability proportions for some of the basic sectors, which were also based on merged results of the

Table 9. Poverty and vulnerability rates for basic sectors

Basic Sector	Poverty Rate	Vulnerability Level		
		Highly Vulnerable	Relatively Vulnerable	Nonvulnerable
		(in %)		
Farmers	34.3	24.7	48.2	27.1
Fishermen	34.0	33.4	50.5	16.1
Children	31.4	25.4	41.4	33.2
Self-employed and unpaid family workers	25.0	18.3	42.5	39.2
Women	22.5	18.1	37.9	44.0
Youth	19.4	14.6	38.4	47.1
Migrants and workers employed in formal sector	13.4	11.5	35.0	53.6
Senior citizens	13.2	7.5	31.5	61.0
Individuals in urban areas	11.5	14.7	23.2	62.1
All Filipinos	21.6	26.7	36.1	37.3

Source: Authors' calculations based on merged 2015 Labor Force Survey – Family Income Expenditure Survey conducted by the Philippine Statistics Authority

LFS-FIES. It is generally observed that vulnerability rates are much higher than corresponding poverty rates. Further, the vulnerability rates are consistently highest for fisherfolk, farmers, and children. Consistent with patterns in poverty rates, the lowest vulnerability rates are also observed for persons residing in urban areas and for senior citizens.

The most vulnerable sectors, particularly the farmers, fisherfolk, and children, have benefitted from social assistance (direct in-kind assistance, rice nutrition and school feeding programs, assistance to the elderly, and various care services) and social safety nets (emergency assistance, price or electricity subsidies, and emergency loans). By far, the biggest social assistance program in the country is 4Ps. Formerly called *Ahon Pamilyang Pilipino*, the program was piloted in 2007 among 6,000 household-beneficiaries[12] and was launched nationwide in 2008 to build human capital for 300,000 poor households.[13] The program was designed to provide cash transfers for poor households on the condition that these households invest in their education and health, particularly those of their children aged 0 to 14 years, and that they improve their availment of maternal health services.

Aside from capacity gaps among agencies assigned to deliver frontline social assistance services, safety nets and other social protection systems, there have been concerns about implementation deficits, including fragmentation, inefficient implementation, program leakages, exclusion and inclusion errors, and susceptibility to patronage politics (Manasan 2009; Orbeta 2011; Villar 2013; Albert and Dacuycuy 2017; Diokno-Sicat and Mariano 2018). The next section discusses the implications of the empirical results for one basic sector, namely, senior citizens, considering the Department of Social Welfare and Development (DSWD)-inititiated SocPen that provides noncontributory pension support, i.e., social assistance, for indigent seniors.

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[12] Pilot implementation of the conditional cash transfer worth PHP 50 million was conducted in municipalities of Sibagat and Esperanza in Agusan del Sur, in the municipalities of Lopez Jaena and Bonifacio in Misamis Occidental, and in the cities of Pasay and Caloocan in Metro Manila.

[13] These households were selected from the 20 poorest provinces (with the exception of three ARMM provinces) as well as the poorest province in each of the five regions not represented by the 20 poorest provinces. In each of the poorest provinces, the poorest municipalities were selected based on the small area estimate of poverty incidence released by the, now defunct, National Statistics Coordination Board, as well as the peace and order situation in the area. A household enumeration of these areas was then administered in the selected municipalities. Subsequently, households were then selected on the basis of a proxy means test for identifying poor households in the enumerated areas.

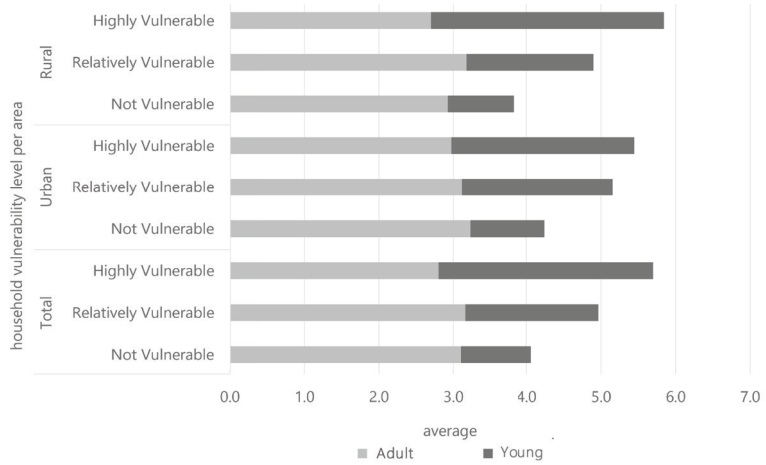
Sources of risks of income variability

As pointed out earlier, labor and employment, price, and demographic factors are key sources of income variability and shocks. Average family size among the nonvulnerable households is much smaller than those of vulnerable households, especially highly vulnerable ones. As Figure 7 illustrates, the disparity in 2015 is largely on account of the number of young members in the household (though this is also observable even from 2003 to 2012).

Highly vulnerable households in rural areas have larger family sizes (5.8) than counterparts in urban areas (5.4). There are also more young members (3.1) than adults (2.7) for highly vulnerable households in rural areas. There are about twice as many adults (3.2) than young members (1.8) for relatively vulnerable households. Further, for households identified as not vulnerable, there are more than three times the number of adults (3.1) than the young (1.0). Thus, demographic patterns among households, particularly the size of their families—especially the number of young member—appear to be contributing to additional risks for vulnerability to poverty regardless of the area where the household resides, i.e., whether in urban or rural areas.

While the attributes of all household members can be examined based on information from the merged LFS-FIES, analysis is limited

Figure 7. Average number of young and adult members in urban and rural areas by household vulnerability level: Philippines, 2015



Source: Authors' calculations based on 2015 Family Income and Expenditure Survey conducted by the Philippine Statistics Authority

to educational attainment, income sources, and the major sector of employment of household heads. Similar patterns can also be observed for all members of the household who are in the labor force.

Higher educational attainment is associated with a lower risk for households to be vulnerable to income poverty. The vulnerability rate of households drops as the educational attainment of the household head increases (Table 10). More than half (53.2%) of households with heads who did not have education are highly vulnerable, and another quarter (24.8%) are relatively vulnerable. About two-thirds (66.1%) of households with heads that have had some elementary education (including those who finished at most elementary) are vulnerable, while less than half (44.0%) of those with heads who have had some high school education—including those who finished at most high school—are vulnerable. In contrast, only a quarter (24.7%) of households with heads who at least attended college are vulnerable to poverty. This suggests the importance of human capital investments not only by the government but also by the households themselves. More often than not, the poor have difficulty making investments in the schooling of their young because of pressing immediate needs given their limited incomes. The decision to invest little in the schooling of children puts the entire household at increased risks of vulnerability. Thus, government interventions on social protection, particularly those with effects on education such as 4Ps, need to continuously incentivize poor families into giving more investments in the schooling of their children especially given evidence that 4Ps has

Table 10. Incidence of vulnerability among households, by highest educational attainment of the head: Philippines, 2015

Highest Educational Attainment	Highly Vulnerable	Relatively Vulnerable	Not Vulnerable	Total
None	53.2	24.8	22.0	100.0
Some elementary to elementary graduate	20.1	46.0	34.0	100.0
Some high school to high school graduate	10.9	33.1	56.0	100.0
Some college and beyond	5.1	19.6	75.3	100.0
Total	13.9	34.5	51.5	100.0

Source: Authors' calculations based on 2015 Family Income and Expenditure Survey conducted by the Philippine Statistics Authority

improved school attendance of poor students in the country (Albert et al. 2015). It should, of course, be noted that the association between education and vulnerability is not just one-way, i.e., the higher its income, the more likely a household invests in the education of the children. This two-way causation is more serious for children and youths.

In 2015, vulnerability rates of over 25 percent are observed among households whose heads had major income sources from fishing, forestry, mining, income from family sustenance activities, wage/salaries from agricultural activities, crop farming, and gardening (Table 11). On the other hand, low vulnerability rates are noticed among households whose heads have major income sources from wage/salary from nonagricultural activities and from wholesale and retail; community, etc. services; construction entrepreneurial activity, not elsewhere classified; net share of crops and others; and assistance from abroad. In addition, the proportion of households under these major income sources that are highly vulnerable are at around 10 percent or less.

Table 11. Household vulnerability, by major income source of household heads: Philippines, 2015

Major Income Source	Highly Vulnerable	Relatively Vulnerable	Not Vulnerable	Total
Wage/salary from agricultural activity	27.8	43.3	28.9	100.0
Wage/salary from nonagricultural activity	10.5	31.9	57.6	100.0
Crop farming and gardening	27.3	46.4	26.4	100.0
Livestock and poultry-raising	21.4	47.4	31.2	100.0
Fishing	37.2	46.9	16.0	100.0
Forestry and hunting	33.1	55.7	11.1	100.0
Wholesale and retail	7.9	34.5	57.7	100.0
Manufacturing	12.2	32.8	55.0	100.0
Community, etc. services	8.0	26.1	65.9	100.0
Transport and communication	11.6	39.9	48.5	100.0
Mining	17.3	60.5	22.2	100.0
Construction	7.6	14.4	78.0	100.0
Entrepreneurial activity, not elsewhere classified	5.8	24.3	69.9	100.0
Net share of crops and others	10.3	39.4	50.3	100.0
Assistance from abroad	10.4	32.2	57.4	100.0

Table 11. (continued)

Major Income Source	Highly Vulnerable	Relatively Vulnerable	Not Vulnerable	Total
Assistance from domestic source	19.7	39.4	40.9	100.0
Rental of lands and other properties	6.2	14.1	79.7	100.0
Interests from banks /loans	0.0	0.0	100.0	100.0
Pensions and retirements benefits	2.9	16.8	80.3	100.0
Dividend from investments	5.5	31.5	63.0	100.0
Rental value of owner-occupied dwelling unit for income	4.6	19.7	75.8	100.0
Income from family sustenance activities	29.8	48.9	21.3	100.0
Received as gifts	10.6	35.0	54.5	100.0
Other income	55.1	34.1	10.8	100.0
TOTAL	13.9	34.5	51.5	100.0

Source: Authors' calculations based on merged 2015 Family Income and Expenditure Survey conducted by the Philippine Statistics Authority

Those engaged in mining are not highly vulnerable, but the sector has the biggest incidence of relative vulnerability as disaggregated data suggests that about 7 out of 10 are either self-employed or are working without pay in a family business. Furthermore, least vulnerable are households with heads whose major income sources are interests from banks/loans; pensions and retirements benefits; rental of lands and other properties; construction rental value of owner-occupied dwelling unit for income; entrepreneurial activity, not elsewhere classified; community, etc. services; dividend from investments; wholesale and retail wage/salary from nonagricultural activity; assistance from abroad; manufacturing; received as gifts; and net share of crops and others. Disaggregated data on highest grade completed suggest that these household heads have had the highest educational attainment, thus showing the correlation of human capital development with sustainable income as suggested earlier in the essay.

As of 2015, close to 10 percent of households have at least one member working as an overseas Filipino worker (OFW). Studies have shown the important role of OFW members in economic mobility among Filipinos. Ducanes and Abella (2008) found that migrant families climb up by 6-percentage points in the income percentile ranking within a one-year period. Table 12 shows that households among those with

at least one OFW member are not only less poor but also has lower overall vulnerability rate (43.8%) compared to households without an OFW member (48.9%) by 5.1-percentage points. Among the nonpoor, overall vulnerability drops across income strata. Among the poor, overall vulnerability does not drop, but the incidence of high vulnerability can drop significantly with the presence of an OFW member.

Table 12. Household vulnerability, by presence of an overseas Filipino worker: Philippines, 2015

Presence of Overseas Filipino Worker (OFW)	Income Group	Vulnerability Level			Total
		Highly Vulnerable	Relatively Vulnerable	Not Vulnerable	
Households without an OFW member	Poor	40.7	44.8	14.6	100
	Low Income but not Poor	13.9	44.9	41.3	100
	Low middle income	5.4	27.8	66.8	100
	Rest of Households	2.9	15.4	81.7	100
	Total	14.2	34.7	51.1	100
Households with at least one OFW member	Poor	31.3	51.4	17.3	100
	Low Income but not Poor	15.9	48.0	36.0	100
	Low middle income	10.3	33.9	55.9	100
	Rest of Households	6.5	23.2	70.3	100
	Total	10.7	33.1	56.2	100

Source: Authors' calculations based on merged 2015 Family Income and Expenditure Survey conducted by the Philippine Statistics Authority

Bird (2009) noted that while the distribution of families with at least one member who is an OFW are more likely to be nonpoor, at least 5 percent of the population would have been poor in a counterfactual scenario without the remittances. In 2015, about three in 10 families received remittances from abroad. Table 13 shows that foreign remittances contribute to reducing vulnerability to income poverty. In a future study, this may also be considered as part of the variables in the model.

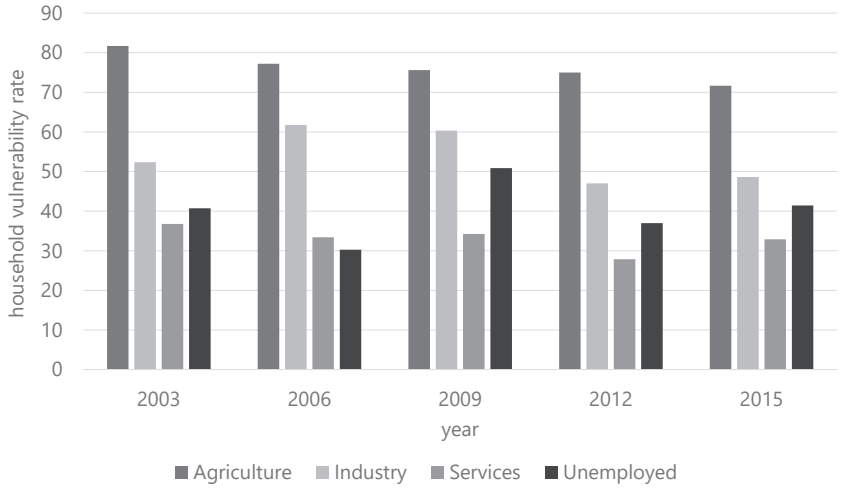
Table 13. Household vulnerability, by type of remittance received by household: Philippines, 2015

Households by Remittances Received	Poverty Rate	Vulnerability Level			Total
		Highly Vulnerable	Relatively Vulnerable	Not Vulnerable	
Domestic remittances only	32.7	23.5	41.1	35.4	100
Foreign remittances only	3.1	8.1	28.3	63. 6	100
Both domestic and foreign remittance	11.8	13.8	38.2	48.0	100
No remittances	12.8	10.4	31.6	58.0	100
All Households	21.0	17.1	37.0	45.8	100

Source: Authors' calculations based on merged 2015 Family Income and Expenditure Survey conducted by the Philippine Statistics Authority

Figure 8 provides a historical portrait of household vulnerability rates by sector of employment of household head from 2003 to 2015. While the vulnerability of households with heads dependent on agriculture declined from 82 percent in 2003 to 72 percent in 2015, the agriculture sector still has the highest vulnerability rate among household heads primarily dependent on each of the major sectors. Households with heads employed in services has consistently been found to be least vulnerable at 33 percent in 2015. As of 2015, half (49%) of households with heads working in industry sector are vulnerable to poverty, and about two-fifths (41%) of households with unemployed heads are vulnerable. While it may seem surprising why those engaged in the industry have higher vulnerability rates than those in services—especially as the average basic pay per day in industry is the highest among those with permanent jobs, disaggregated data suggest that the much higher proportion of those in services are in permanent jobs (and with much higher hours at work) than those in industry.

Figure 8. Household vulnerability rates by major sector of employment of the household head: Philippines, 2003–2015



Source: Authors' calculations based on 2015 Family Income and Expenditure Survey conducted by the Philippine Statistics Authority

Policy Issues and Ways Forward

The main mechanism for addressing vulnerability to income poverty is managing risks systematically, particularly building risk resilience through social protection. The country's framework for social protection focuses on managing situations that adversely affect the wellbeing of the poor and various vulnerable groups. Since 2007, the government has adopted a definition of social protection as

> "policies and programs that seek to reduce poverty and vulnerability to risks and enhance the social status and rights of the marginalized by promoting and protecting livelihood and employment, protecting against hazards and sudden loss of income, and improving people's capacity to manage risks.[14]"

Such definition suggests that social protection has protective, preventative, promotive, and transformative functions (Devereux and Sabates-Wheeler 2004). Instruments on social protection have purposes

[14] Resolution No. 1, series of 2007 of the Social Development Committee of the National Economic and Development Authority (see Villar 2013).

on providing relief from deprivations of minimum basic needs, as well as enabling poor and vulnerable households to invest in the development of their human capital whether directly or indirectly. Aside from being a social assistance, social protection is also a human capital investment that may result in asset accumulation and capacity development which empowers the poor to break away from intergenerational poverty (Barrientos and Hume 2008). Aside from providing means for the vulnerable to stabilize their income and consumption in the wake of risks from ill effects of natural hazards, social protection also builds risk resilience by averting gaps in needs. (Devereux and Sabates-Wheeler 2004). Further, when viewed with a human rights dimension, social protection also empowers everyone to attain decent living conditions (Jones and Shahrokh 2013).

Social protection has figured prominently in the country's development agenda. The *Philippine Development Plan (PDP) 2010–2016* and the current *PDP 2017–2022* both give emphasis on social protection building resilience to withstand harms posed by welfare risks for the poor and vulnerable groups (NEDA 2011, 2017). The PDP puts flesh into how the country can attain its long-term development vision of a prosperous and predominantly middle-class society where no one is poor, articulated in *Ambisyon Natin 2040* (NEDA 2015). The country has also committed to the SDGs which have a guiding principle of leaving no one behind (UN 2015).

The forms of social protection instruments in the country are rather wide, owing to their differing functions from building human capital to improving livelihoods, building risk resilience, and reducing poverty. In the Philippines, social protection may be categorized into four core program responses:

(a) social insurance (including health insurance, crop insurance; mandated occupational or personal pension plans; voluntary occupational or personal pension plans; and supplementary noncontributory schemes)
(b) labor market interventions (including regulations on industrial relations and labor market, as well as active labor market policies)
(c) social safety nets (including stop-gap or urgent responses to the impact of economic shocks and disasters on vulnerable groups)

(d) social welfare (including homeownership support, assistance for meeting minimum basic needs of the poor, and free or subsidized fees for education and health services).

At least 11 institutions[15] from government-owned and -controlled corporations and national government agencies (NGAs) are implementing these responses as part of their social protection mandate. Local government units (LGUs) and civil society organizations (CSOs), likewise, carry out some social protection interventions, or cooperate with NGAs in the implementation of social protection programs at various localities.

The last decade has seen significant strides in social protection in the Philippines with the development and use of objective targeting mechanisms, the implementation of a conditional cash transfer, which currently covers one-fifth of the household population, stronger coordination, and adoption of an overarching social protection operational framework and strategy (SPOFS) in 2012. The SPOFS identifies the underlying purpose and objective of social protection, namely, a better and improved quality of life for its beneficiaries achieved through reduction of poverty and vulnerability and the inclusion of the marginalized in the development process (Villar 2013).

Underlying principles behind the operational framework include (a) tailoring and clustering social protection intervention in line with vulnerabilities faced by individuals, households, and communities from four major risks: individual life cycle, economic, environment and disasters, and social and governance; (b) identifying and responding to priority targets, including make use of a unified national targeting system; and (c) working toward universal coverage over time. Specific implementation strategies laid out in the SPOFS include (i) entailing convergence in social protection delivery, i.e., synchronizing programs with a whole-of-government approach and a bottom-up programming through LGUs; (ii) scaling up community driven development activities;

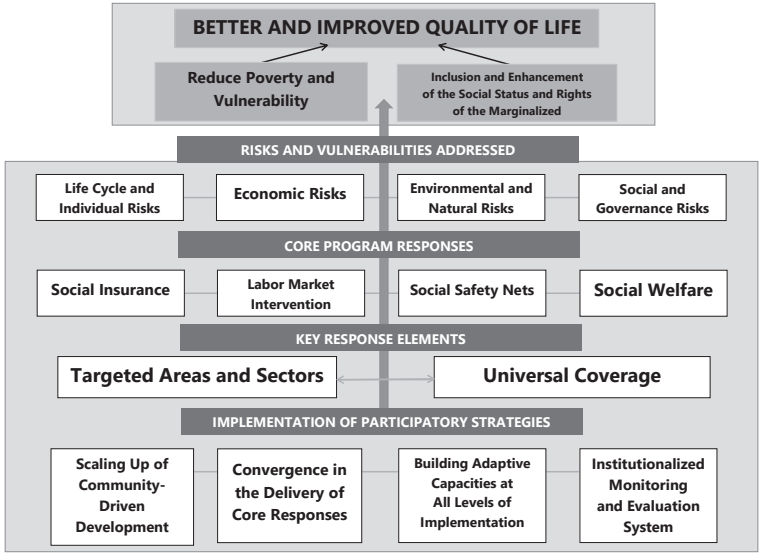
[15] At least seven institutions are implementing social protection programs with contributory schemes, i.e., Government Service and Insurance System; Social Security System; Armed Forces of the Philippines-Retirement and Separation Benefits System; Employees' Compensation Commission; Home Development Mutual Fund; Overseas Workers Welfare Administration; and Philippine Health Insurance Corporation. Meanwhile, noncontributory schemes for social protection are being implemented by at least four institutions: Department of Social Welfare and Development; Philippine Charity Sweepstakes Office; Philippine Amusement and Gaming Corporation; and the Philippine Veterans Affairs Office.

(iii) building adaptive capacity among beneficiaries to manage risks by empowering households and communities, e.g., through human capital development and other promotive and transformative investments; and (iv) making full use of monitoring and evaluation systems (Figure 9).

Across many developing countries including the Philippines, strengthening social protection systems became more urgent in the wake of the impending effects of the global financial crisis in 2009. Social protection, however, can also suffer from a number of implementation deficits. Past evaluations of social protection in the country have noted that social protection measures in the country tend to be fragmented and uncoordinated (especially given the number of institutions implementing social protection), inadequately funded, inadequately designed, short-lived, in some cases redundant and overlapping, and in many cases, even mistargeted and dysfunctional (Aldaba 2008; DAP 2009; Manasan 2009).

A case study on the DSWD SocPen as an illustration of a well-intentioned program meant to provide social protection for senior citizens is discussed in the next section. More details are given in Velarde and Albert (2018).

Figure 9. Social protection operational framework and implementation strategy



Source: Villar (2013)

Poverty focus of SocPen

Among social protection programs, 4Ps has gotten a lot of public attention and scrutiny, especially as this is the biggest social protection program in terms of budget and coverage, which have both grown over the years (Orbeta and Paqueo 2016). Another social protection program that also has grown in budget and coverage since its inception in 2011 is SocPen. Both the 4Ps and SocPen are implemented by DSWD. Through SocPen, indigent senior citizens (not covered by any pension) are given monthly stipend of PHP 500 each to augment daily subsistence and medical needs (Figure 10). By targeting indigent seniors, SocPen has a poverty focus. A review of the cash assistance should be regularly undertaken by Congress with DSWD every two years.

Figure 10. SocPen payouts in Taguig City

SocPen = Social Pension for Indigent Senior Citizens
Social pensioners line up in a basketball court in Taguig City to receive their stipends. Each senior receives a different amount depending on how long he/she received the last stipend. Some new beneficiaries receive their stipend for the first time, others receive for the whole retroactive payments from the previous year. After receiving their stipend, their photo is taken with the newspaper bearing the date as 'proof of life' (November 2017).
Source: R. Velarde (2017)

At program inception in 2011, about 150,000 beneficiaries were enrolled in SocPen. Program targets remained below half a million in 2014, until they were doubled in 2015. That year, the minimum age of beneficiary was reduced to 65, and furthered down to 60 in 2016, which resulted in huge budget jumps (Table 14). For 2018, PHP 19 billion is allocated to assist three million indigent senior citizens.

Table 14. SocPen targets and accomplishments: Philippines, 2011–2018

Year	Physical Target	Age Coverage	Actual Served	Budget Allocation (in PHP Million)	Actual Budget Stipend (in PHP Million)
2011	138,960	77 years and above	138,960	871.00	843.47
2012	185,194	77 years and above	211,657	1,227.46	1,231.70
2013	232,868	77 years and above	255,763	1,532.95	1,553.65
2014	479,080	77 years and above	481,603	3,108.91	2,934.42
2015	939,609	65 years and above	930,222	5,962.63	5,946.97
2016	1,368,944	60 years and above	1,343,943	8,711.20	8,593.53
2017	2,809,542	60 years and above	2,559,202	17,940.26	14,978.25
2018*	3,000,000	60 years and above	not yet available	19,282.86	not yet available

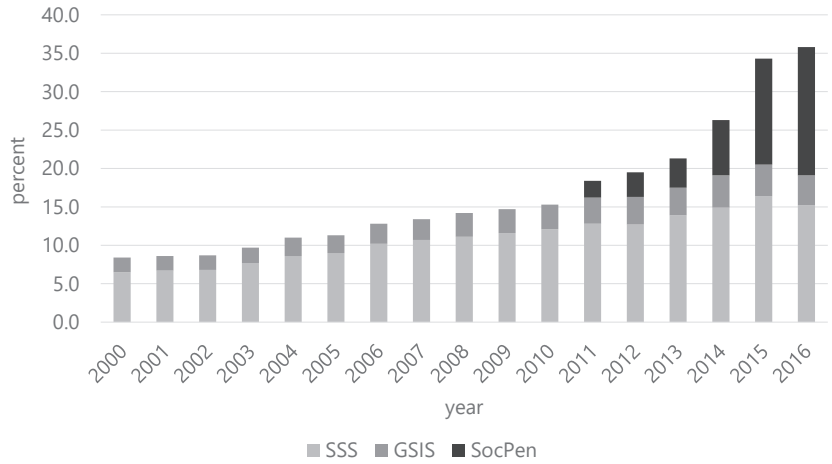
SocPen = Social Pension for Indigent Senior Citizens; PHP = Philippine peso
Note: * = Based on the 2018 approved Government Appropriations Act
Source: Department of Social Welfare and Development (n.d.)

The three million SocPen beneficiaries for 2018 are also among the priority beneficiaries of the government subsidies for lower income families under the recent tax reform law (Pasion 2018). For 2018, the additional monthly cash assistance of PHP 200 for SocPen beneficiaries essentially provided a 40-percent increase from their regular annual stipend—from PHP 6,000 to PHP 8,400. In 2019 and 2020, the monthly subsidies from the tax reform law will increase to PHP 300 monthly, bringing the total annual assistance to PHP 9,600 for each of the current three million senior beneficiaries for 2019 and 2020. In total, the subsidies from the tax reform law will effectively bring the total SocPen program budget to PHP 26.5 billion in 2018 and PHP 30.1 billion annually in 2019 and 2020.

To the SocPen beneficiaries, the increase in cash is most welcome, especially since it cushions the impact of inflation brought about directly or indirectly by the government's tax reform program. But the rapid increase in the government's pension for indigent seniors needs safeguarding. In particular, more attention is needed to ensure SocPen's focus on poverty and maintain its social protection objectives.

The increased coverage of SocPen over the years has led to almost doubling the coverage of the entire Philippine pension system. In 2016, 19 percent of elderly Filipinos with Government Service and Insurance System (GSIS) or Social Security System (SSS) coverage has been topped up by about 17 percent of seniors with SocPen coverage (Figure 11). Prior to SocPen, the whole pension system covered only those who had been formally employed either in the public or the private sector. As of 2013, coverage to both SSS and GSIS has only been at less than a third of the labor force as of 2013. Only a quarter of those employed actively contribute to SSS, another 3.4 percent contribute to the GSIS. As a result, only 17.5 percent of senior citizens have benefited from old-age contributed pensions of SSS and GSIS. In 2016, the 19 percent of elderly Filipinos covered by either GSIS or SSS is topped up by around 17 percent of seniors under SocPen. Thus, the SocPen has helped close the pension coverage gap among elderly Filipinos.

Figure 11. Share (in %) of senior citizens with pension



SSS = Social Security System; GSIS = Government Service Insurance System;
SocPen = Social Pension for Indigent Senior Citizens
Sources: Department of Social Welfare and Development and PSA (2017)

Per program design, SocPen beneficiaries are indigent seniors defined as "Filipinos aged at least 60 years who are frail, sickly, or with disability and without pension or permanent source of income or regular support from his/her relatives to meet his/her basic needs, as determined by the DSWD database of poor families called *Listahanan*" (DSWD n.d.). Thus, beneficiary identification begun with using a masterlist of potential beneficiaries from Listahanan, which was also used for 4Ps. Regional lists were shared with and validated by the LGUs, specifically Office of Senior Citizens Affairs (OSCA) and the City/Municipal Social Welfare and Development Office (C/MSWDO) staff, through home visits to potential beneficiaries.

Recognizing that Listahanan is an incomplete list of the poor, the DSWD allowed "on-demand" applicants into SocPen in cases where an applicant is not in Listahanan. In 2014, the DSWD further relaxed the SocPen's target beneficiaries to those identified as indigent by OSCA and C/MSWDO, in addition to those identified in DSWD database. This effectively moved responsibility of identifying SocPen beneficiaries from DSWD to the LGUs. Further, Listahanan is no longer used as sole basis for identifying indigent elderly. Likewise, SocPen beneficiary lists (that are available at the regional field offices) are no longer linked to Listahanan. Flexibility for adding beneficiaries is important since not all poor households (and elderly indigents, especially those who are living alone, abandoned, neglected, or homeless) may have been recorded in Listahanan. Further, elderly that may have accumulated assets over their lifetime, and consequently, classified by Listahanan as nonpoor, may turn out to be vulnerable to poverty given high cost of medical expenses for their age. Without specific guidelines on how LGUs should screen prospective beneficiaries consistently, this leaves room for political patronage. Below are some direct quotes from some elderly collected during an external review of the program undertaken by nongovernment organizations (Coalition of Services of the Elderly and HelpAge International):

> *"Ang katuwiran kasi ng mga kwan dun, sa isang barangay kung hindi apat, tatlo... ang makakakuha ng pension. Yung dating pangulo ng OSCA [ang nagsabi nun]... Kung hindi tatlo, apat ika ang makukuha. So yung mga namimili naman ilalapit doon sa kapitan kung ano lang ang gusto ni kapitan, kung kalaban ka ni kapitan wala, magtiis ka nalang sa gusto ng kapitan. (According to the previous OSCA president, some recipients get issued stipend*

> *three to four times in other barangays, especially if you support the barangay captain. Those who do not support do not get pension.)"* — Anonymous nonrecipient A

> *"Kwan, 'eto binigyan ng limang daan. 'Kami wala,' sabi ko naman. Eh sabi,'Mahina ka eh. Kasi palakasan eh.' Bakit yung iba binibigyan kami wala? (We do not get any while others get PHP 500. Some say it is because we are on the administration's weak side. Why do other people get support while we do not get any?)"* — Anonymous nonrecipient B

By providing a monthly assistance to social pensioners (many of whom are in Listahanan), SocPen has a poverty focus. However, the current lack of standardized operational guidelines for consistently screening program applicants has weakened the poverty focus of SocPen and its main objective of extending protection to indigent seniors. Velarde and Albert (2018) further provide evidence of how this poverty focus in SocPen has weakened and recommend linking current beneficiaries with the Listahanan.

Integrating data on poverty and vulnerability for social protection

While the country has had some progress in reducing poverty from 1990, the rate of reduction has been rather minimal in recent years, with a substantial proportion (16.5%) of households remaining poor as of 2015 and about three times as many (48.5%) vulnerable to poverty. Poverty alleviation and social protection efforts have typically revolved around the formulation and implementation of "one size fits all" strategies, even in huge programs such as free college education, SocPen, and 4Ps. At least for the cases of SocPen and 4Ps, program designs have looked into targeting aspects, unlike other social assistance programs such as free college education and free irrigation that are "leaky buckets" to be paid for by all taxpayers. The free college education program, while well meaning, has potentially unintended consequences of making access to college inequitable (Orbeta and Paqueo 2017). Although state universities and colleges (SUCs) are providing free college, their students slots are limited. Thus, SUCs sort college entrants based on admission exams. Since it is more likely that those attaining better in entrance examinations are from nonpoor and nonvulnerable families, the poor will be crowded out of

benefits for the free college program. Even if the poor do benefit from free college program, they are at high risk of not completing college especially as tuition is not the only cost for obtaining a college education. Further, the huge costs for the free college program are not sustainable and may potentially crowd out other extremely needed development programs in basic education, agriculture, infrastructure, and national security. While social protection now has a lens of social justice and human rights, it requires a more realistic targeted assistance that addresses equity issues, given fiscal constraints.

Typical social protection actions involve the provision of a uniform social assistance to all beneficiaries, rather than accounting for differentiated needs. SocPen, for instance, provides PHP 500 monthly pensions for all beneficiaries, who are by law, supposed to be indigent senior citizens. At program inception, the SocPen grants were only given to a limited number seniors in Listahanan aged 77 years and above. Later, the age cut-offs were brought down to 65 years and further down to 60 years. When the prospective beneficiaries from Listahanan were exhausted, the SocPen targeting was relaxed to allow LGUs to identify the indigent elderly to meet the number of program target beneficiaries. Both SocPen and 4Ps appear to have started off with a limited number of targeted beneficiaries due to budget constraints, but the targets have kept rising in time, without program benefits adjusted for inflation. The program could have been more impactful if rather than increasing coverage, the program had differentiated the highly vulnerable (e.g., the poorest 7%) from the relatively vulnerable (e.g., the next poorest 7% together with the next 25%). In 2015, the poverty rate among citizens is registered at 13 percent, while the proportion that are highly vulnerable and relatively vulnerable are 7.5 percent and 31.5 percent, respectively. At the onset, the program could have piloted assistance to the highly vulnerable or poorest segment (i.e., those from the poorest 7.5%, assuming that income is monotonically decreasing with vulnerability) when budgets were limited. And in time, with better resources, more beneficiaries (from the relatively vulnerable) could have been targeted with those from the highly vulnerable also being provided a bigger amount of monthly pensions, say PHP 750, considering the bigger needs of the highly vulnerable and their farther position from the poverty line. By choosing to simply give a PHP 500 monthly pensions for all beneficiaries and focusing on increasing the number of beneficiaries rather than increasing the benefits provided

to the highly vulnerable beneficiaries, the SocPen has clearly been less impactful, especially for those who need help the most. In other words, different levels of assistance could actually be provided to different sets of vulnerable groups, rather than slicing the pie equally for all, which may be easy to implement, but potentially problematic as the same assistance is given to everyone regardless of the level of needs. Making use of the Listahanan, especially its most recent conduct, is important not only for DSWD but also for all government agencies. The Listahanan, though, has to identify further the extremely poor from those who are not extremely poor, as well as the low-income households, so that specific interventions directed for various vulnerable groups can make use of this rich database.

Support from the development community during extreme crises, such as unconditional cash transfers provided by the United Nations Children's Fund (UNICEF) to 10,000 poor households have themselves been one-size-fits-all interventions, in both the assistance and the payment modes. In the aftermath of the effects of super typhoon *Yolanda* (Haiyan), UNICEF provided monthly cash assistance of USD 100 (or PHP 5,000) to 10,000 Yolanda-affected families living in Tacloban City and neighboring municipalities from February 2014 to July 2014 (Reyes et al. 2018). While the program has been a big help to beneficiary households in various aspects of their recovery, the cash support was uniform, even in a monthly payout mode. Flexible payout terms, such as having an option of one-time six-month assistance (over the six month payouts) could have been provided, especially for those who may have opted to invest cash support in entrepreneurial activities, rather than spending for daily needs.

Social protection could actually also be made more impactful if policies and programs were integrated, synergized, and concerted. Collaboration enables social protection actors to address complex challenges, use knowledge and expertise more effectively with shared understanding and a common purpose, and integrate support to become more efficient and effective. When done in synergy, social protection interventions can attain outcomes that cannot be achieved by working in isolation (Albert and Dacuycuy 2017). The extra assistance, for instance, given to SocPen beneficiaries as subsidies from the tax reform, coupled with various health assistance from the national government and LGUs, clearly provide a mechanism to fill needed gaps. However, the extent

to which all these social protection programs are making a dent on the welfare of elderly indigents is unknown.

When vulnerable households face shocks, development losses are often the result of adhoc decisions and the lack of preparations for uncertainty. In the face of limited resources and uncertainty, setting priorities and making constrained choices are unavoidable. Poor households, for instance, may decide to put more priority on addressing daily survival needs over investing in the education of their young members given limited daily income and uncertainties in opportunities. But in the wake of extra support from 4Ps, the poor have become more willing to prioritize the schooling of children, which, in turn, can unleash more opportunities for improved welfare when their children finish basic education and get better income prospects.

To overcome obstacles in reducing poverty, the government needs to see the importance of forward-looking planning and risk-resilience building in a context of uncertainty. This requires the national government to build an enabling environment for shared action and responsibility, with local governments and other stakeholders formulating an action agenda that addresses all relevant risks to vulnerability, jointly seeing synergies, tradeoffs, and priorities in policy responses, and using all available resources, institutions, and means of implementation across different contexts. Risk resilience measures based on an examination of data on both poverty and vulnerability will allow vulnerable households not only to reduce the effects of adverse events (e.g., natural calamities, price shocks, and idiosyncratic shocks) on their conditions but also empower them to seize the moment and take advantage of opportunities for improving their prospects for a better future today.

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This study continues previous work on estimating the vulnerability level of households to income poverty using a modified probit model based on income and other poverty correlates data sourced from the Family Income and Expenditure Survey, as well as the country's official poverty lines. Past model specifications are improved by including data on price and climate shocks to welfare, as well as by generating individual assessments for urban and rural areas before combining the cross-section results, rather than using a common specification nationally as done previously. The vulnerability assessment in this study provides inputs to forward-looking interventions that build the resilience of households for preventing or reducing the likelihood of future poverty. The study emphasizes the importance of using both poverty and vulnerability estimates in programs and identifies differentiated actions for those highly vulnerable and relatively vulnerable to poverty.

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