

THE DISTRIBUTIONAL IMPACTS OF FISCAL POLICY

THE CASE OF THE PHILIPPINES

Hyun H. Son

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The Distributional Impacts of Fiscal Policy: The Case of the Philippines

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ABSTRACT

The distributional impacts of fiscal policies are instrumental in reducing inequality in countries like the Philippines, where inequality has been persistently high. This paper assesses how equitable various taxes and transfers in the Philippines are by deriving the elasticities of Atkinson and Sen's social welfare functions and introducing a welfare reform index. Among various income sources, the paper finds that rentals from properties, dividends from investment, incomes from construction entrepreneurial activities, and remittances from abroad are regressive. In contrast, family sustenance activities, entrepreneurial activities in farming and fishing, and remittances from domestic sources are found to be progressive. The paper also finds that while direct taxes like personal income tax are overall progressive in the Philippines, they only generate little revenues, indicating their limited impact on inequality reduction. Furthermore, this paper shows that the poor bear much of indirect tax burden on individual commodities such as food items largely consumed at home since they spend a greater proportion of their expenditure on such basic commodities relative to their nonpoor counterparts.

Keywords: social welfare function, tax progressivity, redistribution, normative analysis, horizontal inequity, fiscal policy

JEL codes: H23, H24, H31, H53, I38

I. INTRODUCTION

Economic inequality is one of the most urgent development challenges facing the Philippines. While the country continues to solidify its position as a leader in economic growth in Southeast Asia, income inequality remains high, with the Gini coefficient averaging 0.42 between 1985 and 2015.¹ Economic growth in the Philippines has been lopsided, favoring only a few, while leaving behind millions of impoverished families. The richest 10% of the country's population held 31.3% of the national income in 2015—more than 10 times the income held by the poorest 10% of the population in the same year.²

Such a high level of inequality has reduced the responsiveness of poverty reduction to economic growth in the Philippines. The share of the economically secure in the Philippines only slightly rose from 37% in 2002 to 44% in 2015—lower than the increase of one-fifth to two-thirds in East Asia and Pacific (World Bank 2018).

The nature and pattern of inequality in the Philippines has evolved over time. Urban and nonagricultural households have benefited more from improvements in social welfare over 2000–2012 than rural, agricultural households. In the past, the highest levels of welfare accrued to households whose main income sources were wages and salaries. More recent trends, however, show that households relying on remittances now enjoy higher welfare levels. Moreover, poor income units have been increasingly concentrated in the youngest cohort (30 years old and under), while the concentrations of richer income units are older in the cohort of 60 years old and above (Valenzuela, Wong, and Zhen 2017).

For countries with stubbornly high income inequality and wide disparities in opportunities like the Philippines, the distributional impacts of fiscal policies are at the center of policy debates and research work concerned with reducing inequality. The Philippine government implements tax and transfer programs to tackle persistently high inequality, which include conditional and unconditional cash transfer programs and the series of tax reforms that commenced in January 2018.

The extent to which a government's fiscal system is equitable, therefore, greatly plays an important role in curbing inequality. A trade-off between efficiency and equity usually exists in implementing fiscal policies. Policy makers are confronted with the challenge of maximizing efficiency through reduced costs of taxation and distortions, while ensuring equity by paying attention to the progressivity of the tax burden. Depending on how a government collects and spends its revenues, a fiscal system may be defined as either progressive or regressive if it redistributes income from the rich to the poor, or vice versa.

This paper aims to assess the extent to which a government's fiscal systems are equitable, with the Philippines as a case study. The paper derives the welfare elasticity for the Atkinson's class of social welfare function. Using the idea of welfare elasticity, the paper proposes a welfare reform index, which can be utilized to assess how equitable fiscal policies are and help make such policies more equitable through marginal reforms.

¹ Author's estimates based on Google Public Data Explorer. 2018. Gini Index. <https://tinyurl.com/ycw8omst> (accessed 29 November 2018).

² Author's estimates based on Google Public Data Explorer. 2018. Income Distribution. <https://tinyurl.com/y9nlbobo> (accessed 29 November 2018).

The paper also uses an interdependent social welfare function to derive the welfare elasticity. The Atkinson welfare function encompasses a rather restrictive assumption that an individual's satisfaction is independent of consumptions of others in society. However, people do compare themselves with others and feel relatively deprived when they find that a large proportion of people have a higher income or consumption. In this context, the paper uses Sen's social welfare function that reflects manifestations of envy, given an individual's and others' positions in the income distribution. To measure the effect of envy on the fiscal system, the paper uses Sen's (1974) social welfare function to capture the degree of envy. The welfare elasticity allows for assessing how the degree of envy affects the equity of a fiscal system.

The methodology developed in the paper is applied to the Philippines' fiscal system, utilizing the 2017 Annual Poverty Indicator Survey (APIS).³ The paper is structured as follows: Section II presents the literature review and discusses the Philippine fiscal system; Section III presents the data used and the concepts for measuring individual welfare; Section IV specifies the empirical strategy for deriving social welfare elasticities and the welfare reform index, and their application to various fiscal instruments in the Philippines; Section V discusses the empirical findings; and Section VI presents the conclusions and policy implications.

II. LITERATURE REVIEW AND COUNTRY CONTEXT

The distributional impacts of fiscal policies—or the extent to which a tax or transfer system reduces income inequality—depend on the progressivity and size of taxes and transfers (Slavov and Viard 2016a). Depending on the policy objectives, policy makers can either prioritize the size of the fiscal system or the level of its progressivity. For instance, if a policy's focus is to improve the welfare of the bottom 20% of households in the income distribution, a large tax system with little progressivity may be preferred over a smaller tax system that is more progressive. This is because a larger tax system can mobilize more revenues, which in turn can finance social programs that make larger transfers to the poor even though the tax burden on the very rich is relatively smaller (Slavov and Viard 2016b).

Empirical research on the equity aspects of fiscal policies such as Cubero and Hollar (2010) and Inchauste et al. (2015) use the following common indicators of the redistributive potential of fiscal policies:

- (i) Tax progression, which measures the tax effectively paid relative to income—called the effective tax ratio—per quantile (decile, quintile, or quartile) of income;
- (ii) Kakwani index, which is equal to the concentration coefficient for taxes minus the Gini coefficient for before-tax income;
- (iii) Lorenz and concentration curves, which entails comparing the pre-tax Lorenz curve for income with the concentration curve for that tax;
- (iv) Quasi Gini Coefficient, which is the Gini coefficient for a tax's concentration curve; and
- (v) Reynolds-Smolensky index, which is the difference between the pre-tax Gini coefficient and the quasi-Gini index.

³ APIS 2017 is the latest available round of APIS that contains the most up-to-date and detailed information on income sources and expenditure items. APIS 2019 and 2020 do not provide detailed information on income and expenditure components.

The main methodological difference between the papers by Cubero and Hollar (2010) and Inchauste et al. (2015), and this paper, is the former's use of inequality measurements and the latter's utilization of social welfare functions. Inequality measurement is a descriptive approach that mainly deals with how total income is divided among various individuals. In contrast, social welfare analysis adopts a normative approach to the assessment of income distribution since it aims to find out how total income should be divided among different individuals.

Making normative judgements is inevitable in assessing any public policy, including fiscal policies. This is because policies may have varying impacts on different individuals. A policy that may be detrimental to the welfare of certain groups may be beneficial to others. For instance, optimal tax theory requires normative judgements to determine how society can improve social welfare given constraints due to limited resources and behavior changes arising from tax policies (Diamond and Saez 2011).

Hence, assessing and reforming fiscal policies require a social welfare function that can be put into practice and is flexible enough to accommodate changes in the weights assigned to individuals from different segments of the income distribution. A class of homothetic social welfare functions proposed by Atkinson (1970) for measuring inequality satisfies the two abovementioned conditions. The paper uses Atkinson's social welfare function, which depends on an inequality aversion parameter through which the weights given to individuals in different segments of the income distribution can be modified.

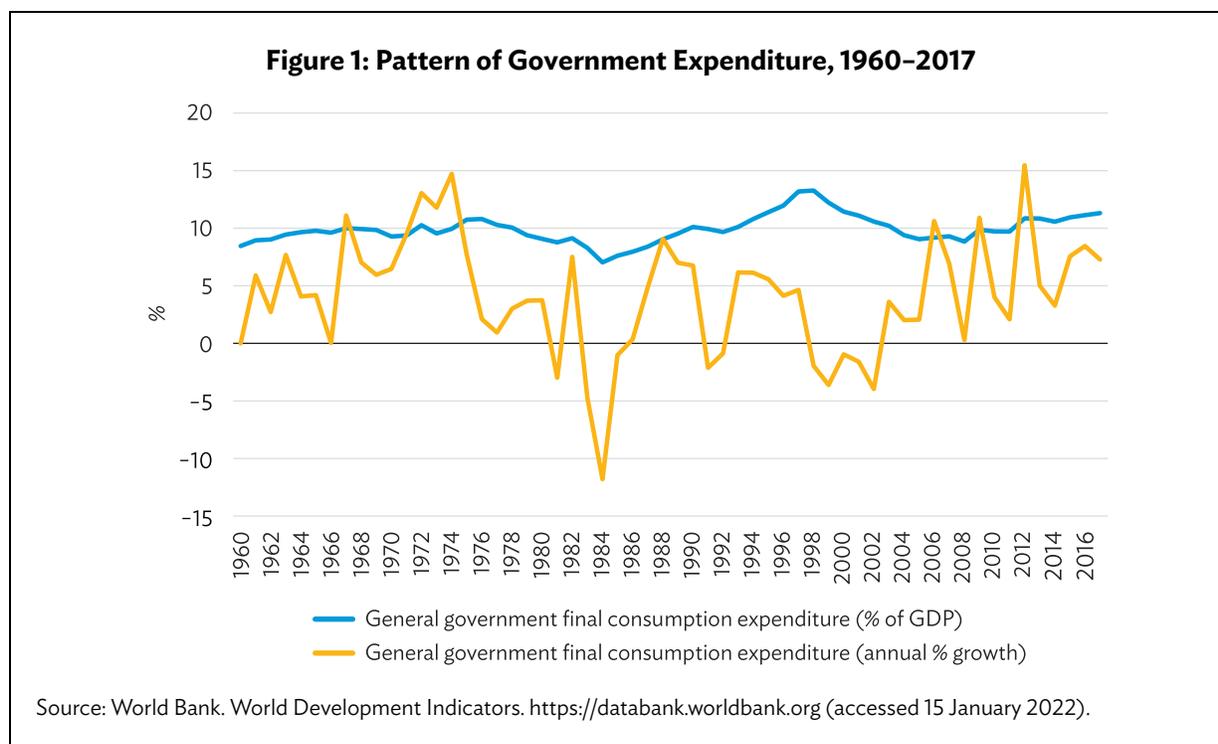
In the Philippines, the equity of fiscal systems has yet to be fully explored in literature, particularly using empirical analysis. The Philippines offers an interesting case as the country has suffered bouts of fiscal woes amid persistently high levels of inequality.

Government expenditure averaged 9.97% of the gross domestic product (GDP) and grew at 4.23% per year over 1960–2017 (Figure 1).⁴ A substantial decrease in government spending both in terms of annual growth and as a percentage of GDP was observed in the mid-1980s following economic woes caused by excessive borrowing from oil-rich countries and a volatile political environment with the tumultuous end of then President Ferdinand Marcos' regime. The government was able to maintain a high level of spending by the time the Asian financial crisis hit in 1998 because of additional revenues mobilized from the privatization of government assets. Average inequality declined during 1985–1988 due to a rise in the income shares of the bottom 50% and a drop in income shares of the top 1% and 10% during this period.⁵ The decline in the income shares of the top 1% and 10% coincided with private investments bottoming out to less than 14% of the GDP in 1985–1987 (Estudillo 1997). Government spending relative to GDP fell from 1998 to 2004 following the ouster of then President Joseph Estrada (Sicat 2011). Most recently, the government ramped up its spending to address the health and economic fallout from the coronavirus disease (COVID-19) pandemic through its relief and stimulus packages, and health programs.⁶

⁴ The World Development Indicators define government final consumption expenditure as consisting of purchase of goods and services, including compensation of employees and expenditures on national defense and security.

⁵ From 1985 to 1988, the income share of the top 1% decreased from 0.197 to 0.184. The income share of the top 10% also decreased from 0.497 in 1985 to 0.487 in 1988. In contrast, the income share of the bottom 50% rose from 0.130 to 0.131 during 1985–1988. See World Inequality Database. <https://wid.world/> (accessed 1 March 2022).

⁶ Government spending as a percentage of the GDP increased from 12.5% in 2019 to 15.3% in 2020. See World Bank. 2022. World Development Indicators. <http://databank.worldbank.org> (accessed 15 January 2022).

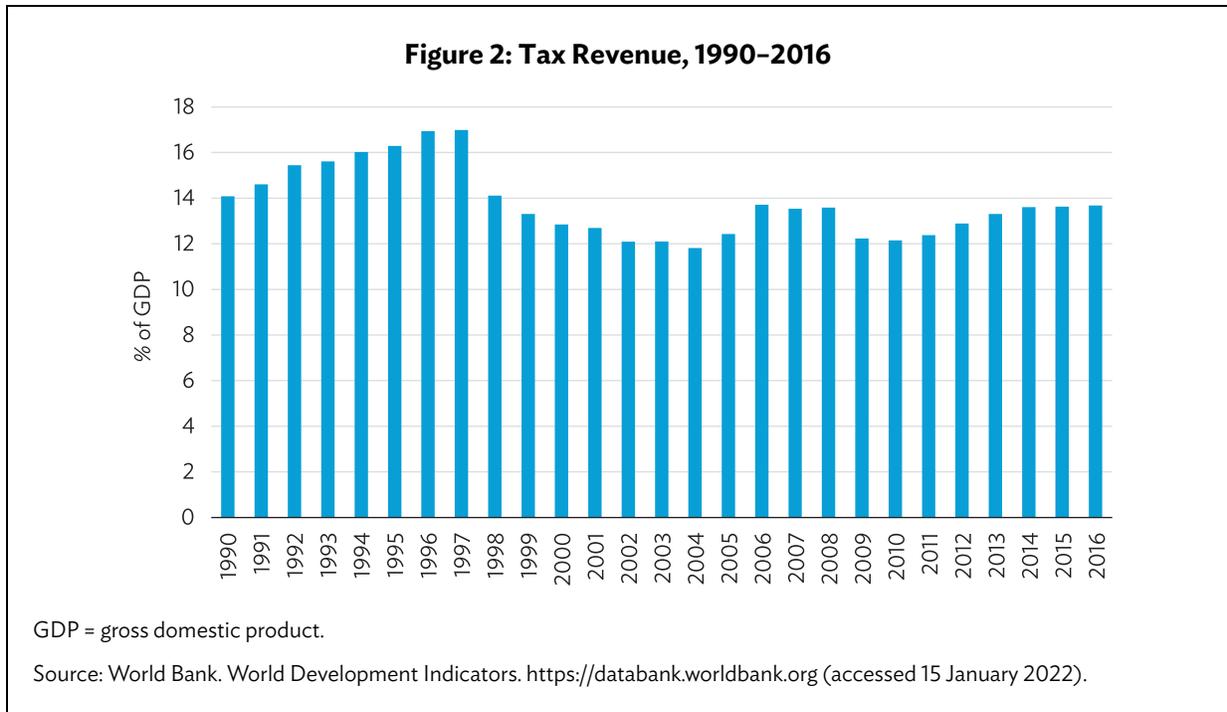


Budget deficits, or the annual amount a government has to borrow to meet the shortfall between its revenues and spending, averaged -2.08% of GDP over 1988–2017, reaching its lowest point at -5.30% of GDP in 2002 (Trading Economics 2018).

On the revenue side, the government relies on both direct and indirect taxes, including personal income tax, corporate income tax, value-added tax, and excise taxes. Tax revenues accounted for 14% of GDP over 1990–2016 (Figure 2). In 2019, tax revenues contributed about 15% of GDP (World Bank 2022), which is substantially lower compared to the Organization for Economic Co-operation and Development (OECD) average of 34% in the same year (OECD 2021). Government revenues took a hit amid the COVID-19 pandemic as the crisis has reduced taxes and other revenue sources.⁷

The country's fiscal policy is currently being revamped as the government started implementing its first batch of tax reforms in January 2018. Such reforms lowered personal income taxes, while raising or setting new excise taxes on oil products, vehicles, cigarettes, and sugar-sweetened drinks. The revenues will be used to help fund the government's massive infrastructure program amounting to ₱8 trillion (about \$153 billion). To help offset higher prices as a result of the tax reforms, the Philippine government is providing unconditional cash grants worth ₱2,400 (about \$46) to each of the 10 million impoverished households and individuals. However, nearly 4 million of the beneficiaries have yet to receive their cash grants as of September 2018 (Panti 2018).

⁷ According to the Philippines' Bureau of Treasury (2020), government revenue for 2020 narrowed to ₱2.0 billion, which was 9% lower against the ₱3.1 billion raised in 2019.



III. DATA AND CONCEPTS

The paper utilized APIS data to assess the distributional impacts of the Philippine fiscal system. APIS is a nationwide household survey that gathers data on the socioeconomic characteristics and living conditions of households across the Philippines' 81 provinces, as well as all cities and municipalities in the country's National Capital Region. The paper used APIS 2017, which contains detailed information on income sources and expenditure components for more than 10,000 households that were successfully interviewed in 2017.

Using APIS 2017 data, the paper derives the following measures of individual welfare and sources of income:

A. Individual Welfare Measure

To assess the distributional effects of various government fiscal policies, the economic welfare of everyone in society needs to be measured. A welfare measure for individuals reveals the degree to which an individual is better or worse off than another individual. Two of the most common measures of individual welfare are income and consumption. Indicators of individual welfare are derived from information on individuals' income or consumption collected through household income and expenditure surveys.

Many rich industrialized countries use per capita income as an indicator of household welfare. Income provides households with an entitlement to consume goods and services that satisfy their needs. However, consumption is regarded as a better measure of household welfare because it reflects

the households' long-term standard of living more accurately than income. The economic theory of consumer behavior hypothesizes that individuals maximize their utility under a given budget constraint. This theory defines individuals' utility by a consumption basket that individuals consume. In developing countries, studies of poverty and income inequality are generally carried out based on household consumption expenditure. The assessment of fiscal policies is generally conducted based on individuals' income. Thus, in this paper, the measure of individual welfare is derived from household income.

An ideal welfare measure should incorporate all factors that contribute to individuals' welfare directly and indirectly. Household income and expenditure surveys, which form the basis of most income distribution studies, do not provide sufficient information to account for all the relevant factors affecting economic welfare. Fortunately, the 2017 APIS used in this paper provides a comprehensive concept of income.

Since households differ in size and composition, some adjustment is required to factor in the different needs of household members. Per capita income, used to measure household welfare, assumes that everyone in a household requires the same allocation of household resources. However, children surely require less of most things than adults. Large households may also enjoy economies of scale, which result in savings. For instance, to enjoy the same level of utility, a two-person household does not require twice the amount of money as a one-person household. Hence, adult equivalent scales have been devised to consider varying needs among children and adults, as well as economies of scale within households. To account for the different needs of children and adults and economies of scale, we have adopted the simple adult equivalent scale widely used in OECD member countries: first adult in the household = 1.0; second and subsequent adult = 0.7 of the first adult; and each child = 0.5 of the first adult.

The number equivalent adults in the i th household consisting of A_i adults and C_i children are given by $E_i = 1 + 0.7(A_i - 1) + 0.5C_i$, where E_i is the number of equivalent adults in the i th household. Suppose a household has two adults and two children, then the number of equivalent adults calculated using this scale is equal to 2.7. Although this household has four members, its needs are equivalent to 2.7 adults. The household welfare is measured by dividing total household income by the number of equivalent adults as calculated based on this scale.

Let x be the per equivalent adult income of a household, which is a measure of household welfare. Since households are selected randomly from the population, we can assume that x is a random variable with probability density function $f(x)$, then the average welfare of society is given by:

$$E(x) = \int_0^{\infty} xf(x)dx \quad (1)$$

This average welfare of society gives an equal weight to each household irrespective of household size. This implies that the weight assigned to the welfare of a single-person household is the same as a household consisting of, say, eight persons. This approach is unsatisfactory because there exists no welfare justification for giving a larger weight to individuals belonging to smaller households and a smaller weight to those belonging to larger households. Individuals belonging to larger households, therefore, are discriminated and generally poorer. Thus, giving an equal weight to every household irrespective of their size will lead to a biased evaluation of fiscal policies.

Since our objective is to measure the distribution of welfare of individuals, it makes sense to assign weights to everyone equally irrespective of the size and composition of households to which he

or she belongs. This approach can be justified from the welfare point of view if we opt for an individual social welfare (Danziger and Taussig 1979).

Under this weighting scheme, the size distribution of individual welfare is constructed by assigning everyone in a household a welfare value equal to the income per equivalent adults for that household. This approach will be appropriate if we assume that every household member enjoys the same level of welfare. The validity of this assumption is difficult to assess because household surveys do not provide any information about how households distribute their resources to their members.

However, if household members care about each other, it may be reasonable to assume that households will allocate their resources such that each member enjoys the same level of welfare. If this assumption is not satisfied, then the evaluation of the distribution effects of fiscal policies will be biased. However, this assumption is unlikely to be realistic because the intra-household allocation of resources may vary by household composition, age, gender, or other factors. Unfortunately, we have no alternative but to make this assumption. In the measurement of inequality and poverty, studies usually make this assumption because household surveys do not provide information on the allocation of resources within households. None of them, however, point out this limitation.

Suppose $n(x)$ is the number of individuals in a household with per equivalent adult income x , then the average number of individuals in society is given by:

$$E(n(x)) = \int_0^{\infty} n(x)f(x)dx \tag{2}$$

Assuming every individual in the household enjoys the same level of welfare, the probability density function of individual welfare will be given by:

$$g(x) = \frac{n(x)f(x)}{E(n(x))} \tag{3}$$

where $\int_0^{\infty} g(x)dx = 1$.

The average per person economic welfare of society is then given by:

$$\mu = \int_0^{\infty} xg(x)dx \tag{4}$$

Note that $E(x)$ given in equation (1) is the average welfare of households that weighs all households equally, while μ in (4) is the average welfare of individuals that weighs all individuals within the household equally. The average welfare of individuals is justifiable from a welfare point of view.

B. Sources of Income

Individuals derive their income from various sources. Suppose there are k income sources, which add up to the total household income. After adjusting all income sources by dividing them by the number of equivalent adults, the household welfare can be written as:

$$x = \sum_{j=1}^k v_j(x) \tag{5}$$

where $v_j(x)$ is the per equivalent adult income derived from the j th source. Substituting (5) into (4) gives:

$$\mu = \sum_{j=1}^k \mu_j \tag{6}$$

where:

$$\mu_j = \int_0^{\infty} v_j(x)g(x)dx \quad (7)$$

and μ is the average welfare of individuals derived from the total household income, which is the sum of the average welfare of individuals, namely, μ_j derived from the k income sources. $100 \times \frac{\mu_j}{\mu}$ is the percentage contribution of the j th income source to the average welfare of individuals.

Table 1 in Section IV.A presents the average welfare of individuals by income sources and shows the percentage contribution of each income source to the total individual household welfare. The most dominant source of welfare are wages and salaries, which contribute 49.3% to the total welfare. Wages and salaries cover all gross earnings including overtime, bonus, commission, and tips.

Another major income source are remittances received from abroad, which account for nearly 10% of the total welfare. Households also receive transfers from domestic sources, which contribute 4.6% to the total welfare.

Imputed rent, for those households who own houses, makes a contribution of 9.1% to the total welfare. Although owning a house does not provide a cash income, the services of the dwelling nevertheless have a value equivalent to the net income that could be obtained by letting the dwelling to a tenant.

Pensions and retirement benefits contribute 3.1% to the total welfare. This income source also includes workers' compensation and social security payments. The Philippines implements various cash transfer programs such as conditional cash transfers, survivor's benefits, community-based employment program, and disability benefits, but the contribution of such programs is small.

Personal income and other direct taxes contribute to a 4.5% reduction in total household welfare. Thus, the direct tax revenues collected by the Philippine government is relatively small compared to countries at similar level of income.

IV. EMPIRICAL STRATEGY

A. Social Welfare Functions

The main purpose of using a social welfare function is to evaluate how economic resources are allocated with the goal of identifying which policies work and which ones do not (Kakwani and Son 2016). A social welfare function explicitly specifies normative judgments by assigning weights to different individuals. Since policies impact the individuals differently, as some individuals might gain from policies while others might lose, hence, normative judgments cannot be avoided and a social welfare function must be used to evaluate policies.

In this paper, we use the social welfare functions that can be put into practice and are flexible enough to accommodate changes in the weights assigned to individuals from different segments of the income distribution. We employ two of the most well-known social welfare functions that can be estimated from household surveys: Atkinson's (1970) social welfare function, which was derived using

the concept of an equally distributed equivalent level of income; and the Gini social welfare function developed by Sen (1974).

(1) Atkinson’s Social Welfare Function

Atkinson assumed that the social welfare function is utilitarian and every individual has the same utility function. Under such restricted assumptions, the average welfare of society is given by:

$$W = \int_0^{\infty} u(x)g(x)dx \tag{8}$$

where $u(x)$ is the utility derived by an individual with per equivalent adult income x and $g(x)$ individual density function derived in equation (3). The utility function has the following properties:

$$\frac{du(x)}{dx} > 0 \text{ and } \frac{d^2u(x)}{dx^2} < 0$$

which implies that the utility function is increasing and concave in x .

In deriving his social welfare function, Atkinson ensured that social welfare function is invariant with respect to any positive linear transformation of individual utilities. He derived his social welfare function using the concept of equally distributed equivalent level of income x^* , which, if received by every individual, would result in the same level of social welfare as the present distribution:

$$u(x^*) = \int_0^{\infty} u(x)g(x)dx \tag{9}$$

where x^* is per person social welfare of society and a money-metric measure of social welfare. Because of the concavity of the utility function, social welfare x^* is always less than the mean welfare μ defined in (4). The inequality measure implicit in this social welfare is given by:

$$A = 1 - \frac{x^*}{\mu} \tag{10}$$

which will be referred to as Atkinson’s inequality measure. Using (10), the social welfare x^* can be written as:

$$x^* = \mu(1 - A) \tag{11}$$

which shows that the social welfare x^* depends on the two factors, mean income and inequality in society. Since this social welfare is sensitive to inequality, it allows us to evaluate the relative impact of government policies on the poor and nonpoor.

If Atkinson’s inequality measures are to be scale-independent—when all incomes are increased by the same proportion—inequality should not change. We need to consider further restrictions on the individual utility function such that the utility function must be homothetic, which is of the form:

$$\begin{aligned} u(x) &= a + \frac{bx^{1-\epsilon}}{1-\epsilon} \quad \text{if } \epsilon \neq 1 \\ &= a + b \ln(x) \quad \text{if } \epsilon = 1 \end{aligned} \tag{12}$$

where $b > 0$ and a and b are constants. This utility function yields a class of money-metric social welfare $x^*(\epsilon)$ as:

$$\begin{aligned} x^*(\epsilon) &= \left[\int_0^\infty x^{1-\epsilon} g(x) dx \right]^{\frac{1}{1-\epsilon}} & \text{if } \epsilon \neq 1 \\ &= \exp \left[\int_0^\infty \ln(x) g(x) dx \right] & \text{if } \epsilon = 1 \end{aligned} \quad (13)$$

where *exp* stands for exponential. Equation (13) presents a class of Atkinson's social welfare functions. Note that $x^*(\epsilon)$ is independent of a and b , which implies that Atkinson's social welfare functions are invariant to any positive linear transformation of the utility function.

Substituting (12) into (10) yields Atkinson's class of inequality measures:

$$\begin{aligned} A(\epsilon) &= 1 - \frac{1}{\mu} \left[\int_0^\infty x^{1-\epsilon} g(x) dx \right]^{\frac{1}{1-\epsilon}} & \text{if } \epsilon \neq 1 \\ &= 1 - \frac{1}{\epsilon} \exp \left[\int_0^\infty \ln(x) g(x) dx \right] & \text{if } \epsilon = 1 \end{aligned} \quad (14)$$

Normative judgments in Atkinson's social welfare and inequality are incorporated through the value of ϵ , which is a measure of inequality aversion. Inequality aversion captures society's relative sensitivity to income transfers at different income levels. As ϵ rises, more weights are given to transfers at the lower end of the income distribution. If $\epsilon = 0$, the social welfare becomes equal to the mean income, which reflects an inequality-neutral attitude wherein society does not care about inequality at all but is mainly concerned with increasing its average standard of living.

(2) Gini Social Welfare Function

To capture the idea of relative deprivation, Sen (1974) developed a social welfare function by assigning weight to income depending on the ranking of individuals in society by a welfare measure. The lower a person is on a welfare measure, the greater is his or her sense of deprivation with respect to others in society.

The Gini social welfare function developed by Sen (1974) is defined as:

$$W_G = 2 \int_0^\infty x [1 - G(x)] g(x) dx \quad (15)$$

where $G(x)$ is the individual probability distribution function, interpreted as the proportion of individuals who have per equivalent adult income less x . This social welfare function is the weighted average of x , where the weight on x is given by:

$$v(x) = 2[1 - G(x)]$$

such that $\int_0^\infty v(x) dx = 1$. According to this weighting scheme, the weight on income x is proportional to the number of individuals who are richer than the individual with welfare level x .

The Gini index is defined as one minus twice the area under the Lorenz curve. Following Kakwani (1980), the Gini index can be written as:

$$G = \frac{2}{\mu} \int_0^\infty x \left[G(x) - \frac{1}{2} \right] g(x) dx \quad (16)$$

Combining (15) and (16) yields the Gini social welfare function as:

$$W_G = \mu(1 - G) \tag{17}$$

which demonstrates the Gini index G is the proportional loss of social welfare caused by inequality. This measure of inequality is relative because it remains unchanged when each income or welfare is altered by the same proportion. On the other hand, if inequality exists, then society’s loss of social welfare is μG , which is the absolute measure of inequality because its value remains unchanged when each income is increased or decreased by the same amount. The Gini social welfare function, therefore, provides both relative and absolute measures of inequality. In contrast, Atkinson’s social welfare can provide only relative measures of inequality because they are derived from a homothetic utility function.

B. Welfare Elasticity and Income Sources

As discussed, the income sources in APIS 2017 include government transfers and direct taxes. Government transfers increase the average welfare of society and affect the inequality of individual welfare. We can capture both these effects by calculating the elasticity of social welfare with respect to the means of various income sources. Similarly, direct taxes reduce the average welfare and affect the inequality of individual welfare. Direct taxes are like government transfers but have a negative impact on social welfare.

Utilizing the properties of the Lorenz curve and concentration curves given in Kakwani (1977, 1980), we obtain:

$$x = \mu L'(p) \tag{18}$$

and

$$v_j(x) = \mu_j C'_j(p) \tag{19}$$

where $L'(p)$ and $C'_j(p)$ are the first derivatives of $L(p)$ and $C_j(p)$ with respect to p , respectively.⁸

Substituting (18) and (19) into (5) gives:

$$x = \sum_{j=1}^k \mu_j C'_j(x) \tag{20}$$

We utilize this equation to derive the social welfare elasticity with respect to means of various income sources.

First, we derive the social welfare elasticity for Atkinson’s social welfare function. Substituting (20) into (9) gives:

$$u(x^*) = \int_0^1 u[\sum_{j=1}^k \mu_j C'_j(p)] dp \tag{21}$$

⁸ $L(p)$ is defined as the proportion of welfare x enjoyed by the bottom p proportion of individuals, whereas $C_j(p)$ is the proportion of j th income source received by the bottom p proportion of individuals when ranked by x . For a detailed discussion of properties of the Lorenz curve and concentration curves, see Kakwani (1980).

where $dp = g(x)dx$, $0 < p < 1$ and $0 < x < \infty$. This equation enables us to derive the elasticity of Atkinson's social welfare function with respect to the mean of the j th income source.

We assume that the mean of the j th income source changes without affecting its distribution across individuals, i.e., $C_j'(p)$ does not change when μ_j changes. Differentiating (21) with respect to μ_j gives the elasticity of x^* with respect to μ_j as:

$$\delta_j = u'(x^*) \frac{\partial x^*}{\partial \mu_j} = \frac{1}{x^* u'(x^*)} \int_0^\infty u'(x) v_j(x) g(x) dx \quad (22)$$

In deriving this equation, we have used (18) and (19). The interpretation of this elasticity is as follows: if the mean of the j th income component increases by 1%, social welfare will increase by $\delta_j\%$.

Following a similar reasoning as above, we derive the elasticity of x^* with respect to μ as:

$$\delta = \frac{\mu \partial x^*}{x^* \partial \mu} = \int_0^\infty u'(x) x g(x) dx \quad (23)$$

It is easy to verify from (20) and (21) that:

$$\delta = \sum_{j=1}^k \delta_j \quad (24)$$

An intuitive interpretation of this equation is that if all income sources change by 1%, the social welfare x^* changes by $\delta\%$.

Following Atkinson (1970), we assume that the utility function is homothetic as defined in (12), then the elasticity in (22) becomes:

$$\begin{aligned} \delta_j &= \frac{\int_0^\infty x^{-\epsilon} v_j(x) g(x) dx}{\int_0^\infty x^{1-\epsilon} g(x) dx} \quad \text{if } \epsilon \neq 1 \\ &= \int_0^\infty \frac{v_j(x)}{x} g(x) dx \quad \text{if } \epsilon = 1 \end{aligned} \quad (25)$$

and from (23) we obtain $\delta = 1$ for all values of ϵ , which from (24) implies that $\sum_{j=1}^k \delta_j = 1$. The larger the value of elasticity, the greater the impact of that income source on social welfare. Thus, the higher the value of elasticity, the greater the welfare superiority of that income source.

Next, we derive the social welfare elasticity for the Gini social welfare function. Kakwani (1980) has demonstrated that $\mu G = \sum_{j=1}^k \mu_j C_j$, which C_j is the concentration index of the j th income source.⁶ Using this result in conjunction with (6), we can write the Gini social welfare function as:

$$W_G = \mu(1 - G) = \sum_{j=1}^k \mu_j(1 - C_j) \quad (26)$$

Differentiating equation (26) with respect to μ_j yields the social welfare elasticity of the Gini social welfare function as:

$$\vartheta_j = \frac{\mu_j(1 - C_j)}{\mu(1 - G)} \quad (27)$$

⁶ The concentration index is defined as one minus the area under the concentration curve (Kakwani 1980).

which always implies that $\sum_{j=1}^k \vartheta_j = 1$. This elasticity like Atkinson's welfare elasticity indicates that if all income sources change by 1%, the Gini social welfare changes by 1%. The elasticity enables us to measure the effect on society's social welfare (as measured by the Gini social welfare function) for a small change in the j th income source. The higher the value of this elasticity, the greater the welfare superiority of that income source.

C. Welfare Reform Index

In this section, we propose a welfare reform index, which enables us to assess how equitable a government transfer or tax is or how much it favors the poor or the nonpoor. Differentiating Atkinson's social welfare function defined in (11) gives:

$$\delta_j = \frac{\mu_j}{\mu} - \frac{(\mu - x^*)}{x^*} \left[\frac{\mu_j}{A} \frac{\partial A}{\partial \mu_j} \right] \quad (28)$$

where A is Atkinson's measure of inequality.

Equation (28) equation shows that the welfare elasticity with respect to the j th income sources can be decomposed into two components. The first term on the right-hand side of (28) is the share of the j th income source to total income. This is called the income component, which is the proportional change in the mean income of society when the mean income of the j th income sources changes by 1%. The second component on the right-hand side of (28) may be called the inequality effect. It is the proportional change in social welfare because of the change in income redistribution or inequality caused by the change in the mean of the j th income source.

The inequality effect indicates whether an increase in μ_j favors the nonpoor or the poor. If this component is positive (negative), it implies that the redistribution effect of the j th income source increases (decreases) social welfare. This leads us to propose a welfare reform index:

$$\varphi_j = \frac{\delta_j}{s_j} - 1 \quad (29)$$

where $s_j = \frac{\mu_j}{\mu}$ is the share of the j th income source in total income. If φ_j is positive (negative), any increase in the j th income source will benefit the poor proportionally more (less) than the nonpoor. φ_j measures the marginal benefits in terms of the increase in social welfare per additional peso spent on the j th income source.

Suppose i and j are two different government transfer programs. Given this, if $\varphi_i > \varphi_j$, ₱1 spent on the i th program will lead to a greater increase in social welfare than ₱1 spent on the j th program. In other words, we can improve social welfare by reducing expenditure on the j th program and increasing expenditure on the i th program by the same amount. Hence, φ_j can be usefully employed to design marginal reform in government tax and expenditure policies.

Similarly, differentiating the Gini social welfare function defined in (26) with respect to μ_j gives:

$$\vartheta_j = \frac{\mu_j}{\mu} - \frac{(\mu - W_G)}{W_G} \left[\frac{\mu_j}{G} \frac{\partial G}{\partial \mu_j} \right] \quad (30)$$

This decomposition has a similar interpretation as (28). Thus, the welfare reform index for the Gini social welfare function is given by:

$$\rho_j = \frac{\vartheta_j}{s_j} - 1 \quad (31)$$

We will evaluate the equity of the Philippines' fiscal system using the two alternative social welfare functions: Atkinson's and Sen's. The reform index for the class of Atkinson's social welfare functions is φ_j given in (29) and for the Gini social welfare function is ρ_j given in (31).

D. Application of the Social Welfare Elasticity and Welfare Reform Index

(1) Fiscal Policy

Fiscal policies consist of direct taxes levied on individuals' incomes and indirect taxes levied on expenditures. In addition, individuals save part of their disposable incomes to invest in future consumption. The government can directly tax savings through individuals' deposits in the bank or levy taxes on returns they derive in the future. The individual welfare can be, therefore, written as:

$$x = \sum_{i=1}^m p_i q_i(x) + T(x) + S(x) \quad (32)$$

which immediately gives:

$$\mu = \mu_E + \mu_T + \mu_S \quad (33)$$

Assume that there are m commodities consumed by individuals, p_i is the price of the i th commodity, and $q_i(x)$ is the quantity of the i th commodity consumed by an individual with welfare x . Given this, $E(x)$ is the total expenditure incurred with mean μ_E , $T(x)$ is the direct tax paid with mean μ_T , and $S(x)$ with mean μ_S is the savings by an individual with welfare x . All expenditure, income tax, and savings have been deflated by the number of equivalent adults. The average welfare μ is the sum of averages of total expenditure, direct taxes, and savings.

To assess fiscal policies at the macro level, we calculate the social welfare elasticity with respect to each of the components in (33). Suppose δ_E , δ_T , and δ_S are social welfare elasticities with respect to μ_E , μ_T , and μ_S , respectively. Given this, the social welfare elasticity with respect to μ is equal to 1 so that:

$$\delta_E + \delta_T + \delta_S = 1 \quad (34)$$

The welfare reform indexes for each component in (33) can be given by:

$$\varphi_E = \frac{\mu \delta_E}{\mu_E} - 1$$

$$\varphi_T = \frac{\mu \delta_T}{\mu_T} - 1$$

$$\varphi_S = \frac{\mu \delta_S}{\mu_S} - 1$$

such that:

$$\frac{\mu_E \varphi_E}{\mu} + \frac{\mu_T \varphi_T}{\mu} + \frac{\mu_S \varphi_S}{\mu} = 0 \quad (35)$$

which provides a framework for evaluating fiscal policy at the macro level.

(2) Indirect Taxes and Subsidies

Indirect taxes are levied on household expenditures and, therefore, increase the prices consumers pay. The price increases reduce social welfare. In contrast, subsidies on household expenditures increase social welfare because they reduce the prices consumers pay. To measure the impact of indirect taxes and subsidies, we calculate the elasticity of social welfare with respect to the price of the i th commodity, which is taxed or subsidized.

Suppose that due to indirect taxes and subsidies, the price vector p changes to p^* . How will this price change affect the individual welfare x ? To answer this question, we consider the expenditure function $e(u, p)$, which is the minimum expenditure required to maintain u level of utility when the price vector is p . Because of the change in prices, the real welfare of the individual will change by:

$$\Delta x = -[e(u, p^*) - e(u, p)] \quad (36)$$

which, on using Taylor expansion, gives:

$$\Delta x = -\sum_{i=1}^m (p_i^* - p_i) q_i(x)$$

which immediately yields:

$$\frac{\partial x}{\partial p_i} = -q_i(x) \quad (37)$$

This equation is useful in deriving the social welfare elasticity with respect to the price of i th commodity. First, we consider Atkinson's social welfare function x^* given in equation (9). Differentiating (9) with respect to p_i and utilizing (34) yields:

$$u'(x^*) \frac{\partial x^*}{\partial p_i} = -\int_0^\infty u'(x) q_i(x) g(x) dx$$

which gives the elasticity of x^* with respect to p_i as:

$$\tau_i = \frac{p_i \partial x^*}{x^* \partial p_i} = -\frac{1}{x^* u'(x^*)} \int_0^\infty u'(x) e_i(x) g(x) dx \quad (38)$$

where $e_i(x)$ is the expenditure on the i th commodity of an individual welfare x . The elasticity τ_i will be negative because any increase in price will reduce individuals' real income, which in turn will diminish social welfare. It will be useful to write:

$$\tau_i = -\frac{\bar{e}_i}{\mu} + \left(\tau_j + \frac{\bar{e}_i}{\mu} \right) \quad (39)$$

where \bar{e}_i is the mean expenditure on the i th commodity.

The first term in (39) is the income effect of the price increase and will always be negative. The second term is given by:

$$\left(\tau_i + \frac{\bar{e}_i}{\mu} \right) = -\frac{A}{(1-A)} \left[\frac{p_i \partial A}{A \partial p_i} \right] \quad (40)$$

where A is the inequality measure implicit in Atkinson's social welfare function.

Equation (40) shows that the second term on the right-hand side of (39) will be positive (negative) if the increase in the price of the i th commodity reduces (increases) income inequality. Thus, the redistribution or inequality effect informs us whether an increase in the price of i th commodity hurts the poor more than the nonpoor, or vice versa. If this component is positive (negative), it suggests that the i th price increase hurts the nonpoor more (less) than the poor. This leads us to suggest the price reform index:

$$\sigma_i = \frac{\tau_i \mu}{e_i} + 1 \quad (41)$$

If σ_i is positive (negative), an increase in the i th prices hurts the nonpoor more (less) than the poor. Thus, if σ_i is negative (positive), then the i th commodity should be subsidized (taxed) so that the poor benefit (suffer) more (less) than the nonpoor. On this account, σ_i can be utilized to reform tax or subsidy systems so that the maximum improvement in social welfare is achieved from a given marginal reform.

V. ANALYSIS OF EMPIRICAL RESULTS

A. Direct Taxes

Tables 1 and 2 present the empirical results of the analysis of the distributional impact of the Philippines' fiscal system. Table 1 shows the values of the welfare elasticity and welfare reform index for different income sources using Atkinson and Sen's social welfare functions. Atkinson's social welfare function enables us to assess the distributional impacts for different values of the inequality aversion parameter. When the inequality aversion parameter is zero, society is not concerned with inequality and focuses only on improving its average welfare. However, there can be a trade-off between the average welfare of society and inequality. A government policy may succeed in enhancing the average welfare of society, but at the same time may lead to stagnant or declining living standards among the poor. To analyze the distributional impacts of government policies, we should use a social welfare function, wherein the inequality aversion parameter should be always greater than zero.

As pointed out earlier, the higher the value of the inequality aversion parameter, the greater the weight given to income transfers at the lower end of the income distribution. Hence, a policy concerned with the poor's welfare would require a higher value of the inequality aversion parameter. How high the value should be, however, cannot be determined a priori. This paper provides the estimates for the value of inequality aversion parameter equal to 1.

Table 1 shows that the welfare elasticity varies widely for different income sources. If, for instance, wage and salary income increases by 1%, per capita welfare increases by 0.498%. The result indicates that wage and salary income is a major source of household welfare among the poor. Among the poorest 30% of households engaged in an economic activity, nearly 71% depended on their earnings contributed by wages and salaries. The Philippines has a huge informal economy, which accounted for 38.3% of the country's labor force in 2017. The International Labour Organization (2018) estimates that nearly two in five workers in the country are likely to be employed in jobs with no formal work arrangements and social protection benefits. The country's informal economy

Table 1: Welfare Elasticity and Reform Index by Income Source, 2017

Income Source	Mean* (₱)	Percentage Share	Atkinson Social Welfare Function**		Gini Social Welfare Function	
			Elasticity	Reform Index	Elasticity	Reform Index
Salaries and wages	16,091	49.30	0.498	0.009	0.506	0.027
Net shares of crops, fruits, etc.	151	0.46	0.004	-0.061	0.004	-0.076
Family sustenance activities	305	0.93	0.021	1.234	0.021	1.207
Cash receipts from abroad	3,103	9.51	0.066	-0.305	0.062	-0.349
Cash receipts from domestic source	1,506	4.61	0.077	0.668	0.078	0.696
Rentals from nonagricultural lands	439	1.34	0.004	-0.689	0.003	-0.754
Interest	45	0.14	0.001	-0.617	0.000	-0.745
Pension and retirement benefits	1,023	3.13	0.018	-0.430	0.016	-0.492
Dividends from investment	68	0.21	0.000	-0.916	0.000	-0.974
Other sources of income	13	0.04	0.000	-0.408	0.000	-0.418
Crop farming and gardening	1,223	3.75	0.060	0.588	0.058	0.558
Livestock and poultry-raising	141	0.43	0.006	0.438	0.006	0.427
Fishing	306	0.94	0.021	1.185	0.021	1.235
Forestry and hunting	29	0.09	0.002	1.639	0.002	1.374
Wholesale and retail	2,523	7.73	0.065	-0.165	0.065	-0.164
Manufacturing	259	0.79	0.008	-0.008	0.008	-0.054
Community, social, and personal services	602	1.85	0.015	-0.180	0.015	-0.188
Transport, storage, and communication	754	2.31	0.029	0.271	0.031	0.336
Mining and quarrying	13	0.04	0.001	0.922	0.001	1.025
Construction	43	0.13	0.000	-0.647	0.000	-0.778
Entrepreneurial activities not classified	289	0.88	0.003	-0.669	0.003	-0.711
Other economic activities	6	0.02	0.000	0.395	0.000	-0.057
Total received as gifts	736	2.25	0.023	0.018	0.023	0.001
Imputed rent	2,972	9.11	0.078	-0.140	0.077	-0.159
Direct taxes	1,464	4.48	0.021	-0.536	0.017	-0.623
Per capita total expenditure	25,422	77.88	0.919	0.180	0.896	0.150
Savings	5,756	17.63	0.060	-0.660	0.088	-0.503
Per capita total household welfare	32,641	100	1.000	0.000	1.000	0.000

* Mean values presented in the table are expressed in per capita and biannual terms.

** The elasticities and welfare reform indexes for Atkinson's social welfare function are estimated for the inequality aversion parameter, equal to one, $\epsilon=1$.

Source: Author's calculations.

covers the so-called underground or informal micro, small, and medium-sized enterprises (MSMEs), which are not necessarily registered with the government. MSMEs accounted for 99.5% of all enterprises and employed 63.2% of the labor force as of end-2018 (Shinozaki and Rao 2021). The large informal economy in the Philippines may be attributed to various reasons such as weak tax enforcement, inefficiencies of tax administration, and tax avoidance behaviors. Economic activities outside the government tax systems are estimated to make up 28% of the country's GDP (Chongvilaivan and Chooi 2021). Hence, if the Philippine government implements a labor market policy that increases the share of wage and salary income, the poor will likely benefit more than their nonpoor counterparts. Moreover, such a labor market policy may be well suited especially in a post-pandemic setting as it could help bring back part of 1.7 million wage and salary jobs that were wiped out in 2020 because of the COVID-19 pandemic, according to Asian Development Bank (ADB) estimates (Bird, Lozano, and Mendoza 2021).

The welfare elasticity for family sustenance activities is 0.021 for both Atkinson and Gini social welfare functions. This means that the poor depend heavily on such family sustenance activities. Households engaged in farming and fishery—whose produce or catch are often just enough to feed their families—comprise the poorest sections in the Philippines. Farmers and fisherfolk belong to households with highest poverty incidences at 34% each in 2015 (PSA 2017). If the government's social objective is to reduce extreme poverty and inequality, it may consider providing subsidies to poor households relying heavily on family sustenance activities as their major source of welfare.

As suggested, the welfare reform index can be employed to make government fiscal reforms more equitable through marginal reforms. The positive value of reform index indicates that any increase in the j th income source redistributes income from the nonpoor to the poor, resulting in higher social welfare and lower income inequality. Moreover, the higher the value of the index, the greater the benefits will be to the poor. The value of reform index for the family sustenance activities is 1.234 when the inequality aversion parameter is equal to 1. The family sustenance activities will proportionally benefit the poor more than the nonpoor. The extremely poor are likely to benefit even more from family sustenance activities.

The major source of income for the poor comes from labor earnings because they are unlikely to possess physical assets. Any policy that increases the share of wages and salaries should, therefore, help the poor more than the nonpoor. While our empirical results support this proposition, they are insignificant. The welfare reform index for the wage and salary income is 0.009 when the inequality aversion parameter for Atkinson's social welfare function is 1. The corresponding value for the Gini social welfare function is somewhat larger at 0.027. These results indicate that wage and salary benefit the poor more than their nonpoor counterparts.

Income sources that disproportionately benefit the nonpoor are rentals from nonagricultural lands, remittances from abroad, interest, dividends, construction, and social and personal services. The reform indexes for the income source from pensions and retirement benefits have negative values, indicating that the poor do not benefit much from this income source as compared to their nonpoor counterparts. In most developing countries, the poor do not have access to pensions and retirement benefits. Many workers are engaged in informal sector jobs, which do not provide retirement benefits. Since the Philippines is now a middle-income country, the government may be in a better position to mobilize resources for providing universal social security.

In the Philippines, income transfers from abroad contribute nearly 10% of total household welfare and are largely perceived to help poor families. Such a perception is not supported by our empirical results. The values of the welfare reform index for remittances from overseas are -0.305 for

Atkinson's social welfare and -0.349 for Gini social welfare. This suggests that international remittances are regressive and benefit the nonpoor proportionally more than the poor. This result is consistent with findings of studies by Pernia (2008) and Deluna and Pedida (2014) that remittances have no significant effect on income inequality. Although remittances appear to increase average incomes for all income groups in the Philippines, such increases seem to be greater for richer households than their poorer counterparts—a pattern that is also observed in several Latin American countries. This is because richer income quintiles have proportionately more households that receive remittances especially from abroad and in bigger transfer size relative to poorer income quintiles (Pernia 2008).

By contrast, income transfers from domestic sources show the opposite effect. The values of the welfare reform index are about 0.7 for both social welfare functions, suggesting that benefits of domestic remittances generally accrue to the poor. Domestic income transfers are more welfare-enhancing for poorer households and better at reducing inequality than remittances from abroad. This may be due to the pattern of internal migration in the Philippines, wherein workers from rural areas leave for modest jobs in urban centers. Despite this, earnings from such modest jobs serve as one of the primary sources of support to impoverished rural households.

It is interesting to highlight that the conclusions emerging from Sen's social welfare function are broadly consistent with those drawn from Atkinson's social welfare function, despite different assumptions underpinning the two social welfare functions. The Atkinson welfare function encompasses a rather restrictive assumption that an individual's satisfaction is independent of others' consumption in society. In comparison, Sen's social welfare function assumes that a person does compare herself with others and feel relatively deprived when she finds her income or consumption lower.

B. Fiscal Policy

We have assessed fiscal policy largely based on three components: (i) direct taxes as mostly represented by personal income tax; (ii) indirect taxes as captured by total expenditure; and (iii) taxes on savings.¹⁰

The welfare reform index for direct taxes is about -0.6 , which indicates that direct taxes such as personal income tax are progressive so the nonpoor contribute proportionally more than the poor. In the Philippines, income is taxed progressively up to 35% for the richest taxpayers or those whose annual taxable income exceeds ₱8 million. However, with the 2018 tax reforms, the rest of taxpayers will see lower tax rates ranging from 15% to 30% by 2023 (DOF 2022). Even so, the progressivity of the personal income tax had been diminishing over 2003–2009 as the relative share of tax paid in total spending of higher-income households had been decreasing compared with lower-income households. This decline was attributed to difficulties in tax administration (Usui 2011). Since the distributional impacts of tax depend on its progressivity and size, the overall impact of income tax on inequality is very small. While this paper finds direct taxes progressive overall, the revenues collected from direct taxes only account for about 4.5% of the total household welfare.

Assuming the value-added taxes are proportional to total expenditure, the progressivity of value-added taxes can be assessed based on the welfare reform index of the total expenditure.

¹⁰ Accumulated incomes and net savings may influence wealth, which in turn could affect the distribution of inequalities. In the Philippines, the net personal wealth share of the top 10% declined from 76.2% in 1997 to 62.8% in 2021, according to data from the World Inequality Database. The analysis of fiscal policies' impact on wealth is beyond the scope of this paper and could be examined more extensively in future studies.

This index value as presented in Table 1 is 0.18, derived from Atkinson's social welfare function. Thus, we deem the value-added taxes regressive, contributing to worsening inequality, if designed poorly. Its degree of regressivity can be reduced by giving exemptions to essential goods and services that are consumed by the poor. Such a policy will, however, make the tax base narrower, resulting in a smaller tax revenue for the government. A better policy would be to expand the progressive personal income tax base, which is currently very low in the Philippines.

The welfare reform index for savings is -0.66 when Atkinson's social welfare function is used. The result indicates that savings are highly concentrated among rich individuals. Hence, any taxes imposed on investment incomes will be highly progressive as the rich would bear greater tax burden than their poor counterparts.

The Philippine government collects about 16% of its revenue from corporate income taxes. Higher corporate taxes might lower demand for capital and hence reduce the capital stock, increasing its return and thereby widening the income distribution. Higher corporate taxes might also result in higher prices from manufacturing corporations, hence, shifting the burden to consumers. Further, the burden of corporate taxes can be passed on to wages, finding that workers bear about one half of the total tax burden. In this case, it is reasonable to assume that corporate tax is proportional to wage and salary income. Nevertheless, our values of welfare reform index for wage and salary, close to 0, suggest that shifting of the corporate tax burden to high wage and salary earners is rather insignificant. Horizontal inequities exist among businesses as firms that qualify for tax incentives face effective tax rates between 6% and 14%, while businesses that do not get such incentives face rates as high as 30% (Sawada 2018).

Overall, aside from disproportionately benefiting the nonpoor and weighing down the poor, the tax system in the Philippines generates little revenue relative to the distortions it creates. The middle class and poorer segments of the population bear much of the burden of the country's tax system. As much as 20% of the total tax collected in 2013 came from only 4.66 million households comprising the middle class (Angara 2015).

The first series of tax reforms implemented in January 2018 are expected to increase the progressivity of the Philippines' tax system. Multilateral development agencies such as ADB and the World Bank have thrown their support behind these tax reforms, noting that lowering of personal income tax rates was a right step toward progressivity by easing the tax burden on the middle class. Moreover, the Philippine government seeks to reduce the current 30% corporate income tax rate to 20% by 2029—a move that has been welcomed by different stakeholders to improve the competitiveness of the Philippines' tax system (Tadalan 2019).

C. Indirect Taxes on Individual Commodities

Table 2 presents the values of welfare elasticity with respect to prices. Since price hikes erode one's real income, economic theory predicts that social welfare will be lower when prices increase. All values of social welfare elasticity are expected to be negative. Our empirical estimates of elasticity are indeed consistent with the results anticipated by the economic theory.

The price reform index can be either negative or positive. The positive (negative) value of the price reform index implies that the increase in prices hurts the poor proportionally more (less) than their nonpoor counterparts. The value of reform index for food items largely consumed at home is 0.478 when Atkinson's social welfare function is used. This suggests that any indirect taxes on food items are highly regressive. The poor pay a much higher proportion of their income for taxes compared to their nonpoor counterparts.

Table 2: Elasticity and Price Reform Index for Indirect Taxes, 2017

Expenditure Group	Mean* (₱)	Percentage Share	Atkinson Social Welfare Function**		Gini Social Welfare Function	
			Elasticity	Reform Index	Elasticity	Reform Index
Cereal and cereal preparations	2,811.0	8.61	0.146	0.698	0.146	0.701
Meat and meat preparations	1,402.7	4.30	0.054	0.247	0.054	0.257
Fish and marine products	1,307.2	4.00	0.060	0.506	0.061	0.535
Dairy products and eggs	832.7	2.55	0.031	0.232	0.032	0.242
Oils and fats	167.6	0.51	0.007	0.386	0.007	0.386
Fruits	349.9	1.07	0.014	0.288	0.013	0.259
Vegetables	612.3	1.88	0.029	0.529	0.029	0.523
Sugar, jam, and honey	221.1	0.68	0.010	0.505	0.010	0.475
Food not elsewhere classified	235.7	0.72	0.010	0.437	0.011	0.459
Coffee, cocoa, and tea	385.2	1.18	0.018	0.509	0.018	0.539
Mineral water, soft drinks, and juices	356.7	1.09	0.013	0.232	0.013	0.227
Total food consumed at home	8,681.9	26.60	0.393	0.478	0.395	0.485
Food regularly consumed outside home	2,315.9	7.09	0.073	0.031	0.074	0.038
Alcoholic beverages	144.0	0.44	0.006	0.281	0.006	0.296
Tobacco	304.6	0.93	0.014	0.534	0.014	0.460
Other vegetables	2.4	0.01	0.000	1.389	0.000	1.399
Clothing, footwear, and other wear	467.7	1.43	0.014	-0.006	0.014	-0.055
Furnishing and household maintenance	767.5	2.35	0.021	-0.104	0.019	-0.172
Health	913.1	2.80	0.025	-0.094	0.023	-0.181
Recreation and culture	340.7	1.04	0.011	0.018	0.009	-0.118
Education	865.1	2.65	0.023	-0.115	0.023	-0.147
Miscellaneous goods and services	1,758.4	5.39	0.055	0.019	0.053	-0.013
Housing, water, and fuels	5,567.1	17.06	0.168	-0.017	0.159	-0.066
Food consumed at hotels	58.9	0.18	0.002	-0.077	0.002	-0.077
Transport	1,524.8	4.67	0.049	0.040	0.047	0.016
Special occasion	671.1	2.06	0.019	-0.083	0.019	-0.085
Durable furniture	525.7	1.61	0.011	-0.342	0.010	-0.388
Communication	512.8	1.57	0.015	-0.044	0.012	-0.205
Direct taxes	1463.8	4.48	0.021	-0.536	0.017	-0.623
Per capita total expenditure	25,421.9	77.88	0.919	0.180	0.896	0.150

* Mean values presented in the table are expressed in per capita and biannual terms.

** The elasticities and welfare reform indexes for Atkinson's social welfare function are estimated for the inequality aversion parameter, equal to one, $\epsilon=1$.

Source: Author's calculations.

The poorest 30% of the Filipinos spent almost 60% of their expenditures on food in 2018 (PSA 2018). The index values for nonfood items are rather small for both Atkinson's and Gini social welfare functions, although they are mostly negative. This suggests that indirect taxes on most nonfood items are modestly progressive, suggesting any price increases in nonfood items due to taxes will pass more on to nonpoor consumers than poor ones. As indicated by the reform index value of 0.18 for the total expenditure, indirect taxes are overall regressive. Hence, price increases caused by indirect taxes on food and nonfood expenditure generally hurt poor consumers proportionally more than their nonpoor counterparts.

Exempting many items largely consumed by the poor is believed to make indirect taxes somewhat less regressive. Our empirical results do not support this belief. Nevertheless, the degree of regressivity can be minimized by levying higher tax rates on luxuries and lower rates on necessities, or zero tax rates on most essential goods and services. Such a tax system with multiple rates could be designed using our proposed welfare reform index. The commodities with positive (negative) values of the price reform index would attract lower (higher) tax rates. As our results show, there are only several expenditure groups with a negative index value. It is indeed difficult to design an indirect tax system that is progressive. A large number of developing countries rely heavily on indirect taxes because they are unable to collect sufficient revenues from direct taxes.

Many governments in both developing and developed countries impose heavy excise duties on alcohol and tobacco. These commodities are generally called "sin goods" because of their adverse impact on people's health. Governments, therefore, find it politically easy to sell these taxes to voters. The values of the price reform index are 0.281 for alcohol beverages and 0.534 for tobacco. The results suggest that excise taxes on these goods are regressive. The poor bear the heavy burden of excise taxes on alcohol and especially on tobacco, from which 6.32% of government revenues are sourced. Among poor households in the National Capital Region, the poor allocate a greater share of their income to alcohol at 0.90%, compared with 0.58% for the nonpoor.

Table 2 shows that Filipino households spend over 17% of their welfare on housing utilities like electricity, water, and other fuels. Our estimates of the price reform index suggest that price increases stemming from taxes on these housing utilities will hurt nonpoor households proportionately more than their poor counterparts. This is somewhat expected as nonpoor households allocate a greater proportion of their expenditures on nonfood items like housing utilities to maintain their living conditions.

It is also interesting to note that expenditures on education and medical services are progressive as indicated by the negative values of the price reform index, -0.094 for health and -0.115 for education. Many governments exempt these expenditures from taxation. Some governments even subsidize education and medical services because societies tend to value these services highly. However, the benefits of these general subsidies largely go to the nonpoor rather than their poor counterparts. Moreover, general subsidies are costly as well. Education and medical subsidies targeted to the vulnerable and needy would help create fiscal space for governments.

VI. CONCLUSIONS AND POLICY IMPLICATIONS

Fiscal policies play an indispensable role in reducing inequality by redistributing income. For taxes and transfers to become effective tools for inequality reduction, an important first step is to determine their distributional impacts. This paper derives the elasticities for Atkinson's and Gini social welfare functions and introduces a welfare reform index to assess the extent to which taxes and transfers reduce inequality among different segments of the population in a country. The proposed methodology is applied to the Philippines as an empirical illustration.

This paper finds that social welfare elasticity varies widely for different income sources. For example, a 1% increase in wages and salaries raises total household welfare by 0.498% when the inequality aversion parameter is set to 1 for Atkinson's social welfare. This finding implies that wages and salaries benefit the poor proportionately more than their nonpoor counterparts in the Philippines. This is in part due to wages and salaries being a major source of income for poor households compared with their nonpoor counterparts. Among the poorest 30% of households in 2017, more than 70% had wage- and salary-earning members. Thus, policies seeking to increase the share of wages and salaries in total income will help improve the overall welfare of poor households.

Family sustenance activities were found to benefit the poor proportionately more than the nonpoor, as suggested by elasticity and welfare reform index values based on empirical results. This finding is expected given that poor households are heavily dependent on family sustenance activities such as farming and fishery. Nearly 75% of the poorest 30% Filipinos were engaged in family sustenance activities in 2017.

Our findings suggest remittances from abroad to be regressive, while domestic remittances are progressive. The welfare reform index for income transfers from abroad was -0.305 for Atkinson's social welfare function and -0.349 for Gini social welfare function, indicating that international remittances benefit the nonpoor more than the poor. A similar trend is found in several Latin American countries and may be due to top income quintiles having more households receiving remittances and in larger amounts compared with bottom income quintiles. In contrast, the corresponding values for domestic remittances were 0.668 and 0.696 for Atkinson's and Gini social welfare functions, respectively. This suggests that the benefits of remittances from domestic sources accrue more to poor households than to their nonpoor counterparts. Earnings from rural–urban migration, even from modest jobs, are an important income source for poor households in rural areas.

The paper also finds that while the personal income tax is progressive, revenues collected from it account for only less than 5% of the total household welfare. This finding indicates that personal income tax alone has a limited role to play when it comes to addressing inequality. The decrease in personal income tax rates as part of the first set of Philippine tax reforms implemented in 2018 was considered as a move toward progressivity since it reduces the tax burden on the middle class. Still, more needs to be done to enhance the progressivity of the tax system. The planned reduction of the corporate income tax rate from 30% to 20% by 2029 is, for instance, expected to make the Philippines' tax system more progressive and competitive. Assessing the 2018 tax reforms is, however, beyond the scope of the current paper.

Our estimated value of the price reform index for food group indicate that any indirect taxes on food are regressive.

The paper's empirical findings show excise taxes on alcohol and especially tobacco as regressive. Since 2012, the Philippine government has adopted and repealed laws to increase taxes on tobacco products and alcoholic beverages (Mendoza 2020). The poor bear much of the burden of excise taxes as they tend to allocate a greater share of their income to these sin goods than the nonpoor. In the Philippines, alcoholic beverages account for 2.45% for the total expenditure of the poorest 30%, while for national-average households, the corresponding figure is 1.58% (Ordinario 2020).

Our focus on the equity perspective in this paper does not imply that efficiency should be ignored entirely in analyzing fiscal policies. However, the development platforms of many governments, including the Philippine government, usually revolve around reducing, if not eradicating, poverty. With poverty reduction as a central development agenda, the social welfare function—which forms the basis for assessing fiscal policies—should render a greater weight to those at the lower end of the income distribution than those at the upper end. In such situations, the contribution of efficiency to social welfare will be rather small as compared to that of equity.

In terms of distributional impacts, various fiscal instruments can increase the average welfare of society but induce a decline in living standards of poor segments of the population, or vice-versa. The appropriateness and desirability of taxes and transfers will ultimately depend on the objectives of policies—i.e., whether they seek to prioritize the welfare of those at the lower end of the income spectrum or increase the average welfare of the population by expanding the tax base.

Given the findings that have emerged in the paper, the following policy implications can be drawn.

One, use taxes as a platform for job creation. Wages and salaries are major sources of income for the Filipinos including the poor. Over 70% of the poorest 30% households engaged in an economic activity that derived their earnings contributed by wage and salary income. Given the large informal economy in the Philippines, taxes can be used as a platform to create productive jobs. Nearly two in five Filipino workers are engaged in the informal sector, where MSMEs are operating. The high costs of tax compliance discourage MSMEs from complying with the rules. For example, MSMEs pay much higher taxes relative to their income. Further, tax procedures for MSMEs are complex, requiring a considerable amount of time and resources to comply with tax rules. The government can provide tax incentives and simplify tax administrative procedures for MSMEs, which can help generate jobs especially for the poor.

Two, simplify and digitalize the tax system. Digitalizing the country's tax system can help reduce the costs of tax administration and improve tax compliance. Greater use and adoption of electronic services or e-services, such as e-filing and e-payment, electronic business registration and renewal, and online registration and data management can help improve tax compliance in the Philippines.

Three, widen the tax base. The Philippines' narrow tax base is attributed to its large informal sector. Efforts to broaden the country's tax base would benefit from taxing digital services and transactions. The prolonged COVID-19 pandemic has encouraged a flourishing digital economy, such as online selling and video streaming. To tax digital services and transactions, the government must first adopt a standard definition of activities and transactions that fall under the digital economy. It must also measure the size and impact of the digital economy. Further, the digital economy tends to engage self-employed individuals. The Philippines' Bureau of Internal Revenue estimates that only 22% of self-employed individuals file and pay their income taxes. The government can also simplify tax procedures for self-employed individuals, including those working in the digital economy, to increase compliance.

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The Distributional Impacts of Fiscal Policy

The Case of the Philippines

This paper focuses on the distributional consequences of fiscal policies. It examines how fiscal policies affect income distribution by deriving the elasticities of social welfare functions by Atkinson and Sen as well as introducing a welfare reform index, and applying them to the Philippines' fiscal instruments. Rentals from properties, dividends from investment, and remittances from abroad were found regressive, while family sustenance activities and remittances from domestic sources were found progressive. The paper also finds the direct taxes of the Philippines to be progressive, although they have limited impact on inequality reduction given the little revenues they generate.

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