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Measuring economic lifestyle and flows across population age groups: Data and methods in the application of the National Transfer Account (NTA) in the Philippines

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Surian sa mga Pag-aaral Pangkaunlaran ng Pilipinas

Measuring Economic Lifecycle and Flows across Population Age Groups: Data and Methods in the Application of the NTA in the Philippines

Rachel H. Racelis and J.M Ian S. Salas

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Measuring economic lifecycle and flows across population age groups: data and methods in the application of the National Transfer Accounts (NTA) in the Philippines[1]

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September 2007

Abstract

The age structure of the population of the Philippines, as in many developing countries in the world, will be experiencing significant changes in the next four decades. These changes can have potentially important implications on economic development. Many studies in the Philippines have examined the population-development linkages. The National Transfer Accounts (NTA) offers another way to examine these links. In the NTA the interaction among population age structure, economic lifecycle behavior and systems for intergenerational support, and their potential implications on the accumulation of wealth, rates of economic growth and generational equity are examined. An important feature of the NTA is the central role played by intergenerational transfer of resources in explaining the link between population and development.

The main purpose of this paper is to provide an overview of the NTA system and then describe the methods and data used in the application of NTA in the Philippines. The NTA system is consistent with the System of National Accounts. It provides methodologies for assigning labor earnings and consumption to population age groups, and for estimating reallocation or transfer of economic resources across age groups. Age reallocations are generally from the working age groups to children and the elderly. Data sources for the estimation of components of the NTA Flow Accounts for the Philippines include National Income Accounts, National Health Accounts, National Education Expenditure Accounts, household income and expenditure surveys, and government finance documents. Some Philippines NTA results are presented as examples, specifically the age profiles of current consumption (C), labor income (YL) and the life cycle deficit (LCD). Three other papers in the PIDS Discussion Paper Series present more detail on results and analyses of Philippines NTA Flow Account estimates.

Keywords: National Transfer Accounts, economic lifecycle, intergenerational transfer, income age profile, consumption age profile, lifecycle deficit

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[1] Prepared under the Asia's Dependency Transition Project, a project covering the four countries of China, India, Philippines and Thailand. The Philippine Institute for Development Studies and the Nihon University Population Research Institute implemented the Philippines component with support from the United Nations Population Fund (UNFPA.) The Project is part of an international collaboration to develop and apply the National Transfer Accounts (see www.ntaccounts.org.)

Measuring economic lifecycle and flows across population age groups: data and methods in the application of the National Transfer Accounts (NTA) in the Philippines

Rachel H. Racelis and J.M. Ian S. Salas

I. Introduction

The age structure of the population of the Philippines, as in many developing countries in the world, will be experiencing significant changes in the next four decades. Many Philippine studies done both at the macro and household levels have argued that changing population demographics has a bearing on economic development and poverty Among these are those by Orbeta and Pernia (1999), Orbeta (2002), Alonzo et. al. (2004), Orbeta (2005) and Orbeta (2006.). In macro level analyses, the relationships examined were between population aspects quantified in terms of population growth rate and fertility rate, and economic aspects quantified in terms of GNP per capita and human capital expenditures. In household level analyses, the relationships examined were between population aspects quantified in terms of household size and number of young children, and economic aspects quantified in terms of investment in children, asset accumulation, saving, labor supply of adults, parental earnings and poverty status.

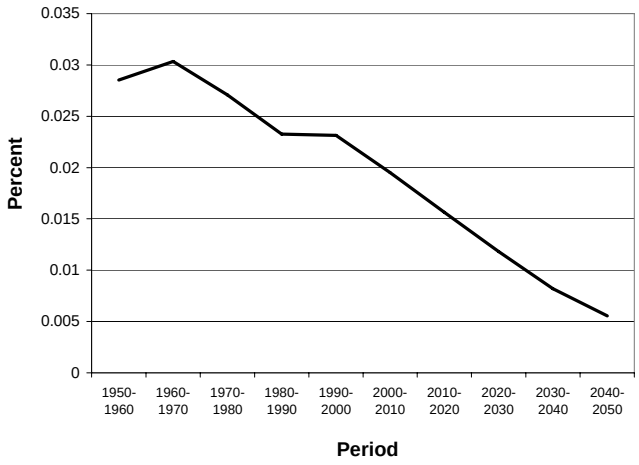
The National Transfer Accounts (NTA) offers another way to examine the population-development links. Using NTA estimates, the interaction among population age structure, economic lifecycle and systems for intergenerational support, and their potential implications on the accumulation of wealth, rates of economic growth and generational equity can be examined. Population age structure affects how much is produced, consumed and reallocated among age groups within the economy. Reallocation or transfers of economic resources among age groups (and the modes or systems of transfer) affect the accumulation of wealth of individuals as well as the whole economy. An important feature of NTA analysis is the central role played by intergenerational transfer of resources in explaining the link between population and economic development.

The next section of this paper presents historical and projected population data to set the context of demographic change and to highlight important population age structure changes expected in the next four decades in the Philippines. The succeeding sections then provide an overview of the NTA system and describe methods and data used in the application of NTA in the Philippines. Some Philippine NTA results are presented in the last section, specifically the age profiles of current consumption (C), labor income (YL) and the life cycle deficit (LCD).

II. Philippine Population Trends

Philippine population size was 19.2 million in 1948, 42.0 million in 1975 and 76.5 million in 2000 (NSCB, 2003.) It is projected to be 115.9 million in 2025 and 140.5 million in 2050 based on United Nations projections. While the absolute size of population in 2050 is projected to be roughly double the 2000 population, average annual growth rates are expected to decline in the future following the historical pattern of growth in the period 1950-2000 (Figure 1.)

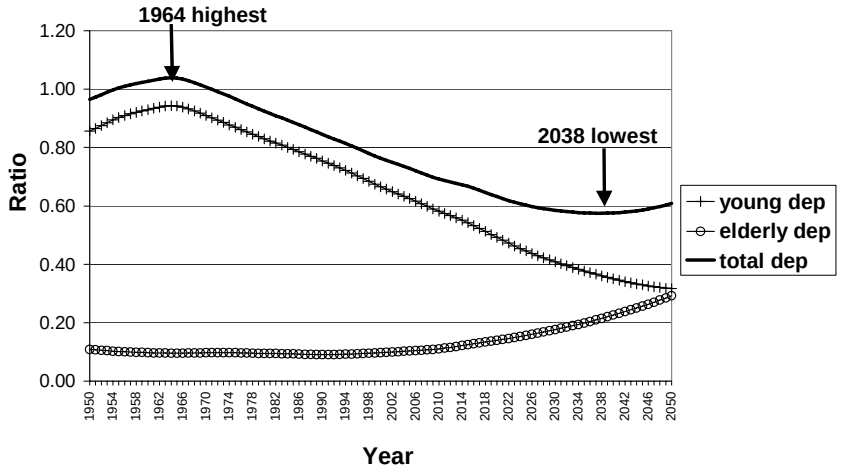
Figure 1. Average Annual Population Growth Rates: Philippines, Actual 1950-2000 and Projected 2000-2050



The historical and projected changes in Philippine population age structure are described in terms of age dependency ratios and population pyramids. Age dependency ratios are computed by taking the ratio of the sizes of the dependent populations to that of the working-age population. Dependent populations include those aged 0-14 years (young dependency) and 65 or older (elderly dependency.) The population pyramid is a graphical presentation of the population distribution by age.

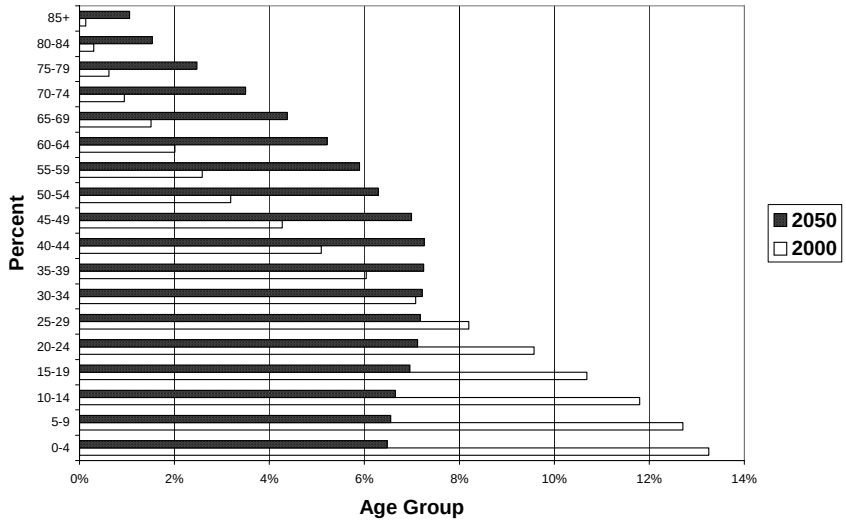
Total age dependency in the Philippines was highest around 1964, with about 10 dependents for every 10 working-age persons (Figure 2.) It came down in 2000 to about 7 to 8 dependents for every 10 working-age persons, and is projected to hit its lowest around 2038 at about 6 dependents for every 10 working-age persons. Both the decline in the percentage of young population and the increase in the percentage of working-age population had driven the decline in the total dependency ratio up to the year 2038. Then the ratio will increase after 2038 as elderly dependency starts to rise faster.

Figure 2. Dependency Ratios
(Population 0-14, 60+ and Combined / Population 15-60):
Philippines, 1950-2050



Up to 2000, the shape of the pyramid representing the distribution (in percent) of the Philippine population by age group had remained expansive or wide-based, indicating the continuing predominance of the young population (Figure 3.) By 2050, however, the shape of the population pyramid is projected to become constrictive (lower proportions of young population) with significant bulging out at the older ages.

Figure 3. Population Pyramid (Age Distribution):
Philippines, 2000 and Projected 2050



III. An Overview of the NTA

The discussions in this section borrow heavily from Lee and Mason (2004), Mason (2005) and Mason, et al. (2005).

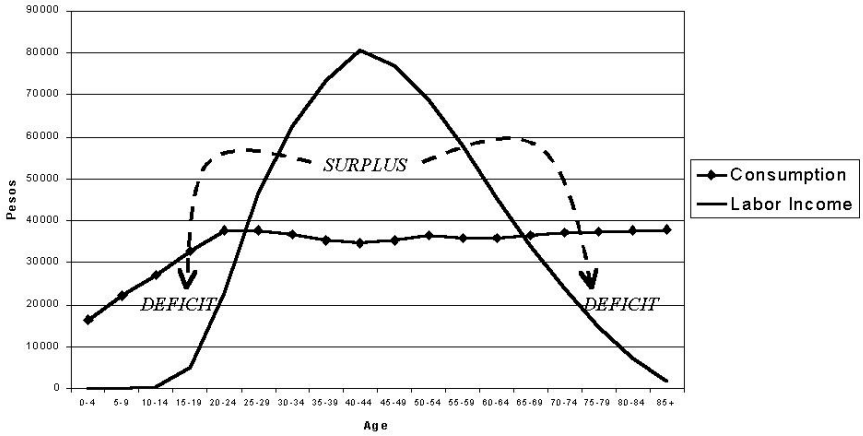
NTA Activities

The development of the NTA system has been ongoing since 2004 (Lee and Mason, 2004.) The East-West Center, Honolulu (Dr. Andrew Mason) and the Center for the Economics and Demography of Aging, University of California, Berkeley (Dr. Ronald Lee) jointly lead the international efforts. As of 2006, the NTA has been constructed and used in policy analysis in 17 countries in Europe, South America and the United States, and Asia. In 2007, two African countries joined the group..

What is NTA?

To describe briefly, the NTA is a comprehensive system for measuring economic flows from members of one age group to other age groups, done at the aggregate level and for a prescribed period of time. The economic flows among age groups, also referred to in NTA as age reallocations or intergenerational transfers, arise because in any society members who produce more than they consume (surplus ages) support those members who consume more than they produce (deficit ages). The populations in the deficit ages are also referred to as dependents and generally include children and the elderly. Reallocations of economic resources are made from surplus to deficit ages (Figure 4).

Figure 4. The Most Important Graph in NTA: Per Capita Consumption, Labor Income and Lifecycle Deficit By Age



Intergenerational Reallocation

Societies use different approaches to reallocate resources from surplus to deficit ages. One method relies on capital markets. Individuals accumulate capital during

working ages and when they are older and no longer productive support their consumption by relying on capital income (interests, dividends, interest income, profits etc.) and by liquidating assets. The other method relies on transfers from those at surplus ages to those at deficit ages. Some of these transfers are mediated by the public sector while many are private transfers of which familial transfers are the most important.

Table 1. A Classification of NTA Reallocations

Governing institution	Asset-based reallocation		(Pure) Transfers
	Capital and property	Land and credit	
Public	Public infrastructure	Public debt Student loans	Public education Public health care
Private	Housing Consumer durables Factories Inventories	Consumer credit Rental of land	Familial support of children and parents Bequests Charitable contributions

Source: Mason, et. al. (2005)

In the NTA these reallocation systems are classified along two dimensions, the governing or mediating institutions and the economic form of reallocation (Table 1.) Public sector reallocations rely on mandates embodied in laws and regulations, and are mediated by all levels of government. Private sector reallocations are governed by voluntary actions and are mediated by households and other private institutions (e.g., charitable organizations.) In terms of form, assets can be used for inter-temporal resource allocation or the allocation of resources across time periods. As described above, assets or capital are accumulated while young and dis-accumulated when old. Transfers, on the other hand, are reallocations from one age group to other age groups, which involve no explicit *quid pro quo*.

The household plays a prominent role in private age reallocations. In virtually every society reallocations to children are dominated by intra-household transfers, and in many countries the elderly live with and are supported by their adult children. Moreover, many assets are held by households rather than by individuals.

NTA Core Components

The core of the NTA system consists of two accounts: the flow account (also called the lifecycle account) and the wealth account. The flow account measures flows that lead to a reallocation of resources from one age group to another. The wealth account measures the value of the stock associated with each flow. In both types of accounts, components are examined separately for the private and public sectors.

In the NTA Flow Account, life cycle deficits are computed as the difference between consumption and labor income earned at each specific age. Age groups whose

consumption exceeds labor income are described as deficit age groups; while those groups consuming less than their earnings are the surplus age groups. In general the deficit age groups are the young and the elderly, and the surplus groups consist of the working age groups. Then, the amounts of resources reallocated across ages (from surplus to deficit ages) are estimated and the estimates are made for each type or mode of reallocation. Resource reallocations through asset-based reallocation (i.e., capital, land or credit) and through pure transfers (i.e., internal household resource transfers between members and transfers from taxpayers to government service beneficiaries) are estimated separately.

The governing equation for the flow account (EQUATION 1), which must be satisfied for any individual, household, age group, or (closed) economy, is:

$$\underbrace{C - y^l}_{\text{Lifecycle deficit}} = \underbrace{\underbrace{rA - S}_{\text{Asset reallocations}} + \underbrace{\underbrace{\tau_g^+ - \tau_g^-}_{\text{Net public transfers}} + \underbrace{\tau_f^+ - \tau_f^-}_{\text{Net private transfers}}}_{\text{Net transfers}}}_{\text{Age reallocations}}$$

The difference between consumption and production, termed the *lifecycle deficit*, must be matched by *age reallocations* consisting of *asset reallocations* and *net transfers.* Asset reallocations can be further divided into *capital and property reallocation* and *credit reallocations*. Transfers are further divided into *net public transfers* and *net private transfers*, the latter consisting of bequests and *inter vivos transfers.* In turn, *inter vivos transfers* consist of transfers between *(inter)-* and within *(intra-)* households. The above equation describes where financing of lifecycle deficits of deficit age groups will be coming from..

The complete NTA system also provides estimates of wealth associated with age reallocations. Wealth comes in several forms: capital (*K*), property and credit (M), and transfer wealth (*T)*. The governing equation (EQUATION 2) for the wealth account is:

$$W = K + M + T.$$

Total wealth (*W*) and its components can be defined for an individual, an age group, or a population. The first two forms of wealth are familiar concepts. Transfer wealth is the present value of future net transfers.

A complete listing of the components under each "core" account of the NTA is presented in Table 2. The components listed under the Flow Account are indicative of how Equation 1 is estimated. For example, public and private consumption expenditures are estimated as the sum of education, health and other expenditures, and total consumption is the sum of public and private consumption. Labor income is the sum of salaries and wages, benefits and self-employed income. Lifecycle deficit is total consumption less total labor income. The components listed under the Wealth Account follow closely Equation 2. The age groups presented in Table 2 is highly aggregated to

facilitate presentation, but typically, the NTA components are estimated by single-year of age with the top-most age group set at 90 years or older.

Other Features of NTA

The individual is the fundamental analytic unit in the NTA. All transactions are treated as flowing to and from individuals and are classified on the basis of the age of those individuals.

Several conventions have been adopted in the NTA to attribute to individuals transactions that are between or within households. First, all intra-household transfers are assumed to be between the household head and household members. Second, private inter-household transfers are assumed to be between household heads. Third, all household assets are assumed to be held by the household head. Thus, all asset income are attributed to the age group to which the household head belongs.

Another important feature of the NTA system is its consistency with National Income and Product Accounts (NIPA). Variables in the NTA system are frequently defined in a manner identical to NIPA definitions. Differences in conventions are explicitly identified. Many NTA variables, e.g., income, consumption, saving, and investment, use NIPA values as control totals.

More information on the NTA can be obtained from the the following website: www.ntaccounts.org.

Table 2. National Transfer Accounts – Components by Core Account

NTA FLOW ACCOUNT

	Total	Domestic by age					Foreign
		0-14	15-29	30-44	45-59	60+	
Lifecycle Deficit							
Consumption							
Public							
Education							
Health							
Other							
Private							
Education							
Health							
Other							
Less: Labor Income							
Earnings							
Benefits							
Self-employment							
Asset Reallocations							
Public							
Income on Assets							
Less: Public Saving							
Private							
Income on Assets							
Less: Private Saving							
Transfers							
Public							
Inflows							
Outflows							
Direct taxes							
Indirect taxes							
Private							
Inter vivos							
Inter-household							
Inflows							
Outflows							
Intra-household							
Inflows							
Education							
Health							
Other							
Outflows							
Education							
Health							
Other							
Bequests							
Inflows							
Outflows							

NTA WEALTH ACCOUNT

	Total	Domestic by age					Foreign
		0-14	15-29	30-44	45-59	60+	
Wealth							
Capital							
Property and Credit							
Transfer Wealth							
Public							
Private							

IV. Philippine Data and Estimation Methods

For the Philippines, only components of the Flow Account have been estimated so far. Estimation of the Wealth Account has not yet commenced because computational procedures and guidelines are still presently being developed by the lead institutions on NTA. A relatively complete set of the Flow Account has been estimated for the year 1999, i.e. including lifecycle deficit, public transfers, private transfers and asset reallocation. The lifecycle deficit was also estimated for the years 1994 and 2002, to be used mainly as reference to assess the basic age profiles obtained for the year 1999.

The estimation of the Flow Account for the Philippines proceeded in the following (logical) order:

First, using Equation 2 as reference, components on the left-hand side of the equation were estimated, i.e. components that eventually went into the computation of lifecycle deficit. These are the Consumption and Labor Income components.

Second, net public and net private transfers (right-hand side components) were estimated next. Except for the age profile of taxes, estimates of NTA components from (1) are used further in the computation of net public and private transfers, where net transfers = inflows minus outflows.

Third, (total) asset reallocation is derived as a residual by rearranging the terms in Equation 2 and using the results from (1) and (2). That is,

$$\textit{Asset reallocation} = \textit{Lifecycle deficit} - \textit{Net private transfers} - \textit{Net public transfers}$$

Discussions below on data and estimation methods will be organized according to the order listed above in which the Philippine NTA components were estimated. But first the major data sources and the general estimation steps applicable to all components are briefly described.

Main sources of data for the estimation of components of the Philippines NTA Flow Account included: National Income Accounts (specifically Income and Outlays breakdown), National Health Accounts, National Education Expenditure Accounts, household income and expenditure surveys, government finance documents, and UN Population Database (national population by in single ages).

The general steps for the estimation of individual NTA components are as follows:

1. Obtain the value of the National Income Accounts (NIA) “equivalent” of the NTA component and use the NIA value as the aggregate control total. (See

Appendix 1 for descriptions of the control totals used in the Philippines NTA Flow Account.)

2. Calculate per capita values of the NTA component (e.g., private household education expenditure, private household health expenditure, salaries and wages, etc.) by age in single years either directly from household survey data or using some other data and method;
3. Multiply per capita values obtained from (2) by the population size of each age to obtain aggregate values by age and then compute for the grand total by taking the sum of aggregate values across all ages;
4. Compare the grand total from (3) with the control total from (1); and, if necessary, adjust the per capita values estimated in (2) to gain consistency with the control total

In some cases, especially for public consumption, the reverse process is done wherein estimation starts with the control total. First, the (control) total value is distributed equally to identified consumers or user populations at each age, where user populations are identified using survey data. This step provides the total or aggregate value for each age group, e.g. public hospital expenditures allocated to each age group. Next, per capita values (not per user or per consumer) are computed by dividing the aggregate total by the population size at each age.

Consumption and Labor Income

Philippine income and expenditure surveys collect data on most components of income and expenditure only at the household level. Per capita income or expenditure by age group cannot then be computed from these surveys using direct methods. Thus, alternative methods for allocating income and expenditure components to age groups were used in most of the estimation of Philippines NTA Flow Account. The 1999 APIS was selected for the pilot estimation of NTA in the Philippines because it contained most of the data required at the individual household member level that could be useful for constructing indicators for allocating income and expenditure components to age groups. The 1999 APIS, for example, contains individual-level information on school attendance in public and private schools, government hospital use, morbidity, employment status and class of worker.

The discussions that follow below for private sector NTA components focus on describing Step 2 or the methods used to obtain the per capita profile by age. For the public sector NTA components, the discussions focus on describing the approach used to identify consumers or service users and to compute the indicators for allocating or distributing (total) public expenditures to age groups.

It should be noted that for public sector components, the per capita profile by age is estimated starting from the correct Control Total. The per capital age profile for public components thus do not need to be adjusted. For the private sector components, on the other hand, per capita profiles by age are derived directly or indirectly from survey data. These profiles derived from surveys then need to be adjusted using Steps 3 and 4

described above to be made consistent with the Control Totals from the National Income Accounts.

Labor Income

Labor income consists of two parts: salaries and wages; and self-employment income. Earnings or salaries/wages data is reported at the individual worker level in the 1999 APIS. Per capita salaries/wages (not per worker) by age were computed directly from the survey.

Unlike salaries/wages, entrepreneurial or self-employment income is reported in the APIS at the household level. Assignment to household members was done using an indirect method. First, employment status and class of worker information were used to determine who among the household members to assign self-employment income to. Then self-employment income was distributed to household members engaged in own-account work based on wage/salaries age profiles (as described above) as allocation weights. Per capita self-employment income by age was then computed from the assigned individual values.

Public Consumption

Public consumption or expenditures consists of three components: education, health and other public expenditures. Age profiles are computed separately for each component.

Public education expenditures are further broken down by schooling level – elementary, secondary and higher education expenditures. Breakdown of expenditures by level was taken from the National Education Expenditure Accounts. Each of the sub-components were distributed equally to students enrolled in public schools who were of the ages 6-12 years (elementary expenditures), 13-16 years (secondary expenditures) and 17-24 years (higher education expenditures), respectively. The key for distributing each schooling level's expenditures to single age groups was computed using 1999 APIS and national population data. The data on schooling attendance by age and proportions enrolled in public schools were computed from the 1999 APIS. Numbers of students enrolled in public schools were then computed by multiplying age-specific enrolment rates by the proportion of students attending public schools and by the population size at each age. The distribution of the estimated public school students at each level by age are then used to allocate each level's expenditures to the different age groups.

Public health expenditures are further divided into hospital, public primary care facilities (RHU system) and other expenditures. Breakdown of expenditures by type was taken from the National Health Accounts. Each of the health sub-components was distributed equally to users of government hospitals (hospital expenditures), users of primary care facilities (RHU expenditures) and to the entire population, respectively. Similarly, data on government hospital utilization and RHU utilization were computed from the 1999 APIS. Number of government hospital users and RHU users by age were

then computed by multiplying the age-specific utilization rates from the APIS by the population size at each age. The distributions of government hospital and RHU users by age were used to allocate public hospital and RHU expenditures, respectively, to age groups. The distribution of Philippine population by age was used to allocate other health expenditures of government to age groups.

Other public expenditures, which include among others national defense, public works, and environmental protection, are expenditures that cannot be attributed to any particular age group. Thus, other public expenditures were assumed to equally benefit members of the population. The distribution of Philippine population by age was used to allocate other expenditures of government to age groups.

Private Consumption

Private consumption or expenditures consists of three components: education, health and other expenditures. Age profiles are computed separately for each component.

Household education expenditures is reported in the APIS at the household level only. Assignment to household members was done using the regression method. First, school enrollment status information was used to determine whom among the household members to assign education expenditures to. Next, education expenditures were regressed (without intercept) on the number of enrolled household members of each single-year age groups 6 to 25 years old. Then the regression coefficients for each age were used as the weights to distribute household education expenditure to individual enrolled household members. Per capita education expenditures by age was then computed from the assigned individual values.

Household health expenditures are further divided into hospital and non-hospital expenditures. Household health expenditures is reported in the APIS at the household level only. Assignment to household members was done using indirect approaches. First, hospital utilization and morbidity rates by age were computed using the APIS. Then each of the health sub-components, hospital and non-hospital expenditures, were distributed at the household level to all individual household members based on the age profiles of hospital utilization and morbidity rates, respectively, as allocation weights. Per capita health expenditures by age was then computed from the assigned individual values.

For private other consumption, which include among others food and clothing, distribution to individual members of the household was done based on an *ad hoc* allocation rule derived from an extensive review of the literature and estimation methods, e.g., Engel's method and the Rothbarth method (Lee and Mason, 2004). The scale or weight of consumption of individuals, w(a), living within any household who are under 20 years of age (a) are set in terms of equivalence to adult consumption as follows (weight for adult consumption set equal to 1.0):

$$w(a) = 1 - 0.6k \text{ where } k=1 \text{ if } a \leq 4$$
$$= 1 - 0.6[(20-a)/16]k \text{ where } k=1 \text{ if } 4<a<20$$
$$= 1 \text{ if } a \geq 20.$$

These equivalence scales were used as weights in the distribution of household expenditure other than for education and health care to individual household members. Then similarly, per capita other household expenditures by age were computed from the assigned individual values.

Public and Private Transfers

Public Transfers

Public inflows minus public outflows equal net public transfers. The public consumption component (estimation of age profile has already been discussed above) basically constitutes the Inflows part of "net" public transfers.

The Outflows part consists of direct taxes and indirect taxes collected by government. Household direct taxes data are reported in the APIS only at the household level and, similarly, indirect taxes can only be estimated based on APIS consumption data at the household level. Assignment of direct and indirect taxes to household members was done using indirect approaches. Direct taxes were allocated to household members based on the age profile of labor income (derived previously) as allocation weights. Indirect taxes were allocated to household members based on the age profile of household other consumption (also derived previously) as allocation weights. Then per capita direct and indirect taxes by age were computed from the assigned individual values.

Private Transfers

Estimates of private transfers for the Philippines NTA only includes *inter vivos* transfers because of incomplete data on bequests. Household surveys collect data on inheritance received or the inflows side but none on the outflows side.

Aggregate inter-household transfers were directly computed from survey tabulations of total support, assistance and relief received from domestic private sources (inflows side) and total expenditure on gifts and contributions to others (outflows side). These transfers were all attributed to household heads.

On the other hand, aggregate intra-household transfers were derived using a stylized model of familial transfers. Household members who are not the household head allocate their income, net of taxes and public transfers, to two ends: own consumption and intra-household transfer (transfers to other age groups). All those with "surpluses" contribute these to the household head and these contributions are quantified in the NTA as outflows from the surplus age groups. The household head in turn distributes or transfers the surpluses collected from other household members as well as his own

surplus to the deficit age groups and these transfers are quantified in the NTA as inflows to the receiving age groups. The intra-household transfers components are computed using the age profiles generated for the consumption components and labor income described above.

Asset Reallocation

While "total" asset reallocation is derived as a residual, its breakdown or the public and private components are estimated directly from data, except for private saving which is derived as a "second" residual. Following from Table 2:

Total asset reallocation = (public income on assets – public saving)
(private income on asset – private saving)

As explained earlier, the age profile of (total) asset reallocation is derived using estimates of the age profiles of the various components of the Life-Cycle Account discussed above. Age profiles of public income from asset, public saving and private income from asset are estimated directly from survey and other data. Thus, private saving is computed by rearranging the equation above as follows:

Private saving = [(public income on assets - public saving)
+ private income on asset] – total asset reallocation

Private asset incomes earned by households are all attributed to household heads and thus assigned to the age groups to which the heads belong. Private asset incomes include dividends, interest income and rental income.

Public income on asset (primarily interest payment on public debt) for each age group is computed as the net of inflows and outflows to the age group. Interest payments on public debt viewed as earnings or inflows to individuals are allocated to age groups using the age profile of private asset income (investors). The same interest payments viewed as obligations or outflows of individuals are allocated to age groups using the age profile of total direct and indirect tax payments (taxpayers).

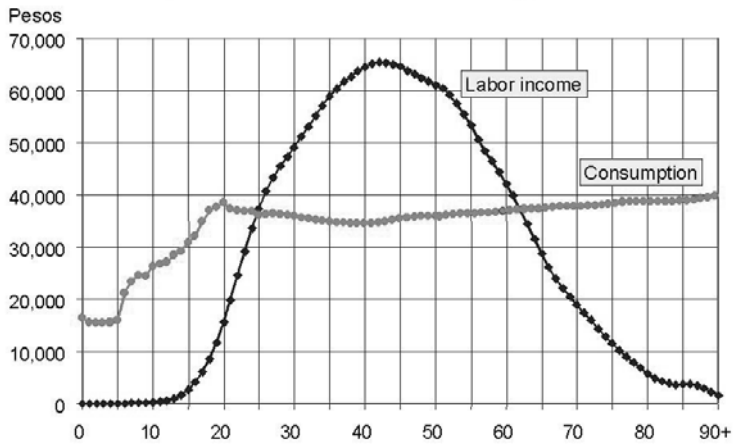
Public saving consists of public investments and public lending. Public investments (net additions to public capital stock, with depreciation estimated using the perpetual inventory method following Cororaton and Cuenca, 2002) are allocated to age groups using the age profile of private asset income. Public lending (also referred to as government borrowings) of each age group is computed as the net of inflows and outflows to the age group. Public lending viewed as inflows to individuals are allocated to age groups using the age profile of private asset income (investors). The same public lending viewed as outflows of individuals are allocated to age groups using the age profile of total direct and indirect tax payments (taxpayers).

V. Examples of Philippines NTA Results

Presented in this section are estimates of selected lifecycle account components constructed using 1999 APIS data. Per capita and aggregate age profiles are both shown.

Age profiles of mean per capita labor income and current consumption are shown in Figure 1. Labor income has the expected inverted-U shape, which peaks at age 42 and appears slightly skewed to the right. Consumption is strongly influenced by the shape of the ad hoc equivalence scale used to distribute household other consumption to its members. The life-cycle deficits are recorded for ages 0-24 years and 62 years and older.

Figure 1. Per capita age profiles for consumption and labor income: Philippines, 1999



The aggregate age profile for labor income and consumption are shown in Figure 2 and the aggregate life-cycle deficit in Figure 3. The population age structure magnifies the life-cycle deficit attributable to the younger age groups, becoming significantly larger than the deficit attributable to the elderly. The life-cycle surplus shown for the ages 25-61 years is not sufficient to cover the deficits, emphasizing the burden of raising and sustaining a very young population as well as supporting the elderly. The aggregate surplus (which makes up most of net private transfers) amounts to only about one-half of the combined deficit. This implies that public transfers and asset reallocation finance the remaining half of aggregate lifecycle deficit.

Figure 2. Aggregate age profiles for consumption and labor income: Philippines, 1999

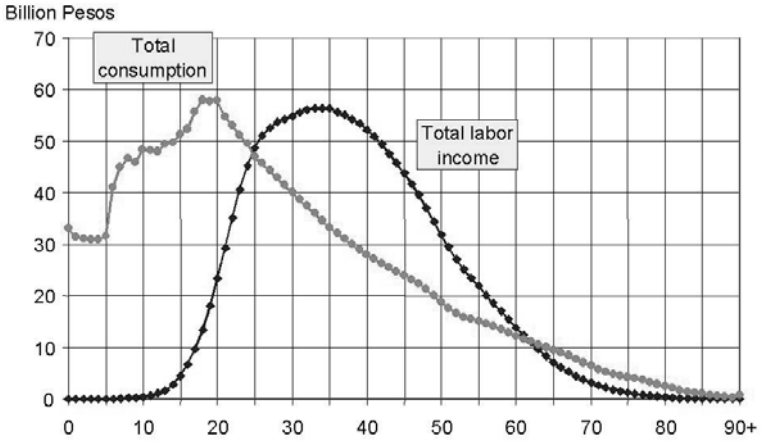
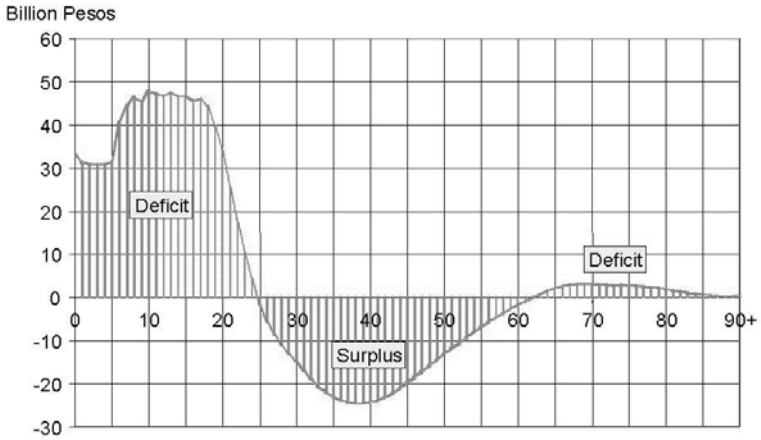


Figure 3. Aggregate age profile for lifecycle deficit: Philippines, 1999



For more discussion about NTA results and analyses refer to three other NTA papers in the PIDS Discussion Paper Series.

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Appendix 1
Control Totals for Components of the Philippines NTA Flow Account

NTA Component	Control Total	Data Sources
CONSUMPTION		
Public – Total	Government consumption expenditures (GCE)	National Income Accounts (NIA)
Education	GCE * (education budget share)	GCE from NIA; budget share computed by dividing total public education expenditures (data from NEXA) by total government budget (data from NSCB, 2003)
Health	GCE * (health budget share)	GCE from NIA; budget share computed by dividing total public health expenditures (data from NHA) by total government budget (data from NSCB, 2003)
Other	GCE less public education and health expenditures	Public education and health expenditures as estimated above.
Private – Total	Personal consumption expenditures (PCE) less net indirect taxes paid by households	NIA
Education	PCE * (education household expenditure share)	PCE from NIA; household expenditure share computed from household income and expenditure survey
Health	PCE * (health household expenditure share)	PCE from NIA; household expenditure share computed from household income and expenditure survey
Other	PCE less household education and health expenditures	Private education and health expenditures as estimated above.
LABOR INCOME		
Earnings	Compensation of employees, residential	NIA
	Net compensation from	NIA

	rest-of-the-world (ROW)	
Self-employment	2/3 * operating surplus of households	NIA; allocation rule of 2/3 based on NTA findings in other countries
ASSET REALLOCATION		
Public		
Income on assets		
- income, public credit	Interest payments on public debt	NIA
Public saving		
- public net investment	Gross value addition (GVA) for construction by the public sector LESS depreciation of public capital stock	GVA for construction from NIA (NSCB Philippine Statistical Yearbooks); depreciation calculated as 10% of previous year stock value (following approach by Cororaton and Cuenca, 2002)
- public lending	Item reported as "borrowing" – also the net operating balance (i.e. revenues-expenditures) LESS net acquisition of non-financial assets	Annual Financial Report of the National Government, Commission on Audit
Private		
Income on assets	1/3 * operating surplus of households	NIA; allocation rule of 1/3 based on NTA findings in other countries
	Operating surplus of private corporations	NIA
TRANSFERS		
Public		
Inflows	(same as public consumption above)	
Outflows		
- direct taxes	Direct taxes, fees and fines	NIA
- indirect taxes	Net indirect taxes	NIA