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Salas, J.M. Ian S.; Racelis, Rachel H.

Working Paper

Have Lifecycle Consumption and Income Patterns in the Philippines Changed between 1994 and 2002?

PIDS Discussion Paper Series, No. 2008-11

Provided in Cooperation with:
Philippine Institute for Development Studies (PIDS), Philippines

Suggested Citation: Salas, J.M. Ian S.; Racelis, Rachel H. (2008) : Have Lifecycle Consumption and Income Patterns in the Philippines Changed between 1994 and 2002?, PIDS Discussion Paper Series, No. 2008-11, Philippine Institute for Development Studies (PIDS), Makati City

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Surian sa mga Pag-aaral Pangkaunlaran ng Pilipinas

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Rachel H. Racelis and J.M. Ian Salas

DISCUSSION PAPER SERIES NO. 2008-11

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March 2008

For comments, suggestions or further inquiries please contact:
The Research Information Staff, Philippine Institute for Development Studies
5th Floor, NEDA sa Makati Building, 106 Amorsolo Street, Legaspi Village, Makati City, Philippines
Tel Nos: (63-2) 8942584 and 8935705; Fax No: (63-2) 8939589; E-mail: publications@pids.gov.ph
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Have lifecycle consumption and income patterns in the Philippines changed between 1994 and 2002?[1]

Rachel H. Racelis and J.M. Ian Salas
University of the Philippines

January 2008

Abstract

Have age profiles of consumption and labor income in the Philippines changed from 1994 to 2002? What are the implications of the changes observed in the lifecycle patterns? The National Transfer Accounts (NTA) methodologies are applied to estimate the per capita age profiles of current consumption and labor income for the Philippines for the years 1994, 1999 and 2002. Age profiles estimated include those for public and private consumption for three broad types, i.e. education, health and other, and two types of labor income, i.e. earnings from paid employment and self employment income. Some of the main findings include: (1) Consumption pattern by age: The age profile for mean per capita current consumption is strongly influenced by the profile of private other consumption being the single largest item of consumption. The pronounced sharp rise in per capita mean consumption observed up to age 18 and the subsequent decline is due to the age pattern of public and private education spending. And the gradual increase in per capita consumption after age 45 may be attributed to the increasing per capita public and private spending for health care as age increases. (2) Consumption age profile over time: The age profiles for current consumption have generally remained unchanged from 1994 to 2002, with mean age of consumption staying at about 27 years. (3) Labor income pattern by age: The age profile of labor income have the expected inverted-U shape, peaking at around age 40 (4) Labor income age profile over time: The overall shape of the age income profiles have generally remained the same, but a gradual shift of the position of the profiles towards the right was observed from 1994 to 2002. The mean age of labor income was 35 in 1994, 38 in 1999 and 39 in 2002. The implications of the consumption and labor income lifecycle patterns and changes observed over time for the Philippines include the following: increase in the deficit age cut-off at older ages; increase in the span of productive or surplus ages; and increase in the lifecycle surplus to deficit ratio.

Keywords: National Transfer Accounts, economic lifecycle, 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.)

Have lifecycle consumption and income patterns in the Philippines changed between 1994 and 2002?

Rachel H. Racelis and J.M. Ian Salas

I. Introduction

Data on consumption expenditures and labor income have been available for some time in the Philippines: in the Family Income and Expenditure Surveys (FIES) conducted routinely by the National Statistics Office (NSO) since the 1970s, and in the Annual Poverty Indicator Surveys (APIS) also conducted by the NSO since the late 1990s. Numerous studies have been done over the years using these data. But so far the study of the patterns of consumption and labor income earned over the lifecycle has been limited. Income and the age factor have been examined in previous studies but mostly in the course of analyzing income inequality, wage differentials and poverty in the Philippines (Encarnacion 1978, Estarillo and Ilagan 1988, Estudillo 1995; and Alba 1998). The studies that presented age profiles of income had actually profiled household income versus the age of the household head. Similarly, household consumption expenditures were profiled against age of household heads in previous Philippine studies (Mason and Tirol 1992; Figueroa and Bernal 1992; Alba and See, 2007). Some attempt at estimating consumption age profiles at the individual level has been done but only for health expenditures (Racelis, et. al. 2004; Racelis et. al. 2006; Racelis et. al. 2007). There still continues to be very limited individual-level data on consumption expenditures in the Philippines which may explain the general lack of studies on the lifecycle patterns of consumption. Now various methodologies for assigning household consumption expenditures to household members are available, specifically those that have been developed in the National Transfer Accounts (NTA).

This study has the following objectives: (1) to establish individual lifecycle patterns of consumption and labor income in the Philippines using data for the years 1994, 1999 and 2002; (2) to discern changes in lifecycle patterns in the years indicated; and (3) to explain observed changes in lifecycle patterns using a simple components approach to identify and explain the sources of change and using, if necessary, additional information such as employment distribution by age.

An examination of the patterns and changes in age profiles over several years is useful for a number of reasons. First, the age profiles of more than one year provide better basis for establishing the typical shapes or typical lifecycle patterns of consumption and labor income in the Philippines. Second, because each year's consumption and labor income age profiles show at what ages Filipinos incur lifecycle deficits, an examination of results for several years would indicate whether deficit ages are changing over time. Third, NTA results may eventually be used to make projections of the total consumption and aggregate lifecycle deficits of future population in the Philippines, and NTA

estimates for multiple years can indicate whether "keep the age profiles constant" assumptions would be appropriate or not.

II. Application of NTA in the Philippines

Current consumption and labor income per capita mean age profiles estimated for the years 1994, 1999 and 2002 using NTA methodologies are used and analyzed in this paper. The choice of the years for which age profiles were estimated was determined primarily by availability of income and expenditure survey data.

A short description of what NTA is and how the NTA methodology was applied using Philippine data is provided in this Section. For a more detailed description of the data and estimation procedures used to produce the full NTA-Flow Accounts for the Philippines please refer to Paper No. 2007-12 of the PIDS Discussion Paper Series, which is downloadable from the website http://www.pids.gov.ph.. The paper referred to describes the methods used to produce the 1999 consumption and labor income age profiles, but practically the same procedures were followed to produce the same age profiles for the years 1994 and 2002. Some general references on the NTA methodology and analyses include Lee and Mason 2004, Mason and Lee 2004, Lee at al. 2004, Mason 2005a, Mason 2005b and Mason et. al. 2005.

The NTA is a comprehensive system intended for the measurement of economic resource flows across ages, done at the aggregate level and for a prescribed period of time. In the NTA the individual is the fundamental analytic unit. All transactions are treated as flowing to and from individuals, and are classified on the basis of the age of those individuals. The economic flows among age groups arise because in any society members who produce more than they consume support those members who consume more than they produce. The difference between consumption and production or labor income at different ages is referred to as the lifecycle deficit. A negative lifecycle deficit is referred to as lifecycle surplus. The ages at which individuals produce more than they consume are referred to as surplus ages, while the ages at which individuals consume more than they produce are referred to as deficit ages. This paper does not look into the flows of economic resources across age groups (this is discussed in a separate paper), but rather focuses on examining the patterns of consumption and labor income over the lifecycle, and comparing lifecycle patterns across different years. It also discusses the implications of changes in lifecycle patterns of consumption and income on the range of the deficit ages and aggregate lifecycle deficits.

Consumption expenditures (C) and labor income (YL) are defined in NTA as follows, using components of the Philippines National Income Accounts as reference:

C = government consumption expenditures
+ (personal consumption expenditures
- indirect taxes)

YL= compensation of employees from resident producers
+ compensation of employees from the rest-of-the-world (ROW)
+ 2/3 household operating surplus

The lifecycle deficit (LCD) is the difference between consumption (C) and production or labor income (YL). In the discussions that follow below, government consumption expenditures are referred to as public consumption and personal consumption expenditures referred to as private consumption. Public and private consumption are disaggregated in the NTA into three broad types: education, health and other consumption. Compensation of employees from resident and ROW producers are taken together and referred to as the earnings type of labor income. The 2/3 household operating surplus is referred to as self-employment income. Note that labor income does not include asset income and other similar types of income. In NTA these are accounted for in the resource reallocation or flows across age groups.

The main sources of data for the estimation of the current consumption and labor income per capita age profiles analyzed in this paper included: National Income Accounts (NSCB 2003) specifically Income and Outlays breakdown, National Health Accounts, National Education Expenditure Accounts, household income and expenditure surveys (the 1991 Labor Force Survey, 1994 Family Income and Expenditure Survey/Labor Force Survey, 1999 Annual Poverty Indicator Survey and 2002 Annual Poverty Indicator Survey), and UN Population Database (United Nations 2007). The household surveys were also used to generate other information such as the distribution of employed persons by age, and educational attainment of workers in paid and self employment.

The general steps in the estimation of per capita means by age of the various types of consumption and labor income go as follows:

1. Obtain National Income Accounts (NIA) data and compute for the NTA-defined consumption and labor income totals. Use the computed totals as the aggregate control total. The aggregate control values used for correcting the 1994, 1999 and 2002 age profiles are shown in Table 1. Data on population and consumer price index were taken from United Nations (2007) and NSCB (2003), respectively.

Table 1. NTA aggregate controls: Philippines, 1994, 1999 and 2002 current and constant prices (in billion pesos)

Item Description	*1994*	*1999*	*2002*	*1994*	*1999*	*2002*
	Current Prices			*Constant Prices*		
CONSUMPTION						
Public – Total	183	389	457	183	267	274
Education	35	88	110	35	60	66
Health	14	30	26	14	20	15
Other	134	271	321	134	186	193
Private – Total	1,078	2,027	2,460	1,078	1,388	1,476
Education	47	89	154	47	61	93
Health	29	41	91	29	28	55

Other	1,001	1,896	2,214	1,001	1,299	1,329
Total Public and Private	1,260	2,416	2,917	1,260	1,655	1,751
Education	82	177	218	82	122	131
Health	35	71	76	35	48	45
Other	1,143	2,168	2,623	1,143	1,485	1,574
LABOR INCOME						
Earnings	499	1,030	1,373	499	706	824
Self-employment	475	791	1,200	475	542	720
POPULATION (thousand)	67,360	74,971	79,873			
CONSUMER PRICE INDEX (1994=100)	*100.0*	*146.0*	*166.6*			

2. Calculate per capita means by age in single years for the items listed in Table 1 using household survey data or using some other data and method;
3. Multiply per capita means obtained from Step 2 by the population size at 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 Step 3 with the control total from Step 1; and, if necessary, adjust the per capita means estimated in Step 2 at each age upwards or downwards 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 users of services (e.g., users of public hospitals) at each age, where users are identified using survey data. This step provides the total or aggregate value for each age group, e.g. total public hospital expenditures allocated to each age group. Next, per capita values (not per user or per consumer) by age are computed by dividing the aggregate total allocated to an age group by the population size of the age group.

III. Components of Lifecycle Pattern Changes and Standardization

A components approach is used in this paper to organize the analysis of change in consumption and labor income per capita age profiles over time. Let xpercap(i,t) represent the per capita mean for item X (i.e., for consumption or labor income items) for an age group, i, and at a given year, t. This per capita mean can be expressed and reformulated as follows:

$$
\begin{aligned}
xpercap(i,t) &= XAGG(i,t) / POP(i,t) \\
&= [xshr(i,t) * XAGG(t)] / [pshr(i,t) * POP(t)] \\
&= [xshr(i,t) / pshr(i,t)] * [XAGG(t) / POP(t)] \\
&= [xshr(i,t) / pshr(i,t)] * xpercap(t)
\end{aligned}
$$

where

XAGG(i,t) = total aggregate value of X that accrued to i-age group
POP(i,t) = population size of i-age group

XAGG(t)	= national aggregate value of X (also the sum of XAGG(i,t) across all ages)
POP(t)	= total population size
xshr(i,t)	= share or proportion of national aggregate of X that accrued to i-age group
pshr(i,t)	= share or proportion of population with age i-years
xpercap(t)	= national or overall mean per capita value of X
i	= age group
t	= year

The reformulation shown above states that the per capita mean level for age group, i, at a given year, t, can be explained by three components: the overall national per capita level, the share of the i-age group out of the national total for X and the proportion of i-age group out of the total population. Changes in the age-specific per capita mean values across time may then be explained in terms of these three components. That is, changes in the age profiles may be attributed to (1) national per capita effects, (2) aggregate consumption and labor income age distribution effects and (3) population age distribution effects. The formula above can be rewritten further as follows:

$$xpercap(i,t) = [xshr(i,t) / pshr(i,t)] * xpercap(t)$$
$$= f(i,t) * xpercap(t)$$

and this new expression simply states that the age-specific per capita means are some factor higher or lower than the national means, where the factor, f(i,t), is the ratio of the i-age group's share of the aggregate value of X to it's share of the total population.

The reformulation of per capita means presented above suggests a way to systematically explain the sources of change in the age profiles of consumption and labor income over time. First, changes in the national per capita values (i.e., the xpercap(t) component) and age distributions of the population (i.e., the pshr(i,t) component) would indicate the extent of effects that changes in the general economic and demographic conditions in the country had on the age profiles.

Then the next logical step would be to examine the third component, xshr(i,t). Computationally, the xshr(i,t) is derived by removing the national per capita effect and the population age distribution effect from the original age profiles or from the original mean per capita value at each age. But, as shown later on, population age distribution had not changed significantly from 1994 to 2002, and, thus, it was decided that this component not be removed from the age profiles. Instead, only the national per capita effect is removed from the age profiles by using a standardization procedure. Whatever changes are observed in the patterns or shapes of the age profiles across the years, after the national per capita effects have been removed, may then be attributed to shifts in the distribution of aggregate consumption or labor income by age.

The standardization procedure adopted not only removes the monetary value (or the. national per capita effect) from the age profiles, but also introduces a common

reference point into the profiles – making the age profiles for the different years comparable. The usual age group used in NTA analysis as reference for standardization purposes is prime age adults 35-39 years old. An exception is education expenditures: the age group 13-16 years old, or the high school age group, is the reference group. The standardized per capita mean of X for i-age group is the ratio of i-age group mean to the j-age group mean (i.e., the reference group mean) and, substituting the second expression shown previously for mean per capita for X, this ratio can be expressed as follows:

$$\begin{aligned} \textit{standardized xpcap}(i,t) &= \textit{xpercap}(i,t) / \textit{xpercap}(j,t) \\ &= [f(i,t) * \textit{xpercap}(t] / [f(j,t) * \textit{xpercap}(t)] \\ &= f(i,t) / f(j,t) \end{aligned}$$

Or the standardized per capita mean at each age is also the ratio of the i-age group factor, f(i,t), to the reference group factor, f(j,t), where the factors as explained above are the measurements of the extent to which the i-th and j-th age groups' per capita means are higher or lower than the national per capita value. The standardized means for a given year when plotted across age show the pattern of relationship of the consumption or income of the different age groups relative to the consumption or income of the reference group. A comparison of the standardized per capita mean age profiles for the different years would show whether there had been changes in the lifecycle patterns of consumption and labor income over time.

The analyses in the paper are organized around the three components of per capita means described above. National per capita levels and population age structures are examined in Sections IV and V, respectively. Age profiles of standardized per capita means for consumption and labor income items are examined in Sections VI and VII, respectively. (The original per capita age profiles, un-standardized and in current prices, are presented in Annex 1.) Any changes observed in the age profiles of standardized per capita means are investigated further using the distributions of aggregate consumption and labor income by age (i.e., an examination of the xshr(i,t) component), and using additional data such as employment data. (The xshr(i,t) computations or the distributions of aggregate consumption and labor income items by age are reported in a summary table in Annex2.)

IV. National Per Capita Levels for Current Consumption and Labor Income

The effects of changes in national per capita levels on the age profiles are primarily to vertically shift the entire profiles up or down over time as may be observed from comparing Figure 7 (standardized) and Figure 23 (in current prices) in Annex 1.. Public and private per capita consumption in constant prices showed substantial increases from 1994 to 1999, but was nearly unchanged from 1999 to 2002 (Table 2.) However, real per capita education expenditures, both public and private, and private health expenditures had increased from 1999 to 2002, despite unchanging overall consumption. Per capita labor income in constant prices, on the .other hand, had increased steadily from 1994 to 1999 and from 1999 to 2002. Still, national per capita labor income had remained below per capita current consumption in all the three years.

Table 2. National Per Capita Means: Philippines, 1994, 1999 and 2002
(In current and constant prices)

Item Description	*1994*	*1999*	*2002*	*1994*	*1999*	*2002*
	Current Prices			*Constant Prices*		
CONSUMPTION						
Public – Total	2,713	5,192	5,720	2,713	3,556	3,434
Education	514	1,176	1,375	514	805	825
Health	203	395	322	203	271	193
Other	1,996	3,621	4,023	1,996	2,480	2,415
Private – Total	15,999	27,032	30,795	15,999	18,515	18,484
Education	704	1,191	1,934	704	816	1,161
Health	432	547	1,144	432	375	687
Other	14,863	25,294	27,717	14,863	17,325	16,637
Total Public and Private	18,712	32,224	36,515	18,712	22,071	21,918
Education	1,218	2,367	3,309	1,218	1,621	1,986
Health	635	942	1,466	635	645	880
Other	16,859	28,915	31,740	16,859	19,805	19,052
LABOR INCOME						
Earnings	7,411	13,744	17,191	7,411	9,414	10,318
Self-employment	7,054	10,556	15,021	7,054	7,230	9,016
All labor income	14,465	24,301	32,212	14,465	16,644	19,335

V. Population Age Structure

Figure 1. Population distribution by age,
Philippines 1994, 1999 and 2002, percent

The percentage distributions of national population by age are shown in Figure 1 for the years 1994, 1999 and 2002. Population data in single ages for the three years were obtained from the United Nation (2007) Word Population Prospects for 2006. As expected of a growing population, the young consist of the largest and the elderly still a very small part of total Philippine population. For example, the under 1 year olds accounted for about 3.0 percent in 1994 and about 2.7 percent in 1999 and 2002. The 75 year olds, on the other hand, accounted for about 0.2 percent of the population in all the

three years. The gradual decline in the percentage shares of the young population under 10 years old is already discernable in the three population age distributions shown in Figure 1. Except for the very young, however, the overall population distribution by age can be said to have remained generally unchanged from 1994 to 2002.

VI. Age Profiles of Current Consumption Items

Public Current Consumption

The standardized per capita means age profiles of public consumption for education and health are presented in Figures 2 and 3, respectively The corresponding age profiles of the un-standardized per capita means in current prices for these two consumption items are shown in Figures 17 and 18 in Annex 1.

Figure 2. Age profile of per capita public consumption for education, Philippines, 1994, 1999 and 2002, standardized relative to consumption age group 10-14

Figure 3. Age profile of per capita public consumption for health, Philippines, 1994, 1999 and 2002, standardized relative to consumption age group 35-39

The age profiles in Figure 2 have the expected hump shape for per capita spending for public education. Per capita spending for elementary and college ages are

160 percent and 60 percent or lower, respectively, of per capita spending for the age group 13-16 or the high school ages. Figure 3 shows the typical U-shaped age profile for health spending for all three years. Per capita spending is highest for the very young and the very old at about 3 times the per capita value for the reference group 35-39. The value of the standardized mean per capita for other public consumption is 1.0 for all ages and this is a result of the assumption used – that other public consumption accrues equally to every individual in the population. The per capita levels of other public consumption in current prices are presented in Figure 19 in Annex 1. .

There had been no significant changes in the overall shape and position of the per capita age profiles of public consumption items from 1994 to 2002.

Private Current Consumption

Figures 4, 5 and 6 present the age profiles of the standardized per capita means for private expenditures on education, health and other consumption, respectively. The corresponding age profiles of the un-standardized per capita means in current prices for these three consumption items are shown in Figures 20, 21 and 22 in Annex 1. In contrast to the age profile for public expenditures on education, private expenditure on education has multiple humps (Figure 4): at the start of elementary school at around age 7; at the start of high school at around age 13 and at the start of college education at around age 16. Moreover, per capita private spending on education increases with the age of the child or as the level of schooling attended goes up. There are some slight variations between the years, but the overall pattern described above has remained the same over the three years.

Figure 4. Age profile of per capita private consumption for education, Philippines, 1994, 1999 and 2002, standardized relative to consumption age group 10-14

Again, compared to the age profiles for public expenditures for health, the profile for private expenditures for health has the J-shape rather than the U-shape. The mean per capita spending for the health care of the elderly over 60 years old is more than double that for children under 1 year of age (Figure 5.) Age profiles for private spending for

health have generally stayed the same, but there has been a marked increase in the mean spending after age 45 in the years 1999 and 2002.

Figure 5. Age profile of per capita private consumption for health, Philippines, 1994, 1999 and 2002, standardized relative to mean consumption age group 35-39

Figure 6. Age profile of per capita private other consumption, Philippines, 1994, 1999 and 2002, standardized relative to mean consumption age group 35-39

The age profile for private other consumption (Figure 6) is driven primarily by the allocation rule, i.e. an ad hoc equivalence scale, used to distribute household other expenditures to its members. The allocation method assigns weights to household members on the basis of age as follows: 0.4 for children age 0-4; linearly increasing from 0.4 to 1.0 from age 5 to 19; and 1.0 for members with age 20 or older. As can be observed from Figure 6, the age profile for private other consumption has not changed from 1994 to 2002.

Current Consumption

Current consumption consists of public and private consumption, with private consumption accounting for roughly 85 percent of total consumption (Table 1). In turn, private "other" consumption accounts for over 90 percent of private current consumption,

with the remaining under 10 percent accounted for by private health and education expenditures. The shape of the age profile or the pattern of mean per capita current consumption by age (Figure 7) is thus strongly influenced by the shape of the profile of private other consumption (being the single largest component). There are pronounced sharp increases in mean values as age approaches 7, 13 and 16 years and, as shown previously, these are due specifically to education expenditures.

The age profiles for current consumption have generally remained the same in the years 1994, 1999 and 2002, with mean age of consumption staying at about 27 years in all the three years. Since there were no remarkable changes observed in the mean per capita profiles of the various consumption items over the three years, and population age distribution had also not changed significantly, it follows that the distribution of aggregate consumption of different items by age had also not changed significantly over the same years. A summary of the age distribution of aggregate public and private consumption of education, health and other items are shown in Table 3 in Annex 2.

Figure 7. Age profile of per capita consumption, Philippines, 1994, 1999 and 2002, standardized relative to consumption of age group 35-39

VII. Age Profiles of Labor Income by Type

The age profiles of standardized per capita means for paid employment earnings and self employment income for the three years are shown in Figures 8 and 9. All profiles have the expected inverted U-shape. (The original per capita un-standardized age income profiles are shown in Figures 24 and 25 in Annex 1.) But the pattern of the standardized per capita means (or the ratios of age group means to the mean of the reference group 35-39) across age differ between the two types of income. The earnings or wage profile shows per capita mean ratios rising sharply between ages 15 to 25, staying at around 1.0 for about 20 or so years, and then declining sharply thereafter. In contrast, the age profile for self employment income shows per capita mean ratios increasing more gradually from age 15 to a peak level exceeding 1.0 at around age 45 and then gradually declining thereafter.

Schooling and retirement patterns of workers are two important factors that explain the difference between the two age income profiles. Individuals who have completed college education usually enter formal sector paid employment and do so between the ages 20 to 25, hence the sharp rise in the number of workers and, as a result, sharp increase in the per capita mean earnings at these ages. Furthermore, paid employment is governed by provisions in the 1974 Philippine Labor Code regarding retirement age and this explains the sharp decline in mean per capita earnings as age approaches the compulsory retirement age of 65 years. These two factors have less impact on self employment income because the compulsory retirement age is generally not observed and because there is a much lower proportion with college education among the self-employed.

Figure 8. Age profile of per capita earnings from employment, Philippines, 1994, 1999 and 2002, standardized relative to mean income age group 35-39

Figure 9. Age profile of per capita self-employment income, Philippines, 1994, 1999 and 2002, standardized relative to mean income age group 35-39

While the overall shapes of the age profiles of per capita mean earnings and self employment income have remained nearly the same from 1994 to 2002, the position of the profiles for both types of income had gradually shifted to towards the right during the same period. Mean per capita incomes are rising later at young ages, with the mean

income reaching 60 percent of the mean of the reference group 35-39 as follows: for earnings, at age 19 in 1994 to age 22 in 2002; and for self employment income, at 24 in 1994 to age 29 in 2002. Similarly at the older ages, mean per capita incomes are declining later, with the mean income falling to 60 percent of the mean of the reference group 35-39 as follows: for earnings, at age 56 in 1994 to age 60 in 2002; and for self employment income, at age 64 in 1994 to age 69 in 2002. The shifts in the age income profiles to the right are also indicated by increases in the mean age of income, which is a weighted average computed using aggregate pesos or income earned at each age as weights. For earnings from paid employment, the mean age of earnings was 33 in 1994, 35 in 1999 and 36 in 2002. For self employment income, the mean age of income was 38 in 1994, 41 in 1999 and 42 in 2002.

The age profiles of standardized per capita means with the two types of labor income combined are shown in Figure 10 and the corresponding original per capita age profiles in current prices are shown in Figure 26 in Annex 1. The combined labor income age profiles show distinct shifts to the right between all the years at the older ages, but a clear shift only between 1994 and 1999 at the young ages. The mean age of total labor income was 35 in 1994, 38 in 1999 and 39 in 2002.

Figure 10. Age profile of per capita labor income, Philippines, 1994, 1999 and 2002, standardized relative to mean income age group 35-39

The shifts in labor income age profiles may be explained by changes in the distribution of aggregate income by age (i.e. the xshr(i,t) component) and in the composition of employed persons by age. The highest share of aggregate earnings was accounted for by the 24 year olds in 1994 and by the 27 year olds, an older age group, in 1999 and 2002 (Figure 11). Similarly for self employment income, the highest share of aggregate income was accounted for by those age 31 in 1994, age 36 in 1999 and age 39 in 2002 (Figure 12.) In general, the shares out of the two types of labor income of workers aged 22 or younger decreased, while the share of workers age 32 or older increased from 1994 to 1999 and 2002. A similar observation can be made from an examination of the distribution of employed persons by age as shown in Figure 13. The proportion of employed workers under age 35 decreased while the proportion of workers over age 45 increased from 1994 to 2002. The young are entering the workforce at later

ages and the elderly are staying in the workforce longer. The median ages of the employed were 35, 36 and 38 for the years 1994, 1999 and 2002, respectively.

Figure 11. Distribution of aggregate earnings from paid employment by age,Philippines,1994,1999, 2002, percent

Figure 12. Distribution of aggregate self-employment income by age, Philippines, 1994, 1999 and 2002, percent

Figure 13. Distribution of employed persons by age, Philippines, 1994, 1999 and 2002, percent

VIII. Summary of Findings and Implications

Main Findings

The main findings of the paper include:

1. National Per Capita Levels: Per capita consumption in constant prices had increased from 1994 to 1999 but had stayed nearly unchanged from 1999 to 2002. On the other hand, per capita income had continuously increased during the same years, but had consistently remained below per capita consumption.

2. Population Age Structure: Except for the very young ages, population distribution by age had remained generally unchanged from 1994 to 2002.

3. Current Consumption: The typical shape of the age profile of current consumption starts out at about 40 percent (of the mean per capita consumption of the age group 35-39) at age under 1 year, rising to reach 100 percent at around age 16, continuing to increase to about 110 to 120 percent at around age 18, declining to and staying at 100 percent from age 30 to 45, and then rising again to about 120 percent by age 80. The age profile for per capita means current consumption is strongly influenced by the profile of private other consumption being the single largest item of consumption. The pronounced sharp rise in per capita means observed up to age 18 and the subsequent decline is due to the age pattern of public and private education spending. The gradual increase in per capita current consumption after age 45 may be attributed to the increasing per capita public and private spending for health care as age increases. The shape and position of the age profiles for current consumption have generally remained unchanged from 1994 to 2002, with mean age of consumption staying at about 27 years.

4. Labor Income: The age profiles of labor income have the expected inverted-U shape, peaking at around age 40. The mean per capita income at age 23 is about 60 percent of the mean for the age group 35-39, over 100 percent for the ages 40-45, and is again about 60 percent at around age 63. The overall shapes of the age income profiles have generally remained the same, but a gradual shift of the position of the profiles towards the right was observed from 1994 to 2002. The mean age of labor income was 35 in 1994, 38 in 1999 and 39 in 2002. An examination of the distribution of employed persons by age for the same years showed similar shifts of the distribution towards the right, with median age of employed increasing from 35 in 1994 to 38 in 2002.

Implications

The implications of the observed lifecycle patterns and changes over time for the Philippines are drawn by analyzing current consumption and labor income age profiles together. As described previously in Section II, the difference between consumption and labor income at each age is referred to as lifecycle deficit. A negative lifecycle deficit is

referred to as lifecycle surplus. The ages at which individuals produce more than they consume are referred to as surplus ages, while the ages at which individuals consume more than they produce are referred to as deficit ages. Changes in either or both consumption and labor income age profiles could result to changes in the range of deficit ages and the sizes and pattern of lifecycle deficit. In the case of the Philippines, the shape and position of the consumption age profiles had remained the same in the years 1994, 1999 and 2002 but the labor income age profiles for these same years were observed to have gradually shifted towards the right, although the general shape of income age profile had stayed unchanged..

The per capita mean age profiles for current consumption and labor income for all three years are shown in Figure 14. At the young ages, the deficit age cut-offs or where the consumption and income profiles cross have not changed significantly at 24 years in 1994 and about 25 years in 1999 and 2002. At the older ages, on the other hand, the deficit age cut-offs have noticeably changed from 58 years in 1994, 61 years in 1999 and 64 years in 2002. The composition of the population incurring lifecycle deficits had thus become even younger from 1994 to 2002, with the slight increase in the number of young deficit age groups and reductions in the number of elderly deficit age groups. The span of the surplus ages had also increased from 34 years in 1994, 36 in 1999 and to 39 in 2002.

Figure14. Age profile of per capita consumption(C) and labor income(Y), Philippines, 1994,1999 and 2002, current prices

Taking the per capita profiles in Figure 14 and multiplying these by the population size at each age for the relevant years produces estimates of the aggregate current consumption and labor income at each age shown in Figure 15. Then subtracting aggregate labor income from aggregate consumption produces estimates of the aggregate lifecycle deficit at each age which are shown in Figure 16. The estimated sizes of total lifecycle deficits and surpluses (i.e. negative deficits) are entered into the relevant portions of the lifecycle deficit graphs for each year in Figure 16. For example, the estimated total lifecycle deficits in 1999 was Php1,052 billion, while the total surpluses generated that same year was estimated to be PhP461 billion. As the graphs and estimated total values in Figure 16 show, the increase in the span of the surplus ages from

1994 to 2002 has resulted to an increase in the ratio of surpluses to deficits from 0.41 centavos for every one peso of deficit in 1994, 0.44 in 1999 and 0.72 in 2002.

Figure 15. Age profile of aggregate consumption (C) and labor income (Y), Philippines, 1994, 1999 and 2002, current prices (PhP billion)

Figure 16. Age profile of aggregate lifecyle deficit, Philippines,1994,1999 and 2002, current prices (PhP billion)

To summarize, the shifts in the position of per capita age profiles for labor income from 1994 to 2002, while the shape and position of the consumption age profile had remained unchanged, had the following implications: increases in the deficit age cut-off at older ages; increases in the span of productive or surplus ages; and increases in the lifecycle surplus to deficit ratio. The latter finding suggests one possible option to cope with the increasing burden of supporting the deficit age groups which is to encourage and facilitate longer span of productive work.

As a last note, an important implication of the fact that age profiles of per capita consumption and labor income can change over time, as observed in the Philippines for labor income from 1994 to 2002, is that using a “keep age profiles constant” assumption in simulation and projection work may not necessarily be appropriate.

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ANNEX 1

Age Profiles of Mean Per Capita Consumption, Labor Income: Specific Components at Current Prices

Figure 17. Age profile of per capita public consumption for education, Philippines, 1994, 1999 and 2002, current prices

Figure 18. Age profile of per capita public consumption for health, Philippines, 1994, 1999 and 2002, current prices

Figure 19. Age profile of per capita public other consumption, Philippines, 1994, 1999 and 2002, current prices

Figure 20. Age profile of per capita private consumption for education, Philippines, 1994, 1999 and 2002, current prices

Figure 21. Age profile of per capita private consumption for health, Philippines, 1994, 1999 and 2002, current prices

Figure 22. Age profile of per capita private other consumption, Philippines, 1994, 1999 and 2002, current prices

Figure 23. Age profile of per capita consumption, Philippines, 1994, 1999 and 2002, current prices

Figure 24. Age profile of per capita earnings from employment,Philippines,1994,1999 and 2002, current prices

Figure 25. Age profile of per capita self-employment income, Philippines, 1994, 1999 and 2002, current prices

Figure 26. Age profile of per capita labor income, Philippines, 1994, 1999 and 2002, current prices

ANNEX 2

Distribution of Aggregate Consumption, Labor Income and Specific Components by Age

Table 3. Distribution of Aggregate Consumption, Labor Income and Specific Components by Age, Philippines 1994
Philippines, 1994, 1999 and 2002 (percent)

Year and Age Group	*CONSUMPTION*							*LABOR INCOME*		
		Public			*Private*					*Self-*
	All	*Education*	*Health*	*Other*	*Education*	*Health*	*Other*	*All*	*Earning*	*Employment*
1994										
0-4	7.3	0.0	29.8	14.5	0.0	17.1	6.4	0.0	0.0	0.0
5-9	9.3	38.5	14.2	13.3	20.6	9.9	7.1	0.0	0.1	0.0
10-14	10.4	42.3	7.8	12.1	16.1	6.6	8.9	0.5	0.7	0.3
15-19	12.4	16.4	5.8	10.9	40.7	6.7	11.4	6.4	9.0	3.7
20-24	12.1	2.9	5.3	9.4	22.5	7.4	12.5	14.3	17.6	10.8
25-29	10.1	0.0	5.1	8.1	0.0	6.9	11.3	16.1	17.2	14.9
30-34	8.3	0.0	4.8	6.9	0.0	5.9	9.3	15.1	14.8	15.5
35-39	6.9	0.0	4.7	5.8	0.0	5.3	7.7	13.7	13.1	14.4
40-44	5.7	0.0	3.8	4.8	0.0	5.0	6.3	11.7	10.6	12.9
45-49	4.3	0.0	3.2	3.6	0.0	4.5	4.8	8.2	7.0	9.5
50-54	3.6	0.0	3.3	3.0	0.0	4.6	4.0	6.0	5.0	7.1
55-59	3.0	0.0	2.9	2.4	0.0	4.8	3.2	3.9	3.0	4.9
60-64	2.4	0.0	2.9	1.9	0.0	4.7	2.5	2.2	1.4	3.1
65-69	1.6	0.0	2.2	1.3	0.0	3.8	1.8	1.0	0.4	1.7
70-74	1.3	0.0	1.9	1.0	0.0	3.2	1.3	0.5	0.1	0.8
75-79	0.8	0.0	1.3	0.6	0.0	2.1	0.8	0.2	0.0	0.3
80up	0.6	0.0	0.9	0.4	0.0	1.5	0.6	0.1	0.0	0.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1999										
0-4	7.0	0.0	24.5	13.4	0.0	20.6	6.2	0.0	0.0	0.0
5-9	9.3	35.2	12.6	12.8	14.4	8.5	7.3	0.1	0.0	0.1
10-14	10.8	40.6	7.6	11.8	20.4	5.9	8.9	0.4	0.4	0.4
15-19	12.2	19.6	6.1	10.7	42.8	5.9	10.8	3.1	3.9	2.1
20-24	11.8	4.6	6.1	9.6	22.4	6.3	12.1	10.1	13.0	6.3
25-29	9.7	0.0	5.9	8.2	0.0	5.8	11.0	14.5	17.3	11.0
30-34	8.2	0.0	5.8	7.1	0.0	5.0	9.2	15.3	16.0	14.3
35-39	6.8	0.0	5.5	6.0	0.0	4.5	7.6	14.9	14.2	15.8
40-44	5.7	0.0	4.6	5.1	0.0	4.4	6.4	13.3	12.2	14.8
45-49	4.9	0.0	4.3	4.2	0.0	4.7	5.4	10.6	9.6	11.9
50-54	3.7	0.0	3.8	3.1	0.0	4.8	4.1	7.4	6.6	8.5
55-59	3.1	0.0	3.6	2.6	0.0	5.4	3.4	5.0	4.0	6.3
60-64	2.4	0.0	3.1	2.0	0.0	5.3	2.7	2.9	1.9	4.3
65-69	1.8	0.0	2.6	1.5	0.0	4.7	2.0	1.4	0.5	2.5
70-74	1.2	0.0	1.8	0.9	0.0	3.5	1.3	0.6	0.2	1.1
75-79	0.8	0.0	1.3	0.6	0.0	2.6	0.8	0.2	0.1	0.5
80up	0.5	0.0	0.9	0.4	0.0	2.1	0.6	0.1	0.0	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2002										
0-4	6.9	0.0	27.4	13.1	0.0	17.3	6.1	0.0	0.0	0.0
5-9	8.6	37.7	12.1	12.3	6.1	8.0	6.8	0.0	0.0	0.0
10-14	10.6	42.1	7.0	11.7	18.0	5.9	8.7	0.2	0.3	0.1
15-19	12.8	17.2	5.4	10.6	49.8	5.8	10.7	2.4	3.3	1.4
20-24	11.8	3.1	5.4	9.5	26.2	6.4	11.9	9.0	12.5	4.9
25-29	9.4	0.0	5.7	8.3	0.0	6.1	10.9	14.1	17.4	10.2
30-34	8.0	0.0	5.2	7.1	0.0	5.3	9.2	14.7	15.5	13.8
35-39	6.8	0.0	4.6	6.1	0.0	4.7	7.8	14.7	13.6	16.1
40-44	5.8	0.0	4.4	5.2	0.0	4.5	6.6	13.8	12.3	15.5
45-49	5.0	0.0	4.3	4.4	0.0	5.1	5.7	11.5	10.0	13.1
50-54	4.0	0.0	4.0	3.4	0.0	5.5	4.5	8.3	7.3	9.4
55-59	3.1	0.0	3.5	2.6	0.0	5.8	3.5	5.5	4.6	6.5
60-64	2.5	0.0	3.2	2.1	0.0	5.8	2.7	3.2	2.2	4.4
65-69	1.9	0.0	2.9	1.6	0.0	5.1	2.0	1.7	0.8	2.7
70-74	1.3	0.0	2.2	1.0	0.0	3.8	1.4	0.7	0.2	1.3
75-79	0.8	0.0	1.5	0.6	0.0	2.6	0.8	0.2	0.0	0.4
80up	0.6	0.0	1.1	0.5	0.0	2.1	0.7	0.1	0.0	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0