



Demographic Transition and the  
Maldives' Economy:  
*Trends, Challenges, and Future  
Prospects*

# NATIONAL TRANSFER ACCOUNTS **MALDIVES**

## 2020

MALDIVES BUREAU OF STATISTICS

Ministry of National Planning, Housing  
and Infrastructure

# National Transfer Accounts

Demographic Transition and the Maldives' Economy:  
Trends, Challenges, and Future Prospects

MALDIVES BUREAU OF STATISTICS (MBS).  
Ministry of National Planning, Housing & Infrastructure



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We hope NTA will be useful in making relevant policies of the Maldivian government as well as help in making informed and improved decisions for the progress of the country.

# Introduction

This study explores the extent of intergenerational resource allocation in Maldives, using the United Nations' National Transfer Accounts (NTA) methodology. The NTA methodology enables us to measure some important features of intergenerational resource allocation at the aggregate level, in a manner consistent with National Income and Product Accounts. The NTA estimates economic flows from one age group or generation to another and year to year, thereby giving policymakers valuable information with which to design national frameworks for public policies. The results of this study can shed light on several issues: the implications of population aging; changes in public and private financing of education, health, and pensions; women's full contributions to the economy; and human capital needs.

The study is organized as follows. In the next section, we briefly describe the population structure, economy, and social sectors of Maldives. We then present basic NTA estimates for Maldives in 2019 and estimate the first demographic and second demographic dividends, respectively. In Section 3, we compare the results with the 2016 results. Section 4 provides evidence on the disparities. In Section 5, we use the NTA to generate insights on the fiscal sustainability of Maldives, and simulate the future of the social welfare budget. Section 6 provides some insights on the effect of COVID-19 on the generational economy in Maldives. In the last section, we summarize and conclude the paper with some implications for policy.

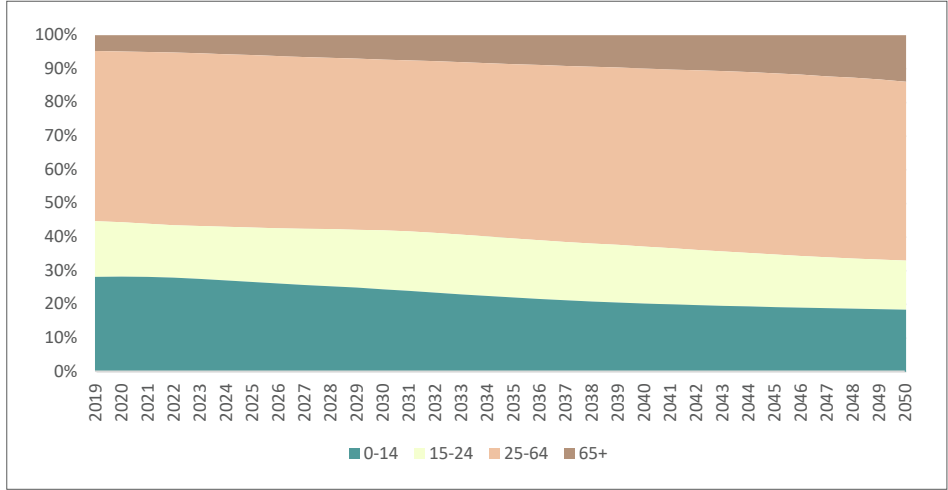
## 1. Background:

# Maldives Population, Economy, and Social Sectors

The population of Maldives was 533,941 in 2019, including 161,202 resident foreigners (National Bureau of Statistics et al., 2020). Foreigners account for an estimated about 30 percent of the population in the Maldives who migrated from neighboring countries such as India and Bangladesh. In 2019, over 37 percent of the population was under 25 years old, and 3.4 percent were ages 65 and older. The foreign laborers are concentrated in the working-age group, whose representation among people ages 25-64 is almost 80 percent. This is in contrast with resident Maldivians, whose share of the population in the same age group is about 50 percent. In 2019, the share of people ages 65 and older was 4.7 percent for resident Maldivians, and only 0.2 percent for resident foreigners.

The age structure of the resident Maldivian population is expected to change rapidly in the coming years (Figure 1) as life expectancy improves and fertility and mortality decline. According to the most recent population projections (National Bureau of Statistics et al., 2018a)<sup>1</sup>, about 7 percent of the resident Maldivian population will be 65 or older in 2030, and this share is projected to reach 14 percent by 2050. In contrast, the share of young people will decrease steadily. The share of people ages 0-14 will shrink from 28.2 percent in 2019 to 18.4 percent in 2050. As a result, the old-age dependency rate (the ratio of people ages 65 and older to people ages 15-64) will rapidly increase from 0.070 in 2019 to 0.141 in 2040 and will reach 0.204 in 2050. The youth dependency ratio (the ratio of people ages 0-14 to people ages 15-64) will decrease substantially, from 0.420 in 2019 to 0.272 in 2050.

Figure 1. Population projections 2019-2050: resident Maldivian age distribution.



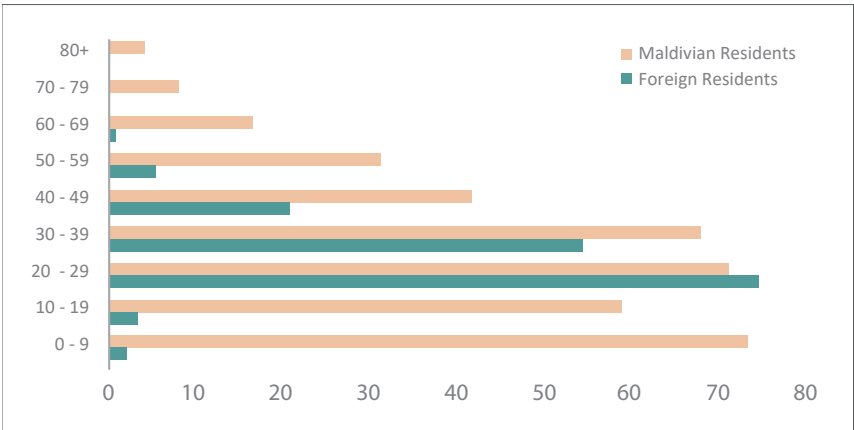
Source: National Bureau of Statistics et al. (2018a).

1 One can also rely on the UN projections (United Nations, 2019). However, there are substantial differences between UN projections and the NBS projections. One reason might be that the NBS has adjusted the under reported migrants. In general, ex post comparisons between UN projections and a nation's projections show that observed trends in population variables tend to be closer to the nation's projection as well, simply because a nation's projections reflect developments in the modeling process.

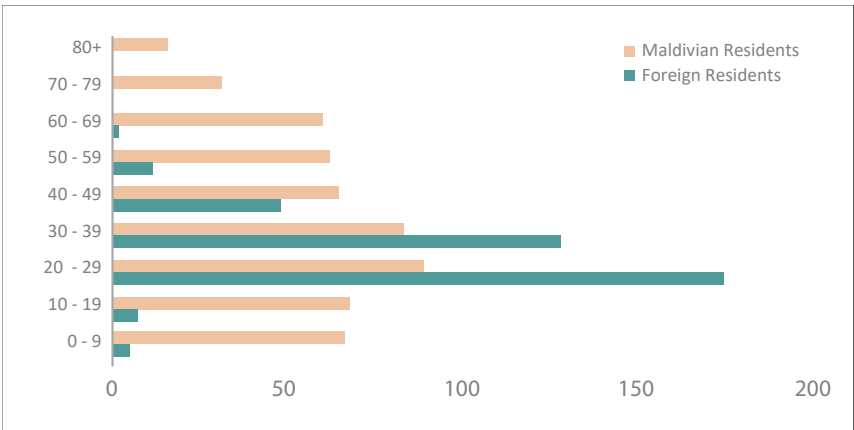
Figure 2 shows the population age distribution of resident Maldivians and the resident foreign population. The resident foreign population is expected to grow much more rapidly than the resident Maldivian population. The share of the resident foreign population is expected to grow from 30 percent in 2019 to 41 percent in 2050. The bulk of foreigners residing in Maldives are there for employment purposes and are in their 20s and 30s. Thus, as the share of resident foreigners increases, both the youth and old-age dependency ratios will be substantially lower throughout the projection if we include the resident foreign population.

Figure 2. Population age distribution: resident population, 2019, 2030, and 2050 (thousands)

A. 2019

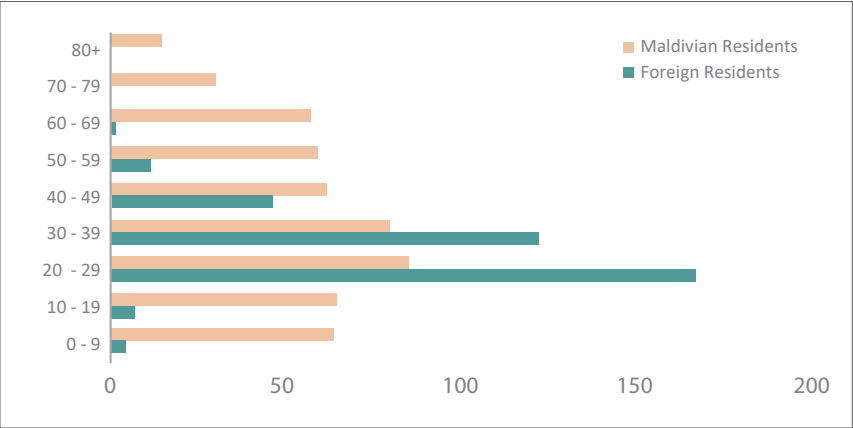


B. 2030



Source: National Bureau of Statistics et al. (2018a).

C. 2050



Source: National Bureau of Statistics et al. (2018a).

Maldives has demonstrated some development success. The GDP per capita almost tripled between 2005 and 2019, increasing from US\$3,640 in 2005 to US\$10,626 in 2019. The growth rate between 2016 and 2019 was an impressive 7 percent per annum. This robust growth has been coupled with considerable development of the country’s infrastructure and connectivity. The Maldives economy is substantially dependent upon a small number of sectors, including tourism, which accounts for almost 30 percent of GDP. In fact, the nation’s strong economic growth is mostly driven by the fast growth in the tourism sector. The number of tourist arrivals increased from 602,000 in 2006 to 1.7 million in 2019, more than 8 percent. This is remarkable growth, but the dominance of tourism in the economy makes the country vulnerable to variations in global economic and social conditions. The economy also faces a small labor market, diseconomies of scale, and geographic isolation. Hence it is challenging to diversify from its current economic profile.

The Maldives social sector comprises education, health and social protection, and the pension system. Maldives introduced several education reforms as part of its 2013-18 Education Strategic Action Plan; the 2019-23 Plan was announced in 2019. In large part due to these plans and implementations, the education and human capital development index has been substantially improved. For example, the net enrollment rate (NER) for primary school is close to 100 percent, and the NER for lower secondary school is close to 90 percent, with some gender inequality. Enrollments in higher secondary and tertiary education are gradually increasing as well. Despite these achievements, the system faces some challenges, such as improving regional and gender disparity, the quality of education, and skills for employment, to name a few (Ministry of Education & Ministry of Higher Education, 2019). In addition, labor force participation, especially among women, remains low, and the share of the younger population who are

not in education, employed, or training (NEET) remains high. Women's labor force participation is substantially lower than men.

Maldives has universal health care through the National Social Health Scheme that covers most primary care services. Aasandha Scheme was implemented in 2012 which replaced the Madhana Scheme. Aasandha Scheme was introduced with an annual limitation of 100,000 MVR to each individual. Husnuvaa Aasandha was introduced in February 2014 without the annual individual limitations except for 1,000 MVR given every two years for making the spectacles (Ministry of Health, 2016). Maldives has an impressive record of improving health outcomes, as evidenced by the rise in life expectancy and reductions in fertility and mortality rates. The country spends a higher percentage of its GDP on healthcare than any country in Southeast Asia. Maldives continues to rely heavily on expatriate health professionals, who account for 82 percent of physicians and 55 percent of nurses and faces the challenges of both high turnover and ensuring the quality of the healthcare workforce. Managing logistics and supplies across the islands' centers and hospitals is challenging (World Health Organization, 2018). Expenditures for older people are increasing very rapidly, which has led to financial pressure on government budget.

The Maldives' pension system has witnessed tremendous reform since 2009 (see UNDP Maldives, 2021). The Maldives Pension Act of 2009 established a two-pillar pension system, including a noncontributory citizen's pension aimed at providing a basic pension for all Maldivians aged 65 and above and a new contributory pension scheme based on a defined contribution (DC) model with centralized recordkeeping. The value of the first pillar, the Old-Age Basic Pension Scheme (OABP) benefit,<sup>2</sup> was indexed against inflation, but the 4th amendment to the Act in 2019 changed that provision. Hence, currently there is a requirement to review Basic Pension every 3 years, but does not impose the obligation of indexation against inflation. The OABP may contribute to Maldives' continuing fiscal deficit because of the fast aging of the population. The second pillar, the Maldives Retirement Pension Scheme (MRPS), is a DC pension scheme administered with a contribution of 14 percent of the pensionable wage contributed equally by both employees and employers. The members of this scheme receive investment returns in addition to making contributions. The primary objectives of MRPS are to ensure that individuals save during employment, to contribute to their livelihood in retirement, and ultimately to create financial independence (Maldives Pension Administration Office, 2020). The number of people insured through the MRPS has increased, and continued wage growth would result in a higher contributory pension over time. Hence in the long run, most Maldivians will rely on the MRPS.

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<sup>2</sup> In 2014, the Maldives also introduced Senior Citizen Allowance (SCA) for all Maldivians aged 65 and above on top of OABP; these were later merged to form the OABP.

## 2. Maldives NTA 2019:

## i. Overview

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This section closely follows the NTA methodology described in United Nations (2013), Lee and Mason (2011), and Lee, Lee, and Mason (2008). The primary source of the microdata sets used in our analysis is the Household Income and Expenditure Survey (HIES) of 2019. We also used HIES 2016 to compare the results of 2019 with those of 2016.

In any modern-day economy, populations are composed of people at different stages of the economic lifecycle with different needs and different resources available to meet those needs. Among populations at the beginning or toward the end of their lives, consumption is usually greater than what they earn from their labor. Those in the middle of their economic lifecycle generally earn more from their labor incomes than they spend on consumption.

Many different factors affect how consumption and labor income vary by age. For example, average labor incomes are affected by hours worked, labor force participation rate, and wage rates among different cohorts of workers, which are, in turn, shaped by many sociocultural, economic, and political factors that influence each of these elements of the labor market. In the same vein, average consumption is shaped by incomes, prices, and preferences that are influenced by many other forces.

Panel A in Figure 3 plots the average consumption and labor income by age in Maldives in 2019. It shows that average labor income in Maldives, as in many other countries, begins at zero among children, increases among young adults, peaks at prime working age, then eventually declines as people begin retiring from the labor market. Labor income captures the value of earnings by wage workers, as well as the share of the returns to labor for those who are self-employed. Average consumption also is relatively low among young children, increases as children enter the country's education system, declines as children exit formal schooling, and then eventually increases again as the consumption of healthcare increases with age. Consumption, in this case, includes both public and private consumption. Panel B in Figure 3 shows the components of labor income and consumption. The earnings of employees peak early, at age 37, while earnings of the self-employed peak much later, at age 53. The consumption profiles peak at around ages 13-14 and then at ages 80+. This is because per capita private and public education consumption peaks at ages 13-14 and public health consumption peaks at ages 80+.

This picture of the economic lifecycle in Maldives is strikingly different when the population distribution of the country is taken into account. Panel C in Figure 3 shows the aggregate consumption and labor income by age in Maldives in 2019. While children and the elderly consume much more on average

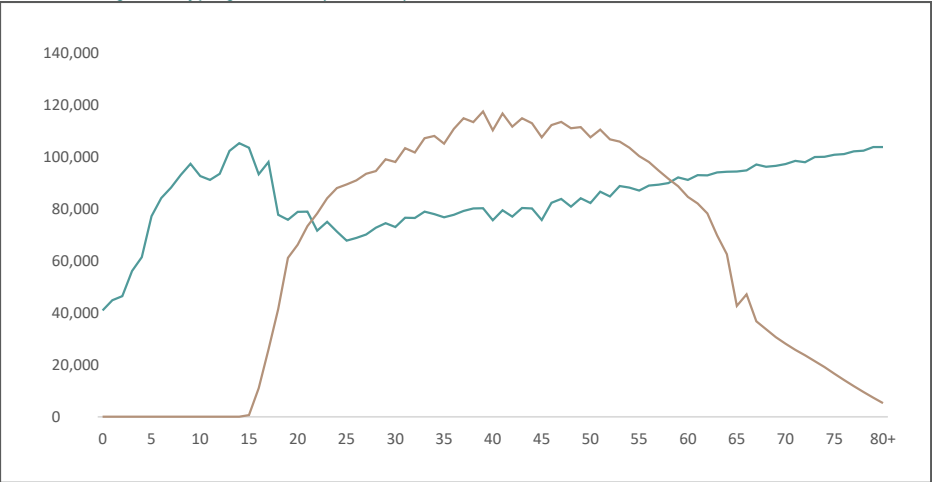
than prime-working-age adults, aggregate consumption is highest among those aged 20 to 39 years, who constitute almost 40 percent of the population. Further, while average labor incomes by age are somewhat symmetric, the aggregate labor income is skewed toward younger cohorts of workers.

What is evident from these pictures, whether looking at the per capita or the aggregate age profiles, is that there are life stages when consumption exceeds earnings from working, or what is normally referred to as lifecycle deficits. These deficits may be filled in a number of different ways, although they are usually classified under two schemes: sharing and saving (Mason and Lee, 2011). The most straightforward is the transfer of resources from those with labor income that exceeds their consumption to those with deficits. These transfers may be mediated by the government, such as through taxes that are eventually used to finance public school and health systems, or by the private sector, such as parents sending their children to school, or adult children taking care of their elderly parents. Alternatively, surplus labor income can be invested or saved and drawn on in the future when it is needed. This act of saving and investing in turn allows other people to borrow and use these resources.

These features of the generational economy are captured by the NTA (Lee and Mason, 2011; United Nations, 2013). The NTA is a macroeconomic accounting framework that measures how different generations in an economy consume and produce resources, and how the gaps in each generation's consumption and production are filled or utilized. It combines information from household surveys, administrative data, national macroeconomic accounts, population censuses and projections, and even household allocation models to provide estimates of a country's economic lifecycle patterns. NTA is designed in a way that is consistent with the United Nations System of National Accounts.

Figure 3. Consumption and Labor Income by Age: Maldives, 2019

A. Per capita age profile (MVR)



Source: National Bureau of Statistics et al. (2018a).

B. Components of labor income and consumption

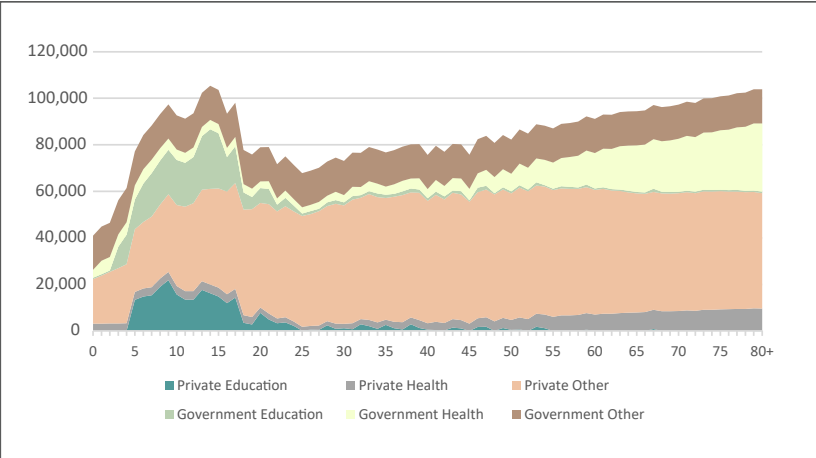
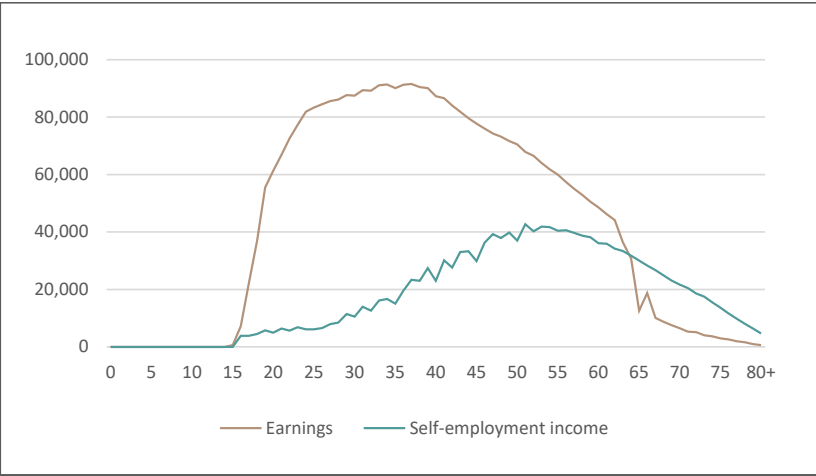


Table 1 provides a summary of National Transfer Lifecycle Account estimates in 2019. The account items are summarized by broad age groups: young population aged 0 to 24 years, prime-working-age adults aged 25 to 64 years, and the elderly population aged 65 years and older. With the importance of foreign workers in the Maldivian economy, the National Bureau of Statistics disaggregates the Maldivian population by type of resident population—i.e., resident Maldivians and resident foreigners. However, we do not provide aggregated NTA by sub-account for the resident foreign population due to the limited availability of data on foreign population characteristics.

**Table 1. National Transfer Account: Maldives, 2019**

		All Resident Population				Resident Maldivian				Resident Foreign		
A. Per capita (1000 MVR)	Per capita	0-24	25-64	65+	Per capita	0-24	25-64	65+	Per capita	0-24	25-64	65+
Lifecycle Deficit	6.0	48.3	-24.9	77.6	8.6	60.9	-26.1	78.7	-21.3	-14.6	-23.1	26.0
Consumption	78.5	77.8	77.8	99.6	112.4	82.9	90.9	100.6	57.0	52.2	58.3	52.5
Private Consumption		48.3	56.6	59.4	76.8	50.5	65.4	59.9				
Education		8.1	1.1	0.1	5.3	9.7	1.9	0.1				
Health		3.0	3.1	9.0	4.7	3.7	5.2	9.2				
Others		37.2	52.4	50.4	66.8	37.1	58.3	50.7				
Public Consumption		29.4	21.2	40.2	35.7	32.4	25.6	40.7				
Education		10.6	1.3	0.7	6.8	12.7	2.1	0.7				
Health		4.2	5.2	24.8	7.9	5.0	8.8	25.3				
Others		14.7	14.7	14.7	21.0	14.7	14.7	14.7				
Labor Income	72.5	29.4	102.7	22.0	108.8	21.9	117.0	21.9	78.3	66.8	81.4	26.5
Earnings		27.0	81.8	5.6	84.1	19.0	82.1	5.1				
Self-employment		2.4	20.8	16.4	19.7	2.9	34.9	16.8				
Aggregate (Billion MVR)	Total	0-24	25-64	65+	Total	0-24	25-64	65+	Total	0-24	25-64	65+
Lifecycle Deficit	3.2	9.7	-7.9	1.4	6.6	10.2	-4.9	1.4	-3.4	-0.5	-2.9	0.0
Consumption	41.9	15.6	24.5	1.8	32.7	13.8	17.1	1.8	9.2	1.7	7.4	0.0
Private Consumption	28.6	9.7	17.9	1.1	21.8	8.4	12.3	1.1				
Education	2.0	1.6	0.4	0.0	2.0	1.6	0.4	0.0				
Health	1.7	0.6	1.0	0.2	1.7	0.6	1.0	0.2				
Others	24.9	7.5	16.5	0.9	18.1	6.2	11.0	0.9				
Public Consumption	13.3	5.9	6.7	0.7	10.9	5.4	4.8	0.7				
Education	2.5	2.1	0.4	0.0	2.5	2.1	0.4	0.0				
Health	2.9	0.8	1.7	0.4	2.9	0.8	1.7	0.4				
Others	7.8	2.9	4.6	0.3	5.5	2.4	2.8	0.3				
Labor Income	38.7	5.9	32.4	0.4	26.1	3.7	22.0	0.4	12.6	2.2	10.4	0.0
Earnings	31.3	5.4	25.8	0.1	18.7	3.2	15.5	0.1				
Self-employment	7.4	0.5	6.6	0.3	7.4	0.5	6.6	0.3				

The lifecycle account is composed of consumption and labor income. Consumption is distinguished by type of intermediary, i.e., public (general government) or private (households, corporations, and non-profit institutions), and by type of consumption, i.e., education, health, and others. Labor income, on the other hand, is disaggregated by type of worker, i.e., wage employees or self-employed.

When we examine the average consumption per person in each age group, the Maldivian NTA shows that the elderly consume more per person, on average, than other age groups. The gap is mainly due to consumption of health care: per capita health consumption is estimated at MVR24,800 among the elderly, roughly four to five times the consumption by other broad age groups.

Labor income is an important resource in financing consumption. In 2019, the Maldives economy generated MVR38.7 billion in labor income. A large proportion of this (81 percent) was attributable to earnings of wage employees. Labor income from self-employment was also substantial, at MVR7.4 billion, but comprised less than one-fifth of all labor income for the year. When disaggregated by resident type, around one-third of all labor income was earned by the resident foreign population.

The difference between consumption and labor income represents a lifecycle deficit (or surplus). It shows the value of consumption that is not financed by labor income, but from other resources, such as asset income, use of savings, and private and public transfers. Resident Maldivians ages 24–58 years and resident foreigners ages 18–60 years have a lifecycle surplus. That is, the surplus years are much longer for resident foreigners (43 years) than for resident Maldivians (36 years). The average per capita lifecycle deficit of the elderly (MVR77,600) is much larger than that of the young population (MVR48,300). However, when aggregated over the population, the young population is estimated to have incurred a deficit of MVR9.7 billion, or almost seven times the MVR1.4 billion aggregate lifecycle deficit among the elderly population.

The greater number of surplus years among foreign residents is a direct consequence of foreign residents predominantly migrating to Maldives during their prime working age, after making their largest investments in human capital spending. Although a large share of the lifecycle surplus might be transferred outside the economy as remittances by the foreign resident population, some of that surplus remains in the Maldivian economy in the form of transfers among and within households, as taxes, and even as investments or savings.

## ii. Support Ratios and the First Demographic Dividend

---

In the early stages of an economy's demographic history, both fertility and mortality are high. Life spans are short as adults die early from communicable and other diseases. The economy remains a young population. Later in the demographic transition, fertility rates start to decline. Eventually, with the sustained reduction in fertility rates, the share of prime-working-age individuals grows faster than the rest of the population. The demographic transition can lead to higher living standards on average.

This mechanism can be written as follows. Per capita income ( $Y/N$ ) is a product of per worker productivity ( $Y/L$ ) and the ratio of effective labor force to the effective consumers ( $L/N$ ). That is,

$$\left(\frac{Y}{N}\right) = \left(\frac{Y}{L}\right) * \left(\frac{L}{N}\right) \quad (1)$$

where  $Y$  represents income,  $N$  effective consumers, and  $L$  effective labor force. The ratio,  $L/N$ , is called the support ratio (SR), which is the ratio of two areas in Figure 3.B. The growth can be written as

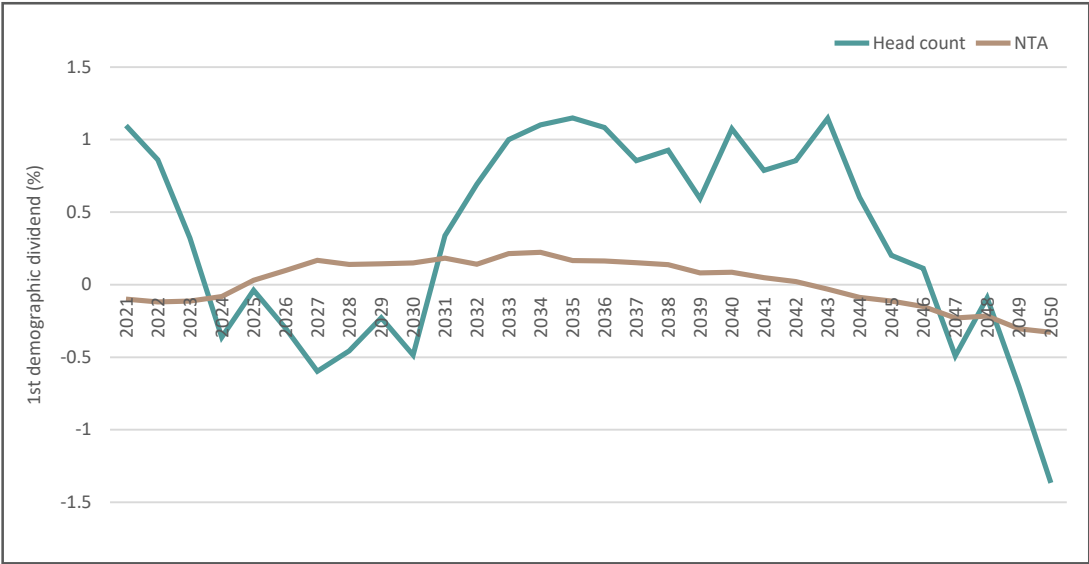
$$growth\left(\frac{Y}{N}\right) = growth\left(\frac{Y}{L}\right) + growth\left(\frac{L}{N}\right) \quad (2)$$

Thus, per capita income growth is the sum of labor productivity growth and support ratio growth. The second part, the growth of the support ratio, is the first demographic dividend (DD). Holding the labor productivity constant, there is a one-to-one direct relationship between the growth in per capita income and the DD.

Figure 4 presents the implied growth in income per person (the first DD). We report the first DD based on the Maldivian resident population.<sup>3</sup> Two measures are presented. The first measure is based on population head counts, using those aged 25 to 64 years as workers (L), and the rest of the population as consumers (N). The second measure is based on NTA estimates of labor income and consumption that take into account the actual production in the labor market (effective labor) and actual consumption (effective consumers).

The first DD phase for Maldives has already ended, as it shows a negative number. However, the DD rebounds and lasts until between 2025 and 2042, based on NTA estimates of the support ratio. The NTA-based growth rates of the support ratio are, however, much more modest than the estimate of the first demographic dividend using population head counts.

Figure 4. First Demographic Dividend: Resident Maldivians, 2020-2050

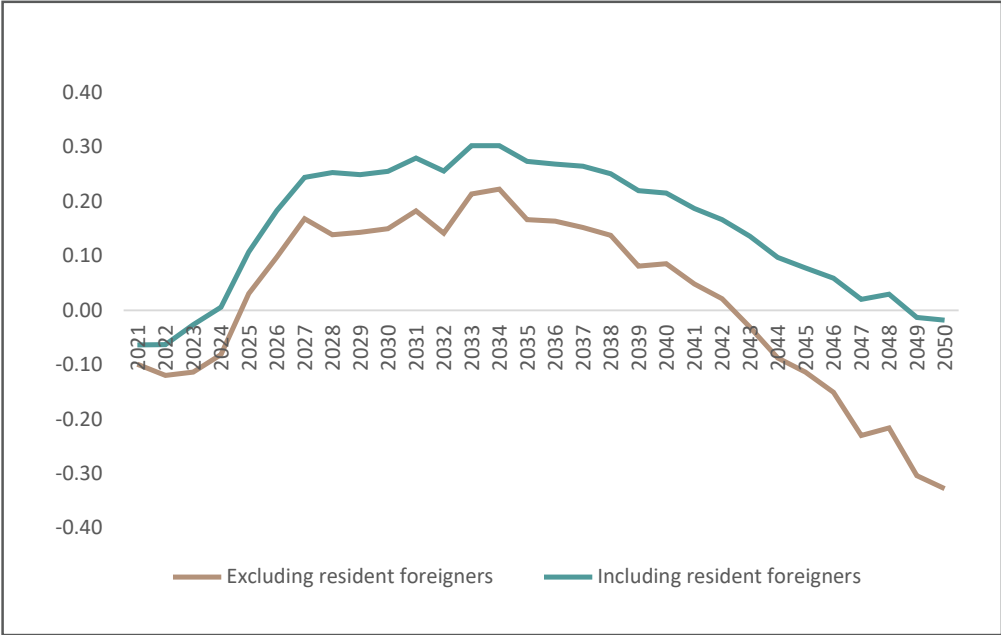


Note: Population projections are from National Bureau of Statistics and UNFPA (2018). The head-count support ratio is calculated as the proportion of the population aged 25 to 64 years relative to the population aged <25 and 65+ years. The NTA support ratio is calculated as the proportion of the number of effective workers relative to the number of effective consumers. The effective number of consumers (workers) is calculated by weighing the population of different age groups by the per capita consumption (labor income) at that age relative to the average per capita consumption (labor income) of those aged 30 to 49 years. The first demographic dividend is calculated as the growth rate of the respective support ratio.

3 This may be the more relevant population for Maldivians, rather than the whole resident population, since the resulting estimated first demographic dividend captures the direct impact of the demographic transition on per capita income growth of Maldivians.

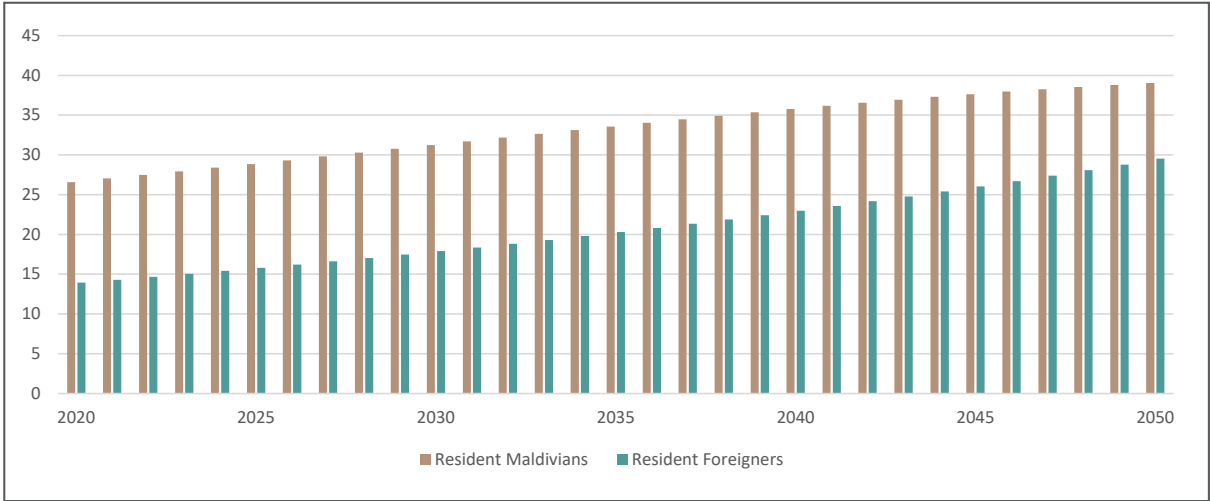
What would be the contribution of resident foreign workers to the DD? Figure 5 shows the first DD with and without resident foreigners. Including the resident foreigner population extends the first DD by five more years. However, the results should be interpreted with caution. The first DD from the resident foreign population may not accrue to the local economy because majority of their lifecycle surplus may not necessarily be retained in the domestic market. If a lot of their surpluses disappear in the form of remittances, then the effect will be mitigated.

Figure 5. First Demographic Dividend with and without Resident Foreigners, 2020-2050



Because there are labor shortages in the supply of some local sectors, the resident foreign population plays a prominent role in the Maldivian economy. If we assume that the per capita age profiles of labor income among resident Maldivians and resident foreigners remain the same into the future, when combined with projected population distribution by age, the contribution of foreign workers can be expected to become more significant. Figure 6 shows that, by 2050, with the sheer projected demographic trajectories of the foreign and Maldivian resident populations, the share of aggregate labor income that accrues to the foreign population in Maldives is projected to increase from 33 percent in 2019 to 43 percent in 2050. One remaining question is to what extent jobs between resident Maldivians and resident foreigners are gross substitutes (i.e., they crowd out jobs). Resident foreigners may crowd out low level jobs. However, given that most businesses take advantage of the cheap labor of resident foreigners, it is unlikely that the crowding out effect appears in high level jobs.

Figure 6. Projected Aggregate Labor Income by Resident Type, 2019-2050



Source: Population projections are from National Bureau of Statistics and UNFPA (2018a).

### iii. The Second Demographic Dividend

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As an economy inches toward becoming an aging population, depending on the support system available for the elderly, saving and investments increase with the growing retired workforce. This boosts the pool of capital available for the economy that can raise the average productivity of workers. Also, with declining fertility, parents, who now have fewer children to take care of than earlier generations of parents did, tend to invest more heavily in the human capital of their children. This investment raises their children's productivity when they eventually join the workforce. The increase in productivity due to capital deepening (both physical and human) is the so-called second demographic dividend.<sup>4</sup>

In order to provide some insights into the potential benefits of the second demographic dividend, we simulate the contribution of increasing labor productivity by 0.5 percent per annum. This rate is purposely chosen to be substantially lower than estimates of the historical average labor productivity growth around the world in order to provide a low-ball estimate of the potential from the second DD.<sup>5</sup> In addition, we explore the possible contribution of employing the potential workforce in the labor market. In this scenario, we assume that the previously unemployed potential workforce will earn the same rate as the average worker of the same age. We combine these assumed trajectories of per capita labor income age schedules with the projected change in population age distribution to estimate the implied aggregate labor income until 2050.<sup>6</sup>

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<sup>4</sup> See Lee and Mason (2010), and Mason et al. (2016).

<sup>5</sup> Labor productivity around the world is based on output per worker growth calculated from the Penn World Tables.

<sup>6</sup> There also appears to be a substantial underutilized Maldivian workforce in the economy, but we do not consider that group in our simulation. In 2016, for example, the NBS et al. (2018b) estimated that 9.3 percent of the labor force was unemployed. Among those who were employed, 14.3 percent were underemployed. In addition, the potential labor force – i.e., those who are not employed, and are either available but not looking for work or are looking but not available for work – comprise about one-tenth of the working age population. In total, about 48,000 Maldivians, or about one-fifth of the working-age population, are not able to completely harness their potential by fully participating in the labor market. Much of this underutilized workforce is of prime working age, when productivity is highest. While the rate of labor supply underutilization is higher among men (21 percent), the size of the underutilized labor supply among women is also significant.

Table 2 summarizes the results of our simulation. For reference, we include a base scenario where only the population age distribution changes, while the age profile of per capita labor income remains the same as its 2019 level until 2050. With only demographic change, aggregate labor income among the resident Maldivian population is projected to increase to MVR39.0 billion in 2050 from MVR26.6 billion in 2019. On the other hand, increasing labor productivity is projected to increase aggregate labor income by MVR6.6 billion, relative to the aggregate labor income in the demographic change-only scenario in 2050.

The biggest potential, however, comes from raising both labor productivity and employment among the population. In our simulation, raising labor productivity by 0.5 percent each year for resident Maldivians, when coupled with the employment of the potential labor force, raises aggregate labor income by as much as MVR8.2 billion from the base scenario in 2050.

Table 2. Simulated Aggregate Labor Income of Resident Maldivians (in 2019 Billion MVR)

	2020	2030	2040	2050
Demographic change only	26.6	31.2	35.8	39.0
... with labor productivity growth (LPG)	26.7	33.0	39.7	45.6
... with potential labor force (PLF)	27.5	32.4	37.0	40.5
... with both LPG and PLF	27.7	34.2	41.1	47.2

## iv. Human Capital Spending

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Human capital spending on children is relatively low in Maldives given its current economic development and fertility level. Human capital, in this case, is a synthetic cohort measure that is calculated as the sum of per capita education consumption between ages 3 and 24 years and per capita health consumption for ages 0 to 16 years. We normalize the values relative to the average labor income of those aged 30 to 49 years. This allows us to compare human capital investments among economies without reference to differences in currency valuations and the cost of labor, which is an important input to human capital.

Figure 7 presents the average human capital spending per person among countries with NTA estimates relative to their total fertility rate (TFR) as well as level of development (per capita GDP).<sup>7</sup> The figures show that per capita human capital spending goes down as fertility decreases and goes up as per capita GDP increases. The trade-off between human capital investment and TFR captures the quantity-quality tradeoff in the number of children; as the number of children per woman (i.e., quantity) declines, there is a tendency for parents to invest more heavily in the human capital of their children (i.e., quality).<sup>8</sup> On the other hand, the positive correlation between human capital investment and per capita GDP in the figure is due to the nature of high income elasticity of education and health; people spend disproportionately more on education and health as their income rises. However, children in Maldives, as in its South Asian neighbors India and Bangladesh, receive less in human capital investment than children in other economies with similar levels of fertility or development, and the gap is quite substantial.

Among economies with similar TFR, children receive about four years' worth of prime-age labor income in human capital investments on average. In Maldives, however, the average human capital investment in children is less than two years' worth of prime-age labor income. The same story holds for per capita GDP.

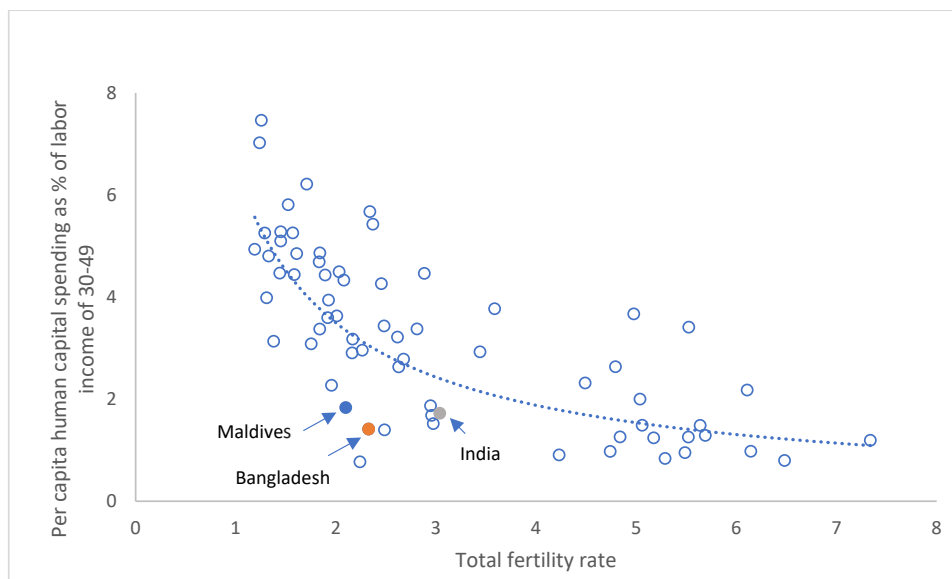
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7 The human capital spending, however, does not compare spending on a certain level of education. Some countries may have higher per capita spending on tertiary education than spending on secondary education, and vice versa.

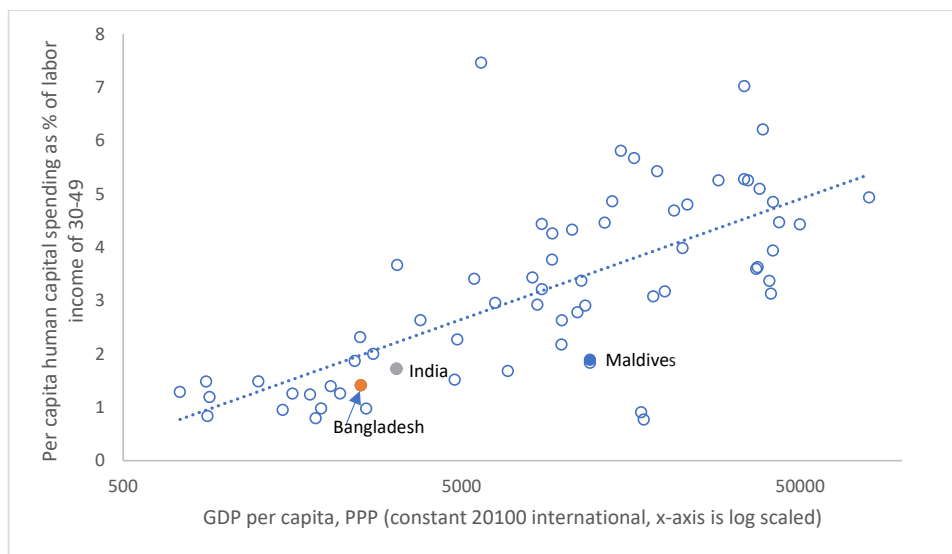
8 See Becker (1964) and Becker and Lewis (1973) for discussions.

Figure 7. Human Capital Spending

A. Per capita human capital spending vs. total fertility rate



B. Per capita human capital spending vs. level of economic development



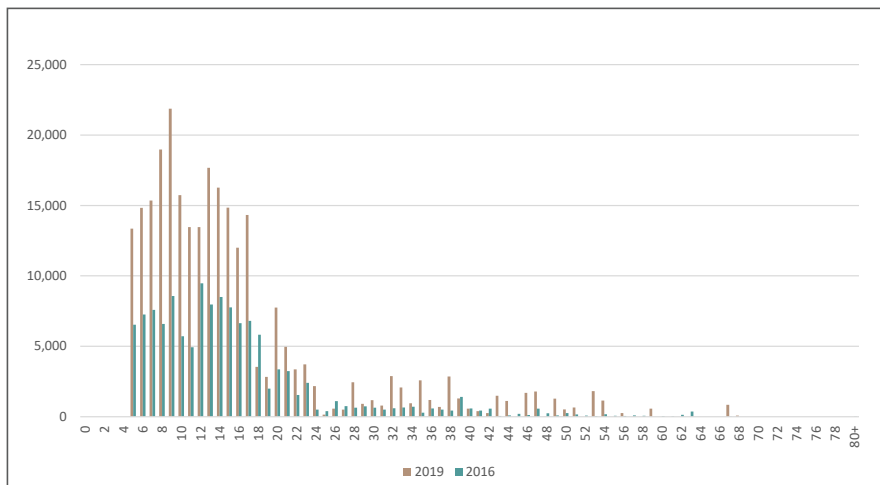
Note: Human capital spending per person is calculated as the sum of per capita health consumption for those age 0 to 16 years and per capita education consumption for those age 3 to 24 years. The values are normalized relative to the average labor income of the population age 30 to 49 years. Data for other countries are from [www.ntaccounts.org](http://www.ntaccounts.org). See Lee and Mason (2011) for details.

### 3. Comparisons between 2016 vs. 2019 NTA

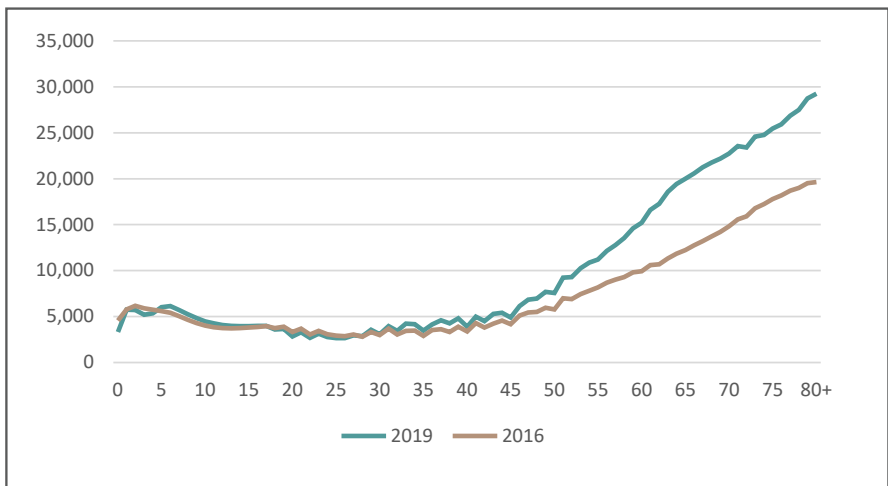
A comparison of 2019 and 2016 NTA provides some interesting insights on the trend of NTA in Maldives. While the two NTAs show similar pictures, three pieces of evidence are noteworthy. First, private spending on education increased substantially between 2016 and 2019 (Figure 8, Panel A). The increase in private education consumption cannot be attributed to an increase in private school enrollment because enrollment declined slightly between 2016 and 2019. Instead, it may reflect a rise in the average household’s consumption of private education, or it could be a result of a substantial increase in the consumption of private education by high-income households. Thus, an increase in private education consumption could be good news for Maldives because it reflects an investment in its human capital, but it could also be a source of rising inequality as wealthy people are more likely to spend more on education.

Figure 8. Comparisons of NTA (2016 vs. 2019)

A. Per capita private education consumption (2016 vs. 2019, MVR)



B. Per capita public health consumption (2016 vs. 2019, MVR)



Second, government spending on health increased much more for people ages 50 and older, while it changed little for other age groups (Panel B). This suggests that the substantial increase in government health expenditure between 2016 and 2019 (9.9 percent per annum) has been concentrated on people ages 50 and older. The HIES does not provide reasons for this increasing government health expenditure for older people. However, it might be because people are not living healthier although they are living much longer. The Global Burden of Diseases and Injuries study (2020) suggests that most deaths in Maldives are due to non-communicable diseases, and they are growing rapidly. Between 2009 and 2019, while deaths due to neonatal disorders declined, the incidence of non-communicable diseases increased, especially ischemic heart disease (36 percent), stroke (45 percent), chronic kidney disease (59 percent), diabetes (65 percent), and Alzheimer's disease (93 percent). As these diseases are concentrated in older people, and there is no individual limit on Aasandha coverage, healthcare expenditures may become an increasing burden on the government budget.

To summarize, households are spending more on the education and health of their children, while the Maldives government is spending more to maintain older people's health.

The results should be interpreted with caution since the two-year interval under study is quite short; the change could be due to year-specific macro-economic conditions. In addition, the evidence here does not reveal the reasons for this change. Nonetheless, these findings are noteworthy and require further investigation.



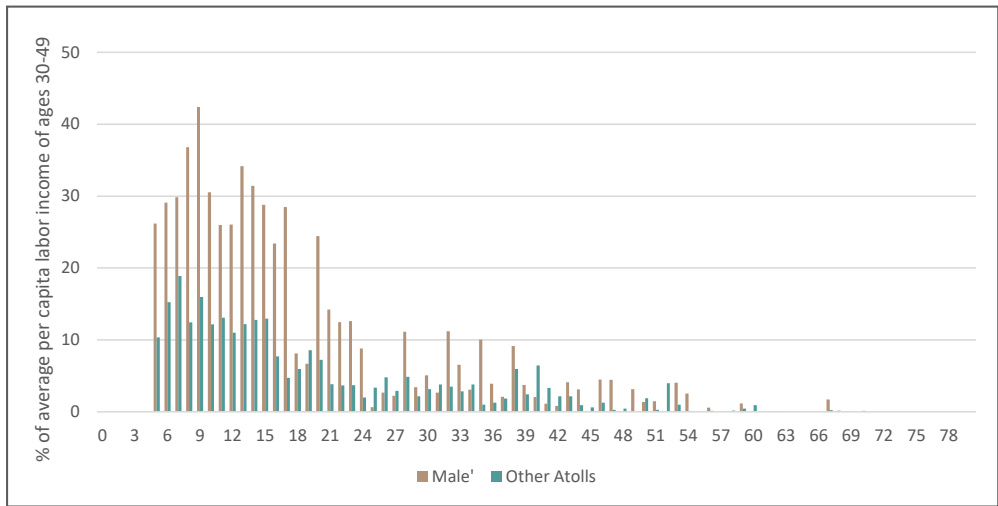
# i. NTA by region (Malé vs. Atolls)

The high geographic dispersion of the Maldives population poses a challenge for the cost-effective provision and delivery of basic education and healthcare services. The dispersed nature of the inhabited islands also presents challenges in applying developmental programs equitably.

Figure 9 presents per capita private education consumption (Panel A) and per capita private health consumption (Panel B) in Malé and the atolls.<sup>9</sup> As is clear from the figure, there are significant differences and disparities between the urban center of Malé and the outlying rural island communities in private consumption of education and healthcare. While the disparity among children is due to education consumption, that among the elderly is mainly due to healthcare consumption. As the numbers are normalized (divided) by per capita labor income of those ages 30-49 in each place of residence, the result is not due to differences in labor income between Malé and the atolls. Instead, it suggests that either the propensity to consume education and healthcare is higher in Malé, households in Malé have sources of income other than labor income, or some wealthy households in Malé are spending disproportionately more on education and healthcare.

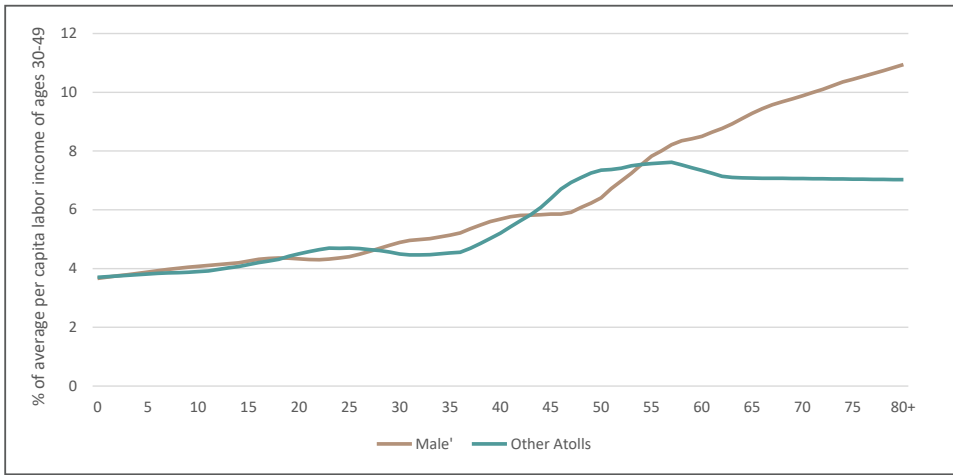
Figure 9. Private Consumption (Malé vs. the Atolls)

A. Private education consumption: Malé vs. the atolls (2019), as a percentage of average per capita labor income of the population ages 30-49



9 Although it would be more interesting to break down the NTA data by income quintile, it is not possible due to the small number of observations.

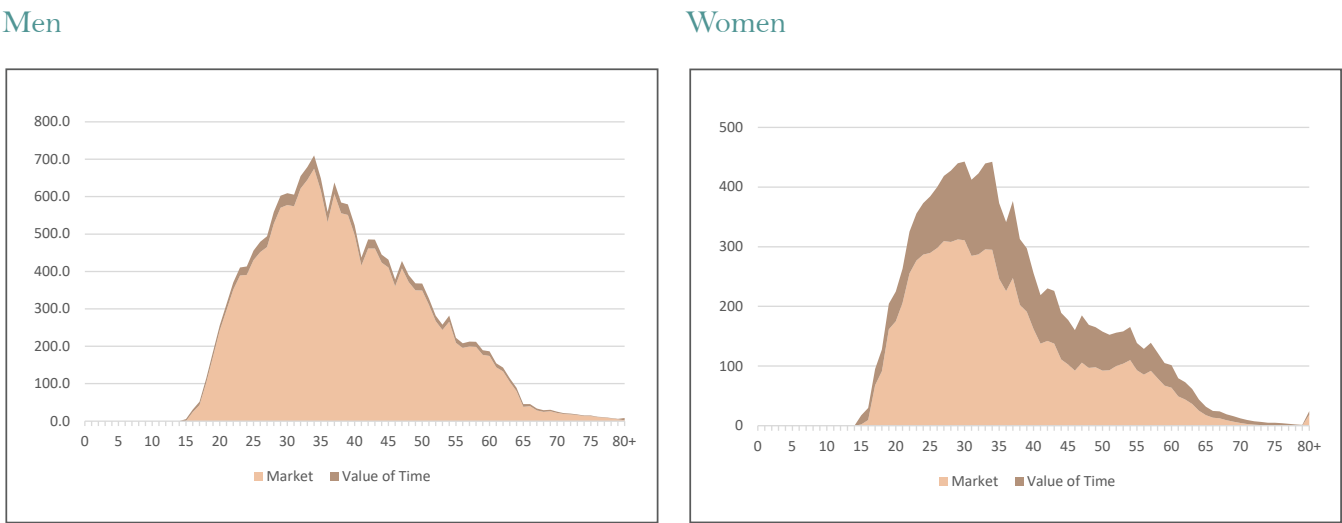
B. Private healthcare consumption: Malé vs. the atolls (2019, as a percentage of average per capita labor income of the population ages 30-49)



## ii. Gender Dimension

Standard measures of economic activity leave out one important component of production and consumption—the unpaid care and household services most often provided by women. Unpaid services—such as cooking, cleaning, and caring for children and the elderly—add considerable value both to family welfare and to national economic output. And because household services are largely performed by women, standard measures that leave them out seriously underestimate women’s economic contribution. Estimates of unpaid work need a full set of time-use surveys that indicate how much time women and men—and girls and boys—spend performing household tasks. The next step is to multiply the hours spent on each task by the average wage paid for that type of work in the marketplace. Based on information about time use in HIES 2019, Figure 10 reports the per capita value of market-based goods and services production vs. home-based production. Although women’s compensation from the market is smaller than men’s, the value of women’s contribution at home is much higher. In aggregate terms, women’s home-based production is worth 3.86 billion MVR, which is about 48 percent of their total labor income (8.05 billion MVR).

Figure 10. Value of Market Production vs. Home Production (Aggregate, Million MVR)



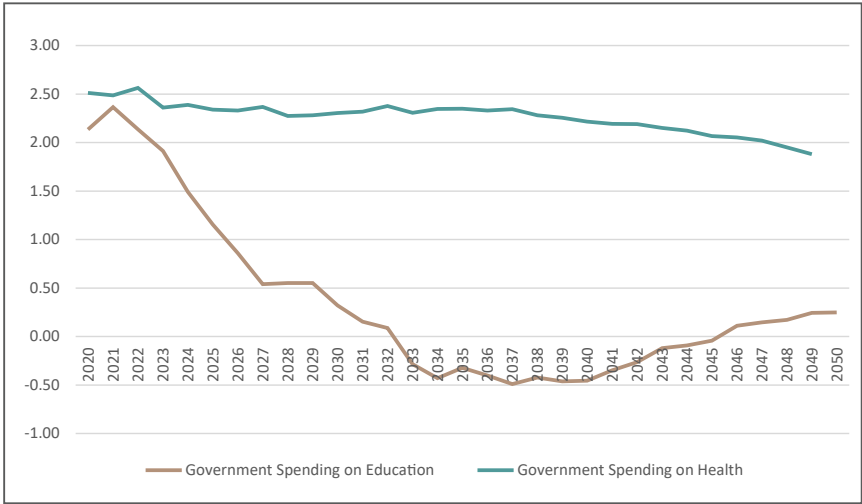


Changes in population age structure matter for public finances for a very simple reason. The beneficiaries of public programs are primarily children and the elderly.

One way to measure the effect of changes in age structure is to calculate the increase in benefits that would arise given the base-year age profile of benefits and the projected population age structure. This can be calculated as a percentage of budget increase or as a percentage of GDP. It is important to understand that the size of the population has no direct effect on public spending as a percentage of GDP because, in this case, the age profiles of benefits are assumed to grow at the same rate as per capita income. Population age structure does have an important effect on public spending as a share of GDP, however, because benefits are concentrated among particular age groups – primarily the young for education and the old for health and social welfare spending.

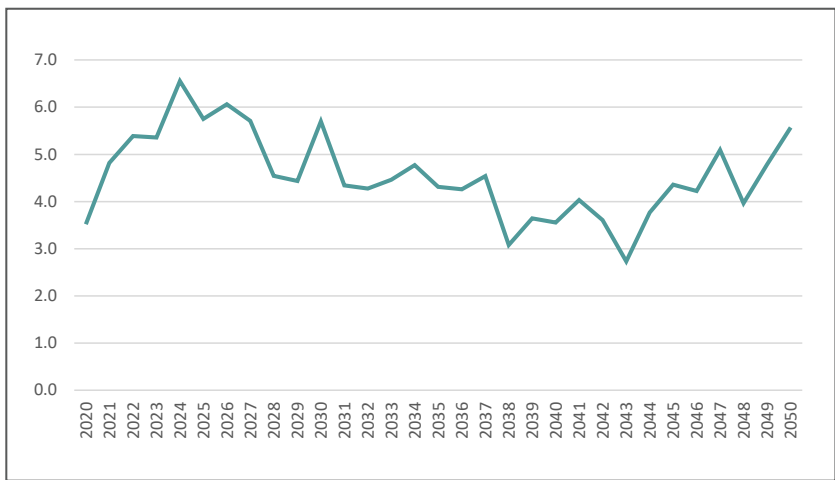
Figure 11 presents the implied budget requirement as a result of the projected population age structure change in Maldives for 2020-2050. It suggests that even without an increase in per capita benefits, the government budget needs to increase substantially. The aggregate public spending on healthcare and other social protection should grow by more than 2 percent per year until 2050 to maintain the same level of service enjoyed by the 2019 Maldivian population (Panel A).<sup>10</sup> The growth in aggregate spending requirement to finance public education in this status quo scenario is much more modest or even negative for some years because it is driven by declines in fertility and in the share of the school-age population.

Figure 11. Annual Budget Growth due to Change in Age Structure  
A. Education and health growth (real, percent): no change in per capita benefit



10 Other social protection includes single parent allowance, foster parent allowance, emergency medical welfare, and disability insurance. Although we do not model separate profiles for other social protection, it may affect the results little as the Aasandha accounts for 87 percent of all health and social protection spending in 2019. In addition, most of the other social protection spending goes for either disability allowances or emergency medical welfare. Thus, the profiles of the Aasandha are good proxies for other social protection program profiles as well.

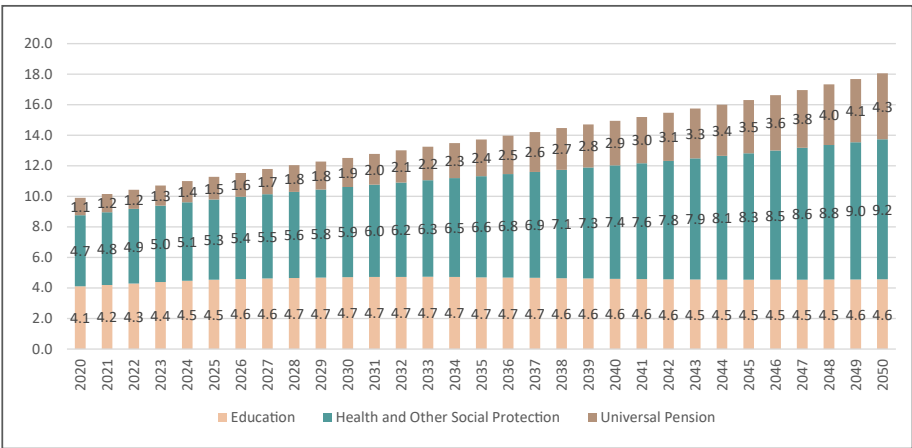
B. OABP growth (real, percent): no change in per capita benefit



Estimates of public spending on education, health, and other social protection, and the OABP as a percentage of GDP for projections to 2050 are presented in Figure 12.<sup>11</sup> The results show that social welfare spending as a percentage of GDP will double by 2050 (from 9 percent in 2020 to 18 percent in 2050)<sup>12</sup> even without an increase in the per capita benefit.

As incomes grow, public spending will become increasingly important. How countries adjust to higher income is a matter of policy and will be determined by political decisions. All else being the same, any improvements in the quality or quantity of public benefits provided to the population necessarily require higher public spending than these baseline estimates.

Figure 12. Social Welfare Spending as a Percentage of GDP due to Change in Population Age Structure



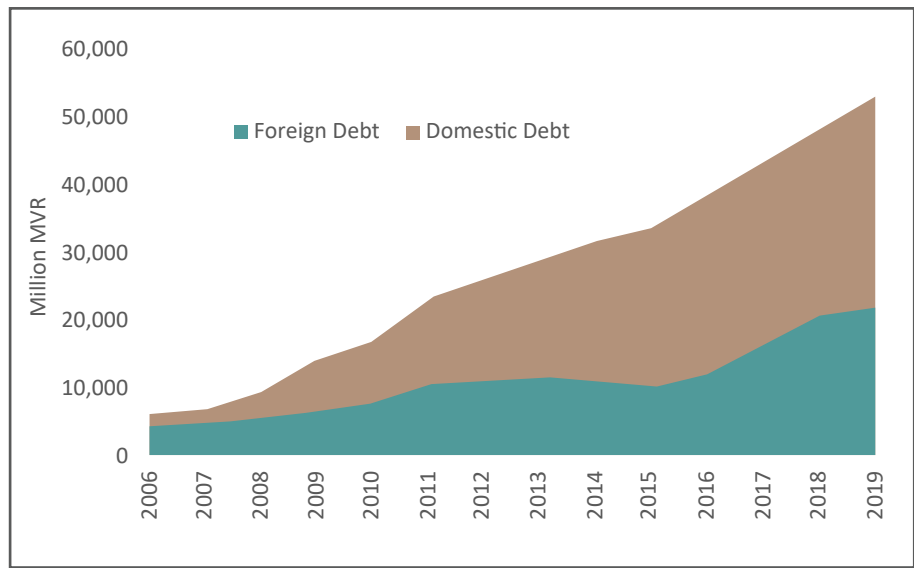
<sup>11</sup> OABP as a percentage of GDP is much smaller than its actual budget share of pensions because it does not include other institution-specific pensions.

<sup>12</sup> These are low-ball estimates, as we do not consider the other institutional pensions other than the OABP. The actual budget for pension will be much higher than the projected value.

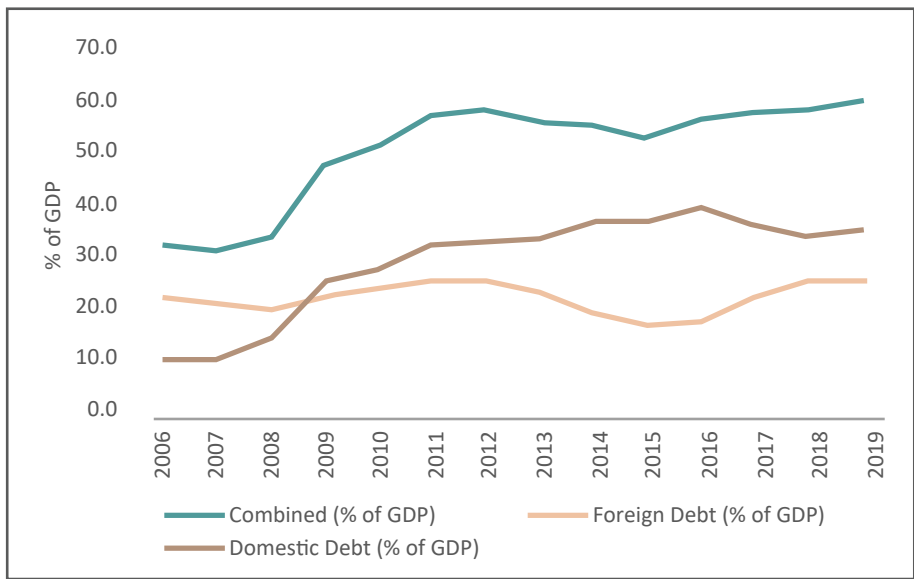
The increasing government expenditure has implications for government’s fiscal balance and debt. The overall balance (between revenue and expenditure) has been consistently negative in Maldives since 2012. Both domestic and external debt have increased, and population aging will exacerbate the problem (Figure 13).

Figure 13. Domestic and Foreign Debt (2006-2019)

A. Amount (Million MVR)



B. As a percentage of GDP





The pandemic has had a devastating effect on Maldives because the nation's economy relies so heavily on tourism. According to preliminary official estimates, real GDP might have contracted by 33 percent in the first 9 months of 2020, year on year (World Bank 2021). Total revenues and grants fell by 35 percent with the decrease in economic activity and tourist-dependent tax and nontax revenues. As the government increased spending on capital expenditures relative to 2019 and spent more on health, social, and economic relief measures, total expenditures were only 4.5 percent lower than in 2019. As a result, the fiscal deficit increased from 6.6 percent in 2019 to 20.1 percent in 2020. Thus, the large contraction in GDP and additional borrowing due to COVID-19 have further elevated debt vulnerabilities (World Bank, 2021; also see UN Maldives, 2020 for social effects).

It is too early to simulate the effect of COVID-19 on the generational economy as sufficient data are not available. Yet it is reasonable to conjecture that employment, labor income, and private consumption have been as severely affected as GDP. Public transfers and expenditures have not decreased much. Thus, the effect of the pandemic may be very different across generations due to their different age profiles. The incomes of those who rely more on labor income and less on government transfers might have been affected most severely. Hence the effect might be especially severe for workers in their 20s and 30s, at least in the short run. The pandemic may also have a long-term impact for those entering job market. A detailed analysis will require more extensive data on households and the economy between 2020-2021.



The demographic transition in Maldives is expected to introduce both opportunities and challenges. Using two rounds of National Transfer Accounts (NTA) for Maldives, we document some of these challenges. Our main findings are as follows.

First, the window of opportunity is very short in Maldives. DD is not automatic. Capturing the DD requires early investment on human capital. However, Maldives is still spending on human capital below the average for its TFR or per capita GDP. Households are increasing human capital spending on the young. That is good news, but it could be a source of increasing disparity if only wealthier households spend more on education. DD can be also increased by enhanced labor productivity with the population change (the second DD), which will last even longer after the first DD disappears.

Second, the main gaps between Malé and the atolls are private education consumption by children and private healthcare consumption by older people. Although improving, women's average market wage is still lower than men's, and counting women's unpaid work increases their contribution to labor production substantially.

Third, public programs on health, social protection, and pension will be a rising fiscal burden. Even without an increase in per capita benefits, social welfare spending as a share of GDP will double by 2050, due to population aging. The OABP can be less problematic if the OABP and other social programs are harmonized; for example, if the MRPS becomes the main support system for the elderly and OABP focuses only on supporting the poor elderly in the future, the burden will be reduced.<sup>13</sup> Although education spending does not increase with changes in the age structure of the population, Maldives needs more education spending to boost human capital. The level of spending, both per capita and aggregate, is expected to increase most rapidly for public health programs. This may be because people in the nation are living longer but not healthier. Promoting healthy-aging incentives for exercise and balanced nutrition, practicing preventive medicine, and early treatment of diseases and medical conditions can contribute substantially to the country's healthcare goals. Public information campaigns and other policies that encourage healthy aging would be useful. The sheer speed of increase in debt caused by population aging will exacerbate the problem in Maldives. Maldives may eventually have to consider a new tax or budget cuts on some types of government spending, or both.

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13 Another issue in Maldives pension system is its coverage. Maldives pension system need to consider covering informal sector workers and migrants as well.

Fourth, Maldives is one of the worst-hit countries in the world from the pandemic. Although the Maldivian economy is recovering rapidly in mid-2021, continued high fiscal deficits after the pandemic are threatening the country's macroeconomic sustainability. High public spending and low taxes are among the main drivers of the public and external fiscal imbalances and they will worsen after the pandemic. The recovery should be a platform on which to build a better Maldives, instead of returning to business-as-usual before the pandemic. Maldives should build new SDG financing frameworks and strategies to further strengthen the social services sector, make it more cost-effective, reduce inefficiencies, and discourage unnecessary use of government health programs. Investing in human capital, including by retraining and upskilling workers, will help Maldives recover and come back better. In the long run, investing in children's human capital not only raises children's labor productivity, but also raises their chances of being productively employed. Programs to expand work opportunities are therefore crucial complements of any program that expands human capital investments in children.

All results here are based on highly stylized assumptions and estimated simulation techniques. The study does not provide policy scenario-based simulation. And we should not read too much into the limited evidence currently available. Nonetheless, the results in this study should send a clear message to policy-makers who have an eye on the effects of population structure on the generational economy of Maldives. Any economic policies should include mechanisms that consider changes in the generational economy and decrease future fiscal pressures. Whatever worked for Maldives in the past may not work the same way in the future, largely because of the rapidly changing population structure and fiscal imbalance.

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Appendix A1.  
NTA Methodology and Detailed  
Method to Estimate the Maldivian  
NTA, 2019 and 2016

This Appendix summarizes the major steps employed in estimating the 2016 and 2019 National Transfer Accounts (NTA) for Maldives. The general steps and concepts, which are followed in estimating the Maldives NTA, are discussed in more detail in United Nations (2013) and also in the Maldives NTA Manual by the NBS. As mentioned in the main text of this study, only the Lifecycle Account is estimated in this round of estimation.

In NTA, all incomes in an economy are used in one way or another. This is the same identity that governs national accounting frameworks; i.e., the total income in an economy equals its total expenditures. This is depicted in the equation below:

$$\underbrace{YL_t + YA_t + T_t^+}_{Income} = \underbrace{C_t + T_t^- + S_t}_{Expenditure}. \quad A-(1)$$

$YL_t$ ,  $YA_t$ , and  $T_t^+$  refer to total labor income, asset income, and transfers received, respectively, in an economy at time  $t$ . These incomes are used as consumption,  $C_t$ ; transferred outward,  $T_t^-$ ; or saved,  $S_t$ . The flow of resources in the economy are made by economic agents, including households, governments, corporations, and non-profit organizations.

NTA reworks this identity by equating the lifecycle account—i.e., consumption and labor income—on one side, with how the lifecycle deficit (or surplus) may be filled-in (or used)—i.e., through reallocations—on the other side, captured by the following equation:

$$\underbrace{C_t - YL_t}_{Lifecycle\ Account} = \underbrace{\underbrace{[YA_t - S_t]}_{Asset-based\ Reallocations} + \underbrace{[T_t^+ - T_t^-]}_{Transfers}}_{Reallocations\ Account}. \quad A-(2)$$

Unlike in the UN System of National Accounts, the primary economic agents in NTA through which the resources are reckoned are the different cohorts—i.e., age groups—in an economy. The public sector, represented by the government, and the private sector, represented by households, corporations, and nonprofit organizations, are also important agents in NTA, but only to the extent that these agents mediate the flow of resources across populations in different age groups. In essence, NTA introduces an age dimension into national accounting by estimating the lifecycle and the reallocation accounts by age group, a:

$$\underbrace{C_t(a) - YL_t(a)}_{\text{Lifecycle Account}} = \underbrace{\underbrace{[YA_t(a) - S_t(a)]}_{\text{Asset-based Reallocations}} + \underbrace{[T_t^+(a) - T_t^-(a)]}_{\text{Transfers}}}_{\text{Reallocations Account}}. \quad \text{A-(3)}$$

This elaboration by age group of the national accounts is particularly useful as it allows NTA to capture the age dimension of intra-household transfers—i.e., transfers within households—which is an important resource to fill the lifecycle deficit among children and the elderly, especially in economies where public transfer systems, including public pensions, social health insurance, public school systems, etc., are not very well developed. In a standard national accounting framework, these intra-household transfers are not captured since it nets to zero within an economy by definition.

In order to provide age-specific values, we allocate aggregate-level values to individuals within households if values are at the household level (say in surveys) and to age groups if values are at the country level (say as expenditures by government ministries), following the standard procedures outlined in United Nations (2013).

## Appendix A2. Allocation Rules and Data Sources

Age-specific per capita values are calculated for each NTA sub-account. Except for education-related variables, all profiles are smoothed to reduce the noise from sampling variation and other sources of error or random variation in the data. Only the lowest level of sub-accounts is smoothed, and never the upper-level accounts. For example, in calculating labor income, only the age profiles of earnings and self-employment labor income are smoothed, and not the total labor income by age. In order to maintain aggregate consistency, the age profiles calculated as described in the Appendix Table are rescaled to agree with NTA macro-controls calculated from the Maldives System of National Accounts. Calculation of the NTA macro-controls are discussed in-depth in United Nations (2013) and in the Maldives NTA Manual by the NBS.

Appendix Table. Summary of procedures estimating basic NTA age profiles



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