Trends and Characteristics of Labor Force Participation among Older Persons in Developing Asia and their Retirement Decisions: Literature Review and Cross-Country Assessment

Aiko Kikkawa (Economist, Asian Development Bank)
Raymond Gaspar (Consultant, Asian Development Bank)

Draft as of 18 August 2021

Abstract

This paper examines the pattern and prospects of labor force participation and the retirement decisions of older persons in developing Asia. We review relevant literature and conduct a detailed analysis of descriptive statistics drawn from the labor force survey micro data of selected countries in the region. Evidence suggests that the structure of social security and pensions, education and health status of workers, household structures and gender norms, and technological change and adoption at the workplace explain the observed patterns of labor supply among older persons in advanced economies. Some of these factors are equally relevant in developing Asia, while others seem to pose divergent impacts. The restricted coverage and depth of social security and pension schemes likely have limited effect in many countries of developing Asia to date, except in selected areas and among educated older workers. The lack of career options upon the first retirement can also explain the early exit from the labor market among the skilled group. This paper recommends public and private actions that could promote longer working lives in the region.

Keywords: Developing Asia, labor force participation, older workers, retirement, population aging, pensions

JEL Codes: J11, J14, J21, J26

I. Introduction

Developing Asia is aging at an unprecedented speed. By 2050, individuals aged 65 and above will account for 18%, or 800 million, of the region's total population, up from only 8% in 2019 (UN-DESA 2019). At the forefront of the ongoing societal aging are the People's Republic of China (PRC), the Republic of Korea, Thailand, and Viet Nam, while it is proceeding at a slow to moderate speed in countries with large populations such as India, Indonesia, and the Philippines.

The rapidly graying population calls for policies and actions to create a society and environment that promote active aging of the growing number of older persons as a way of upholding their well-being. The Regional Framework on Healthy Aging (2018–2022) underlines current efforts from many Asian countries to continue improving their health systems; updating the measurement, monitoring, and research on aging; and adopting a sustainable and progressive financing toward universal health coverage (World Health Organization 2018). Many countries in developing Asia are reviewing their existing social security and pension systems and aged care to better respond to the growing demand for social protection of older persons.

Another important component of the policy mix to adapt to the population aging is the promotion of a longer working life. It is widely documented how working even at an older age contributes to both the objective and

subjective well-being of older persons especially through income security, greater sense of social participation, and self-fulfillment (Hao 2008; Schwingel et al. 2009; Sewdas et al. 2017). Retaining older workers and encouraging employment among retirees can bring economic benefit as the working age population is expected to gradually shrink in the coming decades. Ogawa et al. (2021) estimate that the untapped work capacity of persons aged 60–79 in Japan could have led to a higher real gross domestic product (GDP) ranging from 3.2% to 6% while, in Malaysia, its GDP would have increased by between 2.5% and 4.2%. Retaining older workforce including those near retirement, therefore, are well attuned to the reality and growing challenges of societal aging.

In many Asian Development Bank developing member countries (DMCs) in Asia, the labor force participation (LFP) rates of older workers remain relatively high and steady over the years. The steady trend, however, masks heterogeneity across gender and other individual characteristics. Notable is the mild retreat in the labor market among older men, while the labor force participation rate of women is generally on a steady rise. The decline of LFP among older men seems to contradict the record of steady improvement in the region's health and longevity indicators, which could have contributed to extended years of productive working life. Or partly, the exits from the labor market could also be interpreted as resulting from the emergence of middle- and upper-income groups who are more likely to make voluntary decisions to retire and enjoy their retirement life based on pension and savings.

A large body of literature suggests that multiple factors at the individual, household, and policy level influence the pattern of LFP among older persons and their retirement decisions. Among the countries in advanced stages of population aging, evidence points to some key determinants such as social security and pensions (e.g., Gustman and Steinmeier 1985; Krueger and Pischke 1992; Coile, Milligan, and Wise 2017; and Börsch-Supan and Coile 2020), health status and likelihood of survival (e.g., Blundell et al. 2017; Munnell 2015; and Kalemli-Ozcan and Weil 2010), education level (e.g., Blau and Goodstein 2010; Burtless 2013; Johnson and Wang 2017), household duties(e.g., Schirle 2008), and firm technology adoption (e.g., Friedberg 2003 and Lewandowski et al. 2017). This paper reviews these studies and discusses whether the LFP of older persons in developing Asia are influenced by such criteria using descriptive data. We rely on labor force survey microdata of selected countries in developing Asia that are undergoing different stages of aging—Bangladesh, Indonesia, the Philippines, Sri Lanka, Thailand, and Viet Nam—and supplement these with demographic and health information.

We find that some of the determinants that have been influencing the labor force participation of older workers in countries with advanced stages of population aging are also equally relevant in developing Asia while others are not, or that the direction of influence is not uniform. For example, the social security effect in many countries in developing Asia has remained modest though increasing over time. Health is a key determinant of labor force participation among older persons in developing Asia; however, labor participation of older adults may be less influenced by extension of life expectancy, considering that much of the improvement is seen among the under-5 population and not above. Likewise, the educated older workforce in advanced economies go through a phased retirement before fully giving up their career. In developing Asia however, they tend to leave the labor market earlier than others and immediately upon retirement age, indicating the lack of career options or preference for permanent retirement.

The rest of the paper is organized as follows. Section 2 presents the overall pattern of labor force participation and retirement decisions of older persons in developing Asia. Sections 3 to 7 review global evidence and literature, discuss each of the seven determinant factors that shift the labor force participation rate of older persons, and provide a hypothesis on the applicability to Asia. Discussions on the labor market prospects among older persons in developing Asia alongside other policy implications that could shape future research agenda conclude the paper.

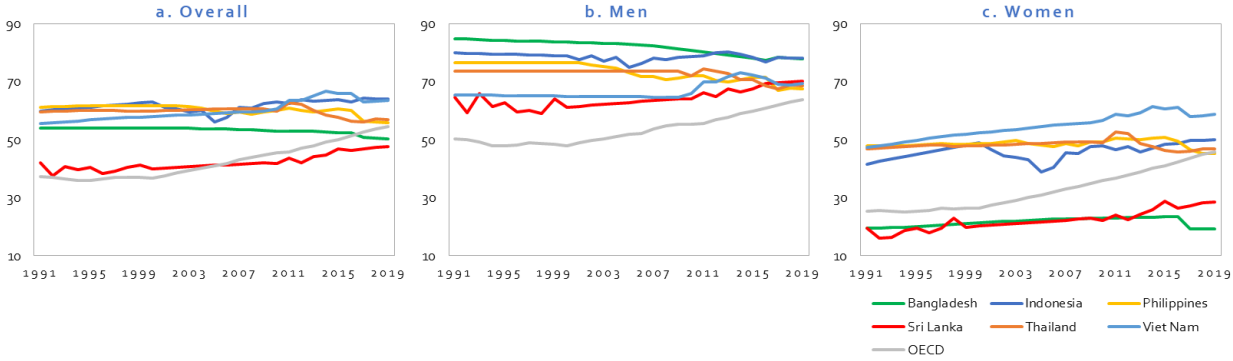
II. Overall Pattern of Labor Force Participation of Older Persons in Developing Asia

Over the years, the active involvement of older persons in the labor market in many DMCs in the region remained high and steady. Figure 1 presents the labor force participation rates among persons aged 60–64 in selected developing Asian countries along with the counterpart average from Organisation for Economic Co-operation and Development (OECD) countries.

The LFP rates of older individuals in selected countries in developing Asia are high and comparable to that of OECD economies, with the rates hovering around 60% since the 1990s, and with working older persons a minority in Sri Lanka (Figure 1a). In recent years, however, the LFP rates vary across countries — a steady upward trend in Sri Lanka and a moderately declining trend in Bangladesh (50.3% in 2019), the Philippines (55.9%), and Thailand (56.9%). In Indonesia, the participation rate of older workers has shown a continued rise following a downward trend in the early 2000s and settling at 64.9% by 2019. The labor force participation rates of older workers in Viet Nam, meanwhile, display more dynamism in recent years, heading toward higher participation rates at 63.6% in 2019.

In the countries being studied, the majority of older individuals who remain active at work are informal workers and are self-employed in the rural areas. Among those in the 60–64 age group, the labor force participation rates of those living in rural areas are consistently higher than their urban counterparts: 55.9% in rural areas vs. 49.3% in urban areas in Bangladesh; 69.9% vs. 52.2% in Indonesia; 61.8% vs. 50.1% in the Philippines; 49.2% vs. 41.3% in Sri Lanka; 64.9% vs. 50.2% in Thailand; and 76.9% vs. 45% in Viet Nam. Many of these working elders in informal and vulnerable sectors are not eligible for an adequate pension, leaving them with limited options to retire.

Figure 1. Labor Force Participation Rate of Persons Aged Between 60 and 64 in Developing Asia by Sex, 1991–2019



OECD = Organisation for Economic Co-operation and Development.
Source: Data on labor force participation rates by age from ILOSTAT for Asian countries and OECD.Stat for the OECD average.

The overall trend masks a large gender heterogeneity (Figures 1b and 1c). Owing largely to the unequal distribution of household tasks based on gender norms and limited economic opportunities, the labor force participation rates among older women are substantially lower than that of men, particularly in Bangladesh and Sri Lanka. The likelihood of joining the workforce also fluctuates more over the life course of women as they often take greater responsibility in managing the household and caring for many family members including their spouse, children, and grandchildren. When retiring, women tend to retreat from the labor market more gradually starting in their early 50s, often to take a more active role in raising grandchildren, as observed by Ko and Hank (2014) especially in the Republic of Korea.

Notable in Figure 1b is the slight decline in labor force participation rates among older men in some countries. In Bangladesh, the LFP rate of men aged 60–64 slid to 77.8% in 2019 from 84.7% in 1991, while dropping to 67.6% from 76.4% in the Philippines during the same period. The observed downtrend especially among older men seems to contradict the steady improvement in the overall health and longevity of the population during the period, which could be expected to contribute to the extended years of productive working life. Some of the labor market exits during the period could be linked to the emergence of middle- and upper-income groups who can afford to choose retirement and live off their pension and savings.

In contrast, the labor force participation of older women shows an apparent uptick in Indonesia (50.1% in 2019), Sri Lanka (28.4%), and Viet Nam (58.7%) (Figure 1c). In particular, the prolonged involvement of older adults in the labor market can be attributed largely to a rise in the female workforce in Indonesia, especially those in the rural areas. Improved schooling years and prior work experience facilitated by implementation of gender-inclusive labor market policies contributed to the increased labor market involvement of women in their older ages. The labor force participation rate of older women in Thailand in 2019 showed an upward trend to 46.8% after the sudden drop in 2012. In contrast, the proportion of women aged 60–64 in Bangladesh and the Philippines declined in recent years, with the former owing to the retreat among tertiary-educated women and the latter among those living in rural areas with lower education.

Overall, the stagnant labor force participation rates among older persons in developing Asia is a contrast to OECD member countries, which have shown sharp increases during the past few decades after reaching the lowest levels in the mid-1990s.

Empirical Models of Labor Supply of Older Persons

A standard model of labor supply decision is the neoclassical model of labor-leisure choice, in which an individual maximizes utility from the consumption of both goods and leisure within a budget constraint on labor and nonlabor income. The decision depends on the shape of the individual's utility function, as well as their wage rate, work hours, assets, and nonfinancial factors such as government social protection policies. Similarly, retirement is largely a labor supply choice, which often requires longer-term planning and involves weighing a large degree of uncertainty on the length of retirement years, a changing health condition, changes in social security provision, and inflation. Retirement may also involve the transition from a career to a bridging job that completes retirement.

The life cycle retirement model, which reflects labor force participation and the retirement decision, is often used to examine the labor supply paths of older workers, e.g., Gustman and Steinmeier (1984), Gustman and Steinmeier (1985), and Kalemli-Ozcan and Weil (2010). In this model, individuals make labor–leisure choices over their lifetime subject to uncertainty. Mao, Ostaszewski, and Wang (2011) extended the model to consider the consumption–leisure trade-off, savings, mortality, income, and the degree of risk aversion.

Based on labor supply and retirement theories, extensive empirical research has been conducted to fully understand the dynamics of the labor force participation of seniors in advanced countries. Empirical evidence points to some of the key determinants of LFP and retirement decisions among older persons: social security and pensions, health, education, household structure, and firm technology adoption. The following sections discuss these key determinants and assess their applicability in the context of LFP among older persons in developing Asia.

III. The Influence of Social Security and Pension Reforms

The availability and the generosity of pension programs and related reforms have long been posited to explain much of the movements in the labor force participation rate as well as the employment of older workers in

countries with rapidly aging population. In many OECD countries, the decline in labor participation of older men until the mid-1990s has been linked to the rise in financial disincentives for continued work as a result of the introduction and coverage and benefits expansion of public pension programs.

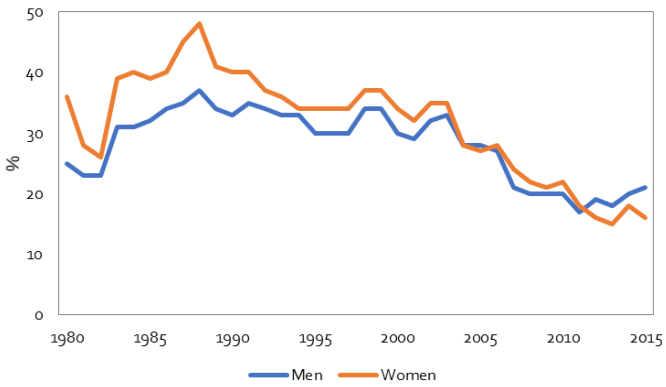
The increased generosity of the Social Security system has been responsible for the move toward early retirement in the United States (US), with the increase in Social Security retirement benefits evidently lead to at most 15% of the decline in participation rates of older workers (Krueger and Pischke 1992). Stock and Wise (1990) predicted dramatic impacts on retirement patterns because of changes in pension plans. Empirical evidence suggests a strong link between the availability of private pension plans and the labor force participation of older men. Gustman and Steinmeier (1984) and Lazear (1983) suggest that the probability of men working at the age of 58 to 63 falls by 18 percentage points if they have private pension plans.

Meanwhile, changes introduced in the structure of the pension system since the mid-1990s—the most common of which was the increase in the pension age—have adjusted retirement incentives among older workers and led to longer working lives. Many countries have enacted social security reforms over the past few decades, which have changed the eligibility age, actuarial adjustment factors, eligibility of the disability benefit, and other parameters of public pension systems (Börsch-Supan 2013). Gustman and Steinmeier (1985) showed that the Social Security reforms in the US—particularly the 1983 amendment that raised the retirement age, increased delayed retirement credit, and lowered the reduction rate for earnings over the test amount—lowered the incentive to retire.

Coile et al. (2017) highlighted several cases in which a specific reform—such as an increase in the statutory retirement age in Japan or the United Kingdom (UK)—appears to have affected employment. In Japan, the labor force participation of older cohorts is highly sensitive to aging-related policies, including the statutory retirement age and the pension system. Oshio, Usui, and Shimizutani (2018) showed that labor participation decisions among older workers are strongly associated with changes in social security incentives, such as the rise in pensionable age.

Börsch-Supan and Coile (2020) document the series of pension reform activities in 12 population-aging economies. Some countries carried out back-and-forth reforms, while others adopted multiple reforms of the same type. Taking various pension reforms together, the implicit tax on working longer slid downward in the 1990s, strengthening the incentives for older-aged adults to work (Figure 2). The rise in implicit tax can be attributed to raising the eligibility age, lowering the benefit generosity, strengthening actuarial adjustments for delayed claiming, and reducing access to nonsocial security programs that offer alternative pathways out of the labor force. In the same study, the authors estimated that increasing the implicit tax on working longer from 0% to 100% reduces the employment of older men by 6.7 percentage points in the early retirement phase and 1.8 percentage points in the late retirement phase. The equivalent effect for women in the early retirement phase is 4.6 percentage points.

Figure 2. Average Implicit Tax on Working Longer at Age 62 in Selected OECD Countries, 1980–2015



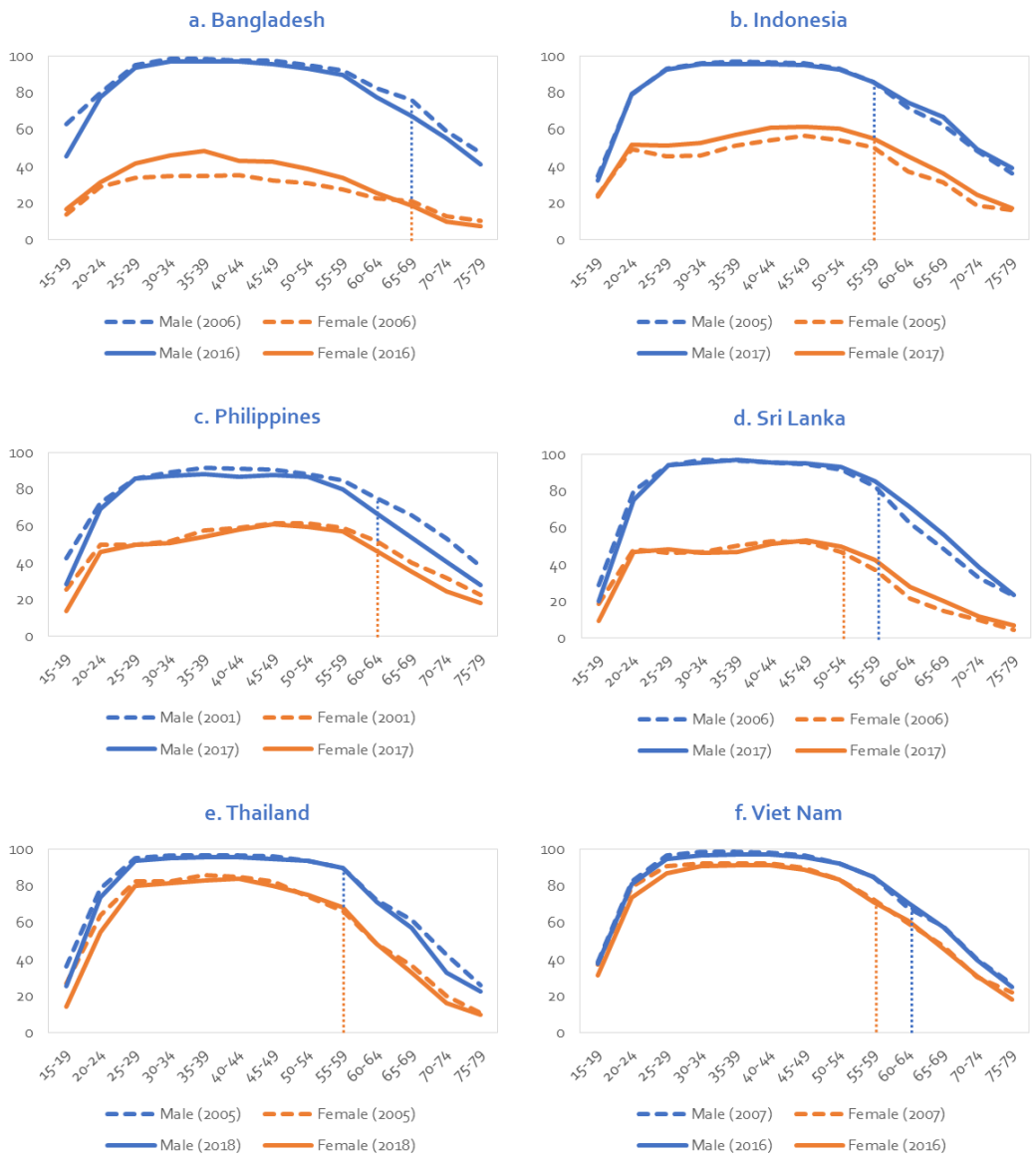
OECD = Organisation for Economic Co-operation and Development.
Note: Unweighted average on implicit tax on working longer in Belgium, Canada, Denmark, France, Germany, Italy, Japan, the Netherlands, Spain, Sweden, the United Kingdom, and the United States.
Source: Börsch-Supan and Coile (2020).

Social Security and Pension and Retirement Patterns in Developing Asia

The abovementioned evidence only suggests that the availability and generosity of pensions in OECD countries have strongly influenced the decision of older workers to remain working, go through a phased retirement, or exit from the labor market. To some extent, a similar labor market response is also observed in selected developing Asian countries that have well-placed pension systems. In the urban areas of the PRC, the availability of a formal sector pension reduces the probability of men and women to remain employed by 52% and 54%, respectively (World Bank 2016). The same study also found a similar but less-pronounced effect on the employment of older men in Indonesia, i.e., 19% among urban workers and 25% for rural workers.

Labor market exit in developing Asian countries covered in this study does not seem so apparent even as individuals approach the statutory retirement age (Figure 3). The figure also shows that such pattern has not changed from the previous decade or so. The steep drop in the labor participation rate following the retirement age is more obvious in Thailand and moderately so among older men in Sri Lanka. These countries have a relatively higher coverage of mandatory pension schemes. OECD (2018) indicates that 35.9% of Thailand's total labor force is covered by mandatory pension schemes compared with 29.8% in Sri Lanka. In contrast, pension coverage is lower in Indonesia (17.8%), the Philippines (27.3%), and Viet Nam (21.9%). Pension coverage is also seen to be closely linked to the sectors and occupations at which individuals are employed, which can also be linked to one's education level.

Figure 3. Labor Force Participation Rates by Age and Sex in Developing Asian Countries, Various Years



Note: Dotted lines refer to the country's statutory retirement age by sex.
Source: Authors' illustration using data from labor force surveys of respective countries.

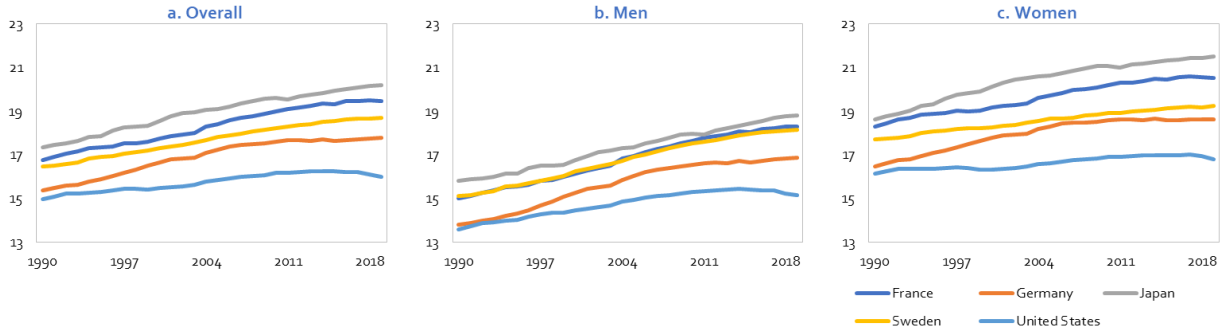
The limited changes seen in labor participation during retirement age can also be attributed to the pension income being quite small as a share of income, and is only applicable to a few groups of workers, especially the public employees and formal workers in large corporations. Knox-Vydmanov (2016) found that the income contribution of pensions to older persons in Asia's DMCs remain small, at most 27% in Viet Nam and 20% in the Philippines and Thailand. Further, retirement benefits are often not generous enough for one to decide to fully withdraw from the labor market. It is generally consistent with findings from the impact assessment of the new social insurance program for the elderly in the Republic of Korea. Koh and Yang (2021) found that the program had very little impact on the labor market activity of older persons in terms of employment and working hours, owing much to transfer size as well as the pervasive case of familial support in the country.

IV. Health Status and Longevity as Drivers of Labor Participation and Retirement among Older Persons

As one ages, the trajectory of physical health and cognitive function expectedly deteriorates, affecting the likelihood of older workers to remain in the workplace while sustaining productivity. Health condition, be it objectively or subjectively measured, is a prerequisite and serves as an important determinant of LFP among older persons. The deterioration of health is found to explain between 3% and 15% of the drop in employment among individuals between the ages of 50 and 70 in the US and the UK, respectively (Blundell et al. 2017). Meanwhile, using longitudinal qualitative data, Furunes et al. (2015) documented that health along with other nonfinancial factors largely influenced the decision of individuals in Norway 58 years and older to continue to work . In Germany, self-assessed health also significantly influenced post-retirement work (Fasbender et al. 2015).

The extension of a healthy life span can, therefore, lead to the expectation that more workers will decide to delay retirement and work even in their old age. Based on the Global Burden of Disease Study database, a healthy life expectancy or the number of years of life expected to be lived in good health, particularly with lower risk of mortality and nonfatal outcomes, has increased over the years (Figure 3). Munnell (2015) noted that improved health and longevity have caused, along with other important factors, the reversal of the downward trajectory of labor force participation of men aged 55–64 in the US during the mid-1980s. Translating the improved health status of elderly people in selected OECD countries into their capacity for work, Coile, Milligan, and Wise (2017) estimated an average of 5.5 years of extended working life among men of ages 55–69 when comparing that cohort between 1977 and 2010.

Figure 3. Healthy Life Expectancy of Persons Aged Between 60 and 64 in Selected OECD Countries, 1990–2019



OECD = Organisation for Economic Co-operation and Development.
Source: Data on healthy life expectancy by age from the Global Burden of Disease database.

In another instance, however, the extended human life span among older individuals can have a different consequence on retirement decisions. When retirement years are short and uncertain, the optimum choice is to work until a very old age because one may miss out on the delayed consumption. What if the extension of life years coincides with a higher probability of survival? Evidence seems to suggest that it can prompt labor market exits. Kalemli-Ozcan and Weil (2010) showed that the fall in mortality (i.e., lower risk of dying) is more likely to encourage individuals to plan and save for retirement. The certainty of retirement years alongside the higher probability of survival could encourage individuals to save throughout their active working lives and therefore enjoy their scheduled retirement using those accumulated funds. In other words, the mere extension of longevity may not be sufficient to prolong retirement.

Coile, Milligan, and Wise (2017) also assert the ambiguity of the relationship between health improvement and changes in labor force participation of older workers. They note that the gradual improvement in mortality

rates since 1980 coincides with declining labor participation among older men, but during the mid-1990s, the labor force participation followed an upward trend as mortality consistently improved.

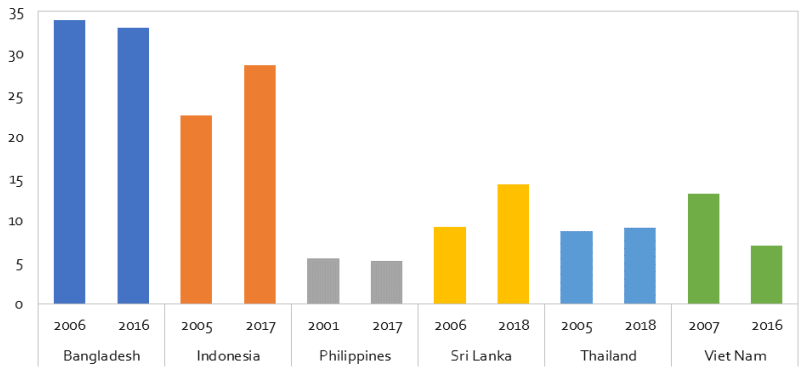
Health Condition, Longevity, and Retirement in Developing Asia

As seen in OECD countries, health improvement and longevity have mixed effects on labor force participation and the retirement decisions of older workers. To some extent, the positive effect lies in the capability of workers to handle tasks required for the job while the opposite is expected when longevity guarantees a retirement life based on accumulated savings/pensions.

Giles, Hu, and Huang (2015) found that poor health status is strongly linked with the lower probability of employment in the PRC, Indonesia, and the Republic of Korea. Using activities of daily living and instrumental activities of daily living to indicate health status, the study saw 5.2% and 6.0% reductions in the probability of employment for urban men and women aged 45 and above in the PRC for an increase in disability. In contrast, the effect of poor health on the probability of working among rural residents is rather weak owing to their limited options to support their living. A similar pattern is seen also in Indonesia and the Republic of Korea, but less pronounced in the latter given the considerably low reported disabilities. Poor health status is also associated with fewer hours of work for those elderly continuing to work in rural PRC and urban Indonesia (Giles et al. 2015).

We examine the major reasons for nonparticipation in the labor market using the selected country's labor force surveys. This is in lieu of the health status information of workers that is not available from existing labor force surveys, making it particularly challenging to conduct a detailed quantitative analysis of labor supply behavior of older individuals. Figure 4 shows that ill health, injuries, and disability are among the major contributing factors for individuals in their 60s to be absent from the labor market temporarily or permanently, which is relatively high in Bangladesh and Indonesia, reaching more than 20% of the total older individuals not in the labor force. In over a decade, an even greater share of older adults in Indonesia attributes their nonparticipation in the labor market to illness and injury.

Figure 4. Illness/Injury as a Major Reason for Not Participating in the Labor Market
(% of all individuals in their 60s who are not in the labor force)



Source: Authors' illustration using data from labor force surveys of respective countries.

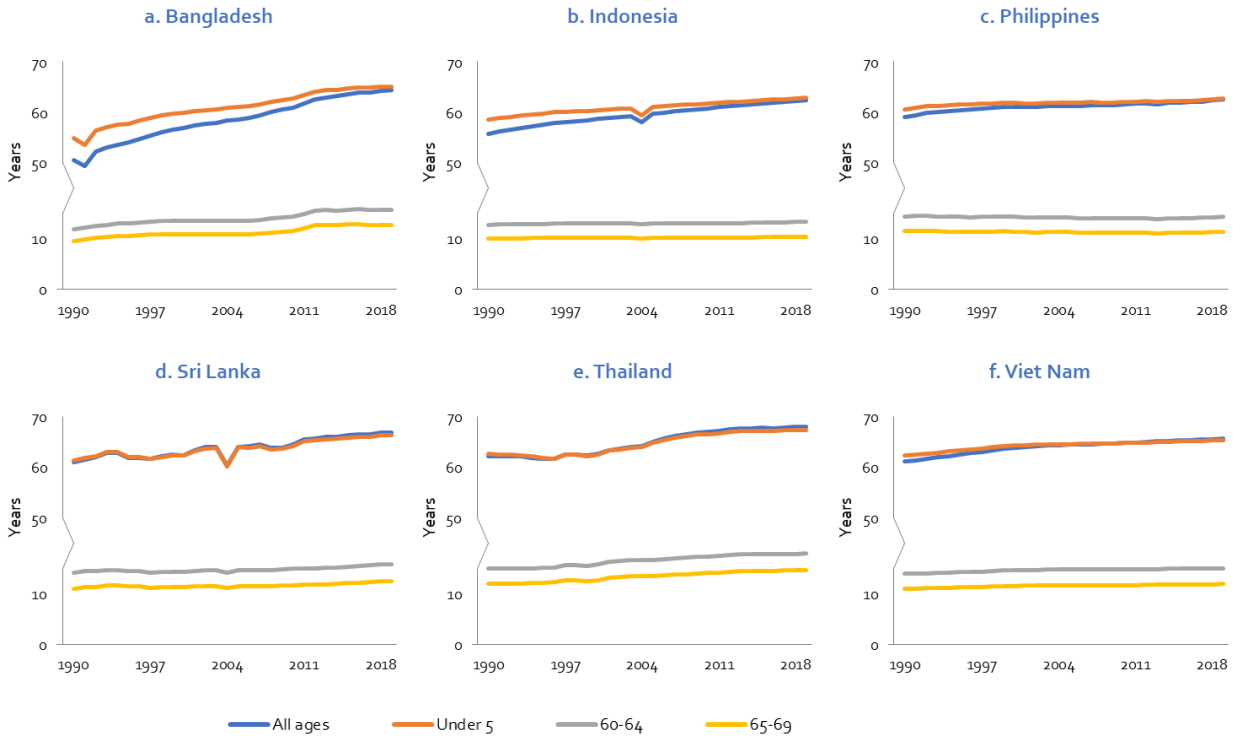
In Viet Nam, labor market exit due to ill health among older persons has declined in recent years, potentially allowing labor participation of older adults to rise over the years. Using the nationally representative Vietnam Aging Survey in 2011, health status has been consistently identified as one of the significant factors influencing older adults' decision to work in Viet Nam. For instance, Giang and Nguyen (2016) found that heath status markedly influenced the labor supply choice of older people in rural areas, while Giang and Le (2018) found that older persons with at least one chronic health condition have lower probability of labor force participation relative to those without chronic health conditions.

Meanwhile, ill health as a factor for labor market nonparticipation remains low in the Philippines and Thailand during the observed periods, with older men comprising the majority. In Thailand, using the 2007 Survey of Older Persons, Adhikari, Soonthorndhada, and Haseen (2011) found that individuals aged 60 and above who suffered from at least one chronic disease were 21% less likely to participate in the labor force than those without any chronic disease, generally consistent with the recent findings of Paweenawat and Liao (2021) using the socioeconomic surveys.

In Sri Lanka, more older persons leave the labor market due to physical illness and disability over the 10-year period. Using the Sri Lanka household income and expenditure surveys, Tilakaratna, Sooriyamudali, and Perera (2019) found that illness and disability among individuals 60 years and older reduce their probability of remaining active in the labor market by around 9%. Nonetheless, it is important to note that many older workers continue to engage in work despite ill health. As many as 18% of older persons suffering poor health conditions still engage in labor market activities in Sri Lanka (Senanayaka and Kumara 2012).

Based on the strong association between health status and labor force participation, there is scope to boost the labor participation of the country's older workers. The overall healthy life expectancy is rising across developing Asia (see Figure 5), but much of the improvement in healthy life years in is seen among the under-5 population and less so among older cohorts. The overall mortality improvement is attributed more to those under the ages of 5 than older adults, with adult mortality and morbidity now driven by rising incidences of noncommunicable diseases. This indicates that the labor participation of older adults may be less influenced by the extension of life expectancy.

Figure 5. Healthy Life Expectancy of Different Age Groups in Developing Asian Countries, 1990–2019 (no. of years)



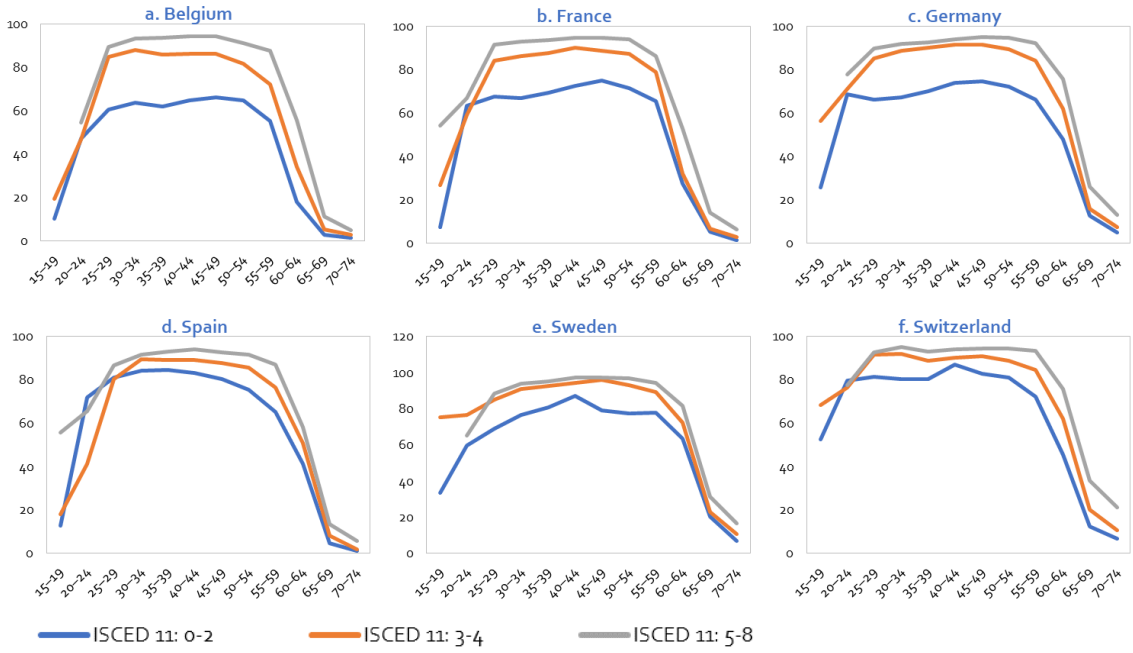
Source: Data on healthy life expectancy by age from the Global Burden of Disease database.

V. Education Level, Labor Participation, and Retirement Decisions of Older Persons

The ability of older-aged adults to work as well as the work opportunities open to them tend to be related to their level of education. Educational attainment is strongly tied to the type of occupation they take on and the wage level they are paid; therefore, it constitutes an important determinant of labor force participation of all, including older workers. Evidence from OECD suggests that older workers with limited education generally drop out of the labor force earlier than those who are more educated because of factors such as the high probability of ill health amid involvement in more physically demanding jobs (Johnson, Karamcheva, and Southgate 2017) as well as more adverse working conditions (Potočnik, Tordera, and Peiró 2009).

In many European Union (EU) countries, the older highly educated group leave the labor market later than those with a low- to medium-level of education (Flores and Lüske 2016). Figure 6 illustrates this pattern—aside from having higher participation rates in general, individuals with tertiary qualifications remain in the labor market longer relative to those with secondary education and below.

Figure 6. Labor Force Participation Rates by Age Group and Educational Attainment in Selected EU Countries, 2019



EU = European Union, ISCED = International Standard Classification of Education.
Source: Authors' illustration using data on activity rates by age from Eurostat database.

In the US, Burtless (2013) and Blau and Goodstein (2010) document the large role played by higher educational attainment in explaining the increasing labor force participation of older men. The former estimates that over half of the 8.7 percentage point rise in participation rate among males 60–74 years old between 1985 and 2010 can be attributed to the improved levels of education. In their projection of the future employment potential for the near-elderly workforce based on demographic trends and trends in mobility and functional status from the 1982–2004 National Long Term Care Study and the 1992–2010 Health and Retirement Study, Rehkopf, Adler, and Rowe (2017) conclude that those with a high school diploma have a generally high and consistent potential to work productively between 55 and 74 years old, while if less favorable trends continue for men and women without a high school diploma, the group could have lower ability to work at older ages.

Examining the detailed US labor force data spanning the years from 1970 to 2016, Johnson and Wang (2017) observed that the increase in the labor force participation rates of men and women aged 65 and older since

1995 were largely concentrated among college graduates. This increase is also attributed to more involvement of better educated older adults in full-time work as nearly all the employment gains of older-aged adults come from full-time work and not from part-time work. Similarly, Larsen and Pedersen (2017) found that more than one-quarter of the observed increase in labor force participation among those in the age group 65–69 from 2004 to 2013 in Denmark and Sweden is attributed to the improvement in education level, especially that of women. The same study shows, however, that education among the same age group explains less of the change in labor force participation in Germany (i.e., 14%), and largely from men.

In some instances, better education may not lead to a longer working life. The wealthy educated group, backed by their accumulated savings and wealth, may opt for early retirement. In their analysis using the Dutch panel of workers aged 50 years and older, Pilipiec, Groot, and Pavolva (2020) observed that the preference toward earlier retirement has increased over time and relates to, among others, having higher net income. In Switzerland, Baumann (2016) found that workers aged 56–64 with tertiary education were 14 percentage points more likely to retire early than those without upper secondary education.

Education Level and Labor Force Participation of Older Persons in Asia

In developing Asia, the level of education positively correlates with the labor force participation of the working age population. The rapid rise in education level among women is a major contributor to their more active involvement in the labor market, a trend that could be expected to increase their likelihood to remain at work even at later stages in their lives. That said, the relationship between education and employment among older age groups can be expected to exhibit negative correlation. In particular, the more educated older-aged adults opt to exit the labor market early, highly likely with the availability of pensions, assets, and family support (Giles, Hu, and Huang 2015).

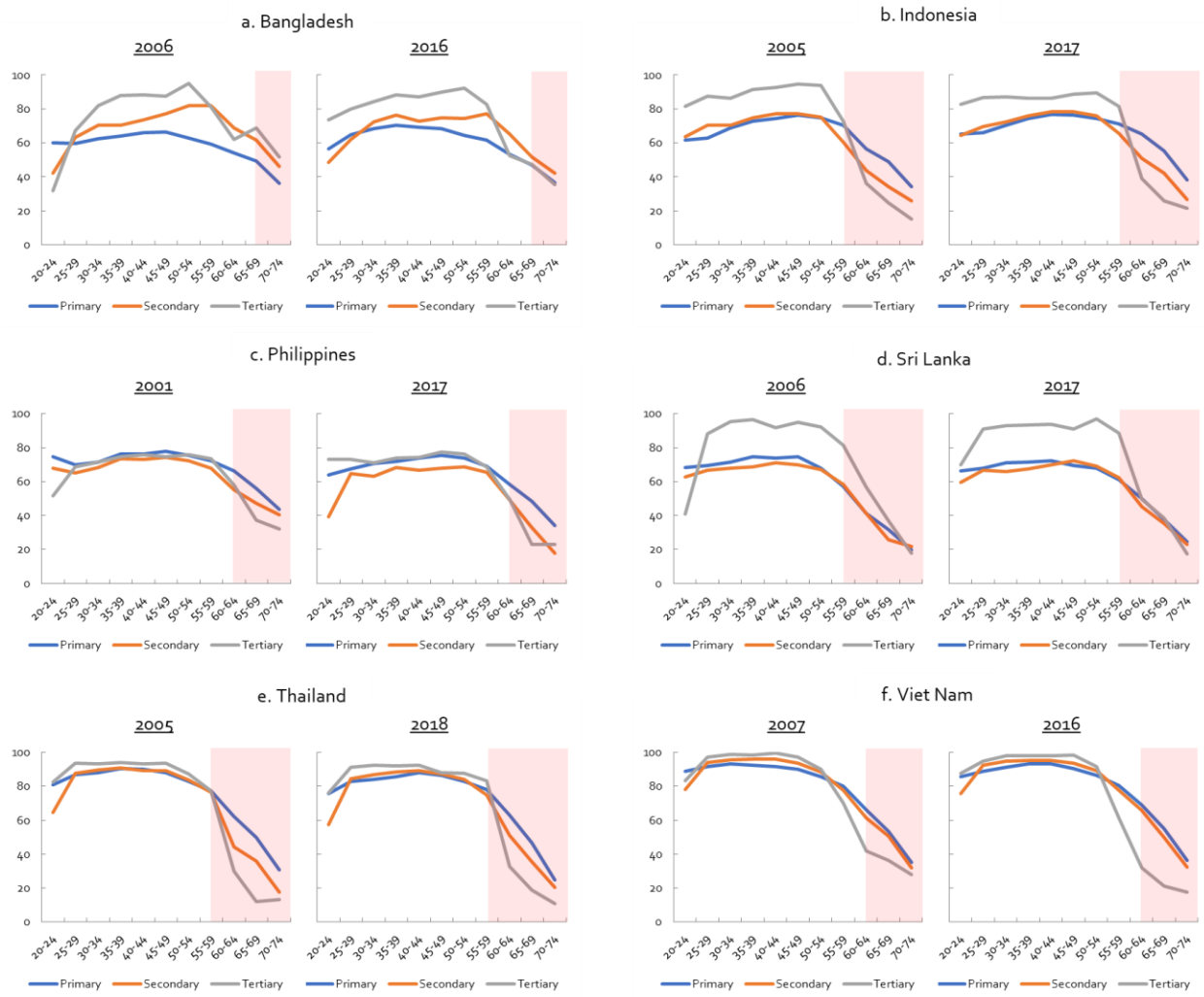
Such cases are becoming more common over the years in many countries in developing Asia. Examining the labor force surveys in over a decade, Figure 7 shows that tertiary educated individuals past the age of 60 are leaving the labor market sooner in recent years, notably in Bangladesh, the Philippines, and Viet Nam. Meanwhile, in Indonesia, Sri Lanka, and Thailand, a slight to moderate increase was observed in the participation rates of older persons with at least tertiary qualifications.

In general, the latest labor force surveys show that in selected countries individuals in their 60s and beyond and with tertiary education exhibit the lowest labor force participation rates, while those among the primary age groups have the highest participation rates. The rapid switch can be witnessed more apparently in Thailand where the LFP rate of older people in the 60–64 age group is 50.2 percentage points lower than that of the 55–59 age groups at 83.2%.

Figure 7 shows clearly that such a shift to lower participation rates occurs earlier in Viet Nam among the 55–59 age group. Giang and Le (2015) argue that older people with higher education in Viet Nam tend to receive their retirement pension, allowing them to work less for their living at old age. With the higher earnings during their working lives, educated adults are more likely to have greater incentive to save and enjoy retirement. The early labor market exit among educated workers also suggests the limited scope for a second career for older professionals after the first retirement.

In contrast, older persons who have attained at most primary education tend to stay longer in the labor market, with more than 50% of the 60–64 age groups continuing to work. In Thailand, Adhikari, Soonthorndhada, and Haseen (2011) found that the older adults without any form of schooling, including those with at least primary education, are most likely to remain active in the labor market than their educated peers. The least educated adults are working the longest primarily out of necessity for lack of assets, savings, and access to adequate social security programs (World Bank 2016).

Figure 7. Labor Force Participation Rates in Developing Countries in Asia, by Age Group and Educational Attainment



Note: Shaded area refers to the age groups beyond the statutory retirement age.
Source: Authors' illustration using data from labor force surveys of respective countries.

VI. Reduction in Household Duties and Informal Care Work

The reduction in the burden of household work and informal care over the decades has raised labor market participation among women including the older ones. Family obligation, including care for grandchildren and spouse, can be influential to labor supply behavior, especially among older women. Intuitively, female employment is expected to rise when the time–cost of unpaid care work is reduced, shared equally with men, and made more compatible with involvement in the formal work (Ortiz-Ospina and Tzvetkova 2017). Across the EU, the time spent by women ages 45–64 as well as those aged 65 and above on household and family care has continuously declined from 2000 to 2010. The probability of working falls by nearly 20 percentage points for women with children under the age of 6 (Cogan 1978).

Female LFP is found to exert influence on that of male LFP. In Canada, the US, and the UK, Schirle (2008) postulated that much of the increase in labor force participation among older married men can be explained by the rise in the participation of their wives, considering the complementarity between time use of the two. In

connection, a study involving Australians aged between 45 and 65 found that the lack of caring responsibility for a family member among men increases the likelihood to remain employed (Noone et al. 2018).

In developing Asia, the labor market participation among those of working age as well as of older women has been on an upward trend in recent years. Older women who remain active at work are primarily backed by improved schooling years and greater prior work experience. However, women including the older ones are still bound by social norms that limit their choice of whether to work and where they work. Women are generally perceived to hold prime responsibility for housework and informal care, which are often cited as major reasons for nonparticipation in the labor market (Figure 8). Across countries, majority of women aged 50–69 are no longer active in the labor market due to household duties. This incidence is particularly high in Bangladesh where almost half (48.8%) of the total women population in the 50–69 age group could not gain employment. It is followed by Sri Lanka (42.9%), Indonesia (34.0%), and the Philippines (33.2%).

Figure 8. Major Reasons Cited by Persons Aged 50–69 for Not Participating in the Labor Market by Sex (% of total population)

Source: Authors' illustration using data from labor force surveys of respective countries.

It is interesting to note too that in over a decade, responsibility for household duties have been cited less among older women in Bangladesh, Indonesia, and the Philippines. In Bangladesh, for example, a growing share of women of the same age group cite retirement as the major reason for withdrawing from the labor force. Also worth noting is the modest increase in the proportion of older men leaving the labor force to attend to family and household duties. It is more apparent in Bangladesh and the Philippines, with the latter's case partly attributed to more women deployed for overseas employment with their spouse tending to their house and kids.

Further, especially in the female workforce, older workers tend to be more engaged in unpaid family work. Mature workers tend to work a few hours in a week than their younger counterparts, which could be attributed to many factors including physical health shaping work preferences. More often, older women spend shorter

hours on wage employment, with more time allotted towards household duties. In Bangladesh and Indonesia, more than 60% of workers aged 60 and above spend less than 40 hours per week working. Among older workers especially women, the lesser time spent on working suggest the need for more flexible working arrangements to encourage them to remain active throughout their healthy lives.

VII. Technological Change, Structural Transformation, and Skill Obsoletion

The unprecedented pace of adopting technology at the workplace could threaten the future job security of older workers. Technological changes, which alter the skills contents and demand for labor, could influence labor and retirement decisions among older workers whose job skills and knowledge may easily become obsolete. Advanced technologies and processes are not integrated in the older workers' initial career training and employers may prioritize investing in the human capital of younger cohorts who have longer remaining work years.

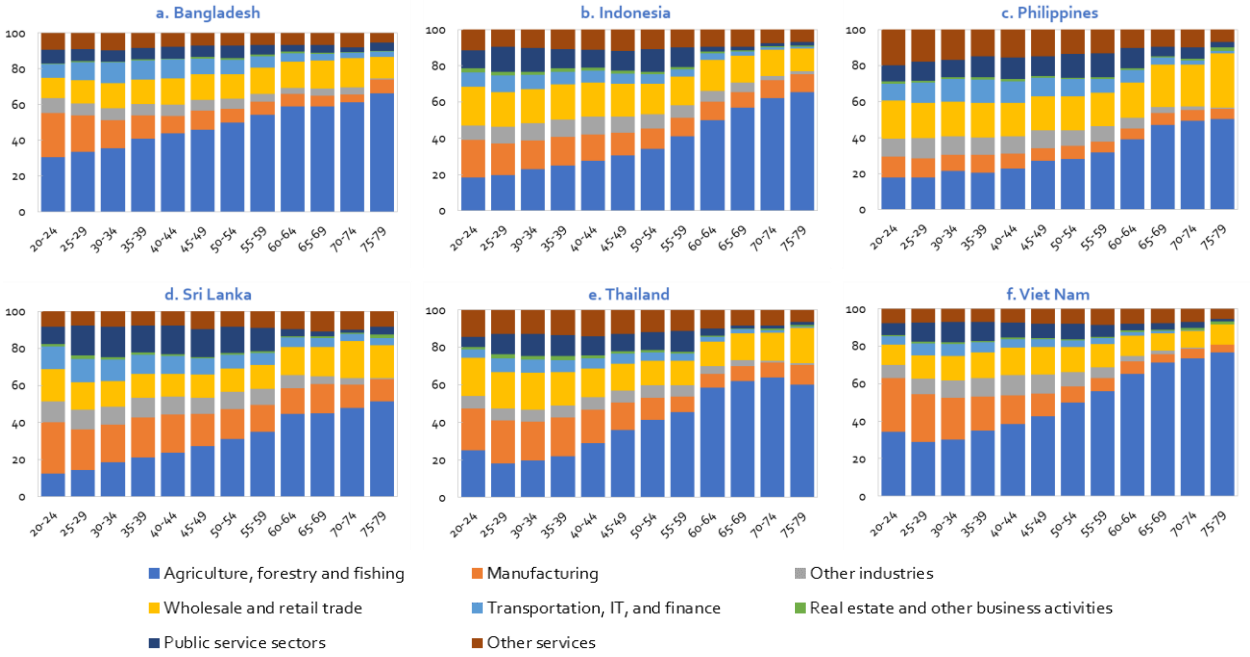
The share of technology-enabled tasks in the total job pool is rising: in 2018, an average of 29% of total task hours across industries are performed by machines (WEF 2018). Older workers who lack certain skills or are less willing to invest in retraining may either be encouraged or forced to leave the workforce. Using the Current Population Survey and Health and Retirement Study in the US, Friedberg (2003) examined the effects on older workers of the increasing use of computers in the workplace and found that individuals aged 50–62 who use computers at work generally choose to delay retirement.

In their analyses of the age dimension of changes in the task composition of jobs in 12 European countries between 1998 and 2014 by integrating O*NET occupation content data with EU–LFS individual data, Lewandowski et al. (2017) found that the shift away from routine work and toward nonroutine work occurred much faster among workers born between 1970 and 1989 than among those born between 1950 and 1969. These results imply that older workers may be among those most likely to be made redundant or to lose their jobs if the shift away from manual and routine work intensifies in the future.

Structural transformation from agriculture to manufacturing and services industries is indeed taking place at a rapid pace in many developing countries in Asia, and so is technological change and adoption in workplaces. Mechanization and automation, among other technologies introduced in the workplace, play a significant role in the reduction of routine jobs, shifting the workforce to perform more sophisticated tasks. ADB (2018) reported that 43%–57% of new job titles in selected countries of the region in the past 10 years are related to information and communication technology, including the specialized technicians needed to work with computer-controlled machines. Questions, however, remain as to the extent to which such gradual shifts affect the jobs and employment of older workers.

Labor force surveys of selected countries in the region show that the majority of older workers are employed in the agriculture sector, increasing further by age (Figure 9). For instance, in Bangladesh, 58.9% of those in the 60–64 age group work in the agriculture sector while agricultural workers account for 66.3% of those in their late 70s who remain active in the labor market. This is more apparent in Viet Nam, i.e., 65.2% of those in the 60–64 age group who remain working are in the agriculture sector but a higher 76.6% are among those in the 75–79 age group. Following subsistence agriculture, many older adults who continue to work are in the wholesale and retail sector, especially in Indonesia and the Philippines where at least 15% of older individuals in the 60–64 age group work in low-wage retail jobs.

Figure 9. Employment Distribution by Age and Sector (%)

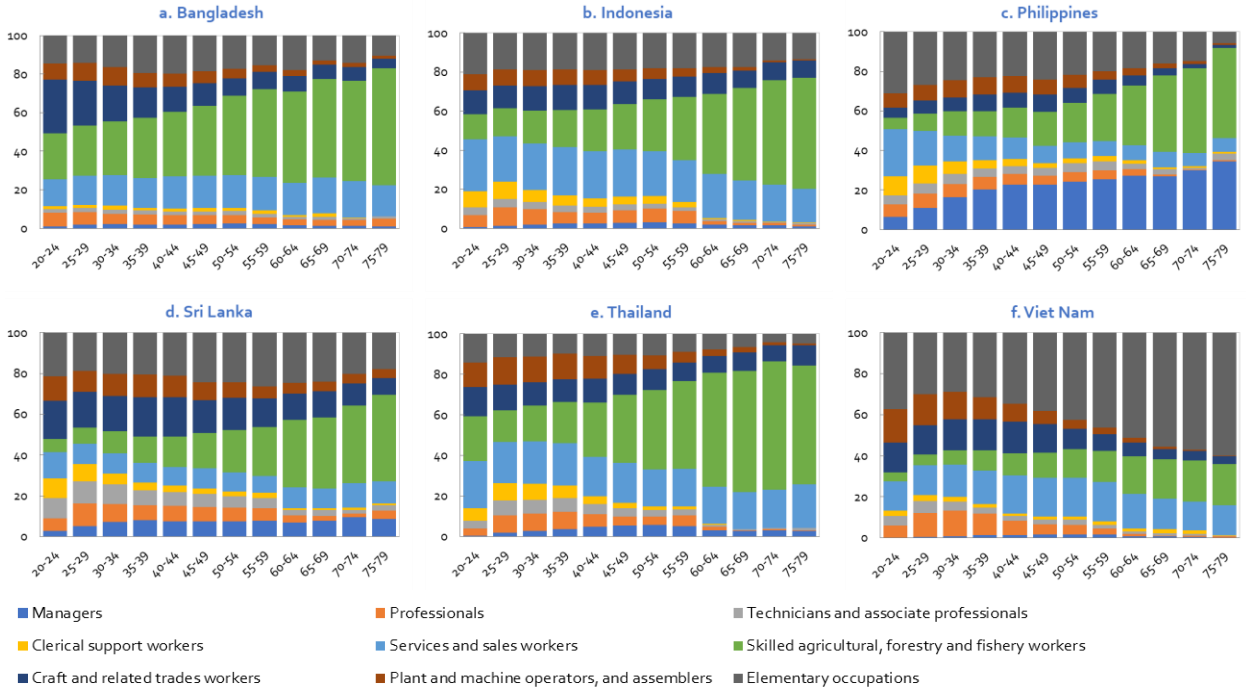


IT = information technology.
Source: Authors' illustration using data from labor force surveys of respective countries.

Meanwhile, the employment distribution by occupation and age group shows that agricultural work and elementary occupation represent the bulk of occupations of the older workforce (Figure 10). In the Philippines and Sri Lanka, a slightly higher share of individuals aged 60 and above hold managerial positions, leveraging on their longer years of work experience relative to their younger counterparts. In Viet Nam, workers handling elementary occupations account for more than 50% of workers in their 60s and above.[1]

[1] Due to changes in occupation classifications, many of the skilled agricultural, forestry, and fishery workers have been classified under the elementary occupations.

Figure 10. Employment Distribution by Age and Occupation (%)



Source: Authors' illustration using data from labor force surveys of respective countries.

VIII. Conclusion and Policy Implications

This paper reviewed the global evidence on the determinants of employment and retirement among older persons and examined the dynamics among the older workers in developing Asia using data drawn from national labor force surveys of selected countries. The labor force participation rates in many developing Asian economies remained relatively high globally and exhibited a steady trend over the last 3 decades, with stable or declining participation of older men offsetting the rising participation of older women. Large-scale employment among older persons presents a great opportunity for developing Asia to support and encourage continuation of work amid expectations that fewer young people will enter the workforce in the coming decades.

Some factors that have shaped the evolution of labor force participation among older workers in countries where population aging is at an advanced stage may have similar implications to the prospect of active aging in developing Asia where the expansion of social security provision and improvements in health and education are expected. The evidence thus far suggests that these developments may either incentivize or disincentivize older persons to work, which calls for further research to overcome the paucity of data in understanding the labor supply behavior of the older workforce in developing economies.

The influence of social security and pensions on labor force participation of older persons in many countries in developing Asia has remained limited and is largely concentrated among public servants and possibly the more educated workers who hold formal jobs. Future pension reforms, therefore, should further expand their coverage, especially to reach those who are vulnerable at old age, while also considering how these initiatives will shape the work and retirement incentives of workers. Raising the pensionable age is inevitable at some point, but the priority particularly in developing Asia is to ensure that enough job opportunities are provided to older persons beyond the low-wage farm and retail work.

In both OECD countries and developing Asia, health issues could possibly be the major constraint on labor participation of older-aged adults. While the overall healthy life span in the region is expected to follow a similar trend in the advanced economies, the health status of older persons in developing Asia has not improved dramatically, with other economies reporting some degree of deterioration. Governments in the region should consider reforming and strengthening the health service delivery to address the rising incidence of noncommunicable diseases, especially among older individuals. While countries are taking different pathways toward universal health coverage, more needs to be done in terms of the adequacy and sustainability of such programs.

It is apparent that the more educated older-aged workers in developing Asia leave the labor market earlier and upon retirement than those who are less educated. The substitution effect seems to be describing more the relationship between education and labor participation and retirement behavior of older adults. Such pattern also seems to suggest the lack of career path and employment for older educated workers in the region. It may be worthwhile to understand and potentially address the barriers and issues that inhibit them to stay in the labor market and tap their expertise and experience toward productive aging. The life-long learning approach that promotes reskilling and upskilling should be promoted among older workers who are more vulnerable to job replacement as a result of the adoption of new technologies in the workplace. The improved educational attainment of new cohorts of older adults could allow a greater possibility of life-long learning. In contrast, most low educated workers have little or no choice but to continue working. There should be comprehensive support toward lifelong learning while keeping an eye on the specific needs of older learners and introducing financial incentives for workers and employers.

Efforts to promote active aging should also be accompanied by continuous initiatives to empower women. The lower fertility and corresponding aging transition in developing Asia would require robust efforts to encourage the labor participation of the female workforce. Older women have the primary societal role of caring for their spouse and grandchildren. An intuitive solution could be to lessen the burden of household tasks or duties by providing alternative public and private service providers in areas such as child and elderly care. Other sociocultural and gender norms and barriers that remain strong in some countries need to be overcome through policy and public actions (Jayachandran 2020).

Last, age-friendly policies and environment should be built early on in developing Asia. In a recent report, the World Health Organization (2021) finds substantial costs arising from acts that perpetuate ageism, particularly among older individuals. Ageism against older people, who are often highly disadvantaged in workplaces with limited access to specialized training and education, is found to be associated with poorer physical and mental health, increased social isolation and loneliness, greater financial insecurity, decreased quality of life, and even premature death. To prevent these dire consequences, governments in developing Asia should raise the demand for labor supply of older workers, which is expected to remain stagnant unless there is a general shortage of the workforce or the government enacts a policy that requires firms to retain workers until a certain age. In addition, labor market challenges will need to be addressed, such as seniority-based human resources practices that are especially prevalent in the public sector but also observed in the corporate culture.

This paper gives an initial background on this relevant yet relatively unexplored topic within the context of developing economies. The analysis and findings at this stage remain far from conclusive without the rigorous empirical exercises due to limited data from existing labor force surveys. For future research, it is valuable to overcome such challenge not necessarily by expanding the scope of labor force surveys but by examining the

feasibility of the use of standardized micro surveys particularly targeting older persons[2] to allow better cross-country comparative analysis.

[2] Such as Malaysia Aging and Retirement Survey (MARS), Indonesia Family Life Survey (IFLS), Health, Aging, and Retirement in Thailand (HART) , and Survey on Older Persons and Social Health Insurance (OP&SHI) in Vietnam,

References

Adhikari, R., K. Soonthorndhada, and F. Haseen. 2011. Labor Force Participation in Later Life: Evidence from a Cross-Sectional Study in Thailand. *BMC Geriatrics*. 11 (15).

Asian Development Bank (ADB). 2018. *Asian Development Outlook 2018: How Technology Affects Jobs*. Manila.

_____. 2019. *Asian Economic Integration Report 2019/2020: Demographic Change, Productivity, and the Role of Technology*. Manila.

Baumann, I. 2016. Early Retirement and Exit from the Labor Force. In Baumann. *The Plight of Older Workers: Labor Market Experience after Plant Closure in the Swiss Manufacturing Sector*. Springer International Publishing. pp. 81–90.

Blau, D. M. and R. M. Goodstein. 2010. Can Social Security Explain Trends in Labor Force Participation of Older Men in the United States? *The Journal of Human Resources*. 45 (2). pp. 328–363.

Blundell, R., J. Britton, M. Costa Dias, and E. French. 2017. The Impact of Health on Labour Supply Near Retirement. *IFS Working Paper*. No. W17/18. Institute for Fiscal Studies.

Börsch-Supan, A. H. 2013. Entitlement Reforms in Europe: Policy Mixes in the Current Pension Reform Process. In A. Alesina and F. Giavazzi, eds. *Fiscal Policy after the Crisis*. Chicago: University of Chicago Press. pp. 405–435.

Börsch-Supan, A. H. and C. Coile. 2020. Social Security Programs and Retirement Around the World: Reforms and Retirement Incentives – Introduction and Summary. *NBER Working Paper*. No. 25280. Massachusetts: National Bureau of Economic Research.

Burtless, G. 2013. Can Educational Attainment Explain the Rise in Labor Force Participation at Older Ages? *Center for Retirement Research Issue in Brief Series*. No. 13–13. Center for Retirement Research at the Boston College.

Coile, C., K. S. Milligan, and D. A. Wise. 2017. Health Capacity to Work at Older Ages: Evidence from the United States. In D. Wise, ed. *Social Security Programs and Retirement around the World: The Capacity to Work at Older Ages*. Chicago: University of Chicago Press.

Cogan, J. F. 1978. *Married Women's Labor Supply: A Comparison of Alternative Estimation Procedures*. Santa Monica, CA: RAND Corporation.

Fasbender, U., M. Wang, J-B. Voltmer, and J. Deller. 2016. The Meaning of Work for Post-Retirement Employment Decisions. *Work Aging and Retirement*. 2 (1). pp. 12–23.

Flores, M. and M. Lüske. 2016. Determinants of Older Workers' Employment Chances. OECD Presentation. Brussels. 28 June.

Friedberg, L. 2003. The Impact of Technological Change on Older Workers: Evidence from Data on Computer Use. *ILR Review*. 56 (3). pp. 511–529.

Furunes, T., R. J. Mykletun, P. E. Solem, A. H. de Lange, A. Syse, W. B. Schaufeli, and J. Ilmarinen. 2015. Late Career Decision-Making: A Qualitative Panel Study. *Work, Aging and Retirement*. 1 (3). pp. 284–295.

Giang, L. T. and D. D. Le. 2018. Working Beyond the Traditional Retirement Ages: How Does Chronic Health Condition Influence Older Workers in Vietnam. *Ageing International*. 43. pp. 158–173.

Giang, L. T. and T. L. Le. 2015. Determinants of Labor Force Participation of Older People in Vietnam. *Journal of Economics and Development*. 17 (2). pp. 28–52.

Giang, L. T. and T. H. D. Nguyen. 2016. Determinants of Work Decisions among Older People in Rural Vietnam. *Population Ageing*. 9. pp. 289–303.

Giles, J., X. Lei, Y. Wang, and Y. Zhao. 2015. One Country, Two Systems: Evidence on Retirement Patterns in China. *Policy Research Working Paper*. No. 9650. Washington, DC: World Bank.

Giles, J., Y. Hu, and Y. Huang. 2015. Understanding the Retirement Decision in Aging East Asia: A Background Paper for the EAP Regional Report on Aging. Mimeo. Washington, DC: World Bank.

Gustman, A. L. and T. L. Steinmeier. 1984. Partial Retirement and the Analysis of Retirement Behavior. *Industrial and Labor Relations Review*. 37 (3). pp. 403–415.

_____. 1985. The 1983 Social Security Reforms and Labor Supply Adjustments of Older Individuals in the Long Run. *Journal of Labor Economics*. 3 (2). pp. 237–253.

Hao, Y. 2008. Productive Activities and Psychological Well-Being among Older Adults. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*. 63. pp. 64–72.

Ichino, A., G. Schwerdt, R. Winter-Ebmer, and J. Zweimüller. 2007. Too Old to Work, Too Young to Retire?. *The Journal of the Economics of Ageing*. 9. pp. 14–29.

Jayachandran, S. 2020. Social Norms as a Barrier to Women's Employment in Developing Countries. *NBER Working Paper*. No. 27449. Massachusetts: National Bureau of Economic Research.

Johnson, R. W. and C. X. Wang. 2017. *Educational Differences in Employment at Older Ages*. Washington, DC: Urban Institute.

Johnson, R. W., N. Karamcheva, and B. Southgate. 2017. *What Explains the Educational Differences in the Propensity to Work among Older Adults?* Washington, DC: Urban Institute.

Kalemli-Ozcan, S. and D. N. Weil. 2010. Mortality Change, the Uncertainty Effect, and Retirement. *Journal of Economic Growth (Boston)*. 15 (1).

Knox-Vydmanov, C. 2016. *Work, Family and Social Protection: Old Age Income Security in Bangladesh, Nepal, the Philippines, Thailand, and Vietnam*. HelpAge International, East Asia/Pacific Regional Office.

Ko, P-C. and K. Hank. 2014. Grandparents Caring for Grandchildren in China and Korea: Findings from CHARLS and KLoSA. *Journals of Gerontology. Series B: Psychological Sciences and Social Sciences*. 69 (4). pp. 646–651.

Koh, K. and H. Yang. 2021. Social Insurance in an Aging Population: Impacts of a Government Transfer Program in South Korea. *Economic Development and Cultural Change*. 69 (4). pp. 1301–1322.

Krueger, A. B. and J-S. Pischke. 1992. The Effect of Social Security on Labor Supply: A Cohort Analysis of the Notch Generation. *Journal of Labor Economics*. 10 (4). pp. 412–437.

Larsen, M. and P. J. Pedersen. 2017. Labour Force Activity after 65: What Explain Recent Trends in Denmark, Germany and Sweden?. *Journal of Labour Market Research*. 50. pp. 15–27.

Lazear, E. P. 1983. Pensions as Severance Pay. *Financial Aspects of the United States Pension System*. pp. 57–85.

Lewandowski, P., R. Keister, W. Hardy, and S. Górka. 2017. Routine and Ageing? The Intergenerational Divide in the Deroutinisation of Jobs in Europe. IZA Discussion Papers. No. 10732. Bonn: Institute of Labor Economics (IZA).

Mao, H., K. M. Ostaszewski, and Y. Wang. 2014. Optimal Retirement Age, Leisure and Consumption. *Economic Modelling*. 43. pp. 458–464.

Munnell, A. H. 2015. The Average Retirement Age – An Update. Issue in Brief No. 15-4. Chestnut Hill, MA: Center for Retirement Research at Boston College.

Noone, J., A. Knox, K. O'Loughlin, M. McNamara, P. Bohle, and M. Mackey. 2018. An Analysis of Factors Associated with Older Workers' Employment Participation and Preferences in Australia. *Frontiers in Psychology*. 9 (2524).

Ogawa, N., N. Mansor, S-H. Lee, M. R. M. Abrigo, and T. Aris. 2021. Population Aging and the Three Demographic Dividends in Asia. *Asian Development Review*. 38 (1). pp. 32–67.

Organisation for Economic Co-operation and Development (OECD). 2018. *Pensions at a Glance Asia/Pacific 2018*. Paris: OECD Publishing.

Ortiz-Ospina, E. and S. Tzvetkova. 2017. Working women: Key facts and trends in female labor force participation. https://ourworldindata.org/female-labor-force-participation-key-facts.

Oshio, T., E. Usui, and S. Shimizutani. 2018. Labor Force Participation of the Elderly in Japan. NBER Working Paper. No. 24614. Cambridge, MA: National Bureau of Economic Research.

Paweenawat, S. W. and L. Liao. 2021. Labor Supply of Older Workers in Thailand: The Role of Co-residence, Health, and Pensions. *ADBI Working Paper Series*. No. 1224. Tokyo: ADB Institute.

Pilipiec, P., W. Groot, and M. Pavlova. 2020. The Analysis of Predictors of Retirement Preferences over Time. *Journal of Population Ageing*. https://doi.org/10.1007/s12062-020-09305-3.

Potočnik, K., N. Tordera, and J. M. Peiró. 2009. The role of human resource practices and group norms in the retirement process. *European Psychologist*. 14(3). pp. 193–206.

Rehkopf, D. H., N. E. Adler, and J. W. Rowe. 2017. The impact of health and education on future labour force participation among individuals aged 55–74 in the United States of America: the MacArthur Foundation Research Network on an Aging Society. *Ageing & Society*. 37(7). pp. 1313–1337.

Schirle T. 2008. Why Have the Labor Force Participation Rates of Older Men Increased since the Mid-1990s?. *Journal of Labor Economics*. 26 (4). pp. 549–594.

Schwingel, A., M. M. Niti, C. Tang, and T. P. Ng. 2009. Continued Work Employment and Volunteerism and Mental Well-Being of Older Adults: Singapore Longitudinal Ageing Studies. *Age and Ageing*. 38. pp. 531–537.

Senanayaka, T. S. and A. S. Kumara. 2012. The Employment Status of the Elderly in Sri Lanka: Patterns and Determinants. MPRA Paper. No. 43033. https://mpra.ub.uni-muenchen.de/43033/1/elderly_in_sri_lanka.pdf.

Sewdas, R., A. de Wind, L. G. L. van der Zwaan, W. E. van der Borg, R. Steenbeek, A. J. van der Beek, and C. R. L. Boot. 2017. Why Older Workers Work Beyond the Retirement Age: A Qualitative Study. *BMC Public Health*. 17 (1): p. 672.

Stock, J. H. and D. A. Wise. 1990. Pensions, the Option Value of Work, and Retirement. *Econometrica*. 58 (5). pp. 1151–1180.

Tilakaratna, G., C. Sooriyamudali, and A. Perera. 2019. *Working Beyond the Age of Retirement: Patterns and Determinants of Elderly Labour Force Participation in Sri Lanka*. Institute of Policy Studies of Sri Lanka.

United Nations, Department of Economic and Social Affairs, Population Division. 2019. *World Population Prospects 2019, Online Edition. Rev. 1*. New York.

World Bank. 2016. Live Long and Prosper: Aging in East Asia and Pacific. *World Bank East Asia and Pacific Regional Report*. Washington, DC.

World Economic Forum (WEF). 2018. *The Future of Jobs Report 2018*. Geneva.

World Health Organization. 2018. *Regional Framework on Healthy Aging (2018–2022)*. New Delhi: World Health Organization, Regional Office for South-East Asia.

_____. 2021. *Global Report on Ageism*. Geneva.