

## **Human capital in Japan's Demographic Transitions: implications for other Asian countries**

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### **Introduction**

Rapid population aging is becoming a common feature in Asian countries where changes in the age distribution as well as the size and growth of their populations are having significant economic impacts. A positive economic effect is realized from the demographic transition from high to low rates of mortality and fertility which produces a large share of the working-age group in the total population. This demographic structure produces a “demographic dividend” which, when it is associated with active investments in human capital, supports economic growth. Economies in East Asia have benefited from such a dividend and parts of South Asia are now beginning to realize it too. But there is also a negative economic impact – when the “population bonus” decays following fertility declines and rising life expectancies. The share of elderly dependents in the total population rises, and the population bonus becomes a “population onus” with an increasing social security burden on the economy for taking care of the elderly.

There are ways to address the population onus through higher labor market participation of married women and the elderly, and improvements in the quality of the labor force. The role of human capital becomes more important in the aging society as people tend to stay longer at schools and in the labor markets.

This paper is about these human capital issues in Japan's demographic transition. In the next section, we will overview the demographic development in the Asian countries with a specific reference to Japan. Human capital has supported the region's economic growth in various ways. One is abundant supplies of labor and improvement in labor quality through extended schooling. High rates of household savings contribute to capital formation as economies realize the demographic dividend. At the same time economic growth is a major driver of both supply of and demand for education; incentives for investment in both physical and human capital are stimulated by the expected high rate of economic growth in the domestic markets (Bils and Klenow 1999). Thus, there is a virtuous circle between human capital formation and economic growth.

In the third section we turn to the relationship between the demographic transition and human capital formation in the firm. As the demographic transition

proceeds the accumulated human capital contributes to higher labor force participation by existing human resources, in particular of women, which is called a “subtle revolution” in the society. Increasing female college enrollment and resulting access to employment in qualified service sector jobs has been prevalent in the Asian countries which used to be male-dominated societies. At the same time, however, female labor force participation raised the opportunity cost of having children, leading to lower fertility ratios which reduced population growth rates.

In the fourth section we examine how gains in adult longevity expand the lifetime working and training periods, thereby increasing the average quality of human resources. Yet older workers are not efficiently utilized under the general practice of mandatory retirement usually at age 60 years in Japan, a practice which has become an anomaly when average life-expectancy is now nearly 80 years. An increasing number of the retirees and semi-retirees expands the social security burden on the firm and current employees. Traditional social institution and employment practices which were established in the past are major factors that have prevented the efficient allocation of human resources in an aging society.

The fifth section shows how migration of the skilled workforce within the Asian region can play an important role in aging societies, by drawing in labor from economies at different stages of demographic development. Migration would not only moderate the impacts of population aging but improve labor force quality by stimulating competition in the domestic labor markets. It is also related with a globalization strategy of multinational firms, allocating their human resources across nations. However, stringent migration law and disincentives for foreign professionals are major obstacles.

Finally, the policy implications are discussed for other Asian countries facing futures in which populations age more rapidly. One implication for the better allocation of human resources is the need for flexible labor markets to allow a variety of work styles for married women, elderly and foreigners, rather than rigid protection of employment. Another is the need for a market-based social security system balancing the benefits and burden, in particular linking labor force participation of the elderly with life-expectancy. The role of human capital will be more important for both labor market and social security policies in East Asian countries experiencing rapid aging.

### **Overview of the Demographic Transition**

Population aging and declining populations have significant effects on human capital formation and economic performance. The trend in Asia is becoming clear from United Nations population data which show the Japanese population peaking in 2010,

followed by China around 2030 and India in around 2060 (Figure 1). Old-age dependency ratios follow a similar pattern (Figure 2). The Asian countries which had enjoyed a “demographic dividend” will eventually face the period of repaying the debts in terms of declining population and high old-age dependency ratios. One economic implication is that the time differences in the phase of population aging across the region could provide good opportunities for stimulating trade and investment of capital and labor intensive products.

(Figure 1 and Figure 2)

Human capital formation is affected by the demographic transition. With increasing longevity in the process of economic development the investments in human capital have been stimulated by the firm, accounting for their longer time span to get the benefits. The expected higher return to education encourages families to invest in their children to achieve more advanced levels of schooling. On the other hand, human capital formation does affect the timing of the demographic transition. Mainly due to the higher costs of college education, it becomes an optimum strategy for a family to have fewer children and spend more per capita for education, which is the substitution of quantity of children by their quality (Becker 1976). With smaller family size, the college enrollment ratio of women has risen over time narrowing the gender gap in higher education. The higher female labor force participation in qualified jobs has resulted in an improvement in the economic position of women. It is likely to increase the opportunity cost of women for raising children, leading to lower fertility ratios, other things being equal.

Declining total fertility rate, the average number of children per woman aged 15-49 years, has been a common feature in East Asia. Those countries below the replacement level of 2.1 are Thailand (1.8), Japan (1.4), Singapore (1.2), Korea (1.2), Hong Kong(1.0) and Taiwan (1.0) in 2009, implying shrinking populations in the near future (United Nations Demographic Yearbook). The Japanese population has already reached its peak, and is projected to decline continuously in coming decades from 127 million in 2010 to 87 million in 2060 (National Institute of Population and Social Security Research 2012).

Population aging and shrinkage is likely to discourage the investment in both equipment and human resources through various channels. Household saving ratios would decline under the “life-cycle theory of saving” with an increasing share of the elderly who withdraw their savings. The firm’s incentive for investment in human capital would be discouraged by an expected decline in trend economic growth and

reversal of pyramid-like age composition of the labor force.

The speed of population aging also depends on increasing longevity. Japan's average life expectancy was 79.6 years for males and 86.4 years for females in 2010, which is among the highest in the world. Longevity in East Asian countries has also risen reflecting better health condition arising from high rates of economic development. Actually, their speed of the increase in longevity may well exceed that of the per capita GDP growth. This implies that they have to prepare for sharp increases in fiscal burdens as old-age dependency ratios rise in future, quickly catching up to the level of Japan (Figure 3).

(Figure 3)

Japan as the front runner in population aging will be affected by its completion of the demographic transition in several ways. A vicious circle of lower investment in education and declining GDP growth may be unavoidable because of the close relationship between the changes in total dependency ratios (reverse scale) and the average GDP growth in 1955-2010 period. If a major driver of high economic growth rates is the decline in total dependency ratios, the coming period of continuously rising elderly dependency should imply the opposite, that is, as dependency ratios rise, real GDP growth rates will be discouraged (Figure 4). Also, increasing disparities in human capital formation both in the household and firm is a growing social issue. Despite the shrinking young population, the numbers of students in private junior high schools and elementary schools have increased. Demand shifts reflecting families' willingness to pay for higher quality private education, rather than rely on free public education. But this leads to a widening difference in quality as measured by test scores of the youth human capital.

Disparity of human capital is more serious in the labor markets. The divergence between the regular workers with guaranteed employment and non-regular workers<sup>1</sup> with lesser pay and no company-based health or pension benefits becomes a major social issue as the share of non-regular workers has been growing to one-third of total employment with the deceleration of the GDP growth. As the possibility of on-the-job training in the firm is limited to regular workers, this phenomenon is driving not only a welfare wedge but disparities in the distribution of human capital in the economy.

(Figure 4)

## Demographic transition and human capital formation in the firm

There are various ways in which the demographic transition affects human capital formation. First, an increasing ratio of college enrollment is a consequence of a household strategy of limiting the number of children and investing heavily in their education. In Japan, the average number of children per family declined from 4.27 in 1940 to 1.96 in 2010, and the college enrollment ratio has continuously increased from 2% to 45% for women and 13% to 56% for men between 1955 and 2010. (Figure 5). With the smaller number of children in a family, the gender gap in investing in higher education is likely to diminish. Higher level of education of women stimulates their labor force participation, and the ratio of college graduates in newly employed has increased overtime, accounting for nearly 60% for both male and female in 2010.

(Figure 5)

Second, college education becomes more important in both obtaining academic knowledge and as a screening device for potential ability of an individual. While competition is strong for the celebrated college entrance examination, the same cannot be said about graduate education. The enrollment ratios in graduate schools were a mere 8% for women and 17% for men in 2010, much lower than OECD country averages. This dichotomy in enrollment between college and graduate school implies that screening is more important in higher education. It reflects the preference of large companies for finding potential employees for intensive skill formation in the firm.

Third, on-the job training in the firm is key for skill formation. Both blue-collar and white-collar workers are recruited right after graduation from high schools and colleges and they are trained through systematic job rotations which provide a variety of job experience in the firm under a long-term employment guarantee. The average wage of an employee is based on the seniority i.e. increasing with the years of experience in a particular firm and reflecting their higher skills<sup>2</sup>. The wide range of rotations across different jobs in the firm is supported by the firm-specific labor unions<sup>3</sup>. In this sense, the longer work experience in the firm is likely to improve the average quality of the human capital. The average length of the employees worked in a particular firm in the manufacturing industry increased by 2.9 years for males and 4.3 years for females between 1980 and 2010. The seniority wage profile in 2010 implies the improvement of labor quality by 8-10% based on the assumption that wages are set in parallel with labor productivity.

How much of an increase in labor productivity will be required to

compensate for the shrinking labor force? Japan's average GDP and labor force (in man-hours) grew by 3.7% and 1.1% in the 1980s, respectively, indicating annual labor productivity growth of 2.6%. In the 1990s, the growth of GDP and labor force were 1.5% and 0.5%, respectively while in the first decade of 2000 they were 0.6% and -0.3%, respectively. Hence, even though labor supply will continue to decline by 1% in the coming periods, GDP could grow by 2.7% if labor productivity continues to grow at the same rate as in the 1980s.

There are various ways that human capital contributes to economic growth. One is a direct impact through increased effective labor inputs, but the share is relatively small, even at earlier stages of Japan's economic development. According to an intensive study of the sources of Japan's high growth rates the contribution of education accounted for 0.35% of the total economic growth of 9% in the 1953-71 period (Denison and Chang 1976). More than half of the sources of GDP growth were attributed to total factor productivity growth, reflecting more efficient allocation of labor and capital in the economy.

Nevertheless, there are obstacles to optimal utilization of human capital in Japanese labor markets. One is the higher ratio of married women leaving the labor market for child-raising and later coming back as part-time workers. This is known as the M-shaped age-specific labor force participation of women mainly due to the difficulty of raising children while working in fulltime in the age group of 25 to 39. Actually, this M-shaped pattern is decomposed into low levels of labor force participation of married women and relatively high levels of single women (Figure 6). In the last 20 years, the M-shaped pattern has been flattened to some extent, but it was largely a result of the changing composition of their marital status i.e. more single women and less married women in the 25-39 years age brackets. This is also reflected by the fact that the labor market attachment of highly-educated women was 68% compared with the OECD average of 80% in 2010.

(Figure 6)

There are no particular cultural and social reasons why Japanese women are having fewer children; the average number of children a family wishes to have is 2.4 in 2010, a slight decline from 2.6 in 1977 (National Institute of Population and Social Security Research). It is because the trade-off between child-raising at home and continuous full time work is so strong in the Japanese labor markets as shown in a clear negative relationship between an increasing labor force participation of women and declining fertility ratios (Figure 7). Indeed, in 2011 36% of women aged 25-44 years

who are not in the labor markets do wish to work but are unable to do so mainly because of child-rearing responsibilities. This is contrary to the general cross-country observation in the OECD countries that there is a positive relationship between the levels of female labor force participation and fertility ratios. This indicates that there is a possibility that the trade-off relationship between women's full-time work and child-raising in Japan could be improved with sufficient reforms in the social institutions. The government has tried to ease the trade-off by extending the maternity leave scheme close to two years and wage guarantees of 50% through the unemployment insurance, but over 70% of first-time mothers still leave fulltime jobs without taking advantage of such schemes. This is mainly because children are not grown up in two years, and they easily anticipate severe time constraints after the end of maternity leaves.

(Figure 7)

It is possible that natural market adjustments, for example, relative wage changes or development of labor-saving technologies, can sufficiently offset the impact of changing demographics. However, there are obstacles which prevent the flexible labor market adjustments such as Japanese employment practices and insufficient child care facilities.

Japanese employment practices worked so well at the time of high rate of economic growth up to the end of 1980s combined with a pyramid-like age structure of the population. The practices consisted of long-term job security, seniority-based wages and firm-based labor unions, which are effective mechanism for training multi-skilled employees through on-the-job training in the firm (Yashiro 2011). The long-term employment guarantee is a basis for employees to concentrate on skill formation by rotating through various types of jobs in the firm. Also, the wage structure based on the length of time in the same firm sets the higher opportunity costs for employees leaving the firm. A firm-based labor union provides flexibility of job transfers within a firm. Japanese employment practices are based more on maintaining an efficient mechanism for creating firm-specific skill formation than on paternalism. But, the efficiency of employment practices depends largely upon the demographic composition of the employees. Under the pyramid-like age structure of employees, the seniority-based wage structure is less costly for the firm, and the value of the older employees should be higher by their scarcity in the firm combined with their long work experience. However, shifting the demographic compositions from the young to the middle-aged and older workers has gradually changed the merits to demerits, which is likely to reduce the

incentive for firms' skill formation.

The trade-off relationship arises from the essence of the Japanese employment practices. Most employees' skills are formed through life-time on-the-job training in the firm achieved with frequent job rotations within the firm or firm groups which are often accompanied by geographic relocation<sup>4</sup>. Though it is a necessary process for creating multi-skilled workers in both blue-collar and white-collar jobs, it imposes large burden on the employees and their family. Another notorious practice of persistent overtime hours worked provides a safety-net in recessions by adjusting labor inputs through cutting the overtime hours worked in order to avoid or minimize the lay-offs. It is also a result of heavy reliance by large Japanese firms on new graduates of colleges or high schools and transferring the skills from the senior employees through a time-consuming team-style production.

Though the geographical relocation or persistent overtime hours worked is a necessary process for skill formation and employment stability, the costs are particularly high for two-earner family in which both husband and wife have full-time jobs. Unless the current employment practices are changed to the more flexible work-style in exchange for less employment protection, the trade-off relationship will be maintained. Recently, the option of shorter hours of work for women with small children has been more available, but is still limited to around 10% of total firms.

A major reason for lack of effective policies to promote better work-life balance for married women who wish to participate in the labor markets while raising children is a conflict of interests with a traditional family of male household head with fulltime female homemaker. The traditional type of single earner household accounted for a majority of households up to 1980s, and has been protected as a "standard family" by favorable income tax and social security system (Figure 8)<sup>5</sup>. Even though they are now a minority in society, the system persists in large companies and the labor unions and undermines support for major reforms to shift the standard toward two earners family model.

(Figure 8)

Child-care facilities are still poor, particularly in urban Japan. Most nursery schools are managed by the local authorities as a part of the welfare policy for children rather than as a labor market policy for supporting working mothers with small children. This comes from a traditional thought that children should be taken care of in the family, and only those children without sufficient family support are covered by the welfare policy. The user fees for nursery schools are kept at quite low level, and most of the



costs are financed by the local government. The lower-than-market-based prices would stimulate demand while discouraging supply due to budget constraints, resulting in a long waiting list in urban areas. Thus, increasing the supply of child-care services should be achieved through a combination of private consumption and public subsidies, such as government subsidies for the basic costs of nursery schools leaving it up to consumers to purchase additional child-care services in the markets. Currently, some regulatory reforms are under way to increase the supply of nursery schools by stimulating private initiatives away from the public sector provision. Also, some municipalities provide subsidies to private nursery schools with flexible management including longer opening hours and some value-added services, though they still belong to minority group.

### **Gains in adult longevity and social security burden sharing**

Gains in adult longevity are a major factor in population aging. An increasing number of the elderly expand the social security expenditures shifting significant burden to the working generation. It is a major factor in widening the gap between benefits and costs of the social security across different generations. A basic framework of the Japanese social security system was established in the early 1970s based on the pyramid-like age structure of the population. Also, the inter-generational income transfer had been well accepted based on the perception that the retired generation was generally poor. Thus, it was considered to be fair that they are financially supported by the working age population with the higher level of education and earnings under a rapid economic growth. But, such economic conditions have largely been changed since 1990s with less than 1% real GDP growth. Youth unemployment has increased and their earnings have stagnated, while the social security benefits for the elderly have been improved. On the other hand, it is politically difficult to reverse the trend of the intergenerational inequality against the interest of the growing elderly population. This politics of aging or “silver democracy” will be an important issue in the Asian countries with rapidly proceeding aging of the population.

The merits and demerits of gains in adult longevity to the society would depend on the extent that older people could extend their working period, so that they share the increasing burden of tax and social security contributions. One good thing about Japanese population aging is that the high level of elderly males labor force participation, by international standard has been maintained. The labor market participation rates of males at age 60-64 and 65-69 were 78% and 49% respectively in 2010. This high level of elderly labor force participation both skilled and unskilled,

could be interpreted as reflecting the higher life-expectancy implying generally healthy physical conditions as well as larger uncertainty about the future<sup>6</sup>. If the elderly stay in the labor markets to get earnings, they continue to save, rather than withdrawing their savings. In this sense, the projection of household savings based on life-cycle theory can be modified with the higher labor market participation of the elderly<sup>7</sup>. In order to maintain the high level of older workers labor market attachment, it is important to encourage their “later retirement” by improving the labor market and social security policies.

A major policy issue here is a traditional practice of mandatory retirement. The “retirement” is in most case not from the labor markets, but from the firm one had been employed by for many years as regular workers. Over 90% of Japanese large firms have a set retirement age at 60 years old in 2010. Many employees are re-hired at about half of the wages before the mandatory retirement in a yearly employment contract up to age 65. As the Japanese labor markets are segmented between those who are guaranteed job security by the firm and those who are employed only in a fixed term contract, the employees after the mandatory retirement are not assigned responsible positions in the firm. On the other hand, in the medium and small firms, the retirement age is usually set at 65 years or even later, because their wage profiles are flatter and older workers are not as costly as those in the large firms.

This mandatory retirement practice is legally prohibited in the United States and in some European countries as “discrimination by age”. A major reason why it is not considered as discrimination in Japan is because it is combined with “reverse discrimination” of rigid employment protection and seniority based wages favoring the older workers up to the age of 60 years. This is quite a wasteful practice in the rapidly aging population, and needs to be abolished, so that both the elderly and non-elderly labor force can be better utilized. However, the current government is moving in the opposite direction by forcing the firms provide fixed employment contracts to every worker up to the age of 65<sup>8</sup>.

In Japan up to 1980s, the allocation of human resources between industries had been successfully done within a firm group, not through the ordinary labor markets. Large firm groups contain a wide variety of subsidiaries across industry, and many workers could be transferred from declining sectors to growing sectors while maintaining their employment. Such smooth labor movement across industry without increasing the unemployed could have been possible under rapidly expanding domestic markets in the high economic growth period. However, after the bursting of the bubble economy in 1990s, many large firms have kept excess workers in the firm, and the costs of the labor hoarding have been shifted to the younger generation by reducing new

employment opportunities.

### **Utilizing migration of skilled workers in the labor markets**

As already discussed, population aging in Asia is occurring at various speeds. These differential speeds imply the possibility of utilizing them through an increase in trade of goods and services, capital movements, and human resources. In 2011 Japan's registered foreigners amounted to 2.1 million (1.6% of the total population) which is quite low by OECD standards. Manufacturing sector employment accounted for 40% of total foreign employment, and Chinese accounted for 44% of this total in 2010. The official policy toward foreign workers is to open the door to the skilled while closing it to the unskilled. However, this principle is not necessarily consistent with the actual labor market conditions for several reasons:

- The definition of “skilled” is on an ad hoc basis, and many occupations requiring national licenses such as doctors or nurses are not included. Also, foreign babysitters or nursemaids taking care of small children are classified as unskilled, though their availability would be important for middle class families to support women continuing full time jobs. As a result, skilled workers account for less than 10% of the total foreign workers. Secondly, the Japanese descendants abroad, mainly from South America are accepted regardless of their skill levels, and most of them work in manufacturing sector as blue-collar workers. Thirdly, unskilled workers are de facto accepted as “trainees”, mainly in the manufacturing or agriculture, on the condition that they would return their countries after three years of training. This is a waste of human resources, and should give them the possibility of being accepted as a category of skilled workers after the training to remain the current occupation.
- Another factor for under-representing professional foreign workers is a lack of flexibility in the Japanese labor markets. Large firms emphasize investment in firm-specific human capital based on a long-term commitment, so that it takes more time for an outsider to play an important role in the Japanese firms. This is like a handicapped race for attracting high quality human capital in the international labor markets. Another factor discouraging skilled workers coming to Japan is an insufficient infrastructure supporting the family life such as international schools for children and hospitals for non-Japanese patients. This is mainly due to inflexibility in education or health care services administration not meeting with the

globalization of business activities.

Increasingly employers are recruiting foreign students graduating from Japanese educational institutions as a route for utilizing foreign workers. Foreign students studying in Japan increased from 56 thousand in 1999 to 137 thousand in 2009. However, those who are employed in Japan total 11 thousand annually accounting for approximately 30% of the graduates. Though the government has set a target to increase foreign students to 300 thousand by 2020, it needs to be accompanied with an increasing possibility that they will be permitted to stay in the domestic labor market. A major factor preventing their employment by Japanese firms is a mismatch in the domestic labor markets reflecting the long-term employment commitment and seniority-based wage structure.

## **Conclusion**

With the old-age dependency ratio set to increase in the years ahead it is important to utilize existing human resources more efficiently by encouraging the labor force participation of married women and older men. Japanese employment practices which are based on firm-specific skill formation through on-the-job training were efficient at times of high rate of economic growth, but not so any more, in light of the stagnation of the economy for the last two decades. Nevertheless, mainly due to a successful memory in the past, it is quite difficult to change them because of the resistance both from employers and labor unions.

The contribution of human capital to economic growth is not only reflected by an improvement in the quality of labor, but by more efficient reallocation of labor from declining to growing industries-- which will encourage total factor productivity growth. In this sense, population aging and globalization of economic activities will require the more flexible labor markets where not only the firm-specific but firm-general human capital, such as married women, older men, and foreign professionals, are better utilized. In order to moderate the negative impacts of demographic changes, the best utilization of existing educated human resources is required through “age-free” and “gender-free” principles. This needs various reforms in the traditional corporate culture which were established in the economic circumstances under a pyramid-like population structure in the past. Reducing adverse effects of demographic changes and making the best utilization of existing human capital requires policies for promoting flexibility in the labor markets and social security systems.

Rapid population aging in the East Asian countries is mainly attributable to

high rates of economic growth associated with active investment in human capital formation, just like the case of Japan. But the speed of aging or increase in old-age dependency ratios in some countries is likely to be even higher than that of Japan. Thus, the need for the better allocation of human capital should have higher priority. And since there are differences in the speed of the population aging the adverse impacts of the aging in an individual county can be reduced by increasing trade and investment within and beyond the region. Free trade agreements could play an important role in optimal allocation of the region's human capital.

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Figure 1. Population prospects

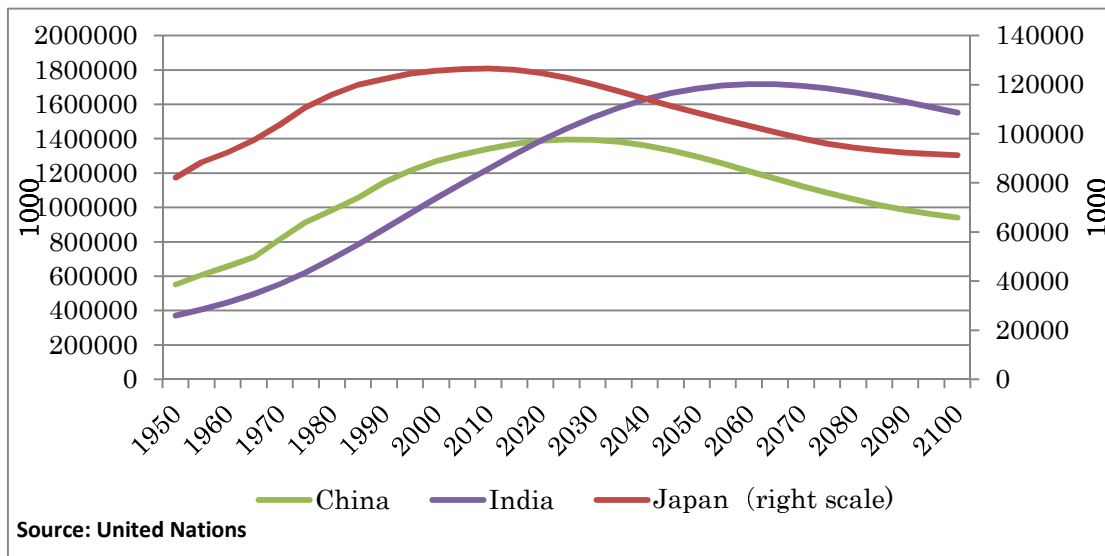


Figure 2. Old-age dependency ratios, Japan, China and India

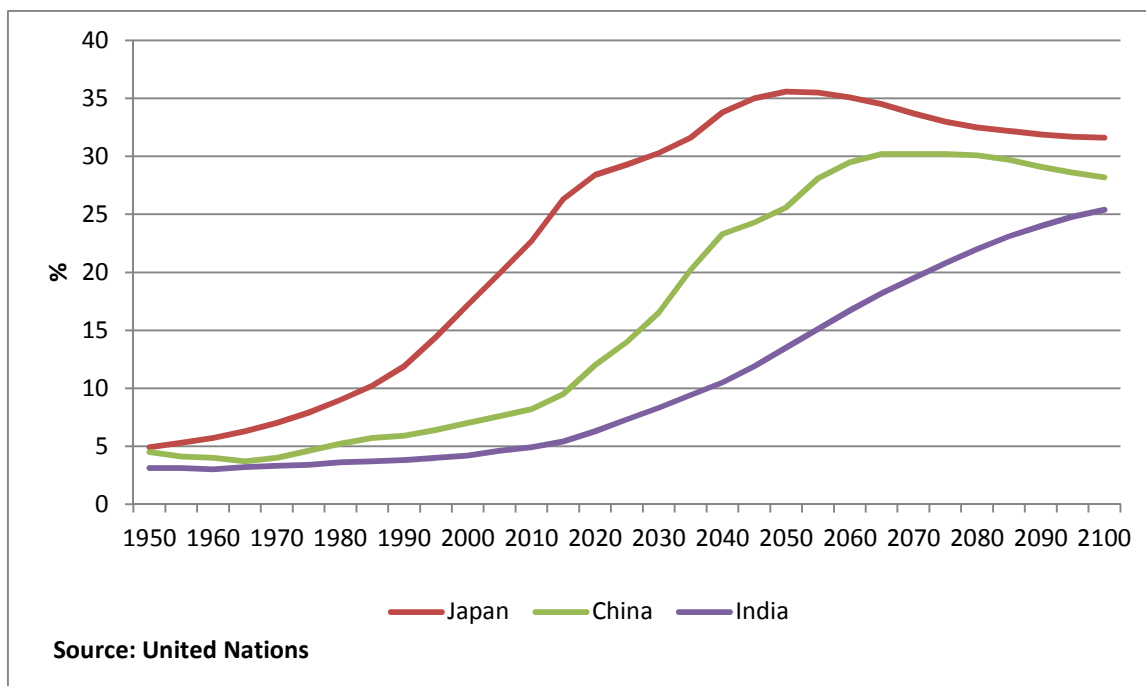


Figure 3. The Old-age Dependency Ratio, various Asian Countries

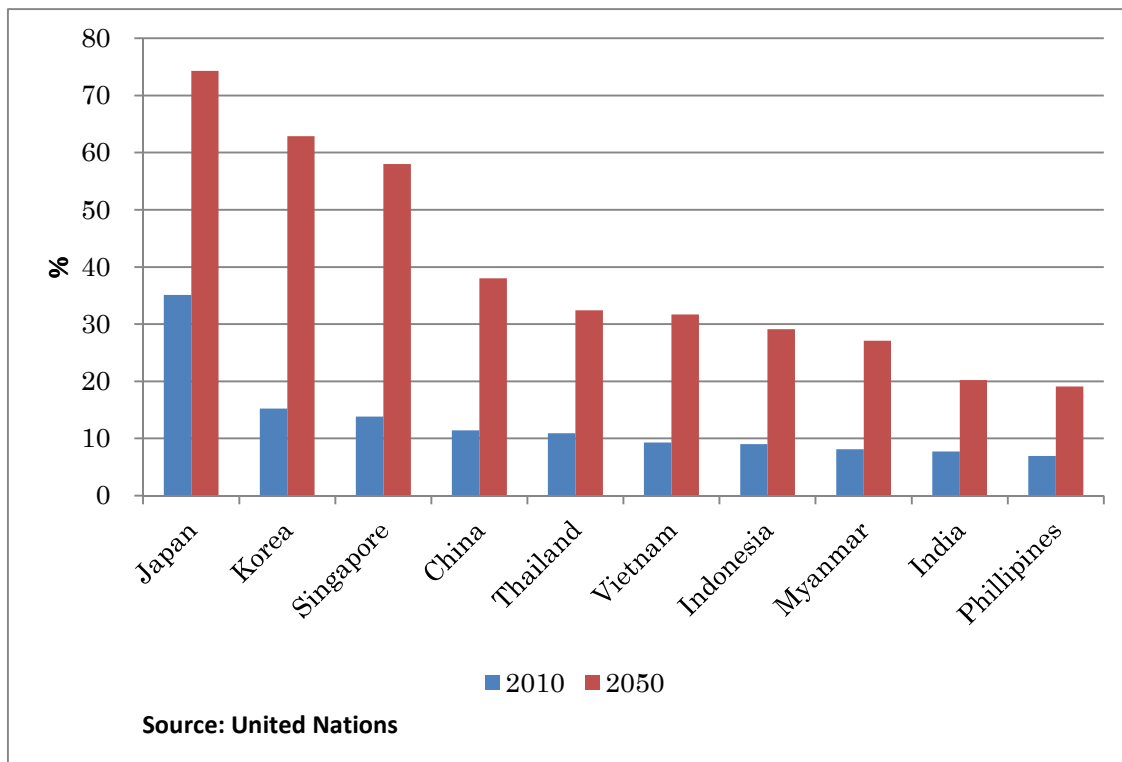


Figure 4. Changes in total dependency ratios and real GDP growth rates

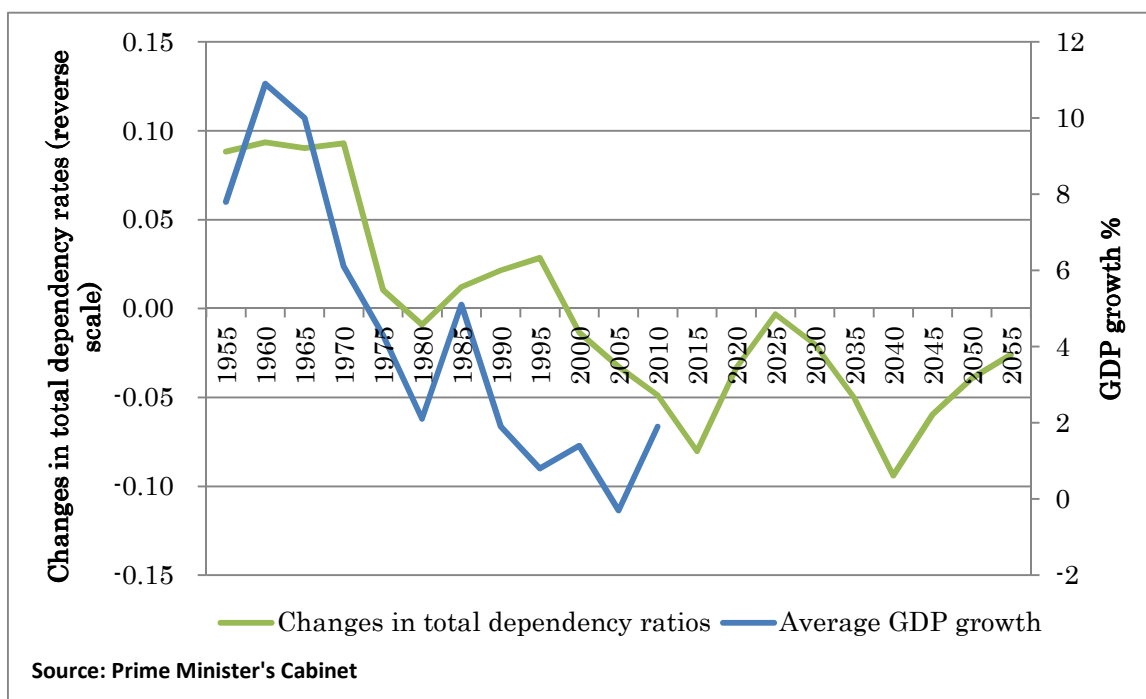
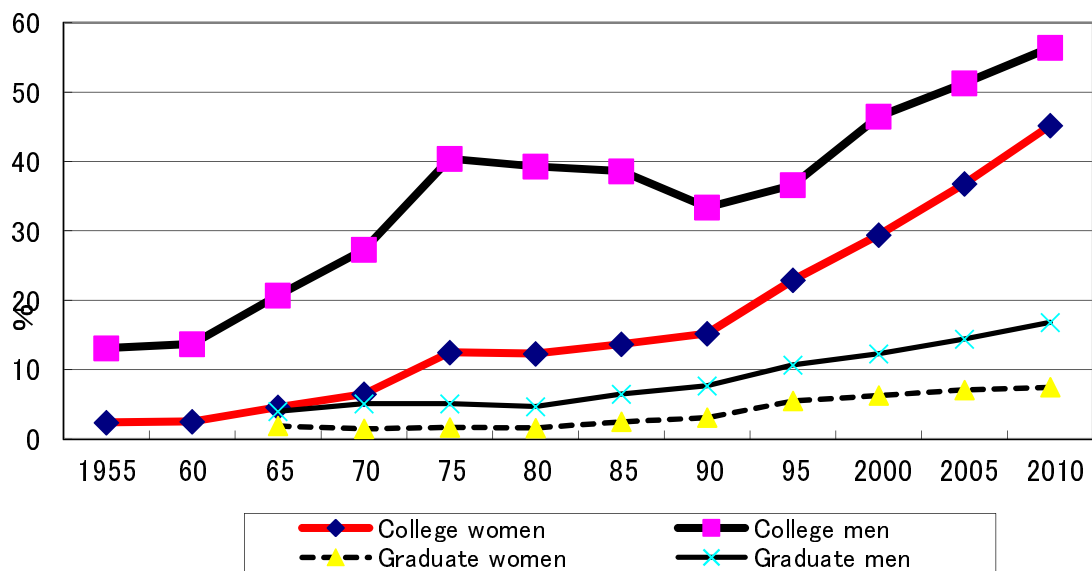
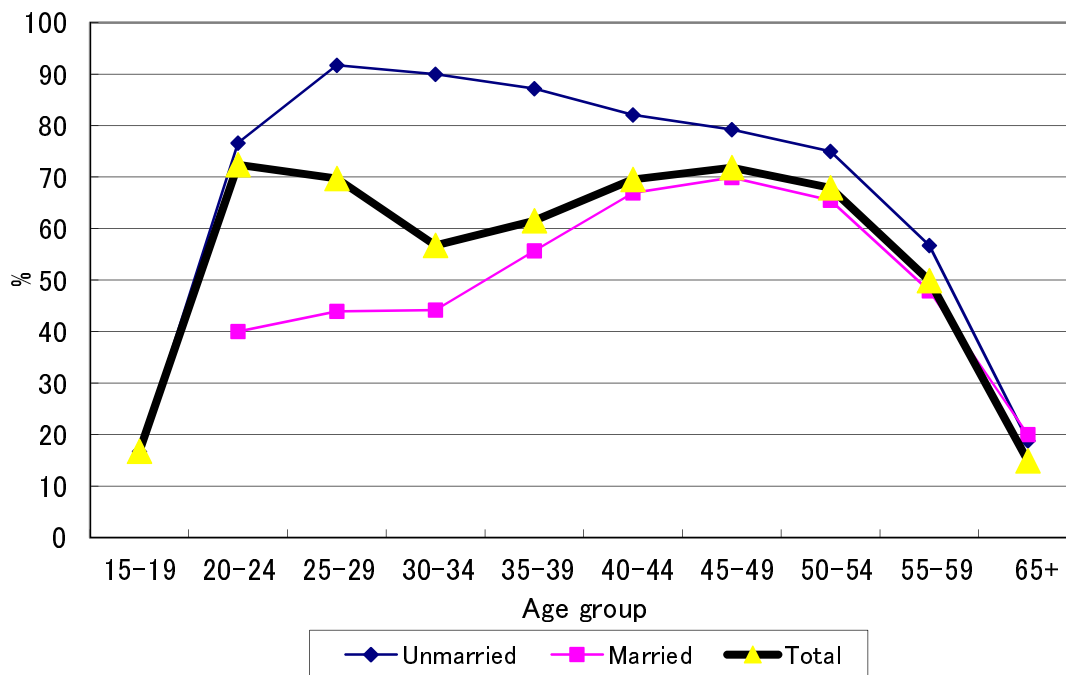


Figure 5. College Enrolment Ratio



Source: Ministry of Education

Figure 6. Labor force participation of Japanese women by age group



Source: Ministry of general Affairs, Labor Force Survey, The Social Security and Population Research Institute



Figure 7. Female Labor Force participation (percent) and Fertility ratio (percent)

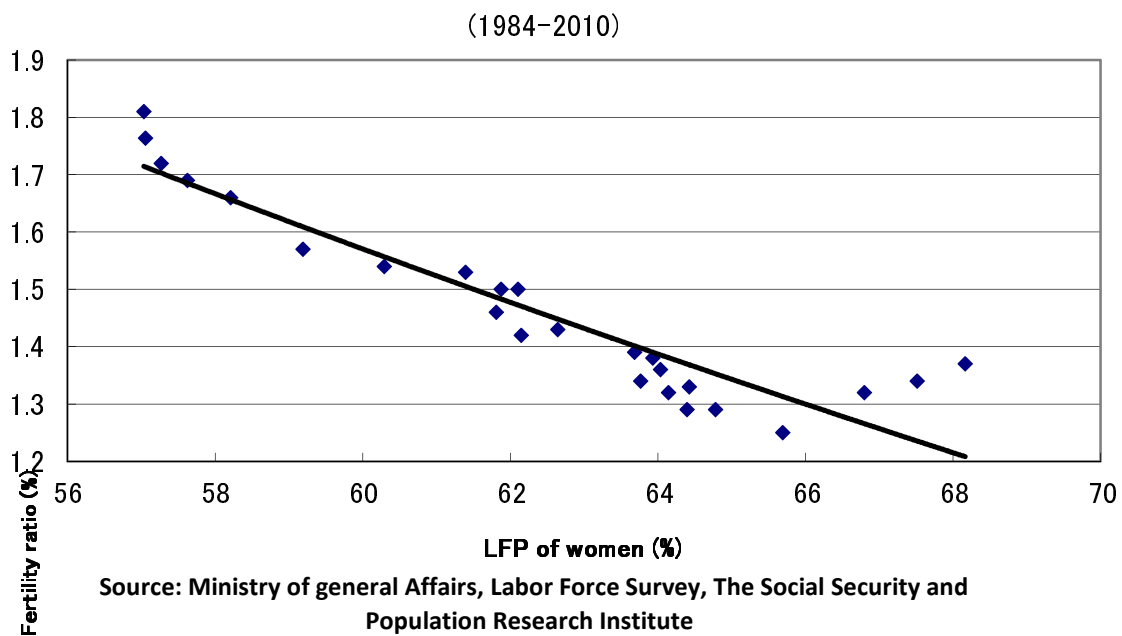
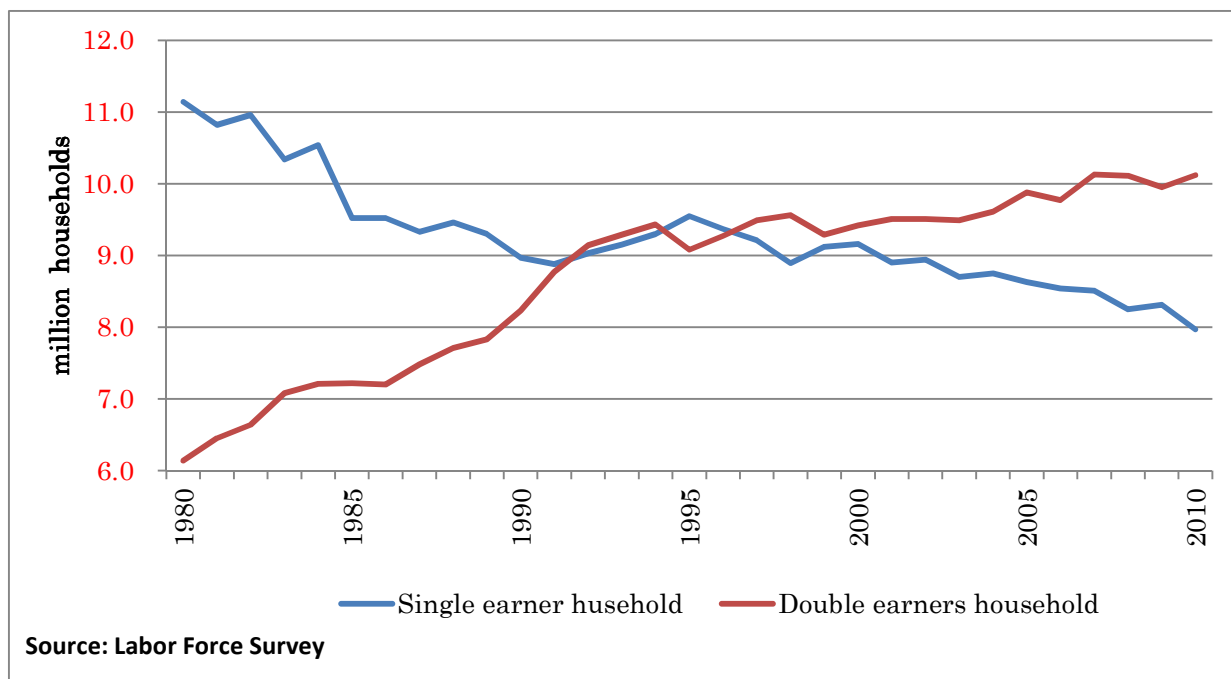


Figure 8. Comparison of single and double-earner households



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**Endnotes**

**Acknowledgements:** The author appreciates the valuable comments by Prof. Andrew Eungi Kim, Dr. Jayant Menon, and other participants in the PAFTAD35 conference.

<sup>1</sup> Non-regular workers in Japan are not necessarily part-time workers, and often do overtime works as regular workers. They have fixed-term employment contracts, which are often not renewed in recessions for employment adjustment in order to keep the employment security of regular workers.

<sup>2</sup> Another implication of the seniority-based wage is an “entrapment effect” of the employees for keeping the human capital for the firm.

<sup>3</sup> A majority of the labor unions in Japan are organized by company including both white and blue-collar workers, and shifting one job to another in the same firm has no restrictions.

<sup>4</sup> One of the reasons why geographical relocations are needed in the process of on-the-job training is a different degree of importance of the same job between a main office and local branch in the large firm. An employee is assigned a manager position in a local branch for acquiring the experience to become a manager in a main office.

<sup>5</sup> Income tax allowance and a certain reduction of social security premiums are granted for household head with non-working spouse.

<sup>6</sup> According to the opinion poll asking the elderly the reason of continuous working after the retirement age, the top answer is a need for money, and the second is to keep a healthy condition by working rather than staying at home.

<sup>7</sup> The projection of household saving ratio based on the demographic composition suggests that the speed of the decline is less rapid when accounting for the increasing labor force participation of the elderly (Yashiro 2003).

<sup>8</sup> This is different from the mere extension of the mandatory retirement age to 65 years in a sense that wage adjustments are allowed after the mandatory retirement of age 60.