# Female Labor Supply in Aging East Asia: Past, Present and Future Prospects in Four Advanced Economies

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**Abstract**

In this study, we will explore and project female labor supply in four advanced Asian economies. The countries included in our analyses are Hong Kong, Japan, South Korea and Singapore. In these countries, fertility rates have been very low for an extended period of time, and societies are aging rapidly. One of the feared immediate consequences of this development is a shortage in labor supply. Increasing female labor force participation is often seen as one option to increase labor supply, given that female labor force participation is significantly lower than male participation and women show patterns of economic activity that are distinctly different from the patterns observed in other advanced economies in Europe and North America. In the first part of this project, we will present and explain these observed differences, based on existing research about female labor force participation, and use our gained insights to project selected scenarios of future female participation, which composes the second part of this project. The results of these projections will allow us to assess the effect of a rise in female participation for labor supply. A distinct value added compared to existing labor force projections is our inclusion of information on women's educational attainment level. This will demonstrate that not only the size and the age-structure of the potential future female labor force are changing, but their skill level as well.

**Introduction**

Populations in Hong Kong, Japan, Singapore and South Korea are aging. Besides concerns what a larger share of elderly means for public expenditures on health care and pensions, the accompanying shrinkage of working-age population is also a growing concern. As Figure 1 shows, populations' age structures have been changing drastically during the last 50 years. The share of the young population (below age 15) has been decreasing, and the share of those above age 65 has been increasing. In Japan, the decline in the share of the population of what is commonly referred to as *working-age* (ages 15 to 64) has already set in in the mid-1990s, whereas in Hong Kong, Korea and Singapore, the decline just started. In addition to increasing the age at which people leave the labor force, increases in female labor force participation (FLFP) are often seen as a (partial) solution to compensate for a shrinking population share of working age, particularly in countries with large gender gaps in labor force participation, and selected policies towards this goal are being discussed or have already been implemented (see e.g. Evans and Li, 2013, for Hong Kong).

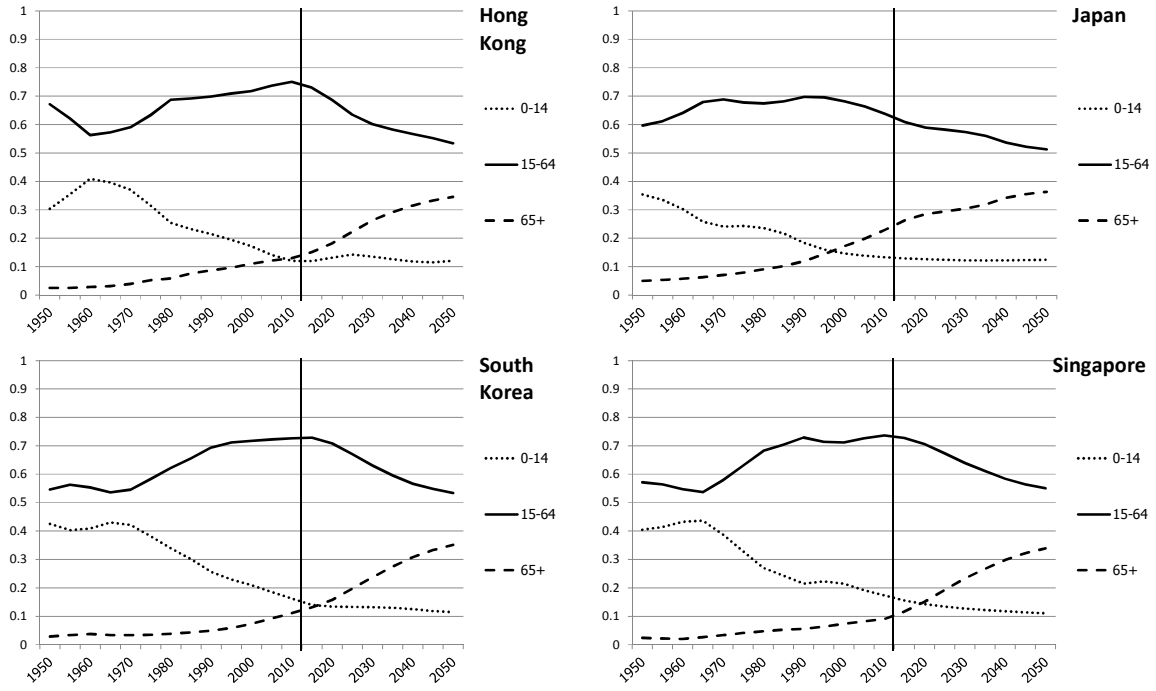


**Figure 1: Population shares for three braod age-groups (below age 15; age 15 to 64; age 65 and above), 1950 to 2050. The vertical line marks the year 2010; data for later years are projected.** Source: UN (2015). World Population Prospects 2015, medium variant.

Excluding China, the populations of Hong Kong, Japan, Singapore and South Korea (a total of 185 millions) make up about 78% of the remaining population in East Asia. Given that the East Asian region leads the trend in many socioeconomic and demographic indicators in Asia, knowing the future population and labor development of these countries are indicative of the larger Asian region. This study aims to first offer an overview of age-specific developments of FLFP, contrasting it to male participation, and looking at differentials by education and other socio-economic characteristics. Then,

we plan to make labor force projections up to 2050 to evaluate the potential patterns of FLFP could look like with the changing educational compositions of these aging populations.

The decision to limit our analysis of female labor supply to the four Asian countries Hong Kong, Japan, Singapore and South Korea is based on the fact that these countries are the most advanced economies in East and Southeast Asia that are faced with rapidly aging populations. What these countries also have in common are their relatively low levels of FLFP, compared to counties' male participation and female participation in other advanced economies. Another reason to focus on women in these four countries is the fact that FLFP in these countries has already been analyzed in more detail than in low- and middle-income countries in the region; we want to exploit this existing research about FLFP to work out the commonalities and differences of women's economic activity.

There are two good reasons to do the labor supply projections education-specific: first, participation shows a strong education gradient, where once a certain stage of development is attained, higher education levels are associated with higher levels of economic activity, for men as well as women. For example, in 2010, FLFP rates in Hong Kong for women with at most lower secondary education (ISCED 0, 1 and 2) were 34.1%, whereas those with upper secondary or post-secondary non-tertiary education had almost twice as high participation levels of 62.0%. Among tertiary educated women, 3 out of 4 were in the labor force (74.6%). And second, including the education dimension will allow inferences about future labor forces' education composition, which is closely linked to productivity and economic growth (Lee and Mason 2010). The average level of female educational attainment is projected to increase in each of our four economies. This is a crucial aspect in economies that are expected to be facing shrinking labor force sizes, since smaller but more productive labor forces – due to higher human capital endowment – can have positive effects for economic growth (see e.g. Boersch-Supan 2003, Fougere et al. 2009, Lee and Mason 2010, Ludwig et al. 2012).

**Developments in female labor force participation: statistical evidence and literature review**

In the first part of the project, we will present data on past and present trends in female LFP, explicitly considering the education dimension. To give just one example: In 1992, the female labor force in South Korea was predominantly composed of women whose highest level of educational attainment was primary education (57.4%) and where only 9.3% of working women possessed tertiary education. Within two and a half decades, this changed drastically: by 2007, the share with at most primary education was cut in half (29.0%) and the share with tertiary education tripled (30.8%) (Worldbank 2015). Similar developments took place in Singapore, Hong Kong and Japan. There is a wealth of research that looks at the determinants of female labor force participation across various settings. We will focus on research that explicitly deals with labor supply in Hong Kong, Japan, Singapore and South Korea (e.g. Kim 2012, Steinberg and Nakane 2012, Kinoshita and Guo 2015, Mukherjee 2015) but also include insights gained from other studies covering other larger numbers of countries (e.g. Lim 2002, Burniaux et al. 2004, Jaumotte 2004, IMF 2013, ADB 2015).

**Education-specific projections of female labor supply**

*Methods*

The general labor force projection approach contains two steps: first, participation rates are projected, in a second step, they are combined with future population data. Conceptually, there is a difference

between projections and forecasts. What we propose for this study are strictly projections: calculations of future developments of female labor supply, based on clearly spelled out assumptions. The uncertainty of what will actually happen is dealt with by providing selected justified scenarios.

*Data*

Consistent past and current data on female labor force participation by age, sex and highest level of educational attainment is not provided in any international statistical database. We did already start to collect this data directly from the national statistical offices in each country or the OECD Statistics Directorate and are at this point in the possession of baseline data for a recent year for Hong Kong, South Korea and Japan. As far as future population data is concerned, we will take advantage of a new dataset that was produced by the Wittgenstein Center for Demography and Global Human Capital[1]. This dataset contains education-specific population data for the past (since 1970) and projections for the future (up to the year 2100) for 195 countries, including our 4 selected countries.

**Preliminary Findings**

Figure 2 depicts age-specific profiles of labor force participation for women in our four selected countries. As can be seen, patterns of female labor force attachment are distinct from each other. Women in Singapore and Hong Kong have very similar participation rates until around age 50, after which Singaporean rates remain higher. Participation rates of women in Japan and South Korea show the typical M-shape and are significantly lower at younger ages than in Singapore and Hong Kong, but higher for older age-groups. These profiles reflect not only age-specific behavior of economic activity but also differences across birth cohorts, which again are the result of overall macroeconomic conditions, the policy environment and gender relations within a specific country.

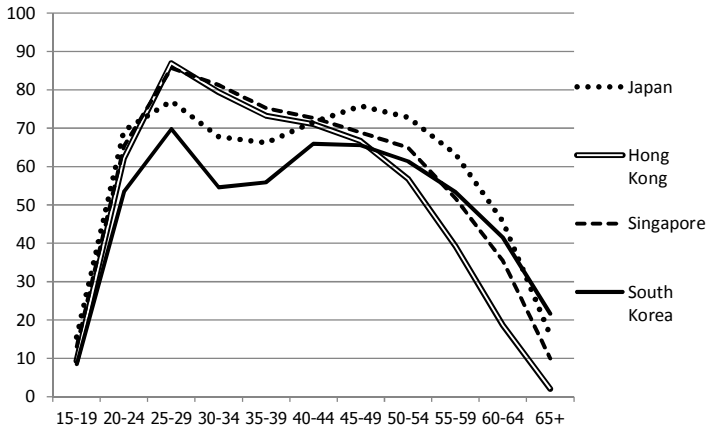


**Figure 2: Female labor force participation rates by age for Hong Kong, Japan, Singapore and South Korea, 2010.** Source: ILO LABORSTA database. Economically Active Population, Estimates and Projections (6th edition, October 2011).

Figure 3 exemplary additionally breaks down the age-specific patterns of labor force participation by education for two of the four countries that we will analyze. The distinct differences between women

[1]The complete data for 195 countries can be accessed under http://www.oeaw.ac.at/vid/dataexplorer/

with different levels of educational attainment are a strong argument in favor of performing education-specific labor force projections.

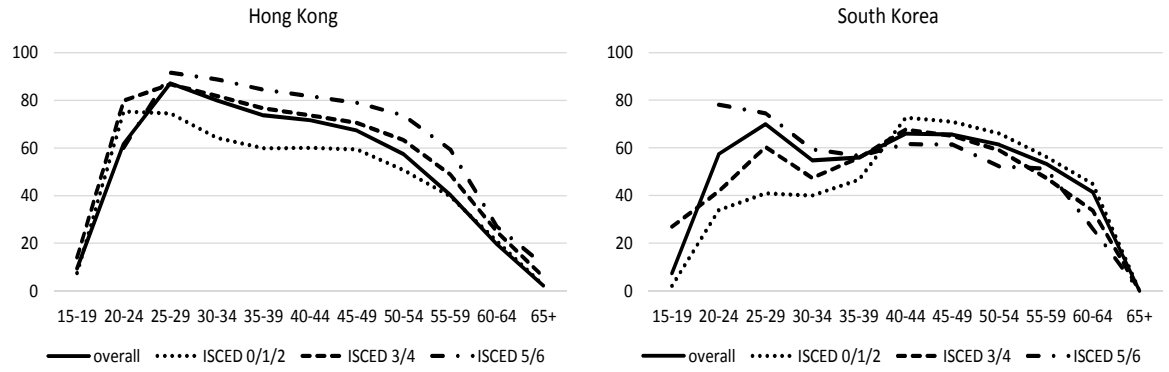


**Figure 3: Female labor force participation rates by age-group and highest level of educational attainment, for Hong Kong (2011) and South Korea (2010).** ISCED 0/1/2: at most lower secondary education. ISCED 3/4: upper secondary or post-secondary non-tertiary education. ISCED 5/6: tertiary education. Source: Data for Hong Kong acquired from the Demographic Data Section, Census and Statistics Department, Hong Kong, SAR. Data for South Korea acquired from the OECD Statistical Office.

A recent study (Cheng and Loichinger, 2015) has shown the crucial role of increasing women's labor force participation rates in rapidly aging Taiwan. The results show that the gap between promoting more conservative versus more progressive labor policies is about two million workers by 2050, and this extra workforce consists mainly of well-educated women. We expect to find similar results, yet likely with country-specific nuances, in our current study on Hong Kong, Japan, Korea, and Singapore. As in the case of Taiwan, the potential of integrating more women into the paid labor market lies not only in increasing the pure numbers of workers but to make use of a highly skilled labor pool. This aspect gets lost in traditional labor force projections that do not explicitly differentiate by level of educational attainment.

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**References**

ADB (2015). Women in the workforce. An unmet potential in Asia and the Pacific. Asian Development Bank, Manila.

Boersch-Supan, A. (2003). Labor Market Effects of Population Aging. *Labour* 17 (Special Issue): 5-44.

Burniaux, J.-M., Duval, R. and Jaumotte, F. (2004). Coping with ageing: a dynamic approach to quantify the impact of alternative policy options on future labour supply in OECD countries. OECD Economics Department Working Paper Nr. 371.

Cheng, Y.-h.A., and Loichinger, E. (2015). Women's Labor Potential in an Aging Taiwan: Education-specific Population and Labor Force Projections up to 2050. unpublished draft, currently under review. We have presented this paper at PAA 2015 (Population Association of America Conference) and APA 2015 (Asian Population Association Conference).

Evans, R. and Li, F. (2013). Hong Kong Seeks More Women Workers as Aging Population Looms. *Bloomberg Business*, Nov. 7, 2013. Retrieved Nov. 30, 2015, from http://www.bloomberg.com/news/articles/2013-11-07/hong-kong-seeks-more-women-workers-as-aging-population-looms

Fougere, M., Harvey, S., Mercenier, J., and Merette, M. (2009). Population Ageing, Time Allocation and Human Capital: A General Equilibrium Analysis for Canada. *Economic Modelling* 26(1): 30-39

IMF (2013). Women, Work and the Economy. Macroeconomic Gains From Gender Equity. Strategy, Policy, and Review Department and Fiscal Affairs Department. International Monetary Fund, SDN/13/10.

Jaumotte, F. (2004). Labour force participation of women: empirical evidence on the role of policy and other determinants in OECD countries. *OECD Economic Studies*, 37 (2).

Kim, J. (2012). Past and future of the labor force in emerging Asian economies. *Japan and the World Economy*, 24: 87-100.

Kinoshita, Y. and Guo, F. (2015). What Can Boost Female Labor Force Participation in Asia? IMF Working Paper, WP/15/56.

Lee, R., and Mason, A. (2010). Fertility, Human Capital, and Economic Growth over the Demographic Transition. *European Journal of Population* 26: 159-182

Lim, L.L. (2002). Female labour-force participation. ILO, Gender Promotion Programm. Report.

Ludwig, A., Schelkle, T., and Vogel, E. (2012). Demographic Change, Human Capital and Welfare. Review of Economic Dynamics 15(1): 94–107.

Mukherjee, S.S. (2015). More educated and more equal? A comparative analysis of female education and employment in Japan, China and India. *Gender and Education,* Published online Nov. 2.

Steinberg, C. and Nakane, M. (2012). Can Women Save Japan? IMF Working Paper. WP/12/248.

UN (2015). World Population Prospects 2015. UN Population Division.

Worldbank (2015). World Development Indicators. Retrieved Nov. 25, 2015. http://databank.worldbank.org/data