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Labor force participation of married female immigrants: Evidence from a low female-LFPR host country[1]

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Abstract

This study uses large-scale census data from Japan to present some of the first evidence on labor force participation rate (LFPR) of married female immigrants by focusing on the group of immigrants who migrate from relatively high female-LFPR home countries to low female-LFPR host countries. First, our results indicate that birth-country culture plays an important role in determining female immigrants' labor force participation, which supports the findings in previous studies that examined a converse direction of migration from relatively low female-LFPR home countries to high female-LFPR host countries. Further, the result indicates that both the wife's and husband's source-country culture have significant effects on immigrant women's work, while this effect is greater for the wife's than it is for the husband's. Second, although immigrants usually act more like the natives the longer they live in the host country, after controlling for individual characteristics, the study finds that female immigrants' LFPR does not decrease after a long period of settlement in the low female-LFPR host country of Japan. Conversely, female migrant LFPRs are higher after five years than they are in the initial years after arrival. We suggest that birth-country culture plays a large and persistent role in determining female labor force participation, which leads to cultural assimilation having less significant effects than economic assimilation.

Keywords: female labor participation, immigrants, culture, education, assimilation
JEL classification: J15, J61

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1. Introduction

The labor force participation of married female immigrants has attracted much academic attention, including in studies of immigrant assimilation (Schoeni 1998; Blau and Kahn 2007; Blau et al. 2011; Ferrer 2015), family roles in migration (Long 1980; Duleep and Sanders 1993; Baker and Benjamin 1997; Cobb-Clark and Crossley 2014), and the effect of culture on female labor supply (Reimers 1985; Antecol 2000; Blau et al. 2013; Fernández and Fogli 2009; Fernández 2007; Fernández 2010; Fernández 2013; Read 2006; Uunk 2015). Empirical evidence has largely been obtained from countries whose female labor force participation rate (LFPR) is higher than that in migrants' source countries. However, the opposite case that immigrants to a country whose female LFPR is lower than that in the source countries has not been examined. This study aims to fill this gap using large-scale individual data from Japan.

Even though it is the third largest economy in the world in terms of gross domestic product, Japan has long been known for its low female LFPR and large gender gap in the labor market. The World Economic Forum (2020) reports that Japan ranks 121st among the 153 surveyed countries in the Global Gender Gap Index. At the same time, a shortage of labor due to population aging has forced the Japanese government to admit an increasing number of immigrants, over half of whom are females. However, because of the long-term persistence of traditional gender roles in Japan, which has led to a lack of public childcare services, long working hours for men, etc., there is concern that female immigrants' labor participation rate could be reduced after a long period of settlement in Japan, even if they originate from high female-LFPR countries. As a result, the study of female immigrants' participation and performance in the Japanese labor market is of considerable policy interest.

Immigrant women's labor market participation is an important indicator of immigrant household assimilation (Ferrer 2015). Assimilation is the process by which migrants gain exposure to the customs of the host country, and adapt to its economic conditions and opportunities (Meng and Gregory 2005). In this study, the former aspect is referred to as cultural assimilation, and the latter is referred to as economic assimilation. Previous studies have been conducted in the United States, where "immigrants typically come from countries with a more traditional division of labor by gender than the host country" (Blau et al. 2011, p. 43). Further, studies in the U.S. context found that migrant assimilation leads to a higher level of labor supply than in the host country (Reimers 1985; Schoeni 1998; Antecol 2000; Blau et al. 2011). However, it could be difficult for them to determine whether the increase in labor participation was mainly caused by cultural assimilation or economic assimilation, or both, as the effects of cultural and economic assimilation are both positive in determining migrants' labor force participation.

However, in a host country which has a relatively lower female LFPR than migrants' countries of origin, such as Japan, the situation is different. Due to a more traditional division of labor by gender, cultural assimilation would imply a *negative* effect on immigrants' labor force participation. In particular, the culture behind the gender gap in Japan includes high social emphasis on women doing housework, women's satisfaction with being a housewife, significant implicit discrimination toward women in workplaces, the

tradition of men's long working hours and few hours spent at home, etc.[2] On the contrary, economic assimilation, which includes migrants' successful transfer of human capital from the home country to the host country and improved economic outcomes, definitely increases the labor supply. Therefore, the change of migrant labor supply after a long period of settlement in a country like Japan can help determine which effect is larger: the negative effect of cultural assimilation or the positive effect of economic assimilation.

Studies using immigration data have contributed to the general understanding of female labor participation by successfully separating the effect of culture from economic and social influences, which has been difficult using solely native data by in-country analysis or cross-country regressions (Antecol 2000; Fernández 2010). The reason for the difficulties when using solely native data is that on one hand, individuals (natives) born in the same country presumably share a similar culture and on the other hand, "the use of cross-country regressions on a large variety of variables that are meant to capture economic and institutional differences across countries, identify culture with the regression residual. However, this approach is fraught with problems of omitted variables and endogeneity, compounded by mismeasurement" (Fernández 2010, pp. 482-483).

Using the data of immigrants helps solve this problem by applying an epidemiological approach to economic analysis. To distinguish the genetic contribution to disease from the physical environment's contribution, epidemiologists study various health outcomes for immigrants and compare them with outcomes for natives (Fernández 2010; Marmot, Syme, Kagan, Kato, Cohen, and Belsky 1975). Economists have applied this approach to separate cultural effects from social and economic effects regarding economic outcomes, because immigrants share the same social and economic environment while having different cultural backgrounds, according to their differing source countries. The epidemiological approach has been applied to examine women's work and fertility (Reimers 1985; Blau 1992; Fernández and Fogli 2009), family ties (Giuliano 2007; Alesina and Giuliano 2011), labor market regulations (Aghion, Algan, and Cahuc 2008), and savings rates (Carroll et al. 1994) (for detailed reviews, see Fernández 2010).

However, existing work has been limited to countries which have a relatively high female LFPR. It remains unknown whether these results would apply in a country which has a lower female LFPR than immigrants' home countries. First, the positive role of culture of origin on immigrants' labor force participation may not persist in host countries with poor environments for women in the workforce and negative attitudes toward female labor participation. Second, migrants may experience different assimilation paths in a low female-LFPR country—female workforce participation would imply positive economic assimilation but negative cultural assimilation. Thus, the anticipated change in LFPR after a certain period of settlement is ambiguous. This differs from migrants in high female-LFPR host countries, where both economic and cultural assimilation have positive effects on migrants' labor force participation.

This study applies the 2010 population census data from Japan, which is the most updated census data including detailed individual information, such as education. In the top ten countries that are sources of migrants to Japan, the International Labor Organization (ILO) estimates of female LFPRs are all higher

[2] It has been said that many Japanese men are ashamed to have a working wife, because it makes them feel that they have failed to support their families.

than Japan's, except Thailand. The stylized effect of this study is shown in Figure 1. We are interested in the following two facts. First, female migrants' LFPRs generally get closer to the levels of their source countries after they have lived in Japan for five years or more. Second, even though they migrate to a country with low female labor force participation, female migrants' LFPRs are much higher for the group that has lived in Japan for a long time than that have lived in Japan for only a short time. The only exception is the special case of Brazilian immigrants, most of who come to Japan because their parents or grandparents are Japanese migrants in Brazil. Note that all samples in this study are permanent immigrants. Temporary worker immigrants who leave their spouses in home countries, visitors, and international students are excluded.

< **Fig. 1** Female Labor Force Participation Rate in 2010 >

Our study investigates the mechanism behind this trend. Regarding the first fact, this study examines determinants of labor force participation for female immigrants who have lived in Japan for five years or more, based on the standard labor supply theory with cultural factors introduced. Consistent with studies based in other countries, this study applies two proxies for culture: LFPRs in the source country and country-average attitudes toward being a housewife. Regarding the second fact, this study investigates the difference between permanent immigrants who have lived in Japan for less than five years and permanent immigrants who have lived in Japan for five years or more, after controlling for the endowment effects of education, husbands' work, etc. We consider that the difference between these two groups could be the result of migrants' adaptation to economic opportunities, acquisition of language skills, etc., defined as economic assimilation, and/or migrants' assimilation to local culture, defined as cultural assimilation. The effect of economic assimilation on female labor force participation is positive regardless of the type of host country, while the effect of cultural assimilation is negative in a host country with a culture of relatively low female labor force participation.

The remainder of this manuscript proceeds as follows. Section 2 briefly reviews the literature, and Section 3 provides the theoretical model. The data are described in Section 4. Section 5 reports and discusses the estimation results for married female immigrants, paying special attention to the role of culture. Section 6 compares female LFPR between immigrants who have lived in Japan for five years or more and immigrants who have lived in Japan for less than five years, controlling for individual and family characteristics. Section 7 concludes the paper.

2. Literature Review

Host countries that have a relatively high rate of female labor participation provide immigrants with an encouraging economic and cultural environment to increase their labor participation after they arrive. The level of immigrant LFPR achieved in host countries is significantly affected by the LFPR in migrants' home countries, which previous studies have interpreted as the role of culture. There has been much research examining the effects of source-country LFPR on female immigrants' labor force participation in relatively

high-female-LFPR host countries (e.g., Long 1980; Reimers 1985; Duleep and Saunders 1993; Baker and Benjamin 1997). For instance, Fernández and Fogli (2009) study the effects of culture by examining the work behavior and fertility of second-generation American women using 1970 census data in the U.S. In that study, the proxy for culture is past female labor force participation and total fertility rates in the woman's country of ancestry. It shows that cultural proxies have significant explanatory power even after controlling for education and spousal characteristics and demonstrates that their results are unlikely to be explained by unobserved human capital.

Blau et. al. (2011) focuses on the assimilation process of immigrant female laborers by examining immigrant groups who have lived in the U.S. for different periods of time, using cross-sectional data of 1980, 1990, and 2000 census in the U.S. Different from Fernández and Fogli (2009), this study does not distinguish between first generation and second and higher generation immigrants. The results indicate that immigrant women from countries with high female labor supply persistently work more than those from low-female supply countries, while both groups of women work less than comparable natives. Further, it finds that "men's labor supply is unaffected by source-country female participation," suggesting that "the findings on women reflect notions of gender roles" (Blau et. al. 2011, p. 43). Moreover, using the 1994–2003 Current Population Survey data, Blau and Kahn (2007) find that current Mexican immigrant women had far lower levels of labor supply than native non-Hispanic whites, while gaps are much smaller in the second-generation, which suggests "assimilation but also some persistence" (Blau 2013, p. 408).

There are a few studies that arrived at the opposite conclusion that LFPR of female migrants was *the highest* in the first few years after migration and decreased later. They explain this using a family investment framework, wherein during the early years of immigration, wives in immigrant families participate in the labor market to finance their husbands' investments in human capital (Long 1980; Duleep and Sanders 1993; Baker and Benjamin 1997; Cobb-Clark and Crossley 2014).

Previous studies examined cultural assimilation by comparing the effects of culture between the first and second as well as higher generations of immigrants. Blau's (1992) study of female immigrants' fertility argued that culture should have a greater impact on first generation than on second and higher generation immigrants for a number of reasons, including the length of time away from the home country, the length of time to adapt to economic conditions and opportunities in the host country, and the length of time exposed to the tastes of the host country (Antecol 2000). Antecol drew attention to the gender gap in LFPR, finding that for first generation immigrants, over half of the overall variation in the LFPR gender gap was attributable to home-country LFPR, which "suggests that there exists a permanent, portable factor, i.e., culture, that is not captured by observed human capital measures, that affects outcomes." Antecol's finding of a smaller role of home-country LFPR for second and higher generation immigrants provided "evidence of cultural assimilation" (Antecol 2000, p. 409). In contrast to those previous studies, this study focuses on a different category of female immigrants, those who migrate to a host country that has a generally *lower* level of female labor force participation than their home countries.

In addition, economic assimilation of immigrants has been studied widely in the literature. Meng and Gregory (2005) relate that the sources of economic assimilation are generally understood to be

accumulation of the knowledge of the customs, language, and opportunities for finding good jobs in the host country (Chiswick 1978; c.f. Meng and Gregory 2005). Considerable research effort, especially in the United States, Canada, and Australia, has been directed toward measuring the economic assimilation of immigrants (see Chiswick 1978; Borjas 1985, 1995a, 1999; Beggs and Chapman 1988; LaLonde and Topel 1992, 1997; Baker and Benjamin 1994; McDonald and Worswick 1999; c.f. Meng and Gregory 2005). Therefore, economic assimilation could widely exist for female migrants, who comprise a considerable part of the total migrants in those studies. Consequently, this study considers not only cultural assimilation but also economic assimilation in explaining the results.

3. Theoretical Framework

The study is based on the standard model of labor supply (Cahuc and Zylberberg 2004) and introduces the factor of culture. The income for female consumption of goods includes a woman's share of her husband's income (regardless of whether she works) and income from her own work (if she works outside). Culture as a variable represents a positive attitude toward being a housewife than working outside home, which increases female bargaining power on spending the husband's income on her own consumption and thereby increasing her non-wage income.

The individual makes a choice between consuming more goods and consuming more leisure time. The utility function is as follows.

$$\begin{aligned} \mathrm{U} &= C^{1-\beta} L^{\beta} \\ \text{s.t. } \mathrm{C} &= \mathrm{w}(L_T - L_c - L) + R \end{aligned} \tag{1}$$

where C is the consumption of goods, L is the time for leisure, w is individual's expected wage in the labor market, L_T is her total time (assumed to be constant), L_c is the time for taking care of children and the elderly, which is determined by the number of children and older family members, and R is non-wage income, i.e., the share of the spouse's wage spent on the individual's consumption.

According to Cahuc and Zylberberg's (2004) calculations, the reservation wage, w_A, is equal to the marginal rate of substitution, (dU/dL)/(dU/dC), taken at point that $C = R$ and $L = L_T - L_c$. Thus,

$$w_A = \frac{\beta}{1-\beta}\frac{R}{L_T - L_c} \tag{2}$$

The optimal value of leisure can be represented as

$$\begin{aligned} \mathrm{L}* &= \beta(L_T - L_c + \tfrac{R}{w}) \quad \text{if } w > w_A \\ \mathrm{L}* &= L_T - L_c \quad \text{if } w \le w_A \end{aligned} \tag{3}$$

Labor supply, h, is defined as $h = L_T - L_c - L*$

Thus,

$$\begin{aligned} h &= L_T - L_c - \beta(L_T - L_c + \frac{R}{w}) \quad \text{if } L_T - L_c - \beta(L_T - L_c + \frac{R}{w}) > 0 \\ h &= 0 \quad \text{if } L_T - L_c - \beta(L_T - L_c + \frac{R}{w}) \leq 0 \end{aligned} \tag{4}$$

Non-wage income, *R*, is determined as follows,

$$\mathrm{R} = \alpha(v) w_s \tag{5}$$

where w_s is the wage of the spouse and α is the share of spouse's wage that is used for the individual's consumption. v is the individual's positive attitude toward being a housewife than working outside home, which is the determinant of α. A larger v indicates a more positive attitude toward being a housewife than working outside home, which increases the bargaining power for the individual, thereby leading to a larger share of the spouse's wages for consumption.

Moreover, *w*, the expected wage of the individual, is determined by her education and tenure.

$$w = w(edu, tenu) \tag{6}$$

Furthermore, w_s, the current wage of the spouse, is determined by human capital and employment, which are represented as follows.

$$w_s = w_s(edu_s, tenu_s, employ_{s,}, job_s) \tag{7}$$

where $employ_s$ denotes the employment status of the spouse, and job_s is the job type of the spouse.

Labor force participation (LFP) equals 1 if the individual participates in the labor market and equals 0 if the individual does not participate. This result is obtained as follows.

$$\begin{aligned} LFP{=}1, \text{ if } L_T - L_c - \beta(L_T - L_c + \frac{R}{w}) > 0, \\ LFP{=}0, \text{ if } L_T - L_c - \beta(L_T - L_c + \frac{R}{w}) \leq 0 \end{aligned} \tag{8}$$

where $R = \alpha(v) w_s(edu_s, tenu_s, employ_{s,}, job_s), w = w(edu, tenu)$, L_T is a constant, and L_c is determined by the number of children and elderly people in the family.

Using the reduced form of the above model, the probit model for LFP is (Greene 2008)

$$Prob[LFP = 1] = F(constant, v, L_C, edu, tenu, edu_s, tenu_s, employ_{s,}, job_s) \tag{9}$$

As a result, the probability of LFP is reduced by the individual having a more positive attitude toward

being a housewife than working outside home, v , spending more time taking care of children and elderly family members, L_C, the spouse having a higher level of education, edu_s, the spouse having a longer tenure, $tenu_s$, the spouse having full-time employment, $employ_{s,}$, and the spouse having a high-skilled job, job_s, while it is increased by the individual's education level, edu, and length of tenure, $tenu$.

4. Data

This study utilizes large-scale individual data from the whole sample of the 2010 population census in Japan. Everyone who has lived in Japan for over three months is required to respond to the questionnaire. The questionnaire is provided in Japanese and 27 foreign languages (MIC 2010) which cover the source countries of over 90% of foreigners in Japan. The whole sample of immigrants comprises 1.629 million persons, which covers over 70% of the total immigrant population reported by the Immigration Bureau in the survey year.

This study focuses on married immigrants aged 15–64 who live together with their spouses and restricts the sample to immigrants who are the head of the household or whose spouses are the head of household. First, this is to exclude foreign workers who came to Japan under a "foreign trainee and technical intern system" (*Gaikokujin Kenshu Gino Jisshu Seido* in Japanese), wherein foreign workers are permitted to live in Japan only if they work in certain firms and will be sent back to home countries if they quit those jobs. These immigrants live in shared houses provided by their firms, and their families are not allowed to come to Japan. Therefore, those samples were not included in our study.

The second reason to use a sample of married immigrants who live with their spouses is that their decisions to work are not restricted by the Japanese immigration policy, even if they do not have green cards. Visas for foreigners who do not have green cards are based on their purpose for being in Japan, such as working visas, spouse or family visas, and study visas. On the one hand, if a foreigner has a spouse or family visa, they are allowed to work for a maximum of 28 hours a week; if they find full-time jobs in Japan, their visas can be changed into working visas. On the other hand, foreigners who have working visas have to leave Japan if they lose their jobs. However, married females who live together with their working husbands do not have to leave Japan if they quit jobs, because they can change their working visas to spouse or family visas. Because this feature gives women the leeway to choose whether they will enter the workforce, this study chooses to use a sample of married immigrants who live together with their spouses. In addition, the study excludes immigrants who are married to natives, because they may experience different paths of assimilation.

The selection of proxies for culture follows previous studies in high female-LFPR host countries. Most of these studies used female LFPR in migrants' source countries as the proxy for culture, while a few studies also used social views or opinions on female housework and labor participation as the proxy (Fernández 2007). As was discussed in Fernández and Fogli (2009), LFPRs in source countries "capture not only economic and institutional conditions but also the country's preferences and beliefs regarding women's roles." However, as immigrants live in the same host country as natives, with the same economic and institutional conditions, "only the belief and preference components" in their source countries are

"potentially relevant" (Fernández and Fogli 2009, p. 146).

In this study of a low female-LFPR country, we introduce similar proxies for culture. The first proxy is social attitudes in source countries toward being a housewife, obtained from the World Values Survey wave 5 (Inglehart et al. 2014). The survey was conducted in 58 countries from 2005 to 2009, which were the closest available years to the 2010 Japanese population census. The respondents were asked to give their opinions on the statement "Being a housewife is just as fulfilling as working for pay," from the four levels of "Strongly agree" (attitude = 4, for this study), "Agree" (attitude = 3), "Disagree" (attitude = 2), and "Strongly disagree" (attitude = 1). Using this data, this study calculates the country-level social attitudes by averaging all responses for each home country. The second proxy for culture is female LFPR in source countries, collected from the database of World Bank Open Data. This variable is the proportion of the female population aged 15 and above who participates in the labor market, as reported by the ILO.

The description of the data is reported in Table 1. Details of variables are described in the Appendix.

5. Determinants of Labor Force Participation: Cultural and Economic Factors

Table 2 and Table 3 report the determinants of labor participation for female immigrants who have lived in Japan for five years or more. The first proxy for culture, positive attitude toward being a housewife than working outside home, has significant negative effects on female immigrants' LFPR. A one standard deviation increase in this variable is associated with a 4.2% decrease in the probability that a female immigrant participates in the labor force.

The second proxy for culture is female LFPR in the source country. We find that, controlling for other factors, female immigrants whose home country has a higher female LFPR have a higher probability of participating in the host country's labor force. A one standard deviation increase in home-country female LFPR is associated with a 1.8% increase in the probability that a female immigrant participates in the host country labor force.[3]

Interestingly, the husband's culture, including both the country-average attitudes toward female labor force participation and female LFPRs in husbands' source countries, also has significant effects, though the sizes of these effects are lower than the wife's own culture. A one standard deviation increase in the husbands' country of origin positive attitudes toward housework is associated with a 2.5% decrease in the probability that the wife participates in the labor force. Moreover, a one standard deviation increase in the husband's home-country female LFP is associated with a 1.0% increase in the probability that his wife joins the workforce. This provides new evidence on the role of the immigrant husband's source-country characteristics in the immigrant women's labor participation, differing from Blau (2011) who compared native U.S. women married to immigrants with immigrant women who are married to U.S. natives. In a low female-LFPR host country of Japan, there is a tradition of long working hours for the husband to support the whole family. The wife's labor participation in this case is affected largely by the husband's willingness to reduce his working hours to share the essential housework, which depends on the husband's

[3] In Fernandez and Fogli (2009), "A one standard deviation increase in female LFP in 1950 is associated with a 4.4 percentage point increase in the probability that a woman works full time."

culture. As a result, the husband's culture plays an important role in a host country with a low female LFPT.

In addition, it could be possible that women who are more willing to work may select husbands who share similar opinions. Nevertheless, as is discussed in the analysis of native wives in Blau (2011), the significant effect of the immigrant husband's culture "could be due to a direct effect of husbands on the behavior of wives or the selection of spouses who share similar values, but either way, again suggests an impact of culture" (Blau 2011, p. 56).

To confirm the role of culture, this study examines the determinants of male immigrants' LFPR in the host country, based on the standard labor supply model used for females. It is indicated that males' LFPR in the source country does not affect their LFPR in the host country[4]; this confirms that the effect of females' LFPR in source countries is due to the culture in the form of female attitude toward choosing between being a housewife and working outside home. In addition, it is shown that although the wife's education level has a significant negative effect on the husband's LFPR, the size of this effect is much smaller than the effect of the husband's level of education on the wife's LFPR (Table 3).

Finally, as was predicted by the theoretical model, the results indicate that education has a significant positive effect on female immigrants' LFPR. Education contributes to the female immigrants' potential wages from work, which increases the probability that the wage will be higher than her reservation wage. Therefore, the probability that the female migrant participates in the labor market increases. On the contrary, the husband's education, tenure, possession of full-time employment, and possession of a higher-paying job have significant negative effects. It is possible that these factors increase the husband's current wage, thus leading to a higher level of non-wage income for the wife, which increases the female immigrant's reservation wage and therefore decreases the probability that the wage provided in the host country will be higher than her reservation wage.

<Table 2. Determinants of Labor force Participation: Home-Country Attitudes>

<Table 3. Determinants of Labor Force Participation: Home-Country Female LFPR>

6. Assimilation of Female Immigrants in the Low Female-LFPR Country

Studies of immigrant assimilation widely use cross-sectional analysis, which examines groups divided by different numbers of years in-country since immigration (e.g. Grant 1999; Meng and Gregory 2005; Blau et al. 2011). This section compares the LFPRs of permanent immigrants who have lived in Japan for less than five years with immigrants who have lived in Japan for five years or more. Although the census data is limited in terms of providing more details regarding the years each immigrant has lived in Japan, the current information can provide reliable results as previous studies have found that assimilation generally occurs in the first 5–10 years after immigration (Duleep and Sanders 1993; Schoeni 1998; Özden and Neagu 2007; Blau et al. 2011). For instance, Blau et al. (2011) show that there is a large gap in the LFPR between

[4] Detailed result of the determinants of male immigrants' LFPR will be provided as required.

the groups that have been living in host country for up to five years and those that have been living in host country for six to ten years since immigration, while the gaps become much smaller or even disappear among the groups that have been living in host country for 6–10, 11–15, 16–20, and 21–30 years since migration.

Controlling for individual characteristics, the difference between these groups is generally attributed to the length of time required to adapt to economic conditions and opportunities in the host country and the length of time of being exposed to the tastes of the host country (Blau 1992; c.f. Antecol 2000). These factors reflect economic and cultural assimilation to the host country. Further, because studies have found that the economic assimilation process differs for immigrants from different source countries (Ferrer 2015; Schoeni 1998), this study examines the top 10 source countries' migrants separately.

<Table 4. Differences of Labor Force Participation Rate between Sample Sub-Groups:
0–4 years since immigration versus 5 years or more since immigration>

The econometric method in our analysis is the nonlinear decomposition of binary outcome differentials developed by Fairlie (2003). Table 4 reports our results. We find that female immigrants' LFPR is higher for the group that has lived in-country for more than five years for all sample countries, except for Brazil. Individual characteristics only explain a small part of the difference. The remaining unexplained part, which we interpret as assimilation, contributes significantly to the difference.

The effect of assimilation, overall, is the sum of the effects of cultural assimilation and economic assimilation. In previous studies, which were conducted in high female-LFPR host countries, cultural assimilation and economic assimilation both had positive effects on female migrants' labor participation; thus, it was difficult to determine which effect was larger. However, in this study, cultural assimilation has a negative effect on female migrants' labor force participation, while the effect of economic assimilation is positive. The total effect of assimilation indicates the relative effect size of cultural and economic assimilation.

Because the total effect of assimilation is positive, for most immigrants in Japan, the negative effect of cultural assimilation should be smaller than the positive effect of economic assimilation. This could be due to birth-country culture playing a persistent role in determining female labor force participation, which leads to migrants receiving a smaller effect from the host-country culture, such as negative attitudes toward female migrants' labor force participation and poor working environment for women in Japan, compared to the positive effects of economic factors, such as the accumulation of knowledge regarding the customs, language, and job opportunities in the host country.

The exception to this general trend is Brazil. This is not surprising, as most Brazilian immigrants to Japan have Japanese parents or grandparents. A large number of Japanese migrated to Brazil for historical reasons, and their children or grandchildren were allowed to move back to Japan based on Japanese immigration policies. Because of their Japanese ancestry, it seems more likely that Brazilian immigrants to Japan will adhere to Japanese cultural norms about female workforce participation.Although there could be some

Brazilian immigrants who are not of Japanese descent, their number would be very small because of the considerable geographic distance between Japan and Brazil, which largely increases migration cost and reduces economic incentives for migrating.

7. Concluding Remarks

This work provides empirical evidence from a host country with a generally *lower* female LFPR than migrants' source countries, which has been absent in previous studies. This allows us to make a unique contribution to the study of migration and females' LFPR. First, our results indicate that culture plays an important role in determining labor force participation, which supports the findings in previous studies from relatively high female-LFPR host countries. New evidence regarding the role of the immigrant husband's source country's culture in immigrant wife's labor participation has also been provided. For female immigrants who have lived in Japan for five years or more, the two widely used proxies of culture, attitudes toward female labor participation and females' LFPRs in source countries, significantly affect female immigrants' labor force participation in the host country. Both the wife's and husband's source-country culture have significant effects, while the size is larger for the wife's than it is for the husband's. Second, controlling for individual characteristics, the study finds that female immigrants' LFPR does not decrease as compared with their first few years in Japan, even though Japan has a lower female LFPR than their source countries. On the contrary, female migrant LFPRs are higher after five years than they are in the first years after arrival. We interpret this to mean that cultural assimilation has a smaller negative effect (i.e., through sharing the host country's negative attitudes toward women working) than the economic assimilation's positive effect (i.e., adapting to economic opportunities and local labor markets). It is suggested that birth-country culture plays a large and persistent role in determining female labor force participation, which leads to cultural assimilation having less significant effects than economic assimilation.

Culture's important role in determining female LFPR may to some extent explain why some economic policies do not achieve their expected results in improving female LFPR. In Japan, major policies on women's employment include the Equal Employment Opportunity Law (EEOL) for men and women, along with significant subsidies to encourage women's participation in the labor market. However, Abe (2011) found that regular employment among women did not increase after the enactment of EEOL. Asai (2014) likewise found that expanding subsidies to women who return to work after childbirth does not increase women's probability of remaining employed after childbirth. The reason for this could be that, in Japan, the role of economic incentives in determining women's decisions to work is smaller than that of other factors such as cultural and social norms. Indeed, as is shown in our study, female immigrants who come from cultures different from those of the native Japanese tend to have higher rates of participation in the Japanese labor market after a long period of settlement. Migrants from some countries, such as the United States and Indonesia, have an even higher LFPR than native females after having lived in Japan for five years or more. As a result, in countries where policies that provide economic incentives have failed to improve women's LFPR, efforts toward influencing cultural factors, such as changing attitudes toward women joining the workforce, may help solve the problem.

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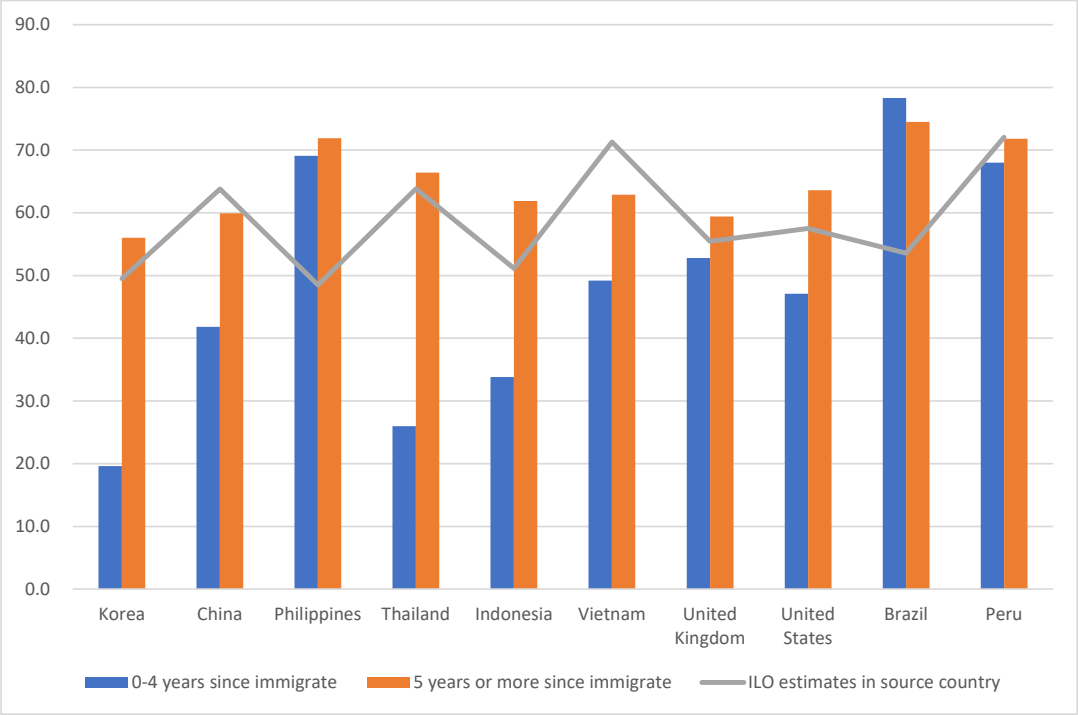
Fig. 1 Female Labor Force Participation Rate in 2010



Note: ILO estimate in a source country is the percentage of female population aged 15 years and older.

Table 1 (1). Summary Statistics of Total Sample

	Obs.	Mean	Std. Dev.	Min	Max
Labor force participation	1352332	0.74	0.44	0	1
Home- country female LFPR	1083805	55.99	8.89	10.05	87.12
Spouse's home- country female LFPR	633721	55.10	9.02	10.05	87.12
Home-country attitudes	1309903	3.01	0.30	1.84	3.55
Spouse's home-country attitudes	875824	3.03	0.29	1.84	3.55
Education	1097621	2.42	1.08	1	4
0–4 years since immigration	1613707	0.18	0.39	0	1
Married	1613707	0.68	0.47	0	1
Female	1613707	0.51	0.50	0	1
Tenure (potential)	1097425	30.37	15.34	0	98
Spouse's education	790120	2.51	1.07	1	4
Spouse's tenure	790120	32.17	13.98	5	98
Spouse's high-paid job	1012734	0.11	0.31	0	1
Spouse's full-time employment	485482	0.71	0.45	0	1
Natives living together	1613707	0.95	1.32	0	29
Kids under the age of six	1613707	0.21	0.51	0	8
Kids under the age of twelve	1613707	0.39	0.73	0	11
Families aged 85 and older	1613707	0.02	0.14	0	7
Live with parents	1613707	0.07	0.25	0	1
House owner	1613707	0.34	0.47	0	1
Population density of residential area	1613707	11.59	3.76	1	19
Aged 15 to 24	1613707	0.09	0.29	0	1
Aged 25 to 34	1613707	0.23	0.42	0	1
Aged 35 to 44	1613707	0.23	0.42	0	1
Aged 45 to 54	1613707	0.18	0.38	0	1

Table 1 (2). Summary statistics of Female Sample (five years or more since immigration)[a]

	Obs.	Mean	Std. Dev.	Min	Max
Labor force participation	100955	0.62	0.49	0	1
Home-country female LFPR	113054	55.95	9.04	10.05	87.12
Spouse's home-country female LFPR	113237	55.79	9.31	10.05	87.12
Home-country attitudes	103108	2.97	0.35	1.84	3.55
Spouse's home-country attitudes	103956	2.97	0.35	1.84	3.55
Education	77012	2.78	0.90	2	4
0–4 years since immigrate	122177	0.00	0.00	0	0
Married	122177	1.00	0.00	1	1
Female	122177	1.00	0.00	1	1
Tenure (potential)	77012	28.14	10.99	5	51
Spouse's education	78110	2.83	1.06	1	4
Spouse's tenure	78110	30.82	11.69	5	77
Spouse's high-paid job	122177	0.15	0.35	0	1
Spouse's full-time employment	66842	0.86	0.35	0	1
Natives living together	122177	0.05	0.29	0	13
Kids under the age of six	122177	0.31	0.59	0	8
Kids under the age of twelve	122177	0.59	0.83	0	9
Families aged 85 and older	122177	0.01	0.08	0	2
Live with parents	122177	0.04	0.20	0	1
House owner	122177	0.36	0.48	0	1
Population density of residential area	122177	12.03	3.48	1	19
Aged 15 to 24	122177	0.03	0.17	0	1
Aged 25 to 34	122177	0.29	0.45	0	1
Aged 35 to 44	122177	0.31	0.46	0	1
Aged 45 to 54	122177	0.23	0.42	0	1

[a] married, not attending school, living with spouse, aged 15–64, foreign couples

Table 1 (3). Summary Statistics of Female Sample (0–4 years since immigration) [a]

	Obs.	Mean	Std. Dev.	Min	Max
Labor force participation	23143	0.44	0.50	0	1
Home-country female LFPR	24257	56.29	11.46	10.05	87.12
Spouse's home-country female LFPR	24285	56.22	11.54	10.05	87.12
Home-country attitudes	20802	2.85	0.27	1.84	3.55
Spouse's home-country attitudes	20939	2.86	0.27	1.84	3.55
Education	18772	3.23	0.91	2	4
0–4 years since immigrate	24494	1.00	0.00	1	1
Married	24494	1.00	0.00	1	1
Female	24494	1.00	0.00	1	1
Tenure (potential)	18772	17.52	8.27	5	51
Spouse's education	18453	3.26	0.99	1	4
Spouse's tenure	18453	20.34	8.99	5	75
Spouse's high-paid job	24494	0.28	0.45	0	1
Spouse's full-time employment	18127	0.84	0.37	0	1
Natives living together	24494	0.01	0.13	0	5
Kids under the age of six	24494	0.38	0.61	0	4
Kids under the age of twelve	24494	0.55	0.77	0	8
Families aged 85 and older	24494	0.00	0.02	0	1
Live with parents	24494	0.02	0.12	0	1
House owner	24494	0.05	0.22	0	1
Population density of residential area	24494	11.97	3.44	1	19
Aged 15 to 24	24494	0.11	0.31	0	1
Aged 25 to 34	24494	0.57	0.49	0	1
Aged 35 to 44	24494	0.22	0.42	0	1
Aged 45 to 54	24494	0.08	0.26	0	1

[a] married, not attending school, living with spouse, aged 15–64, foreign couples

Table 2. Determinants of Female Labor Force Participation: Home-Country Attitudes (marginal effect)

VARIABLES	(1)	(2)	(3)	(4)
Home-country attitudes	−0.1220***	−0.1200***	−0.0942**	−0.0936**
	(0.0265)	(0.0265)	(0.0366)	(0.0386)
Spouse's home-country attitudes	−0.0676**	−0.0663**	−0.0440	−0.0419
	(0.0265)	(0.0266)	(0.0374)	(0.0404)
Education	0.0305***	0.0330***	0.0690***	0.0735***
	(0.0032)	(0.0033)	(0.0167)	(0.0176)
Tenure	0.0002	0.00002	0.00797*	0.0069
	(0.0008)	(0.0008)	(0.0043)	(0.0045)
Spouse's education	−0.0406***	−0.0382***	−0.0376***	−0.0428***
	(0.0026)	(0.0026)	(0.0140)	(0.0147)
Spouse's tenure	−0.0025***	−0.0024***	−0.0027*	−0.0031*
	(0.0004)	(0.0004)	(0.0016)	(0.0017)
Spouse's high-paid job	−0.0562***	−0.0542***	−0.0428	−0.0477
	(0.0052)	(0.0052)	(0.0284)	(0.0300)
Spouse's full-time employment	−0.0493***	−0.0514***	−0.0535**	−0.0555**
	(0.0042)	(0.0043)	(0.0235)	(0.0246)
Natives living together	0.0288***	0.0299***	−0.0017	0.0301
	(0.0068)	(0.0069)	(0.0348)	(0.0389)
Kids under the age of six	−0.0853***	−0.0857***	−0.0892***	−0.1000***
	(0.0050)	(0.0050)	(0.0241)	(0.0252)
Kids under the age of twelve	−0.0398***	−0.0404***	−0.0464***	−0.0438**
	(0.0036)	(0.0037)	(0.0178)	(0.0188)
Families aged 85 and older	−0.0380*	−0.0397*	−0.2550	−0.1720
	(0.0222)	(0.0222)	(0.2080)	(0.2160)
Live with parents	0.0637***	0.0628***	0.1210**	0.0928
	(0.0092)	(0.0092)	(0.0527)	(0.0579)
House owner	0.0637***	0.0635***	0.0427*	0.0575**
	(0.0044)	(0.0044)	(0.0242)	(0.0257)
Population density of residential area	−0.0035***	−0.0051***	0.0007	−0.0007
	(0.0006)	(0.0008)	(0.0033)	(0.0048)

Table 2. (continued)

VARIABLES	(1)	(2)	(3)	(4)
Aged 15 to 24	−0.0411	−0.0445	0.2420***	0.2270**
	(0.0318)	(0.0320)	(0.0919)	(0.1020)
Aged 25 to 34	0.0147	0.0124	0.2260**	0.2090*
	(0.0203)	(0.0204)	(0.1090)	(0.1160)
Aged 35 to 44	0.0422***	0.0410***	0.1840**	0.1710*
	(0.0144)	(0.0145)	(0.0885)	(0.0940)
Aged 45 to 54	0.0492***	0.0481***	0.0936	0.0928
(reference group: aged 55–64)	(0.0086)	(0.0087)	(0.0627)	(0.0658)
City dummy	No	Yes	No	Yes
Samples	Total	Total	Couples of different nationalities	Couples of different nationalities
Observations	68,150	68,040	2,063	1,996
Loglikelihood	−43699	−43433	−1284	−1198

* p < 0.1, ** p < 0.05, *** p < 0.01; standard error in parentheses

Table 3. Determinants of Female Labor Force Participation: Home-Country Female LFPR (marginal effect)

VARIABLES	(1)	(2)	(3)	(4)
Home-country LFPR	0.0019***	0.0020***	0.0020**	0.0023**
	(0.0005)	(0.0005)	(0.0009)	(0.0009)
Spouse's home-country LFPR	0.0011**	0.0011**	0.0016**	0.0019***
	(0.0005)	(0.0005)	(0.0006)	(0.0007)
Education	0.0354***	0.0385***	0.0664***	0.0719***
	(0.0031)	(0.0031)	(0.0124)	(0.0129)
Tenure	0.0003	0.0002	0.00782**	0.00734**
	(0.0008)	(0.0008)	(0.0032)	(0.0033)
Spouse's education	−0.0491***	−0.0449***	−0.0350***	−0.0393***
	(0.0024)	(0.0024)	(0.0100)	(0.0105)
Spouse's tenure	−0.0036***	−0.0034***	−0.0026**	−0.0027**
	(0.0004)	(0.0004)	(0.0011)	(0.0012)
Spouse's high-paid job	−0.0730***	−0.0681***	−0.0502**	−0.0528**
	(0.0050)	(0.0050)	(0.0238)	(0.0249)
Spouse's full-time employment	−0.0361***	−0.0409***	−0.0377**	−0.0352*
	(0.0040)	(0.0041)	(0.0178)	(0.0185)
Natives living together	0.0322***	0.0323***	0.0300	0.0449*
	(0.0063)	(0.0063)	(0.0226)	(0.0243)
Kids under the age of six	−0.0898***	−0.0891***	−0.0762***	−0.0825***
	(0.0047)	(0.0047)	(0.0181)	(0.0188)
Kids under the age of twelve	−0.0428***	−0.0435***	−0.0449***	−0.0425***
	(0.0034)	(0.0035)	(0.0136)	(0.0142)
Families aged 85 and older	−0.0487**	−0.0494**	−0.1600	−0.1460
	(0.0218)	(0.0219)	(0.1860)	(0.1860)
Live with parents	0.0654***	0.0629***	0.0520	0.0277
	(0.0088)	(0.0089)	(0.0448)	(0.0481)
House owner	0.0253***	0.0304***	0.0184	0.0226

	(0.0040)	(0.0041)	(0.0193)	(0.0202)
Population density of residential area	−0.0057***	−0.0068***	0.0004	0.0020
	(0.0005)	(0.0008)	(0.0025)	(0.0038)

Table 3. (continued)

VARIABLES	(1)	(2)	(3)	(4)
Aged 15 to 24	−0.0284	−0.0319	0.2180***	0.1960**
	(0.0297)	(0.0299)	(0.0819)	(0.0913)
Aged 25 to 34	0.0294	0.0285	0.2040**	0.1920**
	(0.0193)	(0.0194)	(0.0867)	(0.0901)
Aged 35 to 44	0.0609***	0.0599***	0.1880***	0.1740**
	(0.0137)	(0.0138)	(0.0702)	(0.0729)
Aged 45 to 54	0.0615***	0.0600***	0.1110**	0.1060**
(reference: aged 55-64)	(0.0083)	(0.0083)	(0.0510)	(0.0528)
City dummy	No	Yes	No	Yes
Samples	Total	Total	Couples of different nationalities	Couples of different nationalities
Observations	73,914	73,820	3,482	3,419
Loglikelihood	−47523	−47177	−2195	−2096

* p < 0.1, ** p < 0.05, *** p < 0.01; standard error in parentheses.

Table 4. Differences of Labor Force Participation Rate between Sample Sub-Groups: 0–4 years since immigration versus 5 years or more since immigration

Source country	(1) 0–4 years since immigrate	(2) 5 years or more since immigrate	Difference: (2)-(1)	Explained	Matched sample
Korea	19.6	56.0	36.4	11.7	2091
China	41.8	59.9	18.1	1.04	6283
Philippines	69.1	71.9	2.79	−0.782	967
Thailand	26.0	66.4	40.5	5.66	104
Indonesia	33.8	61.9	28.1	4.31	198
Vietnam	49.2	62.9	13.6	2.65	321
United Kingdom	52.8	59.4	6.64	−2.59	127
United States	47.1	63.6	16.5	−0.423	681
Brazil	78.3	74.5	−3.86	−0.569	2737
Peru	68.0	71.8	3.82	1.37	319

Appendix 1.

Table A1. Description of Data Used for Each Variable

Variables	Details
Labor force participation	Participate(employed + unemployed) = 1, not participate = 0
Home-country female LFPR	ILO estimates, country level
Spouse's home-country female LFPR	ILO estimates, country level
Home-country attitudes	Country-average positive attitude toward being a housewife than working outside home in wife's source country
Spouse's home-country attitudes	Country-average positive attitude toward being a housewife than working outside home in husband's source country
Education	Education level: primary school or junior high school = 1, senior high school=2, two-year college or technical college = 3, four-year university and higher=4
0–4 years since immigrate	0–4 years since immigrate = 1, 5 years or more since immigrate = 0
Married	Married = 1, unmarried = 0
Female	Female = 1, male = 0
Tenure (potential)	Potential tenure = age-5-years in school
Spouse's education	Spouse's education level: primary school or junior high school = 1, senior high school = 2, two-year college or technical college = 3, four-year university and higher = 4
Spouse's tenure	Spouse's potential tenure = age-5-years in school
Spouse's high-paid job	Managerial or professional or technical occupations = 1, others = 0
Spouse's full-time employment	Full-time employment = 1, others =0
Natives living together	The number of natives who live together
Kids under the age of six	The number of kids under the age of six
Kids under the age of twelve	The number of kids under the age of twelve
Families aged 85 and older	The number of families aged 85 and older
Live with parents	Live with parents = 1, otherwise = 0

Table A1. (continued)

Variables	Details

House owner	House owner = 1, otherwise = 0
Population density of residential area	Ranking from the highest population density of residential area
Aged 15 to 24	Aged 15 to 24 = 1, otherwise = 0
Aged 25 to 34	Aged 25 to 34 = 1, otherwise = 0
Aged 35 to 44	Aged 35 to 44 = 1, otherwise = 0
Aged 45 to 54	Aged 45 to 54 = 1, otherwise = 0

Appendix 2. [5]

We conduct additional analysis, which compares couples sourced from the same country and those sourced from different countries, and examines the assimilation process of immigrants. The results are consistent with the major findings of the study. Details of the results are reported in Tables A2 (1)-(9).

Table A2 (1). Summary statistics of immigrant women who migrated for 5 years or more: Husbands sourced from the same country

	Obs	Mean	Std. dev.	Min	Max
LFP	39011	0.61	0.49	0	1
Source - country attitudes	39011	2.85	0.31	1.84	3.55
Source - country LFP rate	39011	0.58	0.08	0.23	0.74
Education	39011	2.65	1.09	1	4
Age	39011	35.05	5.63	16	44
Spouse's education	39011	2.74	1.15	1	4
Spouse's age	39011	37.71	6.90	15	84
Spouse's high-paid job	39011	0.20	0.40	0	1
Spouse's full-time employment	39011	0.79	0.41	0	1
Kids younger than 6	39011	0.51	0.67	0	5
Kids aged 6-12	39011	0.44	0.66	0	4
Families aged 85 and older	39011	0.00	0.03	0	1
Living with parents	39011	0.04	0.18	0	1
House owner	39011	0.28	0.45	0	1
Local population	39011	11.61	3.47	1	19

[5] This analysis is supported by JSPS KAKENHI Grant Number 23K01432.

Table A2 (2). Summary statistics of immigrant women who migrated for 5 years or more: Husbands sourced from different countries

	Obs	Mean	Std. dev.	Min	Max
LFP	1717	0.63	0.48	0	1
Source - country attitudes	1717	2.75	0.30	1.84	3.48
Spouse's source - country attitudes	1717	2.80	0.30	2.05	3.40
Source - country LFP rate	1717	0.60	0.09	0.26	0.74
Spouse's source - country LFP rate	1717	0.57	0.10	0.26	0.72
Education	1717	2.65	1.13	1	4
Age	1717	34.44	5.49	18	44
Spouse's education	1717	2.67	1.16	1	4
Spouse's age	1717	37.60	7.79	19	74
Spouse's high-paid job	1717	0.21	0.41	0	1
Spouse's full-time employment	1717	0.77	0.42	0	1
Kids younger than 6	1717	0.64	0.72	0	4
Kids aged 6-12	1717	0.39	0.64	0	3
Families aged 85 and older	1717	0.00	0.03	0	1
Living with parents	1717	0.05	0.21	0	1
House owner	1717	0.24	0.43	0	1
Local population	1717	11.16	3.26	3	19

Table A2 (3). Summary statistics of immigrant women who migrated for 0–4 years: Husbands sourced from the same country

	Obs	Mean	Std. dev.	Min	Max
LFP	13724	0.47	0.50	0	1
Source - country attitudes	13724	2.83	0.27	1.84	3.55
Source - country LFP rate	13724	0.58	0.09	0.15	0.74
Education	13724	2.97	1.12	1	4
Age	13724	31.37	5.70	17	44
Spouse’s education	13724	3.08	1.14	1	4
Spouse’s age	13724	33.92	6.59	17	92
Spouse’s high-paid job	13724	0.35	0.48	0	1
Spouse’s full-time employment	13724	0.81	0.39	0	1
Kids younger than 6	13724	0.40	0.61	0	4
Kids aged 6-12	13724	0.20	0.47	0	3
Families aged 85 and older	13724	0.00	0.02	0	1
Living with parents	13724	0.02	0.13	0	1
House owner	13724	0.05	0.23	0	1
Local population	13724	11.92	3.60	1	19

Table A2 (4). Summary statistics of immigrant women who migrated for 0–4 years or more: Husbands sourced from different countries

	Obs	Mean	Std. dev.	Min	Max
LFP	528	0.44	0.50	0	1
Source - country attitudes	528	2.82	0.31	1.84	3.48
Spouse's source - country attitudes	528	2.86	0.32	1.84	3.55
Source - country LFP rate	528	0.58	0.09	0.26	0.74
Spouse's source - country LFP rate	528	0.56	0.08	0.23	0.74
Education	528	3.18	1.03	1	4
Age	528	32.48	5.67	18	44
Spouse's education	528	3.31	1.01	1	4
Spouse's age	528	36.99	8.55	19	74
Spouse's high-paid job	528	0.40	0.49	0	1
Spouse's full-time employment	528	0.79	0.41	0	1
Kids younger than 6	528	0.48	0.66	0	3
Kids aged 6-12	528	0.17	0.49	0	3
Families aged 85 and older	528	0.00	0.00	0	0
Living with parents	528	0.02	0.13	0	1
House owner	528	0.09	0.28	0	1
Local population	528	11.82	3.49	2	19

Table A2 (5). Determinants of female LFP: Source-country attitudes (marginal effect)

	Couples sourced from the same countries		Couples sourced from different countries	
	(1)	(1)	(2)	(2)
Source - country attitudes	-0.268***	-0.267***	-0.0484	-0.0561
	(0.00923)	(0.00980)	(0.0434)	(0.0467)
Spouse's source - country attitudes			-0.0129	-0.0266
			(0.0443)	(0.0484)
Education	0.0334***	0.0357***	0.0320**	0.0379**
	(0.00350)	(0.00354)	(0.0150)	(0.0159)
Age	0.00404***	0.00404***	0.00393	0.00414
	(0.000724)	(0.000729)	(0.00273)	(0.00291)
Spouse's education	-0.0290***	-0.0271***	-0.0263*	-0.0259
	(0.00344)	(0.00348)	(0.0151)	(0.0160)
Spouse's age	-0.00284***	-0.00281***	-0.00321*	-0.00374*
	(0.000585)	(0.000589)	(0.00190)	(0.00201)
Spouse's high-paid job	-0.0815***	-0.0801***	-0.0578*	-0.0605
	(0.00732)	(0.00739)	(0.0350)	(0.0371)
Spouse's full-time employment	-0.0548***	-0.0580***	-0.0495*	-0.0508*
	(0.00631)	(0.00637)	(0.0282)	(0.0297)
Kids younger than 6	-0.135***	-0.136***	-0.161***	-0.168***
	(0.00397)	(0.00399)	(0.0172)	(0.0183)
Kids aged 6-12	-0.0331***	-0.0334***	-0.0479**	-0.0513**
	(0.00403)	(0.00406)	(0.0193)	(0.0204)
Families aged 85 and older	-0.126	-0.134	-0.274	-0.246
	(0.0903)	(0.0902)	(0.363)	(0.377)
Living with parents	0.0726***	0.0747***	0.119**	0.108**
	(0.0133)	(0.0134)	(0.0511)	(0.0546)
House owner	0.0743***	0.0735***	0.0487*	0.0737**
	(0.00599)	(0.00606)	(0.0285)	(0.0305)
Local population	-0.00290***	-0.00444***	0.00169	0.00128
	(0.000760)	(0.00113)	(0.00382)	(0.00577)
Regional dummies	No	Yes	No	Yes
Observations	39,011	38,944	1,717	1,661
Loglikelihood	-24489	-24316	-1066	-988.5

Notes: *** p<0.01, ** p<0.05, * p<0.1. Standard errors in parentheses.

Table A2 (6). Determinants of female LFP: Source -country female LFP rate (marginal effect)

	Couples sourced from	Couples sourced from

	the same countries		different countries	
	(1)	(1)	(2)	(2)
Source - country LFP rate	0.338***	0.376***	0.257***	0.276***
	(0.0279)	(0.0284)	(0.0952)	(0.0993)
Spouse's source - country LFP rate			0.138*	0.174**
			(0.0715)	(0.0750)
Education	0.0291***	0.0329***	0.0373***	0.0440***
	(0.00325)	(0.00329)	(0.0108)	(0.0114)
Age	0.00346***	0.00359***	0.00624***	0.00597***
	(0.000669)	(0.000674)	(0.00192)	(0.00200)
Spouse's education	-0.0422***	-0.0370***	-0.0208*	-0.0231**
	(0.00318)	(0.00323)	(0.0108)	(0.0114)
Spouse's age	-0.00318***	-0.00308***	-0.00187	-0.00215
	(0.000542)	(0.000546)	(0.00135)	(0.00140)
Spouse's high-paid job	-0.100***	-0.0951***	-0.0527*	-0.0535*
	(0.00704)	(0.00711)	(0.0289)	(0.0304)
Spouse's full-time employment	-0.0438***	-0.0508***	-0.0426**	-0.0334
	(0.00591)	(0.00596)	(0.0205)	(0.0214)
Kids younger than 6	-0.145***	-0.145***	-0.140***	-0.146***
	(0.00372)	(0.00374)	(0.0128)	(0.0133)
Kids aged 6-12	-0.0422***	-0.0419***	-0.0419***	-0.0409***
	(0.00381)	(0.00384)	(0.0141)	(0.0147)
Families aged 85 and older	-0.172**	-0.173**	-0.355	-0.333
	(0.0839)	(0.0842)	(0.262)	(0.274)
Living with parents	0.0807***	0.0793***	0.0752*	0.0667
	(0.0125)	(0.0126)	(0.0435)	(0.0456)
House owner	0.0315***	0.0374***	0.0209	0.0270
	(0.00572)	(0.00580)	(0.0225)	(0.0236)
Local population	-0.00620***	-0.00773***	0.00128	0.00285
	(0.000718)	(0.00108)	(0.00285)	(0.00436)
Regional dummies	No	Yes	No	Yes
Observations	42,859	42,793	3,044	2,985
Loglikelihood	-27095	-26836	-1933	-1842

Notes: *** p<0.01, ** p<0.05, * p<0.1. Standard errors in parentheses.

Table A2 (7). Confirmation of the role of husband's culture: Native wives and migrant husbands

	(1)	(2)	(3)	(4)
Spouse's source-country attitudes	-0.0968***	-0.0991***		
	(0.00896)	(0.00911)		

Spouse's source-country LFP rate			0.0849***	0.0828***
			(0.0254)	(0.0257)
Education	0.0746***	0.0776***	0.0781***	0.0808***
	(0.00373)	(0.00378)	(0.00339)	(0.00344)
Age	0.00807***	0.00808***	0.00903***	0.00908***
	(0.000821)	(0.000827)	(0.000756)	(0.000761)
Spouse's education	-0.0394***	-0.0379***	-0.0323***	-0.0312***
	(0.00335)	(0.00340)	(0.00305)	(0.00309)
Spouse's age	-0.00541***	-0.00524***	-0.00599***	-0.00587***
	(0.000653)	(0.000659)	(0.000608)	(0.000613)
Spouse's high-paid job	-0.0114	-0.0114	-0.0294***	-0.0287***
	(0.00699)	(0.00706)	(0.00663)	(0.00669)
Spouse's full-time employment	-0.0857***	-0.0853***	-0.0941***	-0.0942***
	(0.00665)	(0.00671)	(0.00596)	(0.00601)
Kids younger than 6	-0.179***	-0.181***	-0.170***	-0.172***
	(0.00405)	(0.00409)	(0.00372)	(0.00375)
Kids aged 6-12	-0.0306***	-0.0318***	-0.0253***	-0.0260***
	(0.00455)	(0.00459)	(0.00417)	(0.00420)
Families aged 85 and older	-0.0154	0.000417	-0.0376	-0.0219
	(0.0852)	(0.0854)	(0.0814)	(0.0818)
Living with parents	0.0419***	0.0386**	0.0412***	0.0386***
	(0.0158)	(0.0160)	(0.0146)	(0.0148)
House owner	0.0452***	0.0455***	0.0368***	0.0369***
	(0.00622)	(0.00629)	(0.00577)	(0.00583)
Local population	-0.00480***	-0.00677***	-0.00429***	-0.00544***
	(0.000829)	(0.00125)	(0.000765)	(0.00115)
Regional dummies	No	Yes	No	Yes
Observations	29,968	29,853	34,631	34,513
Loglikelihood	-18514	-18344	-21354	-21182

Notes: *** p<0.01, ** p<0.05, * p<0.1. Standard errors in parentheses.

Table A2 (8). Cultural effects for groups of different migration periods and age categories

	0–4 years since immigration		5 years or more since immigration	
	(1)	(2)	(1)	(2)
Result of women group aged	-0.331***	-0.376***	-0.201**	-0.112

16-24				
	(0.0886)	(0.102)	(0.0847)	(0.0990)
Result of women group aged 25-34	-0.330***	-0.322***	-0.288***	-0.296***
	(0.0269)	(0.0278)	(0.0167)	(0.0176)
Result of women group aged 35-44	-0.429***	-0.382***	-0.254***	-0.249***
	(0.0320)	(0.0341)	(0.0112)	(0.0120)

Notes: *** p<0.01, ** p<0.05, * p<0.1. Standard errors in parentheses.

Table A2 (9). Difference of LFP between different migration periods:
0–4 years since immigration versus 5 years or more since immigration

	(1) Major result		(2) Robustness check
	Estimated immigrants' LFP probabilities compared to natives, m_i		Estimated effect of migration period, p_i
	0–4 years since immigration	5 years or more since immigration	
Korea	-0.356***	-0.0979***	0.242***
	(0.0112)	(0.00637)	(0.00833)
China	-0.152***	0.0382***	0.145***
	(0.00734)	(0.00494)	(0.00499)
Philippines	0.137***	0.161***	0.0906***
	(0.0167)	(0.00993)	(0.00750)
Thailand	-0.309***	0.0805**	0.147***
	(0.0518)	(0.0344)	(0.0158)
Indonesia	-0.195***	0.0507*	0.196***
	(0.0381)	(0.0299)	(0.0274)
Vietnam	-0.0654**	0.123***	0.146***
	(0.0283)	(0.0159)	(0.0260)
United Kingdom	-0.00573	-0.119	0.156**
	(0.0596)	(0.0923)	(0.0748)
United States	-0.0184	-0.0118	0.136***
	(0.0264)	(0.0432)	(0.0367)
Brazil	0.177***	0.135***	-0.0317***
	(0.00907)	(0.00563)	(0.00949)
Peru	0.0608**	0.118***	0.0654**
	(0.0282)	(0.0107)	(0.0284)

Notes: *** p<0.01, ** p<0.05, * p<0.1. Standard errors in parentheses.

Appendix 3. [6]

Note that source-country culture could have little effect on foreign residents who were born in Japan (Group (1)) and those who live together with foreign-born parents in Japan (Group (2)). The results are shown in Tables A3(1) and A3(2).

Table A3(1). Source-country cultural effect on the two groups

	Group (1)	Group (1)	Group (2)	Group (2)
Source - country attitudes	-0.0253		0.00986	
	(0.0695)		(0.0494)	
Source - country LFP rate		-0.00826**		-0.00463**
		(0.00368)		(0.00181)
Education	0.0638***	0.0654***	0.000722	-0.00395
	(0.0146)	(0.0145)	(0.0164)	(0.0157)
Age	0.00288	0.00270	0.00956***	0.00883***
	(0.00229)	(0.00221)	(0.00277)	(0.00273)
Spouse's education	-0.0267**	-0.0275**	-0.00168	-0.000761
	(0.0122)	(0.0121)	(0.0165)	(0.0159)
Spouse's age	-0.00159	-0.00143	-0.00419	-0.00387
	(0.00204)	(0.00197)	(0.00272)	(0.00268)
Spouse's high-paid job	0.0162	0.0127	0.0350	0.0294
	(0.0262)	(0.0262)	(0.0471)	(0.0488)
Spouse's full-time employment	-0.112	-0.113		
	(0.143)	(0.143)		
Kids younger than 6	-0.105***	-0.106***	-0.0631***	-0.0692***
	(0.0165)	(0.0165)	(0.0160)	(0.0158)
Kids aged 6-12	-0.0185	-0.0221	0.00295	-0.00143
	(0.0162)	(0.0161)	(0.0220)	(0.0220)
Family members aged 85 and older	0.0835	0.0869	0.00147	-0.00975
	(0.0613)	(0.0606)	(0.0509)	(0.0512)
House owner	0.0391	0.0352	0.0543	0.0409
	(0.0251)	(0.0249)	(0.0333)	(0.0301)
Local population	-0.0108***	-0.0112***	-0.00170	-0.00116
	(0.00340)	(0.00339)	(0.00389)	(0.00387)
Regional dummies	Yes	Yes	Yes	Yes
Observations	2,032	2,060	794	842
Loglikelihood	-1224	-1241	-307.1	-326.2

Notes: *** p<0.01, ** p<0.05, * p<0.1. Standard errors in parentheses.

[6] This analysis is supported by JSPS KAKENHI Grant Number 23K01432.

Table A3(2). LFP of the two groups with comparison to natives

	Group (1)	Group (1)	Group (2)	Group (2)
Reference: natives				
Foreign residents	-0.0308	-0.0439	-0.0252	-0.0365
	(0.0800)	(0.0822)	(0.0768)	(0.0789)
Mothers of foreign residents			0.0977***	0.0964***
			(0.00636)	(0.00644)
Education	0.0688***	0.0686***	0.0690***	0.0688***
	(0.00358)	(0.00364)	(0.00315)	(0.00320)
Age	0.000661	0.000596	0.000558	0.000498
	(0.000511)	(0.000516)	(0.000459)	(0.000462)
Spouse's education	-0.0261***	-0.0255***	-0.0227***	-0.0221***
	(0.00329)	(0.00333)	(0.00297)	(0.00300)
Spouse's age	-0.000319	-0.000216	-0.000661	-0.000596
	(0.000465)	(0.000470)	(0.000417)	(0.000420)
Spouse's high-paid job	-0.00478	-0.00472	-0.00259	-0.00264
	(0.00668)	(0.00675)	(0.00615)	(0.00621)
Spouse's full-time employment	0.0148	0.0228	-0.0165	-0.0119
	(0.0464)	(0.0474)	(0.0339)	(0.0345)
Kids younger than 6	-0.132***	-0.132***	-0.126***	-0.126***
	(0.00424)	(0.00429)	(0.00384)	(0.00387)
Kids aged 6-12	-0.0122***	-0.0120***	-0.0131***	-0.0132***
	(0.00459)	(0.00465)	(0.00420)	(0.00425)
Family members aged 85 and older	-0.0565**	-0.0581**	-0.0533**	-0.0542**
	(0.0241)	(0.0244)	(0.0225)	(0.0227)
House owner	0.0355***	0.0360***	0.0262***	0.0263***
	(0.00589)	(0.00597)	(0.00537)	(0.00543)
Local population	-0.00100	-0.00357***	-0.00135*	-0.00359***
	(0.000767)	(0.00123)	(0.000692)	(0.00110)
Regional dummies	No	Yes	No	Yes
Observations	24,263	24,115	28,817	28,674
Loglikelihood	-13296	-13146	-15263	-15114

Notes: *** p<0.01, ** p<0.05, * p<0.1. Standard errors in parentheses.