A Multi-Level Analysis of the Effects of Age on the Female Employment Rates in Japan and Taiwan

Abstract

In family sociology, particularly in Asian countries, there has been a critical question on how and why the women's age affects their employment rates. According to previous findings, the effect of age on the female employment rate in Japan is described as an "M shape." The rate increases before 30, declines after that, increases until 60 or 65, and finally decreases again. On the contrary, in Taiwan, the relationship between women's age and employment rate is an inverse U-shape. In Taiwan, the female employment rate hits the plateau at a certain point and declines after that, as has been found in the United States. How do we explain the different patterns between the two countries?

Some scholars argue that the unique pattern in Japan is a result from the life cycle stages of Japanese women. In order to take most responsibilities of household work, many Japanese women leave the job market upon marriage or childbirth. Once their children grow old enough to go to schools, some Japanese women go back to work. Other scholars, however, argue that cohort differences are the main reason for the M-curve. The higher employment rates among young women reflect the younger generation with higher education being more willing to enter and remain in the job market, compared to their older counterparts. According to this argument, the M-shape will probably disappear in the future, when the increases in women's educational attainment stop increasing.

Assuming that the M-shape is a result of life-cycle stages (age effect), the "valley" of the M-shape is made of married women who leave the labor force for devoting their time to raise their children. When Japan's economy was going well, these

married women worked as “paat (part-timers)” after their re-entry to the labor force. As economy slowed down in Japan, many women couldn’t afford this non-continuous labor force participation, possibly resulting in shallower “valleys.”

On the contrary, data from Taiwan have shown a simple inverse U-shape curve. Some sociologists mention that their special employment structure does not necessitate women to quit jobs when they get married. Taiwanese women have more flexible working hours than their counterparts in Japan. Besides, with the expansion of education in Taiwan, more young women are better educated and get career jobs in the labor force. Here, cohorts seem to affect the female employment rates. In addition, Taiwan’s economy has been steadily growing with a healthy rate of around 4% per year for the last couple of decades except 2001, 2008, and 2009. When the economy is growing well, more women may be able to afford to concentrate on childcare as it seemed to be the case in Japan until recently. Therefore, we might expect the same pattern regarding women’s age and employment status in Taiwan as that in Japan. After all, Taiwan has followed Japan’s path in many aspects for a long time.

This study intends to answer, first, what causes the M-shape relationship between women’s age and labor force participation rate in Japan. Does it come from the change by women’s life cycle stage or from cohort differences? We then ask if Taiwan follows Japan’s pattern in the relationship between women’s age and their labor force participation rate or keeps the same pattern in the future.

In this paper, we use data from three survey years in Japan (1998, 2003, and 2008) and Taiwan (1996, 2001, and 2006) to try to clarify the relationship between women’s age and their employment rates, and then to explain the reasons. In the past, however, due to the methodological limitations, it was difficult to consider the effects of age, period, and cohort at the same time. We solve this problem by utilizing the APC model (Age-Period-Cohort model), a variant of hierarchical linear model.

The response variable, whether employed or not, is simply expressed in a dichotomy (0 or 1). To capture a non-linear relationship between women's age and their employment rates, we added age^2, age^{3,} and age^4. Since age^4 was not significant in Taiwan, we deleted that term from Taiwan only. Other variables included in the model are the respondent's education, her husband's income, and the number of children the respondent has.

With the simple logit model, we can estimate the probability of women in the labor market for different ages. According to Figure 1, there has been almost no change in the shape of the relationship between women's age and employment rate in Japan through the three survey periods (1998, 2003, and 2008). In other words, despite changes in economic circumstances and women's educational achievement in Japan, the female employment rate still decreases after 30. Further in the APC model, we find that the effects of cohorts are not significant at all. Based on the result, individual level changes, such as marriage and childbirth, probably are the major reason to result in the M-shape relationship between women's age and their employment rate in Japan, instead of cohort differences.

From the logit model with our 2006 data in Taiwan, we see that young women have higher probabilities to work, compared to their counterparts in 2001 and 1996 (see Figure 2). Does this mean that Taiwan may have the M-shape curve in the future? Or will these women stay in the labor force when they get married and/or have a child? In the APC model, there are indeed some cohort differences before we added control variables to the equation. Women in the 1940 cohort are less likely to work while those in the 1970 cohort are more likely. When control variables are added to the model, the effects disappear, however, though the direction of these effects remain the same.

Our study shows that the life cycle stage is the main reason to explain the relationship between the women's age and employment rates both in Japan. Based on the result of the logit model and the APC model, we found no evidence of a possible effect of cohorts on female employments in Japan. Japanese women go in and out the job market across all cohorts with a similar pattern. In Taiwan, however, cohorts may affect to some degree, but it may be because the younger generation is better-educated. Cohorts do not seem to have an independent influence on the female employment rates.

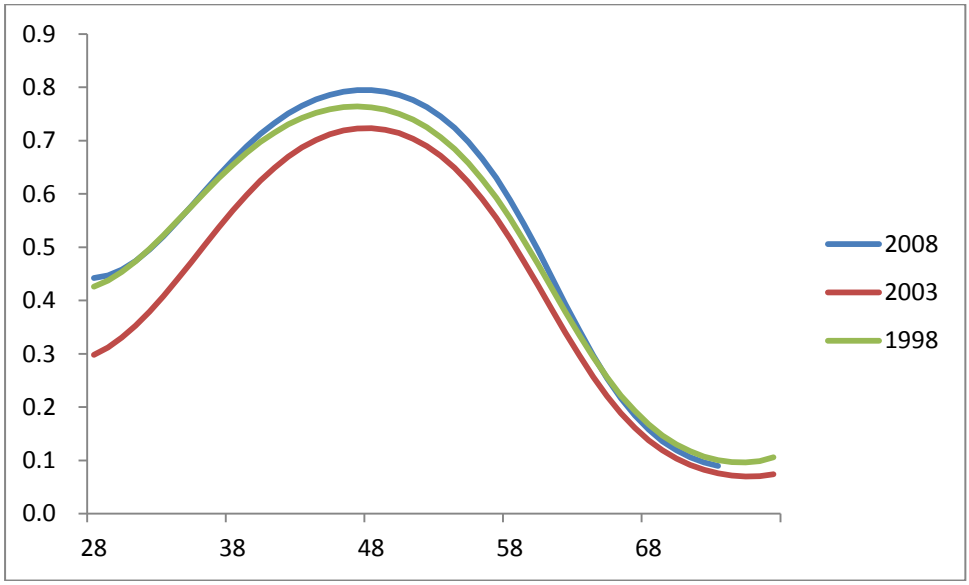

Figure 1. Estimated Female Employment Rate by Age in Japan, 1998-2008

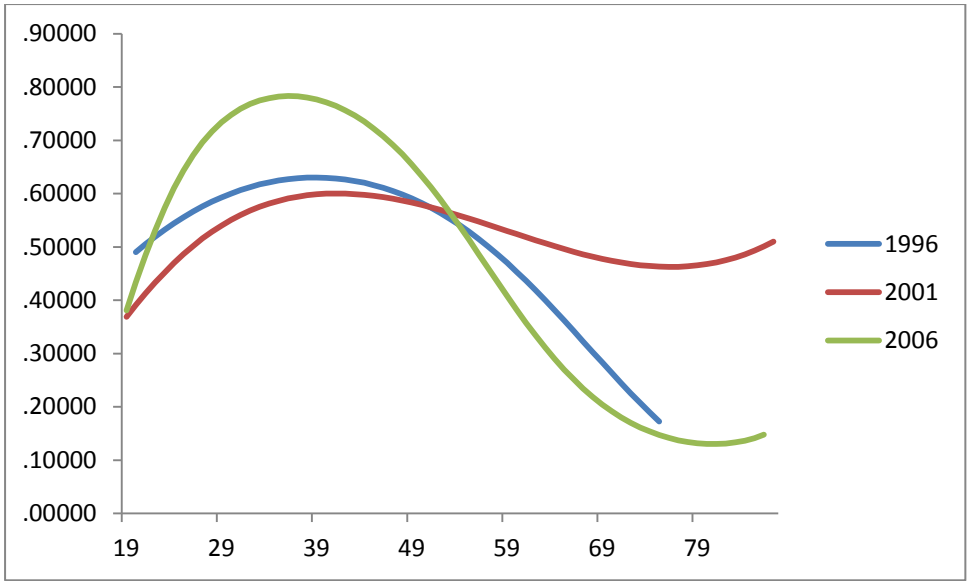

Figure 2. Estimated Female Employment Rate by Age in Taiwan, 1996-2006