Dynamic Female Labor Supply: Applications in China

Heather Chen

2. Literature Review

The idea of bringing life-cycle model to interpret human capital accumulation as well as life-time earnings and consumptions was first proposed by Weiss (1972) and Heckman (1976). The famous theoretical framework introduced by Heckman derives the life-cycle model of household earnings from dynamic human capital accumulation of individuals, regarding labor supply decisions as endogenous. Other family characteristics such as family size and age of children also enter interactively into the model. His theory provides an accurate prediction of married males' earnings in the 1960s, which marked the popularity of using life-cycle model in the field of labor economics.

After the fundamental work stated before, Heckman and Willis (1977) concentrate on the sequential discrete choice model of labor force participation of married women. In their simple reduced form model, married women decide on whether to participate in the labor market by comparing their marginal benefit (denoted by market wages) with the marginal cost (denoted by the shadow price of time). Therefore, the "net benefit" (or cost) of married women's labor participation decision can be regarded as a subtraction of the two terms. Since the market wage of women who stayed at home and the shadow price of those who worked cannot be fully observed, they further express the "net benefit" as a function of many other factors that may influence the two prices, such as the husband's wage rate, the prices of market goods, interest rates, assets, the number and age of children, and so on. The empirical study followed by this model mainly finds out that the distribution of labor participation probabilities is U-shaped, and unobserved population heterogeneity accounts for a large fraction of the behavior they observed.

However, Heckman and Willis's model has an inherent drawback as they view each period's labor participation decision as independent of the choices in the past and in the future, which is hardly the case. The studies of Weiss (1981) as well as Eckstein and Wolpin (1989) improve the former model by allowing labor market participation to affect future wages, the effect is then translated to the choice of future participation. Assuming people are forward-looking, Eckstein and Wolpin construct a dynamic life-cycle model for female labor participation: married women maximize their expected discounted lifetime utility given former

experience, wage rates, and other relevant environmental factors such as schooling and children. The authors solve this utility optimization problem by a process of backward recursion. Selecting the mature women cohort (women age between 30 and 44) from National Longitudinal Survey of Labor Market Experience since 1967, they conclude that increase in schooling has the largest positive effect in explaining women's increase in labor participation, while an increase in the number of young children and in husband's wages will mostly discourage them from going to work.

Followed by Eckstein and Wolpin's study, a series of analysis have been made to explore the underlying factors that contribute to the increase in female labor participation, but their results vary. The most relevant one is done by Eckstein and Lifshitz (2011). Aiming at investigating the labor market participation of all females in working-age population, they extend the original model by letting women's marital status enter into the utility optimization problem. They also improve previous analysis by including a larger sample, using Current Population Survey (CPS) data from 1964 to 2007. Given the rich dataset with complete working information for women in the 1955 cohort (those who born between 1953 and 1957), they successfully obtain estimated parameters using simulated methods of moments (GMM). Their empirical results show a similar conclusion that the rise in female labor participation is mostly due to the increase in schooling. Other factors, such as decreased fertility, increased divorce rates, and narrowed gender wage gap, can only account for about 20 percent of the rise in female employment. 40 percent remains unexplained by observed household characteristics. However, another study by Fernández and Wong (2014) applies a similar life-cycle model on CPS dataset from 1962 to 2010, ending up in different conclusions. Choosing the 1935 cohort as the baseline to estimate key statistics, they find out that a higher divorce risk and a change in wage structure are the main contributors to the increased female labor participation for the 1955 cohort.

Enlighted by the rich empirical analysis evaluated with the U.S. data, many other authors have tried to explain female labor participation in their countries. The cross-country differences gradually become the new focus of many studies. Using a non-recursive five-variable Structural Vector Autoregressive (SVAR) model, Kinoshita and Guo (2015) utilize data from Japan, Korea, Norway, and Finland to study female labor participation in response to a variety of shocks. They pointed out that child cash allowance provided by the government discourage women from participating in full-time work. Large gender wage gap persisted in Asian countries also helps to

explain why women there are more likely to engage in non-regular work rather than regular ones. Their study has strong policy indications, urging the government to adopt family-friendly policies and create jobs with flexible time arrangements, so as to encourage married women in participating more in regular full-time jobs. Cubas (2016) uses a modified version of life-cycle model based on Eckstein and Lifshitz's to look into female labor supply in developing countries. His results indicate that prices of household appliances and access to basic infrastructure are quantitatively important in explaining the cross-country differences in female labor participation in Latin America. Christiansen et.al. (2016) conduct a cross-country analysis based on the micro-data from European countries. Their analysis reveals that governmental policies play a crucial role in women's labor market choices. Creatively bringing women's attitudes towards working outside of household into prediction, the authors find out that women with more egalitarian gender opinions are more likely to engage in labor market activities. Other relevant studies include the one by Ismail and Sulaiman (2017) using data in Malaysia, and the one focusing on the labor supply in Israel Arabs by Yashiv and Kasir (2012).

Another fraction of literature has been dedicated into evaluating other exogenous effect on female labor participation. A few studies emphasize on the influence of the implementation of unilateral divorce laws on female labor supply choices. Fernández and Wong (2014) implies that both the establishment of new divorce laws and decreased gender wage gap contribute to the rise in female labor participation. While Voena (2015) finds out that the introduction of unilateral divorce laws that impose equal division of property will distort women's preferences in a way that lower their labor participation.

Even though there are considerable amount of empirical analysis trying to unravel the factors behind country level female labor participation trend, few empirical studies have been committed to the same purpose in China. The reason of the blank in Chinese literature might due to the lack of long-term longitudinal household survey data. Provided that female labor participation rate in China has followed a decreased trend different from the majority of countries in the world, the rationalities behind this reversed trend become more appealing and intriguing for economic analysis. Studies embedded in a Chinese context include the one by Shen et.al. in 2012. They employ the household survey data in 2002 and find out that a shift in family structure might contribute to the decrease in Chinese female labor supply. As the family sizes in China shrink, elderly parents of the household cannot offer sufficient childcare needed

by the young couple, resulting in female leaving the labor market to take care of young children. Another study by Yao and Tan (2005) addresses the effect of household income on wife's labor supply. Their results reveal that the increase in husband's earnings can only account for a small fraction of female's decreased labor participation. The difficult employment situation faced by Chinese women is the main cause of their leaving the labor market.

Summarized from the above, though a wide range of studies has been carried out in discovering the reasons behind increased female labor participation, the blank in literature based on Chinses data still remains unfilled. Therefore, the aim of this study is trying to employ dynamic life-cycle model to tell the Chinese story of dynamic female labor supply. The study will contribute to current literature in the following three ways. First, it is the first study that attempt to apply a dynamic life-cycle model on Chinese micro-level longitudinal data. Its results will provide a new perspective in interpreting the reversed female labor participation trend in China. Second, the study modifies the classic life-cycle female labor supply model to fit into the Chinese context. Third, it yields comprehensive policy implications. For example, how to encourage Chinese married female in working full-time more effectively.

References

Christiansen, Lone Engbo. Individual choice or policies? Drivers of female employment in Europe. International Monetary Fund, 2016.

Cubas, German. "Distortions, infrastructure, and female labor supply in developing countries." European Economic Review 87 (2016): 194-215.

Eckstein, Zvi, and Osnat Lifshitz. "Dynamic female labor supply." Econometrica 79, no. 6 (2011): 1675-1726.

Eckstein, Zvi, and Kenneth I. Wolpin. "Dynamic labour force participation of married women and endogenous work experience." The Review of Economic Studies 56, no. 3 (1989): 375-390.

Fernández, Raquel, and Joyce Wong. "Unilateral divorce, the decreasing gender gap, and married women's labor force participation." American Economic Review 104, no. 5 (2014. a): 342-47.

Fernández, Raquel, and Joyce Cheng Wong. "Divorce risk, wages and working wives: A quantitative life-cycle analysis of female labour force participation." The Economic Journal 124, no. 576 (2014): 319-358.
Heckman, James J. "A life-cycle model of earnings, learning, and consumption." Journal of political economy 84, no. 4, Part 2 (1976): S9-S44.
Heckman, James J., and Robert J. Willis. "A beta-logistic model for the analysis of sequential labor force participation by married women." Journal of Political Economy 85, no. 1 (1977): 27-58.
Kinoshita, Yuko, and Fang Guo. What can boost female labor force participation in Asia?. No. 15-56. International Monetary Fund, 2015.
Shen, K., Zhang Y. and Yan P. “Family Structure and Female Labor Force Participation in China” Population Research 36, no. 5 (2012): 15-27.
Voena, Alessandra. "Yours, mine, and ours: Do divorce laws affect the intertemporal behavior of married couples?." American Economic Review 105, no. 8 (2015): 2295-2332.
Yao, X., Tan L. “Household income and Chinese women’s labor participation decisions” Economic Review 7, (2015): 18-27.
Weiss, Yoram. "On the optimal lifetime pattern of labour supply." The Economic Journal 82, no. 328 (1972): 1293-1315.
Weiss, Yoram. Expected interruptions in labor force participation and sex related differences in earnings growth. No. w0667. National Bureau of Economic Research, 1981.
Yashiv, Eran, and Nitsa Kasir. "Patterns of labor force participation among Israeli Arabs." Israel Economic Review 9, no. 1 (2011).