Employment and motherhood entry in South Korea

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Abstract

This study investigates the dynamic changes in motherhood entry by employment status and labor market characteristics in accordance with Korea's social and economic change as well as the process of welfare state establishment and expansion. Data used for analysis come from Korea Labor and Income Panel Study (KLIPS), longitudinal data capturing 10 waves of the survey from 1998 to 2007. Event history analysis is applied to examine the motherhood entry. It is discovered that motherhood entry in South Korea has been declining since the early 1980s. The 1997 Asian Financial Crisis further exacerbated the decline. In addition, women's employment status and labor market characteristics have divergent effect on women's likelihood of becoming a mother. And some of these effects vary over time across different social and economic contexts.

Introduction

South Korea has experienced fundamental social and economic changes since the 1970s. From the 1970s till the late 1990s Korea's economic growth speed was fast. However, the 1997 Asian Financial crisis hard hit the country and caused a sudden high rise of unemployment, social polarization and unrest. To cope with the high unemployment and poverty caused by the crisis, South Korea started its welfare state reform programs.

Among the fertility studies concerning South Korea, a lot of scholarships can be found with focuses on a variety of aspects. For instance, Chung and Gupta (2007) disclose the decline of son preference in South Korea. Choe and Retherford (2009) reveal the contribution of education to the lowest-low fertility of South Korea. Yang and Rosenblatt (2008) explores whether Confucian values of maintaining and supporting the paternal family line has been abandoned by the childless couples. Kye (2008) discloses the effect of delay in first marriage on first childbearing by educational differentials. But so far, little is actually known about how women's fertility manners alter by individual employment status and labor market characteristics in accordance with Korea's social and economic change and the process of welfare state establishment and expansion. Cho (2000) and Suzuki (2005) do make an attempt to explore the labor market effect on fertility, but they base their analysis on aggregate data like total fertility rate and total labor force participation, which are very vulnerable to temporary fluctuations of childbearing and labor market changes and thus, cannot disentangle the impact of individual characteristics. To address the topic which has been left quite untouched from individual level perspective, I will explore answers to the following three questions with a study focus on motherhood entry.

1. Does women's motherhood entry differ between the fast economic growth periods and the welfare state establishment/expansion periods?
2. Does employment status have any diverging effect on women's likelihood of becoming a mother? Do labor market characteristics such as work type, work hour, workplace, and income have any effect on motherhood entry?
3. Do employment status and labor market characteristics affect motherhood entry over time?

The most important advantage of this study is that it offers us a unique opportunity to broaden our understanding and knowledge of how individual employment status and labor market characteristics affect Korean women's propensity of becoming a mother over time. In this paper, I start with a description of western welfare regime and the idiosyncratic scenario of Korea, which will cover Korea's social and economic change since the 1970s, female's contribution to the economic development, fertility development, social unrest along with the 1997 financial crisis, and welfare state establishment and expansion. It is followed by a description of data and methods used for this study. In the empirical section of the paper, I highlight the dramatic

changes in motherhood entry by employment status and labor market characteristics. The conclusion section I will summarize the findings and discuss the implications of the results.

Korea's social and economic change, welfare state, employment and fertility

Pioneered by British Labor Party's slogan -- "jobs for all" and "social insurance against the rainy day" in 1945, the concept of welfare states' full employment and expanding social-citizenship rights was widely accepted in Europe after the Second World War (Korpi 2003). During the post-war periods, welfare states were established among the most developed capitalist countries. High economic growth based on manufacturing-oriented industrial economies with full employment, organized labor movement and male bread-winner family models were the main features that nurtured the establishment. The three decades after World War II have been considered by many researchers like Flora (1986) as the golden age of the welfare state. However, from the mid-1970s, welfare-state retrenchment started rising. Coupled with welfare-state retrenchment were high unemployment, non-stable employment and weakened labor movement. To maintain sustainability, welfare states had to control and restructure the regime. Control of social security system and social rights of employees, recommodification of labor, and commercialization or privatization of welfare services were practiced (Ruggles and O'Higgins 1987).

Different from most western countries, South Korea kicked its first steps of welfare state establishment and expansion in the late 1990s. In contrast with the initial pursuit of full employment at the forming stage of western welfare regime, Korea's welfare state was formed with a purpose of coping with large scale unemployment and poverty engendered by the 1997 Asian Financial Crisis (Kim 2009).

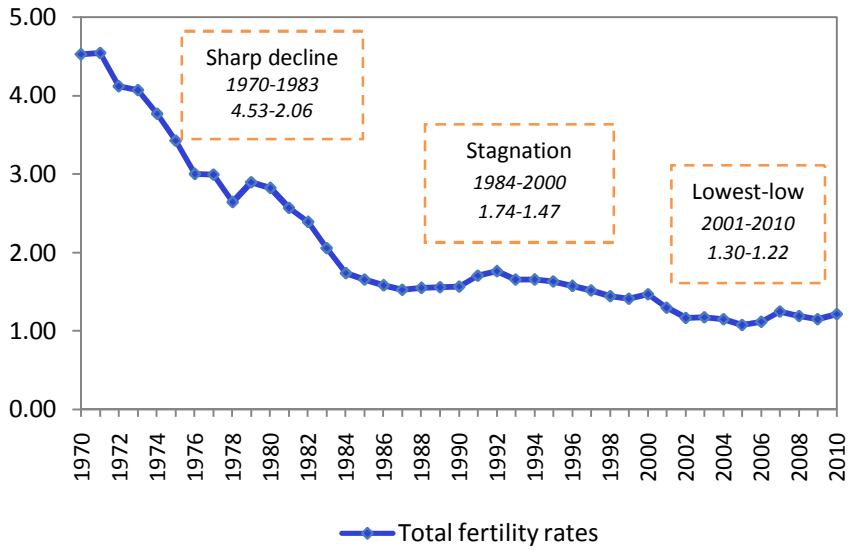
Esping-Andersen (1990) classifies three ideal-types of welfare states: liberal, conservative and social-democratic. Meanwhile he points out that there is no single pure case. Researchers often encounter locating problems as to where to put Korean welfare regime in a comparative perspective. According to Peng (2009), Korea's social policy regime can be categorized as "familialistic" as in Japan and the Southern Mediterranean countries of Italy and Spain, which "assigns a maximum of welfare obligations to the households" (Esping-Andersen 1999:45), while Lewis (1992) places it with Germany, Ireland and Japan as the category of strong male breadwinner welfare regimes. In the following description, instead of trying to figure out the typology of Korea's welfare regime, I mainly focus on Korea's social and economic change, welfare state establishment and expansion, female's employment and fertility development.

Dating back to the 1950s and the 1960s, population explosion was an international concern. Korea back then was a country with rapid population growth, high population density, high

fertility levels and bad economic conditions *(*Jones and Leete 2002; Suzuki 2008). Like many other Asian countries, Korea also viewed smaller population as a path to economic development. As early as 1962, under the Park Chung Hee administration, Korea implemented family planning program, thus becoming one of the forerunners in Asia to control the growth of population (Rhee 2007). The program was in fact an integral part of national economic planning. Its goal was to reduce the number of unwanted fertility and maintain a two-child family size for a prosperous life. In response, Korea's total fertility rates (TFR) experienced a sharp decline from above 4 in the 1970s to below the replacement level (2.06) in 1983 (**see Figure 1**). The goal of the family planning program was achieved. The period 1984-2000 witnessed a stagnated fertility decline, with TFRs lingering between 1.8 and 1.4. The 2001 breakthrough of 1.3 in TFR marked the onset of Korea's lowest-low fertility era. Of course, we cannot attribute the decline of fertility all to the family planning program. There are other factors that may have affected the women's fertility such as value changes and postponement or even foregoing of marriage and childbearing on account of incompatibility between the role of mother and workers.

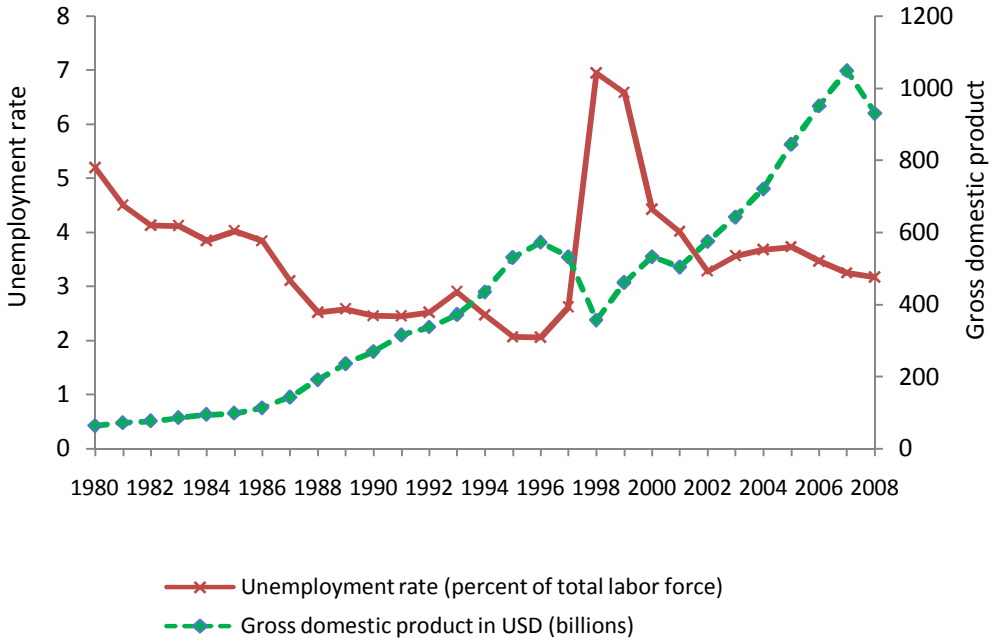
Simultaneously accompanying the fertility decline was the country's dramatically rapid and stable economic growth up to the late 1990s (see **Figure 2**). Its fast economic development gained the nation a membership of OECD in 1996. Together with Korea, several other countries in South East Asia also experienced high economic growth during the same time. Globally, their achievement was honored as "Asian economic miracle". In the situation of fast economic growth, labor shortages drew more and more concern. When the labor market was short of labors and needed more active people, the most obvious resource was women. Improving female labor force participation was the very first measure taken in Korea to solve the problem of labor shortage (Cho 2000). In 1988, the "*Equal Employment Act*", prohibited discrimination against women in employment, wages, and working conditions. It also prohibited discrimination against employed women for marriage, pregnancy or child delivery. Meanwhile, a female public employee target system was established to enhance the recruitment of women in public sectors (Cho 2000). In 1995, *Women's Development Act* was issued to promote women's position and enhance their welfare.

Figure 1: Development of total fertility rates (TFR) of South Korea



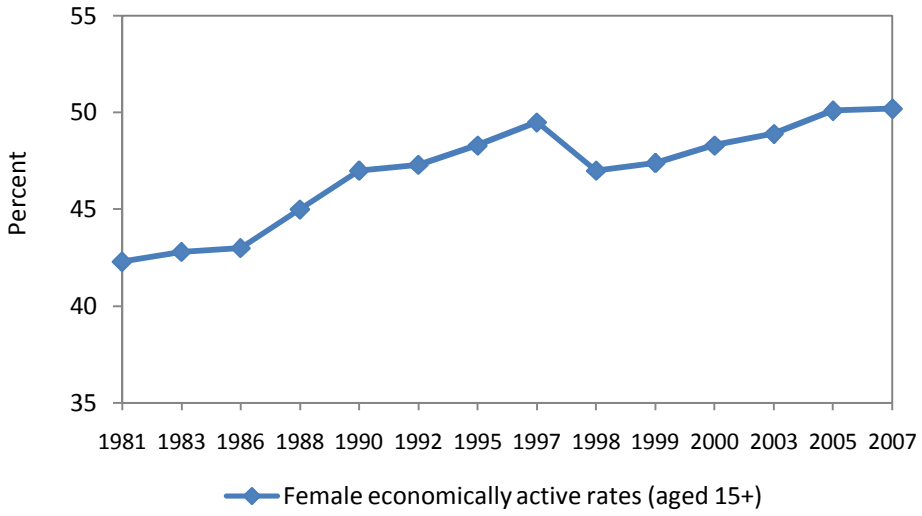
Source: Korea Statistical Information System (KOSIS)

Figure 2: Unemployment rates and gross domestic product (GDP) of South Korea since 1980



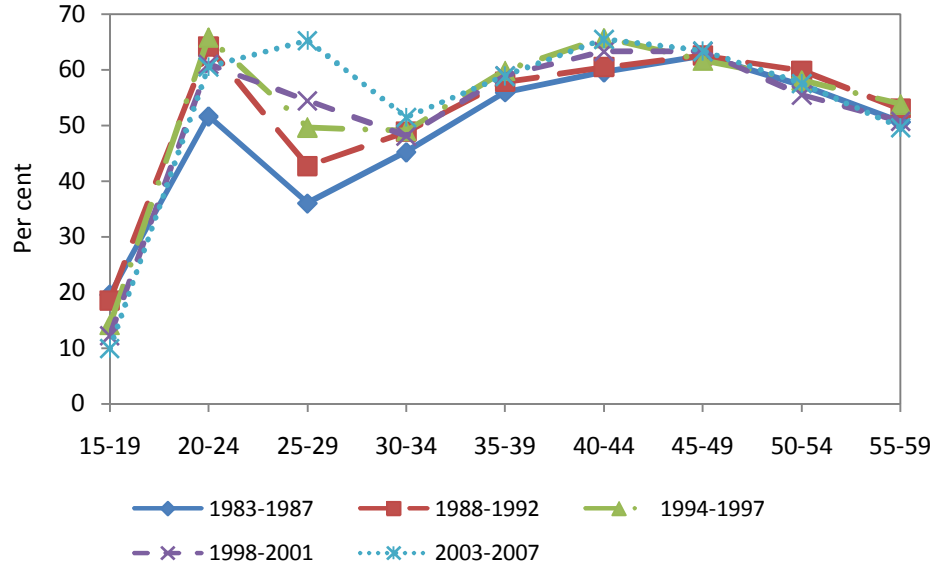
Source: International Monetary Fund, Work Economic Outlook Database, April 2011

Figure 3A: Female economically active rates of South Korea since the early 1980s



Source: LABORSTA Labor Statistics Database, International Labor Organization

Figure 3B: Female economically active rates of South Korea by age since the early 1980s



Source: LABORSTA Labor Statistics Database, International Labor Organization (data unavailable for 1993 and 2002)

Figure 3A displays Korea's female economically active rates since the early 1980s. Since the early 1980s until the late 1990s, the economically active rates of women increased consistently. However, the trend jumped down in 1998 owing to the 1997 financial crisis. Gradually the increasing trend resumed again after 1998. **Figure 3B** displays women's economically active rates by age groups and years. This diagram discloses Korean women's strategies of organizing their life career. The M-shape indicates two economically active peaks and one inactive downturn. Up till 1997, age 20-24 was the most active time for women in the labor market. When aged 25-29, women most often would quit work for family life: getting married, childbearing and childrearing. They would come back to the labor market around their late 30s or early 40s when their children are old enough and need less attention from them. During 2003-2007, women's most active peak time at the labor market shifted from age 20-24 to age 25-29 and labor market leaving time shifted to age 30-34. The two shifts indicate two delays in women's life course – delay in labor market entry largely on account of pursuit of higher education and delay in leaving labor market for family life.

In Korea, fierce competition for good jobs in the labor market drive parents to invest more on children's education so that children can be enrolled into elite universities which are believed to provide better chances for good jobs and a better life in the future (Choe and Retherford 2009). The rising of educational levels leads to women's delayed entry into the labor market. The second delay can be explained by Becker's (1981) theory of opportunity cost. When woman leaves the labor market for childbearing, the loss she gets from leaving the labor force raises the cost of childbearing. In Korea, expecting that they would have to drop out of the labor force for family life, a rational woman would prefer to accumulate more storage of employment experience by staying longer at the labor market to reduce the cost of childbearing or child rearing. The two delays shown in **Figure 3B** might lead to complex consequences to women's life: postponement of marriage or even non-marriage, and postponement of childbearing or even childlessness.

It is worth a note here that the fast economic growth up to the late 1990s in Korea was tethered to foreign markets and was largely driven by short-term foreign capital investment, which was expected to produce short-term high return. The sudden devaluation of Thai Baht and the subsequent economic meltdown of Thailand in early 1997 quickly spread to other countries in Asia. South Korea could not escape the contagion. Finally, Korea was trapped with a large amount of short-term debt to be paid back within a short time while its foreign exchange reserves encountered severe shrink. The country was at the edge of default. At this critical point, International Monetary Fund (IMF) stepped in to save the teetering government. Eventually, IMF and the Korean government agreed on a bailout with strings attached. Besides, the government managed to convince the main creditors to postpone the due time of debt return.

Conditioned on the IMF rescue package, Korea had to open up its economy to foreign investors, permit foreign takeovers, readjust its operations, overhaul its labor market, lay off some

employees and allow bank insolvency. As a matter of fact, Korea's labor market restructuring was first initiated in 1996 (before the crisis) with the labor legislation reform by the conservative Kim Young-Sam government (office time 1992-1997). The launch of 1998 Labor Standard Act amendment after the crisis under the newly elected Kim Dae-jung government (office time 1998-2002) accelerated the reconstruction, engendering a sharp rise in unemployment, and non-regular workers. Rising unemployment, decreasing regular employment, growing inequality and social unrest were felt at every corner of Korean society. **Figure 2 above** shows that in the aftermath of the financial crisis, Korea's unemployment rates skyrocketed and its economic development had nowhere to go but down, which is in clear contrast with the decade before when the whole country enjoyed high economic growth speed and low unemployment rates. **Figure 3A** further proves that women's labor force participation was quite susceptible to the 1997 crisis. They either withdrew from full-time work, or opted for temporary jobs or even got unemployed involuntarily (Cho 1999, Peng 2009).

To ease the consequences of unemployment and poverty, the Kim Dae-jung administration had to immediately reform the existing social security system. The reform was mainly from four aspects: employment insurance, basic living standard, pension, and national health. These practices were out of the administration's "productive" welfare concept that sought to achieve balance between economic growth and social protection (Kim 2009, Chan 2006).

Under the previous security system, those who were able to work enjoyed unemployment insurance if they worked in companies with more than 30 employees and those without working ability (such as those aged below 18 or above 65 and the disabled) were entitled to the Livelihood Assistance. With more people becoming unemployed at the crisis, the number of people who could neither claim for unemployment insurance nor livelihood assistance developed (Kim 2009). To cope with it, employment insurance was expanded to cover all companies. Meanwhile, the old livelihood assistance was abolished. Instead, the National Basic Livelihood Security System was launched. It set a minimum standard of living as a universal right, which led to a minimum income guarantee for all, regardless of age or the ability to work. In addition, the existing national pension system was expanded from covering companies with more than 5 employees to covering everybody, the self-employed included. The National Health Insurance (NHI) was also expanded from covering only workers from large companies to all individuals (Kim 2009, Kwon and Holliday 2007). And the separate health insurance carriers were united into one single body, the Health Insurance Review Agency. Apart from the foregoing main programs, other reforms were going on. In 2000, an employment stabilization policy was launched to provide funding for job placement services, vocational training, business start-ups and employment promotion subsidies. More importantly, internship and job placement services were especially offered to female college or university graduates to help with labor market entry.

Besides, Maternity leave was extended. Since the liberation from the Japanese control in 1945, 60 days of unpaid maternity leave remained unchanged for 56 years. In November 2001, 90

days fully-paid maternity leave became standard according to *Maternity Protection Act*. 60 days of pay was on the employers' responsibility. The additional 30 days were funded through employment insurance and the national budget (Kim 2006). As a counterpoint to maternity leave, the 2001 *Maternity Protection Act* also introduced financial support for parents taking parental leave. It was regulated that any male or female worker with a child under one year old could take paid parental leave and was entitled to receive a flat-rate wage replacement of W200,000 per month for 10.5 months in addition to the 90 days paid maternity leave. (The exchange rate between South Korea won and US dollars in 2001 was roughly 1:0.0008. 200,000 Korean won is roughly 160 US dollars based on the exchange rate of 2001.) Dismissal during maternity leave or parental leave is prohibited. Women and men have the legal right to return to the same or similar positions. As aforementioned, working women most often quit job for family life. Those without regular employment may quit job at marriage or pregnancy and those with regular jobs might quit at childbearing or after taking maternity leave or parental leave despite the existence of legal position protection.

However, some contradictory practices were going on that hinder the development of the welfare state. First, eligibility of employment insurance was restricted to workers with at least six-month employment history, leaving many temporary or part timers uninsured (Kwon and Holliday 2007). Second, the replacement rate of unemployment insurance was only 50% of average earnings during the preceding 12 months and the coverage length was dependent on the length of previous employment and age. Third, the income replacement rate in the pension system was reduced from 70% at the beginning to 60% later. Fourth, commercialization of health insurance offered low benefit with its requirement of 35-40% out-of-pocket payment, leaving the poor and sick heavily burdened. Fifth, the benefit of minimum standard of living was conditioned on earning less than minimum cost of living, family size, and active job searching or training (Kwon and Holliday 2007). Lastly, maternity leave and parental leave were granted only to workers with full employment insurance. Temporary workers were not entitled to this benefit (Kim 2006). In short, many vulnerable groups were left unprotected. Kwon and Holliday (2007) claim that the reform of the Korean welfare state is more of a response to economic crisis and an attempt to bolster economic growth. Stratification between regular and irregular workers, inadequate protection of the poor and inadequate services for the children and family were emerging (Chan 2006).

To address the demand for wider participation in policy making and tackle the problem of social polarization, Kim Dae-Jung's successor Roh Moo-hyun (office time 2003-2008) initiated "participatory" welfare concept, which promoted equality (between gender, region, class, labor and management), inclusion and greater protection of those previously ignored such as women, children, elderly and irregular workers (Chan 2006). Maximizing eligibility, raising the benefit standard, eliminating dead zones in the social insurance and public assistance fields became the aim of the government.

Moreover, the *Maternity Protection Act* was revised in 2005 and regulated that the full payment during leave was paid through public transfer for workers in small- to medium-sized companies, while large companies still took the responsibility of two-thirds of the wage from 2006 onwards (Suzuki 2008, Peng 2009). Moreover, the flat-rate for parental leave was increased from 300,000KRW (roughly 240USD) in 2003 to 500, 000KRW (roughly 400USD) in 2007 (Peng 2009 and Kim 2006). But still, maternity and parental leaves were restricted to female workers with full employment insurance.

Table 1: Major developments of childcare services in South Korea

Fast economic growth periods	
1982	Early Childhood Education Promotion Act To regulate early childhood education[1]
1992	Education Law To standardize early childhood education at national level
Participatory welfare period	
2004	Revised Early Childhood Education Promotion Act
2005	Revised Child Care Act To reassert the primacy of responsibilities for early childhood education and care, including funding, qualification requirement for teachers, staff and facilities
2006	"Saessak" Plan (2006-2010)[2] To reinforce the publicity of childcare and provide high quality childcare services

Tremendous progress has been made to provide child care services to help women reduce the burden of childbearing and childrearing and to facilitate women to reconcile work and family life (**see Table 1**). These legislations led to a rapid growth of public and private childcare centers by 15 fold from 1990 to 2007 and an increase of children enrollment by 22 fold during the same period (Peng 2009)[3]. These actions so far have reflected in some degree the Korean government's primacy concern to early childhood education and population quality.

Whereas, the concept of "participation" of the Roh Moo-hyun administration not only indicates involving the excluded social groups into the social protection but also refers to participation of

[1] Previously, some early child care centers provide only care.

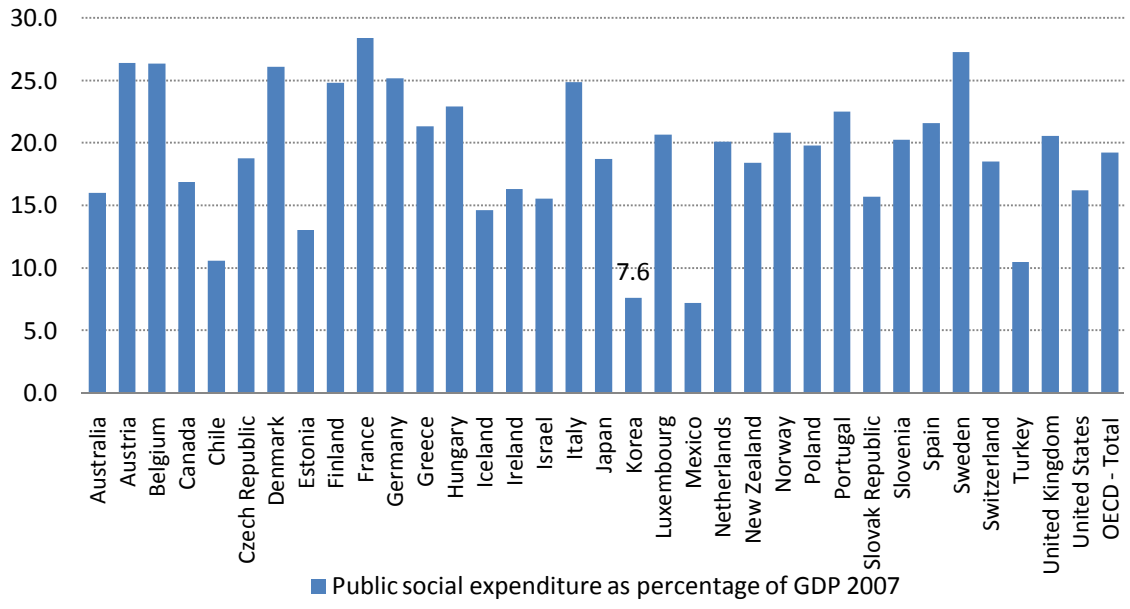
[2] "Saessak" means sprout.

[3] In Korea, private day care centers enjoy a lion share in the day care market. A considerable proportion of private centers are run by not-for-profit organizations or corporations. Both public and private centers are inspected by the government and receive government subsidies. However, parents still prefer to choose public day care owing to their belief of public day cares' better quality.

individuals and communities in providing and managing welfare to those in need (Chan 2006). Chan (2006) and Kim (2009) criticize the "participatory" welfare for its re-emphasizing the traditional individual or family roles in providing care.

In summary, with the promissory welfare programs coming up to agenda since the late 1990s, the government adjusted its direction of population policy from controlling population growth to population quality and welfare. Some welfare policies during the "productive" and "participatory" periods, though ostensibly carrying no pro-natal intentions, betray sub-currents of checking declining fertility, such as extension of maternity leave, initiation of parental leave, policies supporting compatibility of work and child rearing for women, and expansion of both public and private childcare centers. On the whole, the strenuous efforts made by the government to counterpoise the negative impact of crisis on the society are in good direction. However, Korea's welfare establishment and expansion process is fraught with complex. Even though public social expenditure as percentage of GDP has expanded from 2.8% in 1990 to 7.6% in 2007, compared to other OECD countries, Korea was lagged far behind together with Mexico and has a long way to go (**see Figure 4**). So far, a universal child allowance has not yet been introduced in Korea. One reason is out of budget constraints. Another reason is that some economists were concerned that the child allowance may restrain women's labor force participation enthusiasm (Suzuki 2008).

Figure 4: Korea's public social expenditure compared to other OECD countries in 2007



Source: OECD social expenditure database

Data and methods

Data used in this analysis are from the Korea Labor and Income Panel Study (KLIPS) initiated by the Korea Labor Institute in 1998. It is Korea's only labor-related panel survey. The data source for this study comes from wave 1 to wave 10 of the survey from 1998 to 2007. It contains a rich variety of individual's life course information such as demographics, education, labor market mobility, and employment characteristics. The data are oversampled by women living in cities at the interview time.

I use event history analysis to examine Korean women's motherhood transition. The observation window starts when women are aged 15. The events and transitions are recorded prospectively in time and dated monthly. Woman-months is the unit of analysis. The integration of calendar-time dimension will help capture the dynamic changes in motherhood entry over time. As mentioned in the first section, it is a social practice for Korean women to leave the labor market for family formation. To avoid reverse causation problems triggered by such job-quitting and to better capture the effect of female's employment and labor market issues on motherhood entry, I subtract 9 months from the date of first birth. As to respondents who remain childless until the interview time or by age 45, I also predate 9 months earlier just in case they might have their first child shortly after the last interview time or age 45. Hence, the dependent variable in this study is the rate of confirmed conception of the first live child[4]. The total sample used for observing this transition contains 7338 women aged 15-44 from 1978 to 2006, among whom 3370 conceive their first child before their observation window shuts.

I apply piecewise constant exponential model. The baseline hazard is age. The model can be depicted as follows:

$$h(t|x_j) = h_0(t)exp\ (x_j\beta_x)$$

where h_0(t) represents the baseline hazard function, x_j represents a vector of explanatory and control variables used in the analysis and β_x the corresponding vector of the regression parameters that indicate the effect of the variables.

There are two prime time-varying explanatory variables that measure the effect of calendar periods and employment. **Table 2** shows the descriptive statistics of our sample regarding the dependent variable and the two main explanatory variables. First and foremost, the calendar variable - year group is categorized into 6 groups on a five-year base. The 1998-2002 time period is set as the reference category because this period not just marks the onset of "productive welfare" but also a period when the whole nation witnessed the aftermath of the 1997 Asian

[4] In the paper, the terms "conception", "pregnancy", "first birth", "motherhood entry" and "motherhood transition" are used equally to indicate the first live conception.

Financial Crisis. 2003-2006 stands for "participatory" welfare period[5] and the four year groups from 1978 to 1997 represent the periods of fast economic growth before the crisis.

Table 2: Distribution of person-time and events by year group and employment status

	Person-time (Woman months)		Failures (Conception of first child)	
Year group				
1978-1982	153585	17%	714	21%
1983-1987	140379	16%	618	18%
1988-1992	147495	16%	600	18%
1993-1997	161415	18%	545	16%
1998-2002	164917	18%	550	16%
2003-2006	136800	15%	343	10%
Employment status				
Never employed	460553	51%	893	26%
Employed	298757	33%	1181	35%
Ever/Unemployed	145281	16%	1296	38%
Total	904591		3370	

The other important explanatory variable in this study is female employment status. It contains 3 categories: never employed, employed (reference), ever but unemployed. "Never employed" indicates women with no labor market experience and "ever but unemployed" indicates those who leave the labor force.

Seven variables are used as control variables in this study, among which three are time varying and four are time fixed. Current age, time-varying, is grouped into 15-19, 20-24 (reference), 25-29, 30-34, 35-39, and 40-44. Education, time-varying, stands for the effect of human capital on motherhood transition. It is categorized into 6 groups: in-education, elementary, middle school (reference), high school, college, and university or above. "In-education" signifies those periods when women are still enrolled in education. The other five groups indicate women's education

[5] The last wave of the survey was conducted around April to June in 2007. Because of the predating of timing of first birth from first birth to first live conception, no occurrences fall in 2007. Likewise, the number of occurrences in 2006 is influenced by the 9 month subtraction.

completion over time when women move from one educational level to another, month by month on their way up to their highest educational achievement. Marital status, time-varying, is categorized into single, first marriage (reference), disrupted and later marriages.

The time fixed variables include religion, residence at age 14, women's father's and mother's education. Five categories are taken into account for religion: no religion, Buddhist, Protestant, Catholic and others. Residence at age 14 is grouped into 3 categories: the Seoul National Capital Area (including Seoul, Incheon and Geyonggi-do)[6], other metropolitans (including Busan, Daegu, Daejeon, Gwangju and Ulsan), and other provinces (including the remaining nine provinces of South Korea). Women's father's or mother's education is categorized into three groups, respectively: low (elementary education or no schooling), medium (middle and high school education), and high (college or above).

First, I run main effect models to capture the effect of each factor on women's motherhood entry. Model 1 - the simplest model includes only 2 time varying covariates to capture the unconditioned calendar year effects on first birth. In model 2, the effect of employment status is involved. From model 3 to model 5, education, marital status and other background factors are brought under control stepwise. Based on model 5, extension models are specified to investigate the effect of individual labor market characteristics such as work type, work hour, workplace and monthly income.

Afterwards, interaction models are specified based on model 5 and the extension models to capture the impact of employment status and labor market characteristics over time. Apart from the estimations that intend to address the research questions, I also run interaction models of year groups and education on one hand and year groups and marriage on the other hand to look for novelty that may expand our previous knowledge of fertility in the context of Korea. The outstanding features of this study can be briefed into the following points:

- Predating the arrival of first birth to conception time enhances the efficiency of this design to its fullest extent in that it can better capture the employment and labor market effect on motherhood entry while women still stay on workforce.
- Grouping the calendar years in concert with the social and economic change of Korean society and welfare concepts will offer us a better handle of changes in motherhood entry over time.
- Categorizing women into women in education and women who have completed education at various levels is expected to provide a better view of the stratified effect of education on motherhood entry.

[6] Seoul, or the Seoul Special City is the capital and the largest city of South Korea. The Seoul National Capital Area includes the Incheon metropolis and most of Gyeonggi province. Around half of Korea's population live in the Seoul National Capital Area and almost a quarter in Seoul itself.

- Expanding the observation range to all women at reproductive age, regardless of whether they are single or married, divorced or remarried is believed to expand our understanding and knowledge of motherhood entry diversities between women in and out of wedlock.

Results and analysis

Table 3 demonstrates the results from five different main effect model specifications. All the coefficients in the results represent hazard ratios. The estimation of year groups in model 1 shows an overall motherhood entry reduction over time. When employment and education are controlled, the trend and pattern remains almost unchanged. The involvement of marital status in model 4 makes a significant change to the trend. A large part of previous declining pattern disappears. From the 1993-1997 time period onwards, the decline builds up and continues till the end of our observation time. When background factors are controlled in model 5, the results remain similar to that of model 4.

Model 2 incorporates time-varying employment status into analysis, with "employed" as the reference category. The results reveal that women who leave the labor market have more than 100% higher risk of becoming a mother than women who stay in the market. When marital status is controlled, the gap is significantly reduced. The involvement of background factors does not change the trend much. These results are expected. If we bear in mind that a considerable amount of women will choose to leave the labor market as socially expected at marriage, pregnancy, childbearing or childrearing, the strikingly higher risk of motherhood entry for the job leavers becomes easier to understand. Compared to women in the labor market, women with no labor market experience are at lower risk of becoming a mother across models 2 to 5. This difference is also expected. It is largely because Korea women prefer to accumulate some job experience first before forming a family.

Model 3 involves education into analysis. The results disclose clear differential effect of educational levels on motherhood transition. Compared to women who complete their education, women in education are at an extremely lower risk of becoming mothers. Among women who complete their education, there is no statistically significant difference in motherhood entry between women with middle school education and those who achieve higher educational levels. However, when marital status is brought under control, the difference in motherhood entry becomes significantly bigger and the pattern becomes considerably clearer. The higher educated a woman is, the more likely she is to become a mother. The results suggest that in Korea higher educated women are less likely to get married than lower educated women. But among those who do get married, higher educated women are more committed to family life and more ready to become a mother than lower educated women.

Table 3: Piecewise constant exponential models for motherhood entry, South Korea

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Haz. Ratio		Haz. Ratio		Haz. Ratio		Haz. Ratio		Haz. Ratio	
Women's age										
15-19	0.09	***	0.11	***	0.35	***	0.56	***	0.57	***
20-24	1		1		1		1		1	
25-29	2.47	***	2.14	***	1.79	***	0.91	**	0.92	**
30-34	0.81	***	0.71	***	0.62	***	0.23	***	0.23	***
35-39	0.14	***	0.13	***	0.12	***	0.04	***	0.04	***
40-44	0.01	***	0.01	***	0.01	***	0.00	***	0.00	***
Main explanatory variables										
Year group										
1978-1982	2.05	***	2.38	***	2.20	***	1.40	***	1.38	***
1983-1987	1.94	***	2.13	***	1.98	***	1.56	***	1.55	***
1988-1992	1.76	***	1.83	***	1.76	***	1.45	***	1.45	***
1993-1997	1.29	***	1.34	***	1.35	***	1.18	***	1.18	***
1998-2002	1		1		1		1		1	
2003-2006	0.68	***	0.70	***	0.64	***	0.77	***	0.77	***
Employment status										
Never employed			0.75	***	0.95		0.76	***	0.78	***
Employed			1		1		1		1	
Ever/unemployed			2.09	***	2.14	***	1.35	***	1.36	***
Control variables										
Own education										
In-education					0.04	***	0.06	***	0.06	***
Elementary					0.66	***	0.60	***	0.60	***
Middle school					1		1		1	
High school					0.99		1.29	***	1.37	***
College					1.06		1.51	***	1.65	***
University or above					1.15		1.63	***	1.90	***
Marital status										
Single							0.14	***	0.14	***
First marriage							1		1	
Disrupted							0.23	***	0.23	***
Later marriages							0.63		0.63	

Table 3: (Continued)

	Model 1 Haz. Ratio	Model 2 Haz. Ratio	Model 3 Haz. Ratio	Model 4 Haz. Ratio	Model 5 Haz. Ratio	
Religion						
None					1	
Buddist					1.03	
Protestant					1.02	
Catholic					1.00	
Other					1.13	
Residence at 14						
Seoul National Capital Area					1	
Metropolitans					1.16	***
Other provinces					1.23	***
Father's education						
Low					1	
Medium					0.89	***
High					0.76	***
Mother's education						
Low					1	
Medium					1.13	**
High					1.03	
No. of subjects	7338					
Number of obs	115179					
No. of failures	3370					
Time at risk	904591					
Log likelihood	-4120.14	-3844.79	-3436.65	-2341.16	-2315.129	
LR chi2	3773.83	4324.54	5140.81	7331.81	7386.86	
Prob > chi2	0.00	0.00	0.00	0.00	0.00	

Note: Statistical significance: ***: p<=0.01; **: p<=0.05; *: p<=0.10

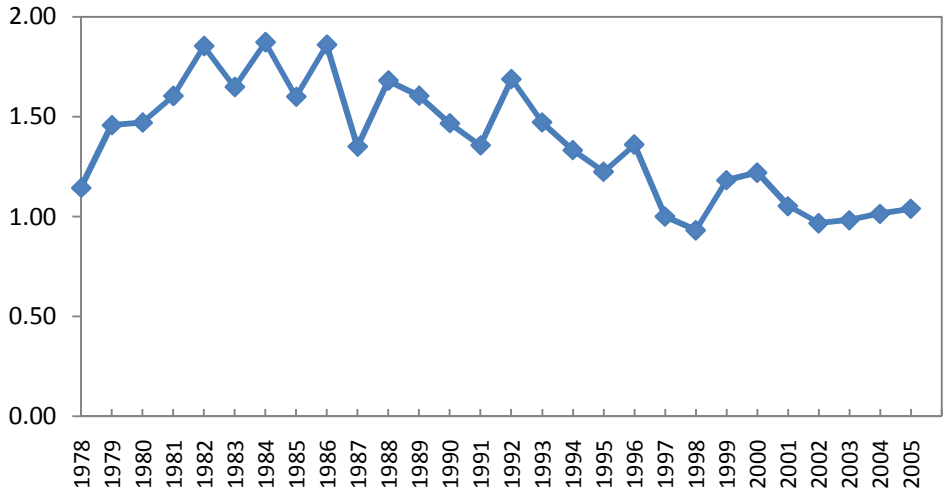
Source: Estimations based on KLIPS

In model 4 I involve time-varying marital status into analysis. As expected, first births out of wedlock (during singlehood or marriage disrupted time) are very rare. The birth rate at later marriages is about 40% lower than at first marriage. Broadening our common understanding that almost all births in Korea fall within wedlock, the results reveals in detail that first births are more likely to fall within the first marriage than later marriages.

Model 5 takes women's background factors into account. Whether a woman is religious or not or in what religion a woman believes does not make much difference to their motherhood entry, but women's residence at age 14 does. Compared to women who grew up in Seoul National Capital Area, women who grew up in any of the five metropolitans are at 16% higher risk of becoming a mother and the risk for women who spent childhood in other provinces is 22% higher. Father's education attainment has a significantly clear negative impact on daughter's motherhood entry, while the effect of mother's education is not clear.

In order to have a better look at the motherhood entry differences between years, especially the diversity before and after the 1997 Financial Crisis, I run an additional model based on model 5 by replacing year groups with single years while holding all other factors equal. **Figure 5** displays a general decline of motherhood entry since the early 1980s. The general decline is likely to be both a consequence of family planning program and other compound factors such as prevalence of childlessness. A clear and steep plummet of first birth rate from 1996 to 1997 can be seen. The first birth rates after 1997 seem to have iced up together except that of the year 1999 and 2000, which is probably out of the Millennium effect. The figure discloses that the 1997 Financial Crisis further depressed women's likelihood of becoming a mother.

Figure 5: Motherhood transition rates by calendar years, standardized for all other factors



To capture the effect of labor market characteristics, I run several extension models based on model 5 **(see table 4)**. Model 6 is specified to estimate whether work type (wage earners or non-wage earners) influences women's intensity of becoming a mother. Wage earners indicate those who work as employees at different sectors. Non-wage earners mainly refer to those who are self-employed or who work for family businesses without salaries. Afterwards, I add more detailed labor market characteristics for wage earners one at a time to model 6 to explore the effect of work hour, workplace and income. In the work hour model, the episodes of "wage earners" are replaced with "part-time" and "full-time". Likewise, in the workplace model, "wage

earners" are substituted by "private/foreign companies", "state-owned enterprises (SOE)/government foundations (GF)", "public sectors" or "others"[7]. For the income model, I weight each individual's income by using the consumer price index (CPI) of 1998 as the reference, taking into account of inflation rates over the years from 1978 to 2006. Thus, the value of income in different years for wage earners has been all adjusted to that of 1998. In this way, income variable is grouped into three categories: low (less than 2 million KRW), middle (2-3 million KRW) and high (more than 3 million KRW)[8] .

Table 4: Motherhood transition rates by employment characteristics, standardized for all other factors

Model 6		
Work type		
Never employed	0.74	***
Wage earner	1	
Non-wage earner	0.80	***
Missing	0.42	
Ever/unemployed	1.31	***

Model 6.1			**Model 6.2**			**Model 6.3**		
Work hour			***Workplace***			***Income***		
Never employed	0.68	***	Never employed	0.56	***	Never employed	0.56	***
Part-time	0.77		Private/Foreign	0.76	***	Low	0.79	**
Full-time	1		SOE/GF *	0.99		Middle	0.79	**
Non-wage earner	0.74	***	Public sectors	1		High	1	
Missing	0.82	***	Others	0.67		Non-wage earners	0.61	***
Ever/unemployed	1.21	***	Non-wage earner	0.61	***	Missing	0.61	***
			Missing	0.67	***	Ever/unemployed	1.00	
			Ever/unemployed	1.00				

Log likelihood	-2307	-2303	-2300
LR chi2	7400.2	7408.4	7413.8
Prob > chi2	0.00	0.00	0.00

* SOE/GF indicates state-owned companies or government foundations

Note: Statistical significance: ***: p<=0.01; **: p<=0.05; *: p<=0.10

Source: Estimations based on KLIPS

[7] Those who work at schools, hospitals or government branches are categorized into public sectors.

[8] Data for CPI inflation figure come from www. Inflation.eu. The currency exchange rate between Korean won and US dollars in 1998 was 1:0.0008. 1 million KRW equaled to 800 USD in 1998. Thus, the three categories are roughly <$1600, $1600-$2400 and >=$2400, respectively.

Table 4 presents the estimated results from model 6 and the other extended main effect models. The effects of other covariates in these models are almost the same with those from model 5 and are thus not exhibited in the table. The results reveal that all other things being equal, the chance of giving first birth is 20% higher for wage earners than for non-wage earners. Among the wage earners, the likelihood of becoming a mother for women working full time is 23% higher than those working part time. Public sectors and state-owned enterprises or government foundations seem like cradles of producing mothers. By contrast, working in private/foreign companies or other places depresses women's motherhood entry. Relative to high income earners, low and middle income earners are at significantly lower risks of becoming a mother. There is no transition divergence between low income earners and middle income earners.

In order to capture the dynamic changes of motherhood entry over time, I run several interaction models between women's individual characteristics and calendar years. All these interaction models develop from model 5.

The interaction effect of employment status and calendar years is displayed in **Figure 6** with "employed" during 1998-2002 as the reference category. In general, motherhood entry for all groups of women declined since the early 1980s, regardless of women's employment status. Compared to women who stay on the labor force, women who leave the labor market have higher risks of becoming a mother over time while women with no employment experience have lower risks during most of our study time. Albeit declining slowly, the trend for women who stay in the labor market appears relatively stable. But the trends for the other two groups of women show different stories. Since the early 1980s, the motherhood decline has been rather steep for women who were ever employed but have quitted jobs. This suggests that leaving the labor market for pregnancy has become less and less common in Korea. Instead of dropping out of the labor market at such an early stage of family life, women are more and more likely to stay in the labor force while pregnant and then drop at childbearing or childrearing or might choose not to drop at all. Motherhood entry for women with no employment experience has also experienced a consistent and steep decline since the start of our observation time. However, the trend reverses slightly during the aftermath of the 1997 financial crisis. This could be a reflection of women's strategy of readjusting life career at economic downturn. During the fast economic growth periods, on the government's appeal of female engagement in the labor market, women with no employment experience would choose to accumulate some employment experience first before starting their family life. But when the country's economic engine went sluggish after 1997 and the job market consequentially slipped into stagnation, instead of waiting hopelessly for a job opportunity, these women may have reconsidered their life career and opted for becoming a mother first.

The estimations from the interaction models for the effect of work type, work hour and workplace are in line with our findings from the main effect models. The further prove that those who have stable job positions (namely, those who work as wage earners, full timers, and

those who work at public sectors or government foundations) are more likely to become a mother over time than non-wage earners, part timers and those who work at private sectors or other areas. At the 1997 financial crisis, motherhood entry of both stable job holders and unstable job holders experienced a sharp decline. But relatively the decline for stable job holders was not that steep.

The effect of income makes a big difference to wage earners' motherhood entry over time. **Figure 7** shows that during the fast economic growth periods before the crisis, it was most often the low-income wage earners that were at higher risk of becoming a mother than the middle- and high-income earners. During the same periods, the trend for middle-income earners was quite stable, whereas that of high-income wage earners experienced a downturn in 1983-1987 and then reversed to as high as that of middle-income earner in the 1993-1997 time period. However, all three trends dropped dramatically in concert with the crisis. The drop for low-income earners is the steepest whereas the drop for high-income earners is relatively slow. This is expected. Low-income earners, most often those who work on a temporary base are more vulnerable to economic meltdown. Under good economic situation, labor market was not as attractive to them as it was to high income earners. Thus, they were more likely to become a mother on account of loose attachment to the labor market. However, during economic downturn, exposed to more instability and with little or no protection from either employment or any of the welfare programs, they were more likely to sidestep motherhood entry.

Figure 6: Interaction effect of employment and calendar years on motherhood entry, standardized for all other factors (reference category: Employed 1998-2002)

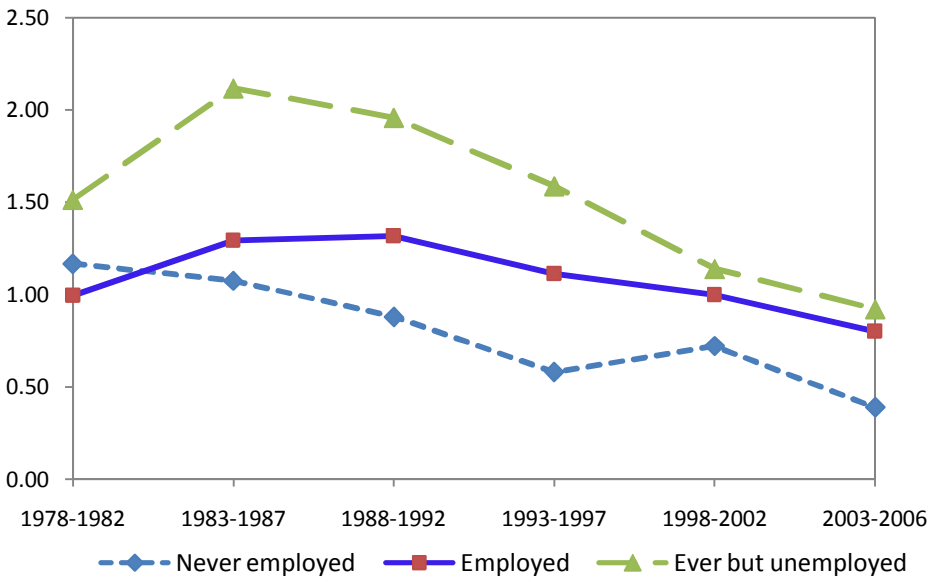


Figure 7: Interaction effect of income and calendar years on motherhood entry, standardized for all other factors (reference category: High-income 1998-2002)

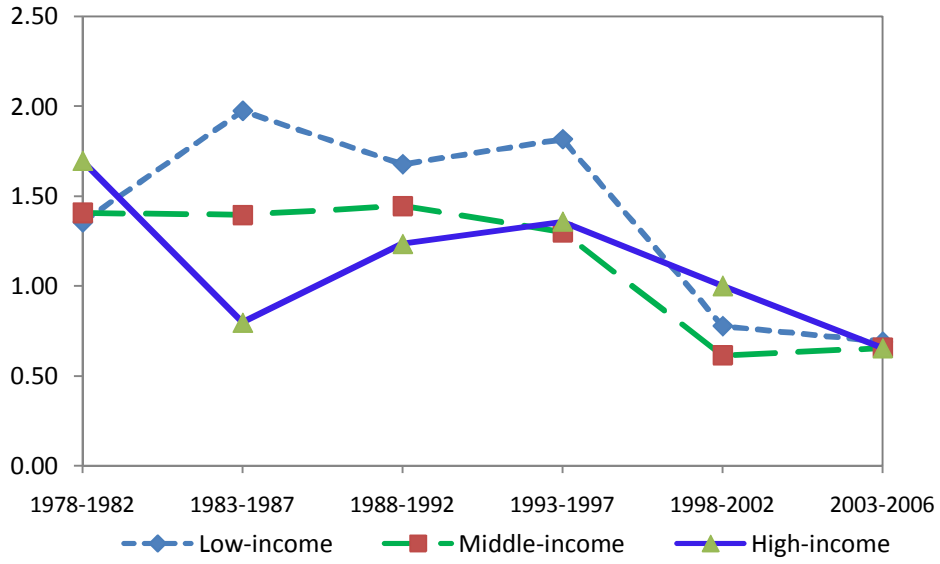
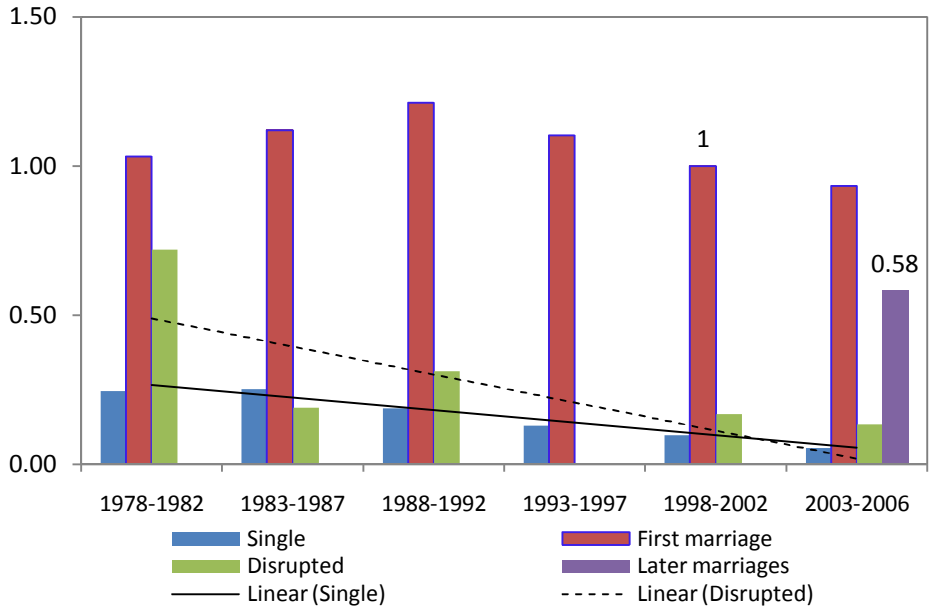


Figure 8: Interaction effect of marital status and calendar years on motherhood entry, standardized for all other factors (reference category: First marriage 1998-2002)



Beyond the employment related models, two other interaction models are specified in order to capture the dynamics of motherhood entry over time by education and marriage. The interaction effect of education over time is in line with the findings from the main effect models and thus not explained. The interaction effect of marital status, despite not the focus of this study, deserves a few words in this paper in that it expands our pervious knowledge that almost all births fall within wedlock in South Korea. **Figure 8** shows that the first birth trend within first marriages has been rather stable over time. Quite recently during the 2003-2006 time period, becoming a mother at later marriages has started gaining prevalence. It, in some way, reflects the increasing social acceptance of divorce in the Korean society as well as social recognition of remarriages and children born within remarriages. The figure also reveals that becoming a mother outside marriages is becoming more and more groundless in Korea, as we can see the first birth trends for women at singlehood and marriage disrupted period have declined over time.

Conclusion

The goal of this paper is to investigate how women's likelihood of becoming a mother alter by employment status and labor market characteristics in accordance with Korea's social and economic change and the process of welfare state establishment and expansion. To address the three research questions, I applied piecewise constant exponential models to estimate the dynamic changes in motherhood entry over time. Main effect models, extended main effect models, and interaction models have been specified.

The answer to the first question is "Yes". The estimates of calendar years (both the year groups and the single years) from main effect models show a general decline of motherhood entry since the early 1980s. The decline might be due to the implementation of family planning program initiated in the early 60s. It might be also due to other compound factors such as prevalence of childlessness. With the risks of becoming a mother during the fast economic growth periods higher than the welfare state establishment /expansion periods, I argue that the 1997 Asian Financial Crisis exacerbated women's propensity of becoming a mother.

This study discovers that employment status do have divergent effect on women's likelihood of becoming a mother and so do labor market characteristics. Compared to women who stayed in the labor market, women who left the labor market for family life had higher motherhood transition rates and women who had never been employed had lower transition rates. Among women who stayed in the labor market, wage earners had slightly higher transition rates than non-wage earners. Further, amid wage earners, full-time workers, those who work at public sectors, SOE or government foundations and high-income earners were at relatively higher risks of becoming a mother.

To address the third question, I run interaction models of calendar years and both employment status and labor market characteristics. A decline of motherhood entry was discovered for all groups of women since the 1980s, regardless of their employment status. The 1997 Asian Financial Crisis seems to have exacerbated the decline. The trend for women who stayed in the labor market was relatively stable, although declining. The estimation reveals that dropping out of the labor market for pregnancy is becoming less and less common. Instead, women might choose to stay at the labor market longer before dropping out for childbearing or childrearing or even choose not to drop. The stagnated job market after the crisis might have made women with no labor market experience opt for becoming a mother first before entering the labor market.

Interaction models do not find any significant diversity in motherhood entry by work type, work hour and workplace except that stable job holders (wage earners, full-timers and those working at public sectors or government foundations) have been at relatively higher risks of becoming a mother over our study time. The results further disclose that during economic downturn, the decline of motherhood entry for stable job holders was not as steep as that of those who have unstable job positions.

The interaction model of income and calendar years discloses that income has made a great difference to motherhood entry over time. During the fast speed economic development periods, low-income earners were at the highest risks of becoming a mother while high income earners were at the lowest risk of becoming a mother. I argue that under good economic situation, the higher propensity of becoming a mother for low-income earners is largely on account of their loose attachment to the labor market. By contrast, deeply attracted by and closely attached to the labor market, high-income earners have lower risks of becoming a mother. However, low-income earners' likelihood of becoming a mother was very vulnerable to economic downturn. The motherhood entry of low-income earners jumped dramatically at the 1997 financial crisis. Meanwhile, the trend for high-income earners jumped as well, but not that steep. I argue that exposed to more instability and under little or even no protection from employment or welfare programs, low-income earners are more likely to sidestep becoming a mother at difficult situations.

This study does not find distinguished differential effect of "productive" welfare and "participatory" welfare on motherhood entry. After all, welfare state establishment of South Korea is still in process, constantly in need of adjustment and change. In the long run, with the country recovering from the crisis and getting back to its financial health, Korea's welfare regime will better itself and gradually bring more people under its coverage.

Apart from the findings and implications discussed above, this study also expands our previous knowledge of motherhood transition by education and marriage in Korea. First, the motherhood transition for women in education is extremely low compared to that of women who have completed their education. Among women who have finished their education, those at a level of

university or above are more likely to become a mother. I argue that in Korea, university educated women are the least likely to get married compared to women at other educational levels. But among women who do get married, university-educated women are more family oriented and more ready to become a mother than other women.

Besides, this study further confirms the Korean social norm that births should fall within marriages. Our estimation reveals that becoming a mother out of wedlock (during singlehood or marriage disrupted time) is becoming more and more groundless over time. Instead, the very recent rising of becoming a mother at later marriages becomes striking. These findings reflect the tight association of marriage (or remarriage) and motherhood in the context of South Korea and the socially accepted proper order of a woman's life – getting married before getting pregnant.

It is hard to deny that apart from the main explanatory and control variables used in the study, there are other factors that may influence women's motherhood entry in the context of Korea. The very first example would be the availability of mother or mother-in-law in or around who may offer help with childrearing and help women reduce the incompatibility of women's work and family life. However, the data available are only whether a woman's mother (or mother-in-law) is living with her at the interview time. This information is obviously not sufficient enough for a time-varying variable. Using it as a time-fixed variable would lead to the risk of anticipatory analysis, which conditions motherhood entry at an earlier time on the future. Availability of child care centers in the neighborhood at childbearing is another factor that may affect motherhood entry. However, such data are desirable but not available. Future research with regard to motherhood entry in South Korea could be focusing on the effect of husband's human capital background on women's motherhood entry within marriages. In addition, the effect of motherhood on women's job career in Korea's context of social and economic change is also worth investigating.

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