

**Economic reforms, family formation  
and the length of the first birth interval in Vietnam**

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**Introduction**

Much of demography literature depicts emergent trend toward the family formation in Asia over the 30 past years is the delayed marriage and the shortening of the first birth interval (Mensch, Singh and Casterline, 2005, Hirschman and Rindfuss, 1982). Nuptiality has closely associated with fertility. Age at marriage is viewed as a proxy for initiation of regularized sexual intercourse and the beginning of parenthood. The younger age at first marriage, the longer the reproductive age the women should be. Changes in marriage patterns, through raising the age at first marriage result in lower fertility and longer intervals between generations and the more children eventually born. The relations of marriage and childbearing tend to be close since marriage is the onset of family formation and parenthood. Relations between nuptiality and childbearing vary widely from one society to society under the diversified impacts of cultural, social and economic determinants.

Located amidst Southeast Asia region, Vietnam shared the social and cultural characteristics with many other regional societies and cultures. The common traditional patterns of marriage practices Vietnam is early and universal. Influenced by Confucian ideology in which kin solidarity is emphasized, marriage and childbearing are viewed as the sacred responsibility to maintain succeeding generations. Primary purpose of marriage is associated with reproductive function to produce offspring as the continuity of family and life.

Social and economic transformation has caused impacts on the marriage and childbearing patterns in many developing countries for over past 30 years. Pattern of early marriage shifts to that of delayed marriage and childbearing. Observations in developing countries show the reliable

evidence that the age at first marriage has increased over the decades under the impact of modernization (Mensch, Singh and Casterline, 2005). Literature emphasizes on the three primary mechanisms of modernization on changes of marriage patterns at national level, including urbanization, expansion of years of education and increased participation of non-agricultural labor. The role of education is clearly evident when it not only prolongs the years of single life because effect of role conflicts but higher education is associated with change in value and ideas about meaning of love and marriage.

In the same vein, the evidence in few studies in age at first marriage in Vietnam showed evidence that age at first marriage increased under the effects of the historical period and modernization process started undergoing in Vietnam in 1945. Pattern of late marriage extends to all people regardless of their gender, education level, religion and occupation and place of residence as the impact of modernization and urbanization. Besides to the effect of education expansion, the effect of war on the pattern of delayed marriage in Vietnam is considerable; especially for female and male cohorts whose marriage age felt on the time during and after the war when all men had to go to the front and the marriage pool was reduced due to the high men death rate. Note that, delayed marriage pattern is clear for social transformation from agriculturally to industrially based economy and translated into age mean of first marriage among birth cohorts born before 1945 and their counterparts born after 1945 (Minh, 1998).

Second sequence of family formation events is the first birth. A trend toward earlier start of childbearing within marriage has been noted in several studies of a number of Asian countries. This trend is typically examined in terms of the number of birth in the first few months or first three years of marriage (Hirschman and Rindfuss, 1982, Rindfuss and Morgan 1983 ). Timing of childbearing is closely related to timing marriage. The interval between marriage and the first birth is especially important in the pace of sequential births among pre-transition and non-contraception populations

(Bumpass, Rindfuss and Janosik, 1978). Demographers tend to direct their own research to much more proximate determinants of fertility, including biological and social factors which played a role as respectively direct and indirect determinants on the child spacing trends observed in many societies (Bongaarts, 1978, ). Biological factors, namely, the frequency of coital intercourse, are viewed as an immediate factor associated with fertility and the timing of births. However, the frequency of coital intercourse is hardly to measure in demographic studies and the common approach to this issue is to use indirect measurement of social, household and individual characteristics and investigate the extent of which the links between context covariates and biological factor established in association with timing of first birth.

Rindfuss and Morgan (1983) studied the trends in and the determinants of the first birth interval in China, Taiwan, Malaysia and Korea. They argued that the shortening of the marriage-to-first-birth interval is partly due to a remarkable increase in the proportion of early marital conceptions which is in turn linked to an increased rate of coital frequency before and early in the marriage. The magnitude of the trend is so strong that the authors talked about a “quite sexual revolution” in those countries.

Several studies followed the footsteps of Rindfuss and Morgan’s explanations of the determinants of the first birth interval across traditional settings in the period of social and economic transformation (Nath, D., Singh, K., Land, K., and Talukdar, 1998 Feng, W and Quanhe, Y. 1996. Fricke, T and Teachman, J. 1993). Even though there exists variation, a prevailing pattern toward a shorted first birth interval found in a number of studies in Asia as the result of changes family pattern in modern World (Hirschman and Rindfuss, 1982). These studies have concluded that the trends in the first birth interval have been shaped in part by broad social changes: a fundamental transformation in marriage system, a massive expansion of education and non-familial employment opportunities. Evidence from South and South East Asia tends to support Rindfuss and Morgan’s

hypothesis that changes in premarital and marital sexual behavior resulted in quicker formation of intimate ties and higher coital frequency among couples. A move from traditionally arranged marriages toward romantically driven marriages leads to the fact that married couples form sexual relationship faster than their previous generations. Notably, the age at first marriage also play important role in the shortening the time between marriage and first birth as the catch-up effect of late marriage among studied populations.

### **The focus of the study**

There are two possible sequences for first marriage, first birth and conception leading to the first birth. These include (1) marital conception (2) premarital conception leading premarital birth or marital birth. In the present study, I drawn upon the conceptual framework for the Hirschman's and Rindfuss's study of the determinants of early family formation. As a rule, they develop a preliminary model of the determinants of the sequence and timing of early family formation events, in which societal determinants (structure of household economy, opportunities in non-household sector and knowledge and availability of birth control) and individual characteristics are main determinants on the timing of family formation. Notably, the trend is believed to have taken place in social settings undergoing the modernization, industrialization and urbanization. When the nuptiality is the initiation of socially accepted sexual intercourse, the marriage decision can be a result of premarital conception and legitimate sexual intercourses.

In the initial formation of hypothesis on changing family patterns in the modern world, Goode (1963) note that the trends toward the same level could be moving in opposite directions because of varied starting points. That is reason for me to focus on the effects of the economic reforms on first birth interval assuming that these effects operate family formation primarily through changes in married couples' sexual behavior. Broadly speaking, I would argue that the social and

economic changes since the introduction of comprehensive socioeconomic reforms, widely known as Doimoi, in 1986 in Vietnam have led to changes in marriage and fertility behavior.

Even though the modernization has been undergoing in this country long before the onset of Doimoi, the economic reform introduced in 1986 marked more substantially social and economic change. Doimoi have helped shorten the time between marriage and onset of childbearing by fostering attitudinal and behavioral changes surrounding sexuality. The reforms marked the end of a centralized planning socialist system and a shift toward privatization, market economy, increased cash flows, and openness in the mass media. The previously closed society became increasingly familiar with Western ideas and values, including more relaxed ideology toward pre-marital and non-marital sexuality.

To establish the link of the impact of Doimoi and the changes in sexual behavior in the society, I rely on the hypothesized difference in terms of sexual attitude and behavior between populations defined along different social dimensions, including age (young versus older generations), place of residence (urban versus rural populations and education. Those indicators have been used in much prior literature. For instance, along the generational dimension, there is a consensus in the literature that while the older generation strongly condemns premarital sexual relations, young people are much more inclined to approve of sex before marriage or at least not to regard it with trepidation or disdain (Hong 1998). Parentally arranged marriages have been gradually replaced by individual-choice marriage with the spreading of the meaning of love, sexuality and intimacy before marriage. This is considered as a precondition to the intimate ties between couples before and after marriage. All these provide a strong support for a study of the impact of Doimoi on the young and older generations. The difference of the level of impact on populations defined along other social characteristics such place of residence, ethnicity, and education are less studied in a quantitative manner in the literature. These characteristics are indicative to experience of modernity.

The people who live in urban areas, are highly educated or belong to dominant group are present an association with egalitarian ideologies since they have more opportunities to expose to mass media, cultural new patterns as well as ideas of individual freedom and self-identity. New attitude and behavior on sexuality are more likely to emerge in these groups of population before its diffusion into other groups.

My analysis of the impact of Doimoi on the age and first birth interval of married women in Vietnam is not only of independent interest, but also helps shed some light on such changes in sexual attitude and behavior in the country. In fact, there do not exist any large scale data sample that capture variables directly related to sexuality in a country such as Vietnam. The data set on age and first birth interval provides the closest possible window to this matter. It allows me to analyze and draws preliminary findings on the impacts of Doimoi on variables such place of residence, and so on, in terms of sexual and fertility behavior.

One of the issues that I also pay special attention in this study is the catch-up effect in late marriages. Despite the steady increase in age upon first marriage since 1970s (Minh, 1998), children remain a central part of individual and family identity. Contraceptive use before the birth of first child remains very low compared to subsequent births. Because of the persistent importance of children, couples may tend to have their first child soon after marriage to compensate for their late start. This pattern of catch-up effect of later marriage also illustrated in China a country sharing common cultural characteristics with Vietnam.

It is worth noting that unpublished and published reports in Vietnam reveal evidence that younger cohorts have shorter interval between marriage and the first birth than do older cohorts. For instance, a study among married women from 15 to 45 years of age in a rural area of Thaibinh province showed that the first birth interval had decreased in the past five years, while there was no significant difference in mother's age at the first birth between those delivering in the past five years

and earlier. The interval was also found to be shorter for those having formal education compared with those without formal education (Hoa et al., 1995). Vu (1998) also found the evidence of the shortening of the first birth interval among the young generation compared to the older generation using a sample of ever-married women in Red River delta, where the social transformation is undergoing more rapidly (Vu, 1998). However, these results were limited to only small local areas in the country and had a different time scale and different research objectives. They did not necessarily indicate the underlying dynamics and patterns of the first birth interval occurring nationwide over the past several decades.

### **Hypotheses**

The focus of the present study is the sequences of family formation on its implication on changes in marriage patterns, sexuality and fertility behavior in the period of social and economic changes. The age at first marriage and initial childbearing among Vietnamese women depend on a number of societal, household and individual factors.

To examine the pattern of the early family formation under the impact of modernization factors, I considered a number of hypotheses:

First, I expected to find association between an incidence of premarital conception and periodic indicators (between older cohorts and younger cohorts) and individual characteristics (urban/rural origin and educational level). Younger women tend to show open-minded toward premarital sexual relationship resulting in premarital pregnancy. High education and women live in urban area or work in non-agriculture sectors also support and experience the premarital sexual activities. Age at first marriage also expect to influence on the premarital conception and family formation. Since they all end up in marriage after getting pregnant it is reasonable to include this variable in the analytic models.

Second, I hypothesized that individual social characteristics are associated to the likelihood of conception and having the first birth after marriage. The social characteristics included wife's and husband's education, place of residence, and occupation. We expected that younger women are more likely to transition to childbearing than older women. Under the light of economic reform, women who have higher educational levels or working on non-agriculture sectors would be more responsive to the socioeconomic changes therefore more likely to display a shortening of the first birth interval. I also examined whether the timing of fertility is a catch-up effect of late marriages. If that was indeed the case, we expected that the age at first marriage is positively correlated with the first birth interval.

### **Data and method**

The analysis uses data from the 2002 Vietnam Demographic and Health Survey (Vietnam DHS). The DHS is a nationally representative, probability-based survey with large sample size of ever-married women from 15 to 49 year old in developing countries. The surveys usually conduct for every five years to allow comparison over time. The 2002 DHS survey is was the third DHS in Vietnam, with prior surveys implemented in 1988 and 1997. The VNDHS 2002 was carried out in the framework of the activities of the Population and Family Health Project of the Committee for Population, Family and Children (previously the National Committee for Population and Family Planning). The main objectives of the VNDHS 2002 were to collect up-to-date information on family planning, childhood mortality, and health issues such as breastfeeding practices, pregnancy care, vaccination of children, treatment of common childhood illnesses, and HIV/AIDS, as well as utilization of health and family planning services. The primary objectives of the survey were to estimate changes in family planning use in comparison with the results of the VNDHS 1997, especially on issues in the scope of the project of the Committee for Population, Family and Children, Vietnam.



Of the 7,150 households selected in the sample, 7,056 households were occupied at the time of the interview, and 7,048 were successfully interviewed, for a household response rate of almost 100 percent. The household response rate was high in both urban and rural areas. A total of 5,706 eligible women were identified in the interviewed households, of whom 5,665 were successfully interviewed, yielding a response rate of 99 percent (DHS report 2002, Vietnam). My sample consists of 5337 ever-married women who got married and have at least one child from 1975 to 2002.

### **Analytical strategy**

To test hypothesis of premarital conception I used binary regression model to examine the effects of corresponding covariates on the likelihood of having premarital conception.

To test hypothesis of transition to marital conception and first birth event-history models are the appropriate forms of analysis. Specifically, I used Cox proportional hazard models to estimate hazard of giving a first birth after marriage. Cox model is overwhelming favored model for many its advantages (Allison, 1995).

In the analysis, individuals become at risk of having a first birth at the time they get marriage and they removed from the risk after they gave a birth. Individuals who are not given a birth are censored. Note that because individuals (157 cases) in the study had a birth before their marriages, they are left-censored and thus not included in the analysis.

### **Measurement of variables**

#### 1. Dependent variables

*Premarital conception:* Premarital conception is defined by the length of birth interval which was less than 8 months. In logistic regression model, a respondent is coded 1 if she is defined having pregnancy before marriage, otherwise 0. Note that the time of marriage is based on the question “In what year/month did you start the marital union”. Because

cohabitation is not common in Vietnam, marital union usually is understood as formal marriage.

*Marital first birth:* Marital conception is defined by the duration between the month of formation of the first marital union to the month of having first birth greater than 9 months. In a Cox hazard model, event-transition indicator is coded 1 if a respondent experiences the event of having marital conception and coded 0 if the respondent does not. Unlike a question about marital union, the time of giving a first birth is exclusive. In the DHS data it is constructed from two questions “in what month/year did you start the marital union?” and “in what month/year did you give a first birth?”

## 2. Independent variables

- a. *Birth cohorts:* birth cohort is historical indicator. Respondents are subdivided into 5 birth cohorts: 1952- 1964, 1959- 1964, 1965- 1970, 1971 -1990, and 1978-1986. To test the effect of economic reform on likelihood of getting premarital conception and transition to first birth, the change in coefficients over generations was investigated.
- b. *Place growing up:* measurement of place of usual residence reflects respondents' urban/rural origin and is classified into two categories urban and rural.
- c. *Wife' education and husband's education:* measurement of education is time-fixed variable because the educational attainment is considered as a predictor of human capital by which people who hold higher education level are more likely to expose to new ideas of individual intimacy and sexual activities. Other, prior literature confirms that people tend to marry after education completed because of mechanism of role conflict (Yabiku, 2005). Accordingly, educational attainment can be predictor to likelihood of having premarital sex and transition to first birth.

They are constructed and treated as continuous variables with 7 point-scale from the question “what educational level have you attained?” no education (reference group), incomplete primary school, complete primary school, incomplete secondary school, complete secondary school, incomplete higher school and complete higher school.

- d. *Wife’s and husband age at first marriage*: For women this information is subdivided into 4 groups: people married before aged 19, from aged 19 to 21, from aged 22 – 23 and after aged 23. For husbands responding 4 groups are before aged 19, 19- 22, 23 – 25 and greater than aged 25.

## **Results**

### *Descriptive analysis*

Before discussion of the multivariate results, a few descriptive statistics will be briefly considered. Table 1 is descriptive of the trend in age at first marriage and onset of the first birth. Since the sample size consist only ever-married women, the means of age at first marriage is relatively representative to the general population. Table 1 shows comparison of the means of age at first marriage and means of age at first birth by year of birth. It indicates that the age at first marriage and age at first birth are highly correlated (Pearson correlation coefficient = 0.92) and tend to decline over generations. Except for the youngest cohorts whose representative sample consists only early marriages, older cohorts including women over 25 year olds also present the decreased trend in age at first birth. Comparison between age at first marriage and age at first birth by birth cohorts reveals pattern of early family formation in recent decades in Vietnam. Figure 1 and figure 2 also show the trend of early marriage and giving first birth among ever-married women by birth cohorts and marriage cohorts. Proportion of women who married and gave birth before 20 and 25 year olds tend to increase over time.

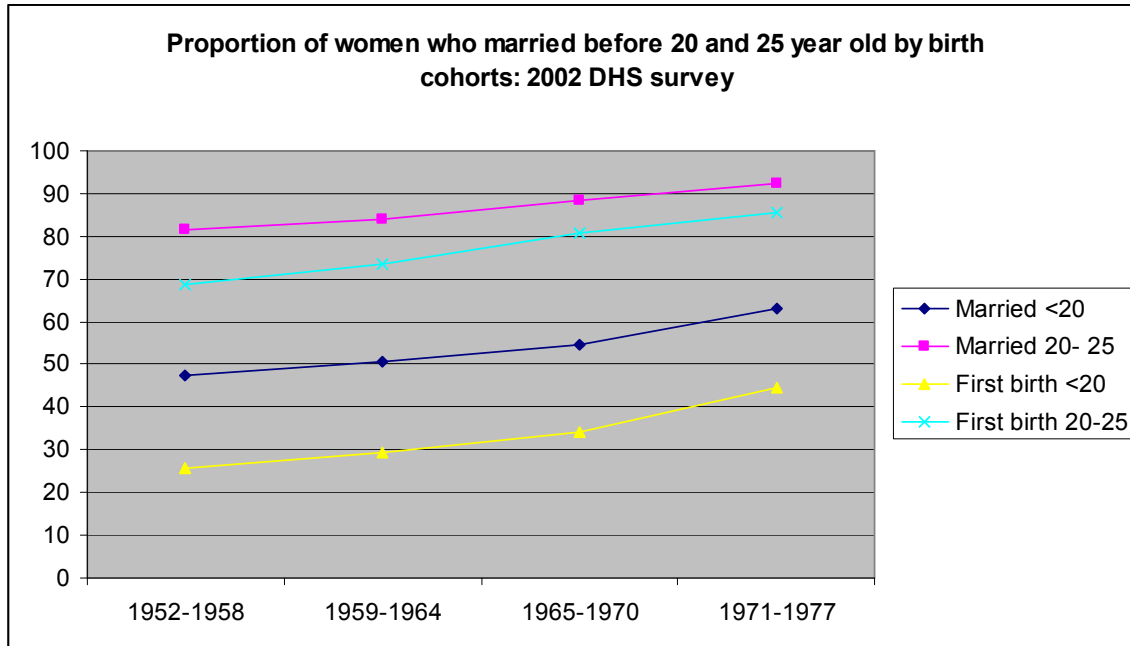
Investigating table 2, table 3 and figure 3 suggests the increased trend of premarital conception but marital births and the shortening of marital first birth duration among ever-married women by year of birth and year of marriage. Younger women tend to engage in premarital sex and lead to early marriage formation and marital births. Marital birth duration also considerably decreases over time.

Table 4 presents the difference in length average of the first birth interval by individual characteristics. Birth interval is associated with individual characteristics such as place of residence, marriage age, type of occupation and education. For instance, urban women also give first birth one month earlier than rural women. Women with higher education have a shorter first birth interval than women with no education or with only primary education. Women (and their husbands as well) who married late also tend to shorten the time from marriage to birth.

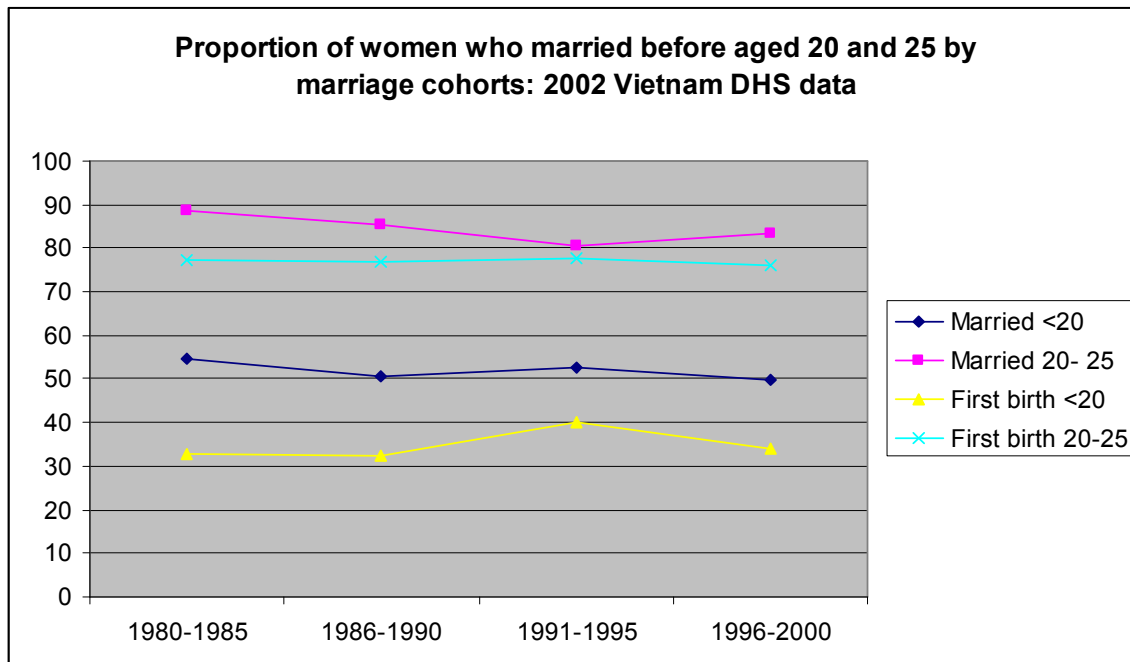
**Table 1**

Birth cohort	N	Age at first marriage		Age at first birth	
		Means	SD	Means	SD
1952- 1958	18.8(1007)	21.39	4.0	23.22	4.1
1959-1964	24.2 (1296)	21.11	3.8	22.87	3.8
1965-1970	23.3 (1244)	20.64	3.3	22.16	3.4
1971-1977	24.9 (1334)	19.87	2.8	21.27	2.9
1978-1986	8.5 (456)	18.50	1.9	19.70	1.9
Total	5337	20.52	3.7	22.10	3.6

**Figure 1**



**Figure 2**



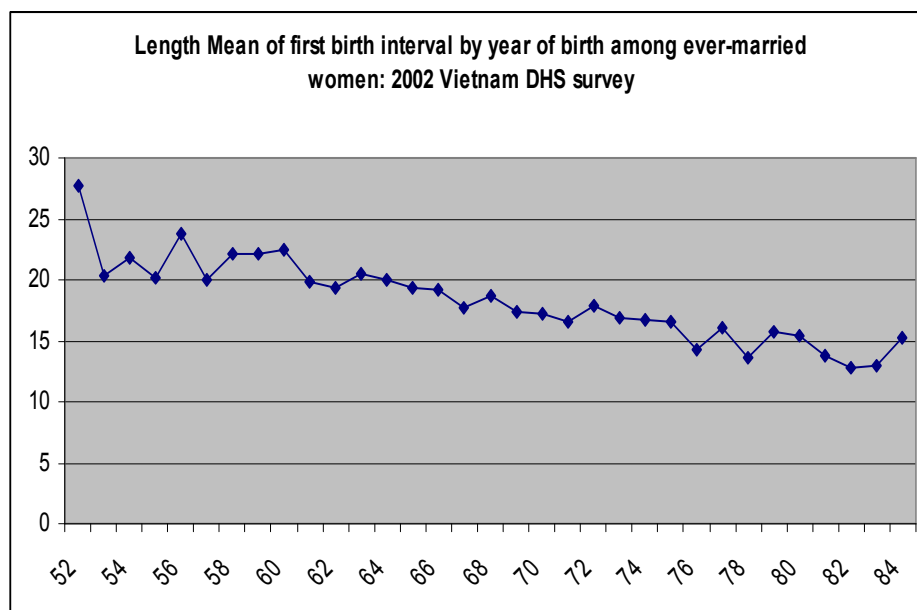
**Table 2: Proportion of premarital conception among ever-married women by birth cohorts**

Duration of birth	Birth cohorts				
	1952-1958	1959-1964	1965-1970	1971-1977	1978-1986
0-8	8.57	8.6	7.92	11.69	13.83
9 - 18	46.62	53.3	56.33	65.37	65.37
> 18	44.81	38.1	35.75	20.81	20.81

**Table 3: Proportion of premarital conception among ever-married women by marriage cohorts**

Duration of birth	Birth cohorts				
	1975-1979	1980-1985	1986-1990	1991-1995	1996-2000
0-8	8.24	8.74	8.62	11.98	10.53
9 - 18	52.13	48.72	57.57	57.23	63.81
> 18	39.63	42.53	33.81	30.28	25.66

**Figure 3**



**Table 4. Mean length of the first birth interval by respondents' social characteristics: Vietnam 1975- 2000**

	<b>Mean (n=5337)</b>	<b>Percent of respondents</b>
<b>Residence</b>		
Rural	17.4	22.0
Urban	18.3	77.9
<b>Employment</b>		
Agricultural field	19.0	64.1
Non-agricultural field	17.6	35.8
<b>Wife's Age at marriage</b>		
<19	20.3	44.1
19-21	17.8	23.5
22-23	16.6	15.0
>23	16.1	17.2
<b>Husband's Age at marriage</b>		
<19	22.4	12.4
19-22	19.3	18.3
22-25	18.5	42.6
>25	16.4	46.6
<b>Marriage cohort</b>		
1975- 1979	21.8	17.3
1980- 1985	20.7	26.1
1986- 1989	16.7	18.5
1990-1995	16.7	24.6
1996-2000	14.5	13.3
<b>W's education</b>		
No education	20.4	6.4
Elementary	18.3	27.7
Secondary	18.5	62.5
Higher education	16.1	3.3
<b>H's education</b>		
No education	20.2	6.4
Elementary	18.7	27.7
Secondary	18.3	62.5
Higher education	18.2	3.3

*Multivariate models*

Determinants of premarital conception

Investigating odd ratios of covariates in Table 5 show the pattern of premarital conception in relation to the shortening of first birth interval. Periodic effect appears to be significant to probability of

having premarital sex and conception among ever-married women. Younger women are more likely to experience sexual activities before marriage and end up in early marriage and marital births. Odds ratio of engaging in premarital sex of married women born from 1964 – 1977 is 42 percent higher than women who born 1952-1963. The difference is even higher between youngest cohort (born 1977-1986) and oldest cohort (born 1952-1963)- 73 percent. The effect remain significant in the presence of other covariates suggest the substantial impact of social change and economic reform when young people show change in sexual behavior prior to marriage than their older counterpart. In addition, along with socioeconomic reform is the improvement in public health and the contraceptive availability. Young people have more chances to assess the family planning services. This leads to the fact that the number of young people who engaged in sexual activities without pregnancy might be higher.

Model 2 examines the effect of urban/rural origin on the probability of having premarital conception. While the direction of coefficient shows the positive association between place of residence and premarital sex it appears insignificant. The effect of wife's education tends to be clearer. For every level women gain in education results in increasing 13.8 percent in odds ratio. Wife's education is stronger than that of husband's education and remains unchanged after other covariates added. This finding suggests that higher education, the more autonomy women have in their intimate relationships. More importantly, higher education women have more chances to contact new ideas and values to shape new attitudinal and behavior regarding sexual activities. Attitude toward premarital sex has changed over time with the social transformation.

The effect of type of occupation is also clear in the model 4 and 5. People who work in non-agricultural sectors have higher probability of having premarital sex, than their counterpart working in agriculture sectors. The difference is 23 percent in odds ratio. Experience in non-family and socialization in urban clearly have notable effect on the sexual behavior.



The effect of age marriage for both men and women is trivial in the last model. The decision on having premarital conception is not affected by the age of intimate relationship and pressure of marriage.

#### Determinants of timing of marital conception

To test proposed hypotheses regarding social characteristics and marital conception, I ran Cox proportional hazard model to estimate the covariates of first birth intervals (Allison, 1995). The coefficients of the five hazard models with monthly rate as the dependent variable are presented in Table 6. In the baseline model (Model 1), with the variable of the years of birth as the predictor, cohort variable shows a statistically significant probability of having a first child (oldest cohort 1952 – 1963 as preference group). Since the economic reform started around late 1980s, younger women tend to experience the social transformation and are more likely to have birth at any moment in time within marriage. In general, younger cohorts give a birth quicker than older cohorts. For instance, hazard ratio of birth cohort 1964 – 1970 is 26 percent higher than that of marriage cohort of 1952 – 1963. Also, hazard ratio of birth cohort 1971 – 1977 is 42 percent higher than that of marriage cohort of 1952 – 1963 and this ratio is 75 percent higher for youngest cohort. The effects remain significant after adding other background variables in Model 2 to Model 3. The effect of historical period on the timing of the first birth is clear by examining the models.

In Model 2, usual place of residence difference shows significant effects on probability of having child after marriage based on urban/rural origin. Those who live in city areas have higher probability of having first birth, than people who live in rural area. This difference is 12 percent.

In Model 3, wife's educational attainment presents slightly effect on transition to first birth. It says that every level women attain in education result in an increase of 3 percent hazard of giving a birth within marriage. Husband's education does not play important role in this transition.

In Model 4, type of occupation is added. Place of residence becomes trivial in the presence of variable of occupation. Two variables are inter correlated because people who lived in urban area are more likely to work in non-agriculture sectors and vice versa. However, type of occupation is more important indicator relative to the fertility behavior. It suggests that working environment and socialization foster the new ideas and shape new sexual behavior.

In the comprehensive model, the hypothesis of catch-up effect of delayed marriage of both wife and husband on the likelihood of having a child is tested. Adding this variable makes education and occupation indicators become insignificant. Both effects of wife's and husband's age of marriage on timing first birth are considerable. Women who married late, after 23 are more likely to give a shorter birth than women married early (married before 19 is reference group). The effect of husband's marriage is even stronger. Rate of having birth of women whose husbands married after aged 25 is 25 percent higher than that of who married under aged 19. Besides to historical effect, age at first marriage shows important effect on marital conception. It is true that effect of marriage age encompass the effects of wife's education and employment. Interestingly, education women are associated with type of occupation and age of marriage. For instance, highly educated women tend to delay marriage and it might be the reason for them to catch up late time of family formation.

### **Discussions**

In sum, central finding of the present study is the presence of association between modernization factors and changes in married couples leading the changes in fertility behavior in Vietnam from 1975 to 2000. The results of multivariate analyses partially support our proposed hypotheses.

Hypotheses on changes in sexual behavior before marriage are supported. Determinants affect the pattern of premarital conception are wife's education and type of occupation. This findings support the hypothesis of positive association of sexual and fertility behavior with women's

education and socialization in urban areas. Women who are highly educated and work in more socialized environment are likely to incline toward egalitarian ideology in terms with women's body, right and physical passion.

The effect of historical period is clear through the changes in coefficients of birth cohorts. The younger cohort presents the stronger effect on likelihood of having premarital conception.

Hypotheses 2 is also supported as findings indicate significant shortening of the first birth interval along with economic reform. Significant decrease of birth interval of birth cohort from 1952 to 1986 reveals the impact of social and economic reform on the first birth was substantial. Even though modernization is continuous process started since 1970s, until 1986 the dramatic economic transformation has eventually undertaken in Vietnam and resulted in substantial social changes. Evidence from present study illustrated the clear effect of economic reform on young cohorts rather than older cohort.

The hypothesis regarding the effects of background characteristics on the timing marital conception is also supported. Consistent with studies in China and other Asian countries, education level play a role in the timing of the first birth with significant of employment. This evidence suggests the existence of enduring differences in attitude and behavior related to sexuality among population groups. Economic reform has brought about individuals new experiences of modernity especially for high educated women. Experience included the new ideas of sexual relationship and matters of intimacy within marriage. Younger women who born and lived in the time of social change and economic reform apparently have greater level of individual freedom and intimacy in premarital and marital relationship. Indeed, qualitative studies in Vietnam during period of renovation provided evidence on differences in knowledge, concepts, and behaviors of young urban people and those who were young in the 1970s. Unlike previous generation, young people articulated a clear-cut concept of sex. They think that sexual relationship plays a very important role

in human life (Hong, 1998). People who live in city, higher education and dominant group are more likely to exposure to the modernization factors such as mass media, education, new experiment and choices which can be available in association with modernity. Young people are more curious or seek intentionally seek information, but that they know about it because this information is popularized in mass media.

The results also support hypothesis of the catch-up effect of late marriage. This is important determinant in shaping conception behavior after marriage. The later marriage the quicker couples transition to the first birth. Children are still a strict norm in Vietnam culture and couples tend to have children as soon as possible especially when they perceive that they get married later than their peers.

The present study implies the indirect association between social changes and sexual behavior in association with timing of family formation. Change in premarital and marital sexual behavior is central matter of relation under the impact of social changes and economic reform.

### **Limitations**

The structure of cross-sectional data is the most limited to the validation of survival analysis. At this point, the unspecific time information of independent variables has restricted the accurate measurement of timing of the first birth based on predictors. One of the goals of the present study is to test the effect of economic reform on fertility behavior. However, the unavailability of indicators relating work, income and occupation has limited the scope of the study. Implications for the underlying meaning of economic reform and changes in sexual behavior using the indirect demographic characteristics may lead to false assumptions if third factors are present but not controlled.

**Table 5: Effects of social and demographic factors on likelihood of premarital conception (odd ratios in 5 binary logistic models with probability of having premarital conception as the dependent variable) 2002 DHS Vietnam**

	<b>Model1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>	<b>Model 5</b>
<b>Intercept</b>	-2.3092	-2.326	-2.8547	-2.804	-2.984
<b>Birth cohort</b>					
1952-1959					
1959-1964	0.99	0.992	0.989	0.979	0.988
1965-1970	0.823	0.825	0.834	0.806	0.802
1971-1977	1.421 **	1.429 **	1.457 **	1.368 **	1.369 ***
1978-1986	1.734 ***	1.75 ***	1.793 ***	1.745 **	1.713 ***
<b>Place of residence</b>					
Urban		1.06	1.026	0.801	1.006
Rural					
<b>Wife's Education</b>					
			1.138 **	1.828 **	1.164 **
<b>Husband's Education</b>					
			0.964	0.970	0.963
<b>Type of occupation</b>					
Non-agriculture				1.245 *	1.236 *
Agriculture					
<b>Wife's marriage age</b>					
< 19					
19 – 21					0.997
22- 23					1.081
> 23					0.976
<b>Husband's marriage age</b>					
< 19					
19 - 22					1.104
23- 25					1.409
> 25					1.206
<b>- 2LL</b>	<b>3437.52</b>	<b>3437.2</b>	<b>3184.4</b>	<b>3171.547</b>	<b>3166.541</b>
	4	5	7	8	14

\* p <0.1, \*\* p<0.05 \*\*\* p< 0.001

**Table 6: Effects of social and demographic factors on the first birth interval (hazard ratios in 5 proportional hazard models with monthly probability as the dependent variable) 2002 DHS Vietnam**

	<b>Model1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>	<b>Model 5</b>
<b>Birth cohort</b>					
1952-1959					
1959-1964	1.044 ***	1.044	1.04	1.043	1.08
1965-1970	1.26 ***	1.262 ***	1.26 ***	1.260 ***	1.297 ***
1971-1977	1.42 ***	1.429 ***	1.43 ***	1.422 ***	1.523 ***
1978-1986	1.753 ***	1.757 ***	1.774 ***	1.783 ***	2.024 ***
<b>Place of residence</b>					
Urban		1.121 **	1.102 **	1.027	1.105
Rural					
<b>Wife's Education</b>					
			1.03 **	1.030 *	1.004
<b>Husband's Education</b>					
			0.0993	0.989	0.984
<b>Type of occupation</b>					
Non-agriculture				1.105 **	
Agriculture					
<b>Wife's age marriage</b>					
< 19					
19 - 21					1.228 ***
22- 23					1.027
> 23					1.196 ***
<b>Husband's marriage age</b>					
< 19					
19 - 22					1.112 *
23- 25					1.253 ***
> 25					1.213 **
- 2LL	29971.92	29961.92	29934.96	29606.92	29483.54
Df	3	5	6	8	14

\* p <0.1, \*\* p<0.05 \*\*\* p< 0.001

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