Determinants of Fertility Decline in Developing Countries: Empirical Evidence from Myanmar

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Abstract

Fertility is one of the key factors influencing population change. Fertility measures were derived from a population. As in developing countries including Myanmar is decreasing fertility rate. The total fertility rate (TFR) of women 15-49 estimated from the 2007 FRHS is two births per women. There has been steady decline in fertility in Myanmar in the past decades from 4.7 children per women in 1983 to 2 children per women in 2007. In this study, by using Myanmar Demographic and Health Survey (MDHS) raw data, fertility decline is calculated based on factors affecting the socio-economic factors such as women's first birth age, paternal' education and occupation, income, social media knowledge and place of residence. Multiple regression analysis is also used to the relationship between number of children ever born and demographic factors by using SPSS software.

Key words: number of children ever born and socio-economic factors and demographic factors.

1.Introduction

Everyone is a member of a population and population changes affect everybody in one way or another. A change in population is usually determined by three demographic processes of fertility, mortality and migration. Fertility represents the role of births in population change and human behavior is an essential factor of reproduction. "Fertility" refers in demography to the reproductive behavior of women and couples to the statistics describing the results of this behavior. The results of the 2014 Myanmar Population and Housing Census indicated that the population of Myanmar on the 29th March 2014 was 51,419,420 persons. The 2014 Census data show that the population density in Myanmar is 76 persons per square kilometre. About 30 per cent of the population reside in urban areas.

The fertility of a population is one of three factors that determine long-term population growth. The other two factors are mortality and migration. Fertility is the measure of the reproductive performance of women as obtained from the statistics of the number of live births. The number of births occurring in any year in a population is determined partly by

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demographic factors such as the age and sex distribution, the number of married couples and their distribution by age, duration marriage and number of children already born.

Fertility in Myanmar appears to have fallen below four children per women during Second World War years and to have risen steadily through the mid-1960s, reaching a level of slightly over five children per women. Fertility decline appears to have begun at about this time, proceeding slowly through the mid-1980s and rapidly thereafter. Fertility appears to have fallen very rapidly during the late 1980s, falling below three children per women in 1989 and 1990. Urban-rural differences have generally increased over time, and urban fertility appears to have fallen below replacement level in the late 1980s.Fertilityin Myanmar has been declining. The number of children a married woman can expect to give birth to is still high though it has declined. Fertility decline in Myanmar is likely to be influenced by the factors such as education, employment, increase in contraceptive use, increase in age at first marriage and increase in the proportion of women never married.

Fertility of Myanmar has been declining. The total fertility rate (TFR) of women 15-49 estimated from the 2007 FRHS is two births per women. There has been steady decline in fertility in Myanmar in the past decades from 4.7 children per women in 1983 to 2 children per women in 2007.

Myanmar fertility is declining else, all over the world fertility is declining. Although only a very few countries have declining populations, 61 countries (with about 44% of the world's population) already have below-replacement fertility rates (less than 2.1 births per woman). On the other hand, in 2050, 130 countries will still have positive growth rates, 44 of them above 1% per year, about the rate observed in more-developed regions in 1965. Fertility has declined most quickly in Latin America and Asia, less rapidly in North Africa and the Middle East, and much more slowly in sub-Saharan Africa. Asia's fertility fell sharply in the last 50 years, from 5.9 to 2.6 children per woman. Sub-Saharan Africa's has dropped much more slowly, from 6.5 to 5.5. Latin America and the Caribbean have seen a decline from 5.9 to 2.7, North Africa and Western Asia from 6.6 to 3.5.Europe's fertility rate fell from 2.6 to 1.4, well below replacement level.

Malaysia is an intermediate-fertility country with total fertility dropping from 5 to2.1 children per woman in the period between 1995 and 2000.

1.1 Objectives of the study

(i) To investigate the impact of maternal demographic and socio-economic factors on fertility rate.

(ii) To examine the relationship between paternal demographic and socio-economic factors on fertility rate.

1.2 Method of study

      The study used the data from Demographic and Health Survey (DHS) which was conducted across the country in 2015-2016. The DHS survey collected information on fertility levels, marital status, fertility preferences, awareness and use of family planning methods, breastfeeding practices, nutrition, mother and child mortality and health, HIV/AIDS and other sexually transmitted infections (STIs), and other health-related issues, such as smoking and knowledge of tuberculosis. The study administered univariate, bivariate and multivariate analyses. Data analysis was performed by using the Statistical Software named SPSS version 22 which is very powerful analysis software.

1.3 Scope and limitation of the study

      In this study, the data on fertility of states and regions in Myanmar to access the study period are used from Myanmar Demographic Health Survey 2015-2016. In addition, some information is obtained from Fertility and Reproductive Health Survey (2007).

1.4 Organization of the study

This paper is composed of five chapters. As the introduction part, the objective of the study, method of the study, scope and limitation of the study and organization of the study are presented in Chapter I. Chapter II deals with the Literature review and Chapter III concerns with the data analysis and conceptual frame work. Chapter IV mentions multiple regression analysis for the number of children on socioeconomic factors and demographic factors. Chapter V describes the finding of paper.

2. Literature Review

Max Weber; fertility decline has been considered one index of a general social process, initiated by the adoption of industrial technology, that alters the economic and social psychological fabric of society. Large young population places a heavy burden on the working-age population and limits the provision of basic needs and social services.

(Thompson 1942, 3).According to Thompson fertility decline is caused by two main changes in society. On the one hand, large numbers of individuals move from the countryside into the cities. Those individuals represent the rural surplus population which relocates in order to find employment in town. In the course of this process, referred to as urbanization, the traditional way of life undergoes massive alterations. While struggling to acquire or to enhance their status with in the new urban environment, a large number of children seem obstructive, and thus not desirable. In contrast to rural areas, urban life includes a different mode of living, another quality of incomes and types of work, other occupational positions along with exercise of power as well as a variety of opportunities for leisure activities. Therefore, townspeople experience a serious conflict between establishing a large family and the achievement of their ambitious objectives. Moreover, urban labor requires a relatively time consuming period of vigorous training, by which the postponement of children becomes a natural side effect. As a consequence, either a low number of children are born to urban couples' or prospective parents might already be to too old to have offspring at all. Furthermore, in comparison to a rural farmer that has to be to the farm 365 days per year in order to care for the cattle, for urbanites rearing children is connected with immobility while they have the desire to travel (Thompson 1942, 207-210).

Note stein (1948) summarizes important factors contributing towards the fertility decline, particularly in undeveloped areas. According to him, substantial restrictions in fertility "depend on the social organization, customs, and beliefs from which arise the aspirations [...] with respect to family size" (Note stein 1948, 250-251).

Becker concentrates on a microeconomic approach in order to show "[...] the interrelationship between socio-economic variables and fertility" (Becker 1960, 209) .Easter in (1975) pursues the intention to unite economic views with principal demographic and sociological concepts. In implementing the previous, his objective is to illustrate the potential output of children per family in context with the demand for children and the costs of fertility control. To solve the question concerning the determinants for a decrement in fertility in the course of modernization, Easter in utilizes a strategy which gives the same weight on *demand* and *output* of children as well as on *fertility control*.

2.1 Survey Description

The paper employed the data from the 2015-16 DHS survey which was conducted across the country. The primary objective of the 2015-16 MDHS was to provide up-to-date estimates of basic demographic and health indicators. Specifically, the survey collected information on fertility levels, marital status, fertility preferences, awareness and use of family planning methods, breastfeeding practices, nutrition, mother and child mortality and health, HIV/AIDS and other sexually transmitted infections (STIs), and other health-related issues, such as smoking and knowledge of tuberculosis. The 2015-16 MDHS followed a stratified two-stage sample design and was intended to allow estimates of key indicators at the national level, in urban and rural areas, and for each of the seven States and eight Regions of Myanmar. The first stage involved selecting sample points (clusters) consisting of EAs or ward/village tracts. A total of 442 clusters (123 urban and 319 rural) were selected from the master sample. At the second stage, a fixed number of 30 households was selected from each of the selected clusters (a total of 13,260 households), using equal probability systematic sampling. For the clusters, which were completely enumerated during the population census, the census household listings were taken as the base and updated in the field by the household listing teams. These updated lists were used for selecting the sample households. For the clusters that were not enumerated or partially enumerated during the census, an independent household listing operation was carried out. Because of the non-proportional sample allocation, the sample was not a self-weighting sample. Weighting factors had to be calculated, added to the data file, and applied so that results are representative at the national as well as regional level. All women age 15-49 who were either permanent residents of the selected households or visitors who stayed in the households the night before the survey were eligible to be interviewed. In half of the selected households (every second household), all men age 15-49 who were either residents or visitors who stayed in the household the night before the survey were eligible to be interviewed. During the course of the fieldwork, 4 clusters were identified as insecure and were replaced with other clusters in the vicinity. In addition, 1 urban cluster had to be dropped due to worsening security. Overall, the survey was successfully carried out in 441 clusters.

3. Theoretical Argument and Data Analysis

3.1 Definition

Regression is a quantitative expression of the basic nature of the relationship between the dependent and independent variables.

The linear regression equation is

$$Y = \beta_0 + \beta_1 X_1 + \varepsilon$$

Multiple regression involves the use to two or more independent variables

The multiple regression model is

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \text{-------} + \beta_k X_k + \varepsilon$$

3.2 Data Analysis

The paper analyzed the data by using the univariate and multivariate analysis. Multiple linear regression models have found wide application in demography. In the study employed multiple liner regression model and considered the relationship between one dependent variable or explained variable and ten independent variables are studied from these models. One dependent variable is "Number of children" and ten independent variables are as follows:

X_1 = Place of residence

X_2 = Listening to radio

X_3 = husband/partner's occupation

X_4 = Age of respondent at first birth

X_5 = Respondent occupation

X_6 = frequency of watching television

X_7 = frequency of reading newspaper or magazine

X_8 = husband/partner's educational attainment

X_9 = highest educational level

X_{10} = wealth index combined

Model specification is as follow:

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \varepsilon i$$

3.3 Conceptual Framework of Research

According to the theory, my paper of research map shows that fertility decline on soico-economic factors such as education, income, rural/urban, marriage age.

Explanatory Variables   **Explained Variable**

Demographic Characteristics

- Place of Residence
- Age at first birth

Socio-economic Characteristics

- Respondent's Educational status
- Partner's educational status
- Family's Wealth Index
- Respondent's Occupation
- Partner's Occupation
- Access to media(radio, newspaper, television)
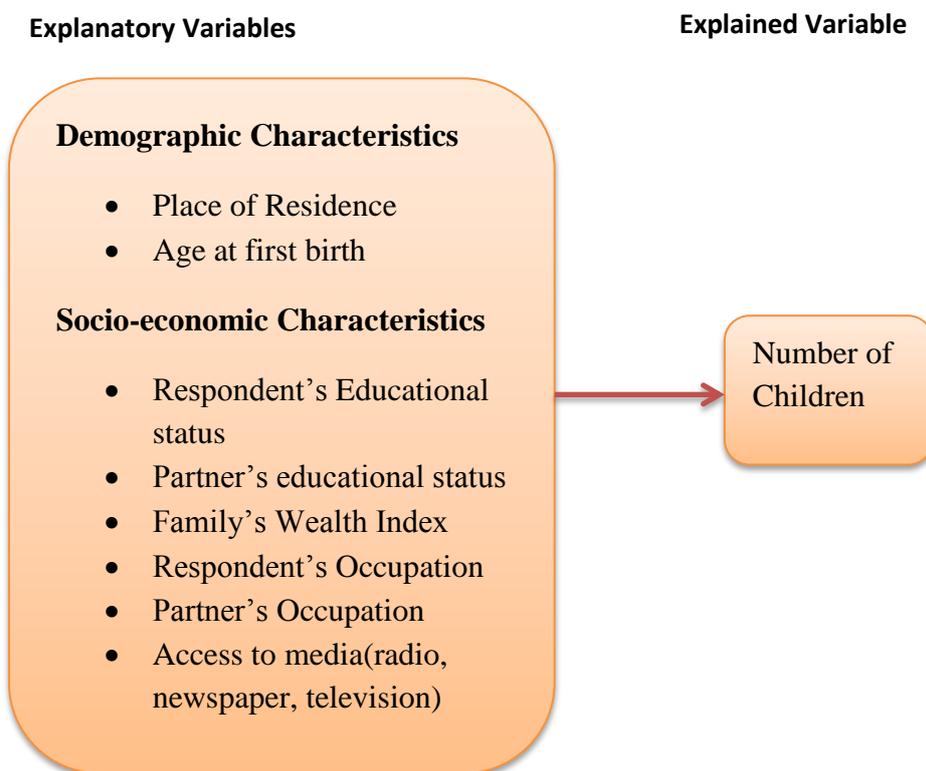
Number of Children

Urban-rural residence, educational attainment, occupational attainment, family income are related to age at first marriage and attitude towards contraceptive use.

4. Analysis of number of children on socio-economic factors and demographic factors

4.1 Demographic Profile

The study respondents' demographic and socio-economic profile is presented as follow.

Rural-Urban Residence

In general, males and females who grew up in cities tend to marry later than males and females who grew up in the countryside. Urban women are better educated than rural woman. Jobs in urban areas are usually outside the home where children are not allowed in the place of work. Therefore, they would not consider to have more children. The urban-rural differentials may be attributed to differential in social services, including higher coverage with immunization, safe delivery of births and access to health care services.

From Table (4.1), rural area lived in 70.6% and urban area lived in 29.4%. So, the study that rural women are more lived than in urban area.

Table (4.1) Type of place of residence

Type	Frequency	Percent
Urban	3785	29.4%
Rural	9100	70.6%
Total	12885	100%

Source: SPSS data analysis

Figure 4.1

Type of place of residence
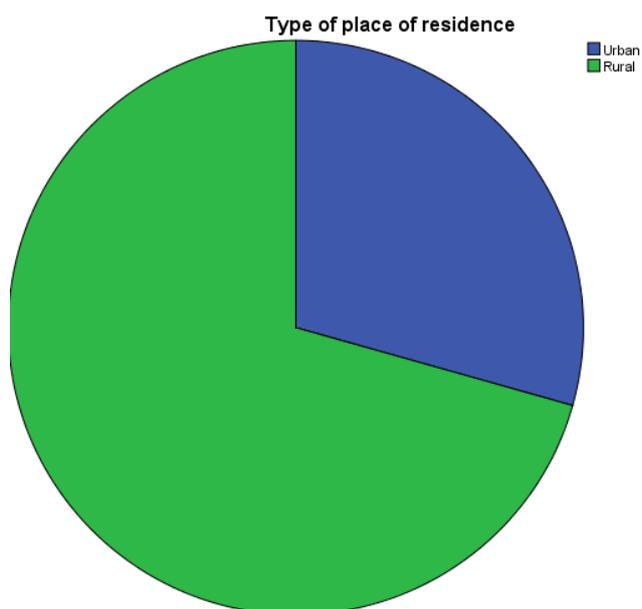
Educational level

Education is the most important variable affecting on fertility, but this paper study education has a negative relationship with the fertility. This means the highest educational level and the number of children are not dependent.

Table (4.2) Highest educational level

Type	Frequency	percent
No education	1592	12.4%
Primary	5129	39.8%
Secondary	4838	37.5%
Higher	1324	10.3%
Total	12883	100%

Source: SPSS data analysis

Figure 4.2

Highest educational level

Legend:
- No education
- Primary
- Secondary
- Higher
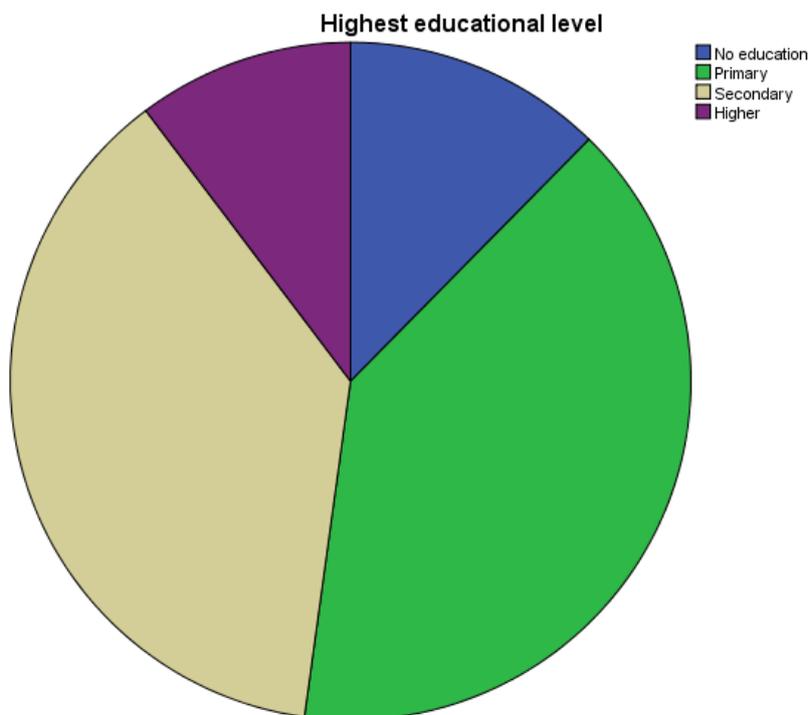
From Figure (3.2), no education is 12.4 %, primary level is 39.8 % and secondary level is 37.5 %. Higher educational level is the lowest (10.3%). So, Myanmar found that educated person are decreased.

4.2 Knowledge of Social Media

Social media such as television, radio and newspaper are the most important variable affecting on fertility, but this paper study radio and newspaper have no relationship with the number of children.

Mass media convey messages on preventing communicable diseases, including HIV/AIDS, tuberculosis, and malaria; healthy life styles for preventing no communicable diseases, and other topic. In Myanmar, men are slightly more likely than women to be regularly exposed to all forms of media, but especially newspapers. Television is the most common form of media used by women and men (60% each). About one-fourth of women (25%) and men (28%) listen to the radio. Exposure to newspapers varies most by gender: 16% of women and 27% of men read newspapers at least once a week

Table(4.3) Frequency of reading newspaper or magazine

	Frequency	Percent
Not at all	7398	57.4%
Less than once a week	3501	27.2%
At least once a week	1986	15.4%
Total	12885	100%

Source: SPSS data analysis
Figure 4.3

Frequency of reading newspaper or magazine
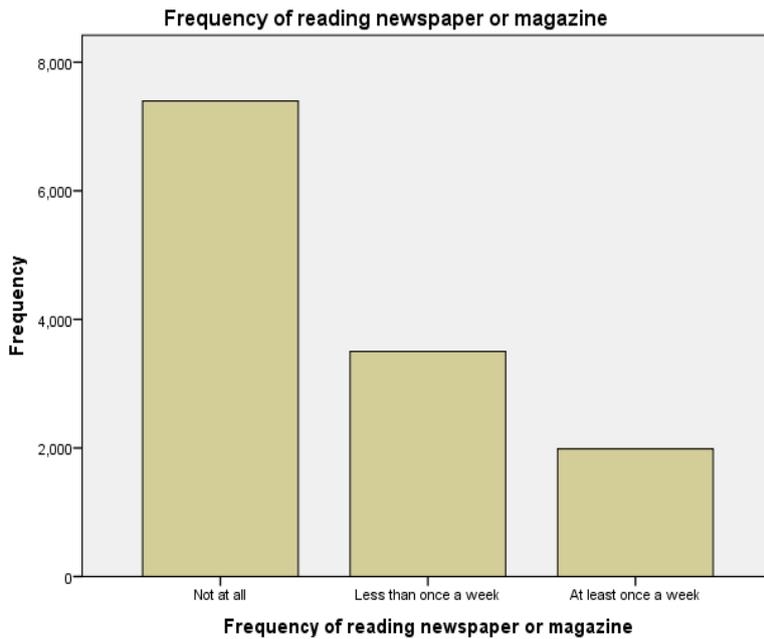
Table (4.4) Frequency of listening to radio

	Frequency	Percent
Not at all	7078	54.9%
Less than once a	2667	20.7%
week	3140	24.4%
At least once a week		
Total	12885	100%

Source: SPSS data analysis

Figure 4.4

Frequency of listening to radio
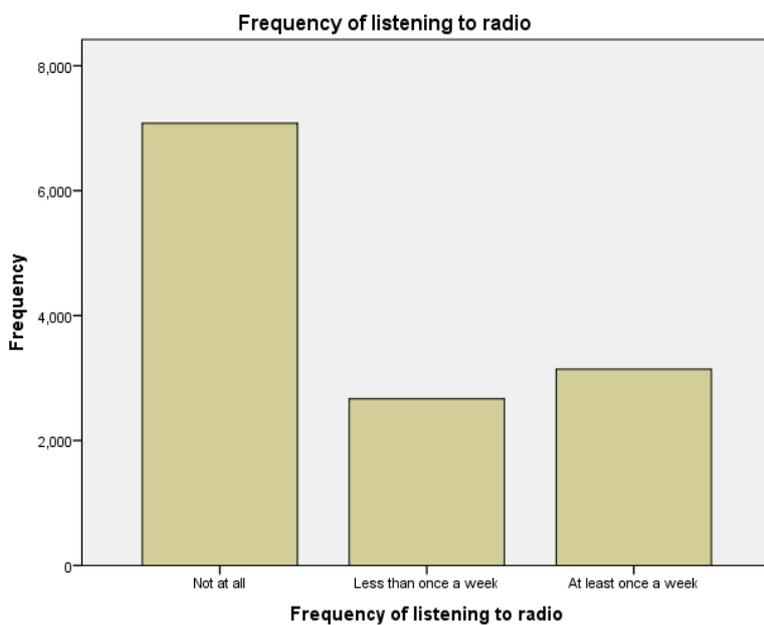
Table (4.5) Frequency of watching television

	Frequency	Percent
Not at all	3069	23.8%
Less than once a week	2346	18.2%
At least once a week	7470	58.0%
Total	12885	100%

Source: SPSS data analysis

Figure 3.5
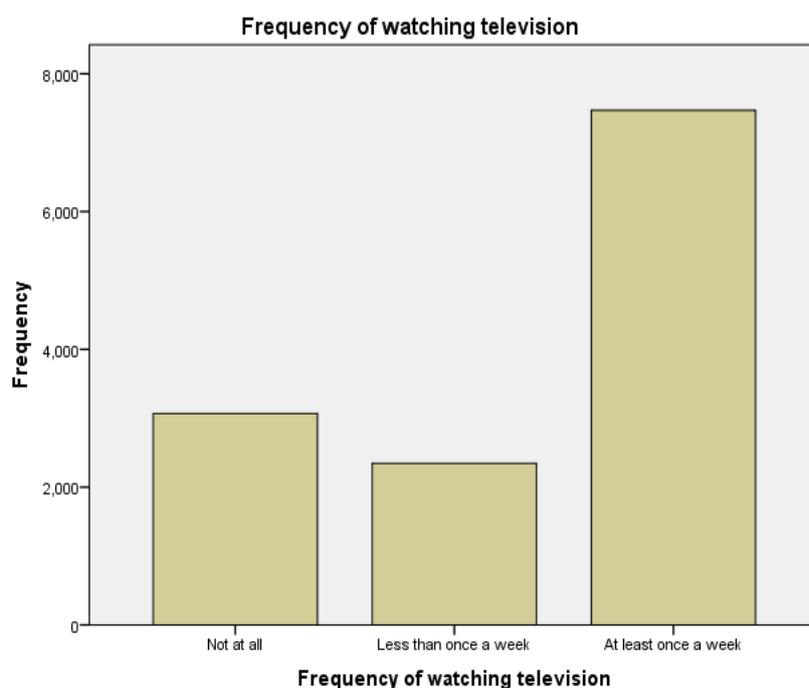
4.3 Childbearing Age at First Birth

Age at first marriage is significantly associated with the level of fertility. It is found to be one of the strong correlates of fertility. The early age at first marriage tends to increase fertility, and the delay in age at first marriage results in a decrease in fertility.

Childbearing in Myanmar occurs relatively late. Only 7% of women age 25-29 gave birth before age 18. The median age at first birth in Myanmar is 24.7 years among women age 25-49.Women with no education have a lower median age at first birth than those with primary education (21.5 versus 23.5 years). Women in the lowest wealth quintile tend to give birth earlier than those in other quintiles.

Childbearing during teenage years can reduce women's educational and employment opportunities and is associated with higher level of fertility. In Myanmar, 6% of women age 15-19 have begun childbearing: 5% have given birth and an additional 1% are pregnant with

their first child. The level of teenage fertility is influenced by education. Nineteen percent of teenagers who have never been to school have begun childbearing, compared with 3% who have a secondary education and 1% who have more than secondary education. The level of teenage fertility is also associated with wealth; 9% of the poorest teenagers have begun childbearing, compared with 3% of the richest.

Table (4.6) Age of respondent at 1st birth

Age	Frequency	Percent
<15	88	1.1
15-19	2206	28.3
20-24	3345	42.9
25-29	1537	19.7
30-34	489	6.3
35-39	118	1.5
40-49	13	.2
Total	7796	100%

Source: SPSS data analysis

Figure 4.6

Age at First Birth

Frequency

4,000

3,000

2,000

1,000

0

<15   15-19   20-24   25-29   30-34   35-39   40-49

Age at First Birth
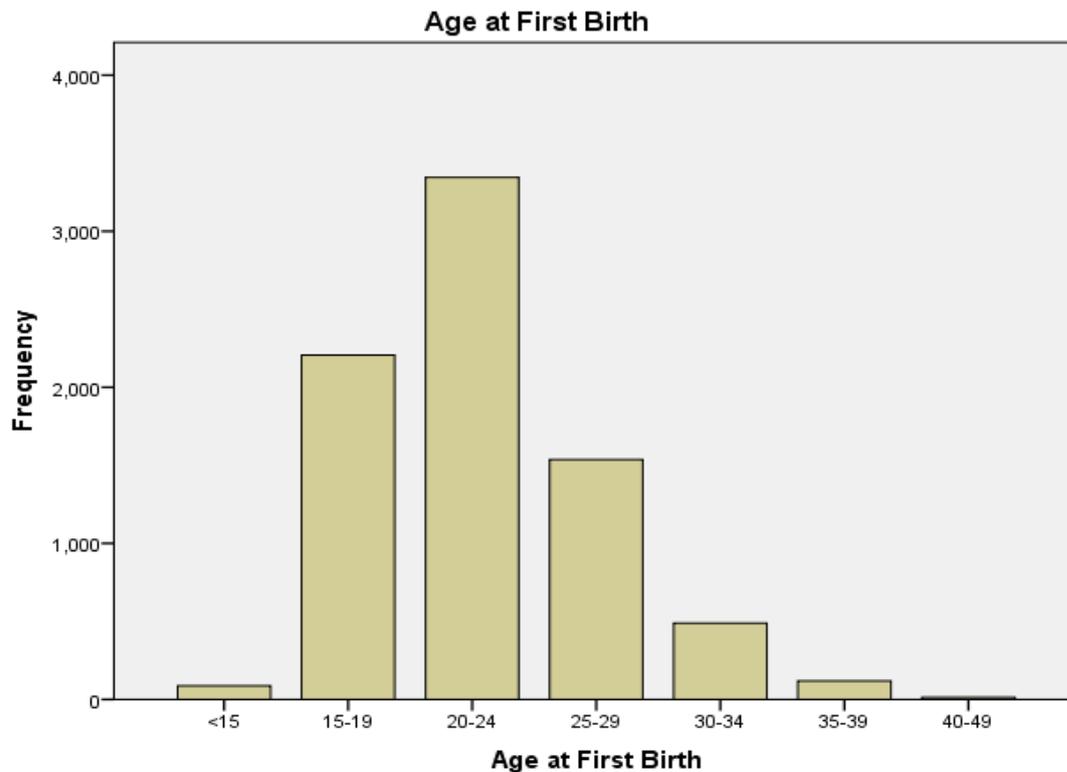
4.4 Determinants of Declining Fertility

The study attempts to identify the determinants of declining fertility by analyzing the data in terms of multivariate statistical method. In this case, collinearity of independent variables is at first examined as follow.

4.5 Measure of Collinearity

Collinearity refers to the situation in which there is a high multiple correlations when one of the independent variable is regressed on the others. Diagnostics are available which allow to detect the presence of collinear data. The tolerance of a variable, $(1-R_j^2)$ is commonly used to measure the collinearity. If the tolearance of a variable is small, it is almost a linear combination of the other independent variables. The variance inflation factor (VIF) for each independent variable is the reciprocal of the tolearance, $(1-R_j^2)$. If a set of independent variables are uncorrelated, then VIF will be equal to one. Other researchers suggest a more conservative criteria; criterian that would employ alternatives to least square regression if the maximum VIF were to exceed 5. Table(4.3) shows the tolearance and VIFs of the variables in the model for the number of children ever born.

Table (4.3) Measures of Collinearity Tolerance and VIF

Variable	Collinearity Statistics	
	Tolerance	VIF
X1	0.686	1.458
X2	0.948	1.055
X3	0.876	1.142
X4	0.913	1.096
X5	0.900	1.111
X6	0.804	1.243
X7	0.748	1.336
X8	0.626	1.596
X9	0.566	1.767
X10	0.555	1.803

From table (4.3), the high value of VIF are found for variable X_9 and X_{10}. Hence, there is high dependency among these independent variables. It can be conclude that, that is the highest education level and family wealth index are highly dependent.

\Table (4.4) Coefficient Correlation Matrix

Dependent Variables	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10
X1	1.000									
X2	-.081	1.000								
X3	.059	-.025	1.000							
X4	-.002	-.011	.007	1.000						
X5	-.061	-.053	-.201	-.004	1.000					
X6	.062	-.060	.013	.030	.010	1.000				
X7	.110	-.163	.054	-.020	.010	-.069	1.000			
X8	.085	-.024	.137	-.071	.005	-.029	-.073	1.000		
X9	.063	-.049	-.002	-.130	.088	-.057	-.233	-.355	1.000	
X10	.356	.033	.105	-.084	.039	-.255	-.051	-.140	-.169	1.000

Further, table (4.4) provided the same findings because independent variables are not related each other with coefficients of correlation which are less than 0.7.

4.3.2 Empirical Results

The following table (4.5), the demographic factors and socioeconomic factors are describe man and standard deviation.

Table (4.5)   Descriptive Statistics

	Mean	Std. Deviation	N
Type of place of residence	1.71	.455	12885
Highest year of education	3.48	1.613	11291
Frequency of listening to radio	.69	.836	12885
Frequency of watching television	1.34	.837	12885
Frequency of reading newspaper or magazine	.58	.743	12885
Husband/partner's educational attainment	2.22	1.590	8737
Husband/partner's occupation (grouped)	6.43	2.762	8649
Respondent's occupation (grouped)	3.96	3.523	12855
Age of respondent at 1st birth	22.36	4.590	7796

Wealth index combined	3.07	1.403	12885

Socio-Economic Variables

Table (4.6) Empirical Results of Multiple Linear Regression Model

Variables	β	t	Sig.
Demographic Variables			
Place of residence	-0.009	-0.751	0.453
Respondent's Age at 1st birth	-0.261	-24.259	**0.000**
Social Variables			
Respondent's Education	-0.220	-16.118	**0.000**
Husband/Partner's education	-0.086	-6.67	**0.000**
Reading newspaper or magazine	-0.004	-0.369	0.712
Listening to radio	0.003	0.271	0.786
Watching television	-0.059	-5.151	**0.000**
Economic Variables			
Family's Wealth index	-0.036	-2.593	**0.010**
Respondent's occupation	-0.018	-1.71	0.087
Husband/Partner's occupation	-0.078	-7.147	**0.000**
Model Fit			
R-squared	0.205		

Adjusted R-squared	0.204		
F-test	194.434		
Sig	**0.000**		

a. Dependent Variable: Total children ever born

From the Table (4.6), it is observed that the coefficient of highest educational level is -0.220 and significance. So, highest educational level and number of children are inverse relationship. If the highest educational level is increased, number of children ever born are decreased.

The coefficient of frequency of watching television is -0.059 and significance. So, frequency of watching television and number of children are inverse relationship. This mean that women are more than touched with media ,fertility declined. But, frequency of reading newspaper or magazine and listening to the radio are not significance with the number of children.

The coefficient of age of respondent at first birth is -0.261 and significance. If the respondent's age are more old, fertility rate is declined. And then, the coefficient of partner's educational attainment and occupation are -0.086 and -0.078. We can say that number of children and coefficients are indirect relationship.

In this table (4.6), the adjusted R^2 20.5% can interpreted as the number of children ever born explained by the ten independent variables considered and model is significance.

5. CONCLUSION

The total population of Myanmar is 51419420 persons in 2014 census. Overall 13% of currently married women age 15-49 want to have another child soon, 18% want to wait at least 2 years, and 61% want no more children or are sterilized. The reason of fertility decline is associated with a number of factors: the education level of parents, age at first birth, knowledge of public health, paternal and maternal occupational, family income, progress of modern medicine. This finding suggests that women with higher education are better able to have only the number of children ever born. Early age at first marriage for woman tends to have the strongest impact on increasing fertility. Finding that women age 19 to 22 are the highest fertility rate and then gradually down birth rate. Almost every country has declined

in fertility rate. Moreover, changes in fertility level are also studied by using multiple linear regression models. The results, seemed to reflect that the number of children ever born is influenced by the paternal' occupation, education.

Finding, rural area is living 70.6 percent and urban area lived 29.4 percent. So, rural residence are more likely. The median age of a woman at her firth birth is 22.36 years. Fertility peaks in the age group 20-24, 42.9 percent. Teenagers (15-19)of a woman at first birth is 22.8%. The oldest age (40-49) of a woman at first birth is 0.2%. The number of children that a woman bears depends on many factors, including the age at which she begins childbearing.

Fertility levels are markedly lower among highly educated women and women living in wealthy households compared with other women. Thirty nine percent of age 15-49 in Myanmar have attended primary school. Thirty seven percent of age have attended secondary level. Ten percent have completed more than secondary education. About 3 in 10 women (32%) and men (29%) have no regular exposure to social media such as television, radio and newspaper. Finding, Fertility decline are not relationship with these factors such as their residence place, listening to the radio, and reading to the newspaper.

As the result of this study, we recognize that the number of children depend upon husband education and occupation, family wealth index, mother's age at first birth and knowledge.

Acknowledgements

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