



ASIA-PACIFIC SUSTAINABLE DEVELOPMENT JOURNAL

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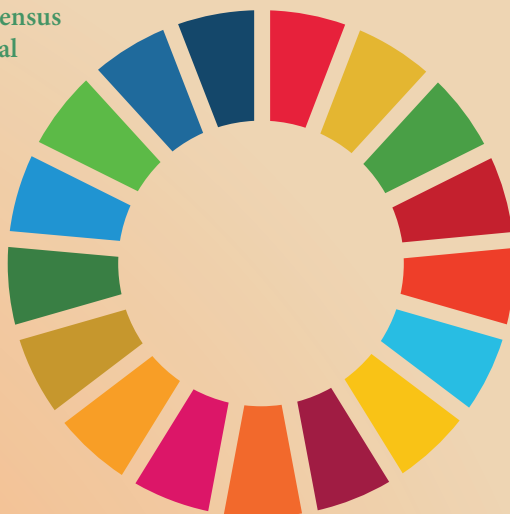
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Social Development Division and
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References to “tons” are to metric tons, unless otherwise specified.

A solidus (/) between dates (e.g. 1980/81) indicates a financial year, a crop year or an academic year.

Use of a hyphen between dates (e.g. 1980-1985) indicates the full period involved, including the beginning and end years.

The following symbols have been used in the tables throughout the journal:

Two dots (..) indicate that data are not available or are not separately reported.

An em-dash (—) indicates that the amount is nil or negligible.

A hyphen (-) indicates that the item is not applicable.

A point (.) is used to indicate decimals.

A space is used to distinguish thousands and millions.

Totals may not add precisely because of rounding.

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PATTERNS AND DETERMINANTS OF AGE AT FIRST BIRTH OF WOMEN IN MYANMAR

*Mya Thandar, Hlaing Hlaing Moe and Aye Aye Htwe**

Fertility rates vary significantly across different socioeconomic and demographic factors, customs, cultures and practices of people living in different parts of the world. The age at first birth, one of the most significant events in a woman's life, is directly and indirectly related to total fertility. The present paper is focused on the patterns, and socioeconomic and demographic determinants of age at the first birth of Myanmar women. For this study, data from the Myanmar Demographic and Health Survey 2015–2016 were used. A total of 7,613 ever-married women between 15 and 49 years who had given birth participated in the survey. The pattern of women at first birth was estimated using as descriptive technique and the determinants of age at first birth were identified using the Cox Proportional Hazards model. The average age at first birth of Myanmar women was 22.4 years in 2015–2016. The results of this study indicate that women's education level and their age when they first engaged in sex, birth cohort, wealth index, residence, husband's education and occupation whether they reside in a female-headed household were found to be significant factors associated with age at first birth. The age of women at first birth tended to be longer for women living in urban areas and women married to men with high degrees of education. Based on the results of this study, rural areas need to be developed and improving educational attainment is required to delay the age at first birth of women in Myanmar.

JEL classification: J13

Keywords: age at first birth, socioeconomic and demographic factors, Cox Proportional Hazards model

* Mya Thandar (corresponding author), Prorector, Yangon University of Economics (email: myathandar.yie@gmail.com); Hlaing Hlaing Moe, Professor, Department of Statistics, Yangon University of Economics; Aye Aye Htwe, Lecturer, Department of Statistics, Yangon University of Economics. Our deepest gratitude is extended to Yangon University of Economics for granting us free Internet access. We would like to thank USAID/ICF International for providing data from the Myanmar Demographic and Health Survey 2015–2016 and the Stata software. Special thank is also extended to the editors and two anonymous reviewers for their valuable comments to improve this article and authors and publishers of different journals for open access to researchers. Without this assistance, this study would be not realized.

I. INTRODUCTION

Age at first birth is defined as the age of women when they begin childbearing. The birth of the first child is one of the most important events in a woman's life. It is seen as a transition period into womanhood, and the beginning of roles and responsibilities of motherhood and childcare. From the demographic perspective, age at first birth is considered to be the gateway for all future demographic and non-demographic events (Kumar, 2017).

Nahar, Zahangir and Islam (2013) noted that age at first birth plays a significant role in the future life of each individual woman and has a direct relationship with fertility. The timing of the first birth influences the number of children a woman bears throughout her reproductive period in the absence of any active fertility control; women who give birth to the first child at an early age tend to have more children than those who give birth to the first child at an older age (Gyimah, 2003). The age at the first birth affects the total number of births that the woman might have in her life, which, in turn, has an impact on the size, composition and future growth of the population (Matthews and Hamilton, 2009).

Global trends in the age at first birth depict a remarkable increase in the age at which childbearing commences, especially in developed countries where it is perceived to be positive (Mirowsky, 2005). In recent years, delaying childbearing, particularly the first child, has become a common topic of discussion in developed countries. A popular view is that women should delay getting married and only begin bearing children in their twenties or early thirties (Mugarura, Kaberuka and Atuhaire, 2016). Meanwhile, the age at which women in developing countries have their first child has important consequences on the demographic characteristics of a population (Rajaretnam, 1990).

Social science research has revealed that the timing of the first birth affects a variety of demographic and non-demographic phenomena in a women's life course. The mean age of mothers at first birth influences the total fertility, size, composition and future growth of the population (Rabbi and Kabir, 2013). An early first birth has proven to have negative implications on the health of the mother and infant (Pebley, Casterline and Trussell, 1982). In addition to the health risks, early motherhood boosts population growth, disrupts economic development, interrupts further educational attainment, hinders career building roles and impedes employment opportunities of women.

In order to realize the unfinished agenda of the United Nations Millennium Development Goals, the 2030 Agenda for Sustainable Development and its accompanying 17 Sustainable Development Goals was adopted. Specifically, Goal 3 seeks "to ensure healthy lives and promote well-being for all at all ages".

Many Asian countries have been able to reduce their fertility through government policies. For instance, China and Viet Nam have reported declines in their total fertility rate, resulting from stringent government policies that discourage early and arranged marriage (Löfstedt and others, 2005). In Africa, however, even though a delayed fertility transition appears to be taking place with notable progress in Botswana, South Africa and Zimbabwe (Bongaarts, 2008), fertility remains high in relation to the standards of the rest of the world.

Under Myanmar law, the minimum age of marriage for a woman is 20, but the age can be lower with parental consent (Myanmar, Department of Population, 2004). Marriage of women between the ages of 18 and 20 is widely accepted, while women less than 18 year old are considered not to be mature enough to get married (Nyi, 2005).

The findings of the Thematic Report on Fertility and Nuptiality indicate that the singulate mean age at marriage for women was 23.6 years, compared with 25.9 for men, an age difference of 2.3 years in 2014. The mean age at first marriage for females between the 2007 survey and the 2014 census declined sharply by 2.56 years over the seven-year period between the two data sets from 26.15 to 23.59 years (Myanmar, Department of Population, 2016).

In Myanmar society, giving birth before marriage is customarily not acceptable. Childbearing in Myanmar occurs relatively late. For 2016, only 7 per cent of women aged 25-49 gave birth before age 18; the median age at first birth was 24.7 years among women aged 25-49. In addition, age at first birth was relatively late in all states and regions; it was below 23 years at an estimated average rate of 22 years in only Shan state and Rakhine state (Myanmar, Ministry of Health and Sports and ICF International, 2016).

According to the Thematic Report on Fertility and Nuptiality, the total fertility of Myanmar at the union level is 2.5 children per woman. Levels in urban and rural areas are 1.9 and 2.8 children per woman, respectively. Chin state, in which 5.0 children per woman was recorded, is an outlier. In the remaining states and regions, the figure ranges fairly evenly from a low of 1.8 children per woman in the Yangon region to a high of 3.5 children per woman in Kayah state. The level of Myanmar is similar to the level in developing countries generally, but it is somewhat higher than the level in most other countries in South-East Asia. The level in Myanmar is lower than levels for the Philippines and Cambodia, but higher than those for Malaysia, Thailand and Singapore (Myanmar, Department of Population, 2016).

Although the fertility level of Myanmar is relatively low in comparison with some member countries of the Association of Southeast Asian Nations (ASEAN), it is important to look at the birth of the first child, which is considered to be one of the

most crucial events relevant to gender equality. Women's childbearing has always been an anchor point for engendering and maintaining gender inequality. Often, the birth of the first child constitutes a turning point in the gender division and gender distribution of employment, care and financial resources. Accordingly, higher age at first birth is supportive of gender equality.

Adolescent fertility is of interest because births to very young women tend to have adverse health consequences for the women and the children. These health consequences are expected to be more severe for younger adolescents. The Thematic Report on Fertility and Nuptiality also shows that the adolescent fertility rate for Myanmar was 33 births per 1,000 women aged 15-19 years. Single year rates rise sharply over these ages, from 3 per 1,000 for 15-year old females to 53 per 1,000 for 19-year old females. The rate varies substantially between urban and rural areas (22 and 38 per 1,000, respectively) and between states and regions, from a low of 21 per 1,000 for the Yangon region to a high of 59 per 1,000 for Shan state (Myanmar, Department of Population, 2016).

No studies concerning age at the first birth of women have been conducted in Myanmar, although fertility or children ever born is considered as a dependent variable in most fertility studies. In general, women's age at first birth is a variable that affects an individual and the fertility levels of the country and has implications on the women's role and social change.

The above-mentioned reasons highlight the consequences of early first birth of women, at the individual and social levels. Accordingly, the objective of this study is to analyse the patterns and determinants of age at first birth of ever-married Myanmar women. The nature and effects of various socioeconomic and demographic factors on the timing at first birth is investigated in order to control the factors that influence the age at first birth and thereby influence fertility and population growth rates at manageable levels.

II. DATA AND METHOD

Source of data

For this analysis, data sets from the national 2015–2016 Myanmar Demographic and Health Survey are used, which include collected data for multiple indicators of demographic and health information (Myanmar, Ministry of Health and Sports and ICF International, 2016).

Although data on 12,885 women aged between 15 to 49 years are available from the 2015–2016 Myanmar Demographic and Health Survey, the focus of this study

is only on ever-married women aged between 15 and 49 years. This is because birth is customarily accepted only after the marriage in Myanmar society while the survey data set includes only one single woman who has given birth. Among the 8,739 ever-married women, 994 remained childless. Childless women are excluded from the analysis. To obtain nationally representative estimates, sampling weight is applied and only 7,613 ever-married women who had given birth are included in the final weighted samples.

Variables description and categorization

In this study, female age at first birth is the outcome variable; predictor variables are selected based on previous studies, mainly on age at first birth (Nahar and Zahangir, 2013; Mhele, 2015; Mugarura, Kaberuka and Atuhaire, 2016; Kumar, 2017; Chernet, Shebeshi and Banbeta, 2019). These studies show that female age at first birth depends on various socioeconomic, cultural and demographic factors. The description and categorization for outcome and selected predictor variables are as shown in the table below:

Outcome variable	Predictor variables	
Age at first birth Y = 1 if below 22 years = 0 if 22 years and above	Women's education X ₁ = 1 if no education = 2 if primary level = 3 if secondary level = 4 if higher level	Female-headed household X ₈ = 1 if no = 2 if yes
	Women's employment X ₂ = 1 if unemployed = 2 if employed	Wealth index X ₉ = 1 if poor = 2 if middle = 3 if rich
	Age at first sex X ₃ = 1 if less than 22 years = 2 if 22 years and above	Residence X ₁₀ = 1 if urban = 2 if rural
	Birth cohort X ₄ = 1 if 1961–1970 = 2 if 1971–1980 = 3 if 1981–1990 = 4 if 1991–2000	Family type X ₁₁ = 1 if nuclear = 2 if joint (extended)
	Spousal age difference X ₅ = 1 if wife is older = 2 if same age = 3 if wife is younger	Husband's education X ₁₂ = 1 if no education = 2 if primary = 3 if secondary = 4 if higher
	Knowledge of ovulatory cycle X ₆ = 1 if no = 2 if yes	Husband's occupation X ₁₃ = 1 if professional = 2 if agricultural = 3 if skilled labor = 4 if unskilled labor = 5 if other
	Contraception used X ₇ = 1 if no = 2 if yes	

Cox Proportional Hazards model

Survival analysis is a set of methods used to analyse data in which the outcome variable of interest is the time until an event occurs. The survival time is the length of time that is measured from the start of a study to the time that the event of interest occurs. The various characteristics in survival data are censored observation, skewed distribution and lack of normality in distribution.

Because of these characteristics, the traditional statistical methods cannot be applied to this type of data. The most commonly used descriptive statistics for survival data are based on an estimate of the survival function. The Kaplan-Meier method is frequently used to estimate the survival function. The log-rank test can be used to test the hypothesis of no difference in survival between the groups. The semi-parametric Cox Proportional Hazards model is the most widely used to analyse the survival data (Saikia and Barman, 2016).

Regarding the Cox Proportional Hazards model, the baseline hazard function is unspecified or has no particular form for hazard and time, and the parametric form for the effect of the predictors on the hazard is assumed. In most situations, the shape of the hazard is of greater interest than the parameter estimates. The Cox Proportional Hazards model is well-suited to this goal.

In the present study, the Cox Proportional Hazards regression analysis was used to analyse the effect of the explanatory variables on the outcome variable “women’s age at first birth”. In assessing the net effects of the selected factors, a multivariate regression analysis was conducted using hazard analysis, in particular the Cox Proportional Hazards model (Cox, 1972; Halli and Rao, 1992). The description of the model based on the exponential distribution may be written as

$$\log h_i(t) = \alpha + \beta_1 X_{i1} + \beta_2 X_{i2} + \dots + \beta_k X_{ik} \quad (1)$$

or, equivalently,

$$h_i(t) = \exp (\alpha + \beta_1 X_{i1} + \beta_2 X_{i2} + \dots + \beta_k X_{ik}) \quad (2)$$

That is, as a linear model for the log-hazard or as a multiplicative model for the hazard. Here, “i” is a subscript for observation, and the X’s are the covariates. The constant α represents a kind of log-baseline hazard, as $\log h_i(t) = \alpha$ [or, $h_i(t) = e^\alpha$] when all of the X’s are zeros.

The Cox Proportional Hazards model, in contrast, leaves the baseline hazard function $\alpha(t) = \log h_0(t)$ unspecified:

$$\log h_i(t) = \alpha(t) + \beta_1 X_{i1} + \beta_2 X_{i2} + \dots + \beta_k X_{ik} \quad (3)$$

or, equivalently,

$$h_i(t) = h_0(t) \exp(\beta_1 X_{i1} + \beta_2 X_{i2} + \dots + \beta_k X_{ik}) \quad (4)$$

or, equivalently,

$$\log \frac{h_i(t)}{h_0(t)} = \beta_1 X_{i1} + \beta_2 X_{i2} + \dots + \beta_k X_{ik} \quad (5)$$

This model is semi-parametric because while the baseline hazard can take any form, the covariates are entered into the model linearly. Considered are two observations i and i' which differ in their X -values, with the corresponding linear predictors

$$\eta_i = \beta_1 X_{i1} + \beta_2 X_{i2} + \dots + \beta_k X_{ik} \quad (6)$$

and

$$\eta_{i'} = \beta_1 X_{i'1} + \beta_2 X_{i'2} + \dots + \beta_k X_{i'k} \quad (7)$$

The hazard ratio for these two observations,

$$\frac{h_i(t)}{h_{i'}(t)} = \frac{h_0(t)e^{\eta_i}}{h_0(t)e^{\eta_{i'}}} = \frac{e^{\eta_i}}{e^{\eta_{i'}}} \quad (8)$$

is independent of time “ t ”. Consequently, the Cox model is a proportional-hazards model. Remarkably, even though the baseline hazard is unspecified, the Cox model can still be estimated by the method of partial likelihood, developed by Cox (1972) in the same paper in which he introduced the Cox model.

In the model, the time variable “ t ” denotes the age at which first birth takes place. The outcome variable, $h(t)$, is the hazard rate, the rate at which first birth occurs. The term h_0 is the baseline hazard function that varies only with t . The variables X_1, X_2, \dots, X_k are the covariates (explanatory variables) and the $\beta_1, \beta_2, \dots, \beta_k$ are the regression-like coefficients that show the effects of the covariates. In essence, the model shows how the covariates representing the characteristics of a subgroup of women influence their risk of experiencing first birth in comparison to the baseline or reference group. An exponential β -value greater than one means that the covariate has the effect of raising the hazard rate, or the risk of early first birth, compared to the baseline group, while an exponential β -value of less than one has the opposite effect. An exponential β -value of one is neutral and exerts no effect.

In the interpretation of results, a hazard ratio of 0.4, for example, means the group concerned has a 60 per cent lower risk than the reference category (Lehrer, 2008; Pettifor, van der Straten and Dunbar, 2004). In addition, a hazard ratio of 1.4 would imply that the group has a 40 per cent higher risk than the reference category. The statistical software used for modelling in this study is Stata version 15.

III. RESULTS

Descriptive analysis

Appendix table A.1 shows the per cent distribution of ever-married women based on demographic and socioeconomic characteristics. Some of the characteristic are as follows. In terms of level of education, 16.8 per cent have no education, 48.5 per cent only completed primary school, 27.7 per cent completed secondary school and 7 per cent attained a higher level of education. Approximately 64.8 per cent of the women hold a job while 62.2 per cent of the women's sexual debut occurred below the age of 22. Thirty-nine per cent of the women are in the 1971–1980 birth cohort, and 9 per cent of women are in the 1991–2000 birth cohort; 62.3 per cent are younger than their husbands; 63.1 per cent understand their ovulatory cycle; and 49.5 per cent use contraception methods. In addition, 42.7 per cent the women are from poor households; 74.1 per cent reside in the rural areas; 17.5 per cent are household heads and 52.4 per cent are part of a nuclear family. Regarding the husband's education and occupation, the husbands of 40.9 per cent of the women have attained only a primary level education and 37.2 per cent of them engage in unskilled labour. Concerning the age at first birth, 51.3 per cent of the women have given birth below 22 years, and 48.7 per cent of them were at least 22 years at the time of first birth.

The mean and median of women's age at first birth are presented in appendix table A.2. The estimated mean and median age at first birth for the entire sample are 22.4 years and 22 years, respectively. The research indicates that the higher the women's education level, the higher the average age at their first birth. For employed women, the average age at first birth is slightly higher than that for unemployed women. The research also shows that the average age at first birth of women in a higher wealth index tends to be older. Concerning residence, women in urban areas are delaying their birth to an older age more frequently than those in rural areas. The average age at first birth of women who are household heads is somewhat higher than for those living in households with male heads. In the youngest birth cohort, the average age of first birth is considerably lower than the oldest birth cohort. For women whose sexual debut occurred at age 22 years or more, the average age of first birth is noticeably higher than for those whose sexual debut occurred at an age below 22 years. For women aware of their ovulatory cycle, their average age of first birth is slightly higher than for those that do not keep track of their ovulatory cycle. Regarding spousal age difference, women with younger husbands have given their first birth at a later age than women with older husbands. Average age at first birth of women whose husbands have attained a high educational level is significantly higher than that for those whose husbands have not received an education. The research also indicates that the husbands' high education level correlates with the average

age at first birth. The average age of women whose husbands hold professional jobs is higher compared to those whose husbands work in agriculture or are unskilled labourers.

Kaplan-Meier estimates showing the graphical presentations of age at first birth by significant demographic and socioeconomic characteristics are presented in appendix figure A.1. Education levels of women and their husbands have the most notable impact, with the risk of early first birth being high among those who have attained only a primary level of education. Basically, the results show that as the education level increases, the failure rate (risk of experiencing an early first birth) declines. The survival curves regarding age at sexual debut show that women who initiate sex at an age below 22 years have a higher risk of first birth, whereas delaying the age at first sex reduces the risk of an early first birth. The survival curves of birth cohort show that women in the youngest cohort have a higher risk of early first birth, while those in the oldest cohort have a reduced risk of early first birth. The survival curves of the wealth index have a notable impact as the risk of early first birth is high among those classified as poor in the wealth index, while for those seen as financially comfortable based on the wealth index have a lower failure rate. The survival curves of residence show that women residing in rural areas have a higher risk of early first birth than women living in urban areas. In addition, women living in urban areas have a lower failure rate.

Association between age at first birth and background characteristics

The results of the log-rank test of the age at first birth among ever-married women by demographic and socioeconomic characteristics are presented in appendix table A.2.

The women's age at first birth is significantly associated with such characteristics as education level, employment status, position in wealth index, residence, sex of their household head, birth cohort, age at first sex of women at the 1 per cent level, and knowledge of ovulatory cycle of women at the 5 per cent level. Moreover, women's age at first birth is also significantly associated with characteristics related to their husbands, such as spousal age difference, husband's education and husband's occupation at the 1 per cent level. Nevertheless, the results of the study show that family type and use of contraception are not significantly associated with women's age at first birth.

Determinants of age at first birth

The results of the Cox Proportional Hazards model in terms of relative risk or hazard ratio of experiencing earlier first birth at ages below 22 are shown in appendix table A.3. These results show that a women's education level, position in wealth

index, residence, living arrangement with a female household head, birth cohort, spousal age difference, age at first sex, use of contraception, husband's education and occupation are significant factors.

The results from the model indicate that there are 15 per cent, 37 per cent and 74 per cent lower risks of early first births among women who have attained primary, secondary and higher-level schooling, respectively, compared to those with no education. The women that fall in the middle wealth index have an 8 per cent lower risk of giving first birth at a young age compared to the women in a poor wealth index. The women living in female-headed households have a 13 per cent lower risk of having an early first birth compared to those residing in male-headed households. Analysis on age at first sex has proved to be statistically significant as women who initiated sex at 22 years and above have a 94 per cent lower risk of having early first birth compared to the women who initiated sex at ages below 22 years. Regarding the effects of their husband's education, women whose husband's education levels are at the primary level, secondary level and higher level have a 10 per cent, 19 per cent and 34 per cent lower risk, respectively, of experiencing earlier age at first birth compared to those whose husbands are uneducated. Though contraception use is statistically significant, the risks of an early birth are almost even among non-users as compared to those who use contraception.

In contrast, residence has a significant effect on the earlier age at first birth. Women residing in rural area have a 12 per cent higher risk of having early first birth compared to the women living in urban areas. Concerning the effect of birth cohorts, women in the youngest cohort (1991–2000) have a 75 per cent higher risk of having an early first birth compared to those in the oldest cohort (1961–1970). The age difference has a significant effect on the earlier age at first birth. Wives who are the same age as their husbands and those who are younger have a 27 per cent and 89 per cent, respectively, higher risk of experiencing an early first birth compared to the wives who are older than their husbands. Regarding the effect of their husband's occupation, women whose husbands engage in skilled and unskilled work are at a higher risk of 19 per cent and 21 per cent, respectively, of experiencing an early first birth compared to women whose husbands hold professional jobs.

IV. DISCUSSIONS

The findings of this research have pointed out that more than 50 per cent of women who have given birth are below 22 years and that their sexual debut occurred at an age below 22 years. In addition, the estimated mean and median age at first birth for the entire sample are 22.4 and 22 years, respectively. The findings from the Cox Proportion Hazards model indicate that women's education level, age at first sex,

birth cohort, wealth index, residence, spousal age difference, husband education and husband occupation are the most important determinants of age at first birth.

The results of the study show that there is a 15 per cent, 37 per cent and 74 per cent, lower risk of early first births among women who have attained primary, secondary and higher-level schooling, respectively, compared to those with no education. In addition, women with primary, secondary and higher level educated husbands are 10 per cent, 19 per cent and 34 per cent respectively, less likely to experience first birth at an early age compared to those whose husbands have no education. Accordingly, women whose husbands have attained a higher education level have a lower risk of early first birth. The result is similar to the findings of Mhele (2015), Mugarura, Kaberuka and Atuhaire (2016), Ndlovu-Muchero (2017), and Chernet, Shebeshi and Banbeta (2019). When women spend longer time at school, this is likely to significantly affect both age at first marriage and the duration between marriage and the first birth (Yohannes and others, 2011).

Residence has a significant effect on the earlier age at first birth. Women residing in rural areas have a 12 per cent higher risk of giving an early first birth compared to the woman living in urban areas. This result is consistent with Mugarura, Kaberuka and Atuhaire (2016) and Ndlovu-Muchero (2017). Women residing in rural areas usually lack access to maternal health and family planning programmes unlike women living in urban areas (Nega, 2015).

Concerning the birth cohort, women belonging to the youngest cohort (1991–2000) have a 75 per cent higher risk of having an early first birth compared to those in the oldest cohort (1961–1970). This finding is analogous to the results of Kumar (2017). Hence, women in the youngest cohort have the earlier first birth, which raises the fertility level, creating the need for family planning programmes.

Regarding spousal age difference, women who are the same age or younger than their husbands have a higher risk of giving an early first birth compared to women who are older than their husbands. This result is similar to the findings of Nahar and Zahangir (2013).

Analysis on age at sexual debut has proven to be statistically significant as women who engaged in sex for the first time at the age of 22 years and above have a 94 per cent lower risk of experiencing an early first birth compared to the women who first engaged in sex when they were younger than 22 years. The results pertaining to age of debut sex has a statistically significant influence on earlier age at first birth. This supports the findings of Suh, Suh and Houston (2007), Mhele (2015), Mugarura, Kaberuka and Atuhaire (2016) and Ndlovu-Muchero (2017).

Though contraception use is statistically significant, the hazards of an early birth are almost even among contraception users and non-users. The result of the contraception use has a statistically significant influence on earlier age at first birth. This supports the findings of Ndlovu-Muchero (2017). Contraceptive use cannot only postpone unwanted births, but it also can lead to a reduction in infant and maternal mortality rates by averting pregnancies among women who are at a higher risk of becoming pregnant (Mirowsky, 2005).

V. CONCLUSION AND RECOMMENDATIONS

The findings of the study reflect that first birth for Myanmar women is concentrated at approximately 22 years. The education level of women and their spouses, age at first sex of women and place of residence have a prominent impact on the risk of age at first birth of women. The women's age at first birth is significantly associated with the discussed background characteristics, except family type, and contraception used.

The findings from the Cox Proportional Hazards model clearly indicate that almost all the selected variables in the study an influence on the age at first birth in their own way; women's education level, female-headed households, and husband's education level have negative effects but poor wealth index, early age at first sex, women in the youngest cohort, women who are the same age or younger than their husbands, women living in rural areas and women whose husbands engage in skilled and unskilled labour have positive effects on the outcome variable.

This data analysis has some shortcomings, such as the effects of ethnicity and religion are not discussed because of data unavailability of the Myanmar Demographic and Health Survey 2015–2016, although they could be determinants for age at first birth of women in Myanmar with multiple ethnicities.

Based on the results of the study, it is recommended that programmes to improve access to education be promoted as they have an effect on increasing women's age at first birth. Considering that educational attainment helps improve individual well-being and social development, particularly for women, the government should implement initiatives to improve the educational attainment of its citizens. Because of the economic burden, girls from poor families and rural areas tend to marry at an early age. To reduce early marriages, and subsequently early commencement of childbearing, it is important that girls stay in school for a longer period of time and ensure they have secured employment afterwards when their schooling is completed. Rules and regulations should be introduced to make schooling up to secondary level compulsory for all girls, and policies that aim to increase women's age at first birth

should be set. These policies should be targeting young women, in particular, those with no education.

Furthermore, plans and policies to alleviate poverty at the household level, especially in the rural areas, should be introduced. Cultural and some socioeconomic factors that devalue the status of women should be addressed in order to empower women to make the right decisions related to reproduction. Information on reproductive health and economic advantages of delayed childbearing should be given to young women to avoid early childbearing. Moreover, a rights-based comprehensive sexual education programme sensitive to the norms and cultures should be part of school curriculum for all boys and girls. Although the study results do not indicate an association between age at first birth and contraception use, having access to contraception could delay the first birth to a later age.

By highlighting the adverse effects of early marriage and early first birth on the health of young mothers and their children, integrated social awareness programmes, including campaigns using social, electronic and print media may be effective in reducing the early first birth of women. A rigorous attempt to foster educational awareness and discourage early childbearing should be made to support the wellbeing of the population. Accordingly, a comprehensive, well planned and long-standing policy, fully supported by state machinery and statutory bodies, should be drafted to put a barrier on this menace.

REFERENCES

- Bongaarts, John (2008). Fertility transitions in developing countries: progress or stagnation? *Studies in Family Planning*, vol. 39, No. 2, pp. 105–110.
- Chernet, Ayele Gebeyehu, Dinberu Seyoum Shebeshi, and Akalu Banbeta (2019). Determinant of time-to-first birth interval after marriage among Ethiopian women. *BMC Women's Health*, vol. 19, No. 157, pp. 1–6.
- Cox, David R. (1972). Regression models and life-tables. *Journal of the Royal Statistical Society*, vol. B34, No. 2, pp. 187–220.
- Gyimah, Stephen Obeng (2003). A cohort analysis of the timing of first birth and fertility in Ghana. *Population Research and Policy Review*, vol. 22, No. 3, pp. 251–266.
- Halli, Shiva S., and K. Vaninadha Rao (1992). *Advanced Techniques of Population Analysis*. New York: Plenum Press.
- Kumar, Sachin (2017). A statistical study of demographic models with reference to some Indian States. PhD dissertation. India: Birla Institute of Technology and Science Pilani.
- Lehrer, Evelyn L. (2008). Age at marriage and marital instability: revising the Becker-Lands-Michael Hypothesis. *Journal of Population Economics*, vol. 21, No. 2, pp. 463–484.
- Löfstedt, Petra, and others (2005). Changes in marriage age and first birth interval in Huaning County, PR China: Yunnan Province. *The Southeast Asian Journal of Tropical Medicine and Public Health*, vol. 36, No. 5, pp. 1329–1338.
- Matthews, T. J., and Brady E. Hamilton (2009). Delayed childbearing: more women are having their first child later in life. National Center for Health Statistics Data Brief, No. 21, pp. 1–8.
- Mhele, Karabo (2015). Determinants of time to first birth among women in ages 15–24 in Swaziland. *African Population Studied*, vol. 29, No. 2, pp. 2012–2030.
- Mirowsky, John (2005). Age at first birth, health, and mortality. *Journal of Health and Social Behavior*, vol. 46, No.1, pp. 32–50.
- Mugarura, Alex, Will Kaberuka, and Ruth Atuhaire (2016). Factors determining the age at first birth in Uganda. *Issues in Social Scientific Research*, vol. 1, No. 5, pp. 61–66.
- Myanmar, Department of Population (2004). *Myanmar Fertility and Reproductive Health Survey 2001: Detailed Analysis Report*. Ministry of Immigration and Population.
- _____ (2016). *Thematic Report on Fertility and Nuptiality: Census Report Volume 4-A*. Ministry of Labour, Immigration and Population. Available at https://myanmar.unfpa.org/sites/default/files/pub-pdf/4A_Fertility%20and%20Nuptiality.pdf.
- Myanmar, Ministry of Health and Sports, and ICF International (2016). *Myanmar Demographic and Health Survey 2015–16: Key Indicators Report*. Nay Pyi Taw: Ministry of Health and Sports; Rockville, Maryland: ICF International.
- Nahar, Mosammat Zamilun, and Mohammad Salim Zahangir (2013). Patterns and determinants of age at first birth in Bangladesh. *Turkish Journal of Population Studies*, vol. 35, pp. 63–77.
- Nahar, Mosammat Zamilun, Mohammad Salim Zahangir, and S. M. Shafiqul Islam (2013). Age at first marriage and its relation to fertility in Bangladesh. *Chinese Journal of Population Resources and Environment*, vol. 11, No. 3, pp. 227–235.

- Ndlovu-Muchero, Sindiso (2017). Demographic and socio-economic determinants of age at first birth in Swaziland. Johannesburg, South Africa: Population Association of America, University of the Witwatersrand.
- Nega, Wondiber (2015). The statistical distribution and some determinants of birth interval for rural Ethiopia. Master of Science in Statistics dissertation. Ethiopia: Addis Ababa University.
- Nyi Nyi (2005). The determinants of age at first marriage in Myanmar. Master of Population Studies dissertation. Bangkok: Mahidol University.
- Pebley, Anne R., John B. Casterline, and James Trussell (1982). Age at first birth in 19 countries. *International Family Planning Perspectives*, vol. 8, No. 1, pp. 2–7.
- Pettifor, Audrey, Ariane van der Straten, and Megan Dunbar (2004). Early age of first sex: a risk factor for HIV infection among women in Zimbabwe. *Aids*, vol. 18, No. 10, pp. 1435–1442.
- Rabbi, Ahabab Mohammad Fazle, and M. H. M. Imrul Kabir (2013). Factors influencing age at first birth of Bangladeshi women: a multivariate approach. *American Journal of Public Health Research*, vol. 1, No. 7, pp. 191–195.
- Rajaretnam, T. (1990). How delaying marriage and spacing births contributes to population control: an explanation with illustrations. *The Journal of Family Welfare*, vol. 36, No. 4, pp. 3–13. Available at www.womenstudies.in/elib/others/ot_how_delaying.pdf.
- Saikia, Rinku, and Manash Pratim Barman (2016). Cox Proportional Hazards model with time-dependent covariates: a review. *The Assan Statistical Review*. vol. 30, No. 2, pp. 179–193.
- Suh, Suhyun, Jingyo Suh, and Irene Houston (2007). Predictors of categorical at-risk high school dropouts. *Journal of Counseling & Development*, vol. 85, No. 2, pp. 196–203.
- Yohannes, Samuel, and others (2011). Duration and determinants of birth interval among women of child bearing age in Southern Ethiopia. *BMC Pregnancy and Childbirth*, vol. 11, No. 38, pp. 1–6.

APPENDIX

Table A.1. Per cent distribution of ever-married women by demographic and socioeconomic characteristics

Variables		Weighted number	Per cent
Women's education*	No education	1 283	16.8
	Primary	3 689	48.5
	Secondary	2 109	27.7
	Higher	530	7.0
Women's employment*	Unemployed	2 676	35.2
	Employed	4 935	64.8
Age at first sex	Less than 22 years	4 732	62.2
	22 years and above	2 881	37.8
Birth cohort	1961–1970	1 336	17.6
	1971–1980	2 966	39.0
	1981–1990	2 626	34.5
	1991–2000	685	9.0
Spousal age difference	Wife is older	1 413	18.6
	Same age	729	9.6
	Wife is younger	4 742	62.3
Knowledge of ovulatory cycle	No	2 812	36.9
	Yes	4 800	63.1
Contraception used	No	3 847	50.5
	Yes	3 766	49.5
Wealth index	Poor	3 251	42.7
	Middle	1 507	19.8
	Rich	2 855	37.5
Residence	Urban	1 974	25.9
	Rural	5 639	74.1
Female-headed household	No	6 277	82.5
	Yes	1 335	17.5
Family type	Nuclear	3 989	52.4
	Joint (extended)	3 624	47.6

Table A.1. (continued)

Variables		Weighted number	Per cent
Husband's education*	No education	1 336	17.6
	Primary	3 116	40.9
	Secondary	2 723	35.8
	Higher	436	5.7
Husband's occupation*	Professional	554	7.3
	Agricultural	1 950	25.6
	Skilled labor	1 449	19.0
	Unskilled labor	2 834	37.2
	Other	734	9.6
Age at first birth	Less than 22 years	3 906	51.3
	22 years and above	3 707	48.7
Total		7 613	100

Source: Myanmar, Ministry of Health and Sports and ICF International (2016).

Notes: *Missing data on women's education for two cases, spousal age difference for 729 cases, women's employment for two cases, husband's education for two cases and husband's occupation for 92 cases.

Table A.2. Mean and median survival times and log-rank test of the age at first birth among married women by demographic and socioeconomic characteristics

Predictor variables	Survival time (age at first birth)		χ^2
	Mean	Median	
Women's education			
No education	20.9	20	553.3***
Primary	21.9	21	
Secondary	22.9	22	
Higher	26.6	26	
Women's employment			
Unemployed	22.1	21	15.5***
Employed	22.5	22	
Wealth index			
Poor	21.4	21	262.1***
Middle	22.4	22	
Rich	23.4	23	
Residence			
Urban	23.4	23	114.8***
Rural	22.0	21	
Female-headed household			
No	22.2	21	13.7***
Yes	22.9	22	
Family type			
Nuclear	22.4	22	0.95
Joint (extended)	22.3	21	
Birth cohort			
1961–1970	22.9	22	571.4***
1971–1980	23.2	22	
1981–1990	22.0	22	
1991–2000	19.2	19	
Spousal age difference			
Wife is older	25.2	25	574.19***
Same age	23.3	23	
Wife is younger	21.4	21	

Table A.2. (continued)

Predictor variables	Survival time (age at first birth)		χ^2
	Mean	Median	
Age at first sex			
Less than 22 years	20.0	20	3 479.6***
22 years and above	26.4	26	
Knowledge of ovulatory cycle			
No	22.2	21	5.0**
Yes	22.5	22	
Contraception used			
No	22.4	22	0.11
Yes	22.3	22	
Husband's education			
No education	21.3	20	342.0***
Primary	21.4	21	
Secondary	22.9	22	
Higher	25.8	25	
Husband's occupation			
Unskilled labor	21.8	21	182.6***
Skilled labor	22.9	22	
Agricultural	21.8	21	
Professional	23.9	23	
Other	23.6	23	

Source: Myanmar, Ministry of Health and Sports and ICF International (2016).

Note: ***, **, * represent 1 per cent, 5 per cent and 10 per cent levels of significance, respectively.

Table A.3. Results of Cox Proportional Hazards model for the age at first birth of ever-married women by demographic and socioeconomic characteristics

Predictor variables	Coef- ficient	Hazard ratio	Standard error	p-value	95% Confidence interval	
					Lower	Upper
Women's education						
No education (ref)						
Primary	-0.17***	0.85	0.04	0.001	0.77	0.93
Secondary	-0.47***	0.63	0.04	0.000	0.56	0.71
Higher	-1.35***	0.26	0.04	0.000	0.19	0.36
Women's employment						
Unemployed (ref)						
Employed	0.01	1.01	0.03	0.820	0.94	1.08
Wealth index						
Poor (ref)						
Middle	-0.09*	0.92	0.04	0.065	0.83	1.01
Rich	-0.02	0.98	0.05	0.695	0.89	1.08
Residence						
Urban (ref)						
Rural	0.11**	1.12	0.06	0.033	1.01	1.24
Female-headed household						
No (ref)						
Yes	-0.14**	0.87	0.05	0.016	0.78	0.97
Family type						
Nuclear (ref)						
Joint (extended)	0.04	1.04	0.04	0.212	0.98	1.12
Birth cohort						
1961–1970 (ref)						
1971–1980	-0.04	0.96	0.05	0.461	0.86	1.07
1981–1990	0.06	1.06	0.06	0.289	0.95	1.19
1991–2000	0.56***	1.75	0.12	0.000	1.53	1.99
Spousal age difference						
Wife older (ref)						
Wife is same age	0.24***	1.27	0.11	0.005	1.07	1.49
Wife younger	0.64***	1.89	0.11	0.000	1.68	2.11

Table A.3. (continued)

Predictor variables	Coef- ficient	Hazard ratio	Standard error	p-value	95% Confidence interval	
					Lower	Upper
Age at first sex						
Less than 22 years (ref)						
22 years and above	-2.76***	0.06	0.005	0.000	0.05	0.07
Knowledge of ovulatory cycle						
No (ref)						
Yes	-0.001	0.99	0.04	0.968	0.93	1.07
Contraception used						
No (ref)						
Yes	0.08**	1.08	0.04	0.032	1.01	1.16
Husband's education						
No education (ref)						
Primary	-0.11**	0.90	0.04	0.028	0.82	0.99
Secondary	-0.21***	0.81	0.05	0.000	0.73	0.91
Higher	-0.41***	0.66	0.09	0.004	0.50	0.88
Husband's occupation						
Professional (ref)						
Agricultural	0.14	1.15	0.10	0.124	0.96	1.37
Skilled labor	0.18**	1.19	0.11	0.047	1.00	1.42
Unskilled labour	0.19**	1.21	0.10	0.024	1.03	1.44
Other	0.16	1.17	0.12	0.123	0.96	1.44
Log likelihood				-26 000.74		
LR chi-square (23)				3 815.31***		

Source: Myanmar, Ministry of Health and Sports and ICF International (2016).

Note: ***, **, * represent 1 per cent, 5 per cent and 10 per cent levels of significance, respectively.

Figure A.1. Kaplan-Meier survival estimates by demographic and socioeconomic variables

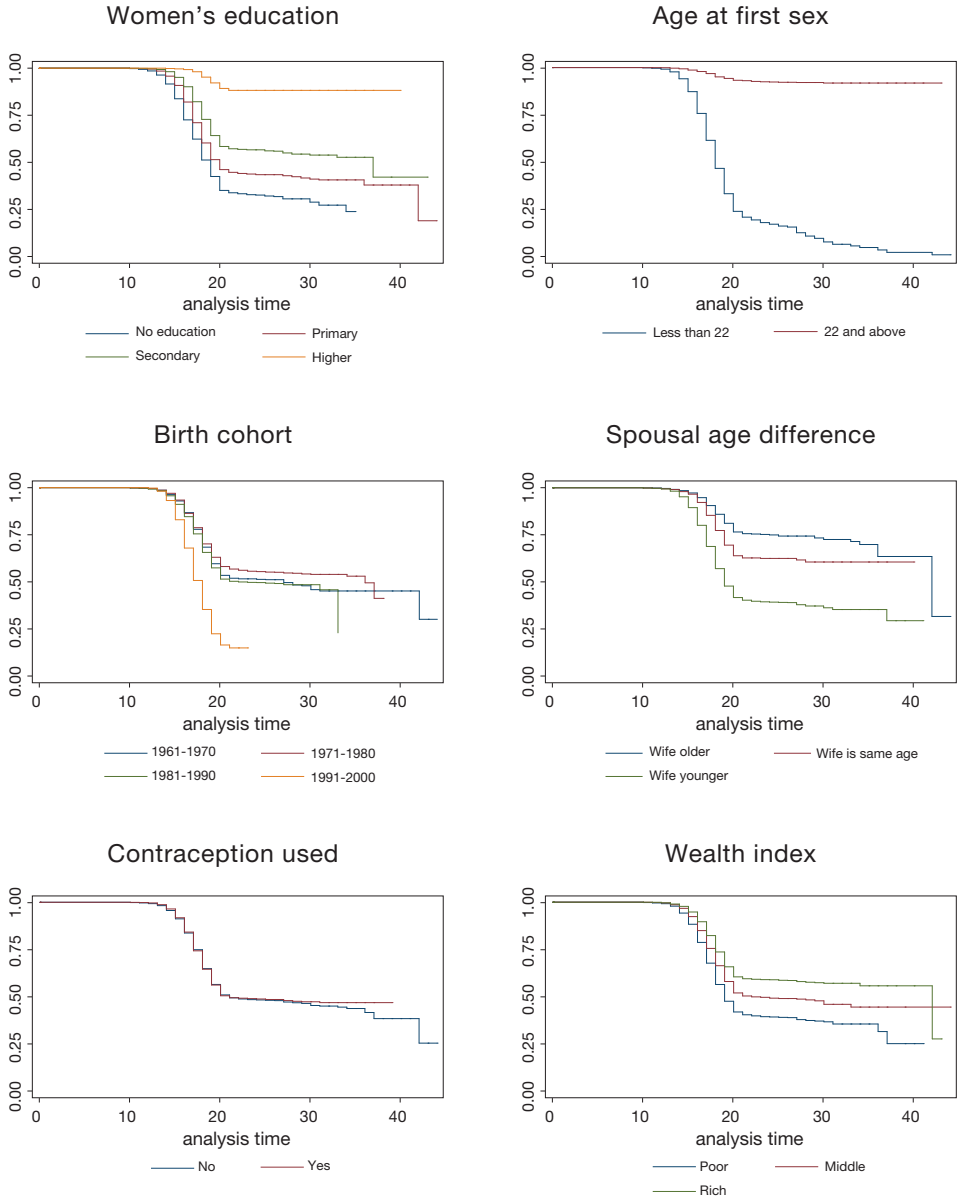
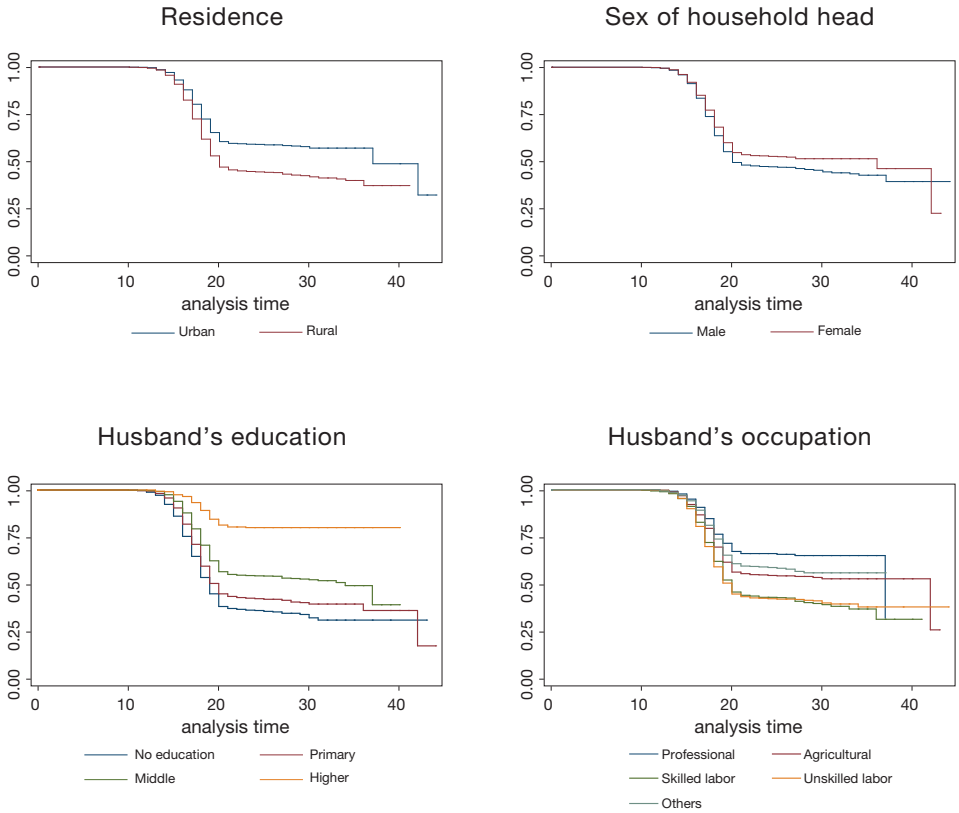


Figure A.1. (continued)



Source: Myanmar, Ministry of Health and Sports and ICF International (2016).

REFERENCES

- Allen, Franklin, and others (2016). The foundations of financial inclusion: understanding ownership and use of formal accounts. *Journal of Financial Intermediation*, vol. 27, pp. 1-30.
- Aportela, Fernando (1999). Effects of financial access on savings by low-income people. Banco de México Research Department. Available at [http://users.nber.org/~rdehejia/!@\\$devo/Lecture%2006%20Microcredit/supplemental/Aportela.pdf](http://users.nber.org/~rdehejia/!@$devo/Lecture%2006%20Microcredit/supplemental/Aportela.pdf).
- Ashraf, Nava, Dean Karlan, and Wesley Yin (2010). Female empowerment: impact of a commitment savings product in the Philippines. *World Development*, vol. 38, No. 3, pp. 333-344.
- Beck, Thorsten, Asli Demirgüç-Kunt, and Ross Levine (2007). Finance, inequality and the poor. *Journal of Economic Growth*, vol. 12, No. 2, pp. 27-49.
- Bruhn, Miriam, and Inessa Love (2014). The real impact of improved access to finance: evidence from Mexico. *Journal of Finance*, vol. 69, No. 2, pp. 1347-1376.
- Camara, Noelia, Ximena Pena, and David Tuesta (2014). Factors that matter for financial inclusion: evidence from Peru. Working Paper, No. 1409. BBVA Bank, Economic Research Department. Available at <https://ideas.repec.org/p/bbv/wpaper/1409.html>.
- Demirgüç-Kunt, Asli, and Leora Klapper (2012). Measuring financial inclusion: The Global Findex Database. Research Working Paper, No. 6025. Washington, D.C.: World Bank.
- _____ (2013). Measuring financial inclusion: explaining variation in use of financial services across and within countries. *Brookings Papers on Economic Activity*, vol. 44, No. 1, pp. 279-340.
- Demirgüç-Kunt, Asli, Leora Klapper, and Douglas Randall (2013). Islamic finance and financial inclusion: measuring use of and demand for formal financial services among Muslim adults. Policy Research Working Paper, No. 6642. Washington D.C.: World Bank.
- Demirgüç-Kunt, Asli, Leora Klapper, and Dorothe Singer (2017). Financial inclusion and inclusive growth: a review of recent empirical evidence. Policy Research Working Paper, No. 8040. Washington, D.C.: World Bank.
- Dupas, Pacoline, and Jonathan Robinson (2013). Savings constraints and microenterprise development: evidence from a field experiment in Kenya. *American Economic Journal: Applied Economics*, vol. 5, No. 1, pp. 163-192.
- Fungáčová, Zuzana, and Laurent Weill (2015). Understanding financial inclusion in China. *China Economic Review*, vol. 34, pp. 196-206.
- Gross, Matthew, Jeanne Hogarth, and Maximilian Schmeiser (2012). Consumers and mobile financial services. Washington, D.C.: Board of Governors of the Federal Reserve System.
- Han, Rui, and Martin Melecky (2013). Financial inclusion for financial stability: access to bank deposits and the growth of deposits in the global financial crisis. Policy Research Working Paper, No. 6557. Washington, D.C.: World Bank.
- Karlan, and others (2016). Research and impacts of digital financial services. NBER Working Paper, No. 22633. Cambridge, MA: National Bureau of Economic Research.
- Kostov, Philip, Thankorn Arun, and Samuel Annim (2015). Access to financial services: the case of the 'Mzansi' account in South Africa. *Review of Development Finance*, vol. 5, No. 1, pp. 34-42.

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