

Socioeconomic status, Marriage Patterns, and Fertility Choices in Jordan

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ABSTRACT

This paper examines the effect of socioeconomic conditions, mainly individual education, parents' education, wealth status, dowry, and place of residence on marriage decision and fertility choices in Jordan. For this purpose, cross sectional micro-data of Jordan Labor market Survey (JLMS) 2010 is used. Logit models and standard linear regression models are employed in the analysis. Main findings can be summarized as follows. Individual's own education is more critical for marriage and fertility than parents' education. Patterns of marriage reflect preference for partners with some education over illiterates, while involvement in university and higher education postpones marriage by 2.5 to 3 years. People tend to marry younger and have more children two decades ago than they do recently. Moreover, individuals in the second, third, and fourth strips of wealth are more likely to marry earlier than the poorest and the richest, whereas fertility declines as wealth increases. No evidence on regional differences regarding marriage and fertility. However, age at marriage and fertility may differ across governorates rather than regions. Individuals in larger households are more likely to marry younger and produce more children. Finally, further investigation is needed to explore the role of parents' education and cost of marriage.

Keywords: Socioeconomic Status, Marriage, Fertility, Logit Models, Jordan Labor Market Survey, Jordan.

INTRODUCTION

Patterns of marriage and fertility might differ from one country to another, however, determinants of marriage decision and fertility choices seem to differ by culture rather than country. For instance, childbearing before marriage is considered as a determinant that speeds the transition into marriage in western societies (Lundberg and Rose, 2003; Harknett and McLanahan, 2004). In contrast, fertility is almost completely related to marriage (i.e. marriage precedes childbearing) in Islamic societies where religion plays a basic role in organizing the relationship between man and woman.

Due to links between marriage and fertility, they tend to share determinants and consequences. Keely (1979), links propensity to marry, marriage timing, and duration of marriage to fertility and consequently the rate of population growth. Other determinants, such as education and labor force participation of woman are considered as powerful factors that influence the incidence of marriage and fertility choices. However, husband's education may influence fertility more than woman's own education (Bloom and Bennett, 1990; Billari and Kohler, 2004; DeRoset and Ezeh, 2005). While conceptions are not perfectly controlled by parents, costs of child care affect ultimate number of children and spacing between births (Hotz and Miller, 1998). Preference for sons over daughters, which is widespread in many countries, can be seen as a barrier to fertility decline.

Socioeconomic status of individual and household

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can be seen as an important determinant of marriage and fertility. Reproductive behavior differs by socioeconomic group, where fertility is usually higher in rural than urban areas, higher among lower educated strips than better educated counterparts, and higher in lower income households according to Bongaarts, 2003. Socioeconomic conditions affect marriage decision in terms of incidence of marriage and marriage age, in addition to fertility choices of married couples regarding the number of children and distance between births. Socioeconomic status of individual and household is linked to marriage and fertility choices for different countries in the literature. However, little is known about these relationships in Jordan. Up to my knowledge, studies that describe the situation of marriage and fertility in Jordan are referred to 1980s (about three decades ago).

This study aims to bridge the gap in the literature, describe patterns of marriage and fertility that prevail in the new millennium, and to link marriage decision and fertility choices of married couples to socioeconomic status of individual and household in Jordan. The paper investigates whether socioeconomic conditions of Jordanian individual and household affect the incidence of marriage, age at first marriage, and number of births per woman. Explicitly, the paper seeks to answer two main questions: do socioeconomic conditions of individual and household affect incidence and timing of marriage? And, do socioeconomic conditions of individual and household affect fertility choices?

Socioeconomic conditions are proxied by individual education attainment, education of parents, and place of residence (region of residence and urban–rural area). In addition, two more variables are introduced to describe economic factors. The first one is an indicator of wealth that is established based on ownership of assets. The second variable is named dowry (mahr) which represent the sum of deposit, gold, furniture, and deferred dowry in the marriage contract. For the purpose of this study,

regressions are limited to individuals in the age of marriage and childbearing that prevails in Jordanian society, 15–40 year. This choice is convenient since the percentage of singles in the data is only 1.1% when age exceeds 40 year. Incidence of marriage is the first response variable that considers the outcome whether a person is married or single at the survey time (2010). Timing of marriage is measured by age at first marriage, whereas number of births per woman indicates fertility.

The remainder of this paper is organized as follows. Section 2 reviews the relevant literature. Section 3 provides an overview of economic situation and fertility in Jordan. Discussion of the data is provided in section 4. Section 5 describes the methods used. Empirical results are discussed in section 6. Finally, Section 7 concludes.

2. Literature Review

Marriage and fertility have continuously received substantial attention in literature due to its powerful impacts on population policies and well being of individuals and households. The relationship between marriage and fertility is investigated in different manners reflecting variations in cultures and perspectives. However, socioeconomic factors can be seen as a common issue that received a particular attention in the literature. Keeley (1979) investigates the age distribution of first marriage, and argues that variations in distributions of marriage age are largely explained by variations in a set of socio-economic variables that either affect the gain to marriage or the cost of search, or both. Variables that increase marital income relative to single income generally lead to earlier entry and longer search, according to Keeley 1979.

Bloom and Bennett (1990) investigate first marriage patterns of American women. They report education as a powerful covariate of timing of the first marriage and race as a powerful indicator of its incidence. Sweeney (2002) studies economic foundation of marriage decision. Results indicate increasing importance of

earnings for women marriage decision, whereas changes in the relationship between economic prospects and marriage decision are limited for men. These findings emphasize the effect on marriage decision of women economic autonomy and women labor force participation. Singh and Samara (1996) study patterns of marriage among women in developing countries. They find substantial proportion of women in developing countries continue to marry as adolescents, where 20-50% of women marry by age 18 and 40-70% do so by their 20th birthday. In addition, they report strong association between education and age at first marriage where women who attended school are less likely to marry during adolescence, and proportion of women who do so is lower in societies with higher proportions of secondary educated women.

Harknett and McLanahan (2004) examine racial and ethnic differences in marriage attitudes after a child birth. They attribute large portion of the racial and ethnic differences in marriage after a non-marital birth to undersupply of employed African American men who are less likely than white, Mexican American, and other Hispanic parents to marry after non-marital birth. Consistently, Lundberg and Rose (2003) report that the birth of a son speeds the transition into marriage when the child is born before the mother's first marriage. The paper estimates the effect of child gender on mother's probability of marriage or remarriage. They find positive effect of a son on marriages to the child's biological father than other marriages, but no significant effect on remarriage probabilities when children are born within a previous marriage.

Other studies investigate the effect of child sex on fertility rather than marriage. Edlund (1999) examines son preferences on sex ratios and patterns of marriage. They reveal that unbalanced sex ratios are possible consequence of preference for sons, and non-random mating may cause women to be consistently born into low-status families and thus, relegated to a permanent

underclass. Education appears as a critical factor for fertility choices as it is for marriage decision. Bongaarts (2003) emphasizes that the educational composition of the population remains a key predictor of overall fertility. DeRose and Ezech (2005) demonstrate the influence of men's education on reproductive decision-making. They argue that husband's education exerts a stronger influence on wife's fertility intentions than does her own education, and they reveal that lower fertility in Ghana is associated with men's desires to decline fertility.

Hotz and Miller (1988) investigate effects of female labor supply, expenditures on offspring, and contraceptive behavior on fertility. They find that when parents cannot perfectly control conceptions, variations in child care costs do affect the life cycle spacing of births. Caldwell and Schindlmayr (2003) explain fertility crisis in modern societies (very low fertility in some European and Asian countries reaching replacement level) by welfare systems, family expenses, and incompatibility between post-industrial society and behavior necessary for population replacement.

Anderson *et al.* (1985) describe trends of fertility in Jordan. They report that total fertility rate fell from about eight in early 1970 to about seven in early 1980, and women tend to get married at older age than they did a decade ago. Moreover, they attribute Jordan's fertility decline to later marriage rather than contraceptive use, and reveal a two year pattern of birth spacing. Abdel-Aziz *et al.* (1983) demonstrate that about quarter of Jordanian married women are using contraceptives and many recent pregnancies are reported to be unplanned. Recent fertility rates suggest that Jordan has adopted successful family planning policies accompanied by increasing economic difficulties that interact together during last decades to decline fertility.

3. Economic Growth and Fertility in Jordan

Economic status may directly affect the decision of

marriage but not childbearing which in turn impacts fertility. Figure 1 plots average fertility rate and average real GDP per-capita over 2000 – 2012 time period as a proxy of economic status for nine countries in the Middle East and North Africa (MENA). West Bank and Gaza strip has the lowest per-capita income with 1,271.7 \$, but fertility rate is the highest with an average of 4.6 birth per woman. GDP per-capita increases to 2,971.9\$ for Algeria while fertility declines to 2.6 birth per woman. Fertility rate of 1.8 birth per woman is lowest in Lebanon while per-capita income is 6,044.9\$. Libya has

the highest per-capita income that equals 7,281.9\$, however, fertility rate is 2.7 birth per woman. Jordan represents the median case in terms of average per-capita income with 2,463.1\$ but relatively high fertility rate with 3.7 birth per woman. Figure 1 suggests a concave relationship between fertility and GDP per-capita that is clarified by the curved fit-line. Fertility is higher at low levels of income that decreases as income increases. After a specific threshold of income, fertility tends to re-increase again.

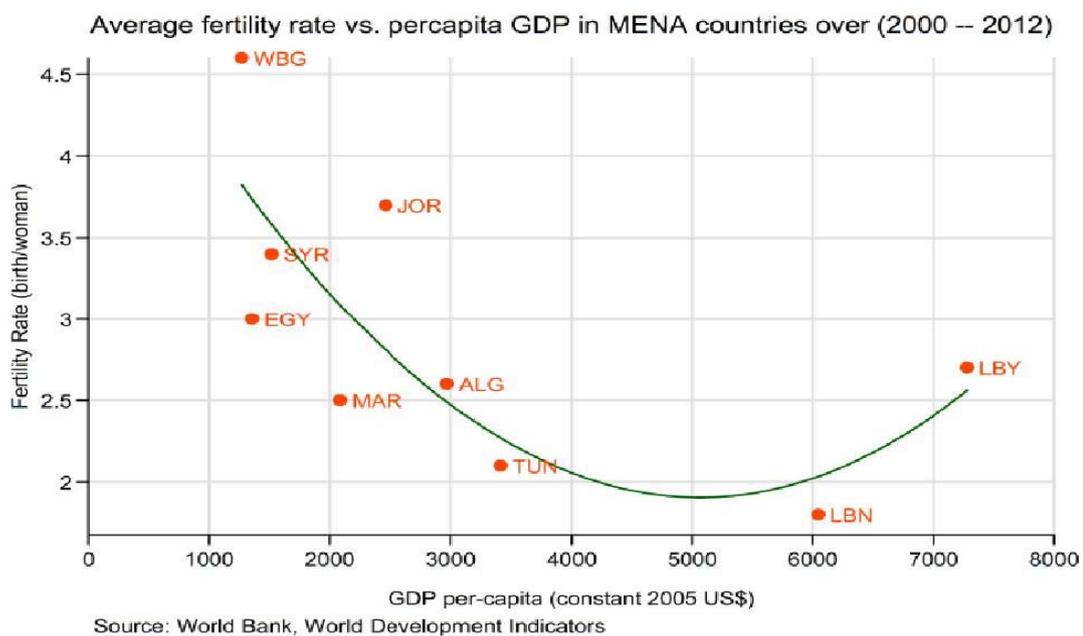


Figure 1: Fertility vs. Real GDP per-capita in MENA Countries

Figure 2 plots growth rate of real GDP per-capita in Jordan spanning the period 1980-2013. The figure shows a decreasing growth trend during 1980s reaching a minimum of (-16.5%) in 1989. Jordanian economy started to recover in the following years reaching a maximum growth rate of 12.7% in 1991. Economic deteriorations in Jordan during the second half of 1980s can be attributed to the disengagement between Jordan

and Palestine that was accompanied by Jordan Dinar depreciation. The year 1990 has witnessed Iraqi entrance to Kuwait which was followed by the first Gulf War in 1991. As consequence, Jordan has received more than half million people raising the population growth to 11.2% according to World Bank statistics. International aid and loans for Jordan to face the economic complications of the war have grown by 55.1% in 1991

according to Central Bank of Jordan. This may explain the economic growth of 1991 after years of economic deterioration.

Figure 3 shows annual population growth and fertility rate in Jordan over 1960-2012 time period. Jordan population has increased from 2.18 million in 1980 to about 6.05 million in 2010 (World Bank statistics), a little less than tripled in 30 year. These increases in population may reflect the high fertility rates in Jordan. However, it was also driven by migration mainly during 1990–1991. Since data has been collected in 2010, this paper will not take into account the consequences of Arab Spring events, and will limit the discussion by the year 2010 despite the existence of some figures for later years. Jordanian population has grown during 1960s when fertility rate was growing. As

a reflection of fertility declines during 1970s, population growth declined during the same decade, and fertility rate continues to decline during 1980s. The beginning of 1990s has witnessed a population shock, where population growth jumps from 3.75% in 1990 to 11.2% in 1991. It remains as high as 5.2% in the year 1992 after which population growth gradually declined to reach a minimum at 1.8 % in 1999. Thereafter it tends to flatten around 2.4%. To sum up, population growth and fertility rates show monotone decrease over 1970–2012, except for 1991 that witnessed the population shock. Fertility has declined from 7.95 birth per woman during 1960s to 3.7 birth per woman during 2000-2013. Average population growth, on the other hand, has declined from 5.8% for 1960s to 2.3% in the new millennium.

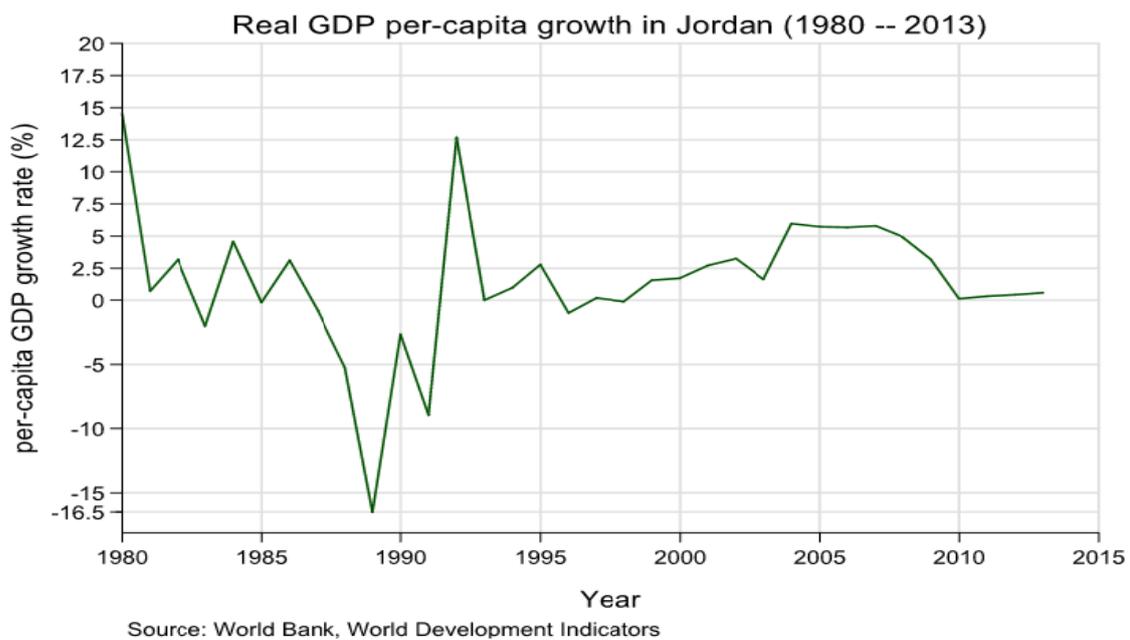


Figure 2: GDP Per-capita Growth in Jordan

Economic changes have no clear direct effect on fertility, where monotone decline in fertility can be seen after 1970 (Figure 3) regardless of economic fluctuations captured by per-capita income in Figure 2. However, it

can influence fertility indirectly through marriage decision. Income distribution inequality can limit the effect of economic gains, and consequently GDP growth cannot affect the incidence of marriage at the population

level. Table 1 shows income distribution in Jordan in year 2003 and 2006. Huge inequality in the distribution of income can be seen in the table where income share held by richest 20% of Jordanians is 45.7% whereas income share held by poorest 20% amounts only 6.6% in 2003. Comparing richest 10% and poorest 10% populations aggravates the picture. The richest 20% income share is 6.9 times the share of lowest 20% strip,

while the share held by richest 10% strip is 11.3 times the share held by poorest 10% of population. Income share of the middle 60% of Jordanians is 47.7% which is almost the same as the share held by only the richest 20% of the population. Income distribution profile does not show real changes in 2006, and income distribution inequality continues to prevail.

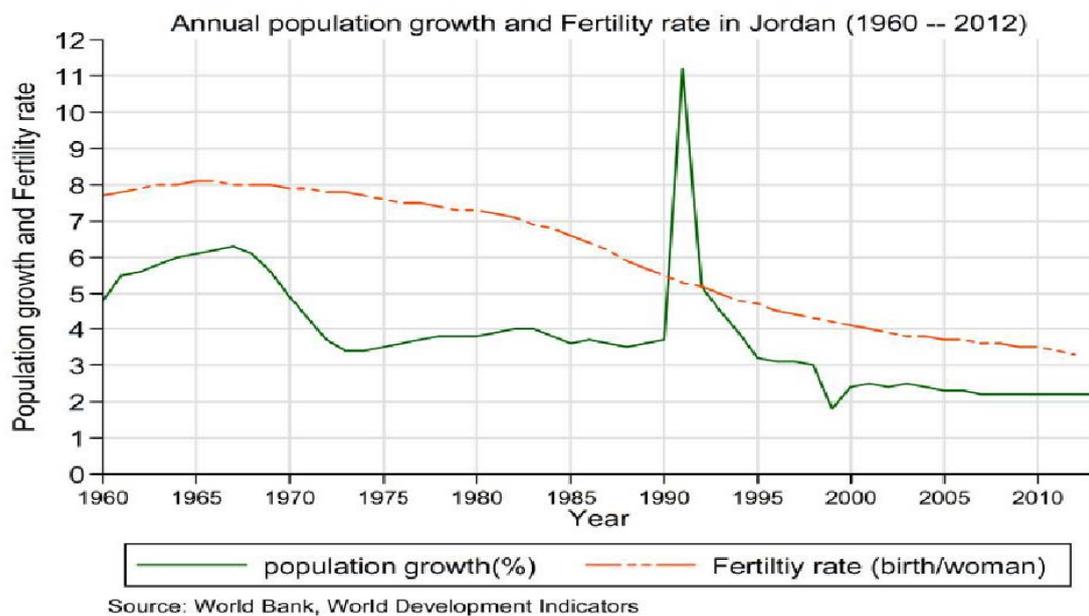


Figure 3: Population Growth and Fertility Rate in Jordan

Income distribution inequality and the relatively high unemployment rates have led to increasing economic difficulties that is reflected in shape of delays in marriage and increasing spinsterhood. For example, cingulate mean age at marriage was about 22 year in 1976 whereas in 1983 it was nearly 24 year according to Anderson et al. 1985. First round of Jordan Labor Market Panel Survey (JLMS 2010) is employed to figure out patterns of marriage and fertility in Jordan.

4. Data: Jordan Labor Market Survey (JLMS- 2010)

Jordan Labor Market Survey 2010, thereafter JLMS 2010, is the first round of an intended periodic panel survey, that is, a longitudinal micro-data survey focusing on the Jordanian labor market conditions. It is a comprehensive household survey that carried out by Jordanian National Center of Human Resources Development (NCHRD) in cooperation with Department of Statistics (DoS) and Economic Research Forum (ERF). The survey consists of household and individual questionnaires that provide information on housing,

services, ownership of assets, migration, remittances, education, employment/unemployment, woman status and decision-making, cost and patterns of marriage, and fertility aspects. Eligible survey individuals are

interviewed separately rather than getting information from any household adult member. Parents respond for children 6–14 year of age.

Table 1
Income distribution profile in Jordan

Population strip	income share in year	
	2003 (%)	2006 (%)
richest 20%	45.7	45.4
second 20%	10.7	11.1
third 20%	15.2	15.2
fourth 20%	21.8	21.1
poorest 20%	6.6	7.2
richest 10%	30.4	30.7
poorest 10%	2.7	3.0

Source: World Bank, World Development Indicators.

JLMS 2010 is a national representative survey targeted 5,760 households in 480 primary sampling units (PSUs). The survey successfully interviewed 5,102 household that contain 25,969 individuals achieving response rate of 88.6%. Most of the non-response is due to empty or closed dwelling. Sample design uses 2004 Population and Housing Census frame. The population is stratified based on geographical location and socio-economic status within each governorate to form PSUs. Then, PSUs are selected in this first stage. In the second stage, random systematic sampling method is used to select households as final sampling units. All individuals within the final selected households are eligible for the JLMS 2010. Remote areas population (most of whom are nomads), in addition to collective dwellings such as hotels, hospitals, work camps, prisons and the like, are excluded. In the following, JLMS 2010 micro-data is used to describe patterns of marriage and fertility in Jordan.

4.1 Marriage

Age at first marriage may be seen as an indicator of socioeconomic status of individuals and households. Marriage age has consequences on maternal health, child health, and family stability especially in case of early marriage. JLMS 2010 includes 16,153 individuals who aged 15 year and above, of whom 94.9% are Jordanians and half of them are females. Non-Jordanian immigrants seem to be underestimated since the design excludes collective dwellings as mentioned earlier.

However, focus will be upon Jordanians. At the survey time, 40.2% of Jordanians are singles, 54.6% are married while the rest 5.2% are found divorced or widowed. 45.1% of singles are females while 55.9% are males. Marital status of Jordanians by age strip is shown in Table 2. Divorced and widowed individuals are grouped under one category named "previously married".

Table 2
Marital status of Jordanians by age (%)

Age strip (yr)	single	married	prev. married	Total	singles within strip
15-20	20.8	0.8	0.0	21.6	96.1
21-30	15.6	10.8	0.3	26.7	58.3
31-40	2.7	17.6	0.5	20.9	13.1
41-50	0.8	12.5	0.7	14.0	5.7
51-60	0.2	6.5	1.0	7.7	2.7
61-70	0.1	4.3	1.3	5.7	1.7
>70	0.0	2.0	1.4	3.4	0.8
Total	40.2	54.6	5.2	100	-

Source: Author's elaborations based on JLMS 2010.

Table 3
Average age at first marriage by governorate and gender (year)

Governorate	Male	Female		Male	Female
Amman	26.5	21.3			
Balqa	25.2	20.9			
Zarqa	25.7	21.1			
Madaba	26.8	21.9			
			Middle	26.1	21.3
Irbid	25.8	21.3			
Mafraq	25.9	20.9			
Jarash	24.7	20.2			
Ajloun	26.1	21.8			
			North	25.6	21.1
Karak	25.9	21.5			
Tafileh	24.7	21.0			
Ma'an	25.7	20.4			
Aqaba	26.3	20.6			
			South	25.6	20.9
Total Average				23.2	20.9

Source: Author's elaborations based on JLMS 2010.

The table shows that little more than two-thirds, 69.2% of the sample aged 15–40 year 1, while 9.1% exceed 60 year of age. The percentage of singles in the

age strip 15–30 year is 36.4%, while 2.7% are singles in (31–40) age strip. Since only 1.1% is singles when age exceeds 40 year, regressions are limited to individuals

aged 15-40 year. The last column of the table shows the percentage of singles within each age strip. Only 3.9% are married among individuals who aged 15–20 year (or equivalently 96.1% are singles). Percentage of singles among 15–40 year strip is 56.5%, whereas 3.7% singles when age exceeds 40 year.

Table 3 compares age at first marriage across governorates for males and females. In Jordan, the average age at first marriage is 23.2 year. This average equals 26 and 20.9 year for males and females respectively. With an average of 26.1 year, age at first marriage in the middle region is higher than north and south regions with 25.6 year for both. Male age at marriage in Madaba is the highest with 26.8 year. Jarash and Tafileh, on the other hand, have the minimum marriage age for males with 24.7 year. Female marriage age ranges from 20.2 year in Jarash to 21.9 year in Madaba. For other governorates rather than Amman, the average age at first marriage is lower among previously

married individuals than currently married counterparts for both males and females. This suggests rising marriage age among recent generations compared to earlier generations. It can also be seen as marriages at young ages are more likely to end by separation.

Table 4 shows age at first marriage by education attainment and wealth status for males and females. For males and females, age at first marriage increases as individual education attainment increases. For currently married males, age at first marriage is 28.5 year when education is university or higher, 27 year in case of post-secondary, while 24.9 year when illiterate. Similar patterns can be seen for currently married females where first marriage age is 24.4 year for university and higher category that decreases gradually with education reaching 19.6 year for illiterate females. These patterns did not change in case of previously married categories, where marriage age increases as education attainment increases.

Table 4
Age at first marriage by education and wealth, for males and females (year)

Variable	Category	Male		Female	
		currently married	prev. married (div./wid.)	currently married	prev. married (div./wid.)
Education	Illiterate	24.9	22.8	19.6	18.0
	Basic	25.2	27.2	19.6	20.6
	Secondary	26.5	23.1	21.5	21.8
	Post-Secondary	27.0	24.7	23.6	24.7
	University and higher	28.5	28.5	24.4	24.8
Wealth	poorest 20%	24.5	23.3	20.6	19.3
	second	25.4	24.1	21.0	18.2
	third	26.1	26.3	21.2	20.1
	fourth	26.3	28.8	21.1	18.7
	richest 20%	27.4	25.0	21.8	21.3

Source: Author’s elaborations based on JLMS 2010.

Wealth status is an indicator established based on individual ownership of assets. Average age at first

marriage is lower among the poorest. This is true for both males and females who are currently and previously

married. Monotone increase in marriage age can be seen among currently married males and females as wealth status increases. Marriage age among the poorest 20% males is 24.5 year that amounts 27.4 year among richest 20% counterparts. Marriage age equals 20.6 year among currently married poorest 20% females compared to 21.8

year among females belong to richest 20% strip. On the other hand, age at first marriage fluctuates across wealth status categories for previously married women. Except for previously married women, it is possible to say that poor Jordanians get married earlier than rich counterparts in general.

Table 5
Fertility rate by governorate, region, and birth and marriage cohort (birth per woman)

Governorate		Region		Fertility by birth and marriage period			
Fertility		Fertility					
governorate	births	region	births	birth cohort	age (yr)	births	
Amman	3.9	Middle	4.0	<=1950	68.2	6.5	
Balqa	4.4			1951-1960	53.4	6.5	
Zarqa	3.9			1961-1970	43.2	5.1	
Madaba	4.2			1971-1980	33.5	3.6	
Irbid	4.2	North	4.3	1981-1990	23.4	1.8	
Mafraq	4.4			1991-1995	16.6	0.5	
Jarash	5.1			marriage period			
Ajloun	4.4			1960-1969	65.5	8.2	
Karak	4.4	South	4.3	1970-1979	56.7	7.0	
Tafileh	4.9			1980-1989	47.1	5.6	
Ma'an	4.3			1990-1999	38.3	4.2	
Aqaba	3.6			2000-2010	29.7	1.8	

Source: Author's elaborations based on JLMS 2010.

4.2 Fertility

Childbearing is almost completely related to marriage in Jordan. For Jordanian woman who aged 15–60, the average number of births (fertility rate) equals 4.1 births per woman. Table 5 shows fertility rate in Jordan by governorate and region of residence, birth cohort, and marriage period. Aqaba has lowest fertility rate among Jordanian governorates with 3.6 birth per woman, whereas Jarash has the highest fertility rate of 5.1 birth per woman. Irbid has the highest fertility rate among the three largest governorates of Amman, Irbid, and Zarqa. The fertility rate in Irbid is 4.2 birth per

woman, while it equals 3.9 birth per woman in the other two governorates. Middle region has lowest fertility rate among the three regions of Jordan with 4.0 birth per woman compared to 4.3 birth per woman for both North and South.

Table 5 also shows fertility rate according to birth cohort and period of marriage. Both show monotone decrease in the number of births per woman that coincide with fertility decline in Jordan mentioned earlier using World Bank statistics. Women who are born until the year 1960 are considered to be out of childbearing age (15-49 year) while some of those born

between 1961-1970 may remain in the age of childbearing. However, fertility rate has declined from 6.5 births per woman who born until 1960 to 5.1 births per woman for women who born during the sixties. Period of marriage variable allows better comparison since the average woman age is either exceeds or close to upper bound of childbearing age for women who are married between 1960 and 1989. Fertility rate declines from 8.2 births for those who married during the sixties to 7.0 and 5.6 births per woman who married during the seventies and the eighties, respectively. That is a 1.2 drop in fertility rate during the seventies and further 1.4 drop in the eighties reflecting an accelerating rate of fertility decline. For last two categories, average woman age is within the range of childbearing age. This means that fertility rates are candidate to increase, in particular, for the last category (women who married during 2000-2010).

Table 6 shows fertility rate in Jordan by wealth status

and education attainment of individual. While fertility does not show significant variation across wealth status categories, it is higher among the poorest compared to more affluent groups. Fertility rate is approximately 4.0 births per woman across wealth status categories except the poorest strip where fertility rate equals 4.4 birth per woman. Education attainment seems to be a crucial determinant of fertility, where number of births per woman declines as education attainment of the woman increases. For example, fertility rate among illiterate women equals 6.8 births per woman that declines to 3.6 births for women with secondary education level whereas fertility further drops to 2.6 births for women with university education or higher. To sum up, fertility rate and age at first marriage tend to differ by governorate rather than region, by period of marriage, and strongly by education attainment. While age at marriage varies by wealth status of individual, fertility is less influenced by wealth.

Table 6
Fertility rate by wealth status and education attainment (birth per woman)

Fertility by wealth status		Fertility by Education	
Wealth strip	Births	Education level	Births
poorest 20%	4.4	Illiterate	6.8
second	4.0	Reads and writes	6.1
third	4.1	Basic	3.8
fourth	4.0	Secondary	3.6
richest 20%	4.1	Post-Secondary	3.7
		University and higher	2.6

Source: Author's elaborations on JLMS 2010.

5. The Statistical Methods

For Jordanians aged 15 to 40 year at the survey time, logit model and linear regression model are employed to link socioeconomic conditions of individuals and households to marriage and fertility outcomes (incidence

of marriage, age at first marriage, and number of births per woman). Logit model is used for incidence of marriage since the outcome is considered to be either married or single, whereas linear regression model is used for age at marriage and number of births per

woman. Socioeconomic conditions are proxied by individual education, education of parents, dowry (mahr), and wealth indicator that established based on individual ownership of assets. Controls for gender, region of residence, urban–rural, birth cohort or marriage cohort are introduced in the regressions in order to control for non-observable factors.

5.1 The Logit Model

Marriage status log odds ratio is regressed on three groups of variables; the first includes individual specific regressors, the second includes household indicators, and the third contains economic variables. The model can be written as:

$$\log \frac{\pi_i}{1 - \pi_i} = \alpha + \beta' X_i + \gamma' Z_i + \delta' E_i$$

Where, π_i is the probability that individual (i) is married at the survey time and $(1 - \pi_i)$ is the probability that the individual is single. X_i is a vector represents individual regressors (age, gender, education, and birth cohort). Z_i is a vector consists of household indicators (household size, parents, education, and place of residence).

Last set is the economic variables E_i include wealth status and dowry (mahr). β , γ and δ represent the effect on the log odds of a unit change in a covariate. In case of dummies, these parameters represent the effect of positive outcome of the dummy indicator (i.e. $D = 1$) with respect to negative outcome ($D = 0$) on the log marriage odds. However, marriage odds rather than log of marriage odds are reported in order to facilitate the interpretation of the regression parameters in terms of relative changes in marriage odds¹.

¹ Relative odds ratio (ROR) is the odds ratio of positive outcome divided by the odds ratio of the negative outcome,

$$ROR = \frac{\frac{\pi_i}{1 - \pi_i} (D = 1)}{\frac{\pi_i}{1 - \pi_i} (D = 0)}$$

5.2 The Linear Regression Model

The effects of socioeconomic status on age at marriage and on fertility are estimated according to:

$$Y_i = \alpha + \beta' X_i + \gamma' Z_i + \delta' E_i + u_i$$

Where, Y_i is the average age of individual i , while represents number of births in case of fertility; X_i , Z_i , and E_i are the same as before, and u_i is a regression error. The identical distribution assumption of the error term is relaxed and heteroscedasticity is allowed. Regression results are discussed in the next section.

6. Results

6.1 Incidence of Marriage

Table A in the appendices shows results of estimating logit models of marriage odds ratio [$P(\text{married}) = P(\text{single})$] for individuals between 15-40 year of age. Estimates are reported in exponential form in order to facilitate the interpretation of the parameters. In first column, individual and household characteristics are included in the regression. Wealth indicator is added in the second specification, while individual Birth cohort is introduced in the last specification in addition to regional controls. Age is included as quadratic polynomial to control for nonlinearities. Some regressors are re-centered, and thus, the constant term in first column represents marriage odds of a 25 year illiterate female living in a 6 member household with illiterate parents.

Marriage odds ratio is increasing with individual education attainment. For example, when education is university and higher the odds ratio is about 58% to 63% higher than illiterate individuals (the reference category). When individual education is post secondary marriage odds is almost 62% and 90% more than illiterate counterparts, while it is about 25% to 43% higher in case of secondary education. However, these differences are not statistically significant. When education is basic,

marriage odds is about 1.6 times higher than illiterate individuals and statistically significant at 90% level. Number of household members increases the household odds by 24.7% to 26.4% that is significant at 95%.

Changing behavior of father's education can be seen. While basic education of the father increases significantly the marriage odds by about 88% to 100%, higher level of education reduces the odds by roughly a quarter (25%) and this reduction is insignificant. Mother's education effect is similar to that of father for basic and university categories. When mother's education is basic, marriage odds significantly increases by 1.2 to 1.4 times. When university or higher, odds ratio is roughly half the odds when mother education is illiterate and statistically insignificant. Secondary education of the mother shows statistical insignificant positive effect on marriage odds ratio. Such results suggest that own individual education is more critical for marriage decision than parents' education.

While second, third, and fourth wealth strip individuals have higher marriage odds ratio, the richest 20% individuals have lower odds all compared to the poorest 20% individuals. Marriage odds of second strip is 5.5% to 9.2% but not statistically significant. Odds ratio of the third strip individuals is 1.2 to 1.3 times more than poorest individuals, while the fourth strip odds is 60% to 100% higher and significant at 95% level. Wealth indicator shows that individuals in the middle strips are more likely to get married than the poorest and the richest. Although not statistically significant, marriage odds ratio is higher for individuals born before 1990s than counterparts who are born after 1990. This suggests that marriage was less complicated decision and less costly two decades ago than it is recently.

Marriage odds ratio in urban regions does not show significant difference from rural regions, but odds ratio in north region is half the odds in the middle at 99% level. South region odds is about 20% less than the

middle but statistically insignificant.

6.2 Age at first Marriage

Table B in the appendices shows the effect on age at marriage of socioeconomic conditions. Basic education tends to reduce marriage age by 1.1 to 1.6 year compared to illiterate individuals, reflecting perhaps preference of a partner with some education over illiterate partner. While secondary education does not show significant effect, involvement in higher education defers marriage. At 99% significance level, intermediate (post-secondary) education raises the marriage age by some 1.5 to 2 years, while university or higher education postpone marriage by about 2.2 to 3 years.

Household size decreases marriage age by 0.2 to 0.6 year with each extra member that is 2.5 to 7 month. Father's education shows insignificant negative effect on marriage age. Mother's education, on the other hand, shows a 99% significant negative effect on age at marriage. For instance, university and higher education of the mother reduces marriage age by roughly 1 year to 1.3 year. Although modest in magnitude, dowry (mahr) has 99% significant positive effect on age at marriage. Wealth status shows negative but not statistically significant effect on marriage age. This effect changes its direction into positive after regional controls are added, but remain statistically insignificant. Father's education and wealth status show no significant influence on age at marriage. The strong significant negative effect of the mother's education on marriage age reflects mothers' preference toward sons' involvement in marriage, and more education of the mother means perhaps more powerful influence on sons' marriage decision. Clearly, effects of parents, education and wealth status on age at marriage need further in depth investigation.

Estimates of marriage cohort show that people tend to marry younger two decades ago than they do recently. For example, between 1985 and 1999, people tend to

marry 3.7 year younger than counterparts involve in marriage during 2001 – 2005 (the reference category). This difference reduces to 1.9 year for individuals married between 1991 and 1995. Age at marriage increases by about 5 months (0.4 year) during 2006 – 2010 compared to the reference category 2001 – 2005. Males marry about 4.5 year later than females whereas estimates show no significant differences in marriage age across regions, neither urban–rural place of residence.

6.3 Fertility

Effects of socioeconomic conditions on fertility are shown in Table C in the appendices. Fertility decreases with woman education where intermediate education, for example, reduces fertility by about 0.4 to 0.5 birth per woman. When woman education is university and higher, fertility is 0.6–0.66 lower than illiterate counterparts. Parents' education again shows no significant effect on fertility, suggesting that woman's own education has more influence on her fertility than parents' education. Household size has positive impact on fertility by about 0.48 to 0.59 birth per woman. Dowry shows modest negative impact on fertility that is turned to be insignificant after regional controls are introduced. Wealth status significantly affects fertility at 99% level. For instance, richest 20% individuals tend to produce about 0.31 births less compared to the poorest.

Monotone decreases in fertility can be seen by period of marriage. Those who married during (1985 –1990) time period tend to have about 1.9 birth higher than counterparts married during (2001 – 2005). Decreases in fertility continue for the next marriage cohort of 1991–1995 with only 1.24 birth more than the reference category. Women married between (2006-2010) have about 0.71 less number of births compared to counterparts married between 2001-2005. Again place of residence shows no significant disparities in fertility across regions or urban–rural areas.

7. Conclusion

This paper examines the effects on marriage and fertility of socioeconomic conditions of individuals and households. Average age at first marriage equals 23.2 year that equals 26 for males and 20.9 for females. Age at first marriage is higher among educated individuals with 28.5 for university or higher males compared to 24.4 year when illiterate. Marriage age is 24.4 year for females with university or higher education compared to 19.6 year when females are illiterate. Fertility rate among Jordanian women who aged 15-60 year is 4.1 birth per woman. Education tends to be the crucial factor for fertility with 2.6 birth per woman when education attainment is university or higher against 6.8 birth per woman when women are illiterate.

Regressions are limited to individuals who are 15 – 40 year of age at the survey time. Main conclusions can be summarized as follows. Socioeconomic conditions of individual and household do matter for marriage and fertility. Individual own education is more critical for marriage decision and fertility choices than parents education. Patterns of marriage reflect preference for partners with some education over illiterates, while involvement in university and higher education postpones marriage by 2.5 to 3 years. Moreover, individuals in larger households are more likely to marry younger and to produce more children.

People tend to get married younger and have more children two decades ago than they do recently. While individuals in the second, third, and fourth wealthier strips are more likely to get married earlier than the poorest and the richest, fertility declines as wealth increases. No evidence on regional differences in marriage decision and fertility choices. However, age at marriage and fertility may differ across governorates rather than regions, and males tend to marry older than females by about 4.5 years. Finally, further investigation is necessary to explore the role of parents education and cost of marriage on marriage decision and fertility

choices. These findings may help policy makers and fertility in Jordan. targeting main factors that affect patterns of marriage

Appendices

Table A: Relative marriage odds ratio [P (married)/P (single)]

	Individual & household	wealth	place of residence
<u>Education – ref. cat. (illiterate)</u>			
read & write	1.196	1.168	1.158
basic	2.838**	2.629*	2.594*
secondary	1.427	1.250	1.254
intermediate (post secondary)	1.897	1.623	1.658
university & higher	1.594	1.577	1.626
number of household members	1.232**	1.247**	1.264**
<u>Father education–ref.cat. (illiterate)</u>			
basic	1.887**	1.885**	2.007***
secondary	0.773	0.795	0.758
university & higher	0.720	0.743	0.736
<u>Mother education–ref.cat. (illiterate)</u>			
basic	2.432***	2.303***	2.233***
secondary	1.168	1.169	1.145
university & higher	0.492	0.546	0.482
<u>Wealth – ref. cat. (poorest 20%)</u>			
second 20%		1.092	1.055
third 20%		2.306***	2.266**
fourth 20%		2.035**	1.958**
richest 20%		0.767	0.667
<u>Birth Cohort–ref. cat. (1991 – 1995)</u>			
<= 1975			1.567
1976 – 1980			2.767
1981 – 1985			3.067
1986 – 1990			1.747
cons.	8.059***	5.183***	4.623**
age	Yes	yes	Yes
gender	Yes	yes	Yes
region	No	No	Yes
urban/rural	No	No	Yes
N	4410	4410	4410
LR chi2	291.491	290.155	307.514
Pseudo R2	0.2529	0.2677	0.2778

Table B: Age at first marriage regression (year)

	Individual & household	Economic factors	Marriage cohort
<u>Education – ref. cat. (illiterate)</u>			
read & write	0.139	0.248	0.451
basic	-1.076***	-1.144**	-1.586***
secondary	0.130	0.168	-0.165
intermediate (post secondary)	1.735***	2.016***	1.557***
university & higher	2.482***	2.998***	2.247***
number of household members	-0.615***	-0.444***	-0.161***
<u>Father education – ref. cat. (illiterate)</u>			
basic	-0.218	-0.291	-0.387**
secondary	-0.247	-0.100	-0.318
university & higher	-0.331	-0.339	-0.444
<u>Mother education – ref.cat.(illiterate)</u>			
basic	-0.545***	-0.351**	-0.532***
secondary	-1.115***	-1.314***	-1.664***
university & higher	-1.301***	-0.958***	-1.137***
dowry (mahr)		0.079***	0.056***
<u>Wealth – ref. cat. (Poorest 20%)</u>			
second 20%		-0.035	0.196
third 20%		0.008	0.294
fourth 20%		-0.456*	0.102
richest 20%		-0.495*	0.243
<u>Marriage Cohort–ref. cat. (2001 – 2005)</u>			
1985 – 1990			-3.708***
1991 – 1995			-1.939***
1996 – 2000			-0.964***
2006 – 2010			0.386
cons.	20.923***	21.046***	22.43***
gender	Yes	yes	Yes
region	No	No	Yes
urban/rural	No	No	Yes
N	4291	2572	2572
R2	0.441	0.258	0.318
RMSE	3.332	3.273	3.142
F	172.710	49.164	56.012

Table C: Fertility regression

	Individual & household	Economic factors	Marriage cohort
<u>Education – ref. cat. (illiterate)</u>			
read & write	-0.075	-0.047	-0.059
basic	-0.229	-0.184	-0.271*
secondary	-0.341**	-0.288*	-0.281*
intermediate (post secondary)	-0.500***	-0.443**	-0.241
university & higher	-0.657***	-0.585***	-0.264
number of household members	0.587***	0.585***	0.482***
<u>Father education–ref. cat. (illiterate)</u>			
basic	0.021	0.025	0.012
secondary	0.016	0.014	0.034
university & higher	0.041	0.036	0.000
<u>Mother education–ref. cat.(illiterate)</u>			
basic	-0.018	-0.010	-0.017
secondary	-0.008	0.007	-0.049
university & higher	-0.065	-0.067	-0.106
dowry (mahr)		-0.012***	0.002
<u>Wealth – ref. cat. (Poorest 20%)</u>			
second 20%		-0.169**	-0.236***
third 20%		-0.121	-0.166**
fourth 20%		-0.038	-0.174***
richest 20%		-0.128	-0.312***
<u>Marriage Cohort–ref.cat. (20012005)</u>			
1985 – 1990			1.892***
1991 – 1995			1.242***
1996 – 2000			0.554***
2006 – 2010			-0.709***
cons.	3.280***	3.320***	3.493***
age	Yes	yes	Yes
region	No	No	Yes
urban/rural	No	No	Yes
N	2571	2571	2571
R2	0.734	0.736	0.784
RMSE	0.998	0.996	0.902
F	356.293	270.101	318.395

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الحالة الاجتماعية الاقتصادية: أنماط الزواج وخيارات الخصوبة في الأردن

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ملخص

تهدف هذه الدراسة إلى البحث في أثر الظروف الاجتماعية والاقتصادية للفرد والأسرة وخاصة مستوى تعليم الفرد، تعليم الأبوين، الثروة، والمهر على قرار الزواج وخيارات الإنجاب في الأردن. تم تحليل بيانات مقطعية من مسح سوق العمل الأردني 2010 ويمكن تلخيص أبرز النتائج فيما يأتي. تعليم الفرد أكثر أهمية من تعليم الأبوين فيما يتعلق بقرار الزواج والإنجاب. تعكس أنماط الزواج نوعاً من التفضيل لفائدة الزواج بشخص حاصل على نوع من التعليم على غير المتعلمين، بينما يؤدي الانخراط في التعليم الجامعي إلى تأخير الزواج من 2.5 إلى 3 سنوات. تظهر الدراسة ميل الناس للزواج أصغر وإنجاب عدد أكبر من الأبناء قبل عقدين من الزمان عما هم عليه الآن. الأفراد في الشرائح الثانية والثالثة والرابعة في سلم الثروة يتزوجون في سن أصغر من نظرائهم في الشريحة الأشد فقراً والأكثر غنى. لا يوجد دليل إحصائي على الفوارق بين مناطق الشمال والوسط والجنوب فيما يتعلق بالزواج والإنجاب، إذ تختلف هذه الخيارات على ما يبدو عبر المحافظات وليس المناطق. تشير الدراسة إلا أن الأفراد في الأسر الأكبر حجماً هم أكثر ميلاً للزواج في سن أصغر وإنجاب عدد أكبر من الأبناء. وتوصي الدراسة بأنه لا بد من الإشارة إلى الحاجة إلى مزيد من البحث والدراسة لمعرفة المزيد عن تأثير تعليم الأبوين على قرار أبنائهم بخصوص الزواج وخيارات الإنجاب.

الكلمات الدالة: الحالة الاجتماعية – الاقتصادية، والزواج، والخصوبة، ومسح سوق العمل الأردني 2010، والأردن.

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