**Child Gender and Men’s Labor Market Outcomes in Dotal Societies**

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**Abstract**

American and German men work more hours and have higher wage rates if they have sons versus daughters. Son preference, higher return to sons’ human capital, providing a masculine role model for sons, and higher costs of raising sons are hypothesized to explain this behavior, among them gender bias has been supported by other empirical studies. In this paper, we first show that Iranian men work longer and earn more when they have children. However, contrary to the existing literature, we find that Iranian men’s income increases if they have daughters versus sons. We argue that the institution of marriage in Iran that imposes the burden of dowry provision on brides’ families is the source of such unconventional behavior in Iranian men, although, we do not rule out the presence of gender bias in Iran. In our analyses, we use a panel survey and run fixed-effect models to remove possible heterogeneity biases, i.e. the possibility that the men who are genetically more likely to have daughters may be different than the men who are genetically more likely to have sons so that this unobserved time-invariant characteristics influences their labor market outcomes. To test our dowry hypothesis, in addition to providing evidence of the immense size of dowry-related expenditures in compare to households’ other expenditures, we estimate age-specific son and daughter effects and show that the daughter-versus-son differential effects on men’s income get bigger and more statistically significant when daughter(s) get closer to marriage age. This finding does not dismiss the existence of gender bias in Iran, but for the first time in the related literature documents the strength of social institutions in shaping men’s labor market responses to the gender of their children.

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*Keywords:* child gender, labor market activities, dowry, Iran.

**1. Introduction**

The effects of motherhood on women’s labor market outcomes have attracted the attention of many scholars for a long time, but the effects of fatherhood on men’s labor market outcomes have just recently been added to the research agenda. Less common are the studies of children’s gender on fathers’ labor market outcomes. The existing literature strives to answer two main questions: First, do men work more or less if they have a son versus a daughter? Second, what are the motives behind the way fathers react to having a son or a daughter? The related literature, which has been focusing mostly on the developed countries, has consistently provided a unique answer to the first question: fathers’ hours of work and wages increase if they have a son (see for example Rose, 2002 and Choi et al. 2005). The answer to the second question, however, is not conclusive.

Our purpose is to evaluate the impact of having sons versus daughters on labor market outcomes of men in a developing country, Iran, where the institutions of marriage, parenthood, and job market structures are substantially different from those in the developed countries. We initially measure the effects of having children on men’s hours of work and income, and find that one more child elevates the men’s hours of work by an average of 105 hours per year, almost three times larger than what was found for American men (Lundberg and Rose, 2002).

We then proceed to investigate the effects of having a son versus a daughter on men’s income. We find that, contrary to the existing literature, men who have daughter(s) have a higher income than men whom have son(s). We argue that the institution of marriage, particularly the heavy financial burden of dowry, explains this finding.[[3]](#footnote-3) Two other findings support our explanation. First, the effects of having daughter(s) become stronger and more significant as the daughters approach the age of marriage, whereas this cannot be seen for son(s). Second, the effect of having daughter(s) is stronger, more significant, and kicks off earlier in rural areas where traditions are stronger and girls’ options outside marriage are more limited.

This paper contributes substantially to the different aspects of the existing literature. Firstly, this paper sheds new light on the relationship between parenthood and job market outcomes, by showing that having a daughter is a significantly more important factor towards shaping a man’s income compared to having a son. To the best of our knowledge, this is the first study that shows daughter benefit fathers to be more active in the labor market.

Secondly, this is the first study exploring the explanations behind the differential effects of daughters versus sons on men’s labor market outcomes. Furthermore, it puts emphasis on how vital it is to hypothesize about the motives behind men’s partial labor market behavior in the same context. In other words, the motives behind other aspects of men’s behavior such as tendency to marriage or predisposition to divorce in response to children’s gender may not necessarily act in the same way for labor market outcomes. Thus, the concluded explanations for the partial behavior of men in response to children’s gender in such studies may not apply to men’s labor market activities automatically.

Thirdly, as a result of our particular specifications to explain men’s partial behavior in response to their children’s gender, we offer a novel explanation for our unconventional finding by showing that society’s institutional arrangements remarkably affects men’s decisions and behavior in the job market. In this sense, our study is also the first study that empirically measures the role of social institutions in forming men’s labor market reactions to children’s gender.

Finally, our use of data and the estimation methods greatly increase the validity of our findings. We use a panel survey of households in Iran’s rural and urban areas, and implement fixed-effect estimates that enable us to control for all of time-invariant unobservable variables that affect men’s labor market outcomes and their decision on marriage and parenthood.

The next section provides a review of major findings in the existing literature and discusses the theoretical background for these findings. Section 3 introduces the data and outlines the empirical specifications and econometrics methods. Section 4 presents the main findings of our analyses, and section 5 concludes.

**2. Theory and Evidence**

Although the effects of marriage and parenthood on women’s labor supply have extensively been studied by economists, the channels and the aspects of the impact of parenthood on men’s labor market outcomes have been less studied. Among the traits of the impact, children’s gender is especially a curious case because of the importance of the implications of its underlying motives. In this regard, two questions are intertwined: (1) do men work more if they have sons versus daughters or vice versa? (2) If yes, what are the motives behind this partial behavior? Suppose that men willingly work more when they have sons relative to when they have daughters because of preferring sons to daughters. Existence of the gender bias reflected in the labor market, can then be indicative of unequal parental treatments of sons and daughters in terms of education, health, or other family provisions. Son preference can also influence marital status, family living arrangements, and fertility decisions. The latter may lead to gender selection which have crucial social and economic consequences especially when it is aligned with the rapid advancement of technologies that help parents realize and even select a child’s gender at pregnancy.

In effect, merely few papers study men’s labor market responses to children’s gender. The papers, however, focus only on the first question. The principal finding is that men’s labor market activities intensify after the birth of sons relative to daughters. Lundberg and Rose (2002), for example, use a panel data set that covers the time period of 1968 to 1992 and show that the raise in the wage of American mens who are born before 1950 is about 3% more for each son relative to each daughter. They also document that all fathers, regardless of their cohorts, work about 53 more hours per year if they have at least one son than at least one daughter. Furthermore, they show that American men work about 69 more hours per year if their first child is a son rather than a daughter. In a similar study, Choi et al. (2005) employ a panel data from 1984 to 2001 and illustrate a similar behavior in Germany. More specifically, they show that German fathers work about 100 more hours per year if their first child is a son versus a daughter. Nonetheless, they see no effect on the men’s earning in response to their children’s gender.

While interpreting some of their results as signs of possible existence of gender bias, neither Lundberg and Rose (2002) nor Choi et al. (2005) attempt to dig into the reasons of the documented behavior. The reasons can probably be found in the researches that do not worry about labor market outcomes. In the following, some of such researches are reviewed. However, one should always be careful in using the explanations of men’s partial behavior in other contexts for labor market outcomes.

Dahl and Moretti (2008) use 1960 to 2000 US Censuses and explore the roots of differences in family structures as they can be attributed to children’s gender, and identify American men’s strong bias toward sons. More precisely, searching for the causes of children living without father, they dig into the channels through which children’s gender affect living with a father. In this line, they find that the probability that mothers never marry increases if their first child is a daughter. If married, the probability that mothers get divorced increases if their first children are daughters. If divorced, the probability that mothers get custody of the first child increases if the first child is a daughter. Besides Dahl and Moretti (2008), numerous studies show that men like sons more than daughters. Morgan et al. (1988) and Mott (1994) indicates that the odds of the endurance of a marriage significantly increase with the birth of a son rather than a daughter. This finding is in line with the results of Teachman and Schollaert (1989) who document that the likelihood of having a second child increases if the first child is a son versus a daughter

Apart from preference-based explanations, there are, at least theoretically, other ways to explain parents’ responses to their children’s gender. One alternative explanation is engrained in the differed return to human capital of sons versus daughters from parents’ point of view. If return of investing in sons’ human capital in the form of health, education, or training is more than that for daughters, then it is expected that parents that have sons work relatively more hours to finance such investments. In the United States, there is insufficient evidence in favor of the return to human capital hypothesis. For example, Taubman (1990) and Lundberg and Rose (2003) both find no evidence that parents having sons spend more on their education, health, or any other human capital-related item compared to the parents having daughters.

A different explanation accounts for parents’ expectation of old-age care. Based on the belief that daughters are more likely to care for their elder parents, it can be hypothesized that parents pay more attention and invest more resources on their daughters relative to sons. Empirical analyses do not support this hypothesis either. McGarry (1998) illustrates that only men whom have sister(s) are less likely to care for elderly parents in the Unites States. Even more notably are the cares of women with only female siblings providing to their elderly parents, they are not significantly different compared to the care men with only male siblings providing to their elderly parents. In addition, if the elder-age support is the key in parents’ decision on how they provide for their children, then it would be expected that both fathers and mothers work excessive hours and have higher labor market outcomes when having daughters versus sons. However, Lundberg and Rose (2002) demonstrate that women’s labor market outcomes are irresponsive to children’s gender.

Demonstration effect is another explanation of the contrasted responses of men to sons and daughters. In this framework, in order to create a traditional role model for sons, fathers work more hours and express more responsibility towards their families. It is hard to bring empirical evidence for or against demonstration hypothesis due to the difficulties of collecting the suitable data.

Finally, costs of raising sons versus daughters can also justify the differential effects of parents’ labor market outcomes. While there is no evidence of differed expenditures of households for a daughter versus a son in the United States,[[4]](#footnote-4) in other societies, social institutions may establish that sons or daughters are more expensive to raise. This is especially the case in the communities in which dowry and brideprice are still crucial in forming marital unions. Dowry, in practice, is any type of transfer such as money, property, or commodity that a bride brings into marriage, which is usually provided by her parents. Dowry, is most common in South Asia, it is the opposite of brideprice which is common in sub-Saharan and Western Africa.[[5]](#footnote-5) Brideprice is a transfer from the grooms’ families to the brides’ families. The standard economic model of dowry, inspired by the seminal study of Becker (1981) on family economics, considers the marriage transfers, i.e. dowry and brideprice, as market clearing tools so that dowry would exist if grooms were scarce and brideprice would exist if brides were scarce.[[6]](#footnote-6) The standard model advanced to incorporate different observations from different contexts. For example, Botticini and Siow (2003) treat dowry as an intrafamily incentive problem and claim that dowry and bequest are used by altruistic parents in order to alleviate a free-riding problem among siblings. In another case, Brown (2009) develops an empirical model to relate dowry to women’s intra household bargaining power and welfare in rural China.

Regardless of the roles and functions of dowry and brideprice, it is apparent that they are massive burdens to brides’ and grooms’ families, respectively. In the societies in which dowry-giving or dotal marriages are common, parents whom have daughters are therefore expecting an inevitable outlay of money around the time of their daughter’s marriage. This, in turn, requires preparations in different form of saving or purchases ahead of the time. Successively, men need to elevate their labor market activities to finance the associated costs.

In practice, any empirical analysis that estimates the impact of children’s gender on men’s labor market activities measures the resultant or net effect of all of the factors that are in practice. Suppose that men (1) prefer sons to daughters; (2) impute greater return to sons’ human capital; (3) expect more old-age care from daughters; (4) intend to act as a role model to their sons; and (5) find daughters more costly because of their marriages-related expenditures. The first, second, and forth factors are expected to increase the labor market activities of men who have sons compared to those who have daughters; while the third and fifth factors induce an opposite behavior. Arguably, the most influential factors among the set of motives are preference and dowry costs, which provoke opposite behaviors in men’s labor market activities. Thus, in the context of a dotal society such as Iran, which is typically a less developed society with strong biases against daughters, a positive estimate of the impact of daughters on men’s income can be interpreted as the relative dominance of dowry effect over preference effect. Such an effect should then be taken only as a lower bond for the effect of the burden of dowry provision on families in dotal societies.

**3. Data and Econometrics Models**

**3.1. Data**

We use the Survey of Households Socio-Economic Characteristics (SHSEC) which is a 4-year panel spanning from 1992 to 1995. The raw sample comprises 5090 households in 1992. With retention rate of about 72% in four-year period, 3662 households are remained in the survey in 1995. The four-year panel consisted of 16978 households, from which 10214 lived in urban areas and the rest lived in rural areas. The urbanization ratio was 57.8 in 1992 and 60.4 in 1995 which shows that the sample is representative of the population in urban and rural areas where we expect most variations.

The survey records indicate one member in each household as the head of the household and assign a code to the designated head. This person is usually a male whom is the owner of the house, the father of children, and whose income is the main source of the income for the household. We call this person the male head of the household, and the person whom is recorded in survey as spouse is the female head of the household. All other members of the household are coded in relation to the head of the household. This enables us to identify if a person is the offspring of the head of the household, his/her other relatives, or non-relative. When the male head is not present, often the female head of the household whom is usually the mother of the children is assigned to be the head of the household. Even if a female is coded as the head of the household, we considered the male head of the household as our observation. We limited our analyses to the households in which both male and female heads of the households were present. Furthermore, we dropped any observation with missing data on gender of the male and female head of the household. This brings down the number of the observations to 14,970.

Weekly hours of work, calculated by multiplying the daily hours of work by weekly work days, real annual work income and real annual total income of the male head of the household are the dependent variables of interest. Work income is earned from salaried self-employed jobs while total income includes both work and non-work sources of income. Non-work sources of income are reported as rent, interest, insurance, pension, public transfer payments, private transfer payments, and selling household-made handcrafts. All income values were deflated to 1992 Rials using the consumer price index. The survey reports a zero for the income from work for some employees and negative values for some self-employed workers. We eliminate these observations by using the log of real income.

The survey also reports daily work hours, days of work per week for the first job, and daily work hours in the second job. Using this information and combining it with income variables described above, we generated a vast range of labor market outcome variables, including weekly work hours in the first job, total daily work hour in the first and second job, hourly wage and income.

The surveys contain a vast array of the individual and household level characteristics. Age, gender, and education are the main variables we use in our analysis for which, fortunately, the missing values in these observations are rare. We combined two variables, if the person is literate or illiterate and their education level, to generate a set of dummy variables for education. The dummy variables represent the categories associated with illiterate, primary school, middle school, high school, university education, religious education, and informal education.

The above variables are available for the female head of the household and other members of the household. All labor market outcome variables are available for every working member of the household.

We use a variety of household level variables such as home ownership, annual food and non-food expenditures, monthly rent or the rent equivalent of household’s dwelling, and car ownership to proxy the wealth. Monthly rent equivalent is used if the dwelling is owned by the household, and it is set to be zero if it rented. Because of the lack of well-functioning mortgage market, the value of household’s dwelling can be considered as the main property owned by the household, and because of the limited capital market, the property is the major wealth of the most households. As a result, rental value of household’s dwelling is highly correlated with household’s wealth in Iran.

Table 1 reports means and standard deviations for the main variables we used in this study. The data on number of children in different groups perfectly matched with the regional population structure, population trends, and marriage age. The number of boys in all age groups are more than the number of girls, which reflects the natural gender ratio. The differences become larger for the groups of girls over 20, because girls get married and leave the family sooner than sons do. The number of boys and girls in the age group of 15-19 outnumbers that in all other age groups. This reflects the extremely high population growth of 1976-86 with an average annual rate of 3.9 percent. The population growth slowed down after 1986, which is evident in lower number of boys and girls in the two youngest groups. Expectedly, households in rural areas have more children than households in urban areas. This difference exists in all ages except for boys and girls of 25 or older, which reflects the lower marriage age for boys and girls in rural areas. These facts make us exclude all households with children 25 or older form our analysis.

 **3.2. Econometrics Models**

We estimate two sets of equations. In the first set of equations, we test two specifications in order to estimate the effects of having children on father’s labor market outcomes; namely, his weekly work hours and logarithm of his income. The specifications are:





Where the subscript *i* represents the individual/father and *t* represents time. *Y* is father’s labor market outcome, *DCHILD* is the dummy variable for having children, *DCHILDNUM* is a set of dummy variables for having one, two, three, four, and more than four children, *DAGE* is a set of dummy variables for father’s each year of age, *DECU* is a set of dummy variables for father’s each education category, and *WEALTH* is the variable that proxies household’s wealth.

The labor market outcomes, *Y*, we used in this study were weekly hours of work, for the effect of children on men’s work effort, and total income of the male head of the household. We calculated and examined several frequently used variables such as hourly wage, annual salary, and income from self-employed activities, and we used them as alternative labor market outcome in our analyses. As expected from the types of work contracts in Iran, none provide significant and meaningful results. The labor market contracts in Iran are not on hourly bases. In fact, hours of work plays a minimal, if any, role in contracts. Most of them are monthly and some are very short-term, even daily. Monthly contracts and most of the daily contracts normally contain a fixed hours of work, 8:00AM to 4:00PM for instance. Even if the work can be done in a shorter time period, the contracts are made based on regular hours. In other words, there are no direct relationship between hours of work and the income in Iran’s labor market. Furthermore, the monthly or annual salaries are very vague representatives of the income that one can get from his or her work. Similar to other developing countries, in Iran, several factual and measurement qualifications dilute the validity of wages and salaries as a reliable labor market outcome. Incomes unrelated to contracts and incomes from other jobs along with the first job are very common. All these concerns make total income the best candidate for measuring the labor market outcome.[[7]](#footnote-7)

We estimate both OLS and individual level fixed-effect models. OLS models suffer from substantial heterogeneity bias. This proves that unobservable factors that determine a man’s decision to have children affect his labor market outcomes. Fixed-effect models resolve these problems by accounting for these unobservable factors.

The second set of equations represents the effect of having daughters versus sons on total income. The specifications are:





Where *BOYGIRL* is a set of two variables; number of boys and number of girls, and *BOYGIRLAGE* is a set of ten variables; number of boys and number of girls in each of the age groups of zero to four, five to nine, ten to fourteen, fifteen to nineteen, and twenty to twenty four years old. Both specifications in (3) and (4) are individual level fixed-effect models.

The main identification assumption in specifications (3) and (4) is randomness of gender of children. There are two concerns about the randomness of offsprings’ gender: heterogeneity bias and selective abortion or gender selection. Heterogeneity bias, which implies men who are genetically more probable to have girls may act differently in the labor market than the men who are genetically more probable to have boys, is resolved by using panel data that allows for controlling time invariant factor.

The randomness of having boys versus girls is an essential assumption and requires more attention. If child’s gender is random, the model mimics a natural experiment: parents are assigned randomly to boys and girls. Conversely, if parents can self-select themselves into having sons or daughters, the assumption of natural experiment will not hold, and the results are not valid. In Appendix B, we show that neither at birth, nor at different ages in the whole population, nor in Household Budget Surveys in different years is there any evidence of such a selection.

**4. Results and discussion**

**4.1. The Effects of Children on Fathers’ Labor Market Outcomes**

We start our analyses with investigating the effect of parenthood on labor market outcomes. Table 2 presents the results of estimating equations (1) and (2) with father’s weekly work hours as dependent variable. Columns (1) and (2) contain the OLS estimates, and columns (3) and (4) present fixed effect estimates. Column (1) and (3) present the basic models with any number of children, whereas, columns (2) and (4) contain the nonlinear specifications by using dummy variables for one, two, three, four, and more than four children. In all these models, we use dummy variables for father’s age and education as control variables. Moreover, we use the rental values of households owned dwelling to control for household’s wealth.

We have provided the OLS estimates in order to present the basic results. The basic OLS results indicate that having children is associated with more work hours. The effect is significant with both using any number of children as regressor and using dummy variables for different numbers of children. Furthermore, the effect becomes stronger and more significant with more children. The fixed-effect models show that the results hold even after controlling for individual level unobservables. These models indicate that men with children work about two hours more than men without children per week, which is equivalent to 105 hours per year. This effect varies depending upon the number of children. The first child has a significant effect and adds two hours and 15 minutes of weakly work, equivalent to 114 hours per year. The second and the third child have a smaller and less significant effect, but the effect becomes larger and more significant after the third child. A man with more than four children works approximately three and a half hours per week, or 181 hour per year, more than a man with four children or less.

Table 3 presents the results of estimating equations (1) and (2) with logarithm of father’s total income as dependent variable. The results reported in Table 3 suggest that the effects of children on father’s total income are similar to that on father’s weekly work hours. The OLS estimate in column (1) shows that men with children earn approximately 18 percent more than men with no children. Most of these differences can be attributed to unobservable factors so that the fixed-effect estimates presented in column (3) shows only about 3 percent of these differences can be granted to the child effect.

The effect of more children on income follows the same trend as the effect on work hours. Having more children relates to a higher income. The largest and most significant effects belong to the effects of more than four children. Our analysis shows that men with more than four children earn about 29 percent more compared to men with four children or less. Even after controlling for unobservables via the fixed-effect model, the effect remains high, approximately 13 percent, and significant.

Our findings that numerous children in a household are associated with higher labor market activities by men is in contrast with the existing literature. Lundberg and Rose (2002) reported that men with more than four children worked and earned significantly less than men with less children. The increase in work hours and income by having multiple children can be attributed to dependency of children to their parents even at their older age. This dependency, as we discuss in the next section, is the result of the institution of marriage in Iran. Parents have to financially support their children, not only when they are young but also when they intent to marry. Apparently, this effect strengthens if the family has more children, which is associated with having older children who are about the age of marriage. To manage the heavy financial burden of children’s marriage, parents work harder and longer when they have multiple children. We explore this further in next section.

Tables 2 and 3 also illustrate the effect of heterogeneity. OLS coefficients in Table 2 are smaller than fixed-effect coefficients, indicating a negative selection effect. Unobservable variables that affect hours of work are negatively associated with having more children. In other words, men with lower level of unobservable variables that affect labor hours, are more likely to have more children. The effects of the unobservable factors on income are opposite to the same on work hours. Table 3 shows that controlling for time invariant unobservable factors significantly reduces the estimated coefficients, and, in most cases, reduces the significance level. This indicates that the unobservable factors that affect men’s income are positively correlated with having more children.

**4.2. The Effects of Children’s Gender on Fathers’ Labor Market Outcomes**

Table 4 presents the main finding of this study. That is, the effect of children’s gender on male household head’s or father’s labor market outcomes. Column (1) presents the effect of boys and girls on father’s total income and column (2) presents the effect of number of children in different age groups on it. Both models are the results of fixed-effect regressions with logarithm of father’s real total income as dependent variable. The sources of total income are salaried jobs, self-employment jobs, and all other non-work sources such as rent, interest, and transfers. We use multiple dummy variables to control for father’s age and education. We also use rental value of household owned dwelling to control for household’s wealth. Moreover, we apply four restrictions. Since we intended to compare the effects of sons versus daughters, first we dropped households without children. Second, we dropped any observation in which married children lived within the households. Our theory suggests that the financial burden of marriage and dowry creates the observed differences in workers’ behavior in job market. Parents who keep their married children in household and share part of their belongings with them may have different incentive than other parents. Among the remained observations, we only kept the households with no members other than parents and children present. Having grandparents, brothers, sisters, and other members in a household may result in sharing parts of the household’s financial burden with them and distorts our analyses. Finally, we excluded the households with children above the age of 25 from our analyses. The average ages of the first marriage for boys and girls in 1991, one year before the first round of the SHSEC, were 24.4 and 20.9, respectively. These averages rose to 25.6 and 22.4 in 1996, one year after the last period of the SHSEC.[[8]](#footnote-8) These numbers suggest that most families expected their children to marry around the age of 25. Thus, they would have prepared for the financial necessities of their marriage before they reach this age. Unmarried children above this age might also enter the job market, and ease part of the financial burden of their parents. In addition, the probability of remaining unmarried increases after the late 20s and the lemon effect may dominate other factors. All these considerations suggest that having children of older ages distorts the results of our analyses.

The results in Table 4 show that men who have girls work harder and bring more income than men who have boys. One more girl in a household has a statistically significant and positive effect on father’s total income. The average differential effect of having a girl versus a boy, which is also statistically significant, is about 3.3 percent. More importantly, the results show that girl’s age is an essential factor in determining the effect of offspring on father’s total income. In effect, the effects of having older girls are stronger and more significant than the effects of younger girls. For instance, having girl(s) in the age range of zero to 4 does not have a significant effect on father’s total income. However, having 5 years or older girl(s) has an increasingly greater and more significant effect on father’s income. To be more specific, having a 5 to 9 year old girl(s) adds about 3.8 percent to father’s total income while having a 20 to 24 years old girl(s) adds more than 9.5 percent to father’s income. The effects of having boys in none of the age groups are significant. Additionally, the tests indicate that the coefficients for girls are significantly greater than for boys and the differences become wider and stronger with age.

These findings are unprecedented in the literature. Both existing theories and empirical analyses on data from other countries indicate that having sons requires fathers have more income and/or work harder than having daughters. Obviously, none of the existing theories fit into the finding of our research. Age-specific findings further confirm our previous suggestion that the institution of marriage is essential in shaping fathers’ economic activities, as a person whom dominantly constitute households’ heads. The fact that the effects of having daughters become stronger and more significant with age supports our proposition. This is in line with the observation that the process of gathering dowry starts years before a daughter reaches the age of marriage, and completes when she is old enough to get married.

Our study, in fact, is the first study that empirically measures the strength and importance of institutions and traditions in shaping men’s labor market outcomes in response to their children’s gender. Given the undeniable biases of men toward sons in the traditional societies of developing countries, which affect in the opposite direction, all the measured dowry effects should be considered as the lower bounds.

If this theory is correct, we should expect a stronger effect in areas where the tradition of dowry is more crucial in social and economic lives, i.e. in rural areas. This provides a further test of our dowry effect hypothesis. Table 5 shows the same analysis of model (2) in Table 4 for urban and rural areas separately. According to results in Table 5, the overall trends of having older daughters are associated with more total income exists in both urban and rural areas, but the effect in rural areas are stronger and more significant. In urban areas, only the last age cohort of daughters have a t-statistics more than one, but in rural areas, all age cohorts, except the youngest, generate significant results.

More importantly, the effects of having daughter(s) on father’s income appear earlier in terms of daughters’ age groups in rural areas. The effects of daughters on father’s income become stronger with the age of daughters in urban areas, but not in rural areas. In rural areas, the effects are strong and significant even when daughters are as young as five to nine year old, even though the average marriage age for girls in rural areas were only slightly less than that of urban areas in early 1990s where the survey was executed.

The mechanism of the effect of dowry can be hypothesized. For example, about 20 years ago when the surveys were performed, Iranian girls were not normally expected neither enabled to enter the job market and have the income of their own as sons were. Perhaps, one effective way to guarantee a safe future for daughters was to offer a generous dowry that attracts financially strong son-in-laws. This explanation is in line with those inspired by Becker’s theory. Consistent with this line are the findings that the so-called dowry effects are stronger in rural areas. Traditionally, in agricultural societies, sons, who would be the head of their households, receive the biggest share of the main source of income, the land. This can guarantee their future income. Daughters, who most likely will not enter the job market, should be prepared, financially, to find a spouse who can support them. Our findings of the strong dowry effects on households’ income underline that marriage is far more than a sheer biological and/or social event for children in social societies. In such societies, in the lack of well-functioning capital markets, parents may utilize this institution and its component, such as dowry, gifts to bride and groom and even to guests, and wedding expenses to show-off their economic affluence. This may also assure the potential partners about safety of conducting business with them. This function of marriage is more important for people who are self-employed and, as a result, need to initiate a business with others. This strengthens our arguments of the effects of children on income from self-employment and not on wages.

Our theory, to be valid, entails one essential requirement: the financial burden of dowry should be substantial compared to families’ regular expenditures, such that families cannot temporarily cut some expenses to provide dowry, and has to plan for a long time to acquire it. There is no data on dowry expenses in SHSEC. We used a cross-section survey of households’ budgets to show that the expenses are considerably large. Appendix A presents a discussion on the structures of dowry expenses, families’ plans on providing dowry, and an estimate of expenses on only one type of dowry items, kitchen appliances. The data indicates that only these types of dowry items account for more than one fourth of households’ annual expenditures. The whole dowry expenses, as a result, can be substantial.

**5. Conclusion**

We estimated the effects of children on men’s weekly work hours and income. Similar to other studies, we found that having children substantially increase men’s work and income. Unlike other studies, we found that the effects strengthened and became more significant by increase in number of children. More importantly, we found that among men with children, having daughters significantly increased men’s income whereas having son has no significant effect. Furthermore, the effects of daughters on their fathers’ income increase by daughters’ age. Finally, our finding shows that the effects are much stronger in rural areas compared to urban areas.

These findings are unprecedented in the literature, and require new theories. We suggest that the institution of marriage generates such unique results. In other words, financial burden of dowry for fathers makes them work harder and bring more to the family.

We provided an estimate of only one type of items in dowry in rural and urban areas, and showed that even this was a sizable portion of families’ income and wealth. In order to measure the exact effect of dowry on parents’ labor market decisions, more studies and better data sets are required.

These findings open new courses of research on labor market studies and families behavior in developing countries. While lack of long panels makes it impossible for us to study families’ behavior in dealing with financial burden of dowry, many questions are put forward and plead for answers. The most important one is if there is any significant effect of dowry in daughters’ future life, i.e., the return to dowry. The other question relates to the changes in education and participation rate of females. With education spreading fast among females both in urban and rural areas, the job market response of fathers may vary. Measuring these changes is beyond the goals of this study, however, is an essential piece of information to understand the societies’ economic life.

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Table 1: Means (Standard Deviations) of Main Variables

|  |  |  |  |
| --- | --- | --- | --- |
|  | Country | Urban | Rural |
| Log real total income | 14.77(0.766) | 14.80(0.701) | 14.25(0.740) |
| Weekly hours of work | 46.0(22.6) | 45.1(23.0) | 47.3(22.0) |
| Monthly rental value of the house if owned(million Rials) | 1.046(1.547) | 1.478(1.831) | 0.404(0.526) |
| Age | 45.67(14.37) | 45.20(13.75) | 46.38(15.21) |
| Number of children | 3.28(2.15) | 3.04(1.94) | 3.63(2.38) |
| Number of boys | 1.79(1.45) | 1.66(1.35) | 1.97(1.66) |
| Number of girls | 1.49(1.37) | 1.37(1.28) | 1.67(1.48) |
| Number of boys 0-4 | 0.30(0.54) | 0.25(0.49) | 0.38(0.61) |
| Number of girls 0-4 | 0.29(0.54) | 0.23(0.48) | 0.36(0.60) |
| Number of boys 5-9 | 0.43(0.65) | 0.40(0.62) | 0.48(0.70) |
| Number of girls 5-9 | 0.42(0.65) | 0.38(0.62) | 0.46(0.69) |
| Number of boys 10-14 | 0.44(0.68) | 0.41(0.63) | 0.50(0.71) |
| Number of girls 10-14 | 0.40(0.65) | 0.38(0.64) | 0.42(0.68) |
| Number of boys 15-19 | 0.32(0.60) | 0.30(0.59) | 0.34(0.61) |
| Number of girls 15-19 | 0.25(0.52) | 0.23(0.49) | 0.28(0.55) |
| Number of boys 20-24 | 0.19(0.47) | 0.18(0.45) | 0.21(0.48) |
| Number of girls 20-24 | 0.10(0.34) | 0.09(0.32) | 0.12(0.36) |
| Number of boys 25+ | 0.10(0.36) | 0.12(0.39) | 0.08(0.29) |
| Number of girls 25+ | 0.04(0.23) | 0.05(0.24) | 0.03(0.20) |
| Obs.\* | 14970 | 8958 | 6012 |

\*: For some variables, the number of observations are less than indicated in table due to missing observations.

Table 2: The Effect of Children on (Weakly) Hours Worked

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | (1)OLS | (2)OLS | (3)FE | (4)FE |
| Any children (Dummy: 0 if none) | 1.512\*\*(0.660) |  | 2.034\*(1.200) |  |
| Exactly one child |  | 1.301\*(0.796) |  | 2.200\*(1.224) |
| Exactly two children |  | 1.475\*\*(0.751) |  | 1.502(1.420) |
| Exactly three children |  | 1.360\*(0.767) |  | 0.824(1.590) |
| Exactly four children |  | 1.646\*\*(0.809) |  | 2.695(1.749) |
| More than four children |  | 2.059\*\*\*(0.773) |  | 3.480\*(1.896) |
| R-Squared | 0.1252 | 0.1251 | **?** | **?** |
| Obs. | 14970 | 14970 | 14970 | 14970 |

Control variables: dummies for age and education levels and wealth. Standard errors in parentheses.

\*: p-value<0.1; \*\*: p-value<0.05; \*\*: p-value<0.01.

Table 3: The Effect of Children on (log) Total Income

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | (1)OLS | (2)OLS | (3)FE | (4)FE |
| Any children | 0.176\*\*\*(0.022) |  | 0.025(0.040) |  |
| Exactly one child |  | 0.130\*\*\*(0.024) |  | 0.021(0.041) |
| Exactly two children |  | 0.158\*\*\*(0.025) |  | 0.018(0.047) |
| Exactly three children |  | 0.194\*\*\*(0.025) |  | 0.074(0.052) |
| Exactly four children |  | 0.193\*\*\*(0.026) |  | 0.066(0.057) |
| More than four children |  | 0.256\*\*\*(0.025) |  | 0.127\*\*(0.062) |
| R-Squared | 0.2864 | 0.2883 | **?** | **?** |
| Obs. | 13981 | 13981 | 13981 | 13981 |

Control variables: dummies for age and education levels and wealth. Standard errors in parentheses.

\*: p-value<0.1; \*\*: p-value<0.05; \*\*: p-value<0.01.

Table 4: The Effect of Sons versus Daughters on (Log Real) Total Income

|  |  |  |
| --- | --- | --- |
|  | (1) | (2) |
| Number of boys | -0.006(0.017) |  |
| Number of girls | 0.033\*\*(0.017) |  |
| Test: Number of girls>Number of boys (p-value) | 0.0263 |  |
| Number of boys 0-4 years old |  | -0.0074(0.0228) |
| Number of girls 0-4 years old |  | 0.0030(0.0224) |
| Test: Number of girls 0-4>Number of boys 0-4 (p-value) |  | 0.3535 |
| Number of boys 5-9 years old |  | 0.0078(0.0227) |
| Number of girls 5-9 years old |  | 0.0371\*(0.0223) |
| Test: Number of girls 5-9>Number of boys 5-9 (p-value) |  | 0.1374 |
| Number of boys 10-14 years old |  | 0.0132(0.0225) |
| Number of girls 10-14 years old |  | 0.0543\*\*(0.0228) |
| Test: Number of girls 10-14>Number of boys 10-14 (p-value) |  | 0.0725 |
| Number of boys 15-19 years old |  | -0.0256(0.0232) |
| Number of girls 15-19 years old |  | 0.0420\*(0.0249) |
| Test: Number of girls 15-19>Number of boys 15-19 (p-value) |  | 0.0171 |
| Number of boys 20-24 years old |  | -0.0192(0.0301) |
| Number of girls 20-24 years old |  | 0.0921\*\*(0.0365) |
| Test: Number of girls 20-24>Number of boys 24-24 (p-value) |  | 0.0068 |
| Obs. | 9895 | 9895 |

All models are Fixed-Effect. Control variables: dummies for age and education levels and wealth. Standard errors in parentheses.

\*: p-value<0.1; \*\*: p-value<0.05; \*\*: p-value<0.01.

Table 5: The Effect of Sons versus Daughters on (Log Real) Total Income in Urban and Rural Areas

|  |  |  |
| --- | --- | --- |
|  | Urban | Rural |
| Number of boys 0-4 years old | 0.0113(0.0335) | -0.0199(0.0326) |
| Number of girls 0-4 years old | -0.0120(0.0315) | 0.0218(0.0328) |
| Test: Number of girls 0-4>Number of boys 0-4 (p-value) | 0.7231 | 0.1476 |
| Number of boys 5-9 years old | 0.0336(0.0331) | -0.0217(0.0332) |
| Number of girls 5-9 years old | 0.0007(0.0307) | 0.0696\*\*(0.0336) |
| Test: Number of girls 5-9>Number of boys 5-9 (p-value) | 0.8125 | 0.0111 |
| Number of boys 10-14 years old | 0.0394(0.0339) | -0.0184(0.0321) |
| Number of girls 10-14 years old | 0.0424(0.0310) | 0.0579\*(0.0348) |
| Test: Number of girls 10-14>Number of boys 10-14 (p-value) | 0.4696 | 0.0362 |
| Number of boys 15-19 years old | -0.0098(0.0350) | -0.0375(0.0333) |
| Number of girls 15-19 years old | 0.0244(0.0334) | 0.0539(0.0384) |
| Test: Number of girls 15-19>Number of boys 15-19 (p-value) | 0.2145 | 0.0307 |
| Number of boys 20-24 years old | 0.0249(0.0414) | -0.0572(0.0466) |
| Number of girls 20-24 years old | 0.0778(0.0490) | 0.0817(0.0556) |
| Test: Number of girls 20-24>Number of boys 24-24 (p-value) | 0.1890 | 0.0236 |
| Obs. | 5915 | 3980 |

All models are Fixed-Effect. Control variables: dummies for age and education levels and wealth. Standard errors in parentheses.

\*: p-value<0.1; \*\*: p-value<0.05; \*\*: p-value<0.01.

***Appendix A: Dowry Expenditures***

We use Iran’s annual Household Income and Expenditure Surveys (HIES) to get an estimation of the magnitude of dowry expenditures.[[9]](#footnote-9) The data was collected and made available by Statistical Center of Iran from 1984 onward, but we chooe the samples from 1991 to 2003 since these are the samples for which one dowry-related question was included in the pertinent questionnaires. Fortunately, the time period coincides with the time period covered by HSEC, which was used in our estimations and analyses. The question comes under the part assigned to durables and among those asking about household’s expenditures on main kitchen items such as refrigerator, freezer, oven, and dishwasher. It asks the surveyed household about its total expenditure on such items if purchased for dowry purposes.

Main kitchen items are one of the principal components of a dowry and take a sizable share in the related costs. Thus, household’s expenditure on these items can provide an illuminating indicator of the burden of dowry on households. The reported expenditures can serve the intended purpose only if they are associated with a complete dowry provision rather than a gradual dowry gathering. To clarify this, one can consider that a household with a girl decides to gather main kitchen items through a long period of time or, alternatively, decides to save the equivalent money and cashes it in and purchases the items when the girls is getting married. If the household displays the gradual gathering behavior, then the reported expenditures highly underestimate the costs of main kitchen items in a dowry and, in turn, the total cost of the dowry. To fathom which behavior is the case, we have designed a simple test described below.

If households, with an unmarried girl, collect the main kitchen items gradually, then one would expect a big share of households report such expenditures. But how big is big? In other words, how one can realize that a big share is something beyond 10%, 20%, or 30%?

According to National Organization of Civil Records (NOCR), average age of marriage for girls in the last year for which the dowry-related expenditure is available, i.e. 2004, was about 22. For the period of 1991 to 2003, one can safely assume that average female marriage age can be between 20 and 22. If dowry-gathering behavior is prevalent, one would expect to see the majority of households with girl(s) under the age of 20 report such expenditure. In fact, about 66, 56 and 44 percent of the households in the samples of HIES 1991-2003 have at least one girl at age groups 0-19, 0-14, and 10-19, respectively. Any of these numbers can provide an upper bound for the share households that could show gradual dowry gathering behavior. Among them, 44% can be taken as a conservative estimation. To find a lower bond, we computed the shares of household with girl(s) only at age groups 10-19, which is 21%. In other words, 21% of households have girl(s) between the age 10 and 19 with no other girl older or younger. These are the household who are most likely to show dowry gathering behavior. Therefore, if dowry-gathering behavior is prevalent, then it is expected that about 21 to 44 percent of households report some dowry-related expenditures. But, what is the ratio of households that reported dowry-related expenditures?

Among 263183 households surveyed from 1991 to 2003, 6691 households have reported the dowry-related expenditures. This constitutes only 2.5% percent of them. To give a clearer picture, we select subsamples of households that have girl(s) only at age groups 0-4, 5-9, 10-14, 15-19, 20-24, and 25-29 and calculate the same rate for each subsample separately. The rates are 0.3%, 1.0%, 2.9%, 5.5%, 5.5%, and 4.1%, respectively. Comparing these ratios with the range of ratios that can imply the prevalence of dowry gathering behavior, i.e. 21% to 44%, clearly shows that dowry gathering is not very common among Iranian households with unmarried girls.

As another piece of evidence against gradual dowry gathering, we calculate that more than 90% and 80% of households that have reported dowry-related expenditures, have girl(s) at age 15 plus and 20 plus, respectively. Note that the country-level average age of marriage for female has been around 20 in those years and rural households, with lower female marriage age, are over represented in HIES samples. Thus, one can imagine the average female age at marriage in the sample to be even below 20. All and all, it seems dowry is not purchased unless around the time of marriage.

If gradual dowry gathering is not commonplace and dowry is mainly purchased around the time of marriage, one would expect the ratio of the number of the households with reported dowry-related expenditures to the total number of households having girl(s) only at age group of 15 to 19 or 20 to 24 represent the rate of household formation in the country. The ratios, in fact, are both about 5.5%. To find the rate of household formation, at the same span of years, we have computed the ratios of numbers of marriages to total numbers of households. For number of marriages, the number of registered marriages provided by NOCR is used. Total numbers of households are extrapolated using the data from census 1991, census 1996, and census 2006. The computed ratios vary between 4.4 and 5.3, which are very close to what we were expecting.

As it was shown above, in the HIES samples, among the households with girl(s) only at age group of 15 to 19 or 20 to 24, about 5.5% of them have reported dowry-related expenditures. We also showed that (1) average female marriage age falls into the center of the two age groups; (2) the rate of dowry reporting is about the rate of household formation in the country. Thus, we can take the average of the amounts spent on the dowry-related expenditure by the households with girl(s) only at age range of 15 to 24 as an approximation of such expenditure actually made about the time of marriage. Therefore, we compute the average dowry-related expenditures and aggregate total non-dowry non-investment expenditures for households with girl(s) only at age 15 to 24. The ratio of the first to the latter is about 23% for the time period of 1991 to 2003. In the time period that coincides with the time span of our panel data, 1992 to 1995, the ratio is about 25%. In other words, the dowry-related expenditure reported by households, that only includes main kitchen appliances, compromises about 25% of all other annual expenditures of the households. As a matter of fact, dowries usually consist of a lot of other items and it is quite understandable that the 25% estimation just serves as a portion of dowry costs to households. The point we are going to make here is that even the measurable part of dowry costs is so sizable that makes households plan from the years before in order to prepare it on time.

***Appendix B: Test of selective abortion***

The randomness assumption for men’s children’s gender composition will be harmed in the existence of child gender selective abortion. The potential problem is that the expected burden of dowry makes families avoid having girls and, as a result, selectively abort girls before their birth. This can cause serious endogeneity problem for our results. In this section, we provide information from different sources and calculate children ratios to illustrate that there is no evidence of child gender selective abortion in Iran. A natural, non-intervened gender ratio is 1.06, which means 106 boys are born for 100 girls born, naturally.

Our different sources are HIES samples, census data, and data of registered births. Figure A.1. shows the ratio of male to female children who are at the age of 0 to 9 in all available HIES samples. Since the age numbers assigned to the children with 365 or less days of age is zero in some samples and one in some other samples, we decided to calculate the ratio for two five-year cohorts of children, i.e. for the age range of 0 to 9, to partly address the problem. We have not computed separated ratios for urban and rural area to obtain enough observations for the age group of interest, especially in the earlier samples. As it is illustrated by the graph, the ratio fluctuates around 1.05, between 0.99 and 1.08. The gender ratio was low and varied widely in 1980s and early 1990s, mostly because of the low number of observation and low quality of data. Since 1992, the gender ratios have been constantly around 1.06. In spite of relatively high variations of the ratio around the natural value, it is difficult to prove any selection against either boys or girls using the surveys conducted by the Statistical Center of Iran.

At the population level, we used census data of 1986, 1996, and 2006 to compute gender ratios. The abundance of data allows for computing the ratio for exact age in both rural and urban areas. The results presented in Figure A.2-a, A.2-b, and A.2-c show no evidence of interfering tendency toward boys at birth in the aggregate level. The ratio was more volatile in 1986, and became more stable in 1996 and 2006 around 105. In spite of the volatility the figures do not show any evidence of gender selection over years.

The data from the National Organization for Civil Registration (NOCR) provides further proof for the inexistence of selective abortion in Iran. If that exists, then one would expect relatively less female birth registrations. This, however, is not confirmed by the registered data. Figure A.3, which depicts the ratios for 1989 to 2009, shows that the ratio has been less than 1.06 during the whole period in both urban and rural areas.

What presented in this section confirms that child gender selective abortion is not empirically substantial enough to make child gender at birth non-random. In this sense, Iranian context is similar to that of more developed countries according to Norberg (2004).

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3. In appendix A, we provide an approximations of the dowry related expenditures in rural and urban areas only for one type of dowry items, kitchen appliances. The approximations show that the share of such expenditures in households’ total expenditures is sizable. [↑](#footnote-ref-3)
4. Lundberg and Rose (2003) use data of Consumer Expenditure Surveys from 1990 to 1998 and find no significant difference in the aggregate expenditure of married-couple families with one daughter and that with one son. However, the households with son spend more on housing and personal care services in compare to the households with daughter that spend relatively more on clothing. [↑](#footnote-ref-4)
5. South Asian countries where dowry is still prevalent include Afghanistan, Bangladesh, India, Iran, Nepal, Pakistan, Sri Lanka, Vietnam, and parts of China. [↑](#footnote-ref-5)
6. For example, see Rao (1993), Das Gupta and Li (1999), Edlund (2001), Tertilt (2002), and Anderson (2003). [↑](#footnote-ref-6)
7. We applied all the estimation using the other labor market outcomes. The results, not reported here, will be available upon request. [↑](#footnote-ref-7)
8. Data from Statistical Center of Iran available online at http://amar.sci.org.ir/ last visited July 18, 2013. [↑](#footnote-ref-8)
9. HIES collects data on household members’ characteristics, household’s belonging and ownership, household’s expenditures on food and non-food items, and household members’ income in four parts. HIES applies a cluster sampling technique with strata in three steps. First, the census zones are defined and selected. Then, rural and urban blocks are chosen. Finally, in each rural or urban block within each census zone a sample of households is selected. The optimal number of samples is determined such that households’ average annual income and expenditures be representative at province level for each quarter. [↑](#footnote-ref-9)