HOUSEHOLD INCOME MOBILITY AND DOWRY: EVIDENCE FROM INDIA

by

Azhar Uddin

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This thesis has been approved on the date shown below:

Dr. Satheesh Aradhyula (Associate Professor)	04/19/2017 Date
Dr. Tauhidur Rahman (Associate Professor)	04/19/2017 Date

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Abstract

This paper examines the impact of dowry on household income mobility in Indian context. Dowry has many adverse effects in the society. Dowry, a key component of the extravagant wedding celebrations that are part of Indian culture, may act as a hindrance on efficacy of poverty alleviation programs. We utilize the two rounds of Indian Human Development Survey (IHDS) data to evaluate if dowry expenditure on a daughter's marriage can explain the income mobility and possibly if it forces some households into poverty trap. Regression results suggest that dowry expenditure constitutes a significant financial burden to high income households contrary to the anecdotal belief that it more adversely affects lower income households.

Chapter 1

Introduction

Marriage is an age-old institution. From the beginning, it was a strategic alliance between two families rather than the decision of the bride or groom. Family ties was an integral part of this institution as alliance between cousins were a common phenomenon. This institution of marriage has come a long way from widespread polygamy to present standard of monogamy. Since marriage was a family decision, it often involved transfer of assets from the groom's family to bride's family, which is commonly known as bride price. This transfer of assets has taken opposite direction in recent past in the form of dowry.

In its simplest form, dowry can be defined as the transfer of money or assets from the bride's family to groom's family. Particularly common in strong patrilineal societies, dowry has long history in many parts of the world including European societies. This practice has become even worse over the years in many Asian and Northern African countries.

The practice of dowry in India can be traced back to pre-British rule, but it was in different form than what is prevailed in present India. In pre-British rule, parents of the bride along with her kith and kin gave valuable gifts to the daughter at the time of marriage so that it can enhance her financial status and to overcome emergency if at all she encounters in the future. The key to note here is the fact that the ownership of these gifts given at the time of marriage were with the bride even after the marriage. The significant difference in dowry system that exists today compared to what it was in olden times is that the ownership of gifts given at the time of marriage has moved from the bride to the groom's family. Because of this change of ownership, prospective husbands started coercing the parents of the bride for higher amount of dowry out of greed, which many a

time the parents of the bride are unable to honor. The outcome of this is the increased domestic violence, abuse and its extreme form, the dowry deaths, which is prevalent in present India.

It is alarming to note that the practice of dowry has spread to many parts of India. It has been widely reported that along with the incidence of dowry, amount of dowry has been on rise over the years. The outcome of this is the increased number of dowry deaths in recent years. According to National Crime Records Bureau (NCRB), the number of dowry deaths reported is 8,455 in 2014 which was 8,093 in 2007. Although the practice of dowry is a punishable offence in India since long back (The Dowry Prohibition Act, 1961), it has unable to curb this evil practice from the society till date; in fact, the occurrence of it has risen in recent years.

There are two types of expenditure associated with a typical wedding celebration in India. First, the expenditure associated with celebrating the marriage which typically is a minor share of the total wedding expenditure. This expenditure is observable and we can roughly estimate the cost of it. Second, the dowry expenditure wherein the family of the bride transfers 'gift' either in terms of cash or in kind to groom's family as a symbol of 'gratitude' hoping that the bride will have a happy married life. Dowry being illegal, which means it is not observable and hence difficult to estimate the expenditure associate with it. However, there is enough anecdotal evidence to suggest that it accounts for the bulk of the expenditure associated with wedding celebration, which is usually decided on close-door agreements between the parents of the bride and the groom to avoid prosecution.

To the extent that dowry exists, it is likely to have impact on the poor households before they marry their daughter and after the marriage. The impact of perceived dowry expenditure in future is likely to have serious adverse consequences on the upbringing of the girl child of a poor

family. As the parents of the poor household will save money for dowry in future, it is natural to expect that the parents may not invest in human capital of the girl child, as in many instances they cannot afford to invest in human capital of the girl child along with saving money for their daughter to be spent at the time of marriage. On the other hand, parents are likely to invest on human capital of their son as they expect their 'eligible' son to garner more dowry resources from the parents of their to be daughter-in-law given the fact that the more educated (eligible) a bachelor is, higher is the expectation of the dowry amount. The immediate effect of this is the preference for boy child and hence the sex selective abortion and infanticide. This preference for boy child can be easily verified by the fact that child sex ratio in India has been falling over the years. According to the Census data of Govt. of India, child (0-6 years) sex ratio declined to 914 in 2011 from 927 in 2001.

Despite tremendous growth rate in India over the last two decades, poverty reduction has been dismal. Many explanations have been put forward for the existence of widespread poverty. One socio-cultural characteristics of Indian life is that people spend huge amount of money on celebrations. One such celebration is the marriage of a daughter which is the costliest affair in life of an Indian family. There is enough anecdotal evidence to suggest that a poor household's expense on daughter's marriage is extraordinary which can go up to 7 times of the annual income of the household. Given that it has become ubiquitous and the amount of dowry has been increasing, it is likely to have serious consequences on economic conditions of the parents of household who has daughter to be married off. This link of dowry expenses on economic mobility has largely been ignored in literature. I intend to examine how dowry expenses impact the economic condition and whether this forces the parents of poor households into poverty trap who married their daughter. To the extent that dowry explains the persistent of poverty in India,

policy maker should come up with more stringent law to eliminate the evil of dowry from the society.

Chapter 2

Literature Review

Literatures on dowry have primarily focused on causes of its existence and its possible consequences on a woman's life post-marriage. A handful of literature has focused on intra-household treatment of girl child with the backdrop of perceived dowry payments at the time of daughter's marriage, while others pay attention to the changing nature of dowry system in Indian context.

In his seminal work, Becker (1981) assumes that dowry is a price that clears market. Augmenting this standard model, Botticini and Siow (2003) explores the endogenous nature of dowry and put forwards two rationales for the existence of dowry. First, they argue that dowry primarily occurs in monogamous virilocal societies, where married daughters leave their parents' home but married sons do not. Second, they argue that parents mitigate the free riding problem that arises because sons have comparative advantage working with family assets by allocating bequests to sons and dowry to daughters.

Dalmia and Lawrence (2005) put forwards institutional and economic rationale for the existence of dowry system in India. They find that dowry payments accounts for the differences in traits that exists between the bride and the groom and their respective families. Hence, dowry payments serve as price for a "good" match. They also empirically verify that the form of inheritance system, the residence of bride post marriage and gender ratio of marriageable women to men have nothing to do with the occurrence or the size of the dowry payments.

In analyzing the causes of dowry in India, Jaggi (2001) highlights two theories as an explanation for dowry- the "marriage squeeze" and excess supply of wives and divergent pattern of human

capital accumulation. Declining mortality and increased population growth will result in larger younger cohorts than older ones, which, given the Indian tradition of lower "acceptable" age for women than men will ensure increased supply of women in the marriage market. This, in turn, will imply higher price of dowry to restore equilibrium in the market under the assumption of perfect information and perfectly competitive marriage market. On the other hand, women get more benefits from marriage as they can fully utilize the household skill learned before marriage, which skill men do not possess given prevailing Indian culture wherein men acquire only market-oriented human capital. This inherent differential of gains from marriage for men and women can be attributed to prevalence of dowry payment that equalizes the net difference of gain in favor of women.

In Indian context, a number of studies have focused on effect of dowry on domestic violence. This violence on wife arises because of non-payment of additional transfers subsequently after the marriage was solemnized with the 'agreed' amount of dowry. This violence can lead to murder of the wife, which is evident from increased number of dowry deaths in India in recent years.

In a case study on dowry violence in rural India, Bloch and Rao (2002) finds some remarkable results. They find that marital violence not only depends on low dowry payments at the time of marriage, but also positively related to the richness of the parents of the bride as husbands are more likely to indulge in domestic violence to extract more resources from the wealthy parents of the bride. Another remarkable finding of their study is that the probability of domestic violence reduces with increased number of male children as husbands' marital happiness increases with more number of male children.

One explanation given in the literature for the rise of dowry practices is that many women themselves are in favor of dowry (Srinivasan 2005). Two reasons are put forward by those women who support dowry. First, higher amount of dowry is essential to find a "good" match and this will ensure their security and happiness post marriage. Second, since in most cases girls are not given share of their parental property, it is natural to expect dowry instead. Hence many girls perceive dowry to be an entitlement as they expect withdrawal of financial support from her parents post marriage and a means of bargaining for her status in the family she marries. Srinivasan and Bedi (2007) argues that higher amount of dowry in fact reduces violence on bride after marriage which could be a potential explanation for persistent of dowry practices.

The extravagant wedding celebration is part of Indian culture, the burden of which almost always falls on the family of the bride. Bloch et al 2002 refer wedding celebration as 'conspicuous consumption' and argue that an increased expense has to do with enhanced social status of the bride's family.

Literature have thus far established many consequences of dowry ranging from its effect on women's status, domestic violence, and women's survival among other negative impacts of dowry. Literature has also focused on answering why dowry practice is still prevalent and in fact increasing in terms of the expenditure associated with it. The adverse effects of dowry are well known fact these days. Primarily, literature has addressed these adverse impacts of dowry on bride's post married life. However, there is scarcity of literature which has focused on the economic impact of dowry on the family who married off their daughter. To the best of our knowledge, no study has attempted to understand the long-run effect of dowry expenditure on economic burden of the family who marries off their daughter. The reason for lack of study on this has to do with unobservable nature of dowry expenditure. To fill this vacuum, this paper is a

sincere attempt to understand how dowry expenditure affects the economic well-being of the family who marries off their daughter. In other words, I try to answer whether dowry expenditure is a potential explanation of persistent poverty of those parents who has daughter to be married off.

Chapter 3

3.1 Overview of the Data:

Researchers from the University of Maryland and the National Council of Applied Economic Research (NCAER), New Delhi conducted a nationally representative and multi-topic Indian Human Development Survey (IHDS) in two rounds: first round (call it IHDS-I) was conducted in 2004-05 while the second round (call it IHDS-II) was conducted in 2011-12. These two rounds of survey were in continuation of Human Development Profile of India (HDPI) survey which NCAER conducted in 1994-95. IHDS covered topics such as health, education, employment, economic status, marriage, fertility, gender relations, and social capital. Children aged 8-11 were given short reading, writing and arithmetic tests to collect information. Information on village, school, and medical facility were also collected.

3.2 Sample:

IHDS was conducted throughout India covering all states and union territories (except Andaman Nicobar and Lakshadweep). A sample of 41,554 households in 1503 villages and 971 urban neighborhoods across India were interviewed for IHDS-I in 2004-05. This survey retained 13,900 households for re-interview from HDPI survey and added 27,654 new households for interview. A sample of 42,152 households in 1420 villages and 1042 urban neighborhoods were interviewed for IHDS-II in 2011-12. About 85% of the households in IHDS-I were re-interviewed in IHDS-II (See figure 3.1). Stratified random sampling was used to draw rural households. To draw sample of urban households, stratified sample of towns and cities within states (or groups of states) were selected by probability proportional to population (PPP).

3.3 Methodology for data collection:

The survey data was collected by face-to-face interview in each household. Different members of the households were chosen for different topics in the household questionnaire. Usually information related to income, employment, educational status and consumption expenditure were collected from the head of the households. The questions regarding health, education, fertility, family planning, marriage, and gender relations in the household and community were given to ever married women aged 15-49. If there were children in the households aged 8-11, they were given short reading, writing, and arithmetic knowledge tests. The survey also collected information on height and weight measurement of children under age 5, aged 8-11, and their mothers, facilities assessment of one government and one private primary school and primary health care facility in the community, village questionnaire assessing employment opportunities and infrastructure facilities in the village. Since the survey covered the households of entire India, survey questionnaire was translated into 13 Indian languages and were administered by local interviewers.

3.4 Data Manipulation:

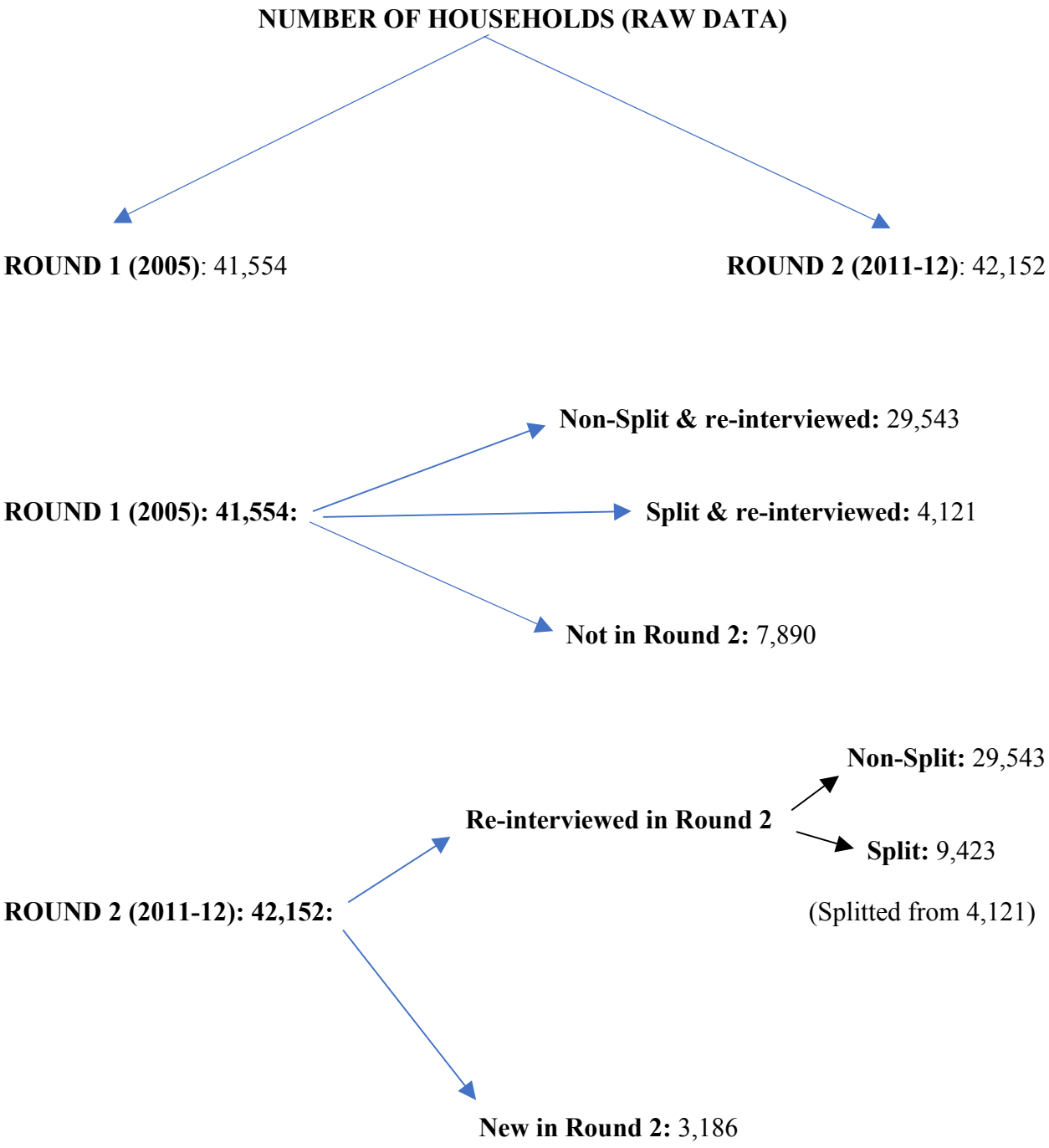
I utilize the IHDS-I and IHDS-II for the analysis. Given the two rounds of data, our first task was to construct a balanced panel data so that we can make comparison between the two surveys. There are two issues involved in construction of a balanced panel. First, not all households were re-interviewed in the second round. This is primarily due to migration of the households from the place of first round to another place. Second, many households splitted between the two surveys and it was impossible to track all the splitted households. There could be many reasons for a household's split. By "household split", we mean members of a family are staying in different places because of "circumstances" while they would have lived together under "normal

circumstances". One common reason for a household's split is migration of a few family members for work. When employment opportunity is not available at native place, young adults many a times move to a place where they can get a job. Usually this type of migration is outside the home district or state. Another important reason for a household's split when there is son's marriage in the family. In a typical household, a married son with his wife is given a separate home to live which takes care of its own financial needs. In this type of households split, usually slitted households live very close to their parents' ancestral home so that they can take care of their parents when need be.

From the two-survey data set, we determine those households who were re-interviewed in the second phase so that I have two observations of the same household in two time periods, one in phase I that was conducted in 2005 and the other one in phase II conducted in 2011-2012. Among the households that were re-interviewed, many households splitted to different households during the time between the two surveys. I removed those households also who splitted in between the two surveys. In this way, I arrived at 29,493 households who were part of both IDHS-I and IDHS-II and did not split between the two surveys, which serves as our final sample.

Below is the summary of how I arrived at my final sample.

Figure 3.1 Determination of final sample.



Given that dowry is a criminal offense in India, dowry payment data is not observable publicly.

As dowry expenditure data is not available, I use the occurrence of a daughter's marriage in a household as a proxy for dowry payments. I utilize the fact that there was a gap of 6-7 years between IHDS-I and IHDS-II and hence many households would have married their sons or daughters during this period. Then we would be interested in whether the occurrence of a daughter's marriage significantly affects the economic mobility of that household.

The most commonly used measure of economic well-being are income, consumption and wealth. We will be using income as our measure for welfare and will be interested to know if there was any economic mobility of households in terms of income between the surveys or not. After adjusting for inflation, all households were divided into four quartiles in both the periods. Since we divided households economic position into income quartile, we are interested in relative position of the households between the two periods. This can be depicted through a transition matrix given below. This transition matrix gives the number of sample households in each income quartiles in both the periods.

Table 3.1: Transition matrix of Income quartiles in Round-I and Round-II

		Round-II (2011-12)				
	Quartile	**Q1**	**Q2**	**Q3**	**Q4**	**SUM**
Round-I (2005)	**Q1**	3,332	2,196	1,249	596	7,373
	Q2	2,190	2,500	1,900	769	7,359
	Q3	1,286	1,883	2,490	1,727	7,386
	Q4	565	794	1,734	4,282	7,375
	SUM	7,373	7,373	7,373	7,374	29,493

As can be seen from the above transition matrix, there is substantial income mobility of households between the two periods. As we are talking about relative income status, the matrix tells that there are some people who are always poor and some are sometimes poor, moving in and out of poverty over time. We will refer to this in and out of poverty as poverty dynamics. It

is to be noted here that we are talking about relative poverty of households, not absolute poverty in terms of income, which means that households in a particular time period in quartile 1 (bottom quartile) may not be poor in absolute terms, but they are poor in relative terms as they fall in the bottom income quartile. In the transition matrix above, households above the principal diagonal are those households who are relatively better off in the second period compared to first period, while those below the diagonal are worse off in second period compared to 1st period. The households in the diagonal are those households whose relative status remained same during the two-time period of our interest.

Now, let us look at the magnitude of income variation in the four quartiles between the two surveys.

Table 3.2: Average annual income (in Rupees) of households by quartiles.

Quartile	No. of households		Mean income		Standard Deviation of income		% increase in income
	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2	
Q1	7373	7373	8,518.17	11,361.61	6,644.83	12,725.74	33%
Q2	7359	7373	21,611.13	31,388.64	3,709.99	5,653.14	45%
Q3	7386	7373	40,916.89	59,360.46	8,524.15	11,657.72	45%
Q4	7375	7374	1,24,134.96	1,91,238.82	1,21,043.59	2,12,880.39	54%

As you can see from the above table that there is upward trend in income mobility for households in all quartiles. Please note that 2nd period's income is adjusted for inflation. So, on an average, real income has increased between the two surveys for all sections of the population, from poor to rich. However, there is a clear pattern in the magnitude of income increase depending on whether that household is in upper or lower quartiles of income. While the poor's (household's in bottom quartile) income increased 33% from first period to second period, the rich's (households in the top quartile) income increased by 54%. The households who were

middle income (quartile 2 and 3), their income increased by 45%. Given this pattern of rich getting richer than the poor, inequality over time will go up.

The above table looks at the overall trend income mobility over time. Now, let us look at this mobility for different groups separately: those who moved up in income status, those who remained in the same income status and those who moved down in income status. We present the quartile wise movement in average income below.

Table 3.3: Average income in different quartile wise movement.

Movement between Round I to Round II	Mean		Standard Deviation	
	Round 1	Round 2	Round 1	Round 2
Similar				
Q1-Q1	8,591.53	11,288.72	5628.37	8000.04
Q2-Q2	21,561.56	31,285.36	3685.65	5596.88
Q3-Q3	41,182.19	59,711.20	8541.71	11425.98
Q4-Q4	1,36,940.37	2,19,906.66	141895.8	259214.53
Households with upward quartile movements				
Q1-Q2	9,200.46	30,634.99	5591.4	5561.22
Q2-Q3	22,064.45	57,563.39	3696.86	11390.48
Q3-Q4	43,342.87	1,50,889.10	8600.2	112807.28
Q1-Q3	8,661.99	57,043.88	6762.95	11075.64
Q2-Q4	22,346.99	1,42,965.48	3684.25	91878.54
Q1-Q4	5,292.72	1,64,477.84	12092.72	126246.97
Households with downward quartile movements				
Q2-Q1	21,016.02	12,445.72	3662.47	7652.22
Q3-Q2	39,648.59	31,980.95	8204.51	5710.45
Q4-Q3	1,06,545.18	62,494.56	76865.91	11945.12
Q3-Q1	39,002.38	10,487.91	8016.31	24244.72
Q4-Q2	1,02,779.66	32,393.52	73440.91	5650.67
Q4-Q1	1,11,080.12	9,577.97	99926.72	12757.06

The bottom part of the above table gives the income status of those who incurred a downward mobility in relative income status. As you can see in all the 6 categories of downward mobility in

income status, there is a substantial decline in real income over the time. If you look, particularly at those who moved from top income status in 1st time period to bottom status in the 2nd time period (movement Q4-Q1), these households have become poor from once richest people. The reason for showing this table is that we can see that for some households there is a substantial fall in real income in contrast to overall improvement in average income over time for the entire sample as was shown in the previous table.

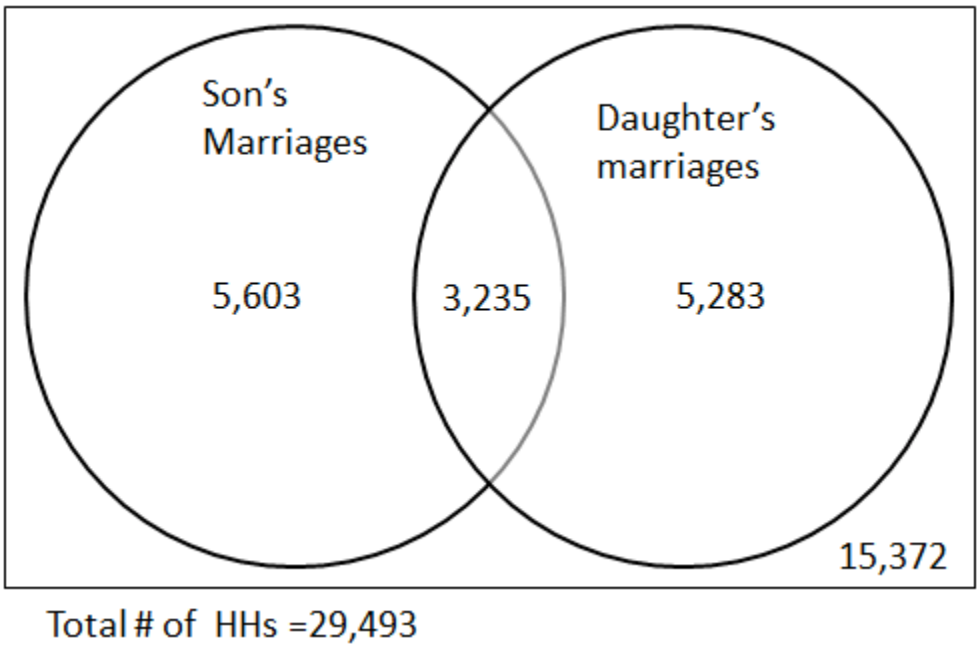
Given the presence of income mobility in transitions matrix, we are particularly interested in investigating what lead people to downward income mobility and consequently if that downward mobility is severe then what lead people to fall into poverty in the second period. In other words, we are trying to answer what causes downward income mobility. There could be many causes that could explain this downward income mobility. For example, the factors like natural disaster, loss of crop, loss of job, death of bread earner in the family could be the reasons for people to fall in income status. In this paper, we are interested in examining whether a particular shock, daughter's marriage, can be attributed to this falling income mobility or not. Given enough anecdotal evidence that the marriage of daughter significantly affects the financial status of a households, we want to verify this empirically. Was this because of daughter's marriage that household were worse off in the second time period? To answer this, we need to examine whether there was daughter's marriage in those households or not that became worse off in the second period.

Next task for us was to find those households who married off their sons or daughters or both and the rest who did not have any marriages in their household between the two surveys. From the household survey data, whether there was marriage in the household between the two surveys is not available. So, we had to figure out that from the other questions in the survey. If the

number of unmarried boys aged 8 and above in the 1st survey is less than the number of unmarried boys aged 14 and above in the 2nd survey, we concluded that there was a boy's marriage in the households. We used the same procedure to find households who married their daughter: if the number of unmarried girl aged 8 and above in the 1st survey is less than the number of unmarried girls aged 14 and above in the 2nd survey, there was a girl's marriage in the households. This procedure does not take care of the case where an unmarried boy/girl aged 8 and above in the 1st survey died before the 2nd survey. We believe this probability is very less and hence ignored as there is no other better ways to find the households who married off their son/daughter.

Using the above definitions to find households who married their son/daughter, we find the following statistics.

Figure 3.2: Number of marriages between the two surveys.



As you can see from the above venn-diagram, a total of 5283+3235 = 8,518 households married their daughter while a total of 5,503+3235 = 8,838 households married their son. A total of 15,372 households did not marry either son or daughter while 3,235 households married both son and daughter between the two survey periods.

Given these statistics on number of marriages and households with downward income mobility, we are interested in knowing if we can attribute this downward income mobility to daughter's marriage and hence dowry expenditure. We present the statistics on how number of marriages are related to downward income mobility in the following table.

Table 3.4: Relationship between downward income mobility and occurrence of marriages.

MOVEMENT	Daughter's Marriage	Son's Marriage	Both daughter's & son's marriage	Non-marriage households	Total number of households
Q2-Q1	19%	14%	9%	59%	2,190
Q3-Q2	19%	18%	10%	53%	1883
Q4-Q3	18%	23%	13%	46%	1734
Q3-Q1	18%	18%	10%	53%	1286
Q4-Q2	18%	21%	12%	49%	794
Q4-Q1	18%	19%	14%	49%	565

From the above tables, we do not find any visible pattern in linking downward mobility and daughter's marriages. For some downward mobility, the percentage of daughter's marriage out numbers percentage of son's marriage, while for others it is the other way around. We also have substantial number of households who experienced a downward income mobility while they did not marry their daughter or son, which means their downward mobility is due to anything wedding expenses. So, from the above table we cannot establish any visible relationship between downward income mobility and the occurrence of daughter's or son's marriages while there could be causal relationship which we would investigate in the following sections.

Chapter 4

Methodology:

To answer whether daughter's marriage can explain the downward income mobility, I must define the treatment and control group first. It is to be noted that in the sample, there were households who married their daughter, son, both daughter and son, and with no marriages in between the two surveys. I define the treatment group to be those households who married their daughter and control group to be those households who did not marry their daughter. In other words, control group will consist of those households who married their son only and those households with no marriages. It is to be noted here that those households who married both son and daughter will come under treatment group as per my definition above. After defining treatment and control group, my task was to find the causal relationship of daughter's marriage on the financial burden of the household. Since I have two-time period data, I use difference-in-difference (DiD) approach to find the causal relationship. In its simplest form, I specify the DiD model as below,

$$\text{Income Quartile}_{it} = \beta_0 + \beta_1 \text{Time}_t + \beta_2 \text{Treatment}_i + \beta_3 \text{Time}_t * \text{Treatment}_i + U_{it}$$

$t = 1, 2$ and $i = 1, \ldots, 29493$.

where dependent variable is the income quartile of i^{th} household in period t, Time is a dummy variable which takes a value of 0 when time period is 2005 and 1 when the time period is 2011, Treatment is a dummy variable which takes a value of 1 for those households who married their daughter and 0 if otherwise. To find the causal effect of daughter's marriage on quartile status of a household, I use the following specification,

$(\text{Quartile Treatment}_{time=1} - \text{Quartile Treatment}_{time=0}) - (\text{Quartile Control}_{time=1} - \text{Quartile Control}_{time=0})$.

This is the difference of difference of average quartile between treatment and control group households. I can't attribute the change (Quartile Treatment $_{time=1}$ – Quartile Treatment $_{time=0}$) to daughter's marriage because something else other than daughter's marriage might be responsible for this. Hence, I must compare the treatment group to a control group to find the causal effect and the control group I have defined to be those households who did not marry their daughter in between the two survey period. From the regression model, this difference in difference is the coefficient β_3. To see why this coefficient is the causal effect of daughter's marriage on the economic status of households, I use the following deduction. In the regression specification, a household can be categorized in one of the four following ways in the data set.

1. Treatment = 0 and Time = 0 (which is basically control group household in 1st Time period)

For these households, we have Income Quartile = β_0

2. Treatment = 1 and Time = 0 (which is basically treatment group household in 1st Time period).

For these households, we have Income Quartile = $\beta_0 + \beta_1$

3. Treatment = 0 and Time =1 (which is basically control group household in 2nd Time period).

For these households, we have Income Quartile = $\beta_0 + \beta_2$

4. Treatment = 1 and Time =1 (which is basically treatment group household in 2nd Time period).

For these households, we have Income Quartile = $\beta_0 + \beta_1 + \beta_2 + \beta_3$

So, the causal effect is,

(Quartile Treatment $_{time=1}$ – Quartile Treatment $_{time=0}$) - (Quartile Control $_{time=1}$ - Quartile Control $_{time=0}$) = $(\beta_0 + \beta_1 + \beta_2 + \beta_3 - \beta_0 - \beta_1) – (\beta_0 + \beta_2 - \beta_0) = \beta_3$

Hence, I am interested the sign of the coefficient β_3 which gives the causal effect of daughter's marriage on the financial status of a household.

This general specification of the model gives the overall impact of daughter's marriage on economics status of household. As I am particularly interested in what lead people to downward income mobility, I would now concentrate on those households whose income position worsened in second time period and would examine whether that decline has anything to do with that of daughter's marriage. So, I change the dependent variable to a binary variable "downward slide" which takes a value of 1 when a household's status worsens from first period to second time period and 0 otherwise. However, there is an issue with this specification. I am assuming that a downward slide of income status from 4^{th} quartile in first time period to 3^{rd} quartile in second time is equivalent to movement from 4^{th} quartile in first time period to 1^{st} quartile in second time period. While the first case is no doubt a worsening of economic status of a household, it is not as severe as the second case. To avoid this, I will redefine the dependent variable and divide that into six different types of worsening of income status namely, downward slide from quartile 4 to 3, downward slide from quartile 4 to 2, downward slide from quartile 4 to 1, downward slide from quartile 3 to 2, downward slide from quartile 3 to 1, downward slide from quartile 2 to 1. In this way, I am not assuming all downward slides in economic status to be equivalent. So, I will have six different specifications for the DiD model. For example, if I take the dependent variable as "downward slide from quartile 4 to 3", then this variable takes a value of 1 when a household slides down from quartile 4 in time period 1 to quartile 3 in time period 2 and 0 otherwise. Similarly, for all other 5 categories of dependent variable. So, my revised specification for downward slide from quartile 4 to 3 looks like this,

$$\textbf{Downward Slide Income Quartile 4 to 3}_{it} = \beta_0 + \beta_1 \textbf{ Time}_i + \beta_2 \textbf{ Treatment}_i + \beta_3 \textbf{ Time*Treatment}_{it} + U_{it}$$

Here, I have not controlled for other factors which may also affect economics status rather than the daughter's marriage. Controlling for all these other factors, my final model looks like this,

Downward Slide Income Quartile 4 to 3_{it} = β_0+ β_1 Time$_i$ + β_2 Treatment$_i$ + β_3 Time*Treatment$_{it}$ + β_4 Family Size$_{it}$ + β_5 Gender Head$_{it}$ + β_6 Age Head$_{it}$ + β_7 Marital Status Head$_{it}$ + β_8 MI Illness$_{it}$ + β_9 MI Drought$_{it}$ + β_{10} MI Job Loss$_{it}$ + β_{11} MI Crop Failure$_{it}$ + β_{12} MI Death$_{it}$ + β_{13} MI Other Loss$_{it}$ + U$_{it}$

In this model, I have added additional controlled variables:

Family Size: This is the total number of members in a household. Depending on the number of people in the households, income will vary. I am not certain of the sign of the coefficient, it can go either direction. If most of the family members are working, then it might positively affect the financial status of the household while on the other hand if most of the members in the family are not working, then it will negatively affect the income status of the households.

Gender Head: Depending on the gender of the head of the household who is also the respondent, income reporting may vary. As for some households, head of the households changed between the surveys, so I controlled for this possible change.

Age Head: Depending on the age of the head households, way they perceive and report income may vary. When the head of the household changes but gender remains the same, age of the households may vary significantly and hence the way they report income may vary and I want to control for that.

Marital Status: Income reporting may vary depending on the marital status of the respondent. This is particularly true when marital status changes from time period one to two and I want to control for this.

Major Incidence: There was a survey question that asked whether the household incurred a significant expense between the two surveys in the event of illness, death, loss of job, crop failure, marriage expenses, drought or any other incidences. This variable is called major incidences. I would want to control for these expenses to find the impact of daughter's marriage

on financial condition of the households. So, I include all the categories of major incidences except the incidence of the marriage expenses. Since the dependent variable is slide in income status from quartile 4 in first time period to quartile 3 in the second time period, I would expect the coefficient of all major incidences to be positive.

As explained before, the variable of our interest is β_3 which will give the causal effect of daughter's marriage on the financial condition of the household. As dependent variable is downward income mobility of households from first time period to second time period, I would expect the sign of this variable to be positive or it may not be significant. Similarly, I ran different regressions for all the quartile slide in status namely, downward movement quartile 4 to 2, downward movement quartile 4 to 1, downward movement quartile 3 to 2, downward movement quartile 3 to 1, downward movement quartile 2 to 1. In all these regressions, I am interested in the sign of the interaction term Time*Treatment. So, my hypothesis is,

Hypothesis: Daughter's marriage (dowry) has no significant effect in worsening the income status of a household.

In terms of regression equation, I hypothesize that $\beta_3=0$ and the coefficient of the interaction in all the other equations (only one type of worsening of economic status as dependent variable is shown above) to be zero.

If the coefficient of the interaction term is significantly positive when dependent variable is "down slide income quartile 4 to 3", and not significant for the other equations, it would mean that daughter's marriage (dowry) seem to have significant financial burden only on the highly rich people (people at top quartile in income status), while its financial burden on rich, middle income and poor are not significant. However, if I find the coefficient to be positively significant in all the equations, it will tell that dowry has drastic financial impact, possibly forcing people

into poverty trap. For example, if people move down from top quartile to lowest quartile because of dowry expenses, this impact is huge.

So far, I have been concentrated on daughter's marriage. I would be also interested in knowing what happens to my results if I consider son's marriage rather than daughter's marriage. As anecdotal evidence suggests that families give dowry in daughter's marriage while receive dowry in son's marriage, I would expect the effect of son's marriage to be opposite to that of daughter's marriage or its effect may not be significant. So, I run all the above regression by replacing daughter's marriage by son's marriage and see if the results change. It is to be noted that the treatment group here would be those households who married their son and controlled group will be those households who did not marry their son in between the two surveys, in other words, control group now will be those households who either married their daughter or those households who had no marriage between the surveys.

Chapter 5

Results:

Here I present the result of my DiD model. I start with the most general specification where the dependent variable is Income Quartile. With this, I want to know the general tendency of income mobility over time which may be due to various factors including daughter's marriage. This result is presented below.

Table 5.5: DiD regression result, using Income Quartile as the dependent variable

Exogenous Variables	(1)	(2)	(3)
Constant	2.474 (0.0077)***	1.745 (0.025)***	1.729 (0.0249)**
Time	-0.00005 (0.0109)	-0.073 (0.0108)***	0.021 (0.012)*
Daughter's Marriage	0.093 (0.0144)***	-0.053 (0.0142)***	-0.057 (0.0141)***
Time* Daughter's Marriage	-0.002 (0.0203)	0.142 (0.0199)***	0.159 (0.0198)***
Family Size		0.104 (0.002)***	0.107 (0.002)***
Gender of Head		-0.024 (0.0175)	-0.022 (0.0174)
Age of Head		0.007 (0.0004)***	0.007 (0.0004)***
Marital Status of Head		-0.053 (0.0081)***	-0.055 (0.008)***
Major Incidence: Illness			-0.089 (0.0143)***
Major Incidence: Drought			-0.263 (0.0254)***
Major incidence: Job Loss			0.353 (0.05)***
Major Incidence: Crop Failure			-0.364 (0.0183)***
Major Incidence: Death			-0.042 (0.0159)**
Major Incidence: Other loss			0.21 (0.0424)***
R^2	0.0014	0.0548	0.0691
No. of Observations	58986	58982	58732

Note: Standard errors in parenthesis.
* Statistically significant at the 10% level of significance, ** Statistically significant at the 5% level of significance, *** Statistically significant at the 1% level of significance.

I have presented here 3 models. The first model is the simplest form of DiD model where I have only three independent variables, two dummies Time and Treatment (daughter's marriage) and the variable of interest, the interaction term. Subsequently, I keep on adding controlled variables to reach to model 3, which is the final model. Now, let us examine the coefficient of the final model. The coefficient of time although positive it is insignificant. The coefficient of treatment is negatively significant which means treatment effect (daughter's marriage) has negative impact on economic status keeping other things constant. However, I am not interested in the coefficient of treatment effect, instead interested in coefficient of the interaction term which will give us the causal effect of dowry. As you can see, the coefficient of this interaction term is significantly positive. This means that the overall effect of dowry is positive in enhancing the economic status. This sounds counter intuitive. Please note that this is an overall effect. This could be due to the fact that some households might have become worse off while others became better off and the effect of those who became better off might offset those who became worse off. This is interesting. This means that daughter's marriage seems to have positive financial impact for some households while it has adverse impact for others. It is worth looking for which type of households it has positive impact and for which households it has negative impact. Another reason could be due to time trend. As you can see from the regression that the coefficient of the treatment effect is significantly negative while that of time is positively significant and the causal effect is the interaction between these two. The effect of these two might off set each other and I am getting an overall positive impact of dowry in enhancing economic condition. Given this counter intuitive overall positive impact of dowry on economic status, I might understand better if I dig further to see for which households it has positive effect and for which households it has negative impact. To do this, I will divide our entire sample into different groups and see what is

happening in each group. Given the question of interest and popular belief that dowry has adverse financial impact, I would be looking at those households whose financial status worsened from first time period to second time period, namely, those who moved from quartile 4 to 3, quartile 4 to 2, quartile 4 to 1, quartile 3 to 2, quartile 3 to 1, and quartile 2 to 1. I want to look at if the worsening of financial status for these households is due to daughter's marriage or not. Now the question is can I club all these households and see the effect of daughter's marriage. This will not be best strategy because I can't assume the movement from quartile 4 to 3 is same as from quartile 4 to 1 because the first movement as not as severe as the second one. So, the best strategy would be to look at each group separately. My DiD model remains the same as the general DiD model presented above except that the dependent variable would change. I created six different binary dependent variables for six groups. For example, for those households who moved from quartile 4 to 3, I created a binary dependent variable which takes a value of 1 only if a household moved from quartile 4 to 3, and 0 otherwise. Similarly, I created other dependent variables for the other five groups. Since I am interested in the coefficient of the interaction term, I present here the case when dependent variable is movement from quartile 4 to 3 and quartile 2 to 1 as I did not find the coefficient term to be significant for the other groups and the result is put in the appendix. Now, let's look at the result where the dependent variable is downward movement from quartile 4 to 3.

Table 5.6: DiD regression result, using downward income movement from quartile 4 to 3 as the dependent variable.

Exogenous Variables	(1)	(2)	(3)
Constant	8.34836E-18 (0.0012)	-0.015 (0.0038)***	-0.016 (0.0038)***
Time	0.057 (0.0016)***	0.056 (0.0017)***	0.059 (0.0018)***
Daughter's Marriage	-4.7705E-18 (0.0021)	-0.002 (0.0022)	-0.002 (0.0022)
Time* Daughter's Marriage	0.006 (0.003)*	0.008 (0.0031)***	0.009 (0.003)***
Family Size		0.002 (0.0003)***	0.002 (0.0003)***
Gender of Head		0.005 (0.0027)**	0.005 (0.0027)**
Age of Head		0.00008 (0.00005)	0.00009 (0.00005)*
Marital Status of Head		-0.001 (0.0012)	-0.002 (0.0012)
Major Incidence: Illness			-0.005 (0.0022)**
Major Incidence: Drought			-0.020 (0.0039)***
Major incidence: Job Loss			0.042 (0.0063)***
Major Incidence: Crop Failure			-0.022 (0.0028)***
Major Incidence: Death			0.009 (0.0025)***
Major Incidence: Other loss			-0.007 (0.0065)
R^2	0.0304	0.0309	0.0342
No of observations	58986	58982	58732

Note: Standard errors in parenthesis.
* Statistically significant at the 10% level of significance, ** Statistically significant at the 5% level of significance, *** Statistically significant at the 1% level of significance.

As noted before, I am particularly interested in the coefficient of the interaction term. As you can see in the last model, which is the final model, the coefficient of the interaction term here is significantly positive which means that daughter's marriage contributes to worsening of

economic status as our dependent variable is downward movement from quartile 4 to 3. So, for this group of households, daughter's marriage has adverse impact. I have not presented here the result for the other dependent variables, downward movement from quartile 4 to 2, downward movement from quartile 4 to 1, downward movement from quartile 3 to 2, downward movement from quartile 3 to 1 as the interaction term is not significant for these group of households. Now, let's look at the result of DiD regression where the dependent variable is downward movement 2 to 1.

Table 5.7: DiD regression result, using downward income movement from quartile 2 to 1 as the dependent variable.

Exogenous Variables	(1)	(2)	(3)
Constant	-1.0842E-19 (0.0013)	0.028 (0.0043)***	0.03 (0.0043)***
Time	0.076 (0.0018)***	0.079 (0.0018)***	0.069 (0.002)***
Daughter's Marriage	8.67362E-19 (0.0024)	0.006 (0.0024)***	0.007 (0.0024)***
Time* Daughter's Marriage	-0.006 (0.0034)*	-0.012 (0.0034)***	-0.014 (0.0034)***
Family Size		-0.005 (0.0003)***	-0.005 (0.0003)***
Gender of Head		0.001 (0.003)	0.0004 (0.003)
Age of Head		-0.0001 (0.00006)*	-0.0001 (0.00006)*
Marital Status of Head		-0.001 (0.0014)	-0.001 (0.0014)
Major Incidence: Illness			0.003 (0.0025)
Major Incidence: Drought			0.016 (0.0043)***
Major incidence: Job Loss			-0.039 (0.007)***
Major Incidence: Crop Failure			0.04 (0.0031)***
Major Incidence: Death			0.014 (0.0027)***
Major Incidence: Other loss			-0.021 (0.0073)***
R^2	0.0387	0.0422	0.0474
No of observations	58986	58982	58732

Note: Standard errors in parenthesis.
* Statistically significant at the 10% level of significance, ** Statistically significant at the 5% level of significance, *** Statistically significant at the 1% level of significance.

As before, I would look at the coefficient of the interaction term. As you can see, the coefficient of the interaction term here is negatively significant which means that for these group of households, daughter's marriage seems to have positive financial impact. The reason for their downward movement in economic status is not daughter's marriage, but because of other major incidences of financial expenses whose effect has offset the positive financial impact of daughter's marriage. As you can see most of the major incidences have adverse impact on economic status which may have off set the daughter marriage's positive impact because of the fact that their financial status indeed worsened. As noted earlier, daughter's marriage seems to have positive financial impact on households who are on bottom ladder of the economic status, specifically those who are in the quartile 2 of the income status, while it has adverse impact on the richest households, those who are on the top quartile of income status. Now, it has become clear why the overall impact of daughter's marriage on economic status was positive as was shown earlier. It is due to the positive impact on some households must have offset the negative impact on other households. So, the story so far is that daughter's marriage seems to have adverse financial impact for some households while it has positive impact for other households and its impact on the rest households whose financial impact worsened seems insignificant.

Now, I can verify what happens when our treatment group changes from those households who married their daughter to those households who married their son. The control group now becomes those households who did not marry their son between the two period, in other words, control group are those who married daughter only and those with no marriages between the surveys. So, I ran all the DiD regression similar to those when the treatment group was those households who married their daughter, now it is those households who married their son. First, let us look at the overall impact of son's marriage (results are in the appendix).

As you can see in the last model, the coefficient of the interaction term is positively significant which means son's marriage seems to have overall positive impact on financial status. This is expected as when you expect daughter's marriage to have negative financial impact, this automatically means son's marriage will have positive impact. Now, let's look at all those groups of households whose financial situation worsened separately as I did with daughter's marriage households. So, I ran all the DiD regressions again as I did earlier for daughter's marriage, now it is for son's marriage. The regression result when the dependent variable is downward movement from quartile 4 to 3, quartile 4 to 2, quartile 3 to 2 and quartile 2 to 1 is shown in the appendix. The regression with other dependent variables are not shown as the interaction term is not significant for the downward movement in other quartiles.

First, let's look at the results when the dependent variables are downward movement from quartile 4 to 3 and quartile 4 to 2 (results in the appendix). As you can see, in both the cases the interaction term is positively significant which means boy's marriage has also adverse financial impact. In this case adverse financial is even severe compared to those with daughter's marriage as son's marriage not only affects adversely in movement from quartile 4 to 3 but also in movement from quartile 4 to 2. Now, if you look at the result when the dependent variable is downward movement from quartile 2 to 1 or 3 to 2 (results in the appendix), you can see that the coefficient of the interaction term is negatively significant which means boy's marriage seems to have positive impact in enhancing economic status for these groups and this is expected.

Result Discussion:

I started with evaluating the financial impact of daughter's marriage. In daughter's marriage, a lion's share of wedding expenses is in the form of dowry expenses. So, I used daughter's marriage as a proxy for dowry expenses. I found that daughter's marriage significantly worsens

the financial condition of the richest people (those who are on the top quartile of the income status), however its impact on lower middle class people (those who are on second quartile of the income status) seems to be positive. This could be due to daughter's marriage to a higher income status household, and there by benefiting indirectly from the daughter's in-laws by facilitating/engaging the household member in new income generating avenues. So, the conclusion I can derive from the results is that daughter's marriage (dowry) has significant adverse impact on the richest people, while its impact on the other people in the income status seems insignificant. In fact, people on the lower middle class seems to be benefiting from daughter's marriage signaling that dowry expenses are not that high even if it exists for these lower income people. This also means the amount of dowry may be too high for the richest people because of which their financial condition worsens. The same story applies when there is son's marriage. Son's marriage seems to have severe financial impact for the richest (this impact is even higher compared with when there is daughter's marriage) while it benefits those who are middle income people (those who are on quartile 2 or 3 of the income status). Benefiting from son's marriage is expected is in case of son's marriage dowry is expected to come into the family. The puzzling issue is how son's marriage affects the richest while dowry is expected to come in. The possibility of bride price in Indian context is very low. So, the only possibility is that for rich, wedding expenses of son's marriage is so high that it severely affects their financial condition. So, the conclusion I can derive is that for richest people, it does not matter whether there is son's marriage or daughter's marriage in the family, it is going to have adverse financial impact. In case of son's marriage, wedding expenses will make sure there is adverse financial impact while in case of daughter's marriage, dowry expenses (also wedding expenses) will ensure financial burden. For lower middle income people (those who are on the second), both

son's marriage and daughter's marriage will have positive financial impact. Positive impact from boy's marriage is expected while that from daughter's marriage comes in an indirect way.

Robustness:

Now I am interested in how robust is our results. I defined the treatment group to be those households who married their daughter and would include those who married both son and daughter. However, if there is both son and daughter marriage, then financial impact could be negligible if the opposing effect cancels each other. Moreover, if there were more number of son's marriage than daughter's marriage, which will effectively become son's marriage, which I might have considered them under control group. To avoid this, I would be interested in knowing what happens when the treatment group becomes those households who married their daughter only. I have been assuming throughout that son's marriage is likely to have opposite financial effect than that of daughter's marriage. However, if their effect is in the same direction, then if we compare the effect of daughter's marriage with that of son's marriage, we may not find any significant difference. To avoid this let us redefine the control group to be those households who did not marry their son or daughter (households with no marriages). Please note I have changed both treatment and control group in this specification compared to the way we defined treatment and control group earlier. With this specification, I ran all the previous regressions. I find that the sign and significance levels of all the previous regressions remain intact with only one exception. With the revised treatment group, I do not find significant positive impact when the dependent variable is "down quartile 3 to 2" with only son's marriage as treatment group although we have the same sign as with previous result. I have kept all these results in the appendix.

Chapter 6

Conclusion:

This paper is an attempt to quantify the financial burden of dowry. Given the nature of dowry payment, it is almost impossible to estimate its value. Given the anecdotal evidence and from the previous studies, the practice and magnitude of dowry payment is on rise, I used daughter's marriage as a proxy for occurrence of dowry. I utilized the two round of multi-topic survey data that was produced by NCAER in collaboration with University of Maryland. Given that there was a gap of 5-6 years between the two rounds of surveys in 2005 and 2011, it was an ideal duration of time to find some households would marry their daughter or son or both and yet there would be households who did not marry either their daughter or son. To find the causal relationship between daughter's marriage and financial impact, I used DiD method. To measure the financial status of households, we used income as a measure and divided the entire sample into quartiles to see how they moved from initial position in the second period. I was considering the relative position of all households as we tracked all the households from first round of survey to the second round of survey.

I found a rather surprising overall financial impact of daughter's marriage: daughter's marriage had overall positive financial impact on people which is counter intuitive. This motivated me to look at effect of daughter's marriage on different sections of the population separately. I looked at those households whose financial situation worsened from first round of survey to second round of survey to see if that happened because of daughter's marriage. I found that daughter's marriage had significant adverse financial impact for richest people while it had positive impact for the lower income people. Similar story was found when I considered son's marriage rather

than daughter's marriage. In fact, financial impact of son's marriage was even more serious for the richest people.

From the analysis, I can conclude that the richest people get affected my marital expenses the most be it daughter's marriage or son's marriage. Marital expenses seem to have no significant financial impact on other sections of the population while it has positive impact on lower income people. Financial impact from daughter's marriage can be attributed to dowry expenses while that of son's marriage can be attributed to the wedding expenses as the case of bride price is very rare in Indian societies. I conclude that dowry seems to have significant financial impact for the richest people contrary to the popular belief that it adversely affects the lower income people.

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APPENDIX-A

Summary Statistics of Selected Variables

Occupation	Frequency		Percentage	
	Round 1	Round 2	Round 1	Round 2
Cultivation	7405	7488	25.11	25.4
Allied Agriculture	285	302	0.97	1.02
Agricultural labor	4273	3145	14.49	10.67
Non-agricultural labor	5337	6309	18.1	21.4
Artisan	1752	476	5.94	1.61
Petty trade	1316	3205	4.46	10.87
Business	1643	422	5.57	1.43
Salaried	5373	5491	18.22	18.62
Profession	295	162	1	0.55
Pension/Rent	1069	1609	3.62	5.46
Others	745	873	2.53	2.96
Region				
Rural	20011	67.85	20011	67.85
Urban	9482	32.15	9482	32.15
Marital Status of Head				
Married, Spouse Absent	384	899	1.3	3.05
Married	25683	23541	87.08	79.83
Unmarried	326	322	1.11	1.09
Widowed	2943	4540	9.98	15.4
Separated/Divorced	155	187	0.53	0.63
Married, no gauna	2	0	0.01	0
Gender of the Head				
Male	26687	25055	90.49	84.96
Female	2806	4434	9.51	15.04

Variables	Mean		Standard Deviation		Number of observation	
	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2
Highest numbers of schooling for adult	7.2586	8.42047	5.08076	5.14647	29493	29486
Family Size	5.01363	5.04591	2.11712	2.4421	29493	29493
Age of the Head	46.6142	51.3857	13.25	12.5229	29493	29489

Major Incidences Statistics

Major Incidences	Frequency	Percentage
Illness	8173	27.75
Draught	2286	7.76
Loss of Job	732	2.48
Crop failure	4843	16.44
Death	5924	20.11
Marriage	9730	33.03
Other loss	665	2.27

APPENDIX- B

Caste wise Distribution of Income

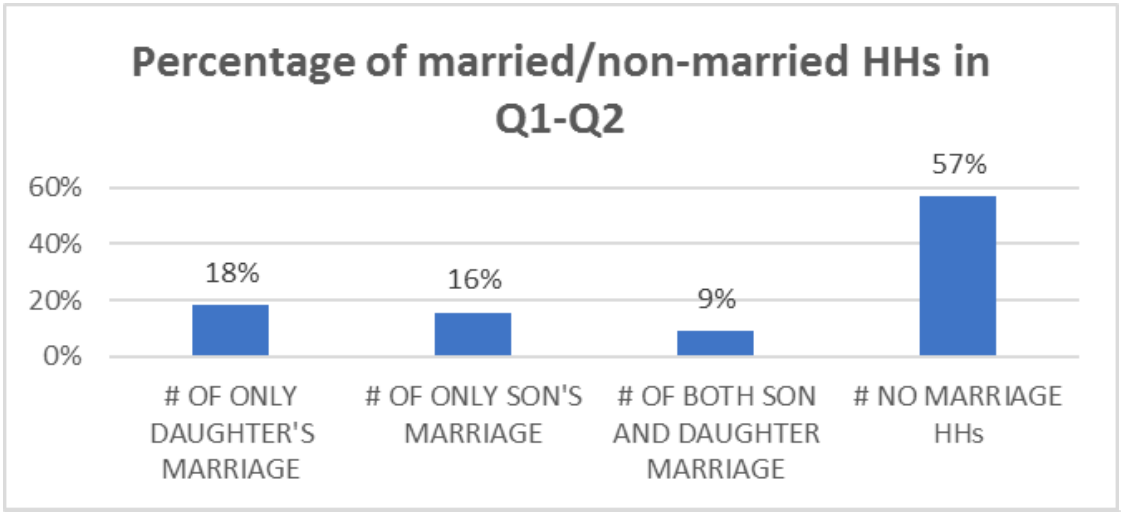
Caste	Mean		Standard Deviation		% increase in Income	No of observation
	Round 1	Round 2	Round 1	Round 2		
Brahmin	78907.08	109882.8	80564.81	141929.45	39%	1652
High Caste	71625.58	104397.52	124130.29	204180.16	46%	5026
OBC	42945.37	64349.44	59420.01	94321.48	50%	10267
Dalit	35047.35	57569.39	38182.95	102495.03	64%	6142
Adivasi	28222.5	39910.52	42232.84	51662.89	41%	2166
Muslim	46024.11	68781.64	65781.6	94271.4	49%	3223
Sikh, Jain & Christian	82160.27	132185.58	98574.15	181241.99	61%	1017
Total	48809.83	73341.38	75636.97	127814.81	50%	29493

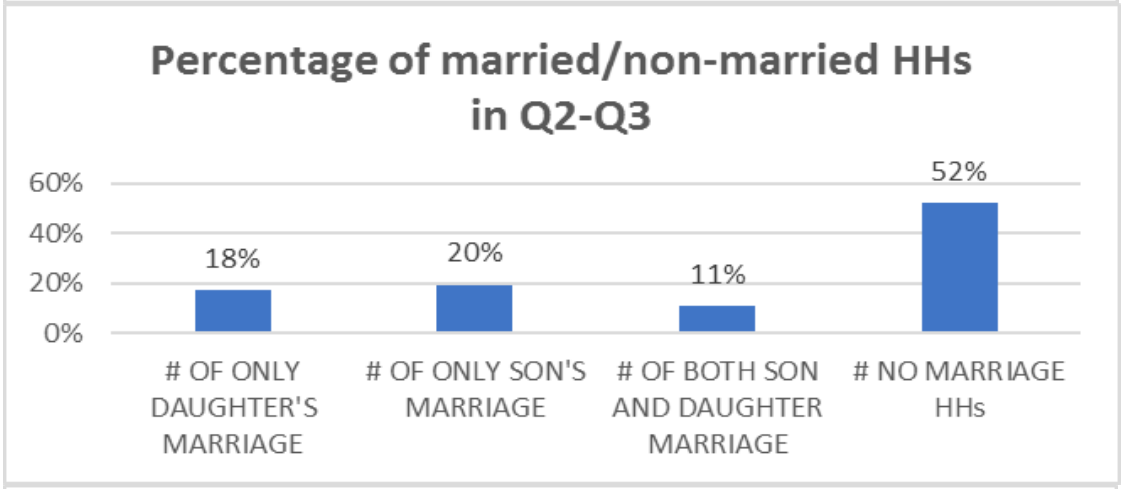
Quartile wise distribution of Monthly Consumption per capita

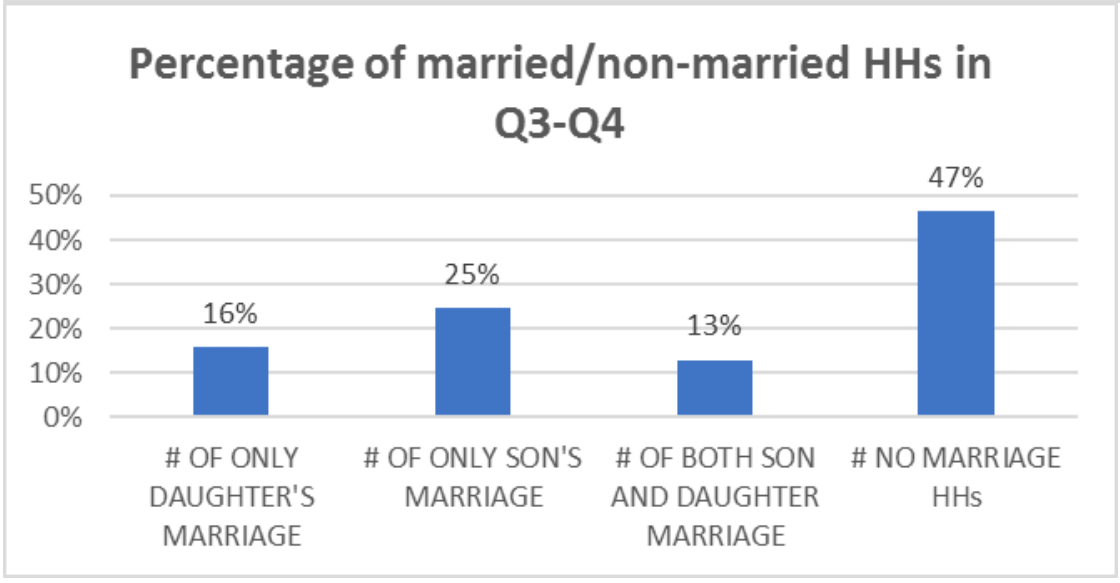
Quartile	Mean		Standard Deviation		No. of Observations	
	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2
Q1	315.32244	420.42409	83.596959	101.86763	7375	7373
Q2	544.40789	718.12949	66.089802	87.152436	7377	7373
Q3	835.53838	1116.52	112.73248	153.92643	7374	7374
Q4	1957.6	2757.09	1410.1	2444.71	7367	7373

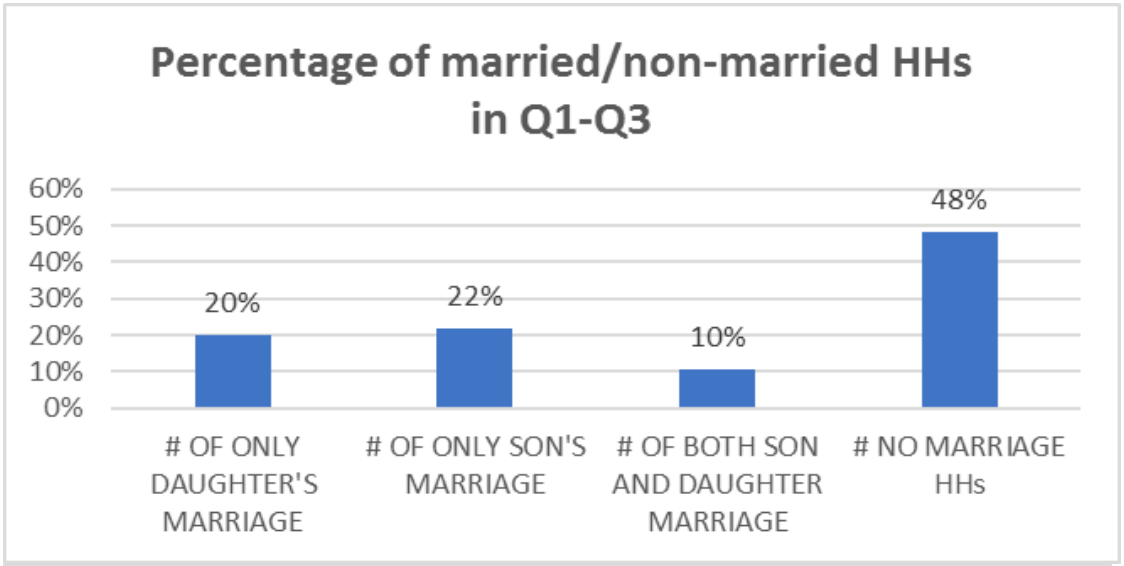
APPENDIX-C

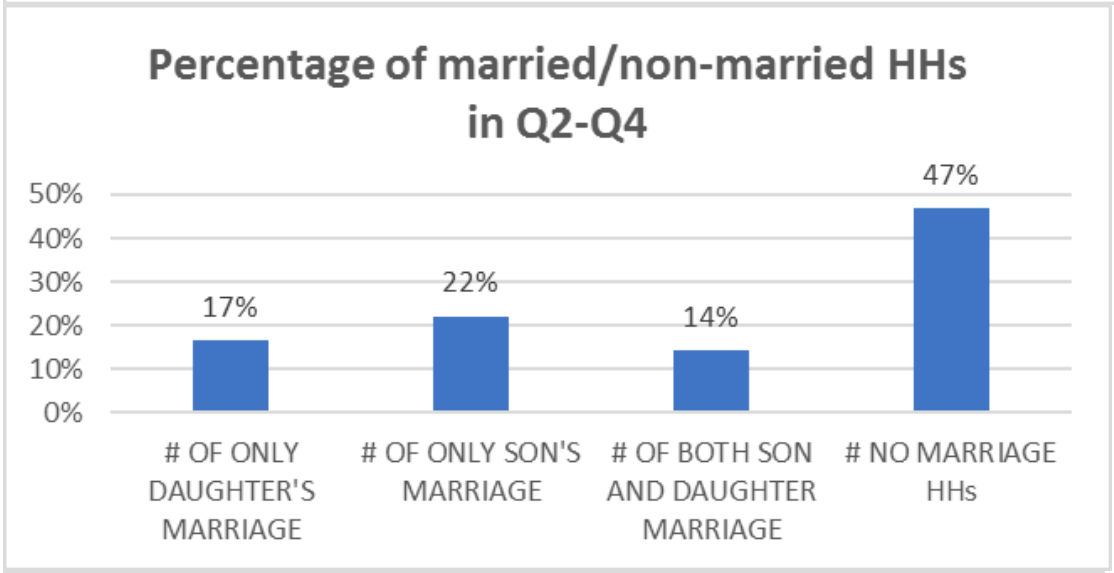
Number of marriages for those who became better off in 2nd round of survey.

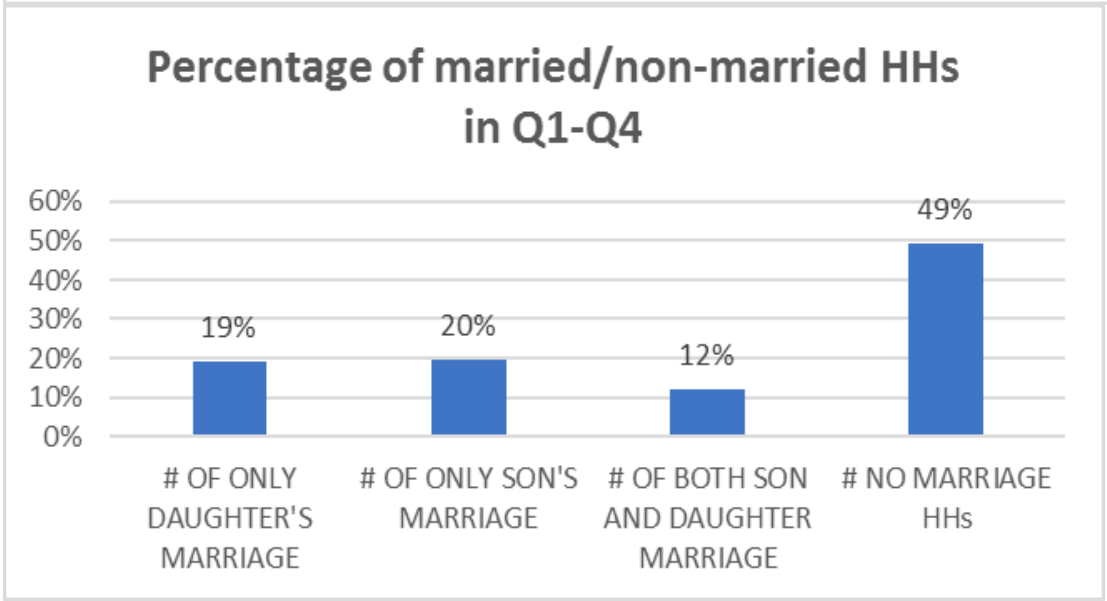




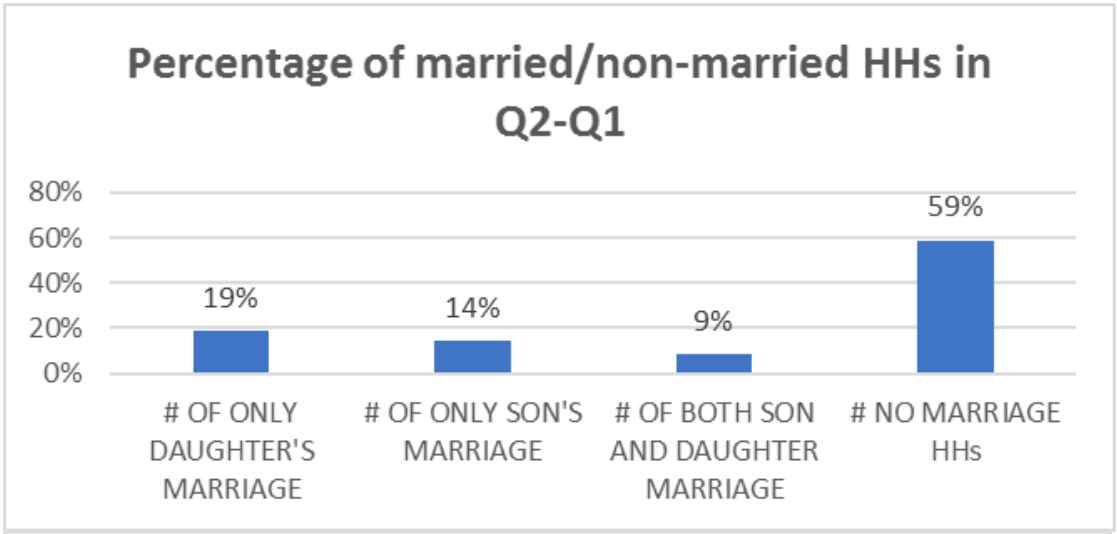


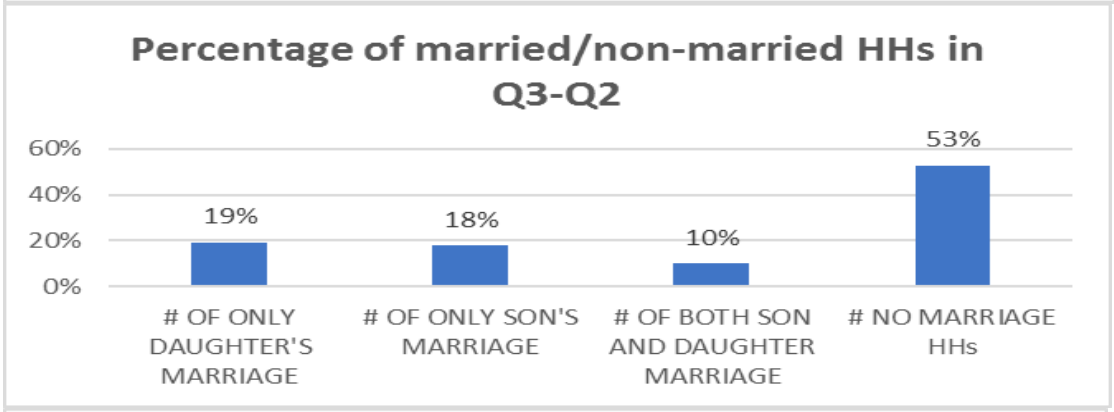

Percentage of married/non-married HHs in Q1-Q3
60%
50%
40%
30%
20%
10%
0%
20%
22%
10%
48%
OF ONLY DAUGHTER'S MARRIAGE
OF ONLY SON'S MARRIAGE
OF BOTH SON AND DAUGHTER MARRIAGE
NO MARRIAGE HHs

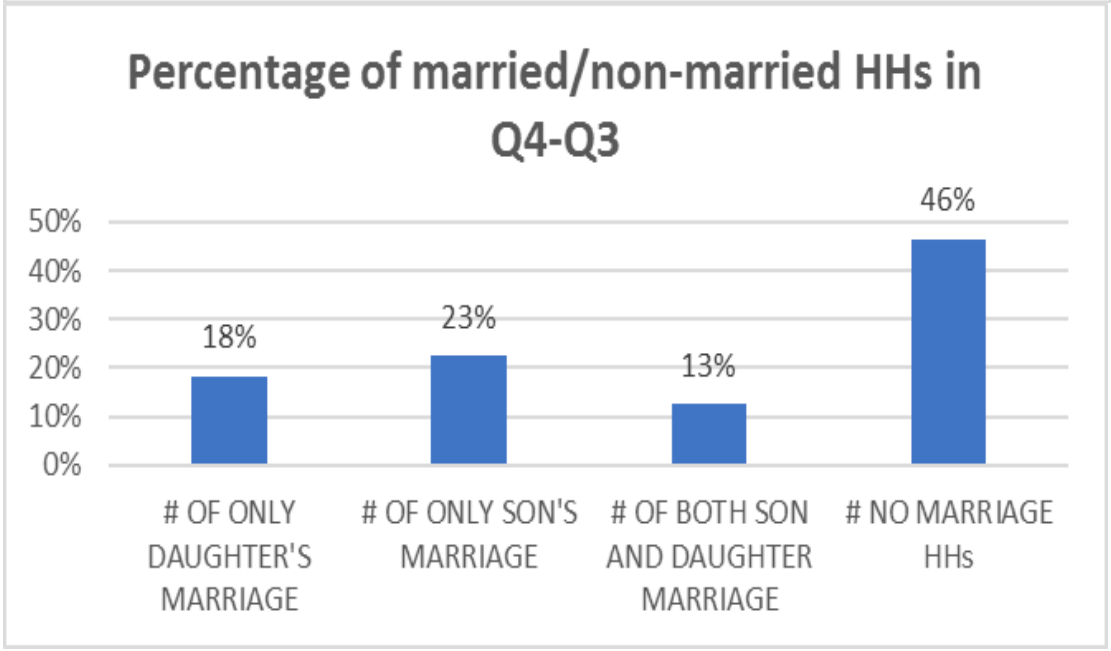

Percentage of married/non-married HHs in Q2-Q4
50%
40%
30%
20%
10%
0%
17%
22%
14%
47%
OF ONLY DAUGHTER'S MARRIAGE
OF ONLY SON'S MARRIAGE
OF BOTH SON AND DAUGHTER MARRIAGE
NO MARRIAGE HHs

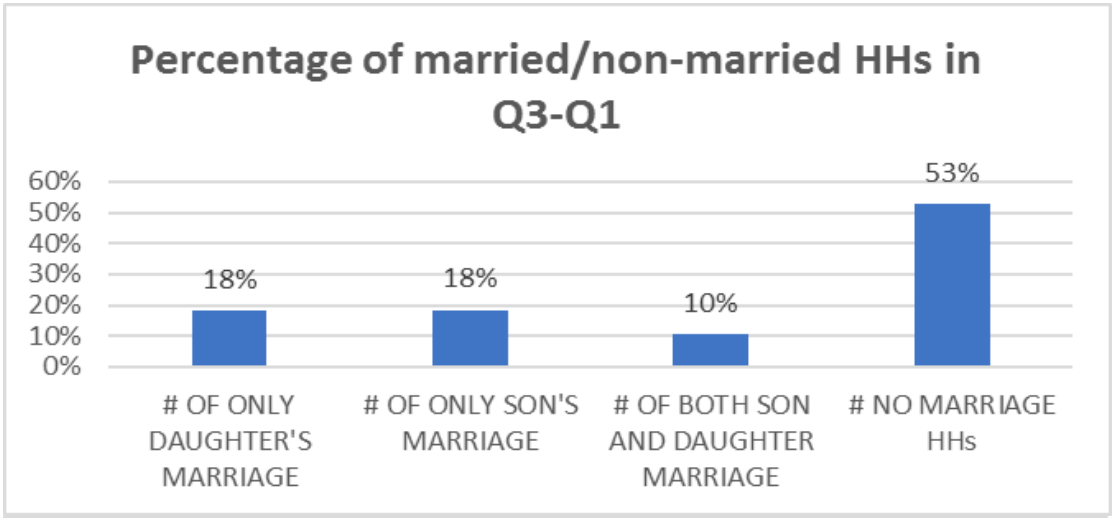

Percentage of married/non-married HHs in Q1-Q4
60%
50%
40%
30%
20%
10%
0%
19%
20%
12%
49%
OF ONLY DAUGHTER'S MARRIAGE
OF ONLY SON'S MARRIAGE
OF BOTH SON AND DAUGHTER MARRIAGE
NO MARRIAGE HHs

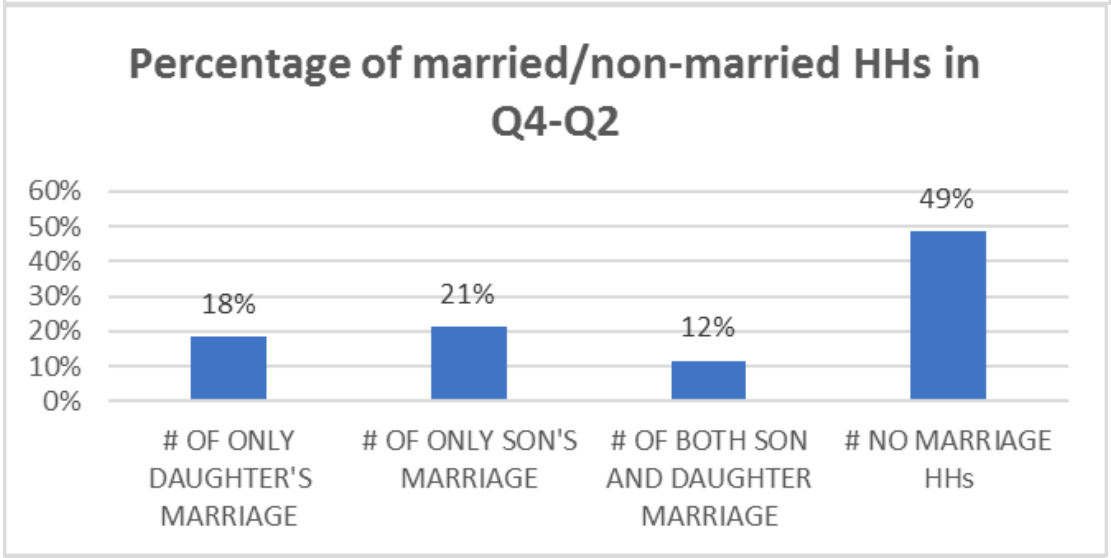
Number of marriages for those who became worse off in 2nd round of survey.

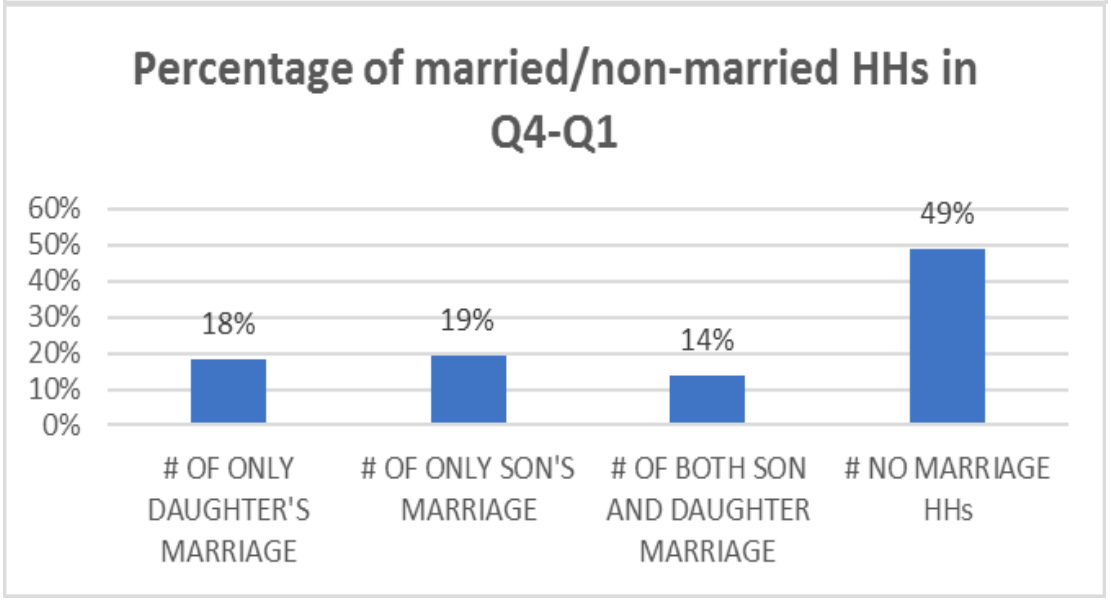




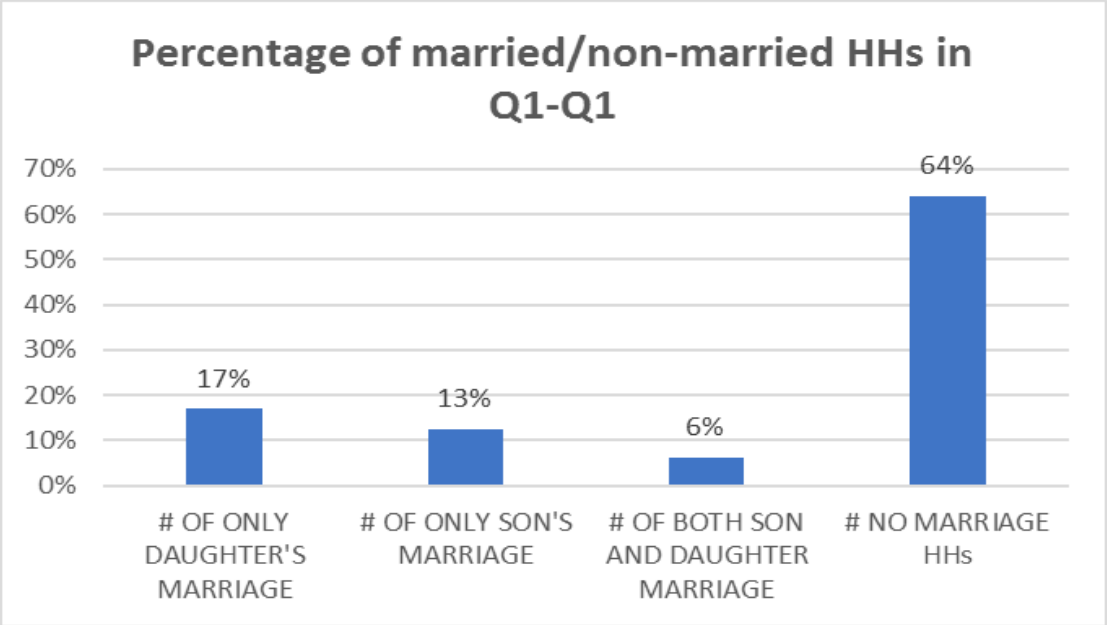


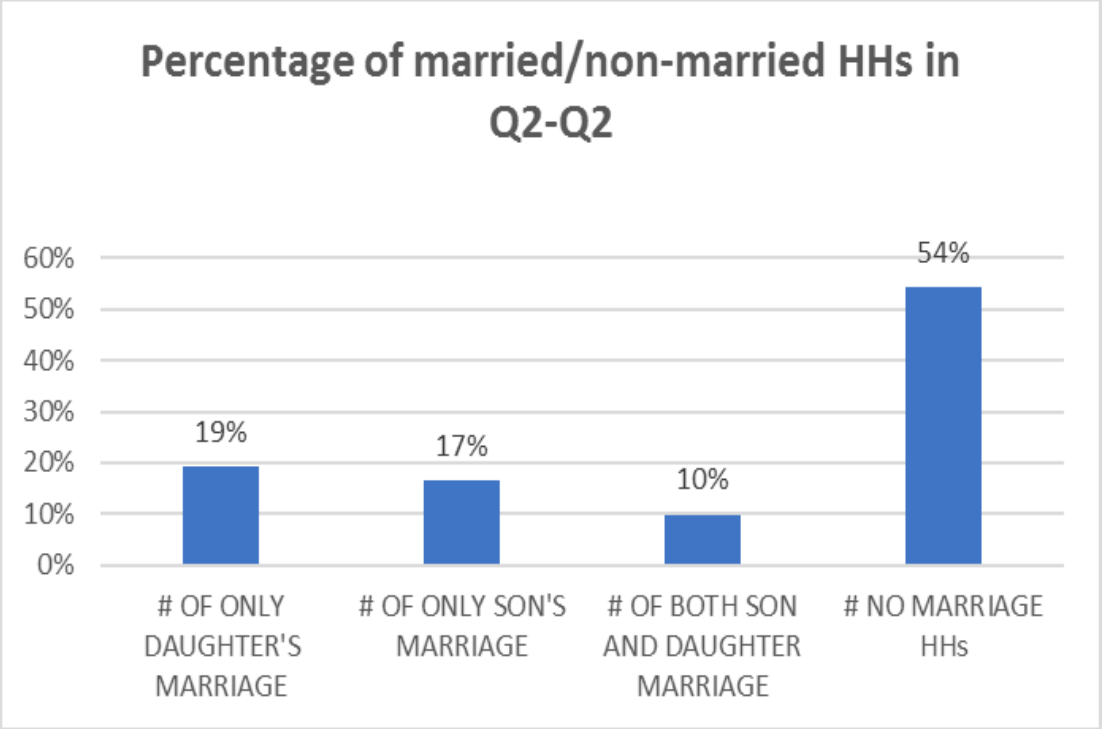

Percentage of married/non-married HHs in Q3-Q1
60%
50%
40%
30%
20%
10%
0%
18%
18%
10%
53%
OF ONLY DAUGHTER'S MARRIAGE
OF ONLY SON'S MARRIAGE
OF BOTH SON AND DAUGHTER MARRIAGE
NO MARRIAGE HHs

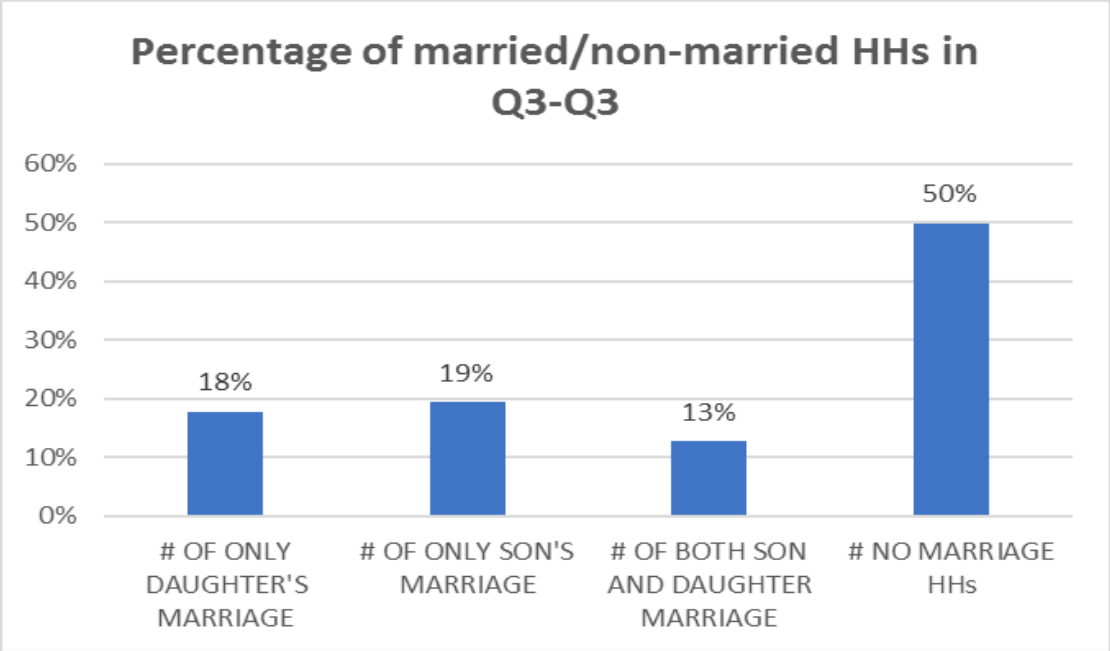

Percentage of married/non-married HHs in Q4-Q2
60%
50%
40%
30%
20%
10%
0%
18%
21%
12%
49%
OF ONLY DAUGHTER'S MARRIAGE
OF ONLY SON'S MARRIAGE
OF BOTH SON AND DAUGHTER MARRIAGE
NO MARRIAGE HHs

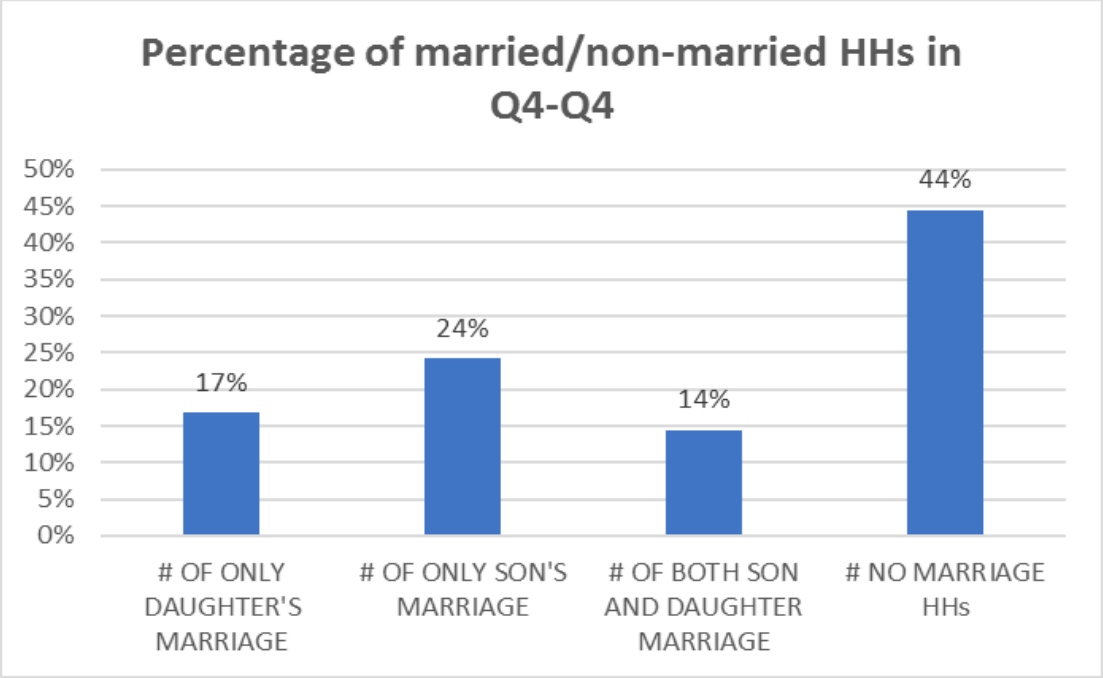

Percentage of married/non-married HHs in Q4-Q1
60%
50%
40%
30%
20%
10%
0%
18%
19%
14%
49%
OF ONLY DAUGHTER'S MARRIAGE
OF ONLY SON'S MARRIAGE
OF BOTH SON AND DAUGHTER MARRIAGE
NO MARRIAGE HHs

No of marriages for those who remained in the same financial status in 2nd round of survey.






Percentage of married/non-married HHs in Q3-Q3
60%
50%
40%
30%
20%
10%
0%
18%
19%
13%
50%
OF ONLY DAUGHTER'S MARRIAGE
OF ONLY SON'S MARRIAGE
OF BOTH SON AND DAUGHTER MARRIAGE
NO MARRIAGE HHs


Percentage of married/non-married HHs in Q4-Q4
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
17%
24%
14%
44%
OF ONLY DAUGHTER'S MARRIAGE
OF ONLY SON'S MARRIAGE
OF BOTH SON AND DAUGHTER MARRIAGE
NO MARRIAGE HHs

APPENDIX-D

DiD regression result, using Income Quartile as the dependent variable (Treatment group=Son's Marriage).

Exogenous Variables	(1)	(2)	(3)
Constant	2.42367 (0.00773)***	1.74231 (0.02498)***	1.72760 (0.02484)***
Time	-0.01264 (0.01093)	-0.04712 (0.01087)***	0.04940 (0.01199)***
Son's Marriage	0.25657 (0.01412)***	0.15608 (0.01392)***	0.15374 (0.01381)***
Time* Son's Marriage	0.04047 (0.01997)**	0.05725 (0.01952)***	0.07451 (0.01943)***
Family Size		0.09680 (0.00199)***	0.09960 (0.00198)***
Gender of Head		-0.02925 (0.01744)*	-0.02696 (0.01734)
Age of Head		0.00688 (0.00035767)***	0.00691 (0.00035559)***
Marital Status of Head		-0.05151 (0.00805)***	-0.05346 (0.00801)***
Major Incidence: Illness			-0.08679 (0.01430)***
Major Incidence: Drought			-0.26026 (0.02530)***
Major incidence: Job Loss			0.34308 (0.04087)***
Major Incidence: Crop Failure			-0.36963 (0.01827)***
Major Incidence: Death			-0.05288 (0.01588)***
Major Incidence: Other loss			0.19909 (0.04232)***
R^2	0.0129	0.0597	0.0742
No of observations	58986	58982	58732

Note: Standard errors in parenthesis.
* Statistically significant at the 10% level of significance, ** Statistically significant at the 5% level of significance, *** Statistically significant at the 1% level of significance.

DiD regression result, using downward income movement from quartile 4 to 3 as the dependent variable (Treatment group=Son's marriage)

Exogenous Variables	(1)	(2)	(3)
Constant	1.04083E-17 (0.00116)	-0.01393 (0.00383)***	-0.01505 (0.00383)***
Time	0.05437 (0.00164)***	0.05368 (0.00167)***	0.05741 (0.00185)***
Son's Marriage	-1.0408E-17 (0.00211)	-0.00132 (0.00213)	-0.00155 (0.00213)
Time* Son's Marriage	0.01476 (0.00299)***	0.01505 (0.00299)***	0.01618 (0.00299)***
Family Size		0.00129 (0.00030511)***	0.00153 (0.00030553)***
Gender of Head		0.00541 (0.00267)**	0.00542 (0.00267)**
Age of Head		0.00007816 (0.00005483)	0.00008945 (0.00005476)
Marital Status of Head		-0.00140 (0.00123)	-0.00185 (0.00123)
Major Incidence: Illness			-0.00449 (0.00220)**
Major Incidence: Drought			-0.02002 (0.00390)***
Major incidence: Job Loss			0.04168 (0.00629)***
Major Incidence: Crop Failure			-0.02272 (0.00281)***
Major Incidence: Death			0.00812 (0.00245)***
Major Incidence: Other loss			-0.00739 (0.00652)
R^2	0.0311	0.0315	0.0348
No of observations	58986	58982	58732

Note: Standard errors in parenthesis.
* Statistically significant at the 10% level of significance, ** Statistically significant at the 5% level of significance, *** Statistically significant at the 1% level of significance.

DiD regression result, using downward income movement from quartile 4 to 2 as the dependent variable (Treatment group=Son's marriage)

Exogenous Variables	(1)	(2)	(3)
Constant	7.58942E-19 (0.00079632)	-0.00115 (0.00264)	-0.00153 (0.00264)
Time	0.02576 (0.00113)***	0.02537 (0.00115)***	0.02441 (0.00127)***
Son's Marriage	-2.6021E-18 (0.00145)	0.00015442 (0.00147)	0.00010884 (0.00147)
Time* Son's Marriage	0.00389 (0.00206)*	0.00409 (0.00206)**	0.00404 (0.00206)**
Family Size		-0.00047386 (0.00021009)**	-0.00042903 (0.00021054)**
Gender of Head		0.00020583 (0.00184)	0.00045333 (0.00184)
Age of Head		0.00006666 (0.00003775)*	0.00006927 (0.00003773)*
Marital Status of Head		0.00012136 (0.00084954)	-0.00006024 (0.00084965)
Major Incidence: Illness			0.00327 (0.00152)**
Major Incidence: Drought			-0.00658 (0.00268)**
Major incidence: Job Loss			0.00965 (0.00434)**
Major Incidence: Crop Failure			-0.00361 (0.00194)*
Major Incidence: Death			0.00424 (0.00169)**
Major Incidence: Other loss			0.00274 (0.00449)
R^2	0.0138	0.0139	0.0145
No of observations	58986	58982	58732

Note: Standard errors in parenthesis.
* Statistically significant at the 10% level of significance, ** Statistically significant at the 5% level of significance, *** Statistically significant at the 1% level of significance.

DiD regression result, using downward income movement from quartile 3 to 2 as the dependent variable (Treatment group=Son's marriage).

Exogenous Variables	(1)	(2)	(3)
Constant	7.58942E-19 (0.00079632)	0.00909 (0.00398)**	0.00868 (0.00398)**
Time	0.02576 (0.00113)***	0.06671 (0.00173)***	0.06462 (0.00192)***
Son's Marriage	-2.6021E-18 (0.00145)	0.00061396 (0.00222)	0.00058645 (0.00222)
Time* Son's Marriage	0.00389 (0.00206)*	-0.00683 (0.00311)**	-0.00650 (0.00312)**
Family Size		0.00000419 (0.00031724)	0.00002423 (0.00031816)
Gender of Head		-0.00287 (0.00278)	-0.00268 (0.00278)
Age of Head		-0.00018039 (0.00005701)***	-0.00017730 (0.00005702)***
Marital Status of Head		0.00186 (0.00128)	0.00182 (0.00128)
Major Incidence: Illness			0.00690 (0.00229)***
Major Incidence: Drought			-0.00165 (0.00406)
Major incidence: Job Loss			0.00803 (0.00655)
Major Incidence: Crop Failure			0.00359 (0.00293)
Major Incidence: Death			-0.00011305 (0.00255)
Major Incidence: Other loss			-0.02239 (0.00679)***
R^2	0.0138	0.0333	0.0338
No of observations	58986	58982	58732

Note: Standard errors in parenthesis.
* Statistically significant at the 10% level of significance, ** Statistically significant at the 5% level of significance, *** Statistically significant at the 1% level of significance.

DiD regression result, using downward income movement from quartile 2 to 1 as the dependent variable (Treatment group=Son's marriage).

Exogenous Variables	(1)	(2)	(3)
Constant	0 (0.00129)	0.02615 (0.00426)***	0.02789 (0.00425)***
Time	0.08206 (0.00182)***	0.08282 (0.00185)***	0.07312 (0.00205)***
Son's Marriage	0 (0.00235)	0.00392 (0.00237)*	0.00415 (0.00236)*
Time* Son's Marriage	-0.02605 (0.00333)***	-0.02635 (0.00333)***	-0.02867 (0.00332)***
Family Size		-0.00445 (0.00033942)***	-0.00473 (0.00033946)***
Gender of Head		0.00119 (0.00297)	0.00057511 (0.00297)
Age of Head		-0.00010417 (0.00006099)*	-0.00010380 (0.00006084)*
Marital Status of Head		-0.00120 (0.00137)	-0.00098374 (0.00137)
Major Incidence: Illness			0.00300 (0.00245)
Major Incidence: Drought			0.01548 (0.00433)***
Major incidence: Job Loss			-0.03820 (0.00699)***
Major Incidence: Crop Failure			0.04095 (0.00313)***
Major Incidence: Death			0.01540 (0.00272)***
Major Incidence: Other loss			-0.01951 (0.00724)**
R^2	0.0406	0.0435	0.0490
No of observations	58986	58982	58732

Note: Standard errors in parenthesis.
* Statistically significant at the 10% level of significance, ** Statistically significant at the 5% level of significance, *** Statistically significant at the 1% level of significance.

APPENDIX-E

Robustness check (Treatment group = Daughter's marriage).

DiD regression result, using Income Quartile as the dependent variable.

Exogenous Variables	(1)	(2)	(3)
Constant	2.40281 (0.00897)***	1.71644 (0.02943)***	1.69462 (0.02928)***
Time	-0.01301 (0.01269)	-0.08683 (0.01268)***	0.00580 (0.01403)
Daughter's Marriage	0.08157 (0.01774)***	-0.06551 (0.01761)***	-0.07070 (0.01749)***
Time* Daughter's Marriage	0.00146 (0.02509)	0.15399 (0.02471)***	0.17141 (0.02461)***
Family Size		0.10634 (0.00257)***	0.11040 (0.00256)***
Gender of Head		-0.03136 (0.02126)	-0.02973 (0.02114)
Age of Head		0.00700 (0.00041819)***	0.00706 (0.00041591)***
Marital Status of Head		-0.05664 (0.00983)***	-0.05725 (0.00978)***
Major Incidence: Illness			-0.08939 (0.01716)***
Major Incidence: Drought			-0.22432 (0.03064)***
Major incidence: Job Loss			0.37085 (0.05092)***
Major Incidence: Crop Failure			-0.38783 (0.02250)***
Major Incidence: Death			-0.05386 (0.01936)***
Major Incidence: Other loss			0.17408 (0.05311)***
R^2	0.0011	0.0501	0.0640
No of observations	41310	41307	41126

Note: Standard errors in parenthesis.
* Statistically significant at the 10% level of significance, ** Statistically significant at the 5% level of significance, *** Statistically significant at the 1% level of significance.

Robustness check (Treatment group = Daughter's marriage).

DiD regression result, using downward income movement from quartile 4 to 3 as the dependent variable.

Exogenous Variables	(1)	(2)	(3)
Constant	-2.1684E-19 (0.00129)	-0.01341 (0.00435)***	-0.01472 (0.00434)***
Time	0.05243 (0.00183)***	0.05131 (0.00187)***	0.05555 (0.00208)***
Daughter's Marriage	4.33681E-19 (0.00256)	-0.00164 (0.00260)	-0.00204 (0.00259)
Time* Daughter's Marriage	0.00757 (0.00362)**	0.00934 (0.00365)**	0.01027 (0.00364)***
Family Size		0.00115 (0.00037938)***	0.00143 (0.00037982)***
Gender of Head		0.00722 (0.00314)**	0.00715 (0.00313)**
Age of Head		0.00007006 (0.00006177)	0.00008719 (0.00006160)
Marital Status of Head		-0.00227 (0.00145)	-0.00279 (0.00145)*
Major Incidence: Illness			-0.00394 (0.00254)
Major Incidence: Drought			-0.02262 (0.00454)***
Major incidence: Job Loss			0.02641 (0.00754)***
Major Incidence: Crop Failure			-0.02369 (0.00333)***
Major Incidence: Death			0.00592 (0.00287)**
Major Incidence: Other loss			0.00252 (0.00787)
R^2	0.0282	0.0285	0.0316
No of observations	41310	41307	41126

Note: Standard errors in parenthesis.
* Statistically significant at the 10% level of significance, ** Statistically significant at the 5% level of significance, *** Statistically significant at the 1% level of significance.

Robustness check (Treatment group = Daughter's marriage).

DiD regression result, using downward income movement from quartile 2 to 1 as the dependent variable.

Exogenous Variables	(1)	(2)	(3)
Constant	-1.2035E-17 (0.00157)	0.02439 (0.00526)***	0.02669 (0.00525)***
Time	6.93889E-18 (0.00310)	0.00564 (0.00315)*	0.00614 (0.00314)**
Daughter's Marriage	0.08372 (0.00221)***	0.08624 (0.00227)***	0.07653 (0.00252)***
Time* Daughter's Marriage	-0.00649 (0.00438)	-0.01241 (0.00442)***	-0.01421 (0.00441)***
Family Size		-0.00434 (0.00045895)***	-0.00473 (0.00045991)***
Gender of Head		0.00470 (0.00380)	0.00418 (0.00379)
Age of Head		-0.00017150 (0.00007472)**	-0.00017381 (0.00007459)**
Marital Status of Head		-0.00202 (0.00176)	-0.00192 (0.00175)
Major Incidence: Illness			0.00230 (0.00308)
Major Incidence: Drought			0.01934 (0.00549)***
Major incidence: Job Loss			-0.04525 (0.00913)***
Major Incidence: Crop Failure			0.04066 (0.00403)***
Major Incidence: Death			0.01828 (0.00347)***
Major Incidence: Other loss			-0.01713 (0.00952)*
R^2	41310	0.0452	0.0505
No of observations	0.0429	41307	41126

Note: Standard errors in parenthesis.
* Statistically significant at the 10% level of significance, ** Statistically significant at the 5% level of significance, *** Statistically significant at the 1% level of significance.

Robustness check (Treatment group = Son's marriage).

DiD regression result, using income quartile as the dependent variable.

Exogenous Variables	(1)	(2)	(3)
Constant	2.40281 (0.00897)***	1.70529 (0.02876)***	1.68760 (0.02859)***
Time	-0.01301 (0.01269)	-0.08628 (0.01262)***	0.01293 (0.01392)
Son's Marriage	0.26576 (0.01736)***	0.16057 (0.01702)***	0.15828 (0.01688)***
Time* Son's Marriage	0.04853 (0.02455)**	0.05284 (0.02389)**	0.07067 (0.02377)***
Family Size		0.11298 (0.00243)***	0.11579 (0.00243)***
Gender of Head		-0.03851 (0.02084)*	-0.03372 (0.02072)
Age of Head		0.00638 (0.00040974)***	0.00644 (0.00040719)***
Marital Status of Head		-0.04231 (0.00962)***	-0.04443 (0.00957)***
Major Incidence: Illness			-0.09195 (0.01692)***
Major Incidence: Drought			-0.24034 (0.03034)***
Major incidence: Job Loss			0.37381 (0.04933)***
Major Incidence: Crop Failure			-0.38909 (0.02207)***
Major Incidence: Death			-0.07705 (0.01882)***
Major Incidence: Other loss			0.18297 (0.04927)***
R^2	0.0132	0.0692	0.0842
No of observations	41950	41946	41780

Note: Standard errors in parenthesis.
* Statistically significant at the 10% level of significance, ** Statistically significant at the 5% level of significance, *** Statistically significant at the 1% level of significance.

Robustness check (Treatment group = Son's marriage).

DiD regression result, using downward income movement from quartile 4 to 3 as the dependent variable.

Exogenous Variables	(1)	(2)	(3)
Constant	0 (0.00132)	1.70529 (0.02876)***	-0.01720 (0.00436)***
Time	0.05243 (0.00187)***	-0.08628 (0.01262)***	0.05400 (0.00212)***
Son's Marriage	0 (0.00256)	0.16057 (0.01702)***	-0.00142 (0.00258)
Time* Son's Marriage	0.01753 (0.00362)***	0.05284 (0.02389)**	0.01856 (0.00363)***
Family Size		0.11298 (0.00243)***	0.00144 (0.00036986)***
Gender of Head		-0.03851 (0.02084)*	0.00951 (0.00316)***
Age of Head		0.00638 (0.00040974)***	0.00007402 (0.00006210)
Marital Status of Head		-0.04231 (0.00962)***	-0.00240 (0.00146)*
Major Incidence: Illness			-0.00499 (0.00258)*
Major Incidence: Drought			-0.01760 (0.00463)***
Major incidence: Job Loss			0.04202 (0.00752)***
Major Incidence: Crop Failure			-0.02149 (0.00337)***
Major Incidence: Death			0.01050 (0.00287)***
Major Incidence: Other loss			-0.00489 (0.00751)
R^2	0.0305	0.0692	0.0340
No of observations	41950	41946	41780

Note: Standard errors in parenthesis.
* Statistically significant at the 10% level of significance, ** Statistically significant at the 5% level of significance, *** Statistically significant at the 1% level of significance.

Robustness check (Treatment group = Son's marriage).

DiD regression result, using downward income movement from quartile 4 to 2 as the dependent variable.

Exogenous Variables	(1)	(2)	(3)
Constant	1.0842E-19 (0.00091611)	-0.00103 (0.00302)	-0.00121 (0.00302)
Time	0.02511 (0.00130)***	0.02481 (0.00133)***	0.02369 (0.00147)***
Son's Marriage	-4.3368E-19 (0.00177)	0.00009663 (0.00179)	0.00007009 (0.00179)
Time* Son's Marriage	0.00523 (0.00251)**	0.00559 (0.00251)**	0.00565 (0.00251)**
Family Size		-0.00057613 (0.00025582)**	-0.00054216 (0.00025652)**
Gender of Head		-0.00034123 (0.00219)	-0.00009473 (0.00219)
Age of Head		0.00008654 (0.00004307)**	0.00008674 (0.00004307)**
Marital Status of Head		0.00005216 (0.00101)	-0.00015129 (0.00101)
Major Incidence: Illness			0.00274 (0.00179)
Major Incidence: Drought			-0.00902 (0.00321)***
Major incidence: Job Loss			0.00869 (0.00522)*
Major Incidence: Crop Failure			-0.00320 (0.00233)
Major Incidence: Death			0.00576 (0.00199)***
Major Incidence: Other loss			0.00806 (0.00521)
R^2	0.0136	0.0139	0.0146
No of observations	41950	41946	41780

Note: Standard errors in parenthesis.
* Statistically significant at the 10% level of significance, ** Statistically significant at the 5% level of significance, *** Statistically significant at the 1% level of significance.

Robustness check (Treatment group = Son's marriage).

DiD regression result, using downward income movement from quartile 3 to 2 as the dependent variable.

Exogenous Variables	(1)	(2)	(3)
Constant	0 (0.00139)	0.01105 (0.00459)**	0.01076 (0.00459)**
Time	0.06479 (0.00197)***	0.06604 (0.00201)***	0.06461 (0.00224)***
Son's Marriage	0 (0.00269)	0.00052731 (0.00272)	0.00050030 (0.00271)
Time* Son's Marriage	-0.00483 (0.00381)	-0.00557 (0.00381)	-0.00519 (0.00382)
Family Size		0.00042752 (0.00038823)	0.00046897 (0.00038929)
Gender of Head		-0.00406 (0.00332)	-0.00384 (0.00333)
Age of Head		-0.00021097 (0.00006537)***	-0.00021239 (0.00006536)***
Marital Status of Head		0.00082437 (0.00153)	0.00076837 (0.00154)
Major Incidence: Illness			0.00749 (0.00272)***
Major Incidence: Drought			-0.00242 (0.00487)
Major incidence: Job Loss			0.00591 (0.00792)
Major Incidence: Crop Failure			0.00115 (0.00354)
Major Incidence: Death			-0.00159 (0.00302)
Major Incidence: Other loss			-0.02331 (0.00791)***
R^2	0.0329	0.0332	0.0337
No of observations	41950	41946	41780

Note: Standard errors in parenthesis.
* Statistically significant at the 10% level of significance, ** Statistically significant at the 5% level of significance, *** Statistically significant at the 1% level of significance.

Robustness check (Treatment group = Son's marriage).

DiD regression result, using downward income movement from quartile 2 to 1 as the dependent variable.

Exogenous Variables	(1)	(2)	(3)
Constant	8.23994E-18 (0.00151)	0.02403 (0.00497)***	0.02605 (0.00496)***
Time	0.08372 (0.00213)***	0.08602 (0.00218)***	0.07521 (0.00242)***
Son's Marriage	-5.2042E-18 (0.00292)	0.00399 (0.00294)	0.00419 (0.00293)
Time* Son's Marriage	-0.02893 (0.00413)***	-0.02872 (0.00413)***	-0.03120 (0.00412)***
Family Size		-0.00501 (0.00042073)***	-0.00528 (0.00042079)***
Gender of Head		0.00339 (0.00360)	0.00231 (0.00359)
Age of Head		-0.00010186 (0.00007084)	-0.00010111 (0.00007065)
Marital Status of Head		-0.00066692 (0.00166)	-0.00039618 (0.00166)
Major Incidence: Illness			0.00543 (0.00294)*
Major Incidence: Drought			0.01757 (0.00526)***
Major incidence: Job Loss			-0.04139 (0.00856)***
Major Incidence: Crop Failure			0.04173 (0.00383)***
Major Incidence: Death			0.01932 (0.00327)***
Major Incidence: Other loss			-0.02195 (0.00855)***
R^2	0.0417	0.0451	0.0511
No of observations	41950	41946	41780

Note: Standard errors in parenthesis.
* Statistically significant at the 10% level of significance, ** Statistically significant at the 5% level of significance, *** Statistically significant at the 1% level of significance.