# Women's returns to education in India: The Role of Marriage Patterns and Processes

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## Abstract

While studies show significant and positive returns to education in the labor market among women in India, female labor force participation in India is low and declining. This motivates us to examine returns to education in the marriage market among women in India. We give special attention to the fact that marriages in India are predominantly characterized by economic homogamy, which may also have its implication on returns. We also look at two common processes that are associated with marriage formation – migration and dowry payments and look at their implication on returns.

We use data from the nationally representative Indian Human Development Survey (2011-12). Our regression analysis shows that return to education measured in terms of per capita household consumption in the marital home is significant and positive. Assortative mating, measured here by differences in fathers' education, has a significant effect on consumption expenditure and the returns are lower in non-homogamous marriages. Finally, the results also show that returns do not significantly vary by migration at the time of marriage but is associated with lower returns in communities with higher dowry propensities.

## Introduction

There have been significant improvements in schooling among girls in India since the 1950s. Enrollment in primary (grades 1-5) and upper primary (grades 6-8) levels show a steady increase during the period. The gradients are the sharpest in recent years which saw several public programs to improve enrollment even in remote areas. Gross enrolment rate (GER) at the primary level, which was around 25% in the 1950s, have gone past the 100% mark in the first decade of the 21st century (Figure 1). The GER for the upper primary level which was less than 5% in the 1950s went up to approximately 90% in 2010-11. Despite this, dropout rates are high at 18.3% for grades 1-5 and 32.9% for grades 1-8 (Ministry of Human Resource Development, 2014) and attainments remain low compared to other countries in similar stages of development. Among women in the age-group of 15-59 years, the average years of education were less than 4 years in rural areas and less than 8 years in urban areas in 2007-08, even though there have been significant improvements in the last few decades (Figure 2).

Two contradictory aspects of women's education and employment in India deserve mention in this context. On one hand, there are significant returns at different levels of education among wage earners, as can be seen in Figure 3. During the 1983-2005 period, private returns to education were the highest for women with secondary education (9-10 years of schooling), even as it declined after 1993-94. At the same time, returns to education increased for women with higher secondary and tertiary education, and declined for women with middle schooling (6-8 years). On the other hand, there has been low and falling labor force participation among women. Figure 4 shows the labor force participation among women (adjusted to include those who are attending school) in recent decades. Till the early 1990s, there was an increase in labor force participation followed by a decline brought about mainly by a decline in the rural areas. The

labor force participation in urban areas shows a rise until the mid-2000s, since when it started declining.

If returns to education play any role in educational choices, we would expect higher enrollment to follow higher labor force participation. However, that is not the case here. Therefore, in this study, we aim to explore the returns to education in the marriage market. While labor force participation is low and declining, marriage is universal. In addition, due to labor market discrimination in occupations associated with low levels of education, the welfare of women within marriage is substantially higher than in the labor force. There are several studies from developed and developing countries (DeSilva & Bakhtiar, 2011; Fulford, 2014; Goldin, 2006; Goldin, Katz, & Kuziemko, 2006; Grossbard-Shechtman & Neuman, 1989; Huang, Li, Liu, & Zhang, 2009; Lam & Schoeni, 1993; Tiefenthaler, 1997; Wong, 1986; Zhang & Liu, 2003) which found positive relation between women's education and spousal earnings starting with Benham's (1974) seminal work. However, most of them look at wage returns. However, due to the large size of the informal economy in India (Harriss-White, 2010; Unni & Lu, 2007), a very small and selective section of the population is employed with formal wage or salary contract. So, as an alternative, we measure returns in terms of per capita consumption in the marital household.

Several factors can potentially bias the estimate of returns to education. The most important ones discussed in the literature are cross-productivity gains and positive assortative mating. Cross-productivity gains can be observed when women's schooling can enhance the labor market productivity of spouses and other family members through the exchange of ideas, mutual learning (Benham, 1974) and intra-household specialization (Becker, 1973, 1981).

The other important source of bias is positive assortative mating (Benham, 1974). Benham argues that higher returns in terms of husband's earnings may be due to positive assortative mating on education in spouse selection. In the Indian context, where marriages are arranged mostly by families (Allendorf & Pandian, 2016; Desai & Andrist, 2010), this has important implications. Arranged marriages among families are often based on cultural and social similarities in religion, ethnicity (*jati* or caste/sub-caste) and language (Billig, 1991; Caldwell, Reddy, & Caldwell, 1983; Dalmia, 2011; Edlund, 1999; Prakash & Singh, 2014). Since there has been very little economic mobility among these groups (Emran & Shilpi, 2015; Kumar, Heath, & Heath, 2002; Majumder, 2010), such practices often take an economic dimension. Several studies (Anderson, 2003; Rao & Finnoff, 2015) observe that homogamy based on socioeconomic status is a key aspect of the marriage market in India. Homogamy by economic status, however, have important implications when we study returns to education in terms of per capita consumption expenditure. In such cases, the effect of socioeconomic status on consumption in the marital home can be wrongly attributed to higher education. Therefore, an understanding of returns to education in the marriage market is incomplete without accounting for the role that homogamy plays in the process of union formation.

Furthermore, there are two important processes – migration to facilitate marriage and the custom of paying dowry – which are closely related to the patterns of assortative marriage formation in India. Migration to facilitate marriage can expand economic opportunities, affecting consumption returns for women in their marital homes. However, the main reason for migration is the prevalence of patrilocal marriage practices. More than 75% women who are older than 21 years live in a place other than their place of birth. Data on migration in India show that among female migrants (both in rural and urban areas), those who say marriage as a reason for

migration have increased significantly in recent years (Fulford, 2015; Rao & Finnoff, 2015). However, there are variations in migration practices. Since most marriages in India are within-*jati* (caste/sub-caste) they are often constrained by the geographical distribution of *jati* members (Fulford, 2015). Ramamurthy (2011) argues that demands of the local and household economies may lead to a preference for local brides rather than brides from a different geographical area. Marriage migration is less likely in regions where female labor force participation is high and where local women with specific skills for agricultural tasks are preferred. While long-distance marriages do exist in areas of sex imbalance, they are a tiny fraction of marriage migration (Kaur, 2004). Case studies (Chaudhry & Mohan, 2011; Mazumdar, Neetha, & Agnihotri, 2013) of cross-regional marriage migrants indicate that poverty, landlessness, and inability to pay dowry are common factors in such marriages. This is corroborated by other studies which find that marriage migration is indeed associated with economic status, for it is poorer households from where daughters tend to marry and migrate further (Bhattacharya, 2000; Rao & Finnoff, 2015; Rosenzweig & Stark, 1989). Fulford (2015) also finds that higher female literacy in a region is associated with a large fall in the odds of migration and decreases in the hours of travel on migration.

Variation in consumption returns for women can also be due to another process that facilitates assortative mating – dowry payments. The payment of dowry by a bride's family to the groom is a transfer of resources from the natal home to the marital home and therefore has direct consequences for the marital household's per capita consumption (Botticini & Siow, 2003). Dowry payment can improve a woman's "marriageability" in the marriage market by balancing the differences in measurable attributes between a bride and a groom (Dalmia, 2011). Dowry also institutionalizes the exchange motive and specialized gender roles in arranged marriages

(Dalmia & Lawrence, 2001). However, there are variations in factors associated with higher dowry payments. For example, Dalmia and Lawrence (2001) find that higher education among brides is associated with increases in dowry payments, suggesting that women that are more educated participate in a more competitive and smaller marriage market relative to less educated women, given women are expected to marry men better or at least as well educated as themselves. Similar arguments can be made for other scare characteristics e.g. presence of match from same caste groups.

In this study, therefore we aim to address the extent marriage patterns and processes affect women's returns to education in the marriage market. Are the positive returns for women in the marriage market an artifact of socioeconomic homogamy at the time of marriage? What role do marriage migration and dowry play in influencing marital household consumption for women?

## Analytical Strategy

Our analytical strategy is based on the estimation of an augmented version of (Mincer, 1974) earning function following (Benham, 1974)

(1) $l(CE) = \alpha + \beta_1 Edu_W + \beta_2 Edu_S + \beta_3 Exp_S + \beta_4 Exp_S^2 + \beta_5 X + \epsilon$

where $l(CE)$ is the logarithm of household per capita consumption expenditure, $S_{edu}$ & $W_{edu}$ are spouse's and woman's years of schooling, $S_{exp}$ and $S_{\exp^2}$ are spouse's years of labor market experience (measured as age - years of schooling - 6) and its quadratic term. Here we depart from the usual Mincerian specification by considering household consumption instead of spouse's earnings or wages.

The main motivation for measuring returns using consumption is that unlike earnings and wages, consumption is a basic indicator of welfare. Fulford (2014) who also used consumption while studying returns to education in India has justified it because wage data is only available for a small proportion of the population due to the large size of the informal labor market. Since everyone consumes, this also has the added advantage of not having a biased estimate of returns due to selection to wage labor or be employed at all. In addition, consumption is less sensitive to shocks, unlike wage income. In this specification, the coefficient $\beta_1$ gives the incremental effect of a year of education by the woman on her consumption.

The original model by Mincer on which this model is based makes strong assumptions about costs of acquiring education, earning profiles and credit market constraints. These can potentially vary by socioeconomic status of natal home (where education decisions were made), occupational rigidities associated with "caste" and rural/urban location etc. To address these, $X$ includes father's education (as a proxy for socioeconomic status), membership to social groups & urban/rural residence.

A commonly used strategy in the literature to account for the unobserved effects on consumption through cross productivity mentioned earlier is to introduce additional variables to account for such processes. Benham (1974) introduces years of marriage to account for how the earnings differentials vary by years of marriage. Wong (1986) uses years married and years married squared and observes differences between men and women between entrepreneurial families (where sharing of knowledge can be mutually beneficial) and families made up of employees to identify cross productivity as against contribution of education. Neuman and Ziderman (1992) add interaction of woman and spouse's education with years of marriage in their study on how the cross productivity differs across occupational categories. Tiefenthaler (1997) adds interaction

of woman's education and a probability of labor force participation in different sectors. She also considers the interaction of woman's education with the probability of being employed in the same sector as the spouse. Groothuis and Gabriel (2010) similarly use women and spouse's employment in the same occupation and industry.

In addition to variables included in $X$, we also consider women's employment status and the duration of marriage as additional controls to account for cross-productivity gain. Our model specifications also control for the region (for known differences in marriage pattern across the country and age cohorts to account for changes over time (Dyson & Moore, 1983; Fulford, 2015; Rao & Finnoff, 2015).

There can be several sources of bias in the measurement of returns to education, due to unobserved heterogeneity in attributes or joint decision of education and marriage. A number of researchers use instrumental variables for women's education. Lefgren and McIntyre (2006) instrument's woman's education by the calendar quarter of birth, Huang et al. (2009) fixed effects estimator on a sample of monozygotic twins and DeSilva and Bakhtiar (2011) instrument's woman's education on 1) size of sibship 2) gender composition of sibship 3) birth order 4) father's schooling attainment 5) mother's schooling attainment. To address this we introduce an instrumental variable strategy used by DeSilva and Bakhtiar (2011), where we instrument woman's education using a number of sisters and mother's education. Vogl (2013) shows that having a younger sister is associated with earlier school leaving and lower literacy in Nepal where marriage patterns are very similar to India. Similar instruments were also used by Butcher and Case (1994) and Gary-Bobo, Picard, and Prieto (2006).

Subsequently, to understand the implication of how socioeconomic status in the natal home, membership to the socioeconomic group and rural location affect returns, we examine the following set of interactions.

(2a) $l(CE) = \alpha + \beta_1 Edu_W + \beta_2 Edu_S + \beta_3 Exp_S + \beta_4 Exp_S^2 + \beta_5 X + \beta_6 \mathrm{W_{edu}} \times \mathrm{WF_{edu}} + \epsilon$

(2b) $l(CE) = \alpha + \beta_1 Edu_W + \beta_2 Edu_S + \beta_3 Exp_S + \beta_4 Exp_S^2 + \beta_5 X + \beta_6 \mathrm{W_{edu}} \times \mathrm{SG} + \epsilon$

(2c) $l(CE) = \alpha + \beta_1 Edu_W + \beta_2 Edu_S + \beta_3 Exp_S + \beta_4 Exp_S^2 + \beta_5 X + \beta_6 \mathrm{W_{edu}} \times \mathrm{U} + \epsilon$

where $\mathrm{WF_{edu}}$ is the woman's father's educational level, SG is the social group the woman belongs to and $U$ is a dummy indicating urban residence

Finally, we examine how assortative mating, migration, and dowry propensities affect returns, to understand the implications of marriage patterns and processes. As discussed earlier, an important source of bias in the estimation of consumption returns in the marriage market can be a marriage between similar economic groups. We examine the effect of assortative mating (AM) using a categorical variable indicating hypogamy, homogamy or hypergamy. We create this variable comparing the woman and her spouse's father's educational categories - illiterate, schooling up to grade 5, schooling beyond grade 5.

We identify migration for marriage using a combination of the variable indicating whether there were village endogamy and the time taken to travel between natal and marital home at the time of marriage. The survey does not provide a direct indicator for dowry payments, but it can be inferred from marriage expenditure patterns in the same locality among those belonging to the same socioeconomic and ethnic group. The ratio of average expenditure on marriage in the bride's household compared to the groom's is used as an indicator of excess expenditure indicative of dowry payments. In specifications (3) we examine how returns vary by patterns of

marriage using the interaction of women's education and assortative mating variable. In specifications (4) we introduce dowry propensity and marriage migration.

$$(3)\quad l(CE) = \alpha + \beta_1 Edu_W + \beta_2 Edu_S + \beta_3 Exp_S + \beta_4 Exp_S^2 + \beta_5 X + \beta_6 \mathrm{AM} + \beta_7 Edu_W \times \mathrm{AM} + \epsilon$$

$$(4)\quad l(CE) = \alpha + \beta_1 Edu_W + \beta_2 Edu_S + \beta_3 Exp_S + \beta_4 H_{\exp^2} + \beta_5 X + \beta_6 \mathrm{MM} + \beta_7 \mathrm{DP} + \beta_8 Edu_W \times \mathrm{MM} + \beta_8 Edu_W \times \mathrm{DP} + \epsilon$$

## Data and Methods

We use data from the Indian Human Development Survey, 2011-12 (IHDS-II) jointly conducted by the National Council of Applied Economic Research (NCAER), New Delhi and University of Maryland, College Park (Desai & Vanneman, 2016). IHDS-II is a nationally representative survey of 42152 households undertaken in all states and all but two union territories of India. The survey includes information collected in these households from 35281 ever-married women in the age group of 15-49 years. Since our paper analyzes women's returns to education in their marital home and the effect of marriage patterns and processes, we limit the sample to 33421 currently married women and exclude women who are currently widowed, divorced, or separated. We allow for listwise deletion of 9 cases with missing data on our dependent variable. An additional 122 cases with missing data for the explanatory variable of dowry practices and 151 cases with missing data on spouse's employment are omitted from the analysis.

### Dependent Variable

The household questionnaire of IHDS-II has a detailed set of questions on total household consumption expenditure, which is modeled on the lines of the widely used and National Sample Survey Organization (NSSO) consumption expenditure surveys in India. IHDS-II asked the head

of the household to report on the household's expenditures such as food, household items, transport, utilities, entertainment, rent, and taxes with a 30-day recall, and items such as medical and education expenditures, household appliances, repair and maintenance, social events, etc. in the last one year. We use a log transformation of the per capita household total consumption expenditure as our dependent variable.

**Explanatory Variables**

Our measure of assortative mating patterns is based on the socioeconomic status of the woman's natal and marital homes at the time of marriage. IHDS-II asks each eligible woman about the educational attainment of her father as well as the father-in-law. We use this parental educational attainment as a proxy for the economic status of the natal and marital households and measure assortative mating patterns comparing the educational level of fathers and fathers-in-law in terms of four categories: no schooling, primary schooling (1-5 years), secondary (6-8 years) and higher (more than 8 years of schooling).

We identify migration at the time of marriage in a two-step process. The first step determines village/town exogamy by using a question whether the female respondent and her spouse belong to the same village or town. A second question asks women about the time that it took them to travel to their natal home at the time of marriage. We use this information to construct a variable on marriage migration with three categories: no marriage migration i.e. or village/town endogamy, short-distance marriage migration if the time taken to travel to the natal home was 2 hours or less, and long-distance marriage migration for more than 2 hours of travel time.

IHDS-II asks about dowry paid at the time of marriage in an indirect way, given the high likelihood of response bias for direct questions on whether or not dowry was paid or received by

the household in question. Respondents were instead asked to report the minimum and maximum amount of money that is usually spent in the respondent's community by a bride's and a groom's family at the time of marriage. Gift exchanges between the bride's and groom's families, as well as in-kind dowry payments to the groom, are likely to be better captured when all marriage expenses are considered together. We calculated a ratio of the average of the bride's expenses and the groom's expenses. Our measure of dowry is, therefore, a measure of to what extent expenses at the marriage of a bride exceed that of a groom.

## Results

In Table 1, we present the weighted means and standard deviations, or proportions of the variables used in this analysis. We see that about 59 percent women report homogamy in paternal education, our measure of assortative mating. About a quarter of the women reports hypogamy, whereas 18 percent report hypergamy. Our measure of dowry propensity shows that wedding expenses for women in the community are considerably greater than those for men. In terms of marriage migration, the vast majority of women marry men from outside of their own village or town. In the IHDS, 55 percent women migrated after marriage to within 2 hours of their natal village/town and a third to distances greater than 2 hours. Women have on average about 5 years of schooling, whereas their spouses have 7 years of schooling. The average age of women in the sample is about 34 years, and about a third in each of the three age cohorts of 15-29 years, 30-39 years, and 40 and above. 32 percent of the sample lives in urban areas.

Our regression analysis results are presented in Tables 2-4. Overall, our analysis shows that returns to education are significant and positive in all specifications. In Table 2, the magnitude of the effect of education on per capita household consumption for women in our IV estimates at

6.4% is considerably larger than the standard OLS specification result of 2.4%, suggesting that returns to education for women may be initially underestimated. Our results show that employment is negatively associated with married women's per capita household consumption, confirming previous research in India that shows that in the household, where women are employed, are not necessarily better off compared to those where women do not work. Women's employment is driven largely by necessity and is concentrated in short-term, insecure, and low-paying jobs (Klasen and Pieters 2012). Note that women's employment, when interacted with education (not reported), is not significant indicating absence of significant difference in cross productivity between working and non-working women. However, years of marriage is positive and significant and accounts for cross-productivity discussed by Benham. We see strong negative relationships between the social group categories in our model; when compared to the more privileged Hindu upper castes, women from scheduled castes/tribe (17 percent lower), other backward classes (9 percent), and Muslim (9 percent) women are worse off. Finally, we also note that there is an urban advantage in household consumption, with per capita household consumption being nearly 16 percent greater than in rural households.

In Table 3, we present the effects of natal as well as marital socioeconomic status on consumption returns. Across the models, our estimates of women's returns to education remain consistent at about 2.2 percent for each additional year of education. In Model 1, we find that higher level of father's education is associated with higher consumption returns for women, with a sizeable 8 percent increase in the per capita household consumption for women whose fathers had completed more than 8 years of education compared to women whose father did not have any formal education. Low level of paternal education (1-5 years) on the other hand has a negative relationship with women's consumption. In Model 2 we introduce the interaction terms

and find that the effect of women's education does vary by father's education, and women with the most educated fathers have the highest consumption in their marital households. The effect of education also varies by the social group where higher education among scheduled caste and scheduled tribe women has a positive effect on consumption returns compared to higher education among the Hindu, forward castes. Education also varies by urban residence, and we find that higher education for women in urban areas increases the returns to education relative to those in rural areas.

In Table 4, we see the main results of this analysis. We find that assortative mating measured by differences in the educational attainment of the father and father-in-law has a significant effect on consumption. Both hypergamous and hypogamous marriages are negatively associated with consumption compared to homogamous marriages reducing per capita consumption by 2.5% and 4.1% respectively. The interaction terms in Model 2 confirm that the effect of education on consumption varies by assortative mating, by showing that non-homogamous marriages reduce the effect of education on consumption.

Marriage migration, both short distance, and long distance exogamous marriages are associated with lower consumption compared to endogamous marriages, with a larger negative effect of long distance marriage migration. Compared to women who marry men from the same village or town, women who marry men from elsewhere and migrate only a short distance with a travel time of fewer than 2 hours, have 3.2 percent lower per capita household consumption. The negative effect is larger with a 6 percent disadvantage for women who migrate a longer distance upon marriage. However, as seen in Model 4, the interaction term between education and short-distance marriage migration is not statistically significant, suggesting that while migration itself

has a direct negative association with married women's consumption and the effect does not vary by educational attainment.

Dowry propensity is positively associated with high consumption expenditure, confirming that a transfer of resources from the woman's natal to her marital home increases the consumption in their marital homes. Our models account for women's age, and the duration of the marriage, suggesting positive implications of dowry payment for married women. We test once again whether the effect of education varies by dowry propensity, and find that returns to education remain positive but are lower for women who pay dowry compared to those who do not. Put differently, the positive effect of dowry on consumption remains positive but is lower for women that are more educated.

**Robustness Checks**

We consider several alternative specifications to test the robustness of our results. Our original sample includes 35 percent women who have zero years of schooling, and about half the women have five or fewer years of education. Hence, we calculate our estimates by restricting the sample to women who had at least one year of formal schooling. Second, given our use of the number of sisters as an instrument for women's education, we run the analysis after restricting the sample to women with at least one sister. Our third strategy is to introduce additional controls in the models, which we expect to influence household consumption expenditure. We control for father-in-law's education (Lam & Schoeni, 1993), age at marriage (to account for joint determination of education and marriage), women's height which an indicator of the childhood nutritional and disease environments (Bozzoli, Deaton, & Quintana-Domeque, 2009; Case & Paxson, 2008), and number of working persons in the household. We also employ a different measure of assortative mating patterns, which is available in the data. IHDS-II asked women

about the difference that they had perceived in the economic status of their natal and marital homes at the time of marriage, with the responses being that the natal home was better off, marital home as better off, or there was no difference between the two. In all of these alternative specifications, our estimates for women's return to education remain significant and does not change substantially. Finally, we also employ alternative specifications for women's education: instead of women's education in years we see the effect of women's education by categories literate versus illiterate, 5 or higher years of education or not, 8 or higher years of education or not and 10 or higher years of education or not. In doing so, we test the Mincerian assumption that returns are same for all levels of education, as well as whether our results are affected by misreporting in education (Card, 2001). An advantage of this strategy that we are able to estimate returns to education in the marriage market which we can compare to the marginal effects of schooling in the labor market shown in Figure 3. We find not only that the returns to education for women remain positive and significant, but also that they increase in magnitude at higher levels of education.

## Discussion

Educational attainment in India is low despite a recent increase in enrollment. It is, therefore, imperative to understand the motivation for educational attainment. Of particular interest are returns to education. Returns in marriage market are relevant when labor force participation are low. In this study, we make an exhaustive attempt to understand returns to education in marriage market among women in the Indian context. We first examine whether there are returns after accounting for usual biases in the Benham specifications. Then we explore how the returns vary by the sources of bias. The importance of socioeconomic assortative mating in India, the high

prevalence of migration for women after marriage, and the role of dowry in facilitating assortative mating are addressed to examine their implications on returns.

Our study is not without its limitations. Besides information on the female respondent's own education, number and sex composition of siblings, parental education, and place of childhood residence, we have little data on the female respondent's natal home and childhood. Nevertheless, we utilize considerable information from the data to account for sources of bias in the woman's own educational attainment as well as the household consumption in the marital home and to assess the assortative mating patterns at the time of marriage. Additionally, our measure of dowry propensity does not distinguish between routine expenses made on the wedding, which serve the purpose of signaling social status to the wider community (Bloch, Rao, & Desai, 2004) and transfers that are implicitly or explicitly made to the groom's family. However, in the absence of any individual-level data on dowry payments, we use community-level dowry propensity as a close substitute.

Despite these limitations, our study makes an important contribution to the literature on women's returns to education, as well as on better understanding the implications of key Indian marriage patterns and processes. Our study establishes that there are significant and positive returns for women in the marriage market. We also find that women who belong to a higher natal socioeconomic status have higher consumption returns from education. Socioeconomic homogamy has a direct positive impact on women's per capita household consumption in their marital homes, and we find that hypergamy or hypogamy, on the other hand, have a negative effect. Our study establishes that consumption returns to education are highest for women in homogamous marriages, with hypergamy and hypogamy lowering the returns. Our study also confirms that women who marry men from their own village or town or when they marry and

migrate a relatively short distance from their natal home, have higher quality matches at least as far as per capita household consumption is concerned. While dowry facilitates the marriage formation in terms of consumption, when women live in communities where dowry is prevalent, the positive effect of their education on consumption is lower than in communities where dowry is less prevalent.

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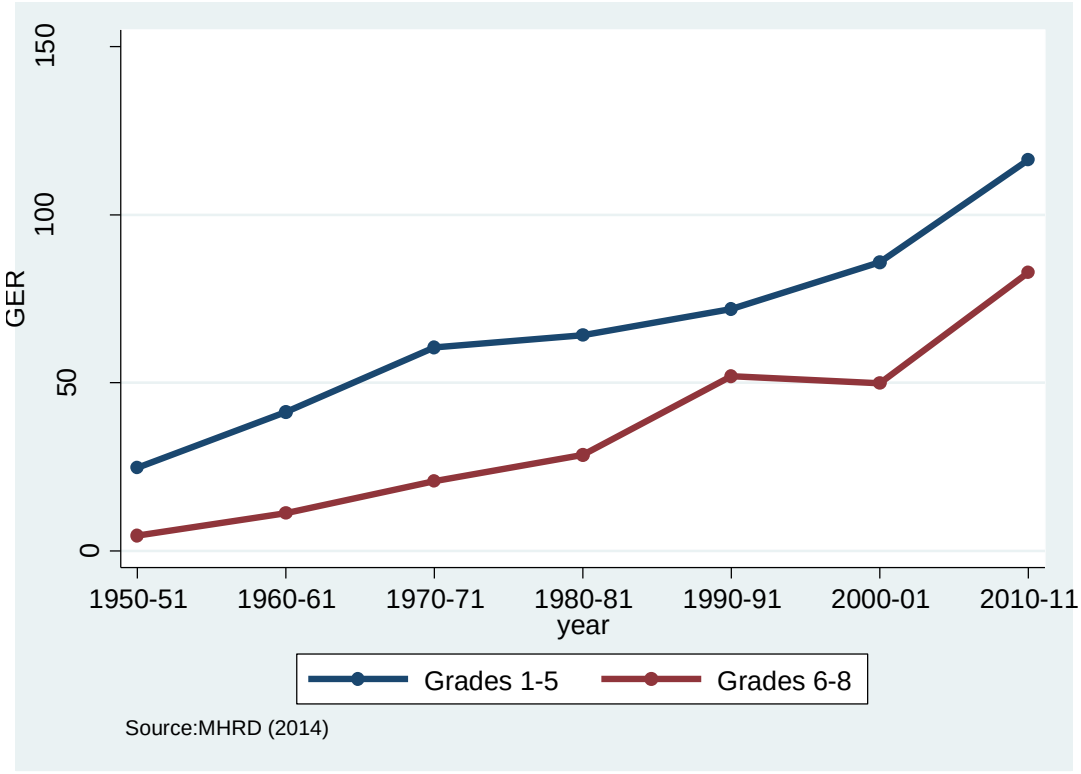


**Figure 1: Gross Enrolment Ratio among girls in India, 1950-2011**

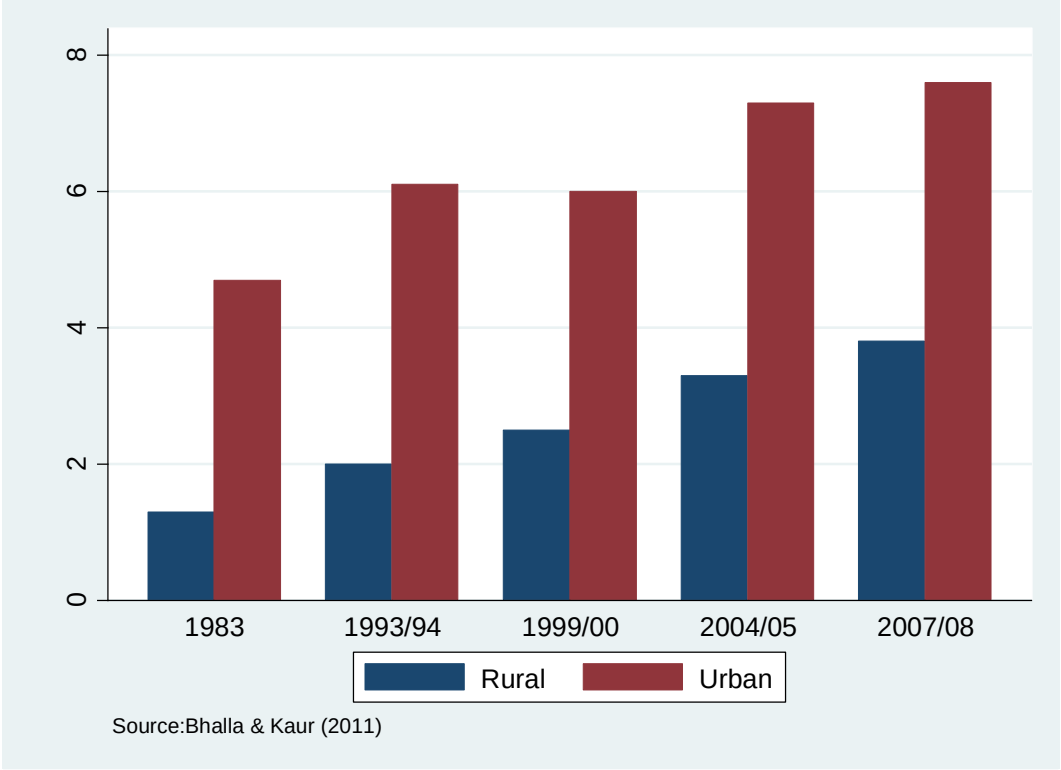


**Figure 2: Average years of schooling among women aged 15-59 in India, 1983-2008**

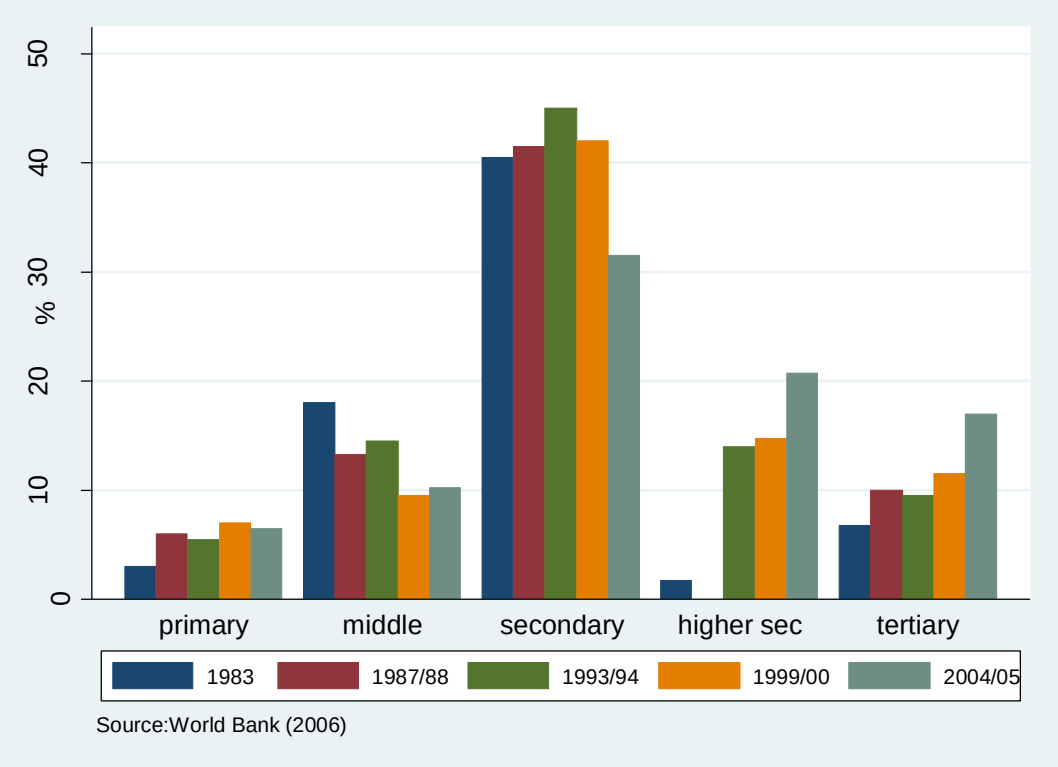


**Figure 3: Marginal returns to education among women in India, 1983-2005**

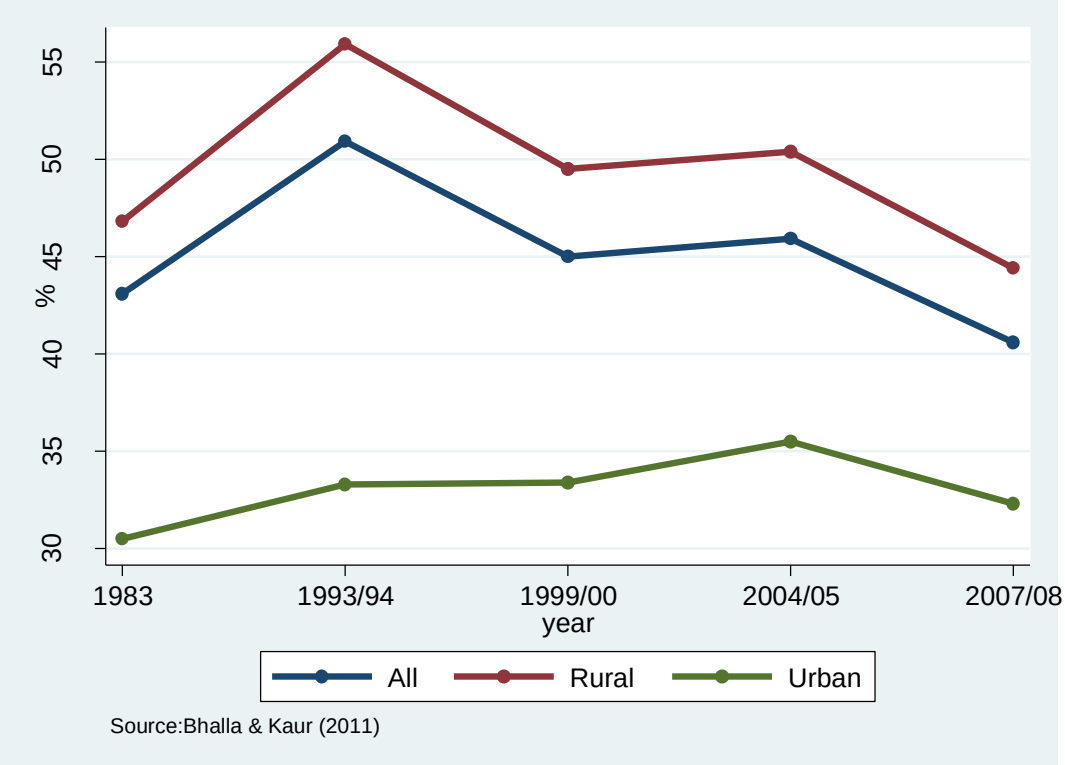


**Figure 4: Labour Force Participation among women aged 15-59 years in India, 1983-2008**

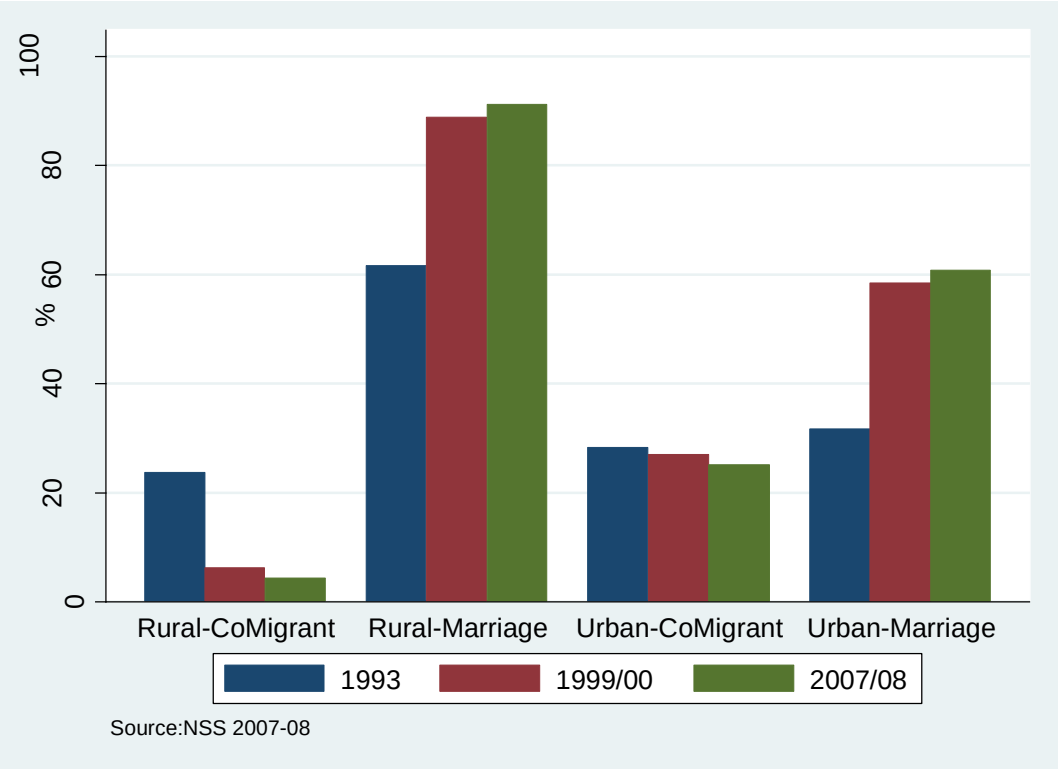


**Figure 5: Main Reason for Migration from NSS 2007-08**

**Table 1: Descriptive Statistics of Explanatory Variables**

| | Average | SD |
|---|---|---|
| Women's Education (in years) | 5.26 | 4.92 |
| Spouse's education (in years) | 7.03 | 4.86 |
| Spouse's experience | 26.81 | 11.11 |
| Employed | 47.74 | % |
| Years of Marriage | 16.02 | 9.43 |
| Number of sisters | 1.85 | 1.46 |
| Mother's education (in years) | 1.51 | 3.09 |
| Father's education (in years) | 3.54 | 4.57 |
| Assortative Mating, Paternal Education Differences | | |
| Homogamy | 58.6 | % |
| Hypogamy | 23.37 | % |
| Hypergamy | 18.03 | % |
| Dowry propensity* | 1.77 | 1.62 |
| Marriage migration | | |
| Married within Same Village | 11.45 | % |
| Exogamy, Short-distance migration | 54.92 | % |
| Exogamy, Long-distance migration | 33.63 | % |
| Social Group | | |
| Hindu forward castes and Brahmins | 20.22 | % |
| Scheduled Caste/Scheduled Tribe | 29.58 | % |
| Muslim | 12.51 | % |
| Other Backward Classes | 35.8 | % |
| Others | 1.89 | % |
| Urban Residence (Ref. =Rural) | 31.66 | % |

* Dowry propensity is measured as the ratio of expenses estimated at a bride's wedding in the community, and at a groom's wedding in the community.

Source: India Human Development Survey-II (IHDS-II), 2011-12

**Table 2: Determinants of Per capita Household Consumption Expenditure in India, 2011-12**

| | OLS | 2SLS | |
|---|---|---|---|
| | | First Stage | Second Stage |
| Women's Education (in years) | 0.024*** | | 0.064*** |
| | (0.00) | | (0.01) |
| Spouse's education (in years) | 0.032*** | 0.473*** | 0.012*** |
| | (0.00) | (0.01) | (0.00) |
| Spouse's experience | 0.003*** | 0.092*** | 0.00 |
| | (0.00) | (0.01) | (0.00) |
| Spouse's experience, squared | 0.000*** | 0.000 | 0.000** |
| | (0.00) | (0.00) | (0.00) |
| Employment (Ref. =Unemployed) | -0.056*** | -0.292*** | -0.044*** |
| | (0.01) | (0.04) | (0.01) |
| Years of Marriage | 0.002* | -0.226*** | 0.011*** |
| | (0.00) | (0.00) | (0.00) |
| Number of sisters | | -0.095*** | |
| | | (0.01) | |
| Mother's education (in years) | | 0.240*** | |
| | | (0.01) | |
| Father's education (in years) | 0.007*** | 0.189*** | -0.003** |
| | (0.00) | (0.01) | (0.00) |
| Social Group (Ref. =Hindu forward castes and Brahmins) | | | |
| Scheduled Caste/Scheduled Tribe | -0.212*** | -0.915*** | -0.171*** |
| | (0.01) | (0.06) | (0.01) |
| Muslim | -0.132*** | -0.937*** | -0.089*** |
| | (0.01) | (0.07) | (0.01) |
| Other Backward Classes | -0.122*** | -0.668*** | -0.091*** |
| | (0.01) | (0.05) | (0.01) |
| Others | 0.137*** | 0.640*** | 0.100*** |
| | (0.02) | (0.11) | (0.02) |
| Urban Residence (Ref. =Rural) | 0.199*** | 0.857*** | 0.160*** |
| | (0.01) | (0.04) | (0.01) |
| Observations | 33,261 | 33,261 | 33,261 |
| *R*-squared | 0.297 | 0.608 | 0.27 |
| *F*-test for weak instrument | | 649.5 ($p$ <0.001) | |
| Tests for Exogeneity | | | |
| Durbin | | | 64.3246 ($p$ <0.001) |
| Wu-Hausman | | | 64.4143 ($p$ <0.001) |
| Woolridge's Robust Score Test for Overidentification | | | 0.0293 ($p$ = 0.8640) |

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

All models include controls for women's age, and region of residence (north/south/east).

Source: India Human Development Survey-II, 2011-12.

**Table 3: Influence of Socioeconomic Status on Women's Per Capita Consumption Expenditure**

| | Model 1 | Model 2 | Model 3 | Model 4 |
|---|---|---|---|---|
| Women's education (in years) | 0.024*** | 0.021*** | 0.023*** | 0.022*** |
| | (0.00) | (0.00) | (0.00) | (0.00) |
| Spouse's education (in years) | 0.032*** | 0.032*** | 0.032*** | 0.032*** |
| | (0.00) | (0.00) | (0.00) | (0.00) |
| Spouse's experience | 0.004* | 0.005** | 0.004* | 0.004* |
| | (0.00) | (0.00) | (0.00) | (0.00) |
| Spouse's experience, squared | 0.000* | 0.000 | 0.000* | 0.000* |
| | (0.00) | (0.00) | (0.00) | (0.00) |
| Employment (Ref. =Unemployed) | -0.057*** | -0.059*** | -0.054*** | -0.059*** |
| | (0.01) | (0.01) | (0.01) | (0.01) |
| Years of Marriage | 0.002 | 0.002* | 0.002 | 0.002 |
| | (0.00) | (0.00) | (0.00) | (0.00) |
| Social Group (Ref. =Hindu forward castes and Brahmins) | | | | |
| Scheduled Caste/Scheduled Tribe | -0.214*** | -0.213*** | -0.258*** | -0.214*** |
| | (0.01) | (0.01) | (0.02) | (0.01) |
| Muslim | -0.132*** | -0.130*** | -0.135*** | -0.130*** |
| | (0.01) | (0.01) | (0.02) | (0.01) |
| Other Backward Classes | -0.120*** | -0.117*** | -0.121*** | -0.119*** |
| | (0.01) | (0.01) | (0.02) | (0.01) |
| Others | 0.138*** | 0.137*** | 0.277*** | 0.139*** |
| | (0.02) | (0.02) | (0.05) | (0.02) |
| Urban residence (Ref. =Rural) | 0.199*** | 0.196*** | 0.200*** | 0.157*** |
| | (0.01) | (0.01) | (0.01) | (0.01) |
| Father's education (Ref. =None) | | | | |
| 1-5 years | -0.043*** | -0.059*** | -0.045*** | -0.042*** |
| | (0.01) | (0.01) | (0.01) | (0.01) |
| 6-8 years | 0.018 | 0.027 | 0.019 | 0.020 |
| | (0.01) | (0.02) | (0.01) | (0.01) |
| More than 8 years | 0.080*** | -0.027 | 0.085*** | 0.077*** |
| | (0.01) | (0.02) | (0.01) | (0.01) |
| Women's education X Father's education (Ref. = Educ. X Father's educ., none) | | | | |
| Educ. X 1-5 years of Father's education | | 0.004* | | |
| | | (0.00) | | |
| Educ. X 6-8 years of Father's education | | 0.001 | | |
| | | (0.00) | | |
| Educ. X More than 8 years of Father's educ. | | 0.013*** | | |
| | | (0.00) | | |
| Women's education X Social Group (Ref. = Educ. X Hindu, forward caste) | | | | |
| Educ. X Scheduled Caste/Scheduled Tribe | | | 0.009*** | |
| | | | (0.00) | |
| Educ. X Muslim | | | -0.001 | |
| | | | (0.00) | |
| Educ. X Other Backward Class | | | -0.001 | |
| | | | (0.00) | |
| Educ. X Others | | | -0.015** | |
| | | | (0.00) | |
| Women's educ. X Urban residence (Ref. =Educ. X Rural) | | | | 0.006*** |
| | | | | (0.00) |
| | 33,261 | 33,261 | 33,261 | 33,261 |
| | 0.306 | 0.307 | 0.307 | 0.306 |

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
All models include controls for women's age, and region of residence (north/south/east).
Source: India Human Development Survey-II, 2011-12.

**Table 4: Marriage Market Features Influencing Women's Per Capita Consumption Expenditure, India, 2011-12**

| | Model 1 | Model 2 | Model 3 | Model 4 |
|---|---|---|---|---|
| Women's education (in years) | 0.027*** | 0.029*** | 0.026*** | 0.030*** |
| | (0.00) | (0.00) | (0.00) | (0.00) |
| Spouse's education (in years) | 0.033*** | 0.033*** | 0.032*** | 0.032*** |
| | (0.00) | (0.00) | (0.00) | (0.00) |
| Spouse's experience | 0.003* | 0.003 | 0.003 | 0.003 |
| | (0.00) | (0.00) | (0.00) | (0.00) |
| Spouse's experience, squared | 0.000* | 0.000* | 0.000** | 0.000* |
| | (0.00) | (0.00) | (0.00) | (0.00) |
| Employment (Ref. =Unemployed) | -0.060*** | -0.059*** | -0.059*** | -0.060*** |
| | (0.01) | (0.01) | (0.01) | (0.01) |
| Years of Marriage | 0.002 | 0.002 | 0.002* | 0.002* |
| | (0.00) | (0.00) | (0.00) | (0.00) |
| Social Group (Ref. =Hindu forward castes and Brahmins) | | | | |
| Scheduled Caste/Scheduled Tribe | -0.224*** | -0.222*** | -0.224*** | -0.222*** |
| | (0.01) | (0.01) | (0.01) | (0.01) |
| Muslim | -0.141*** | -0.141*** | -0.148*** | -0.146*** |
| | (0.01) | (0.01) | (0.01) | (0.01) |
| Other Backward Classes | -0.126*** | -0.125*** | -0.129*** | -0.127*** |
| | (0.01) | (0.01) | (0.01) | (0.01) |
| Others | 0.133*** | 0.133*** | 0.128*** | 0.132*** |
| | (0.02) | (0.02) | (0.02) | (0.02) |
| Urban Residence (Ref. =Rural) | 0.202*** | 0.201*** | 0.202*** | 0.201*** |
| | (0.01) | (0.01) | (0.01) | (0.01) |
| Assortative Mating, Paternal Education Differences (Ref. =Homogamy) | | | | |
| Hypogamy | -0.041*** | -0.004 | | |
| | (0.01) | (0.01) | | |
| Hypergamy | -0.025** | 0.005 | | |
| | (0.01) | (0.01) | | |
| Women's education X Paternal Education Differences (Ref. = Educ. X Homogamy) | | | | |
| Education X Hypogamy | | -0.006*** | | |
| | | (0.00) | | |
| Education X Hypergamy | | -0.005*** | | |
| | | (0.00) | | |
| Marriage migration (Ref. = Married within Same Village) | | | | |
| Exogamy, Short-distance migration | | | -0.032** | -0.022 |
| | | | (0.01) | (0.02) |
| Exogamy, Long-distance migration | | | -0.060*** | -0.067*** |
| | | | (0.01) | (0.02) |
| Dowry propensity | | | 0.014* | 0.053*** |
| | | | (0.01) | (0.01) |
| Women's education X Short-distance migration (Ref. = Education X Endogamy) | | | | -0.002 |
| | | | | (0.00) |
| Women's education X Long-distance migration | | | | 0.001 |
| | | | | (0.00) |
| Women's education X Dowry | | | | -0.007*** |
| | | | | (0.00) |
| Observations | 33,261 | 33,261 | 33,139 | 33,139 |
| R-squared | 0.304 | 0.304 | 0.304 | 0.305 |

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
All models include controls for women's age, and region of residence (north/south/east).
Source: India Human Development Survey-II, 2011-12.