

Work and Young Women's Well-Being: Evidence from Textile Mill Employment in India*

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Abstract

Women in developing countries are now starting to join the work-force in greater numbers and it has been argued that such exposure can lead to improved outcomes for women. This paper examines whether longer tenure in the formal employment sector affect female empowerment, marriage and fertility. I exploit quasi-exogenous variation in duration worked from a natural experiment created by a large Indian textile firm's decision to replace fixed-term contracts with daily employment contracts. Using data from the firm, I find that women stay in the formal labor market longer the more that they are exposed to a fixed-term contract. Surveying workers about 4.5 years after they first entered the textile industry, I find that the women who worked longer delayed marriage, without any detrimental effect on eventual spousal quality in equilibrium. More time working translates to reductions in desired fertility and to increases in female empowerment and autonomy. This has strong spillover effects within the family, as age of marriage increases for younger sisters and school dropout rates decrease for younger brothers. These findings provide new information on the impact of duration of employment outside the parental village for young women in rural areas.

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1 Introduction

Gender disparities in labor market outcomes are widespread in the developing world with labor force participation for women at 52%, about 26% lower than that for men (Duflo 2012, World Development Report 2012). In recent decades, industrialization and globalization has expanded economic opportunities for women and created jobs in manufacturing and in the service sector that have higher returns than traditional agricultural labor. Access to such opportunities has encouraged women to invest in human capital and enter the formal labor market (Atkin 2009, Heath and Mubarak 2012, Jensen 2012, Munshi and Rosenzweig 2006). However, little is known about the impact of exposure to non-agricultural work outside the household on the women who take up these jobs. In particular, does it affect women's empowerment, and do these changes show up as changes in marriage and fertility? This paper studies the effect of living and working outside the parental village on empowerment for young women in rural India.

Growing opportunities in the manufacturing sector can be particularly powerful in South Asia where industries are rapidly growing and creating opportunities for women that did not previously exist due to social and cultural reasons. In these countries, most women seldom leave their village before marriage, and if they work before marriage, it is typically agricultural work. In India, while 75% of women older than 22 have left their place of birth, 87% of them do so for marriage (Fulford 2013). Moreover, marriage remains nearly universal; even among recent cohorts of women age of marriage remains close to 20 (Das and Dey, 1998). As a result, there is a very short window between schooling and marriage. Many women move directly from their parent's homes to their spouses', never having lived independently and with no exposure to life outside their communities. Leaving the village before marriage is uniquely associated with the recent growth of employment in the manufacturing and service sectors. In traditionally conservative societies, such exposure can have a significant impact on women. Young women are exposed to life outside the village and have an opportunity to live independently and earn an income. On one hand, the exposure and the change in bargaining power could lead to better outcomes. On the other hand, working could have an

adverse effect if, for example, these women have lower social standing when they return to their villages. The net effect is an empirical question.

Empirically, identifying the causal effect of working is challenging. Most of the existing literature exploits variation in access to jobs to study the impact of labor market opportunities for women (Atkin 2009, Heath and Mubarak 2012, Jensen 2012). While this sheds light on the extensive margin, the type of women who take up jobs outside the household may differ on other characteristics. For example, they may come from families that are less conservative or may have different outside options and opportunity costs. These differences may affect future life outcomes directly. I try to isolate the effect of working outside the household amongst women who all took up the same kind of job. Specifically, my analysis makes use of a natural experiment in length of work tenure created by a textile firm's decision to change fixed-term contracts to daily wage contracts. Administrative data shows that unanticipated differences in time under the fixed-term contract affected months worked. I track and survey all cohorts of workers affected, on average 4.5 years after they first started working at the factory. Using data from a survey of 985 women who vary in duration worked, I find that working increases the age of marriage and lowers desired fertility, without any observable costs on the marriage market and eventual spouse quality in the equilibrium. There are also strong spillover effects within the family, as age of marriage increases for younger sisters and school dropout rates decrease for younger brothers. I find evidence that an increase in empowerment and autonomy is a plausible channel for these changes.

The textile industry in Tamil Nadu is one of the largest employers of young women. These factories offer a unique setting for studying the effect of working outside the household because women working in this industry often migrate from their native villages to the location of their employment, and live and work at the factories with other women. These firms often employ women using fixed-term contracts with a large deferred payment to incentivize tenure. The firm I worked with replaced fixed-term contracts of three- and one-year lengths with contracts that paid workers daily wages with no deferred payments. The change in wage contracts was unanticipated and workers from different cohorts were exposed to the fixed-

term contract for different lengths of time before the change. I restrict my analysis to the sample that joined before the change in contract to avoid selection bias from choosing into a different contract. I use the duration of exposure to the three-year contract as an instrumental variable (IV) for the duration the woman works outside the household. Further, to control for any cohort of joining time trends, I use a control group consisting of workers with one-year contracts. The difference-in-difference estimates for the first-stage show that for every month of exposure to the fixed-term contract, duration worked increases by 0.5 months.

Since the employment typically takes place in the window between schooling and marriage, one immediate effect of working could be on marriage outcomes. Women who work for longer may get married later than those who work for a shorter duration. I find strong evidence that employment outside the house increases the age of marriage and decreases the probability that a women is married by age 21. The IV results suggest that the elasticity of age of marriage with respect to duration worked is 1.1. While this is only slightly more than an exact one-for-one increase, it does not seem to be the case that women in the sample get married as soon as they complete their employment. Instead, I find that women who work longer receive their first marriage proposal later and also have a longer gap between when they receive their first marriage proposal to when they get married. This suggests that some of the increase in age of marriage may be because women who work longer defer marriage even after receiving a marriage proposal.

Early marriage for women is associated with a number of poor outcomes such as lower educational attainment and economic and social status (Dahl 2010). Work from Bangladesh suggests that delaying marriage increases schooling and preventive healthcare (Ambrus and Field 2008). However, any positive effects of delaying marriage may be undone if there are costs to working outside the household and marrying later. If working away from home is not desirable in the marriage market, these women might find it harder to find a spouse and may end up not getting married, or being matched to spouses of poorer quality, or paying a larger dowry to compensate for having worked and being older. However, I find no evidence that this is the case and working does not have significant effects on the number of marriage

proposals the woman receives, the likelihood that the woman is married, the gifts her family has to give during the wedding and the quality of her spouse in the equilibrium.

Age of marriage has also been shown to be a significant predictor of age of first pregnancy and total fertility rate (Jensen and Thornton 2003), which in turn increases maternal and child mortality. I find evidence that working increases the age of the woman when her first child is born and decreases the number of children the woman has. However these results should be interpreted cautiously since I only observe short- to medium-term outcomes for these women. Instead, I examine the effect on desired fertility and find that desired fertility decreases by 14% for the average woman in the sample who works 18 months.

Finally, I look at spillovers to younger siblings who could be affected directly if they also enter the labor market, or indirectly through the empowerment and wealth effect of the older sister working. I find that while an older sister working does not increase the likelihood that younger sisters work, it increases the age of marriage for younger sisters. Further, it increases the probability that younger brothers are currently studying and decreases the probability that they have ever worked. These results suggest that there may be positive externalities to younger siblings when women work longer.

I consider the evidence on two possible channels for the effects. First, working can increase empowerment through the exposure to life outside the village, the new networks formed at the workplace, the change in the worker's outside option and the opportunity to earn an independent income. This in turn can change bargaining power and translate into changes in real outcomes such as marriage and fertility. Alternatively, women who work longer may live in wealthier households and higher household income may be associated with delaying marriage, lower fertility and more education for boys. I measure the impact of duration of work on intermediate outcomes that measure empowerment and household wealth. I find that women who have worked longer score higher on measures of female empowerment and autonomy. Particularly, working improves autonomy in marriage decisions and labor supply decisions. In a setting like India where most women have arranged marriages and meet their

spouse on their wedding day, this is a significant gain in female empowerment (Banerji, Martin and Desai 2008). On the other hand, I find no evidence that an increase in household wealth is the main channel for the effects.

The results in this paper are relevant to the literature on the impact of participation in the formal labor market on women in developing countries. Access to jobs in the service sector for women in rural areas has been found to reduce early marriage and desired fertility by encouraging women to enter the labor market or obtain more education and training (Jensen 2012). The growth of manufacturing jobs has been associated with improvements in girl's school enrollment and better health for female children through increased returns to investment in female children (Heath and Mubarak 2012, Atkin 2009). But this does not tell us the impact of exposure to such work on the women who take up these jobs. Evidence from the textile industry in Bangladesh associates working with higher female status and better quality of life measures (Kabbeer 2002, Hewett and Amin 2000). But NGOs and human rights groups highlight the negative effects of factory work for women such as long hours, exploitative and unsafe working conditions and social taboos (ActionAid, New York Times). The analysis in this paper provides empirical evidence on the effects of exposure to working on the women who take up these jobs.

This paper also contributes to the literature on other policies that affect marriage and fertility in developing countries. Compulsory schooling laws and lowering the costs of schooling can delay marriage by keeping girls in school for longer (Kirdar, Tayful and Koc 2011, Duflo, Dupas and Kremer 2011). However, policies that affect marriage through schooling would result in women continuing to live at home without getting any additional exposure to life outside the village or experience living independently. Goldin and Katz (2000, 2002) and Bailey (2006) find that the oral contraceptive pill led to delayed marriage and pregnancy and lower desired fertility in the United States by decreasing the cost of delaying marriage by investing in careers. The setting in the paper provides evidence that opportunities that bring women outside their villages for employment in traditionally conservative societies could be an important tool for increasing female empowerment and can impact real outcomes for both

the woman and have externalities to younger siblings.

Changing social norms and cultural beliefs especially on gender roles and attitudes is challenging. However, living and working outside the village is not the only way by which gender attitudes and outcomes can change. Existing literature has studied the impact of mobility and exposure to life outside their community for women through other channels. For example, Jensen and Oster (2009) find introduction to cable television has significant impacts on gender attitudes in rural India, which also translate into increased schooling for women and decreases in fertility. They argue that this is because television portrays life in urban settings dramatically changing the information that these women have. Beaman et al (2012) use a natural experiment that reserved leadership positions for women in village councils to show that female leadership influences adolescent girls' career aspirations and educational attainment. This paper contributes to this literature by examining the link between young women living and working outside their household on empowerment and autonomy.

The rest of this paper is organized as follows. Section 2 gives a background about employment in the textile industry in Tamil Nadu for women to help understand the context for the findings. Section 3 explains the change in wage policy that provides a natural experiment in duration of work, describes the identification strategy and describes the data used. Section 4 presents the main empirical results on marriage and fertility and spillovers to siblings. Section 5 explores possible mechanisms for the findings. Section 6 concludes discussing implications of the findings for policy.

2 Study Context: Textile Industry in Tamil Nadu

The textile industry is one of the largest manufacturing sectors in South Asia that employs women. In India, this sector is a major contributor to industrial production and exports, accounting for nearly 14% of the total industrial production and 20% of the total exports. The South Indian state Tamil Nadu has a significant presence in this industry and employs over 200,000 women in low-skill manufacturing jobs. Over the last two decades, the work-

force in this industry has become increasingly comprised of young women since they are easy to manage, can be paid lower wages and are less likely to unionize (Standing 1999, Fontana 2003).

A common practice for firms in this industry in Tamil Nadu is to hire young unmarried women under an employment contract that provides strong incentives for work tenure. Under these contracts, the women are hired for a period of usually three-years during which they live and work at the factory. The factories provide dormitories, food and other facilities for the workers. During the contract period, approximately a third of their wage each month is deferred and saved until the end of the contract period when it is given to them as a lump sum of money. If the woman leaves before the end of the contract, she forfeits the entire lump sum of money. Thus the lump sum provides a strong incentive to stay at the factory for the duration of the contract.

This type of factory employment for women where women live and work in the factories was adopted by firms in Tamil Nadu in the early 1990s, and is very similar to what was offered to first generation female mill workers in Lowell in the United States in the nineteenth century and women in Japan and China in the early twentieth century (Dublin 1979, Dublin 1981, Eisler 1977, Honig 1996). From the firms perspective, hiring workers using such a contract may be attractive for several reasons. Firms have to invest in training the workers for the job, and once trained the workers could be hired by competing firms for a higher wage thus wasting the resources the firm spends on training. By locking workers in for three-years using the lump sum as an incentive for tenure, the firm can recoup the training costs and reduce labor turnover. Moreover, the lump sum paid at the end could also reduce shirking by workers by increasing the cost of being fired.

The women hired under such wage contracts are typically unmarried, since married woman are less likely to migrate away from the spouse's household and live in the factory dormitories. They are typically around the ages of 17 or 18 years, have discontinued their schooling and come from low-income families in rural areas where the monthly household income is

less than \$100 (Neetha N 2001). Despite there being a lock-in period of three-years, these contracts might still be attractive in an environment where families have a short-term credit constraint and there is uncertainty on when the girl will get married. With limited other opportunities for young women to find work, the employment offers an additional source of monthly income for the family and a relatively secure living environment for young women to live away from home. Further, the deferred lump sum payment is attractive because it enables the families to save up a large sum of money. In a culture where a womans wedding is a large expense on her family, this saving can be used to buy jewelry and meet other expenses for the wedding. In fact, in its early phase, these employment contracts were often advertised as a way for women to save for their weddings.

3 Methodology

3.1 Change in Wage Policy

The firm I worked with operates several textile units in different parts of Tamil Nadu. I focus on the changes implemented at two units. At these units, the firm offered two types of contracts at baseline a three-year contract to workers who enter the firm with no previous industry experience and a one-year contract to workers who enter the firm with some previous industry experience. In 2010 following a change in ownership structure the firm terminated the use of both contracts and switched to paying workers regular wages based on a daily rate and the number of days worked per month.¹ The main change in the wage structure was that workers received full wages for each day worked in the month and no money was deferred. This removed incentives for longer tenure at the firm. The change came into effect immediately and the daily wage went up sufficiently to compensate for the amount deferred under the original contract. Moreover, workers were also given a settlement amount proportionate to the duration they had already worked under the original contract up to that point to compensate them for the change in the system. There were no other

¹Detailed interviews with the management and owners suggest that the change was unrelated to profitability. Moreover, it suggests that there was no way the workers could have anticipated the change. This is also confirmed through several focus groups with the workers who were at the firm at the time of the change.

major changes to the work environment at this time. I use this policy change as a quasi-experiment that affects the duration under fixed-term contracts for young women.

Under the fixed-term contracts, a portion of the wage was deferred until the end of the term specified by the contract when it was given as a lump sum, and that amount would have to be forfeited if the worker failed to complete the contract period. This feature of the contract provided a strong incentive for the women to stay at the firm until the contract period was completed. The longer the time already spent at the firm, the higher the cost of quitting without completing the contract period. Once this feature of the employment was removed, the women could work as long as they liked without any cost to quitting to since they received their full wages each month without any deferred amount. Thus, under the original fixed-term contract, we would expect to see weakly longer tenure at the firm than under the new contract. At the time of the change in wage policy, depending on which cohort a woman joined the firm, she would have been exposed to the fixed-term contract for a different length of time. Thus women who had been exposed for longer to the fixed-term contract would work longer at the firm.

Figure 1 uses administrative data to plot the survival estimates for three year contract workers from different cohorts before and after the policy change. The 2006 cohort was fully exposed to the original fixed-term contract. The survival estimates for this cohort show a gradual decline initially followed by a flat region until the end of the contract period after which there is a steep drop. On the other hand, for cohort that joined after the change in wage policy such that they were never exposed to the fixed-term contract, the plot of the survival estimates shows a steady and gradual decline and overall lower duration of work. For the cohorts in between (2007, 2008, 2009) that were exposed to the fixed-term contract for different durations, we see a gradual change in shape of the survival estimates from that of the 2006 cohorts to that of the cohorts after the policy change. Thus average duration of work increase with exposure to the fixed-term contract where exposure is defined as the number of months before the change in wage contracts the worker joined the firm. This suggests that exposure to the fixed-term contract is a good predictor of duration worked at

the firm.

3.2 Identification Strategy

We are ultimately interested in studying the causal impact of working outside the village on lifetime outcomes. The simple OLS estimation is given by:

$$y_{ic} = \beta_0 + \beta_1 W_{ic} + \beta_2 3^{yr} C_{ic} + \beta_3 X_{ic} + \gamma_c + \epsilon_{ic} \quad (1)$$

where y_{ic} is the outcome of interest for worker i from cohort of joining c , W_{ic} is the number of months worked at the factory, $3^{yr} C_{ic}$ is a dummy for whether the worker had a three-year contract at the start of the spell and X_{ic} is a set of individual characteristics such as age and education. γ_c is a cohort of joining fixed effect defined as six-month cohorts before the policy change. However, the coefficient β_1 is biased and does not give the causal impact of duration of employment since duration worked may be endogenous to the outcomes of interest. For example, a worker from a more conservative family may work less and get married early.

To identify the causal effect of working, I require random variation in duration worked. The sudden termination of the fixed-term contract by the firm provides an exogenous shock to required work tenure for the workers. Workers who had joined the firm before the change came into effect had different levels of exposure to the fixed-term contract based on how long before the policy change they started working at the firm. For example, a worker who joined the firm the month before the change was implemented had only one month under the fixed-term contract compared to a worker who joined three-years before the change and had almost completed the three-year term specified by the contract when the change came into effect.

I define the exposure to the fixed-term contract as the number of months before the change in wage contract a worker joined the firm. This allows for the fact that some workers may have joined earlier but left the firm on their own even before the contract change. I use this exposure variable as a source of variation for duration worked and use an instrumental

variable (IV) approach to measure the causal impact of working outside the household.

There are two main concerns with the identification. First, very old and very recent cohorts of workers may be very different from each other. In particular, the workers who joined after the change in policy selected into a different contract and hence may be different in other dimensions. So I restrict all the analysis to a narrow window of workers hired from right before the change came into effect until three years before the change came into effect (2007 to 2010). Specifically, I do not include any workers who joined after the change in wage contract. Thus within my sample, all the workers had originally selected into the exact same contract. Therefore, there is no selection bias due to contract choice when I restrict the analysis to this group. Further, this drops very old cohorts and restricts the analysis to a smaller range of cohorts. Within this group, I use all workers even if they were no longer working at the firm when the change came into effect. For example, in earlier cohorts there may be workers who dropped in the first few months despite the fixed-term contracts and these workers may differ on other dimensions that affect the outcomes of interest. Not including these workers will bias the analysis by differentially changing the composition of the cohorts being considered.

Second, my identification relies on the fact that the change in policy affected different cohorts of joining to different extents. The duration of exposure to the fixed-term contract depends on which cohort the worker joined and is confounded by a possible time-trend and other differences by cohort of joining. I therefore use as a control group all workers at the firm who had the one-year contract and include cohort of joining fixed effects. The most recent cohort of one-year contract workers are actually affected by the change in policy, but to be cautious in controlling for cohort of joining effects I use even these workers as a control group.²

²Results from the administrative data not included here suggest that historically three-year contract worker cohorts that joined sufficiently before the change such that their entire tenure was under the original contract looked similar with regard to months worked. This suggests that there is no cohort time trend in duration worked that is specific to three-year contract workers.

Figure 2 shows the first stage by fitting a fractional polynomial from the data for the survey sample of the number of months worked at the firm against the number of months before the change in policy the worker joined the firm. We see that the effect of exposure to fixed-term contracts is stronger for workers with the three-year contract than for those with the one-year contract. Duration worked decreased with number of months before the change in wage contract the worker joined the firm.

I estimate the difference-in-difference of duration worked outside the household between three-year and one-year contract workers from different cohorts. I control for observable individual characteristics such as age and years of education.³ I use the following specification for the first stage:

$$W_{ic} = \alpha_0 + \alpha_1 E_{ic} * 3^{yr} C_{ic} + \alpha_2 E_{ic} + \alpha_3 3^{yr} C_{ic} + \alpha_4 X_{ic} + \gamma_c + \epsilon_{ic} \quad (2)$$

where E_{ic} is the exposure to the fixed-term contract defined as the number of months before the change in wage policy the worker i from cohort c joined the firm. α_1 is the difference-in-difference estimate that measures the difference in duration worked between three-year and one-year contract workers from different cohorts such that the change in wage policy had different impacts on their tenure requirements.

I then estimate the causal effect of W_{ic} on marriage, empowerment and the other outcomes we are interested in using the interaction between E_{ic} and $3^{yr} C_{ic}$ as an instrument variable for W_{ic} . The variable E_{ic} is unrelated to the outcomes of interest since the change in wage policy by the firm was an exogenous shock and thus satisfies the exclusion restriction. The IV approach involves estimating the following two-stage model:

$$y_{ic} = \beta_0 + \beta_1 W_{ic} + \beta_2 E_{ic} + \beta_3 3^{yr} C_{ic} + \beta_4 X_{ic} + \gamma_c + \epsilon_{ic} \quad (3)$$

$$W_{ic} = \beta'_0 + \beta'_1 E_{ic} * 3^{yr} C_{ic} + \beta'_2 E_{ic} + \beta'_3 3^{yr} C_{ic} + \beta'_4 X_{ic} + \gamma'_c + \mu_{ic} \quad (4)$$

³Figure A1 in the appendix which plots the distribution of age in the sample by year of joining shows that there is variation in age across cohorts.

where y_{ic} is the outcome of interest for worker i from cohort c . β_1 is the causal effect of working and gives us the effect of working one more month in the factory for women who selected into the contract. I control for age and years of education.

The reduced form which gives the effect of exposure to fixed-term contracts is given by:

$$y_{ic} = \alpha_0 + \alpha_1 E_{ic} * 3^{yr} C_{ic} + \alpha_2 E_{ic} + \alpha_3 3^{yr} C_{ic} + \alpha_4 X_{ic} + \gamma_c + \epsilon_{ic} \quad (5)$$

The IV approach allows me to isolate the causal effect of working outside the household amongst women who all took up this employment.

3.3 Survey and Data

I use two sets of data for my analysis. I first collected employee records from the firm that provided use with a complete list of all female workers hired from 2005, basic demographic information, contact information provided when the worker started working at the firm and the dates of starting and completion of their employment spell at the firm. The records also note if the worker was under the three-year or the one-year contract for each employment spell. I also collected monthly attendance records that provides information on the number of days worked and absent each month.

I used the data from the firm to select the sample for a detailed survey. I selected for the survey all workers hired from 2007 until the policy change was implemented. I also restrict my target sample to workers who worked for atleast one month at the firm. This was a sample of 1414 workers. Of these workers, 616 workers were working at the firm at the time that the policy change was implemented. The process for the follow-up survey was complicated by the fact that the workers had migrated from several districts of Tamil Nadu to work at the firm and many of them no longer worked at the firm at the firm. So I piloted and implemented a multi-step tracking process using a team of field staff from the Center for MicroFinance to identify the location of the workers (or family members) for the survey, and ensure minimal attrition from the sample. Our tracking process was able to successfully

track and complete surveys for about 70% of the sample. I describe the different stages of the process we used to track respondents in Section A1 in the appendix.

Table A2 in the appendix shows the tracking results by cohort of joining. The cohort of joining is an important variable for the subsequent analysis since I use the fact that workers from different joining cohorts were affected differently by the policy change to construct the treatment variable. I consider two measures of tracking success - whether the survey was successfully completed and whether the worker was tracked but refused the survey. I run a regression of these variables on the dummies for the cohort in which the worker joined the firm and a dummy for whether the worker had a three-year contract. I find that the probability of completing the survey successfully is about 15% lower for the cohort that joined the firm 24 to 30 months before the change in wage policy by the firm. So as a robustness check I examine the effects for the restricted sample which omits this group to reduce any bias that may come from the lower tracking rate for this group.

Since the tracking and survey process was only able to capture about 70% of the original sample, an important concern is whether there is differential attrition by exposure to the fixed-term contract. I therefore test whether exposure to the fixed-term contract has an effect on the probability that the survey was completed and the probability that the worker was tracked but refused to participate in the survey using the reduced form specification. The results presented in Table A3 in the appendix show no significant differences in attrition by duration of exposure to the fixed-term contract. A second concern with the sample is that some questions and sections to the survey were added after the pilot round was completed. Moreover, in cases where a family member was surveyed, we omitted questions on attitudes and restricted the questions to those measuring real outcomes. Hence for such surveys we do not have all the outcomes. However, there are no differences by exposure to the fixed-term contract on the probability the worker was in the pilot round or that we surveyed a family member.

Table 1 provides the summary statistics for the sample that was surveyed and also shows

the balance check by treatment for individual characteristics. Columns (1) and (2) show summary statistics for the three-year contract and one-year contract workers respectively. About two thirds of the sample has the three-year contract (664 workers) and the remaining third has the one-year contract (321 workers). The workers with three-year contracts are younger on average; the average age of workers with the three-year contract is about 22 while that of workers with the one-year contract is about 24 years. The average age at the time of joining the employment for workers with the three-year contract is about 17.2 years while that for the workers with the one-year contract is 19.41 years. This is consistent with the fact that workers with the one-year contract were given shorter contracts because they had previous work experience and hence we expect them to be older. The workers with the three-year and one-year contracts both have about 9 years of education they have, come from families with around 5 members and on average have a similar number of siblings. The workers with a one-year contract have a slightly higher birth-order than those with a three-year contract. They are also a little more likely to be from a district around the factory which maybe because they have already worked before and this is a second job and they might choose to work closer to home. They are also a little more likely to come from a household with a widowed parent. For three-year contract workers the father's primary occupation is about 47% likely to be agricultural labor while this is about 43% for the one-year contract workers. The mother's primary occupation is agricultural labor for about 53% of three-year contract workers and 47% of one-year contract workers. For 18% of three-year and 21% of one-year contract workers, the mother is a housewife. For about 18% of the three-year contract workers and about 22% of the one year contract workers, a sibling has worked at a manufacturing job with the worker.

Columns (3) and (4) of Table 3 show balance checks for differences in worker characteristics. I use the reduced form specification without individual controls and only cohort controls and report the coefficient on the interaction term in columns (3) and (4) for the full sample and the restricted sample respectively. Workers in the three-year contract who are more exposed to the contract with tenure obligations are younger and have fewer years in education, but this is not significant at the 10% level. I find no significant differences

by treatment for any of the other observable characteristics. However, I include age and education controls in all the main specifications to account for any potential differences in outcomes by age or education.

4 Results

This section presents the difference-in-difference results for the first stage and the IV and reduced form results for the impact of working on marriage and fertility outcomes. I show the IV and reduced form results for the full sample from the survey. Results for the restricted sample omitting the cohort of workers who joined the firm 24 to 30 before the change in wage policy are provided in Section A3 in the appendix.

4.1 First Stage: Impact of Contract with Tenure Incentives on Duration Worked

Column (1) and (2) of Table 2 show the simple difference for duration worked in the factory by exposure to the fixed-term contract separately for the three- and one-year contract workers respectively. The effect of exposure to the fixed-term contract is large and significant for the three-year contract workers but is smaller and weak for the one-year contract workers. Columns (3) to (6) of Table 2 show the difference-in-difference results for the impact of exposure to the fixed-term contracts on duration worked. For every month of exposure to the fixed-term contract, duration worked by three-year contract workers increases by 0.5 months. Columns (3) and (4) show the results for the full and restricted samples using administrative data from the firm on employment spell lengths. However, one concern is that the duration worked at the firm is not a good measure of total duration worked away from home if workers work at other similar jobs in other firms once the wage policy is changed. In columns (5) and (6), I use a variable from the occupation history in the survey data that measures total duration worked across all jobs. This includes any time spent working in agricultural jobs. I find that the results for the impact of exposure to the fixed-term contract on duration worked continue to hold suggesting that it is not just the duration worked at the firm that is

affected, but total duration worked also increases with exposure to the fixed-term contracts.⁴

The results from the first stage indicate that the change in wage contracts by the firm had a large impact on working. Workers who were exposed to the original wage contract got a larger settlement amount and we might expect the income effect from the liquidity shock to reduce labor supply.⁵ However, the tenure incentives in the fixed-term wage contract had a stronger effect on duration worked and labor supply by the women. The first stage results show that the interaction variable between exposure to the fixed term contract and the dummy for the three-year contract is a good predictor of duration worked.

4.2 Marriage and Fertility

Table 3 shows the IV and reduced form results for the effect of working marriage. For each additional month worked outside the household, the age of marriage increases by about 1.1 months, slightly more than a one-for-one increase (Column (1) of Table 3). Moreover, for every month worked the probability that the woman was married before the age of 21 reduces by about .01 (Column (2)). This represents a decrease in the probability of being married before age 21 by more than 50% for the average worker in the sample with a duration of work of 18 months. In comparison, a delay in timing of menarche has a smaller effect, with a one year delay leading to an increase in age of marriage by 0.74 years (Ambrus and Field 2008). A higher age of menarche has a mechanical effect on marriage since women are typically withheld from the marriage market before puberty. Working may have a larger impact on the timing of marriage if women who work longer also choose defer marriage.

Figure 3 plots a distribution of the time between when a worker in the sample completes her employment spell at the factory and when she gets married. The plot suggests that there is no mechanical rule such that women do not get married while at the factory, but then get

⁴The total work variable is noisy since workers were sometimes unable to report exactly how long they worked at each of their other jobs. Therefore in subsequent regressions for the IV approach I use the variable measuring duration worked at the firm since this is measured accurately from administrative data.

⁵In results not included in the paper, I find that a longer duration of exposure to the fixed-term contract and hence a larger settlement amount has no effect on duration worked after the change in wage contract.

married immediately after completing their employment at the factory and returning home. The results in columns (3) and (4) break down the delay into two components, the age the woman receives her first marriage proposal and the time between receiving this proposal and getting married to understand how the time to marriage is distributed. The results suggest that while some of the delay may be because women who work longer receive their first marriage proposal later, the time between receiving the first proposal and getting married also increases with working suggesting that the women may also be choosing to defer marriage.

While increasing the age of marriage for women is often considered an important policy goal in many developing countries, the overall effect on the marriage market may be negative if women who work longer and delay marriage are matched to a spouse of lower quality. The results in Table 4 show that in the equilibrium there are no negative effect of working on observable characteristics of marriage outcomes. In particular, there are no significant effects of working on the number of marriage proposals a woman receives and whether the woman is married. Further, there is also no significant effect on the value of gifts the bride's family gives the groom and his family at the time of marriage suggesting that women do not have to pay a larger dowry to compensate for working and getting married later.

I next consider an index of spouse quality which includes variables that measure various dimensions of spousal quality such as age gap between the worker and her spouse, whether the spouse lives in a different village or district, the relative economic status of the spouse, the relative education of the spouse and the reported income of the spouse.⁶ In column (4) I present the average effect size (AES) for the equilibrium quality of spouse. The method which follows O'Brien (1984), Kling et al. (2004) and Clingingsmith et al. (2009) computes the average effect size across outcomes as the average of the individual effects standardized by the standard deviation of the effect for the comparison group.⁷ I find no significant effect

⁶Section A2 in the appendix provides details on the components of this index.

⁷To test for the AES against the null hypothesis of no average effect, the individual effects are jointly estimating in a seemingly unrelated regression framework. The stacked regression gives the correct covariance matrix for a test of the AES.

on the spouse quality index.⁸

The results in Table 4 suggests that on observable dimensions, women do not suffer any costs from working. It is important to note that these results are the equilibrium outcomes in the marriage market. For example, spouse quality may worsen because the woman is older when she gets married, but may improve because of her work experience. The results we observe is the net effect of working on the marriage market.

In Table 5, I examine the effect of working on age of first pregnancy and number of children. I present the results for the number of children for women who are married and for all women in the sample in columns (2) and (3) respectively. I find that working longer is associated with women having children later and having fewer children. However these results should be interpreted with caution due to the small sample size since over 40% of the women in the sample are unmarried and do not have children. Moreover, I only observe fertility at the time of survey rather than fertility over the woman's entire lifetime and many of the women in the sample have not realized their lifetime fertility. In column (4), I use an alternate measure, whether the woman had a child before the age of 23. I find that for every month worked in the factory, the probability that the woman had a child by the age of 23 decreases by 0.01, a more than 50% decrease in the probability for the average worked in the sample. I also consider an alternate measure for fertility and report the results for desired fertility, or the number of children the woman reports she would like to have. For the average worker in the sample results show a decrease in desired fertility by 0.27, a 14% decrease from the mean desired fertility of approximately 2 children in the sample (column (5)). This is comparable to the decline in desired fertility observed by Jensen (2012) in an RCT that offered women in rural India recruitment services for jobs in the BPO sector.⁹

⁸In results presented in Table A4 in the appendix, I show that there are no significant effects of working on any of the individual variables that make up the spouse quality index.

⁹Jensen (2012) finds that desired fertility decreases by 0.35 from the control group mean of 3 children, almost a 12% decline.

4.3 Spillovers to Siblings

In this section, I examine whether a woman working has externalities on her siblings¹⁰. I consider the impact of women working on their siblings' marriage, education and work. We expect to see an effect on younger siblings since their outcomes can still be affected. I interact duration worked with whether the sibling is an elder or younger brother or sister. I instrument this with the interactions of the instrumental variable with the type of sibling in this regression.

Table 6 provides the IV and reduced form results for the full sample. The age of marriage for younger sisters increase, and this increase is similar in magnitude to the increase in age of marriage for the worker. However, there is no effect on whether the younger sisters are currently studying or have ever worked which suggests that these increases are due to spillovers from the worker and not from the sister working herself. More empowered older sisters may expose their younger siblings to the new values they learn from working outside the village and bargain for better outcomes for their younger siblings. Alternatively, we may see an effect on age of marriage because in these societies female children are married by birth order and delaying the marriage of an older sister means her younger sisters will also get married later (Vogl 2013).

For younger brothers we see an increase in the probability they are currently studying and a decrease in the probability they have ever worked. The woman working longer may increase household wealth, which results in more education for siblings. Moreover, younger brothers' work may substitute for older sisters' work leading to younger brothers delaying entering the labor force when his sister works longer. Finally, if sisters are getting married later, it delays when the family is required to spend money on marriage related expenses. This may allow younger boys to study longer and not enter the labor market early.

¹⁰The pilot round of the survey did not include a roster of siblings and hence we do not have outcomes for siblings for surveys done in the pilot stage.

5 Mechanisms

The results in Section 4 show that working increases the age of marriage and lowers desired fertility without any observable costs in the marriage market. Moreover, when women work, there are spillovers to her younger siblings; younger sisters get married later and younger brothers study longer and delay entry into the labor market. These changes could be a result of an increase in empowerment and autonomy for women from exposure and higher bargaining power or due to an increase in household wealth. In this section, I examine the effect of working on intermediate outcomes such as empowerment, autonomy and household wealth. I provide the IV and reduced form effects for the full sample. Again, the effects for the restricted sample are provided in Section A3 in the appendix.

5.1 Empowerment and Autonomy

Women who working outside for longer are more likely to have an opportunity to interact and form friendships with women from other areas, both rural and urban, with different customs and traditions. They are in particular exposed to a group of women, who like them, are also working outside their villages in manufacturing jobs. This is a big contrast to the women they would have been exposed to if they had remained in their villages where most women work in agriculture. Moreover, living alone away from family and earning an income is a significant increase in autonomy for these women. They may be required to negotiate with others and make decisions independently. These experiences expand the exposure women have and could change their bargaining power in future decision-making.

In Table 7, I present the average effect sizes for different measures of empowerment and autonomy for the full and restricted sample.¹¹ Again, as with the spouse quality index in Table 4, I follow O'Brien (1984), Kling et al. (2004) and Clingingsmith et al. (2009) and present average effect sizes. In column (1) we see that working outside the household increases the score women receive on the empowerment index which is based on responses to a

¹¹The pilot round of the survey did not include some of these questions. Moreover, in cases where we conducted a family survey we did not ask questions on attitudes and limited the questions to those on real outcomes. Hence we do not have all the outcomes for empowerment and autonomy for those surveys

series of questions that the women answered on topics such as attitudes women's education, whether women should work and earn an income and women's mobility.¹² For the average worker in the sample who works 18 months, empowerment increases by 0.14 standard deviation.¹³ This is a small increase, but is comparable to the effects on gender attitudes found in other work.¹⁴ In results not included in the paper, I find that the results hold when I restrict the analysis to the sample of unmarried women.

Column (2) shows that women who have worked longer have a higher internal locus of control, with degree of internal locus of control increasing by 0.01 standard deviations for every month worked, or 0.18 standard deviations for the average worker in the sample. The locus of control measure I use is constructed using responses to a series of statements about how much they agree or disagree on whether the events in their life can be affected by their actions (high internal locus of control) or whether they depend on outside factors (low internal locus of control) (Rotter 1966).¹⁵ While the increase in the locus of control is modest, in interpreting the magnitude, it is important to note that these measures are typically hard to move. They are considered to be determined during childhood and to stabilize during adolescence (Weisz and Stipek 1982 provides a review).¹⁶ The results suggest that working outside the household gives women more confidence and independence in their ability to influence the outcomes in their lives.

I next consider an index of marriage decisions and attitudes that asks the woman the earliest age she would consider getting married and whether she would be allowed to refuse a mar-

¹²The women were asked whether they agree or disagree to several statements on the role and status of women. Section A2 in the appendix provides details on how this index was constructed.

¹³In results not included in the paper I find that the increase is stronger if I restrict the statements to those about education and economic opportunities for women.

¹⁴For example, Jensen and Oster (2009) find that adding cable television is associated with a 0.19 standard deviation improvement in women's autonomy and decision-making, a 0.19 standard deviation decrease in the number of situations in which beating is considered acceptable and a 0.12 standard deviation decrease in the likelihood of wanting the next child to be a boy.

¹⁵I use five standard statements used in measures of locus of control. The responses to each statement were independently coded for whether agreeing indicates a higher or lower internal locus of control. Section A2 in the appendix provides further details on the questions comprising the index.

¹⁶The most comparable evidence to calibrate the magnitude is from Gottschalk (2003). He documents an increase between 0.05 and 0.1 on the probability of disagreeing with statements indicating an external locus of control following an increase in work by 361 hours through a tax credit for welfare recipients.

riage proposal. These are particularly relevant to understanding how working could affect marriage outcomes. The results in column (3) show that for every month worked, women are 0.03 standard deviations more empowered in the marriage decision.¹⁷ This is a fairly large effect translating to more than half a standard deviation for the average worker in the sample. In a setting like India, where arranged marriages are the most common types of marriage and many women report meeting their spouses on the day of their wedding, the ability to influence marriage outcomes such as refusing a marriage proposal is uncommon and represents a significant increase in autonomy for a woman.

Finally, I consider the impact on decision on labor supply. Less than 25% of the sample report currently working. This includes any type of employment including casual labor within the village. In results not included in the paper, I find that this does not differ by duration exposed to the fixed-term contract. In column (4), I show the effect of working on a work autonomy index. The index includes two questions on the reason the woman stopped working and the person she thinks should control her earnings.¹⁸ I find that working increases the autonomy women have in labor supply decisions by .03 standard deviations for every month worked.

Overall, the results in Table 7 indicate that working increases empowerment and autonomy. Moreover, in results not presented in the paper, I find a positive correlation between age of marriage and empowerment suggesting that it may be a plausible channel for the effects seen on marriage and fertility.

5.2 More Household Wealth?

When women work, they contribute to household income and wealth. If total household income increases we may see changes in marriage and fertility outcomes even if the women are not more empowered and don't have more bargaining power. This wealth effect would

¹⁷Section A2 in the appendix describes this index and Table A4 shows the effects on individual components of this index.

¹⁸Section A2 in the appendix provides more details on the index and Table A4 shows the effects on each component of the index.

be different from the empowerment effect discussed above.

Table 8 shows the impact of working on different measures of wealth for the woman's current household. The mean household income in the sample is approximately Rs. 4900 a month, which is less than \$100. Column (1), shows there is only small positive but insignificant effect on household income. Column (2) and (3) show that there is small and negative but insignificant effect of working on savings and loans. This includes savings in formal institutions as well as savings in the form of gold or jewelry and credit from both formal and informal institutions. Finally, there is a small positive but insignificant effect on the number of household assets the woman reports having in her household. Overall these results are inconsistent with households in which women have worked longer being wealthier and suggest that higher household wealth is unlikely to be an important channel for the effects.

6 Conclusion

Policies that increase age of marriage and lower fertility are of particular interest to researchers and policy-makers. The results in this paper provide evidence that working outside the village leads to higher female empowerment and autonomy, which translates to changes in real outcomes such as delaying marriage and lower desired fertility. Moreover, these benefits of working are not restricted to the women who work, but there are positive externalities to age of marriage and education of younger siblings. These effects on younger siblings occur without the siblings themselves working.

The empirical analysis in this paper uses a change from fixed-term wage contracts to daily wage employment as a source of variation for duration worked at the firm. It is an open question why the change in contract had such a strong effect on duration worked. The women could have continued to work at the factory and even replicated the savings provided by the fixed-term contract themselves. This suggests that there may be other factors that affect the length of time women work. It may be the case that the same barriers that lead to low female empowerment also prevent women from working in the absence of contracts

that incentivize working. Alternatively, existing literature has highlighted that when workers transition from traditional work to factory work they lack discipline and self-control and may need contracts that help them overcome these (Clark 1994, Kaur, Kremer and Mullainathan 2010). The setting in this paper suggests that first generation workers in the manufacturing sector may suffer from discipline problems in how long they work. Further research is required to understand whether the reason is an external barrier to working or internal problems with discipline. However, irrespective of the cause the findings in this paper suggest that providing employment opportunities alone may not be sufficient to encourage women to work. In addition to providing employment opportunities for women, policies should also be designed to provide other incentives to work.

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Figure 1: 3 Year Contract: Kaplan-Meier Survival Estimates

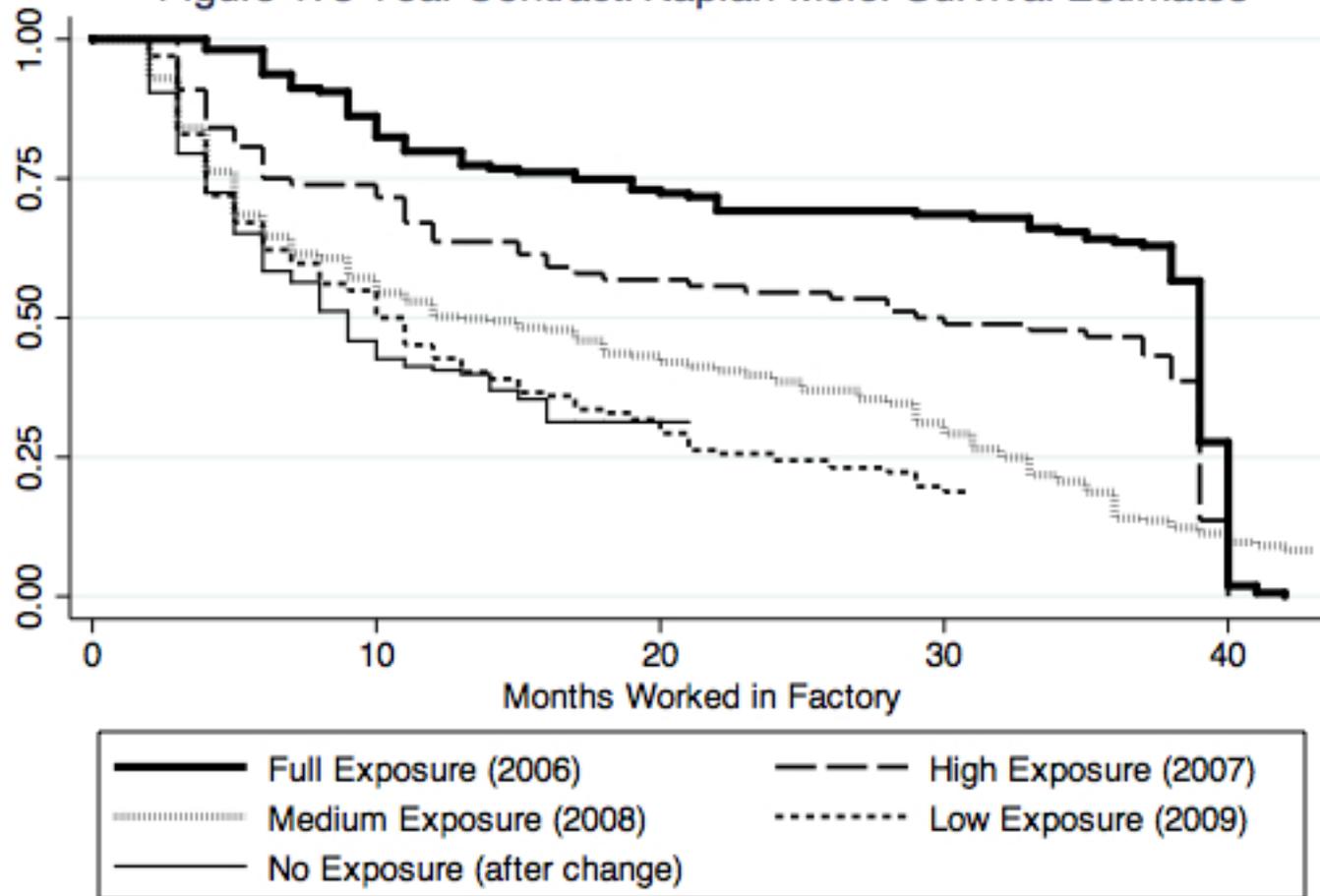


Figure 2: First Stage: Diff-in-Diff of Months Worked Outside

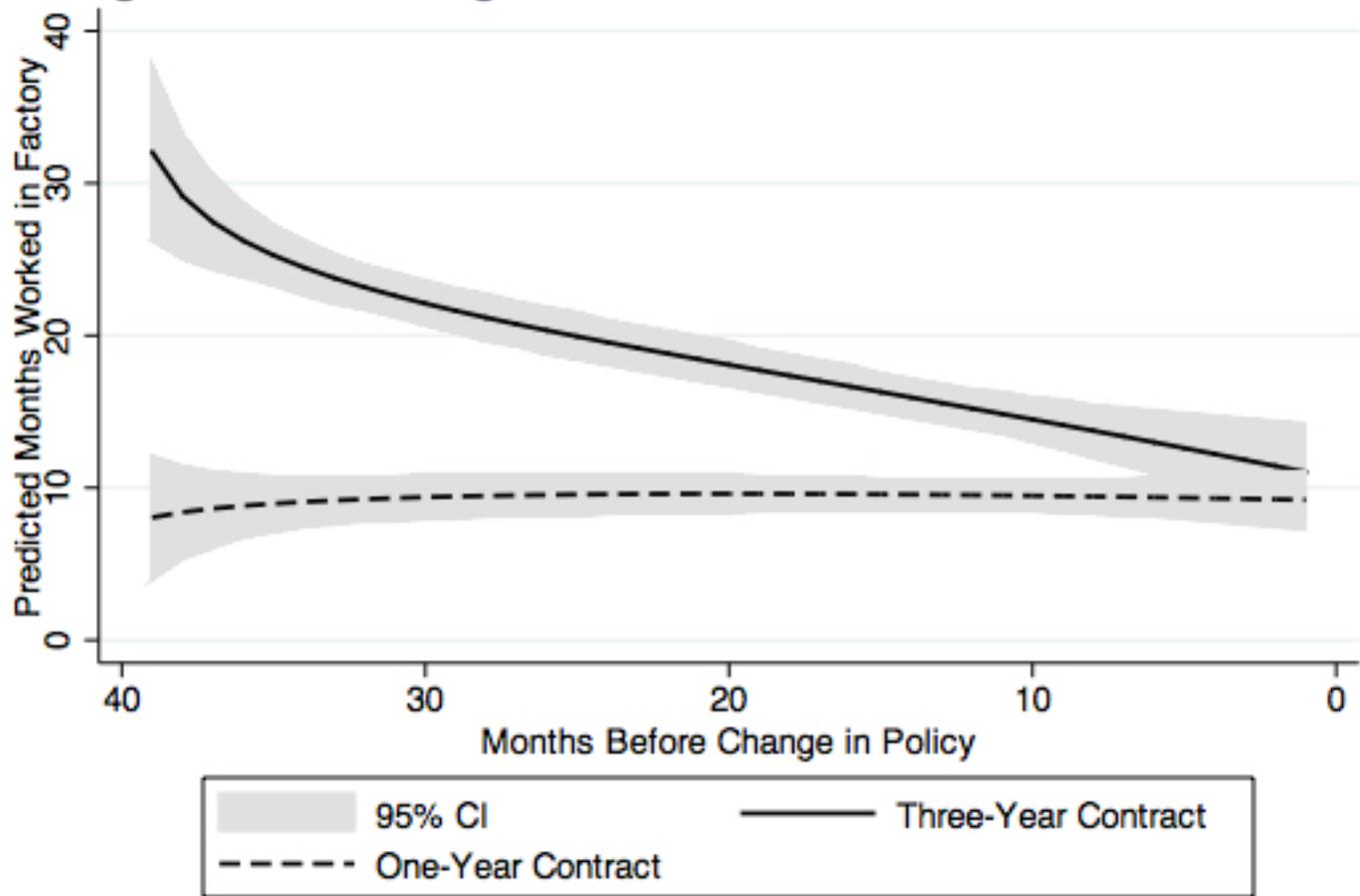


Figure 3: Time Between End of Factory Work and Marriage

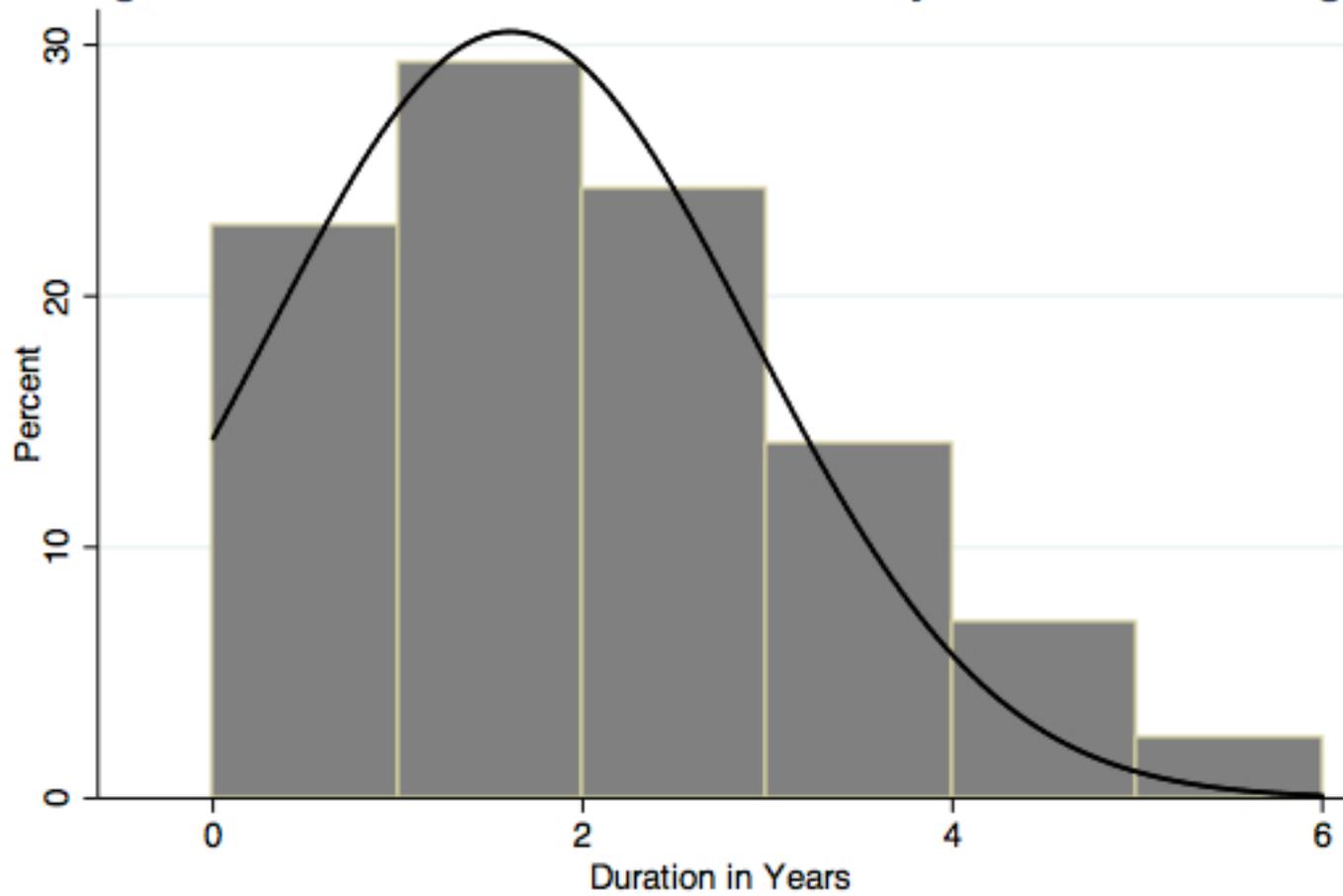


Table 1: Summary Statistics and Balance of Individual Characteristics

	3 Year Contract (1)	1 Year Contract (2)	Full Sample (3)	Reduced Sample (4)
Age	22.06 (2.29)	24.04 (2.78)	-0.03 (0.02)	-0.03 (0.02)
Years of Education	8.93 (1.92)	8.82 (1.82)	-0.02 (0.01)	-0.01 (0.01)
Natal Household Size	5.09 (1.47)	5.16 (1.60)	0.00 (0.01)	0.01 (0.01)
Number of Siblings	2.44 (1.40)	2.51 (1.43)	-0.00 (0.01)	-0.00 (0.01)
Birth Order	1.16 (1.31)	1.42 (1.41)	-0.01 (0.01)	-0.01 (0.01)
Natal Family Lives in District Around Factory	0.30 (0.46)	0.38 (0.49)	-0.00 (0.00)	-0.00 (0.00)
Widowed Parent	0.16 (0.36)	0.24 (0.43)	-0.00 (0.00)	-0.00 (0.00)
Father's Occupation: Agric Labor	0.47 (0.50)	0.43 (0.50)	-0.00 (0.00)	0.00 (0.00)
Mother's Occupation: Agric Labor	0.53 (0.50)	0.47 (0.50)	-0.00 (0.00)	-0.00 (0.00)
Mother: Housewife	0.18 (0.38)	0.21 (0.21)	0.00 (0.00)	0.00* (0.00)
Sibling Worked in a Manufacturing Job with Worker	0.18 (0.39)	0.22 (0.41)	-0.00 (0.00)	0.00 (0.00)
Observations	664	321	985	911
Individual Controls	-	-	No	No
Cohort of Joining Controls	-	-	Yes	Yes

Notes:

(1) In columns (1) & (2) means for 3 year and 1 year contract workers are reported.

(2) In columns (3) & (4) coefficient on interaction between treatment intensity variable and 3 year contract reported for full sample with both contracts and for reduced sample with both contracts excluding cohort that joined 24 to 30 months before policy change.

(3) In columns (1) & (2) standard deviations in parenthesis and in columns (3) & (4) robust standard errors in parentheses

(4) Asterisks denote significance: * p<0.10, ** p<0.05, *** p<0.01

Table 2: First Stage: Effect of Original Wage Contract on Duration Worked

	Months worked in factory		Months worked in factory		Total Work	
	(1)	(2)	(3)	(4)	(5)	(6)
Months before X 3 year			0.463*** (0.0660) [0.000]	0.456*** (0.0685) [0.000]	0.531*** (0.155) [0.001]	0.556*** (0.161) [0.001]
Months before policy change	0.874*** (0.207) [0.000]	0.123 (0.138) [0.375]	0.311** (0.135) [0.021]	0.278* (0.155) [0.074]	-0.366 (0.278) [0.188]	-0.531* (0.317) [0.094]
3 year contract			-2.661* (1.398) [0.057]	-2.365* (1.408) [0.093]	-19.68*** (3.283) [0.000]	-19.94*** (3.323) [0.000]
Sample Observations	3 year 664	1 year 321	Full 985	Restricted 911	Full 776	Restricted 719

Notes:

- (1) Columns (1) and (2) shows the effect of exposure to the fixed-term contract on duration worked.
- (2) Columns (3) to (6) show the difference-in-difference results for the exposure to the fixed-term contract on duration worked.
- (3) In columns (1) to (4) the dependent variable is duration worked in the factory from administrative data.
- (4) In columns (5) and (6) the dependent variable is total work reported from survey data.
- (5) Results are presented for the full and restricted sample.
- (6) The restricted sample drops the cohort that had a poor tracking rate in the survey.
- (7) Individual controls for age and cohort of joining controls included in all specifications.
- (8) Results are consistent with dropping cohort of joining fixed effects.
- (9) The sample size is lower in columns (5) and (6) because in some cases the workers could not provide the duration at each job in their occupation history.
- (10) Robust standard errors in parentheses and p -values in brackets.
- (11) Asterisks denote significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3: Age of Marriage

	Age of Marriage (1)	Married before age 21 (2)	Age received first proposal (3)	Time between first proposal & marriage (4)
Panel A: IV Results				
Months worked in factory	0.0883** (0.0397) [0.026]	-0.00960* (0.00532) [0.071]	0.0512* (0.0268) [0.056]	0.0486 (0.0374) [0.193]
Panel B: Reduced Form Results				
Months before X 3 year	0.0355** (0.0155) [0.022]	-0.00506* (0.00285) [0.076]	0.0275* (0.0145) [0.058]	0.0201 (0.0150) [0.181]
Sample Mean	20.61	0.318	19.91	1.059
Observations	595	948	833	505

Notes:

(1) Columns (1) to (4) of Panel A show the IV results for the impact of working outside the household on age of marriage.

(2) The change in wage policy by the firm is used as an instrumental variable for months worked in the factory.

(3) Columns (1) to (4) of Panel B show the reduced form results for the effect of duration under the old contract on age of marriage.

(4) Individual controls for age and education and cohort of joining fixed effects included

(5) Results are consistent with dropping cohort of joining fixed effects.

(6) About 40% of the sample is unmarried and hence the sample size in columns (1) and (4) is smaller.

(7) Robust standard errors in parentheses and p -values in brackets.

(8) Asterisks denote significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4: Costs of Delaying Marriage

	No. of marriage proposals received (1)	Ever Married (2)	Log Gifts given during Wedding (3)	Spouse Quality Index (4)
Panel A: IV Results				
Months worked in factory in factory	-0.0294 (0.0467) [0.529]	-0.00227 (0.00569) [0.690]	-0.00465 (0.0765) [0.952]	-.0033 (0.0096) [0.726]
Panel B: Reduced Form Results				
Months before X 3 year	-0.0155 (0.0249) [0.535]	-0.00110 (0.00281) [0.695]	-0.00181 (0.0304) [0.953]	-0.00126 (0.00391) [0.748]
Sample Mean	2.996	0.612	178240.4	.
Observations	847	981	585	.

Notes:

- (1) Columns (1) to (3) of Panel A show the IV results for the impact of working outside the household on the marriage market.
- (2) The change in wage policy by the firm is used as an instrumental variable for months worked in factory.
- (3) Columns (1) to (3) of Panel B show the reduced form results for the effect of duration under the old contract on the marriage market.
- (4) Column (4) shows the average effect size for the impact of working outside the household on spousal quality and the effects can be interpreted as standard deviation changes.
- (5) Please refer to the appendix section 2 for the composition of the index.
- (6) Individual controls for age and education and cohort of joining fixed effects included.
- (7) Results are consistent with dropping cohort of joining fixed effects.
- (8) About 40% of the sample is unmarried and hence the sample size in column (3) is smaller.
- (9) Robust standard errors in parentheses and p -values in brackets.
- (10) Asterisks denote significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5: Fertility

	Age when first child was born (1)	No. of kids currently (if married) (2)	No. of kids currently (full sample) (3)	Child before age 23 (4)	Desired Fertility (5)
Panel A: IV Results					
Months worked in factory	0.0680 (0.0513) [0.186]	-0.0289* (0.0175) [0.098]	-0.0272*** (0.0100) [0.007]	-0.0141** (0.00595) [0.018]	-0.0152** (0.00757) [0.044]
Panel B: Reduced Form Results					
Months before X 3 year	0.0220 (0.0170) [0.196]	-0.0109 (0.00692) [0.117]	-0.0137*** (0.00515) [0.008]	-0.00706** (0.00304) [0.021]	-0.00796** (0.00380) [0.037]
Sample Mean	21.54	0.957	0.523	0.365	1.932
Observations	369	458	840	682	570

Notes:

- (1) Columns (1) to (5) of Panel A show the IV results for the impact of working outside the household on fertility.
- (2) The change in wage policy by the firm is used as an instrumental variable for months worked in the factory.
- (3) Columns (1) to (5) of Panel B show the reduced form results for the effect of duration under the old contract on fertility.
- (4) Individual controls for age and education and cohort of joining fixed effects included.
- (5) Results are consistent with dropping cohort of joining fixed effects.
- (6) About 40% of the sample is unmarried and in the pilot round of the survey we did not ask the number of children the woman had; therefore we do not have the full sample in columns (1) to (3).
- (7) Desired fertility was added in a later version of the survey and hence has a smaller number of observations.
- (8) Robust standard errors in parentheses and p -values in brackets.
- (9) Asterisks denote significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6: Spillovers to Siblings

	Ever married (1)	Age of Marriage (2)	Currently Studying (3)	Ever Worked (4)
Panel A: IV Results				
Younger Sister X Months Worked	-0.00447 (0.00668) [0.504]	0.0916* (0.0474) [0.053]	-0.00125 (0.00717) [0.862]	-0.00872 (0.00870) [0.316]
Younger Brother X Months Worked	0.00429 (0.00295) [0.146]	0.144 (0.114) [0.207]	0.0101* (0.00571) [0.078]	-0.0105* (0.00626) [0.094]
Older Sister X Months Worked	0.000931 (0.00353) [0.792]	0.0199 (0.0487) [0.683]	0.000763 (0.00227) [0.737]	-0.00837 (0.00817) [0.305]
Older Brother X Months Worked	0.0000345 (0.00892) [0.997]	0.0241 (0.0784) [0.758]	0.00299 (0.00287) [0.297]	-0.00230 (0.00429) [0.592]
Panel B: Reduced Form Results				
Younger Sister X Months Before X 3 year contract	-0.00178 (0.00262) [0.498]	0.0428* (0.0222) [0.055]	-0.000570 (0.00280) [0.839]	-0.00331 (0.00328) [0.313]
Younger Brother X Months Before X 3 year contract	0.00195 (0.00127) [0.125]	0.0462 (0.0317) [0.145]	0.00453* (0.00258) [0.079]	-0.00477* (0.00273) [0.081]
Older Sister X Months Before X 3 year contract	0.000402 (0.00165) [0.807]	0.00852 (0.0237) [0.719]	0.000298 (0.00109) [0.786]	-0.00386 (0.00373) [0.302]
Older Brother X Months Before X 3 year contract	0.0000415 (0.00404) [0.992]	0.0112 (0.0407) [0.783]	0.00135 (0.00128) [0.292]	-0.00108 (0.00190) [0.568]
Observations	2467	1043	2467	2466

Notes:

(1) Columns (1) and (4) of Panel A and B show the IV and reduced form results for the impact of working on sibling's marriage, education and work.

(2) The change in wage policy by the firm is used as a instrument variable for months worked in factory

(3) Includes individual sibling-level controls for age and worker-level controls for age, education and birth-order, number of siblings and number of younger brothers and sisters.

(4) Standard errors clustered by worker in parentheses and p -values in brackets

(5) Asterisks denote significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 7: Empowerment and Autonomy

	Empowerment (1)	Internal Locus of Control (2)	Marriage Decisions & Attitudes (3)	Autonomy in Work Decisions (4)
Panel A: IV Results				
Months worked in factory	0.0079** (0.0038) [0.036]	0.0109* (0.0058) [0.060]	0.032*** (.0099) [0.001]	0.0288*** (0.0112) [0.010]
Panel B: Reduced Form Results				
Months before X 3 year	0.00464 (0.00289) [0.108]	0.00640* (0.00366) [0.080]	0.0185*** (0.00579) [0.001]	0.0144*** (0.00544) [0.008]

Notes:

(1) Columns (1) to (4) show the average effect sizes for the impact of working outside the household on empowerment and autonomy and the effects can be interpreted as standard deviation changes.

(2) Please refer to the appendix section 2 for the composition of the index.

(3) The change in wage policy by the firm is used as an instrumental variable for months worked in factory.

(4) Panel A and B show the IV and reduced form results respectively.

(5) Individual controls for age and education and cohort of joining fixed effects included.

(6) Results are consistent with dropping cohort of joining fixed effects.

(7) Robust standard errors in parentheses and p -values in brackets.

(8) Asterisks denote significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 8: Is there a Household Wealth Effect?

	Log Household Income (1)	Savings (2)	Loans (3)	HouseHold Assets (4)
Panel A: IV Results				
Months worked in factory	0.0140 (0.00929) [0.132]	-3032.3 (2050.1) [0.139]	-585.5 (1730.2) [0.735]	0.0327 (0.0313) [0.297]
Panel B: Reduced Form Results				
Months before X 3 year	0.00681 (0.00445) [0.126]	-1438.6 (972.6) [0.140]	-318.6 (957.5) [0.739]	0.0158 (0.0153) [0.301]
Sample Mean	4880.0	57873.3	27873.3	5.683
Observations	955	702	605	981

Notes:

- (1) Columns (1) to (4) of Panel A show the IV results for the impact of working outside the household on household wealth.
- (2) The change in wage policy by the firm is used as an instrumental variable for months worked in factory.
- (3) Columns (1) to (4) of Panel B show the reduced form results for the effect of duration under the old contract on household wealth.
- (4) Individual controls for age and education and cohort of joining fixed effects included.
- (5) Results are consistent with dropping cohort of joining fixed effects.
- (6) Some respondents were not able to provide the value of savings and loans and hence the sample size in columns (2) and (3) is smaller.
- (7) Robust standard errors in parentheses and p -values in brackets.
- (8) Asterisks denote significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

7 Appendix

A1 Tracking Methodology

I implemented a multi-step tracking process using a team of field staff from the Center for MicroFinance to identify the location of the workers for the survey and ensure minimal attrition from the sample. We piloted the process in one district first to assess the tracking success before expanding to the rest of Tamil Nadu. 130 surveys were conducted in the pilot round. The process involved the following stages:

A1.1 Stage 1 - Firm Contact Data

We first used the contact data obtained from the firm to extract information on the district and *taluk* (the next sub-division below district) the worker was originally from, whenever this information was available. We then created smaller lists grouped by region and date of joining. Grouping them by region and date of joining meant we could then also rely on worker networks to improve our ability to find workers.

A1.2 Stage 2 - Tracking by phone

Following this, we contacted all workers from the list who had provided a phone number in their contact information. For the workers who we were able to contact successfully, we verified and updated addresses with the most recent contact information. Further, if the contact information belonged to a family member, we collected the current contact information of the worker from this person.

A1.3 Stage 3 - In-person tracking

We then conducted in-person visits to verify and update contact information. The addresses were organized by area and each area was visited by a member of the tracking team. If the worker had migrated from the area for marriage, family members we asked for the workers current contact information. We also asked workers for contact information of other work-

ers who had worked at the same time as them for whom we did not have proper contact information. In cases where the worker was not available for the survey, we requested an immediate family member to participate in the survey and answer the main sections of the survey.

We ran several iterations of this process in each district until we had attempted to track all the workers on the list. As the tracking process was completed in each district, a separate survey team of only female surveyors visited each worker (or family member) to conduct the follow-up survey. We used cell phones and tablet devices to do electronic surveys so that we could monitor and assign work to the tracking and survey teams in real-time. For about 17% of the surveys, a family member responded to the questions. In such surveys, we dropped questions on attitudes and only asked questions that measured real outcomes.¹⁹) In Table A1, I provide the final results from the tracking process we used. I first show the tracking results for the full sample of all workers hired since 2007. I then show the tracking results for only those workers who were working at the firm when the change in policy was implemented. Our tracking process was able to successfully track and complete surveys for about 70% of the sample. About 10% of the sample refused to participate in the survey and about 20% could not be found through the tracking process.

Table A2 shows the OLS for the tracking outcomes on the cohort of joining and type of contract. The results show that the probability of completing the survey successfully is about 15% lower for the cohort that joined the firm 24 to 30 months before the change in wage policy by the firm. All the analysis in the paper is done for the full sample and a restricted sample defined as the sample dropping this cohort. Table A3 shows that there is no difference in tracking by the the instrumental variable. The results for the full sample as well as the restricted sample are presented.

¹⁹There are no significant differences by exposure to the fixed-term contract on whether the survey was given by a family member.

A2 Description of Indices

A2.1 Spouse Quality Index

This index consists of the following 5 variables that measure spouse quality.

- (1) Age gap between the worker and her spouse

Lower age gap indicates better quality.

- (2) Spouse's education relative to the worker's education

More education indicates better quality.

- (3) Spouse and his family's economic status relative to worker's

Better economic status indicates better quality.

- (4) Spouse's income

Higher income indicates better quality.

- (5) Whether the spouse is from the same district

Being from the same district indicates better quality since marrying further away is associated with worse outcomes such as domestic violence (Fulford 2013)

Panel A of Table A4 shows the IV results for the impact of working on the individual components of this index.

A2.2 Empowerment Index

This index consisted of 12 statements about gender roles that were posed to the respondents. For each statement, the respondent was expected to give one of 2 answers: Agree with statement, or Disagree with statement, with each coded separately for which answer indicated empowerment.

- (1) I feel safe to walk/move in my village/area alone during the day.

Agreement indicates empowerment.

(2) A girl should be allowed to study as much as she wants.

Agreement indicates empowerment.

(3) Women should not work outside home after they get married.

Disagreement indicates empowerment.

(4) It is unsafe for an adolescent girl to go outside of her home alone.

Disagreement indicates empowerment.

(5) A husband should earn more money than his wife.

Disagreement indicates empowerment.

(6) Girls should not be allowed to engage in income generating activities that require them to go outside the house.

Disagreement indicates empowerment.

(7) For the most part, it is better to be a man than to be a woman.

Disagreement indicates empowerment.

(8) Girls should get married as soon as they leave school.

Disagreement indicates empowerment.

(9) Girls should be allowed to wear whatever they want without being harassed.

Agreement indicates empowerment.

(10) A husband should be more educated than his wife.

Disagreement indicates empowerment.

(11) Parents should maintain stricter control over their daughters than their sons.

Disagreement indicates empowerment.

(12) I would prefer sons to daughters.

Disagreement indicates empowerment.

Figure A2 shows the distribution of the aggregated Z scores of the components of this index.

A2.3 Internal Locus of Control

This index consisted of 5 statements about the ability to control outcomes in ones life that were posed to the respondents. A high internal locus of control indicates belief that events in ones life can be affected by ones actions rather than outside factors. For each statement, the respondents were asked to choose one of the following: Strongly Agree, Agree, Neither agree or disagree, Disagree, Strongly Disagree. While coding however, Strongly Agree and Agree were mapped to the same Agree value, while Disagree and Strongly Disagree were both coded to a generic Disagree.

- (1) There is no real way that I can solve the problems I have.

Disagreement indicates a high internal locus of control.

- (2) Peoples misfortunes result from the mistakes they make.

Agreement indicates a high internal locus of control.

- (3) I have little control over the things that happen to me.

Disagreement indicates a high internal locus of control.

- (4) Many of the unhappy things in peoples lives are partly due to bad luck.

Disagreement indicates a high internal locus of control.

- (5) There is little I can do to change many of the important things in my life.

Disagreement indicates a high internal locus of control.

Figure A3 shows the distribution of the total number of responses to the above statements that indicate that the survey respondent has an internal locus of control.

A2.4 Marriage Decisions and Attitudes

This index posed 2 questions about marriage decisions to the respondents. Each answer was indicative of more or less empowerment for that respondent.

- (1) What is the earliest age you would have wanted to getting married? *Higher the age, higher the level of empowerment*
- (2) Do you think you will be allowed to refuse marriage proposal? *Answering Yes to this question is indicative of higher empowerment*

Panel B of Table A4 shows the IV results for the impact of working on the individual components of this index.

A2.5 Autonomy in Work Decisions

This index posed 2 questions about the independence of job-related decisions taken by the respondents. Each answer was indicative of more or less empowerment for that respondent.

- (1) Why did you stop working? (if respondent has stopped working) *Any answer that implies that the respondent stopped working because of the wishes of her parents, partners or other family members indicates lower empowerment*
- (2) Who do you think should have control over the money you earn? *Any answer that implies that someone other than the respondent should have control over the money earned by the respondent indicates lower empowerment.*

Panel C of]Table A4 shows the IV results for the impact of working on the individual components of this index.

A3 Robustness Check: Results for Restricted Sample

In Tables A5 to A9, I present the main results for the restricted sample which omits the cohort that joined between 24 to 30 months before the change in the wage contract. The tracking results show that this cohort had a lower tracking rate. I find that the results are consistent with omitting this group.

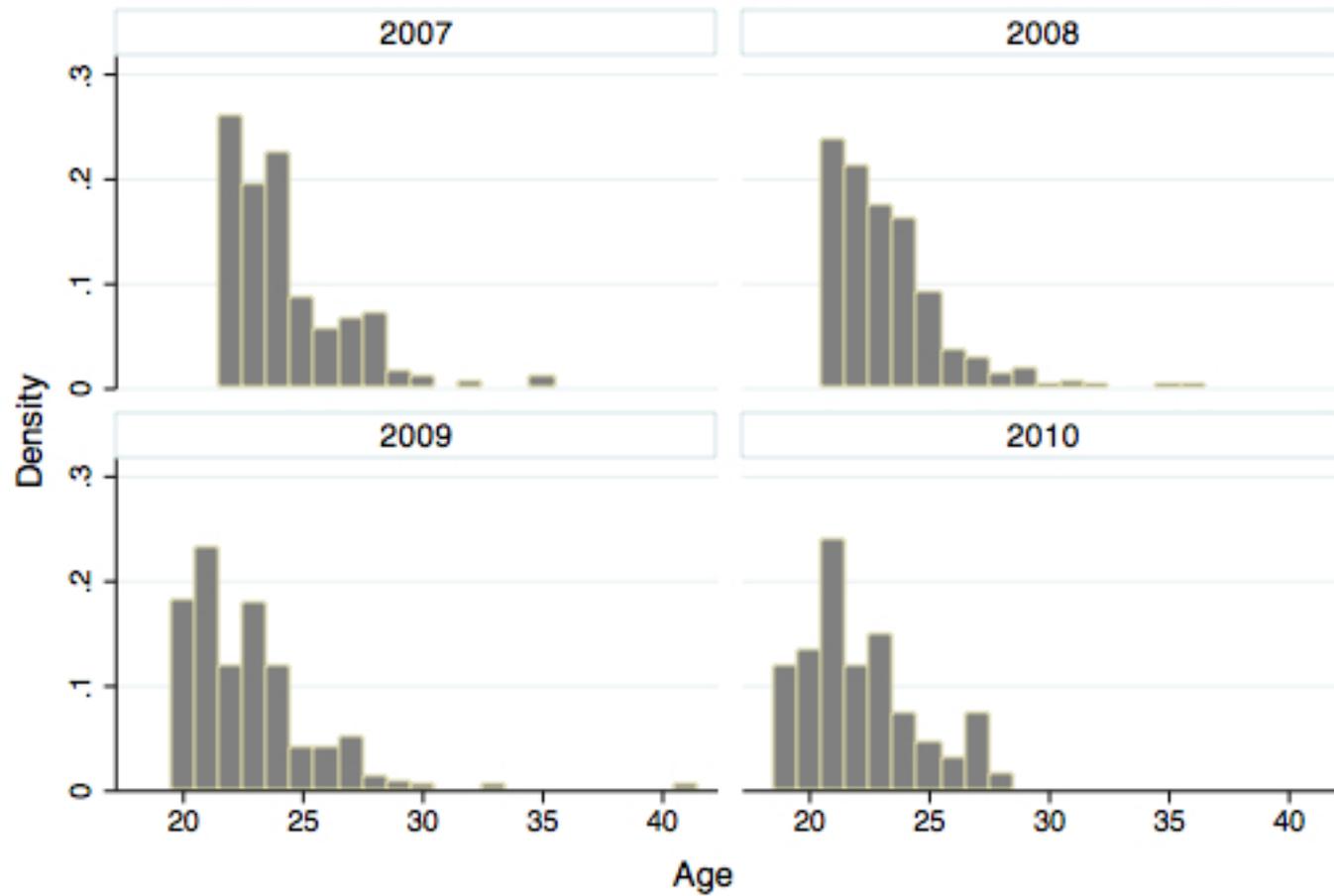
Figure A1: Distribution of Age by Year of Joining

Figure A2: Components of Empowerment Index

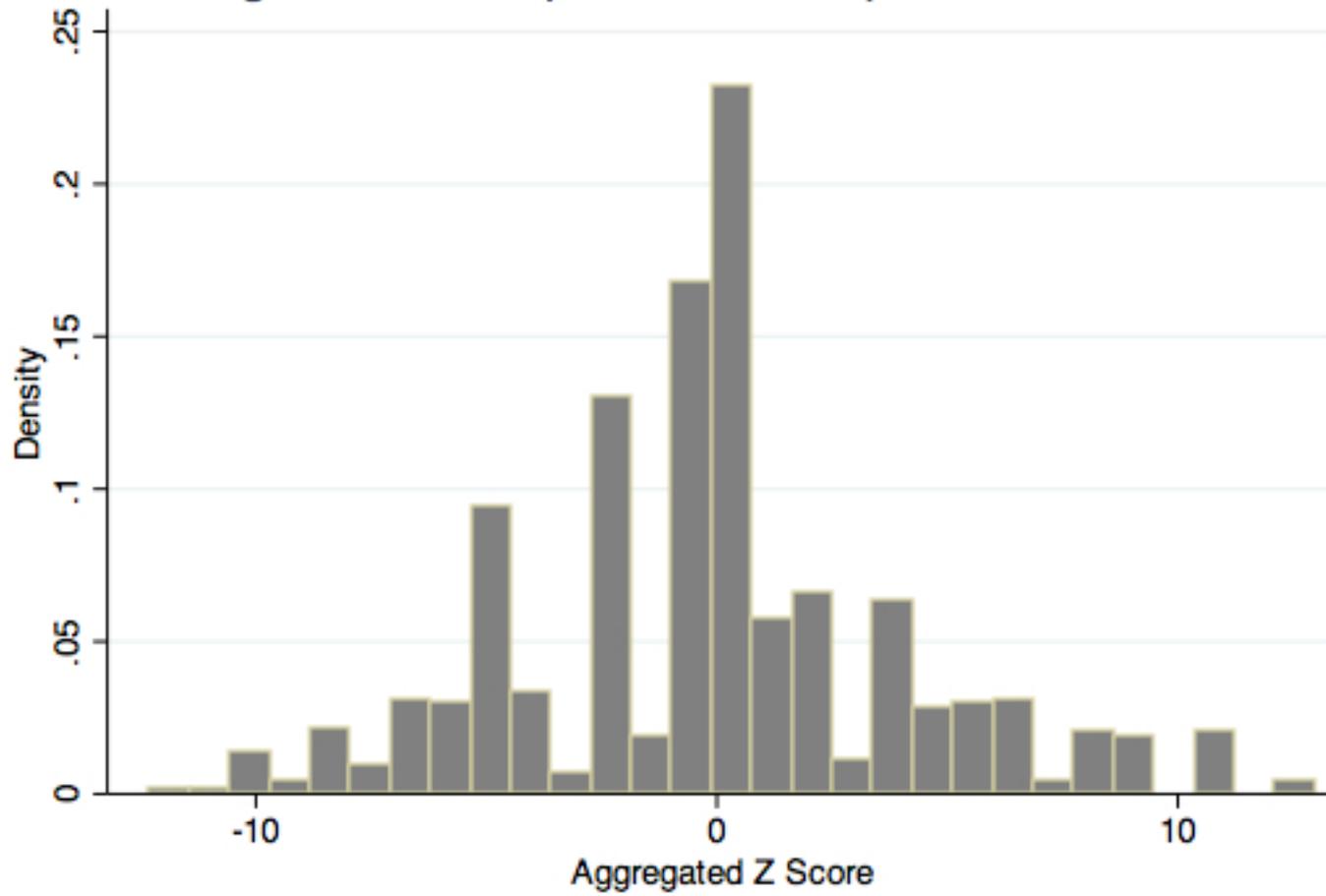


Figure A3: Components of Locus of Control Index

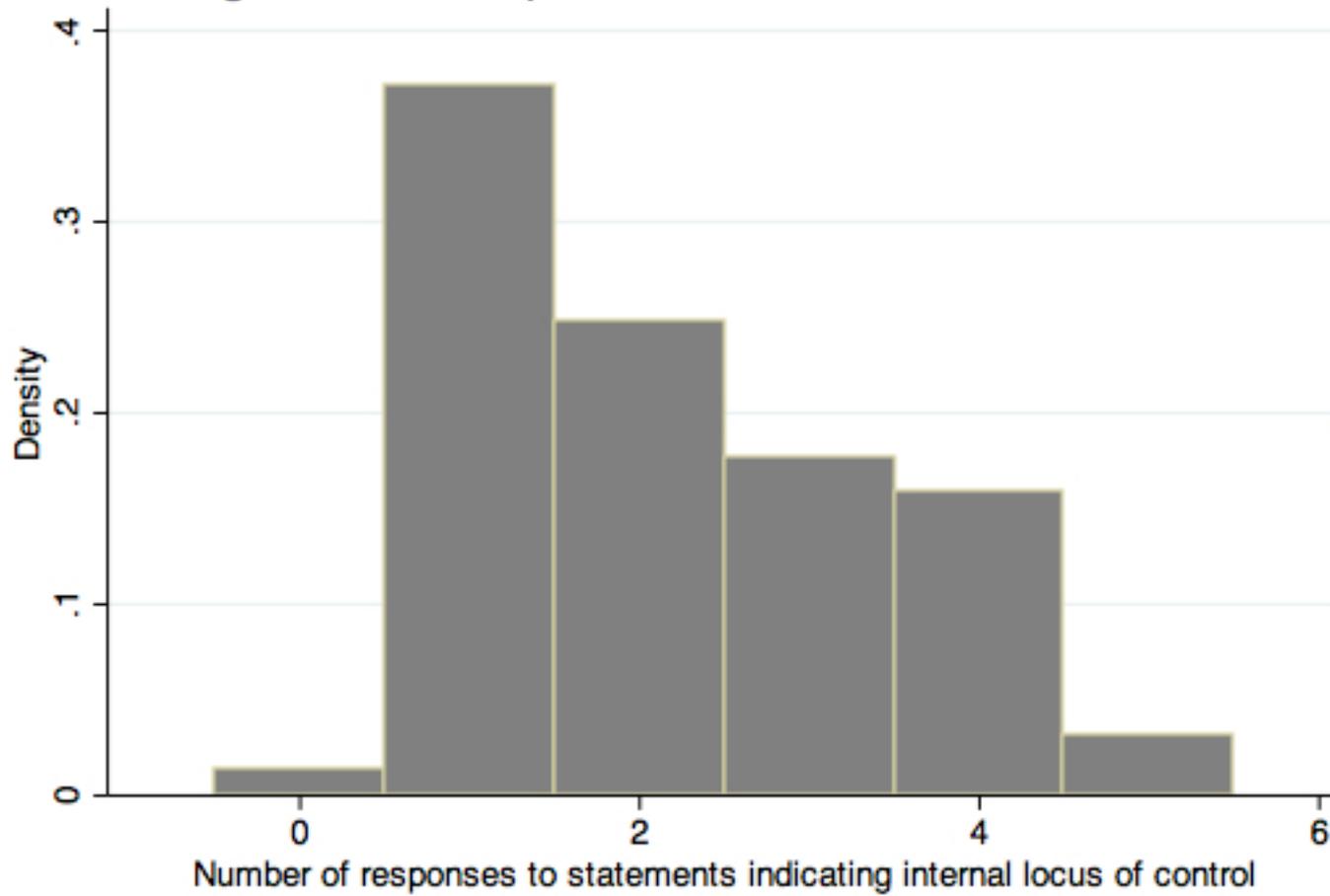


Table A1: Tracking Results

Tracking Status	Number	Percent
Panel A: Full Sample (n=1414)		
Survey Complete	969	68.53
Refused/Cannot survey	122	8.63
Not Found	323	22.84
Panel B: Sample working at time of policy change (n=616)		
Survey Complete	435	70.62
Refused/Cannot survey	62	10.06
Not Found	119	19.32

Table A2: Tracking by Cohort of Joining

	Survey Completed (1)	Refused/ Cannot survey (2)
Join less than 6 months before	0.00201 (0.0471)	0.0332 (0.0294)
Join 6 to 12 months before	0.0577 (0.0398)	0.0258 (0.0241)
Join 12 to 18 months before	-0.00640 (0.0422)	0.0379 (0.0250)
Join 18 to 24 months before	0.0564 (0.0362)	0.00758 (0.0203)
Join 24 to 30 months before	-0.152*** (0.0496)	0.00816 (0.0256)
3 year contract	0.00987 (0.0302)	-0.0335* (0.0194)
Constant	0.840*** (0.165)	0.150* (0.0880)
Observations	1409	1409

Notes:

(1) Columns (1) and (2) show the tracking by cohort of joining.

(2) Robust standard errors in parentheses

(3) Asterisks denote significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A3: Balance Check for Tracking

	Survey completed		Refused/Cannot survey	
	(1)	(2)	(3)	(4)
Months before X 3 year	0.00105 (0.00249)	0.00227 (0.00257)	0.000267 (0.00145)	0.000500 (0.00148)
Sample	Full	Reduced	Full	Reduced
Observations	1414	1273	1414	1273

Notes:

- (1) Columns (1) and (4) show the effect of the change in wage policy on tracking results.
- (2) Cohort of joining controls included in all specifications.
- (3) Robust standard errors in parentheses
- (4) Asterisks denote significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A4: Breakdown of Index

Panel A: Spousal Quality Index (Sample: Married Workers)					
	Age Gap: Worker and Spouse (1)	Spouse; Better Educ (2)	Spouse family Better Econ (3)	Log Spouse Income (4)	Spouse; Inside District (5)
Months worked in factory	0.0174 (0.0749) [0.816]	-0.00286 (0.0102) [0.779]	-0.00962 (0.00948) [0.310]	0.000382 (0.0141) [0.978]	0.00254 (0.00825) [0.758]
Sample Mean	6.038	0.328	0.255	8.666	0.797
Observations	598	591	597	587	598
Panel B: Marriage Decisions and Attitudes					
	Earliest age get married (1)	Allowed to refuse proposal (2)			
Months worked in factory	0.0845*** (0.0304) [0.005]	0.0113* (0.00636) [0.076]			
Sample Mean	21.97	0.336			
Observations	686	690			
Panel C: Autonomy in Work Decisions					
	Stop Work Not Because Parents/Spouse Stopped (1)	Earnings Control Not Husband (2)			
Months worked in factory	0.00818** (0.00397) [0.039]	0.0101 (0.00657) [0.125]			
Sample Mean	0.0797	0.253			
Observations	750	826			

Notes:

(1) Standard errors in parentheses and p -values in brackets(2) Asterix indicate significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A5: Age of Marriage

	Age of Marriage (1)	Married before age 21 (2)	Age received first proposal (3)	Time between first proposal & marriage (4)
Panel A: Full Sample				
Months worked in factory	0.0772** (0.0388) [0.047]	-0.00725 (0.00546) [0.184]	0.0514* (0.0275) [0.061]	0.0333 (0.0352) [0.345]
Panel B: Reduced Sample				
Months before X 3 year	0.0324** (0.0161) [0.044]	-0.00378 (0.00291) [0.194]	0.0276* (0.0148) [0.064]	0.0145 (0.0153) [0.344]
Sample Mean	20.58	0.320	19.87	1.042
Observations	551	877	769	469

Notes:

- (1) Table shows results for the restricted sample that drops the cohort that had a poor tracking rate in the survey
- (2) Columns (1) to (4) of Panel A show the IV results for the impact of working outside the household on age of marriage.
- (3) The change in wage policy by the firm is used as an instrumental variable for months worked in factory.
- (4) Columns (1) to (4) of Panel B show the reduced form results for the effect of duration under the old contract on age of marriage.
- (5) Individual controls for age and education and cohort of joining fixed effects included.
- (6) Results are consistent with dropping cohort of joining fixed effects.
- (7) About 40% of the sample is unmarried and hence the sample size in columns (1) and (4) is smaller.
- (8) Robust standard errors in parentheses and p -values in brackets.
- (9) Asterisks denote significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A6: Costs of Delaying Marriage

	No. of marriage proposals received (1)	Ever Married (2)	Log Gifts given during Wedding (3)	Spouse Quality Index (4)
Panel A: IV Results				
Months worked in factory	-0.0144 (0.0474) [0.761]	-0.000472 (0.00581) [0.935]	0.0118 (0.0745) [0.875]	-.0055 (0.0094) [0.560]
Panel B: Reduced Form Results				
Months before X 3 year	-0.00756 (0.0253) [0.765]	-0.000228 (0.00285) [0.936]	0.00473 (0.0306) [0.878]	-0.00216 (0.00395) [0.585]
Sample Mean	2.980	0.610	181242.9	.
Observations	784	908	543	.

Notes:

- (1) Table shows results for the restricted sample that drops the cohort with a poor tracking rate.
- (2) Columns (1) to (3) of Panel A show the IV results for the impact of working outside the household on the marriage market.
- (3) The change in wage policy is used as an instrumental variable for months worked in the factory.
- (4) Columns (1) to (3) of Panel B show the reduced form results for the effect of duration under the old contract on the marriage market.
- (5) Column (4) shows the average effect size for the impact of working outside the household on spousal quality and the effects can be interpreted as standard deviation changes.
- (6) Please refer to the appendix section 2 for the composition of the index.
- (7) Individual controls for age and education and cohort of joining fixed effects included.
- (8) Results are consistent with dropping cohort of joining fixed effects.
- (9) About 40% of the sample is unmarried and hence the sample size in column (3) is smaller.
- (10) Robust standard errors in parentheses and p -values in brackets.
- (11) Asterisks denote significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A7: Fertility

	Age when first child was born (1)	No. of kids currently (if married) (2)	No. of kids currently (full sample) (3)	Child before age 23 (4)	Desired Fertility (5)
Panel A: IV Results					
Months worked in factory	0.0849* (0.0511) [0.097]	-0.0217 (0.0171) [0.203]	-0.0232** (0.0106) [0.028]	-0.0124** (0.00606) [0.041]	-0.0172** (0.00832) [0.038]
Panel B: Reduced Form Results					
Months before X 3 year	0.0282* (0.0169) [0.097]	-0.00835 (0.00700) [0.233]	-0.0114** (0.00535) [0.033]	-0.00618** (0.00309) [0.046]	-0.00859** (0.00389) [0.028]
Sample Mean	21.53	0.946	0.516	0.362	1.928
Observations	336	424	779	625	526

Notes:

(1) Table shows results for the restricted sample that drops the cohort that had a poor tracking rate in the survey

(2) Columns (1) to (5) of Panel A show the IV results for the impact of working outside the household on fertility.

(3) The change in wage policy by the firm is used as an instrumental variable for months worked in factory.

(4) Columns (1) to (5) of Panel B show the reduced form results for the effect of duration under the old contract on fertility.

(5) Individual controls for age and education and cohort of joining fixed effects included.

(6) Results are consistent with dropping cohort of joining fixed effects.

(7) About 40% of the sample is unmarried and in the pilot round of the survey we did not ask the number of children the woman had; therefore we do not have the full sample in columns (1) to (3).

(8) Desired fertility was added in a later version of the survey and hence has a smaller number of observations.

(9) Robust standard errors in parentheses and p -values in brackets.

(10) Asterisks denote significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A8: Empowerment and Autonomy

	Empowerment (1)	Internal Locus of Control (2)	Marriage Decisions & Attitudes (3)	Autonomy in Work Decisions (4)
Panel A: IV Results				
Months worked in factory	0.0070* (0.0039) [0.074]	0.0122** (0.0061) [0.044]	0.0333*** (0.0107) [0.002]	0.0264** (0.0118) [0.025]
Panel B: Reduced Form Results				
Months before X 3 year	- 0.00400 (0.00293) [0.172]	0.00698* (0.00375) [0.062]	0.0187*** (0.00611) [0.002]	0.0130** (0.00567) [0.022]

Notes:

- (1) Table shows results for the restricted sample that drops the cohort that had a poor tracking rate in the survey.
- (2) Columns (1) to (4) show the average effect size for the impact of working outside the household on empowerment and autonomy and the effects can be interpreted as standard deviation changes..
- (3) Please refer to the appendix section 2 for the composition of the index.
- (4) The change in wage policy by the firm is used as an instrumental variable for months worked in the factory.
- (5) Panel A and B show the IV and reduced form results respectively.
- (6) Individual controls for age and education and cohort of joining fixed effects included.
- (7) Results are consistent with dropping cohort of joining fixed effects.
- (8) Robust standard errors in parentheses and p -values in brackets.
- (9) Asterisks denote significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A9: Is there a Household Wealth Effect?

	Log Household Income (1)	Savings (2)	Loans (3)	HouseHold Assets (4)
Panel A: IV Results				
Months worked in factory	0.0132 (0.00969) [0.174]	-2671.9 (2166.1) [0.217]	217.6 (1894.4) [0.909]	0.0332 (0.0327) [0.310]
Panel B: Reduced Form Results				
Months before X 3 year	0.00629 (0.00457) [0.169]	-1244.4 (1017.6) [0.222]	112.9 (1008.3) [0.911]	0.0160 (0.0159) [0.315]
Sample Mean	4907.3	58245.6	26870.4	5.722
Observations	884	648	554	908

Notes:

- (1) Table shows results for the restricted sample that drops the cohort that had a poor tracking rate in the survey
- (2) Columns (1) to (4) of Panel A show the IV results for the impact of working outside the household on household wealth.
- (3) The change in wage policy by the firm is used as an instrumental variable for months worked in factory.
- (4) Columns (1) to (4) of Panel B show the reduced form results for the effect of duration under the old contract on household wealth.
- (5) Individual controls for age and education and cohort of joining fixed effects included.
- (6) Results are consistent with dropping cohort of joining fixed effects.
- (7) Some respondents were not able to provide the value of savings and loans and hence the sample size in columns (2) and (3) is smaller.
- (8) Robust standard errors in parentheses and p -values in brackets.
- (9) Asterisks denote significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$