Patriarchal norms and women's labor market outcomes

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Abstract

Gender discrimination in the labor market is usually seen as the result of the employers' cultural bias. In this paper, we see the issue from a larger perspective by combining both labor market and household decision making together. It is often observed that women, prioritizing their families over their careers, settle for less paying and less demanding job profiles. This leads to gender wage gap even if the employers do not discriminate between male and female employees. We argue that women may make such choices in presence of patriarchal social norms which see household chores as the primary duty of women. Our theoretical model predicts that women coming from families with stronger patriarchal values are more likely to accept less paying (and less demanding) jobs in the labor market than the women from liberal families. Our empirical section that uses a nationally representative survey data from India provides support for our theoretical predictions. Our results are robust to different measures of patriarchal culture. We also show that the marginal effect of patriarchy on women's wage varies across occupations and places of residence.

JEL Classification: J16, J31, O15
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1 Introduction

The issue of gender wage gap in the labor market is usually seen as the result of cultural discrimination where the employer pays higher wage to a male employee than a similarly qualified female one. Such discrimination leads to phenomenon such as *sticky floor* and *glass ceiling* which are well discussed in the literature (Arulampalam et al., 2007; Chi and Li, 2008; Christofides et al., 2013; Khanna, 2012). [1] While such cultural discrimination comes from the employers' side – the demand side of the labor market, gender wage gap may also come from the supply side. There are several case studies, media reports and anecdotal evidence in which women are found to be willfully settling for less paying and less demanding jobs or quitting labor force altogether thereby creating gender gap in the labor market from the supply side. Women often do that by following social norm which sees household chores as their primary duty. In our paper, we focus on the later approach and propose a theoretical framework which integrates family norms with women's occupational decision. Our theory predicts that for women, lower wage is associated with the patriarchal norm prevailing in their families. We then test our theoretical hypothesis using Indian Human Development Survey (IHDS) – a nationally representative data from India.

The underlying mechanism that leads to women's willful withdrawal from more demanding job profile or the labor market altogether is loosely referred to as the *specialization hypothesis*. This is a norm which sees man as the breadwinner of the family while the woman's primary duty is to take care of the household chores. The fact that such practice was ubiquitous in traditional societies is hardly surprising. What caught the attention of the social scientists is the continuation of such norm in modern, industrial societies.

The persistence of the norm of *intra-household specialization* in modern societies has been explained by different social scientists in different ways. Becker (2009), for example, rationalized such specialization on the efficiency ground. He argues that women have comparative advantage in child rearing because of biological factors making gender based *intra-household specialization* an efficient arrangement. Such specializations in Becker's framework, however, can be incomplete as in the equilibrium women may participate in

[1] The *sticky floor* refers to the phenomenon where earning get stuck in the low wage level, while *glass ceiling* – a metaphoric invisible ceiling which prevents the women workers from climbing the professional ladder– refers to the gender wage gap at the top level of the wage

the labor market as well. In this framework, specialization comes from free choices made by men and women. Becker's approach however, is different from the standard approach in the literature which explains the *specialization* by intra-household power dynamics and sees any decision made within a household as a result of intra-household bargaining process between men and women. The research works falling in this strand of literature can be clubbed into two major sub-groups – resource theory and traditional Marxist-feminist theory (pp 10-20,Berk (2012)). According to the resource theories, the division of labor is determined by the power differential among the household members and they,in turn, derive their power from their respective *resources* such as their occupations, education and income. The Marxist-feminist tradition on the other hand, focuses on the relationship between subjugation of women and the capitalist class process. The detailed analysis of these different approaches of explaining the division of household labor is however, beyond the scope of this paper.

The theoretical structure used in this paper is based on the rational choice paradigm where women take their own labor supply decisions. But while doing so, they factor in the social norm which sees household chores as the primary duty of women. In our framework, women from patriarchal families get disutility if they choose work place commitment over household duties and thereby incorporate gender-power dynamics prevailing at the family level in their decision making process. We argue that with the norm of *specialization* in place, women find it difficult to dedicate more time to work as household chores remain their primary responsibility.

The friction faced by women come from the conflict between the schema of *devotion to work* and that of *family devotion*. While the societal norm upholds the *family devotion* schema for women (Blair-Loy, 2009), in the labor market, particularly in its high- skill segment, long hours are rewarded disproportionately (Goldin, 2014; Weeden et al., 2016). The Current Population Survey (CPS) conducted among the residents of United States in the year 2000 shows that 26.5% of the male employees spend more than 50 hours a week at their workplaces; for women worker this figure is 11.3%. In managerial, professional and technical occupations, this ratio is 37.2% for men and 17.1% for women (pp-34, Jacobs and Gerson (2004)). Taking a cue from this literature, We argue that the higher the norm of patriarchy in a woman's family, the stronger will be the *family devotion schema* they face and the higher will be the chance that she will settle for a less paying (and less demanding job) in order to take care of her family responsibility.

We set up the problem in the form of a formal model where a monopsonist employer devises two type of contracts to hire two type of employees – the ones with high motivation (type H) and the ones with low motivation (type L). We show that the L type women from patriarchal families do not participate in the labor market, while the H type women from patriarchal families settle for lower wage and work hours as specified in the L type contract. We then test our hypothesis using nationally representing Indian Human Development Survey where we construct a household level female autonomy index and find that our empirical results support the hypothesis derived from our theory; the wages of women in salaried position are negatively related with the patriarchy index pertaining to their families. Identifying our empirical model is tricky as cultural values pertaining to a family is also shaped by women's professional lives thereby creating the possibility of reverse causality. We deal with these issues by using fixed effect models and instrumental variable approach. We detail our Econom terics modeling techniques in the empirical section below.

Our paper is closely connected with the segment of the literature which connects culture with women's labor force participation decision and occupational choices (for example see Clark et al. (1991)). For resolving the issue of endogeneity of culture, quite a few papers in this area regressed outcomes variables such as workforce participation and fertility decisions taken by second generation US immigrant women on the cultural values prevailing in their ancestral countries (Reimers, 1985; Fernandez and Fogli, 2009; Fernandez, 2007; Fernandez et al., 2004). Together, these studies show that cultural norm is a very persistent factor that affects women's work decisions over generations and across geographical boundaries. The gender norms regarding work related issues also manifest itself through the sorting of male and female workforce into"male jobs" and "female jobs". Anker et al. (1998) estimated the concentration of women in nine comparable female jobs for different countries in the world. For India they found nursing has maximum feminization (93 percent), teaching (28 percent), maid and house-keeping related services (53.2 percent), tailoring services (11 percent) has moderate amount of feminization.

Building on the literature that explains women's work decisions by their community culture, our paper provides a theoretical framework by integrating family and labor market and predicts that women's labor market outcomes is associated with the gender norms prevailing in their families. In this way, we shed light in the issue of gender wage gap from a different perspective. In this paper, how-

ever, we do not directly explain gender wage gap. We show that female workers from conservative families are less likely to work and earn less than their liberal families counterpart and the result is explained by the work norm prevailing in the family. As male workers do not face any such cultural constraint, our argument can be extended to explain average wage gap between the male and female members of the workforce in terms of family culture.

Our paper is organized as follows: we present our theoretical framework in the section 2 , data in section 3 , empirical results in section 4 and we conclude in section 5.

2 Theoretical Framework

2.1 Baseline model

Our analysis is based on a principal-agent framework where an employer hires agents by offering them a contract which specifies wage and hours of work – (w, l). In the baseline model there are two types of agents– high (H) and low (L) motivation. The pay off functions of the L and H types are

$$U_L = w - \frac{v(l)}{\theta_L} \tag{1}$$

$$U_H = w - \frac{v(l)}{\theta_H} \tag{2}$$

where $\theta_H > \theta_L$ The employer offers two contracts (w_H, l_H) and (w_L, l_L). Among the job seekers, the share of L type is λ and the share of H type is $(1 - \lambda)$. The employer knows the type distribution but does not know the type of an individual job seeker. The employer designs the contract in a way that the L type accepts the (w_L, l_L) contract and the H type accepts (w_H, l_H) contract. The

The profit function of the employer is given by

$$\pi^m = \lambda[Al_L - w_L] + (1 - \lambda)[Al_H - w_H] \tag{3}$$

The monopolist however faces two types of constraints – participation constraints (PC) and incentive compatibility constraint (ICC). The PC for type L is

$$w_L - \frac{v(l_L)}{\theta_L} \geq 0 \tag{4}$$

If this is satisfied, the PC for the H type is automatically satisfied. Let us now look at the ICC for the H type which ensures that H type job seekers do not mimic the L type ones

$$w_H - \frac{v(l_H)}{\theta_H} \geq w_L - \frac{v(l_L)}{\theta_H} \tag{5}$$

The employer does not pay any more than the required amount to satisfy the condition. Hence, condition (4) is satisfied with equality and yields the following condition.

$$w_L = \frac{v(l_L)}{\theta_L} \tag{6}$$

Similarly, condition 5 is also satisfied with equality and in that equation we substitute w_L from equation 6 and get the following condition:

$$\begin{aligned} w_H &= \frac{v(l_L)}{\theta_L} + \frac{v(l_H)}{\theta_H} - \frac{v(l_L)}{\theta_H} \\ &= \frac{v(l_H)}{\theta_H} + v(l_L)(\frac{1}{\theta_L} - \frac{1}{\theta_H}) \end{aligned} \tag{7}$$

Net surplus for the H type is

$$w_H - \frac{v(l_H)}{\theta_H} = v(l_L)(\frac{1}{\theta_L} - \frac{1}{\theta_H}) \tag{8}$$

The employer's problem is the following

$$\max_{l_L, l_H} \Big[\lambda\Big(Al_l - \frac{v(l_L)}{\theta_L}\Big) + (1-\lambda)\Big(Al_H - \frac{v(l_H)}{\theta_H} - v(l_L)(\frac{1}{\theta_L} - \frac{1}{\theta_H})\Big)\Big] \tag{9}$$

From this problem we get two sets of first order conditions by differentiating the objective function by l_L and l_H respectively. The conditions are given bellow:

$$v'(l_L) = \frac{\lambda A}{\frac{1}{\theta_L} + (1-\lambda)(\frac{1}{\theta_L} - \frac{1}{\theta_H})} \tag{10}$$

and

$$\frac{v'(l_H)}{\theta_H} = A \tag{11}$$

From solving equations (6), (8), (10), and (11) we obtain the equilibrium contracts (w_j^*, l_j^*) where $j = H, L$. The condition $v'' < 0$ ensures that the second order condition for maximization will be satisfied. Last, we must check the ICC for the low type as well which ensures that the L type does not choose the H type contract in equilibrium This will require

$$w_L^* - \frac{v(l_L^*)}{\theta_L} \geq w_H^* - \frac{v(l_H^*)}{\theta_L} \tag{12}$$

Equation 6 makes the left hand side of this equation to be 0 which means the condition becomes

$$w_H^* \leq \frac{v(l_H^*)}{\theta_L} \tag{13}$$

Substituting from equation 8 this becomes

$$v(l_L^*)(\frac{1}{\theta_L} - \frac{1}{\theta_H}) \leq v(l_H^*)(\frac{1}{\theta_L} - \frac{1}{\theta_H}) \tag{14}$$

This condition is satisfied as $l_H^* > l_L^*$ and $v' > 0$

2.2 Patriarchy and labor market outcome

The baseline model presented above is the standard exposition of the scenario where an employer separates two types of employees by offering two types of contracts. Let us now modify the basic model to fit it to the research question that we are interested in. The pool of job seekers include both men and women. Suppose, among the women job seekers there are some who come from patriarchal family backgrounds where household chores are considered to be the primary duty of women. Because of this, these women face an extra disutility from participating in the labor market. There utility function is given by

$$U = w - \frac{v(l)}{\theta} - p(l) \tag{15}$$

where $p(l)$ represents the patriarchal disutility. Like the workers' type (High/Low) this disutility is also private information. But unlike the type distribution, the distribution of family types (patriarchal/liberal) is unknown to the employers. They also do not have any extra instrument to separate out women based on their family backgrounds. Even if such instruments exist, in many countries, it will be illegal to give extra incentive to workers based on their family backgrounds. For all these reasons, the employer carry out his optimization exercise ignoring this patriarchy factor. However, when women employees respond to contracts they take the extra disutility in consideration if they come from patriarchal families. We in this section, examine how women job-seekers from the patriarchal respond to these contracts.

For notational convenience we call the L type from patriarchal families LP type and the H type from the patriarchal families HP type. The choices made by male workers as well as female workers from liberal families will follow the baseline model. In this subsection therefore, we only present the choices made by female workers from patriarchal families. The pay-off for the LP type under equilibrium (w_L, l_L) contract is

$$w_L^* - \frac{v(l_L^*)}{\theta_L} - p(l_L^*) < 0 \tag{16}$$

The expression above is negative as the contract does not leave any surplus for the low type. This gives our first proposition:

Proposition 1 : L type women from patriarchal families do not participate in the job market.

Let us now examine if the H type women from patriarchal families have incentive to accept L contract. The pay off of the HP type

under L contract is

$$w_L^* - \frac{v(l_L^*)}{\theta_H} - p(l_L^*) \tag{17}$$

The expression 17 can be positive provided the surplus they get from accepting the L type is more than the patriarchal disutility i.e.

$$w_L^* - \frac{v(l_L^*)}{\theta_H} > p(l_L^*) \tag{18}$$

Let us now examine the ICC for the HP type which examines if the High type from the patriarchal families has any incentive to accept the L contract. This will not happen if the following condition is satisfied:

$$w_H^* - \frac{v(l_H^*)}{\theta_H} - p(l_H^*) \geq w_L^* - \frac{v(l_L^*)}{\theta_H} - p(l_L^*) \tag{19}$$

In the derivation of the optimal contract we showed that condition (5) will be satisfied with equality which cancels out the first two terms from both sides of equation (19). Hence for the ICC of HP to be satisfied we need $p(l_H^*) \leq p(l_L^*)$ which is clearly not satisfied as $p(.)$ is a monotonically increasing function and $l_H^* > l_L^*$. Hence, from the above derivation we have our second proposition:

Proposition 2 : High type female workers from patriarchal families have incentive to accept Low contract.

This clearly leaves the employers with a sub-optimal outcome as some of his H type employees accept L type contract thereby generating less profit. Can the employee do something about it? Given any lack of second instrument which can select on the patriarchal type, the only thing he can do to make the HP type accept H contract is increase w_H to make $w_H^* - \frac{v(l_H^*)}{\theta_H} > w_L^* - \frac{v(l_L^*)}{\theta_H}$. This will satisfy condition (5) with strict inequality. With a sufficiently high w_H, that can cover the patriarchal disutility, condition (19) will be satisfied and HP type will not have any incentive to accept L type contract. But doing this may not be the optimal response for the employer. Because he has to pay a high wage w_H^{**} in equilibrium (which is greater than w_H^*) to all men and women from liberal families who would perform l_H^* perfectly well with the current equilibrium wage w_H^*. Hence, in order to secure higher work hour from H type women from patriarchal families, the employer loses $(w_H^{**} - w_H^*)$ amount profit per male and liberal female employees. This is not a rational response unless the employer believes that among the job-seekers the proportion of women from patriarchal families is very high. In particular, in a country such as India where the proportion of female worker in a typical workplace is very low let alone those from patriarchal families, an individual employer may not incentive to adopt such a strategy.

3 Data

We use the 2004-05 and 2011-12 waves of India Human Development Survey Data (IHDS) data. IHDS database was initially formed through a survey of 41554 households in 1503 villages and 971 urban areas spanning across 35 Indian states and union territories conducted by Indian Council of Applied Economic Research (NCAER), New Delhi and University of Maryland in 2004-05. The survey consists of two parts, household questionnaire with household characteristics on demography, health, education, income, work, occupation, production, consumption, assets, social capital, fertility, children schooling, etc. and individual questionnaire with work, income, gender relation, fertility decision, marriage practices, exposure to mass media, reading, writing skill etc. The respondent households of 2005 survey were re-interviewed in 2011-12 to form a longitudinal database. The number of households increased slightly in the second round and it interviewed 42152 households. We however, do not use the full sample. We rather use the sample consisting of eligible women – married women in the age group 15-49. Around 90% of our eligible women were mothers when the first round of the interviews was conducted in 2005.

4 Empirical Framework

4.1 Empirical Model

In our paper, we aim to test the prediction of our theoretical model i.e. patriarchal family culture has a negative impact on a woman's wage. We run the regression using a panel data that includes both IHDS round 1 and 2. Using this data we run the following regression:

$$w_{it} = \beta_0 + \gamma_i + \beta_1 c_{it} + \beta_2 X_{it} + \epsilon_{it} \tag{20}$$

where w_{it} represents the wage rate for i^{th} woman in the year t, c_{it} represents the patriarchal family culture for the woman i in year t. All other individual level controls are summarized in the vector X_{it}.

4.2 Measuring Culture

In this section we describe the way we have constructed the culture variable that captures the extent of patriarchal culture in a family. In the survey, the women are asked who has the most say in four household decisions in their families – regarding making a purchase, regarding the number of the children the respondent woman would

have, regarding the treatment of her ill child and regarding the wedding of her children. The answer to these questions take four possible answers: the respondent, her husband, any senior male member of the family, any senior female member of the family, and others. Using the responses we create a dummy variable for each of these categories. Each of these dummy variables are defined to capture the patriarchal culture prevailing in the family – each takes the value 1 if the others take the decision, 0 if the woman takes the decision. Note that in this scheme the patriarchy index takes value 1 even when the decision is made by a senior female in the family. But the respondent women in this data set are married and with the norm of patrilocal exogamy in India a woman usually lives with her husband's kins and the senior woman taking the decision is very likely to be her mother-in-law. In the Indian context, it is not unreasonable to characterize a family as patriarchal when the mother-in-law takes decisions for her daughter-in-law. We however make try alternative specifications to check robustness by constructing dummies which takes the value 0 if any woman (respondent/senior female) takes the decision. Then we add these dummy variables to get a patriarchy index. The index can take 5 possible values - 0,1,2,3,4. The index takes the value 0 when all decisions are made by the woman (i.e. the case of full female autonomy) and takes the value 4 when all decisions are made by other people in the family (i.e. full patriarchy). For any other intermediate value, some decisions are taken by the woman while some others are taken by others. Now using the values of the index we define a aggregate patriarchy index for the family. The aggregate patriarchy index takes the value 1 if the patriarchy index takes the value 3 or 4, i.e. if at most one decision is taken by the woman, 0 otherwise.

Our theoretical model predicts that the woman's wage rate will go down with the rise in the aggregate patriarchy in the family. One may find some degree of arbitrariness in the way we are defining the index of patriarchy. But that is true for any other definition of the patriarchy index we might use. To check the robustness of our results, in a later subsection, we test our hypothesis using different measures of patriarchy. In one such definition we use the above mentioned scheme but alter the dummy variables slightly; it takes the value 0 if the decision is taken by any female member(the respondent or senior female) and 1 otherwise. In another definition we use the information regarding *purdah* practice – the practice of covering the woman's head and face in presence of men. This practice also represents patriarchy. Hence, we check if wage is negatively related with the *purdah* practice.

5 Results

5.1 Descriptive Statistics

In this section, we present the key statistics for all the major variables for both the survey rounds. In this study, we have only considered ever married women between the age 15-49 during the first survey who were in salaried jobs. The major variables for the study are summarized in table 1. We find that log hourly wage has increased a bit between two rounds of the survey conducted on 2004-5 and 20010-11 while the patriarchy index has decreased. Interestingly and contrary to the popular belief, *purdah* practice has increased a little between these two years. In round 1, 47% of women respondent's family would pratice *purdah* which increased to 50% in 2009-10. The average education for these women was 2.42 years in 2004-5 which increased slightly to 2.98 years in the year 2009-10.

Table 1 here

In the last section, we have already discussed how the measure of patriarchy has been constructed using different components that capture the decision making process within the family regarding different issues. To understand the nature of this aggregate patriarchy dummy,it is important that we also report the summary statistics of each of these components.

Table 2 here

In table 2 we report the summary statistics regarding each of these decision variables. We find that in IHDS 1, for 85% of women the purchase decision was taken by other members of her family. This came down slightly to 83% in IHDS 2. For the number of children, 79% of the women did not have a say in IHDS 1 which came down to 71% in IHDS 2. For two other variables as well – decision regarding treatment of ill children and wedding of children – the average level of patriarchy came down between two survey rounds. The value patriarchy index was the lest for treatment of ill children in both rounds. In IHDS 1, around 30% of the women respondent could decide on this issue which increased to 35% in round 2 of IHDS.

Next, we present the correlation among different dimensions of patriarchy discussed in the last section. Specifically, the dimension of patriarchy that are taken in consideration are *purdah* practice and women respondent's power to take decisions regarding purchase, fertility, treatment of children's illness and wedding of children

the form of a correlation matrix in table 3.

Table 3 here

Table 3 reveals that the correlation among these indices move around in the range between 37% to 53%. But all of them are significant at 1% level of significance. For example, the correlation between purchase decision and the decision regarding the number of children is 38%. The correlation between purchase and the children's wedding decision is the highest at 53%. Most of the values inter-indices correlation however, moves around 40%.

Besides these key variables, we also present the distribution of eligible women across occupations. There are 89 categories of occupations where occupation categories are as thin as teachers or government officers. The details of these occupations are detailed in table A1 and A2 in the appendix. We find that that among women, nursing and teaching, occupations that are labeled as women friendly occupations are the more popular ones. But we also find that a large proportion of women are employed as agricultural laborers and workers in tobacco and construction industry. This sorting probably is the consequence of the educational distribution of women. We categorize these sub-categories of occupations in three major occupational groups – agriculture, manufacturing and service – and present the resulting distribution in figure 1. Note that in this graph we present the distribution for all eligible women aged between 15-49 at the time of IHDS 1.

Figure 1 here

5.2 Baseline regression

In our baseline regression, we examine the effect of patriarchal culture prevailing in a woman's family on her wage and work force participation. We have already discussed the method of constructing the index of patriarchy. Below we report the results from our baseline regressions.

Culture and wage

We start with our baseline specification where we regress hourly log wage on the index of patriarchy and other controls. The controls include age, age squared and years of education. The results are reported in table 4.

Table 4 here

In column (1) we run individual fixed effect, followed by sub-occupation (all 89 categories) fixed effect and Pooled OLS. We find that for individual fixed effect, the coefficient for the patriarchy index is negative but not significant. On the other hand, in the subsequent columns with sub-occupation fixed effect and Pooled OLS, the coefficients are negative and significant. This , given the stubborn nature of family culture, is hardly surprising. In the individual fixed effect we capture the effect of change in an individual's family culture between two periods on her wage differential in these two periods. Family culture is however a difficult thing to change even over generations, let alone within a period of 10 years. We have already reviewed literature which shows how social norms regarding work participation for women persists over generations (Fernandez and Fogli, 2009; Fernandez, 2007; Fernandez et al., 2004).

But more importantly our theory also makes the prediction in a cross-sectional set up where we compare the labor market outcomes of women coming from different family backgrounds. Women internalize the possible effect of their family culture when they accept their job in period 1 and the trajectory of their career paths are unlikely to change significantly over the next ten years. Our theory suggests that highly motivated women from patriarchal families accept less paying (and less demanding) jobs than women from liberal families with similar educational backgrounds and experiences. Hence, the empirical results are likely to come strong when we allow some cross-sectional variation in data. In the specifications that we used in the subsequent columns, both sub-occupation fixed effect and Pooled OLS, such cross sectional variations are allowed and we get our expected results – the coefficient of patriarchy is negative and significant.

Culture and women labor force participation

Let us now look at the effect of culture on women's labor force participation. Following our baseline regression strategy we regress work participation dummy on culture along with controls such as age, education and age squared. The results are reported in table 5. In column (1) we present the coefficients of regression with individual fixed effect while in column (2) we present the coefficients from pooled OLS.

Table 5 here

We find that the coefficients of culture are negative for both individual fixed effect and OLS confirming our hypothesis. One interesting result that we find in this section is that the coefficient of

culture is negative and significant even for the individual fixed effect which was not the case in the wage equation. In case of the wage equation, we argued that this was the case because the variables were not varying enough for an individual over the period of ten years to generate the result. However, the situation is quite different when it comes to the employment status equation. Employment status changes are more quickly than the wage rate; many women who are studying and preparing for the job market during the round 1 of the survey, joined jobs in round 2 thereby creating enough variation in the dependent variable.

5.3 Instrumental variable approach

The obvious problem with the regression in the baseline section is the problem of endogeneity; there could be many omitted variables affecting both wage and patriarchal culture. In this section, we introduce an instrument for patriarchal culture. Remember that the index of patriarchy that we used here has been constructed using variables that capture women's decision making power within household – the less decision making power a woman has, the greater is the degree of patriarchy that she faces. We argue that this power critically depends on the number of people present in the household – the bigger is the household, the less is the power the woman enjoys. We instrument patriarchal index with the number of people present in the household. We report the results from 2SLS regression in table 6

Table 6 here

In panel A of the table we present the results of the second stage while in panel B we present the first stage results. In panel A we show that the coefficient of patriarchy is negative and significant for hourly log wage. In panel B, we report the results from the first stage regression where we show that Patriarchy index of a family rises with the number of people on the household. Nevertheless, satisfying the exclusion restriction is not straightforward. The household size might affect a women's job prospect and her wage income through channels other than patriarchy index thereby creating problem for the exclusion restriction. For example, bigger families may have different financial/family related need which may prompt the woman to take a certain types of jobs and accept certain wages. In order to deal with this issue we control for these possible channels in the regression. We take sub-occupation fixed effect and include control for the financial condition of the household in form of spousal income and total consumption expenditure of the family. We also control for motherhood status of the respondent woman. We find that women's wages are positively associated with family

prosperity (captured by spousal income and total consumption expenditure) and negatively associated with motherhood. Our main result holds even after including all these controls – patriarchy is negatively related with women's wage.

5.4 Heterogeneity Analysis

In this section we examine the relationship between patriarchy and wage for different categories of residence and occupation.

Occupation

In our baseline section and the instrumental variable regressions we have taken control for all 89 categories of sub-occupations. In this section, we examine the relationship between patriarchy and women's wages for three broad occupational categories — agriculture, manufacturing and service – by aggregating the sub-categories. We run instrumental variable estimation and report the results in table 7.

Table 7 here

We find that even though the sign of the coefficient on patriarchy is negative for all three categories, it is significant only for service sector. The magnitude of the coefficient is the biggest for the service sector as well. This is however, consistent with our theoretical model. The complexity of technology and therefore, the degree of information asymmetry is higher in service sector which forms the premise of our model. The possibility of having two types of contracts within same occupation is higher for such a sector. In manufacturing on the other hand, production is done using conveyer belt where people engage in repetitive tasks. The match between our model and such a production technology is less.

Location of residence

In this section , we examine how the effect of the patriarchy index on a woman's wage varies across the location of residence i.e. across rural and urban setting. We run our IV regression for residents of rural and urban settings separately and report the results in table 8.

Table 8 here

The regressions are run with the sub-occupation fixed effect. We find that the effect of patriarchal culture on woman's wage is negative and significant for both rural and urban locations.

5.5 Robustness analysis

In this section we have used two alternative measures of patriarchal culture. First of all, we use the information on Purdah practice which requires women to cover their faces in presence male strangers. This is practiced in the families with patriarchal family culture. We use the dummy indicating whether the family of the respondent endorses *Purdah* practice [2] – 1 for yes, 0 otherwise. Similar to our original patriarchy index we use number of member present in the household as the instrument. Besides the Purdah dummy we construct another patriarchy index by tweaking our original measure. In our original measure, we assigned score 0 to the categorical patriarchy index if the respondent woman took the decision for that category and assigned 1 if the decision was taken by her husband, senior male, senior female members or others in family. Given that our sample consists of married women, the senior female member in her family most likely refers to her mother in law. In our original definition, a family where the decisions are taken by mother in law the patriarchy index for each category will be 1. Here we change this categorization and assign value 0 to the patriarchy index if the decision is taken by any woman (respondent or senior female) and 1 otherwise. We present the result for both OLS and IV estimation for these alternative measures of patriarchy in table 9

Table 9 here

We find that the coefficients for Purdah and Alternative Patriarchy Index, are negative and significant for IV estimates but not for OLS estimates. Hence, our main result holds for different measures of patriarchy.

6 Conclusion

In this paper, we examine the impact of family culture on women's wage. In our theory we explain why a woman coming from a patriarchal family, because of her family norm, may prioritize her household responsibilities and settle for less demanding job profile and low wage. In our empirical section, we show that women with patriarchal family culture are less likely to be employed and even when they are, they receive lower wage than their female colleagues who come from liberal families. Our paper provides a novel insight into the issue of gender wage disparity. In the conventional approach gender wage disparity is seen only from the labor market perspective where

[2] *Purdah* is the practice of covering women's face in presence of other male members (usually outsiders, but in some cases even family members).

the employers' cultural values are seen as the main factor responsible for the wage gap. We instead, offer a framework that integrates the household and labor market decision making. In our approach, a woman's willful withdrawal can be seen as the result of the patriarchal values prevailing at the family level and therefore, can be seen as part of a bigger scheme of gender relation. This means a meaningful policy aiming gender equity must address labor market issues along with the household issues. The standard policies for bringing gender disparity usually provides incentives to the employers. We argue that incentives should be given to households as well. There are quite a few educational policies in place which give incentives to families for sending their daughters to school. Our analysis suggests similar family based incentive policies that for labor market as well.

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7 Table

IHDS1	Mean	SD	Min	Max
Log wage/hr	2.20	0.72	-3.77	5.63
Patriarchy Index	0.80	0.40	0.00	1.00
Purdah practice	0.47	0.50	0.00	1.00
Age	34.12	7.32	15.00	49.00
Years of education	2.42	4.02	0.00	15.00
N	5747			

IHDS2	Mean	SD	Min	Max
Log wage/hr	2.55	0.85	-3.52	6.46
Patriarchy Index	0.73	0.44	0.00	1.00
Purdah practice	0.50	0.50	0.00	1.00
Age	39.93	7.86	20.00	69.00
Years of education	2.98	4.32	0.00	15.00
N	7226			

Table 1: Descriptive statistics

IHDS 1				
Categories of decision making	Mean	SD	Min	Max
Purchase	.8501107	.3569933	0	1
Number of children	.7957758	.4031679	0	1
Treatment of children's illness	.6918753	.4617577	0	1
Wedding of children	.8693579	.3370373	0	1
IHDS 2				
Categories of decision making	Mean	SD	Min	Max
Purchase	.8369985	.3693916	0	1
Number of children	.7105158	.4535532	0	1
Treatment of children's illness	.6530721	.4760243	0	1
Wedding of children	.806744	.3948784	0	1

Table 2: Composition of Patriarchy Index

	Purchase	**Number of children**	**Treatment of children's illness**	**Wedding of children**
Purchase	1			
Number of children	0.380***	1		
Treatment of children's illness	0.371***	0.376***	1	
Wedding of children	0.534***	0.402***	0.449***	1

Table 3: Correlation matrix for different components of the patriarchy index

	(1)	(2)	(3)
VARIABLES	Indiv FE	Sub-Occupation FE	Pooled OLS
Patriarchy	-0.0196	-0.0365**	-0.0331**
	(0.0272)	(0.0146)	(0.0149)
Age	0.0434***	0.00446	0.00410
	(0.0131)	(0.00814)	(0.00832)
Age sq	-2.83e-05	8.33e-05	0.000126
	(0.000183)	(0.000114)	(0.000117)
Years of Education	-0.00271	0.0351***	0.0516***
	(0.00969)	(0.00213)	(0.00188)
Constant	0.872***	2.043***	1.834***
	(0.234)	(0.142)	(0.145)
Observations	12,026	12,037	12,026
R-squared	0.126	0.228	0.179
Standard errors in parentheses			
$***p < 0.01, **p < 0.05, *p < 0.1$			

Table 4: Baseline 1: Culture and wage

Note: *Log hourly wage is regressed on patriarchal culture and other control variables. In column (1) we use individual fixed effect, in column (2), sub-occupation (89 categories) fixed effect and in column (3), simply the pooled OLS over two rounds of IHDS.*

	(1)	(2)
VARIABLES	Indiv FE	Pooled OLS
Patriarchy	-0.0917***	-0.108***
	(0.0203)	(0.0166)
Age	0.154***	0.141***
	(0.00931)	(0.00822)
Age sq	-0.00167***	-0.00185***
	(0.000133)	(0.000117)
Years of Education	-0.00100	-0.0800***
	(0.00576)	(0.00157)
Constant	-1.602***	-0.579***
	(0.164)	(0.141)
Observations	43,687	43,687
R-squared	0.039	0.068
Standard errors in parentheses		
$***p < 0.01, **p < 0.05, *p < 0.1$		

Table 5: Baseline 2: Culture and Women's employment

Note: *Women's labor force participation status (1 for employed, 0 otherwise) is regressed on patriarchal culture and other control variables. In column (1) we use individual fixed effect, in column (2), sub-occupation (89 categories) fixed effect and in column (3), simply the pooled OLS over two rounds of IHDS.*

A: IV regression-second stage	
	(1)
VARIABLES	Hourly Log wage
Patriarchy	-1.071***
	(0.342)
Age	-0.00386
	(0.0103)
Age sq	0.000117
	(0.000142)
Years of Education	0.0152***
	(0.00395)
Total Consumption Expenditure	9.24e-07***
	(1.26e-07)
Spouse Income	3.06e-06***
	(1.48e-07)
Motherhood	-0.113*
	(0.0653)
Constant	3.933***
	(0.928)
Sub-occupation fixed effect	Yes
Observations	10,634
R-squared	0.002
Standard errors in parentheses	
$***p < 0.01, **p < 0.05, *p < 0.1$	

B: IV regression-first stage	
	(1)
VARIABLES	Patriarchy
Houhehold size	0.0369***
	(0.00203)
Constant	0.519***
	(0.0112)
Observations	12,364
Standard errors in parentheses	
$***p < 0.01, **p < 0.05, *p < 0.1$	

Table 6: Culture and Wage: IV approach

VARIABLES	Agriculture	Manufacturing	Service
Patriarchy	-0.589	-0.704	-2.365**
	(0.381)	(0.552)	(1.176)
Age	0.00263	-0.0181	-0.0543
	(0.00988)	(0.0216)	(0.0555)
Age sq	2.59e-05	0.000354	0.000931
	(0.000139)	(0.000296)	(0.000744)
Years of Education	0.00857***	0.0107	0.0484***
	(0.00313)	(0.0104)	(0.0120)
Total consumption expenditure	7.64e-07***	2.89e-07	1.38e-06***
	(1.63e-07)	(3.44e-07)	(3.13e-07)
Spouse income	8.42e-06***	5.27e-06***	1.20e-06***
	(2.77e-07)	(4.05e-07)	(3.11e-07)
Motherhood	0.00870	-0.142	-0.582*
	(0.0621)	(0.145)	(0.304)
Constant	2.248***	3.006***	5.140***
	(0.408)	(0.761)	(1.611)
Observations	6,219	2,819	1,588
Standard errors in parentheses			
$***p < 0.01, **p < 0.05, *p < 0.1$			

Table 7: Heterogeneity Analysis: Broad Occupation categories – IV estimation

	(1)	(2)
VARIABLES	All Rural	All Urban
Patriarchy	-0.952**	-0.718*
	(0.449)	(0.391)
Age	-0.00481	0.000440
	(0.0105)	(0.0276)
Age sq	0.000127	0.000114
	(0.000144)	(0.000383)
Years of Education	0.0112**	0.0271***
	(0.00445)	(0.00754)
Total Annual consumption	5.34e-07***	1.50e-06***
	(1.50e-07)	(2.11e-07)
Spouse Income	5.53e-06***	1.25e-06***
	(2.13e-07)	(1.90e-07)
Motherhood	-0.0550	-0.430*
	(0.0619)	(0.244)
Constant	4.447***	3.717***
	(0.805)	(1.048)
Sub-occupation fixed effect	Yes	Yes
Observations	8,846	1,788
Standard errors in parentheses		
$***p < 0.01, **p < 0.05, *p < 0.1$		

Table 8: Heterogeneity Analysis: Rural-Urban – IV estimation

	(1)	(2)	(3)	(4)
VARIABLES	Purdah OLS	Purdah IV	Alt patriarchy OLS	Alt patriarchy IV
Purdah	-0.0184	-0.326***		
	(0.0132)	(0.0904)		
Alt Patriarchy			-0.0188	-2.619**
			(0.0174)	(1.244)
Age	0.00432	0.00368	0.00372	-0.00292
	(0.00808)	(0.00824)	(0.00841)	(0.0151)
Age sq	4.98e-05	4.63e-05	5.13e-05	8.18e-05
	(0.000114)	(0.000116)	(0.000119)	(0.000209)
Years of Education	0.0248***	0.0199***	0.0243***	0.00728
	(0.00217)	(0.00263)	(0.00221)	(0.00904)
Total Consumption Exp	8.20e-07***	7.45e-07***	8.73e-07***	8.43e-07***
	(1.01e-07)	(1.05e-07)	(1.05e-07)	(1.85e-07)
Spouse Earning	3.25e-06***	3.13e-06***	3.20e-06***	3.28e-06***
	(1.17e-07)	(1.25e-07)	(1.20e-07)	(2.14e-07)
Motherhood	-0.0193	-0.00891	-0.0305	-0.176
	(0.0364)	(0.0372)	(0.0502)	(0.112)
Constant	1.777**	2.594***	1.833***	5.558***
	(0.699)	(0.713)	(0.697)	(1.864)
Sub-occupation fixed effect	Yes	Yes	Yes	Yes
Observations	11,284	11,284	10,651	10,651
R-squared	0.292	0.258	0.295	
Standard errors in parentheses				
$***p < 0.01, **p < 0.05, *p < 0.1$				

Note: In the original measure of patriarchal culture we mark a family non-patriarchal if the decision is taken by the respondent woman. In the Alternative Patriarchy measure we call it non-patriarchal if the decision is taken by the woman or any other senior member of her household. The second measure – Purdah practice *– is the practice of covering women's face in the presence of other male members.*

Table 9: Robustness check: Purdah and Alternative Patriarchy Index

8 Figures

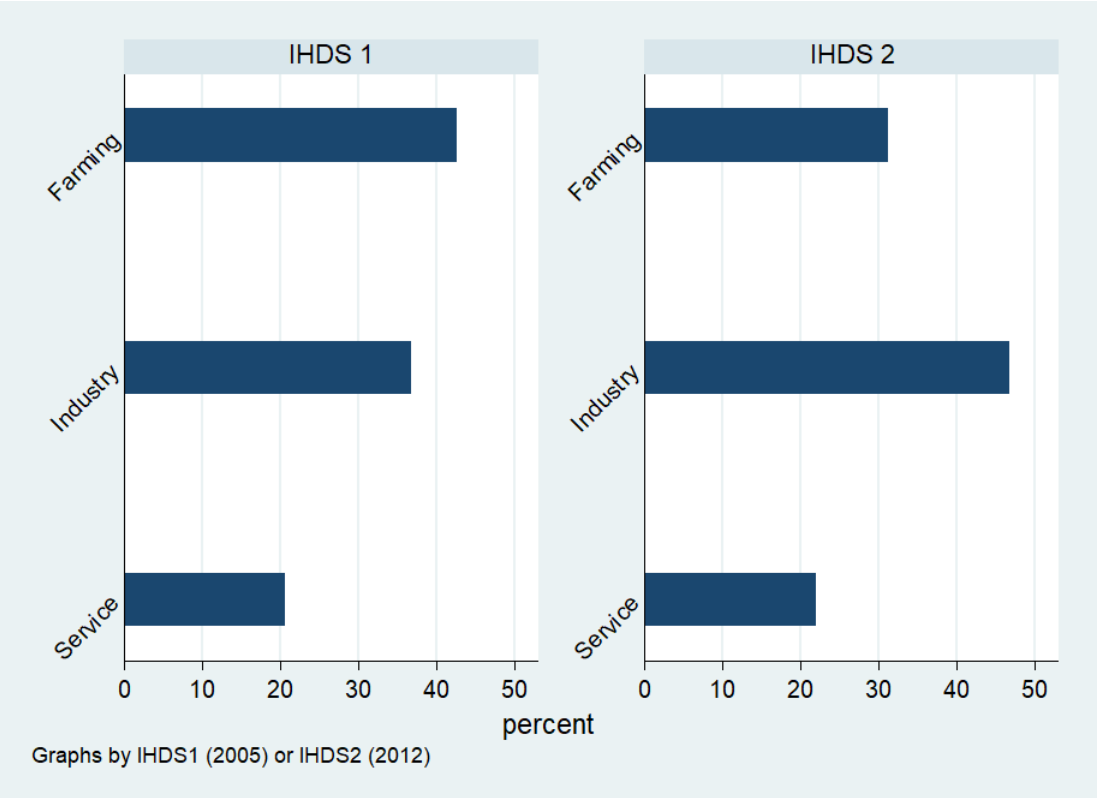


Figure 1: Distribution of occupation for women across survey years

9 Appendix

Sub occupation categories	Freq.	Percent	Cum.
Physical sci tech 1	1	0.01	0.01
Engineers 2	2	0.02	0.02
Eng. tech 3	2	0.02	0.04
Physicians 7	8	0.06	0.1
Nursing 8	132	0.99	1.09
Other scientific 9	7	0.05	1.14
Economists 11	1	0.01	1.15
Accountants 12	12	0.09	1.24
Social scientists 13	3	0.02	1.26
Teachers 15	604	4.54	5.8
Journalists 16	4	0.03	5.83
Artists 17	3	0.02	5.85
Performers 18	1	0.01	5.86
Professional nec 19	5	0.04	5.9
Elected officials 20	5	0.04	5.94
Govt officials 21	8	0.06	6
Mgr finance 23	2	0.02	6.01
Mgr transp/commun 25	3	0.02	6.04
Mgr service 26	2	0.02	6.05
Managerial nec 29	5	0.04	6.09
Clerical supe 30	40	0.3	6.39
Village officials 31	10	0.08	6.46
Typists 32	8	0.06	6.52
Book-keepers 33	10	0.08	6.6
Computing op 34	9	0.07	6.67
Clerical nec 35	228	1.71	8.38
Transp/commun supe 36	3	0.02	8.4
Transp conductors 37	3	0.02	8.43
Mail distributors 38	2	0.02	8.44
Telephone op 39	1	0.01	8.45
Shopkeepers 40	6	0.05	8.49
Manuf agents 41	3	0.02	8.52
Technical sales 42	1	0.01	8.52
Sales, shop 43	44	0.33	8.85
FIRE sales 44	9	0.07	8.92
Money lenders 45	1	0.01	8.93
46	1	0.01	8.94
Sales, nec 49	5	0.04	8.97
Hotel/restaurant 50	11	0.08	9.06

Table A1: Occupational distribution of working women

Sub occupation categories	Freq.	Percent	Cum.
House keepers 51	55	0.41	9.47
Cooks/waiters 52	249	1.87	11.34
Maids 53	359	2.7	14.04
Sweepers 54	121	0.91	14.95
Launderers 55	29	0.22	15.17
Barbers 56	7	0.05	15.22
Police 57	21	0.16	15.38
Service nec 59	139	1.04	16.42
Cultivators 61	5	0.04	16.46
Other farmers 62	7	0.05	16.51
Ag labour 63	7165	53.85	70.36
Plantation lab 64	193	1.45	71.82
Other farm 65	36	0.27	72.09
Forestry 66	44	0.33	72.42
Hunters 67	2	0.02	72.43
Fishermen 68	15	0.11	72.54
Miners 71	28	0.21	72.75
Metal workers 72	12	0.09	72.84
Wood/paper 73	3	0.02	72.87
Chemical 74	9	0.07	72.93
Textile 75	166	1.25	74.18
Food 77	59	0.44	74.63
Tobacco 78	618	4.64	79.27
Tailors 79	166	1.25	80.52
Shoe makers 80	2	0.02	80.53
Carpenters 81	8	0.06	80.59
Stone cutters 82	47	0.35	80.95
Machine tool op 83	6	0.05	80.99
Assemblers 84	8	0.06	81.05
Electrical 85	9	0.07	81.12
Plumbers/welders 87	2	0.02	81.13
Jewellery 88	12	0.09	81.23
Potters 89	44	0.33	81.56
Rubber/plastic 90	9	0.07	81.62
Paper 91	5	0.04	81.66
Printing 92	2	0.02	81.68
Painters 93	6	0.05	81.72
Production nec 94	32	0.24	81.96
Construction 95	1990	14.96	96.92
Boilermen 96	2	0.02	96.93
Loaders 97	71	0.53	97.47
Drivers 98	21	0.16	97.62
Labour nec 99	305	2.29	99.92
Unidentifiable occ X1 101	8	0.06	99.98
No occupation X9 109	1	0.01	99.98
Housewife AA 111	1	0.01	99.99
Out of labour force EE 115	1	0.01	100
Total	13305	100	

Table A2: Occupational distribution of working women: contd