

Status, Caste, and the Time Allocation of Women in Rural India

By

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June 2009

ABSTRACT

We argue that women may be disinclined to participate in market work in the rural areas of India because of family status concerns in a culture that stigmatizes market work by married women. We set out a theoretical framework that offers predictions regarding the effects of caste-based status concerns on the time allocation of women. We then use the all-India National Sample Survey data for the year 2004-05 and the Time Use Survey for six states of India for the year 1998-99 to empirically test these hypotheses. After controlling for a host of correlates, we find that the ratio of women's market work to men's declines as we move up the caste hierarchy. This ratio falls as family wealth rises and the decline is steeper for the higher castes. Finally, the effect on women's market work of higher education is weaker for the higher castes. These findings lend support to our theory and to the view that, through its emphasis on family status, caste plays a pivotal role in undermining the autonomy of women. Our paper has implications for how culture impinges on the rate at which poverty in developing countries can be reduced.

Key Words: Status, caste, time allocation, poverty

JEL Classification Numbers: O12, J22

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1. Introduction

The labor market in rural India has many peculiarities. In this paper, we focus on one that has received little attention: the fact that the time allocation of married women to market work, especially in rural areas, is mediated by their family's desire to maintain 'status'. Working outside the home is deemed to be a low-status activity for married, rural women. This is particularly true of the upper classes, which in many instances are also the upper castes and these severely restrict the activities of women [Srinivas (1956)]. This is further exacerbated by what Srinivas has dubbed 'Sanskritization', a process by which the lower castes emulate the customs of the upper castes in an attempt to acquire the social status and perceived legitimacy of the latter. These restrictions on the activities of Indian women is a throwback on patriarchal regimes of the past where contact with males outside the household was deemed a 'polluting' influence that was to be avoided where possible. At low levels of income, however, working outside the home is inevitable for married women and is seen as a necessary evil.

It is entirely conceivable that caste and class restrictions on the work and, more generally, on their physical mobility of women has to do with the concern men in patriarchal societies have for ensuring that they are the biological parents of their wives' children. In other words, the fact that paternity is always uncertain (given the absence of DNA testing until very recently in evolutionary time) may be the root cause of social restrictions on the mobility of women. This would be consistent with the interpretation of evolutionary biologists and psychologists [see, for example, Smuts (1995)].

Perhaps such concerns constitute the social origin of the 'status' conferred on women who did not work outside their homes. Non-participation in market work has become a signal of greater respectability, which one might well interpret as a euphemism for greater 'sexual purity'. The notion of 'family honor' in South Asia (especially in northern India, Pakistan, and Bangladesh) is inextricably tied up with the behavior of women in the family. The prospect that the family's reputation might be tarnished with even so much as a suspicion of women's sexual infidelity is received with such horror

that the males greatly circumscribe—and closely scrutinize—the activities of the women in their families in these regions.¹

This may not be a phenomenon peculiar to South Asia. Humphries (1987) has suggested that the sexual segregation of the labor force in England may have had its roots in the concern of parents that their daughters may be working alongside unrelated males, thereby leading to sexual liaisons. Prior to the eighteenth century, women contributed to their families' subsistence by participating in work with them and under the watchful eyes of their mothers. But with the emergence of the factory system, this arrangement was no longer viable. Humphries uses data from English counties in the mid-nineteenth century, taking the proportion of illegitimate children as a measure of the failure of family monitoring of the sexual access to daughters. She provides evidence for her claim that segregation by sex of the labor force may well have arisen in England to control sexual access to women. Hakim (1994) examined the change in occupational segregation in England over the period 1891-1991 and finds considerable circumstantial evidence in favor of the Humphries thesis.

In the Indian context, however, it is not only avoidance of work requiring possible contact with non-family males that constitutes the possible core of 'status'. It is likely that what sociologists have dubbed 'status production' is itself an activity that requires a married woman's time [Papanek (1979), Collins (1988)]. The poorest in India are those without assets (typically land). Their only source of earnings is the sale of their labor, and poverty forces both partners in married couples to sell their labor. As incomes improve, however, status concerns become more salient and married women may gradually begin to withdraw from market work. At a sufficiently high level of affluence, they may cease to participate in market work altogether.

This would be true particularly in states or regions where the culture is strongly patriarchal. In India, these would be the northern states (Bihar, Madhya Pradesh, Rajasthan, and Uttar Pradesh). In the less patriarchal southern states (Andhra Pradesh, Karnataka, Kerala, and Tamil Nadu), one may expect this labor supply response to be

¹ See, for example, Derne (1994) on the views of Hindu men on this. Clark and Drinkwater (2007) find in their recent study of labor force participation among ethnic groups in England that this participation is the least among Pakistani and Bangladeshi women. It is perhaps not an accident that Pakistan and Bangladesh (together with the northern states of India) are arguably the most patriarchal regions of south Asia.

less drastic. This would be suggested by the role accorded to the status of women by Dyson and Moore (1983), who have argued that women in the northern states of India have less autonomy than their counterparts in the southern states.² In fact, in their analysis of child mortality in India Murthi, Guio, and Dreze (1995) take labor market participation itself as a measure of female autonomy.

The behavior of time allocation of rural women described above has its analogues in the history of the developed countries. Using cross sectional data from over one hundred countries, Goldin (1995) examined the labor force participation of married women as a function of per capita income and found the relationship to be U-shaped. She argued that the initial decline in participation was due to the fact that there was a stigma associated with married women having to work. So they withdrew when their families became more affluent. Women resumed market work, in Goldin's reckoning, only after they became more educated and they had access to white-collar jobs. Her case study of the U.S. fits this pattern. Our emphasis on status production by married women is quite consistent with Goldin's (1995) view: in some sense, 'status' and 'stigma' may be viewed as opposite sides of the same coin.

In developing countries, it is doubtful that women who withdraw from the labor market are necessarily enjoying more leisure. We posit in our theoretical analysis that the production of status goods is time consuming. Examples of goods that fall into this category are nutritious meals, attention to children (who themselves may be pulled out of child labor activities), involvement in the building up of networks to further social advancement or to facilitate marital alliances, rituals (often religious), etc. There is only limited scope to delegate these activities to others—for the most part, they require considerable time input from the wives [Papanek (1979)]. When the family income rises, it is entirely conceivable that married women change the nature of their activity from market work to status-related work within the household. Rural economic development would be accompanied by a decline in the market work of these women, but this would not necessarily imply an increase in their consumption of leisure.

The rate at which rural poverty levels in poor countries responds to economic progress will surely depend, among other things, on changes in the time allocation of

² But see Rahman and Rao (2004) for a difference of opinion.

families in response to rising affluence. If greater wealth induces an elastic decline in the time allocated to the labor market, poverty may fall more tardily than otherwise. Whether the change in aggregate market work by women comes from a change in their labor force participation rate or merely from a reduction in the time they allocate to market work, the effect on poverty levels will be similar. For a poor country like India, where nearly a third of the rural population is below the poverty line³, knowledge of how the time allocation of women responds to affluence is important in informing the design of effective poverty-reduction strategies.

One implication of women's voluntary withdrawal from market work is that measured poverty may convey a misleading impression of the welfare of families when agricultural productivity rises. The higher wages of the husbands would induce a diversion of the activities of wives into status production and so would not show up as a commensurate increase of family's expenditure on market goods. Expenditure patterns of rural households would tilt towards goods that contain a substantial component of wives' non-market time, and consumption expenditure would underestimate the wellbeing of families as measured by the metric of their own utility function. Though measured poverty would not decline as rapidly with affluence as it otherwise might have, the households would deem themselves better off.

The production of status goods requires not merely housewives' time but also market goods, and this increases the premium on one spouse earning an income in the labor market. Districts with high agricultural productivity may thus actually promote, not undermine, the traditional division of labor wherein the husband earns in the market and the wife uses the income he earns to produce household goods. It is only when the goods that enhance status cannot be produced at home that the labor market participation of women would increase once again. This is the case not only in the developed countries, as Goldin (1995) has documented, but also the urban areas of contemporary developing countries.

In order to discern the time allocation effects of status in rural India, we set out in this paper a household model in which each member of a couple consumes a market good

³ The official figure for the head count ratio of people below the poverty line in 2004-05 is 28.3%, but Deaton (2008) has recently argued that the right figure is closer to 31%.

(a rival good), a status good (a household public good), and leisure. We focus on the family's wealth and caste, and on the wife's education as the key exogenous features of our model. Caste, obviously, is a measure of status. The wife's education, as we model it, increases her wage rate in the labor market but also increases her efficiency in status production at home. Family wealth (or non-labor income), by relieving the need for market work, facilitates the production of status goods by the wife. We demonstrate that an increase in the wife's education may have an *ambiguous* effect on her market work—contrary to what would obtain in standard models that abstract from status concerns. The full effect in our model depends, among other things, on the rate at which the marginal utility of consumption of the status good declines relative to the marginal utility of the market good; if this disparity is large, women would be more involved in status production. Informed by the analytical and simulation results of our theoretical model, we posit that women's labor market work, relative to their husbands', should decline as we move up the caste hierarchy. Furthermore, we hypothesize that, in the presence of status concerns, an increase in family wealth will reduce the market work of women relative to their husbands' at a faster rate as we move up the caste hierarchy. Finally, we predict that an increase in women's education may well reduce their market work in order to facilitate status production—despite the fact that their market wages increase with education.

We then test our hypotheses regarding the role of status in rural India using two different data sets (which differ in the extent of the detail in wife's time allocation across activities). These are the all-India National Sample Survey data (the 65th round, conducted in 2004-05) and in the Time Use Survey covering six states (conducted in 1998-99). Our econometric estimations demonstrate that women's market work relative to men's is lower in the higher castes. Furthermore, the marginal effect on women's market work of an increase in their education becomes more muted as we move up the caste hierarchy. Land ownership is seen to increase women's market work relative to men's, probably because household labor is called on to help out when more land is cultivated. However, a higher level of women's education is found to temper the positive effect of increased land ownership on their market work. Together, the evidence seems quite persuasive in suggesting the presence of status concerns in the time allocation of married women in rural India.

The focus in this paper, it must be emphasized, is exclusively on *family status* and how it impinges on the time allocation of women. To isolate this little-studied aspect of the rural household in India, we abstract from women's *individual* status within the household in terms of personal autonomy, bargaining power relative to their husbands, etc. But our findings have implications for the latter. The individual status of south Asian women is determined at least partly by their earnings [see Kantor (2003) or Anderson and Eswaran (2008) for evidence on this]. There is then a clear tension between the autonomy of married women and family status—for, as our evidence suggests, the latter may call for the withdrawal of women from an activity that generates income for them. To the extent that family status is an entrenched feature of rural Indian society, to that extent greater affluence may lower the individual autonomy of women. And caste is an institution that plays a significant role as a facilitator of this retrograde development in female autonomy. Furthermore, our results support the argument made by Berreman (1993) that Sanskritization is a source of female oppression, for the emulation of the higher castes by the lower comes at the expense of women. Our findings are also consistent with the recent claim of Mitra (2008), who has argued on the basis of aggregate measures of labor market participation that women from the scheduled tribes in India enjoy greater individual status relative to men than women in the rest of the population. Even among the scheduled tribes, however, she claims Sanskritization is eroding the status of women. Our paper may be interpreted not only as providing a formal model of a mechanism through which Sanskritization works but also as furnishing firm statistical evidence for its effects.

The rest of the paper is as follows. In Section 2 we spell out a simple model of time allocation within the household and generate some testable predictions. In Section 3, we econometrically isolate evidence of status effects in the NSS and TUS data referred to above. We offer our conclusions in the final section of the paper.

2. Theoretical Framework

By way of organizing our thinking about the effect of status concerns on time allocation in rural India, we set out a simple theoretical framework. This model will also provide

some guidance for the specification of the regression equations in our empirical analysis. We consider a household comprising a couple that consumes three goods: a market good, X , a status good, Z , and leisure, R ('rest'). The market good and leisure are private; the status good is a household public good consumed by both members of the household. We denote the quantities of these goods by the corresponding lower case letters. The individual is denoted by the subscript i , with $i = 1$ denoting the wife and $i = 2$ the husband. Their respective utility functions are assumed to have identical functional forms and are denoted by $U(x_1, z, r_1)$ and $U(x_2, z, r_2)$, respectively, which we assume to be increasing and strictly quasiconcave in their arguments. Furthermore, we assume that all goods are essential; their marginal utilities of consumption become unbounded as their consumption goes to zero.

The household status good, Z , requires the market good X as an input and also the wife's time. We assume that these inputs are required in fixed proportions. More specifically, we posit that

$$(1) \quad z = \min\{x, kt\},$$

where t is the time input the wife devotes to the production of the status good, x is the input of the market good, and k denotes the human capital of the wife. The idea here is that women with greater human capital (represented by education in the empirical section that follows) are more efficient in generating the status good. The production function in (1) dictates that producing one unit of the status good requires one unit of X and $1/k$ units of the wife's time.

We shall take good X as the numeraire and denote the market wages of women and men with unit human capital to be w_1 and w_2 . Since, for our analysis of status effects, it is the wife's human capital that is relevant we allow this to be arbitrary and denote it by $k (> 0)$; we normalize the husband's human capital to unity. A woman with human capital k earns a wage of $k w_1$. Each person is endowed with one unit of time. So if the wife and husband consume r_1 and r_2 units of leisure, respectively, and the household produces z units of the status good, the times they allocate to the market are given by $l_1 \equiv 1 - r_1 - z/k$ and $l_2 \equiv 1 - r_2$, respectively.

We abstract here from issues pertaining to household bargaining and assume that the couple allocates its resources so as to maximize a family welfare function given by the sum of their utilities. The budget constraint facing the couple is given by

$$(2) \quad k w_1(1 - r_1 - z/k) + w_2(1 - r_2) + A \geq x_1 + x_2 + z,$$

where A is the non-labor income of the couple. The first and second terms on the left hand side are the wife's and husband's labor incomes, respectively. The first two terms on the right hand side denote the expenditures on good X for private consumption and the last term is the expenditure on good X as an input for producing z units of the status good. The objective function of the couple may now be written down as

$$(3) \quad \begin{aligned} \max_{x_1, x_2, z, r_1, r_2} \quad & U(x_1, z, r_1) + U(x_2, z, r_2) \\ \text{s.t.} \quad & k w_1(1 - r_1 - z/k) + w_2(1 - r_2) + A \geq x_1 + x_2 + z. \end{aligned}$$

In what follows, we assume that the functional form of U is separable in its arguments:

$$(4) \quad U(x, z, r) = f(x) + \beta g(z) + h(r),$$

where the sub-utility functions f , g , and h are assumed to be increasing and strictly concave in their arguments. The parameter β , assumed positive, is a measure of the weight of the status good in the preferences of the couple; when $\beta = 0$, the status good is not desired. In the context of India, the parameter β would arguably increase as we go up the caste hierarchy. We explicitly posit this to be the case and we then test the theoretical implications of this premise against the empirical reality. While there are other models relevant to south Asia model the production of household public goods [e.g. Anderson and Eswaran (2008)], the assumption here is that status is a special kind of public good in that its importance increases with the position of the family in the caste hierarchy.

The following proposition summarizes some of the comparative static properties of the model. With an eye on the availability of data, the details of which we provide in the empirical section to follow, we restrict our attention here to the effects of three exogenous variables: non-labor income (A), importance of status in preferences (β), and wife's human capital (k). The proof of this proposition is provided in the Appendix.

Proposition 1:

- (a) An increase in the couple's non-labor income, A , diverts some of the wife's time from market work to the production of status and increases the consumption of all three goods (market good, status good, and leisure) for both members of the couple.
- (b) An increase in the weight, β , given to the status good by the couple reduces the leisure consumption of both members. The husband allocates more time to the labor market and the wife allocates more time to status production.
- (c) An increase in the human capital, k , of the wife increases the husband's leisure and both members' consumption of the market and status goods; but the effect on her leisure is ambiguous.

Part (a) of the above proposition is readily explained. When the couple's non-labor income rises, their demand for all goods increases because the latter are all normal goods. Since the status good requires the wife's time, she diverts some more time away from the labor market to status production. This and the increase in her leisure unambiguously reduce her labor supply. The husband's time allocation to the labor market also declines, but he operates only on the labor-leisure trade-off. The wife, in contrast, has a trade off between labor, leisure, and status production. As a result, her time allocation to the labor market is likely to decline more rapidly with non-labor income than does the husband's.

When the couple puts greater weight on the status good, as in part (b) of Proposition 1, naturally the wife will have to increase the time she devotes to status production. Part of this may come at the expense of her time allocation to the labor market. In any event, her leisure consumption goes down. Since status production also requires the market good as an input, the husband works longer in the labor market than he did before; he, too, consumes less leisure. In other words, the increased desire for status comes at the expense of both members' leisure (and, it can be readily shown, also at the expense of the consumption of the market good).

In part (c) of the above proposition, an increase in the wife's human capital simultaneously increases her wage rate and also raises the efficiency with which she produces status. Naturally, this ends up facilitating an increase in the couple's

consumption of the market and the status goods—and also the husband’s leisure. The effect on the wife’s own leisure is ambiguous since an increase in her human capital effectively increases her wage rate, and associated with this are (the standard) opposing income and substitution effects. This *may* be accompanied by a decline in the wife’s time allocation to the labor market (theoretically, the effect is ambiguous). Were this to happen, one would observe more educated women retreating from the labor market, despite their higher opportunity cost there, into status production within the home.

To get some feel for how the ratio of female-to-male time allocation to the labor market varies with some observable exogenous parameters, it is instructive to simulate the model using the following specific functional forms:

$$(5) \quad f(x) = x^\alpha; \quad g(z) = \beta z^\gamma; \quad h(r) = r^\delta,$$

where α , γ , and δ are all proper fractions and $\beta > 0$. These functional forms imply that all three goods are essential and generate diminishing marginal utility. The absolute values of the elasticities of the marginal utility with respect to the market good, status good, and leisure are $(1 - \alpha)$, $(1 - \gamma)$, $(1 - \delta)$, respectively.

For the functional form specification in (5), we can numerically solve the resource allocation problem (3) of the couple. Our interest in the empirical section to follow is not in estimating full-blown labor supply functions but, rather, in examining how status considerations of the family impinge on the time allocation of women relative to men. Our goal here is not to identify every conceivable outcome that is feasible in our theoretical framework; instead, it is to delineate possibilities compatible with our model that can be reasonably credited to status concerns.

For two different values of β , Figure 1 displays the ratio of the labor supply of the wife to that of the husband (*LSRATIO*) in our model as a function of the couple’s non-labor income (measured, say, wealth). The parameter values are indicated in the caption of the Figure. The dashed line corresponds to a higher value of β (greater weight given to the status good). As non-labor income increases there will be an income effect that would lead to an increase in leisure of both members of the couple, as we have already seen in part (a) of Proposition 1. Our interest is in examining how the labor supplies of wives and husbands are asymmetrically affected (even when they have identical preferences). So we look at the ratio of the optimal labor supplies.

Figure 1 shows that, as the couple's non-labor income increases, the wife's market time allocation decreases relative to that of her husband. The reason is that, with higher incomes the demand for Z rises and this increases the demand for wife's time in status production. As a result, more of the wife's labor is diverted to status good production and the labor she supplies to the market declines by more than does her husband's. Thus a labor supply ratio that is declining in the couple's non-labor income is compatible with our model emphasizing the wife's role in generating status. However, whether we will see this in the data will depend on the variable we use as our measure for non-labor income. In rural India, landholding may seem like a natural measure. It must be pointed out that, however, with land we would *not* expect to see a declining relationship as in Figure 1. And this is for a reason that is not modeled in our theoretical set up. When a household's land ownership increases, it first uses household labor before it hires workers from the labor market because family labor is easier to supervise. The reason is that household labor is likely to exhibit less shirking than hired labor. So, if we use landholding as our measure of non-labor income we would expect the relationship with *LSRATIO* to be upward sloping.

We would expect the labor supply ratio in Figure 1 to decline more rapidly if the marginal utility of the status good declines less rapidly than does the market good. This would imply that, as the couple's non-labor income increases, the demands on the husband's non-leisure time falls more rapidly than the demand for the wife's non-leisure time. How reasonable is it to presume that the status good is more income-elastic than the ordinary market good? There is good reason to believe that this is so. There is a long tradition in economics of acknowledging the importance of status and conspicuous consumption, ever since Thorstein Veblen wrote his *Theory of the Leisure Class* more than a century ago. More recent analyses of this phenomenon have demonstrated that such concerns are a sink for a household's resources because status-seeking essentially comprises *comparisons between people* [Frank (1985), Hopkins and Kornienko (2004), Eaton and Eswaran (2009)]. Consequently, it is a zero-sum activity at best and therefore exhibits little or no satiation. In the Indian context, Bloch, Rao, and Desai (2003) have empirically demonstrated that expenditures for marriage celebrations, as opposed to dowry payments, have a strong component of conspicuous consumption. While we do not

model status here as a comparison between one family and others, its characteristic feature of insatiability is readily captured by positing that the consumption of the status good exhibits less severe diminishing returns than does that of the market good.

One difference worth noting between the scenario here and that analyzed in the more recent research is that the withdrawal of women's labor from the market with greater affluence is superficially more akin to Veblen's notion of conspicuous consumption of *leisure* rather than of *goods*. If status effects work instead through the desire for higher relative income or through the display of conspicuous market goods, then status considerations may increase the labor supply of women. Indeed, this is precisely what Neumark and Postlewaite (1998) have argued in the context of contemporary United States. What is peculiar about status concerns in rural India (and, more generally, in south Asia) is that status is derived from women's *home-based* activity, not market activity. This has the opposite implications for women's labor market participation. As alluded to in the Introduction, it is conceivable that in patriarchal societies social norms that value status in this manner may ultimately obtain as a consequence of paternity uncertainty and the fear that married women may have illicit liaisons with unrelated men. And this concern presumably increases as we move up the caste hierarchy because of the preoccupation of the higher castes with 'purity'. Promoting the norm that status is derived from home-based activity may be one of the means employed by society to preclude this possibility.

From Figure 1 we see that when the couple puts greater weight on the status good the entire schedule of the labor supply ratio is shifted down to the dashed position. This is because, for any given non-labor income, more of the wife's labor is devoted to the status good and this requires less of her time to be allocated to the labor market. This suggests that, as we go up the caste hierarchy, the ratio of wife's to husband's labor supply ratio should decline. Furthermore, we would expect that the effect of caste would be more visible as non-labor increases (as is seen in the simulation of Figure 1) because the wife is increasingly enabled to produce the status good by being relieved of the need to participate in market work. That is, the magnitude of the decrease in *LSRATIO* with wealth would be greater for the higher castes. In other words, this ratio would be

negatively correlated with a variable representing the interaction between caste and non-labor income.

Although we do not pursue the matter here or in the empirical section that follows, we point out one interesting implication of our theory of status production by women. It offers a potential explanation for a peculiar phenomenon discovered by some researchers, namely, the fact that the labor supply curve of women in India may be backward-bending [e.g. Dasgupta and Goldar (2005)]. The textbook explanation for such a phenomenon relies on a very strong income effect associated with a female wage increase that overwhelms the substitution effect. Some analysts have sought to explain these empirically observed backward bending labor supply curves for women by positing some special forms for the utility function [Sharif (1991)]. One difficulty with this approach is that it leaves us with the impression that the theoretical explanation may be relying too heavily on special functional forms. In our model, in contrast, there is good reason to expect that rural women may work less in the labor market when their wage rate rises. When the female wage rate increases, the income effect associated with it would increase the demand for the status good more than it would for the market good if the marginal utility declines less rapidly for the status good. Thus it is very conceivable that some of the wife's labor is diverted to status good production when her wage rate rises. The income effect associated with the wage increase works not only through greater demand for leisure but also through greater demand for an alternative use of the wife's time.

An argument similar to the one above applies to the labor supply response of married women to their husband's remuneration. Standard income effects, once again, would predict that women's labor supply would decline when their husbands' wage rate rises. When women are producing status goods as in rural India, however, their labor supply would exhibit even greater elasticity with respect to their husband's wage rate, especially if status is very income sensitive. This would result in rapid withdrawal of married women from the labor force with rising affluence.

In Figure 2 we display, for two different values of β , the effect in our model of the wife's human capital (say, education) on the labor supply ratio of the couple. As before, the dashed line corresponds to the higher β . The positive slope of the schedule is not

surprising. When the human capital of the wife increases, her effective wage rate (given by $k w_1$) increases and so she would allocate more of her time to the market, while the husband would curtail his. This generates a positive sloped schedule, leading us to expect the labor supply ratio in the data is likely to be increasing in the wife's education. Cameron et al (2001), using data from five developing countries in Asia (that did not include India), find that the labor market participation of women is increasing in their human capital in some but not all of the countries; they caution that the culture of the country is important. The specific cultural factor that is important in rural India is status concern, and this gives rise to an additional effect in our model. When a woman's human capital increases she also becomes more efficient at producing status, and so she may not increase her time allocated to the market by as much as she otherwise would have. In Figure 2, the net effect of higher human capital is still positive. If data reveals that the labor supply ratio is declining in the wife's education, then that would be very compelling evidence indeed of status concerns. For in that case the model would imply that the wife's higher education is deemed so efficacious in producing status that, despite her higher market opportunity cost, her labor market activity is curtailed to facilitate greater specialization in status generation.⁴

The position of the dashed line in Figure 2 indicates that, for given human capital of the wife, greater status concern (higher β) would result in a lower ratio of time allocations to the market. This is a little more specific than what we analytically demonstrated in part (b) of Proposition 1. But notice that the gap between the two curves in Figure 2 widens as the wife's human capital increases. Even our simple model points to the possibility that, as one goes up the caste hierarchy, the magnitude of the decline in the wife's market time allocation ratio relative to her husband's may *increase* with her education. If higher castes place greater weight on status and if higher education makes the wife more efficacious in the production of status, more time of the educated women would be diverted away from the labor market (relative to their husbands'). And this would occur despite the fact that they can also earn a higher wage there. This is a testable

⁴ This is more likely to happen if, unlike in (1), the production function for status goods allowed for some substitution between the wife's time and the amount of market good required as input.

implication and, if verified, would also provide persuasive evidence in favor of status effects.

Thus our theoretical framework suggests three testable hypotheses that speak to the importance of status in the time allocation choices of rural Indian women:

Hypothesis 1: As we go up the caste hierarchy, all else constant, the time allocated to market work should decline for women relative to that of men.

Hypothesis 2: The magnitude of the decline in the ratio of women's to men's market work as we go up the caste hierarchy may be increasing in the family's wealth, all else constant. In other words, the ratio would be negatively correlated with a variable representing the interaction between wealth and caste (defined so as to be increasing as we move up the hierarchy).

Hypothesis 3: The magnitude of the decline in the above ratio as we go up the caste hierarchy may be increasing in the education of the wife, all else constant. That is, this ratio may be negatively correlated with a variable representing wife's education interacted with caste.

We now turn to the data to examine the issue empirically.

3. Empirical Evidence

Testing for status effects in Indian data turns out to be somewhat difficult for two reasons. First, there is a dearth of information on time devoted to status activities *per se*. This is true of the National Survey Sample (NSS) data of India, which is the most widely used and reliable survey data on employment and consumption for the country. In this instance, we have to infer the evidence of status activity circuitously by examining how the time devoted to economic activities responds to factors that may be construed as embodying status. Second, even when detailed information is available on time use, as is the case with the Time Use Survey (TUS), there is ambiguity about what exactly constitutes status activity and what does not. To make the best use of the data available for India and to make as nuanced an assessment that is feasible for our thesis, we use both these data sets. We analyze them separately in what follows.

3.1 Analysis of NSS Data

We first use data from the 61st round (2004-05) of the National Sample Survey (NSS) of India. In our analysis, we restrict ourselves to observations from the rural areas of 15 major states. These are Andhra Pradesh, Assam, Bihar, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, and West Bengal. Our focus on rural areas is because status effects are likely to be most visible there; in urban areas, restrictions on women's activities are less likely.

The NSS surveys on employment and unemployment are conducted at 5-year intervals. The survey gives detailed labor market information on about 120,000 households and about 600,000 individuals. The survey adopts a two stage sampling design – first the primary sampling units (PSU) are randomly picked (villages in rural areas and blocks in the urban sector) and then households are randomly chosen in the selected PSUs. At each stage, as well, the survey is stratified. At the first stage, stratification is according to population. At the second stage, all households are separated into 2 strata: affluent households and the rest.

Table 1 provides the summary statistics for our sample on social groups (castes) and religion. In our sample, 9.9% of the people belong to Scheduled Tribes (*STRIBE*), 19.1% to Scheduled Castes (*SCASTE*), 42.3% to Other Backward Castes (*OBCASTE*), and the remaining 28.7% to the residual castes, which we call Upper Castes (*UCASTE*). Around 83% of the people are Hindus, 10.4% are Muslims, 2.2% Christians, 3.5% Sikhs, and the rest (including Buddhists, Jains, etc.) are negligible. We denote the dummy variables for religion variables subsequently by *HINDU*, *MUSLIM*, *CHRISTIAN*, etc.

Table 2 presents the summary statistics for education levels for males and females in our sample. As can be seen, 31.9% males are illiterate (*EDUC₁*), 20.3% have some education but less than primary (*EDUC₂*), 15.2% have completed primary school (*EDUC₃*), 23.2% secondary school (*EDUC₄*), 4.6% higher secondary (*EDUC₅*), and 4.8% have more than a high school degree (*EDUC₆*). For females, the corresponding figures are 50.1%, 17.5%, 12.7%, 15.4%, 2.55, and 1.8%, which reflect the well-known fact that women are less educated than men are in India.

Econometric Specification

The basic hypothesis that we seek to test here is that status concerns lead to a withdrawal of women from the labor force in more affluent or educated rural households. In developed countries, as mentioned, the greater is a woman's human capital the more likely is she to work outside the home [e.g. Neal (2004)].⁵ Since men's and women's labor activities are jointly determined in the cooperative solution to the problem of time allocation within a household, it makes sense to look at the aggregate female labor supply in relation to the aggregate male labor supply. Hence, as our primary dependent variable, we define *LSRATIO*: the ratio of total female labor supply to total male labor supply in the household. The sample mean of this ratio, reported in Table 3, is 0.426. So we estimate an equation at the household level that identifies the correlates of *LSRATIO*. The equation we estimate is the following:

$$(6) \quad \begin{aligned} LSRATIO_{jk} = & \beta_0 + \beta_1 WAGERATIO + \beta_2 LAND + \sum_{m=2}^4 \lambda_m CASTE_{im} + \beta_3 PLITF \\ & + \beta_4 PLITF \times LAND + PLITF \times \sum_{m=2}^4 \mu_m CASTE_{im} + \beta_5 PLITM \\ & + \beta_6 PLITM \times LAND + \beta_7 NUMCHLD5 + \beta_8 NUMCHLD14 \\ & + \sum_{m=2}^6 \eta_m RELIG_{im} + \omega_k + \zeta, \end{aligned}$$

where j refers to the household, k to the village, ω_k denotes the village fixed effect, and ζ is the error term. The sample statistics for the variables on the right hand side of (6) are shown in Table 3. On the right hand side of the above equation, *WAGERATIO* is a household level variable and is the ratio of the average wage of females to that of males. We expect the coefficient β_1 of *WAGERATIO* to be positive, since if female wages rise relative to male, we expect female labor supply to increase relative to male. The variable

⁵ Table 3 in Neal (2004) shows that, of the White (Black) women in the age group 25-33 of the 1990 NLSY data for the U.S., the percentage who worked was 78% (71%) for those with high school or less and was 87% (88%) for those with some college.

LAND denotes the amount of cultivable land that the household has. Since this variable is measured in units of a thousandth of a hectare, we see from Table 3 that the average amount of land cultivated by households is small (1.03 hectares). If the household cultivates more land we would expect female labor supply to increase because, since household labor requires less supervision than hired labor, women would be called to help out. Besides, in rural areas, households would prefer that women work in their own farms (if they had the option) before looking for work in the labor market. So we expect β_2 to be positive. The variables $CASTE_{jm}$ and $RELIG_{jm}$ are dummy variables for social group and religion. As mentioned earlier, the data set distinguishes four types of social groups (that is, $m = 1, \dots, 4$)— scheduled tribe, scheduled caste, other backward castes and the residual category of castes (“upper castes”). The dummy variable $CASTE_{jm}$ is 1 if house j is of caste group m and 0 otherwise. (The religion dummies are analogously defined, with religion replacing caste.) Since status concerns rise as we go up the caste hierarchy, we would expect that withdrawal of women from the labor market would be more manifest for higher castes. So we expect that $\lambda_4 < \lambda_3 < \lambda_2 < 0$. (Recall that STRIBE, the left-out category, is deemed the lowest in the caste hierarchy.)

We define *PLITF* as the proportion of females in the family who are literate and *PLITM* as the proportion of males who are literate.⁶ The respective sample proportions, from Table 3, are 0.36 and 0.59. In developed countries, the higher return to human capital induces greater labor force participation among the educated, especially among females [e.g. Neal (2004)]. If this is not so in rural India, it suggests that status concerns may be at play. However, we do not have a strong prediction for the sign of β_3 , except that status concerns would reduce the impact of female literacy on the dependent variable to less than what it might have been otherwise. If this coefficient turns out to be negative, however, it strongly suggests status concerns. The coefficient β_4 captures the cross-partial of *LSRATIO* with respect to *PLITF* and *LAND*. If this is negative, it tells us that the marginal effect on *LSRATIO* with respect to land declines when the household has more literate females. This would also be suggestive of status concerns. We expect μ_2, μ_3, μ_4 to be negative and increasing in absolute magnitude because, relative to

STRIBE, status concerns would increasingly restrain the labor supply of its educated women as we move up the caste hierarchy.

We expect β_5 to be negative because more educated men tend to work more, and this would thereby reduce *LSRATIO*. We cannot say how the marginal effect of land on *LSRATIO* would behave when males acquire more education, so we have no particular prediction on the sign of β_6 .

The variable *NUMCHLD5* is the total number of children in the household who are in the age group of 0 - 5 years. Similarly, *NUMCHLD14* is the number of children between the ages of 6 and 14 years. These two variables are intended to capture the effect of having children in the household on female labor supply and, therefore, on *LSRATIO*. Since children under age 5 years need more attention from mothers, we expect β_7 to be negative. Since older children (those between 5 and 14) may help out with housework and look after younger children—thereby releasing the time of adult women—we expect β_8 to be positive.

Finally, we have no particular predictions on the coefficients for the dummies for various religions. The left-out category is *HINDU*.

The NSS data set supplies information on all the right hand side variables except for the wage ratio. First, there is the standard problem that there is no wage data for females who are out of the labor force. In addition, there is the problem that a sizeable portion of the labor force in India is self-employed and therefore there is no wage data for this group as well.⁷ If wages are to be imputed for these groups from a wage regression of people in wage employment, then such imputation would have to correct for the self-selection into various groups. Because of the disparate nature of the groups that do not have wage data, it is not straightforward to apply a Heckman type correction. For this reason, we consider a different strategy.

In rural India, the wage of agricultural labor is usually the floor wage. Compared to the non-farm economy, the education levels of agricultural laborers are also the lowest. Both these factors suggest that self-selection is unlikely to operate in the employment of

⁶ A person with primary or higher education is defined to be literate.

⁷ In our sample, 59.4 % of the labor force is self-employed. There is not much difference among males and females: 57.9 % of males are self-employed, compared to 62.8% of females.

agricultural labor. In other words, a regression of agricultural wages on observable characteristics of age, experience, education and geographical factors is unlikely to suffer from an omitted variable bias (e.g., ability). For this reason, such a regression can be used to impute agricultural wages for the non-agricultural labor population—that is, it would represent the agricultural wages that they would be earned if they were employed as agricultural labor.

The exact procedure we follow is to first estimate a wage equation for individuals working in agriculture for whom wage data is observed in our sample. The equation we separately estimate for males and females is:

$$(7) \quad \begin{aligned} WAGERATE_{ik} = & \alpha_0 + \alpha_1 AGE + \alpha_2 AGESQ + \sum_{m=2}^6 \phi_m ED_{im} + \sum_{m=2}^4 \pi_m CASTE_{im} \\ & + \sum_{m=2}^6 \psi_m RELIG_{im} + \alpha_3 LAND + v_k + \varepsilon, \end{aligned}$$

where ε is the error term. The left hand side is the daily wage of individual i in village k . On the right hand side, AGE is the age of the individual, and $AGESQ$ is its square (to capture any non-linear effects of age). The variables ED_{im} , $m = 2, 3, \dots, 6$, represent a dummy variables for the educational level of individual i , with $ED_{im} = 1$ if $EDUC_m$ is his/her educational level and = 0 otherwise. The variables $LAND$, $CASTE_{im}$ and $RELIG_{im}$ are as defined earlier in the context of the LSRATIO regression. We expect the $WAGERATE$ to be increasing with age (because of experience) but at a diminishing rate, increasing with education levels and also with land cultivated (because of higher opportunity costs).

After estimating (7), we use it to predict the agricultural wage that would be faced by all individuals (even if they are self-employed), based on their personal and household characteristics. Note that equation (7), allows us to impute a wage for both the self-employed women as well as women who are not working. Even after implementing this procedure, however, we still have some individuals with no imputed wage. These individuals (mostly women) live in villages where all individuals engaged in agriculture are self-employed, and so there is no available village-level data on the basis of which we may impute a wage to them. For these individuals, we use a similar regression at *region*

level to impute a wage.⁸ Having computed a predicted wage for all individuals in the sample, we calculate the average male and female wage within a household. The variable *WAGERATIO* denotes the ratio of the average female-to-male imputed wage within the household—it is therefore defined at the level of the household. The average value of this, as shown in Table 3, is 0.734.

3.2 Results from NSS Data

The OLS estimations of equation (7) are shown in Table 4. The categories left out are *EDUC₁* for education, *STRIBE* for caste, and *HINDU* for religion. We see that for males *WAGERATE* is increasing and strictly concave in age, positively correlated with education levels, and increasing in the amount of land cultivated. There is no significant difference between male earnings across caste or religion. For women, age is significant but land is not. The impact of education on wages for women, is felt only at levels above high school. Women of other backward classes and upper castes receive lower wages as compared to scheduled castes and tribes.⁹ Christian and Buddhist women earn less than Hindu women, all else constant.

Table 5 presents the OLS estimation of equation (6). The ratio of female-to-male labor supply of a household (*LSRATIO*) is positively correlated the female-to-male ratio of wages (*WAGERATIO*) but at a significance level a shade below 10%. The coefficient of *LAND* is positive and significant at the 10% level: if the family operates more land, the women within the household work more. As status concerns would predict in the Indian context, *LSRATIO* decreases as we go up the caste hierarchy. In fact the coefficient of *UCASTE* is significantly more negative than that of *OBCASTE*, lending further credence to our hypothesis about the importance of status.¹⁰ The coefficient of *PLITF* is positive but not significant, but that of *PLITF* interacted with *LAND* is negative and significant at the 1% level. This suggests that the effect on *LSRATIO* of a marginal increase in *LAND* declines if the women are more educated. Similarly, the coefficient of *PLITF* interacted

⁸ These are NSS regions, which are agro-climatic regions.

⁹ This somewhat peculiar result is likely an artifact of the data. Most of the women for whom there is wage data fall in the group of casual laborers; few women from other backward and upper castes work in them. The ones who do are probably in dire straits, and this likely explains their lower wages.

with the caste dummies are all negative, with those of other backward castes and upper caste being significant at the 10% and 5% levels, respectively. Educated women in higher caste households work less relative to men, which is precisely what we would expect from status considerations.

As expected, the coefficient of *PLITM* is negative; more educated men would tend to work more, and so *LSRATIO* would be lower. The presence of very young children (below age 5) significantly lowers *LSRATIO* while the presence of older children significantly raises it. This is as expected. Relative to Hindu families, Muslim families have a lower *LSRATIO* while Buddhist families have higher.

All in all, the NSS data appear to lend considerable support to the contention that status concern is an important determinant of the allocation of female labor in rural India. The strongest evidence of this comes from the differences across castes in women's labor supply. Illiterate women of higher castes tend to work less than do illiterate women of lower castes. Interestingly, educated women in the upper castes also tend to work less than do educated women in lower castes.

3.3 Analysis of TUS Data

The Time Use Survey data, which was collected in 1998-99, that we now analyze has a detailed breakdown of the activities of men and women during the day and the time spent in them. The data is coded for 'normal' days, 'weekly variant' days (which presumably are the days of the week when some special activities like visits to the temple are performed), and 'abnormal' days. We do not use the data for abnormal days. The TUS data, unfortunately, is available for only six states of India, namely, Haryana, Madhya Pradesh, Meghalaya, Gujarat, Orissa, and Tamil Nadu. Despite this drawback, however, this data set affords us an opportunity to identify status activities explicitly because of the detailed record of the time use of the respondents.

To maintain comparison with our estimations with the NSS data, we focus on the following variables. First, we define the variable *PROPECON* to be the time spent by females in economic activity as a proportion of the total time spent by the family in

¹⁰ The t-statistic for the difference is 3.27, which is significant at the 1% level.

economic activity. (This is the direct analog of the dependent variable *LSRATIO* that we constructed for the NSS data.) We also construct a variable called *PROPSTAT*, which is the time spent by females in status activities as a proportion of the total time spent by the family in status activities. There is considerable leeway in how we define these status activities. We opted to use a narrow definition for this variable and present the results for it so as not to blur the distinction between leisure and status activities. Essentially, we capture the time devoted to status by any social and cultural activity (participating in social events, cultural functions, religious functions, and entertainment activities of various sorts).

The caste (social group) coding in the TUS data, unfortunately, is cruder than even what is available in the NSS data. In the TUS, there are only three categories of caste, namely, Scheduled Tribes, Scheduled Castes, and Others. We denote the dummy variables for belonging to these groups, respectively, by *STRIBE*, *SCASTE*, and *OTHCASTE*. The last group contains households that would have been ‘other backward’ castes as well as upper castes in the NSS data. From Table 6 we see that the percentages of our TUS sample in these three groups are 22.2%, 18.3%, and 59.5%, respectively. Also, by religion the sample percentages of Hindus is 92.5%; of Muslims 2.6%; of Christians 2.9%; of Sikhs 0.9%; of Buddhists 0.8%; of Jains 0.01%; and the rest 0.98%.

From Table 7 we see that women account for 33.2% of the family’s time spent on economic activities. Of the time spent on status activities, women’s contribution is 31.1%. By these measures, not only do men devote considerable amounts of time to economic and status activities they devote more time to them than women do. The sample average household size (*HHSIZE*) is 4.38, of which the number of literate women (*LITF*) averages 0.501 and the number of literate men (*LITM*) 0.905. The per capita monthly expenditure of a household (*PCEXPEND*) has a sample mean value of 443.27 rupees.¹¹ As is standard practice we shall use this variable as a proxy for income, since reliable income measures are unavailable. The amount of land that is owned by a household (*LANDOWNED*) has a sample average of 278.5, measured in units of thousandths of a hectare.¹² Dummy variables for whether the house is made of

¹¹ The survey gives consumption expenditure in current prices for that year (1998).

¹² This is the unconditional average; the average, conditional on owning land, is 405.0.

provisional material (*HOME_PROV*), semi-permanent material (*HOME_SEMIPERM*), or permanent material (*HOME_PERM*) take on sample averages of 0.517, 0.259, and 0.224, respectively; the majority of the households live in houses made of inferior, non-enduring material. The material out of which a household's home is built can be taken as a proxy for its wealth. By this measure, 22.4% of the sample fall in the wealthiest group.

Econometric Specification

To test for status effects, we estimate the following equation:

$$\begin{aligned}
 \text{(8)} \quad \text{PROPECON}_{jk} = & \gamma_0 + \gamma_1 \text{PCEXPEND} + \gamma_2 \text{NUMLITF} + \gamma_3 \text{NUMLITM} \\
 & + \sum_{m=2}^3 \lambda_m \text{CASTE}_{jm} + \gamma_4 \text{LANDOWNED} + \sum_{m=2}^3 \sigma_m \text{HOME}_{jm} \\
 & + \gamma_5 \text{HHSIZE} + \sum_{m=2}^7 \chi_m \text{RELIG}_{jm} + \omega_k + \zeta,
 \end{aligned}$$

where j denotes household and k the village. As before, the CASTE_{jm} variable on the right hand side is a caste dummy (the group left out is *STRIBE*), and RELIG_{jm} is a religion dummy (left out category is *HINDU*). Likewise, HOME_{jm} is a dummy variable for the type of material from which the household's home is built (and the category left out is *HOME_PROV*). The term ω_k represents village fixed effects, and ζ is the error term.

We expect that households with a higher proportion of working women will have higher incomes and, therefore, higher per capita consumption expenditures. But there is also the reverse causality that families with higher income will devote more time to status activities, which may come at the expense of economic activity. So the expected sign of the coefficient of *PCEXPEND* (which is a proxy for income) would be ambiguous. If the estimated value of the coefficient γ_1 is positive, however, it means that the net of the two effects is positive, that is, the direct correlation between economic activity to income dominates. Greater literacy normally would lead to greater economic activity, as we have noted before. But if literacy of women generates more status activity the correlation could be negative. So if $\gamma_2 < 0$, there is good reason to believe that status effects are in

operation. If we find that $\gamma_3 > 0$, we may reach a similar conclusion with regard to men's literacy because men's economic activity appears in the denominator of the dependent variable. (Literacy raises incomes but the signs of γ_2 and γ_3 would not reflect income effects because we are separately controlling for income through *PCEXPEND*.) Since status activity is caste-related, we expect that at least the highest caste variable (*OTHCASTE*) will have a negative coefficient because women would divert time into status activity. For reasons explained earlier regarding the effect of land holding, we would expect the coefficient of *LANDOWNED* to be positive. To the extent that living in a home made of semi-permanent or permanent material are proxies for the household's wealth, we would expect their coefficients to be negative because the wealth effect is mediated by status concerns that operate more through women's work than men's. The proportion of women's time in economic activities may be higher or lower in larger households, depending on how many dependents there are. The sign of γ_5 is a priori ambiguous. We have no particular predictions on the coefficients of the various religions.

We can also run a regression analogous to (8) with *PROPSTAT* as the dependent variable:

$$(9) \quad \begin{aligned} \text{PROPSTAT}_{jk} = & \gamma'_0 + \gamma'_1 \text{PCEXPEND} + \gamma'_2 \text{NUMLITF} + \gamma'_3 \text{NUMLITM} \\ & + \sum_{m=2}^3 \lambda'_m \text{CASTE}_{jm} + \gamma'_4 \text{LANDOWNED} + \sum_{m=2}^3 \sigma'_m \text{HOME}_{jm} \\ & + \gamma'_5 \text{HHSIZE} + \sum_{m=2}^7 \chi'_m \text{RELIG}_{jm} + \omega'_k + \zeta', \end{aligned}$$

where the definitions of the coefficients and the random variable with primes are defined analogously to those in (8). In (9), we expect many of the effects to be mirror images of those in (8) if status activities, at least to some extent, are coming at the expense of economic activities. We expect that households with higher income will devote more time to status. But, as noted above, there is also the reverse causality that households devoting more time to status will work less and therefore will earn lower incomes. So the coefficient of the variable *PCEXPEND* (which is a proxy for income) would be ambiguous. If the estimated value of the coefficient γ'_1 is positive, however, it means that the effect of income on status activity dominates. We shall deal below with how the endogeneity of income biases the other coefficients that might indicate status concerns.

We expect $\gamma'_2 > 0$ if literacy of women generates more status activity; if a similar effect derives from men's literacy, we would obtain $\gamma'_3 < 0$. (As earlier, literacy raises incomes but the signs of γ'_2 and γ'_3 could not reflect income effects because we are separately controlling for income through *PCEXPEND*.) Since status activity is caste-related, we expect that the highest caste variable (*OTHCASTE*) will have a positive coefficient. Since land owned and living in a home made of semi-permanent or permanent material are proxies for the household's wealth, we would expect their coefficients to be positive. Households that are larger in size may either have more status activities or less, depending on how many dependents there are. The sign of γ'_5 is a priori ambiguous. As before, we have no particular predictions on the coefficients of the various religions.

3.4 Results from TUS data

In Table 8, we present results of the estimation of (8) in columns 2 and 3, and the estimation of (9) in columns 4 and 5. Consider the *PROPECON* regression first. The net effect of per capita expenditure monthly expenditure is positive and statistically significant at the 1% level. The causal effect from higher economic activity to greater income dominates the reverse causality stemming from status activity reducing income. Having more literate women, *NUMLITF*, in the household is significantly and negatively correlated with women's economic activity at the 1% level of significance—lending considerable credibility to our status theory. The significantly positive coefficient for more literate men, *NUMLITM*, suggests an analogous correlation since men's economic activity appears in the denominator of the dependent variable. As we go up the caste hierarchy, the proportion of family's economic time contributed by women goes down—significantly at the 5% for *SCASTE* and at the 1% level for *OTHCASTE*. Ownership of land is uncorrelated with women's proportional contribution to a family's economic activity. Living in a home built with semi-permanent and permanent material is correlated negatively with women's proportional economic activity at the 1% level. (These effects are relative to living in homes built of provisional material.) Since this captures the wealth effect, it says that the wealth effect is stronger for women than for

men. Once again, this suggests status concerns because the women in the family are withdrawing their labor faster than the men are. Household size has a significantly negative effect on women's proportional economic activity. Muslim women exhibit less economic activity than their Hindu counterparts, and Christian women exhibit more. This is probably because Muslim women have more restrictions placed on their economic activities than Hindu women, while Christian women have fewer restrictions.

We now turn to the results presented for *PROPSTAT* in the last two columns of Table 8. Per capita expenditure is uncorrelated with *PROPSTAT*, which is not entirely surprising in view of the fact that causality could go in either direction, with opposing effects on the correlation. Having more literate females in the household significantly increases (at the 1% level) women's proportional contribution to the family's status activities. Increases in the number of literate males have the opposite (and significant) effect, since men's contribution to status activity appears in the denominator of the dependent variable. Caste appears to have no effect on females' status contributions, but landowning significantly does (at the 5% level): the greater the amount of land owned by the family, the higher is the female contribution to the family's status activities. The permanence or semi-permanence of the building material of the home has no effect on *PROPSTAT*. Household size correlates negatively with women's contribution to status activities. Among the religion dummies, only the coefficients corresponding to Muslims and Sikhs are significant, both positively. In many respects the estimation results for *PROPSTAT* here are mirror images of those for *PROPECON*. This is reassuring, for it indicates that time allocated to status activity is at least partly being accommodated by withdrawal from work. The opportunity cost of status activity, in other words, is not only leisure but also foregone income.

We now discuss the issue of possible bias introduced into the OLS estimators of the coefficients of *NUMLITF* (among others)—the positive sign of which we are interpreting as evidence of status effects—because of the endogeneity of monthly per capita expenditure, *PCEXPEND*. If the bias on γ'_2 is in the upward direction, the positive signs of the estimated values may merely be reflecting the bias arising from the fact that *PCEXPEND* is correlated with the error term ζ' in (9). We now argue that, in fact, the bias is in the opposite direction and so works in favor of our interpretation. A positive

shock in the error term will result in an unusually high amount of time devoted by women to status (the left hand side variable). The reverse causation from status activity to income would then tend to reduce household income, the proxy of which is *PCEXPEND*. Now we would expect household income to be positively correlated with literacy (*NUMLITF*). So a positive shock in ζ' would result in a lower value of *NUMLITF*. In other words, *NUMLITF* is negatively correlated with ζ' . This leads to a downward bias in the estimators of γ'_2 .¹³ Since this coefficient turns out to be significantly *positive* (at the 1% level) in our estimations, it follows that our interpretation that this captures status effects is bolstered by the fact that the direction of bias tends to reduce the magnitude of the estimate.

In summary, our results offer robust evidence of status concerns operating in the rural households of India. The similarity in the results obtained using two different data sets (NSS and TUS) gives us some assurance that status effects in rural India are real.

4. Conclusions

In this paper, we have sought to provide a theory for how the desire for family status translates into the time allocation of women in rural India. We have constructed a theory that identifies the effects of caste, wealth, and the human capital of women on the market work of women relative to men. Our theory predicts significant time allocation effects: affluence and education all induce women to curtail market work and reallocate their time towards status production. Caste is seen to play an important role in facilitating this.

We end by reiterating the point that family status and the individual status of women may be working in opposition in rural India. Family status concerns, by reducing market participation for married women, would impede their acquisition of individual autonomy. Agricultural productivity improvements in rural India may well be contributing to a decline in the autonomy of married women, despite the fact that these

¹³ It is conceivable that when the wife withdraws from market work and devotes herself to status production, the family's social capital might increase (due to better social networks) and this, in turn, might increase the husband's income. This could introduce a positive correlation between the error term and *PCEXPEND*, reversing the direction of bias inferred above. It is unlikely, however, that in rural India the decline in wife's income due to status activity will be more than offset by an increase in the husband's.

improvements would increase the remuneration of working women. The perceived collective gain to households by way of family status may come at the expense of women's individual status, especially among the higher castes. A similar process may be at work for women in the lower castes if, as is claimed by some researchers [e.g. Berreman (1993)], Sanskritization is in full swing. That greater affluence might be accompanied by a retreat into a more traditional division of labor within the household is a paradox of rural India that seems to emerge as a consequence of a peculiar cultural preoccupation: an obsession with the 'purity' of married women.

TABLES

Caste	Mean	Std. Dev.
<i>STRIBE</i>	0.099	0.299
<i>SCASTE</i>	0.191	0.393
<i>OBCASTE</i>	0.423	0.494
<i>UCASTE</i>	0.287	0.452
Religion	Mean	Std. Dev.
Hindu	0.830	0.376
Muslim	0.104	0.305
Christian	0.022	0.145
Sikh	0.035	0.183
Buddhist	0.005	0.070
Jain	0.001	0.035
Other	0.004	0.061

Table 1: Proportion of Social Groups (Castes) and Religion in NSS Sample

Level	Description	Males		Females	
		Mean	Std. Dev.	Mean	Std. Dev.
<i>EDUC₁</i>	Illiterate	0.319	0.466	0.501	0.500
<i>EDUC₂</i>	Less than primary school	0.203	0.402	0.175	0.175
<i>EDUC₃</i>	Primary school	0.152	0.359	0.127	0.127
<i>EDUC₄</i>	Middle or secondary school	0.232	0.422	0.154	0.154
<i>EDUC₅</i>	High school	0.046	0.210	0.025	0.025
<i>EDUC₆</i>	Greater than high school	0.048	0.213	0.018	0.018

Table 2: Proportion with various education levels in NSS sample

Variable	Definition	Mean	Std. Dev.
Individual Level Variables			
<i>WAGERATE</i>	Average daily earnings for males	58.56	34.29
	Average daily earnings for females	38.73	17.56
Household Level Variables			
<i>LSRATIO</i>	Female-to-male labor supply ratio in household	0.426	0.606
<i>WAGERATIO</i>	Ratio of female-to-male wage ratio	0.734	0.762
<i>AGE</i>	Age of head of household	26.16	19.32
<i>LAND</i>	Amount of land cultivated by household	1030.4	2291.6
<i>PLITF</i>	Proportion of adult females who are literate in household	0.356	0.414
<i>PLITM</i>	Proportion of adult males who are literate in household	0.587	0.433
<i>NUMCHLD5</i>	No. of children below age 5 years	0.743	0.992
<i>NUMCHLD14</i>	No. of children between ages 5 and 14 years	1.138	1.265

Table 3: Sample statistics for village level and household level variables in NSS sample

Dependent variable: WAGERATE				
	Males		Females	
	Coefficient	Std. Err.	Coefficient	Std. Err.
<i>AGE</i>	0.838***	0.1331	0.217***	0.0526
<i>AGESQ</i>	-0.009***	0.0017	-0.003***	0.0007
<i>EDUC₂</i>	1.301	1.0595	0.041	0.4756
<i>EDUC₃</i>	2.351**	1.0918	0.474	0.5163
<i>EDUC₄</i>	4.273***	1.1086	0.004	0.5719
<i>EDUC₅</i>	17.759***	3.0972	13.039***	2.1366
<i>EDUC₆</i>	66.292***	3.6230	73.674***	3.3421
<i>SCASTE</i>	-1.083	1.8521	-0.554	0.6429
<i>OBCASTE</i>	-1.061	1.8255	-1.475**	0.6192
<i>UCASTE</i>	2.033	2.1238	-1.795**	0.7656
<i>LAND</i>	0.002***	0.0004	0.000	0.0002
<i>MUSLIM</i>	0.863	2.1041	-0.398	0.9421
<i>CHRISTIAN</i>	-4.169	3.1010	-2.295*	1.2179
<i>SIKH</i>	-2.385	5.5146	-2.848	4.2629
<i>JAIN</i>	30.234	20.0339	-1.451	5.4012
<i>BUDDHIST</i>	3.451	4.2819	-3.451***	1.2159
<i>OTHER</i>	3.173	7.9525	13.385***	2.8679
<i>CONSTANT</i>	31.283***	2.8988	29.651***	1.0707
No. of Observations: 12,879 R-Square: Overall = 0.0880			No. of Observations: 8,004 R-Square: Overall = 0.0735	

Table 4: Estimation of wage rate equation with village fixed-effects for NSS sample. (One, two and three asterisks indicate significance at the 10%, 5%, and 1% levels, respectively.)

Dependent Variable: <i>LSRATIO</i>		
	Coefficient	Std. Err.
<i>WAGERATIO</i>	0.0055	0.0034
<i>LAND</i>	5.58 E -06*	2.87 E -06
<i>SCASTE</i>	-0.0850***	0.0150
<i>OBCASTE</i>	-0.0889***	0.0142
<i>UCASTE</i>	-0.1229***	0.0157
<i>PLITF</i>	0.0304	0.0245
<i>PLITF × LAND</i>	-1.23 E-05***	3.37 E-06
<i>SCASTE × PLITF</i>	-1.192 E-04	0.0285
<i>OBCASTE × PLITF</i>	-0.0493*	0.0259
<i>UCASTE × PLITF</i>	-0.0542**	0.0266
<i>PLITM</i>	-0.1158***	0.0075
<i>PLITM × LAND</i>	7.51 E-07	3.86 E-06
<i>NUMCHLD5</i>	-0.0150***	0.0026
<i>NUMCHLD14</i>	0.0251***	0.0020
<i>MUSLIM</i>	-0.0903***	0.0121
<i>CHRISTIAN</i>	-0.0034	0.0222
<i>SIKH</i>	0.0198	0.0305
<i>JAIN</i>	-0.0624	0.0738
<i>BUDDHIST</i>	0.1591***	0.0409
<i>OTHER</i>	-0.0045*	0.0501
<i>CONSTANT</i>	0.5723***	0.0136
No. of Observations: 54,228		
R-Square = 0.0293		

Table 5: Estimation of labor supply ratio equation (6) with village fixed-effects for NSS sample. (One, two and three asterisks indicate significance at the 10%, 5%, and 1% levels, respectively.)

<i>Caste</i>	Mean	Std. Dev.
<i>STRIBE</i>	0.224	0.417
<i>SCASTE</i>	0.1847	0.388
<i>OTHCASTE</i>	0.5916	0.492
<i>Religion</i>	Mean	Std. Dev.
<i>HINDU</i>	0.9232	0.266
<i>MUSLIM</i>	0.0264	0.160
<i>CHRISTIAN</i>	0.0294	0.169
<i>SIKH</i>	0.0091	0.095
<i>BUDDHIST</i>	0.0080	0.029
<i>JAIN</i>	0.0001	0.011
<i>OTHER</i>	0.0108	0.103

Table 6: Proportion of Social Groups (Castes) and Religion in TUS Sample

Variable	Mean	Std. Err.
<i>PROPECON</i>	0.332	0.249
<i>PROPSTAT</i>	0.311	0.349
<i>HHSIZE</i>	4.38	1.98
<i>NUMLITF</i>	0.501	0.750
<i>NUMLITM</i>	0.905	0.921
<i>PCEXPEND</i>	443.27	247.87
<i>LANDOWNED</i>	278.5	564.5
<i>HOME_PROV</i>	0.517	0.500
<i>HOME_SEMIPERM</i>	0.260	0.439
<i>HOME_PERM</i>	0.223	0.416

Table 7: Sample statistics for household level variables in TUS Sample

	Dependent Variable: <i>PROPECON</i>		Dependent Variable: <i>PROPSTAT</i>	
	Coefficient	Std. Err.	Coefficient	Std. Err.
<i>PCEXPEND</i>	4.84 E-05***	1.34 E-05	-1.38 E-05	2.56 E-05
<i>NUMLITF</i>	-0.0402***	0.0046	0.0473***	0.0087
<i>NUMLITM</i>	0.0145***	0.0042	-0.0244***	0.0086
<i>SCASTE</i>	-0.0267**	0.0110	0.0149	0.0274
<i>OTHCASTE</i>	-0.0519***	0.0101	0.0205	0.0250
<i>LANDOWNED</i>	6.74 E-07	4.58 E-06	1.73 E-05**	8.12 E-06
<i>HOME_SEMIPERM</i>	-0.0220***	0.0077	0.0098	0.0149
<i>HOME_PERM</i>	-0.0447***	0.0090	0.0068	0.0169
<i>HHSIZE</i>	-0.0181***	0.0018	-0.0094**	0.0037
<i>MUSLIM</i>	-0.0607***	0.0215	0.0685*	0.0408
<i>CHRISTIAN</i>	0.0561**	0.0282	0.0193	0.0541
<i>SIKH</i>	-0.0147	0.0412	0.1905**	0.0815
<i>BUDDHIST</i>	0.0400	0.0815	-0.1478	0.3001
<i>JAIN</i>	0.0555	0.1991	Dropped	
<i>OTHER</i>	0.0208	0.0337	0.1142*	0.0632
<i>CONSTANT</i>	0.4574***	0.0118	0.3214***	0.0277
No. of Obs: 8340 R-Square = 0.2593			No. of Obs: 4634 R-Square = 0.2278	

Table 8: Estimation of economic time and status equations with village fixed-effects for TUS sample. (One, two and three asterisks indicate significance at the 10%, 5%, and 1% levels, respectively.)

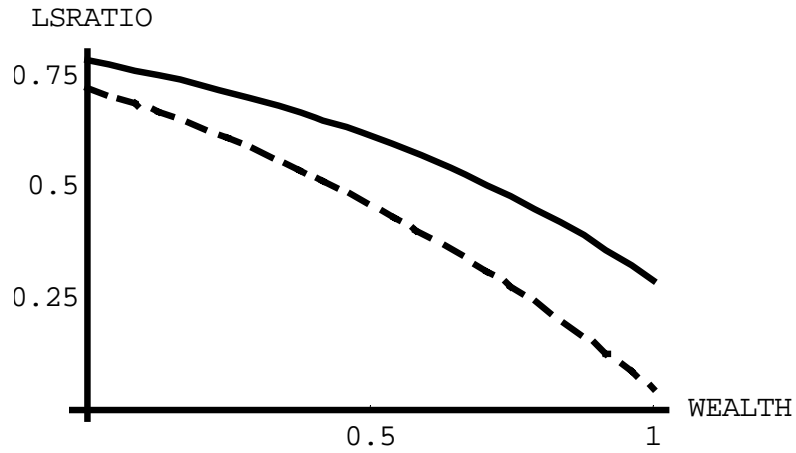


Figure 1: The ratio of wife's to husband's time allocation to the labor market as a function of the non-labor income, A (as captured by wealth). Solid line for $\beta = 0.5$ and dashed line for $\beta = 0.6$. Other parameters: $\alpha=0.5$, $\gamma=0.9$, $\delta=0.5$, $k=1.0$, $w_1 = 0.9$, $w_2 = 1.0$.

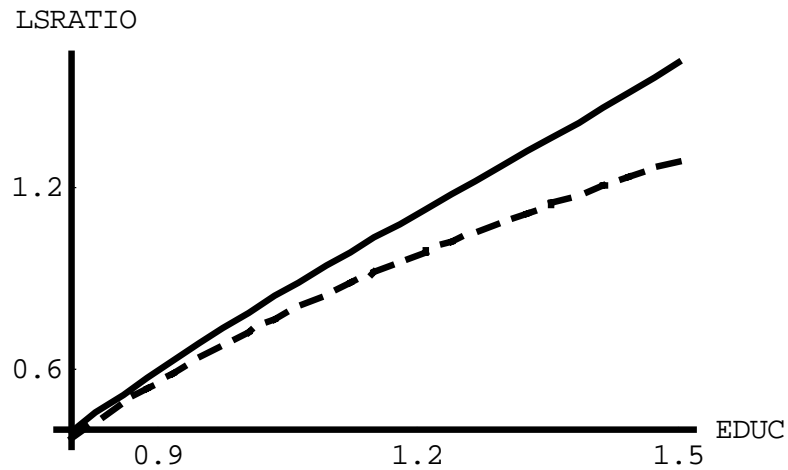


Figure 2: The ratio of wife's to husband's time allocation to the labor market as a function of wife's human capital, k (as captured by her education). Solid line for $\beta = 0.5$ and dashed line for $\beta = 0.6$. Other parameters: $\alpha=0.5$, $\gamma=0.9$, $\delta=0.5$, $A=0$, $w_1 = 0.9$, $w_2 = 1.0$.

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APPENDIX

Proof of Proposition 1:

The first order conditions associated with the optimization in equation (3) of the text reveal that we must have $x_1 = x_2$. We denote the common value by x . Denoting the Lagrange multiplier associated with the budget constraint by λ (the marginal utility of income), and dropping the arguments of functions where there is no ambiguity, we may write the total derivatives of the first order conditions in matrix form as:

$$(A.1) \quad \begin{bmatrix} f'' & 0 & 0 & 0 & -1 \\ 0 & 2g'' & 0 & 0 & -(w_1 + 1) \\ 0 & 0 & h''(r_1) & 0 & -kw_1 \\ 0 & 0 & 0 & h''(r_2) & -w_2 \\ -2 & -(w_1 + 1) & -kw_1 & -w_2 & 0 \end{bmatrix} \begin{bmatrix} dx \\ dz \\ dr_1 \\ dr_2 \\ d\lambda \end{bmatrix} = \begin{bmatrix} 0 \\ -2g'd\beta \\ \lambda w_1 dk \\ 0 \\ -dA - w_1(1 - r_1)dk \end{bmatrix}$$

Primes and double primes on the sub-utility functions denote first and second derivatives, respectively, with respect to the arguments. Since these functions are increasing and strictly concave the first and second derivatives are positive and negative, respectively.

(a) Setting $d\beta = dk = 0$ in (A.1) and applying Cramer's Rule, we obtain

$$\frac{dx}{dA} = (1/D) \begin{vmatrix} 0 & 0 & 0 & 0 & -1 \\ 0 & 2g'' & 0 & 0 & -(w_1 + 1) \\ 0 & 0 & h''(r_1) & 0 & -kw_1 \\ 0 & 0 & 0 & h''(r_2) & -w_2 \\ -1 & -(w_1 + 1) & -kw_1 & -w_2 & 0 \end{vmatrix},$$

where D is the determinant of the 5×5 matrix on the left hand side of (A.1) and given by

$$D = -4g''h''(r_1)h''(r_2) - (2(kw_1)^2 g'' h''(r_2) + (w_1 + 1)^2 h''(r_1) h''(r_2) + 2(w_2)^2 g'')f'' > 0.$$

Simplifying, we obtain,

$$\text{sign}(dx/dA) = \text{sign}[-2g''h''(r_1)h''(r_2)] > 0.$$

In an analogous manner, we obtain

$$\text{sign}(dz/dA) = \text{sign}[-(w_1 + 1) f'' h''(r_1) h''(r_2)] > 0,$$

$$\text{sign}(dr_1/dA) = \text{sign}[-2kw_1 f'' g'' h''(r_2)] > 0,$$

$$\text{sign}(dr_2/dA) = \text{sign}[-2w_2 f'' g'' h''(r_1)] > 0.$$

(b) Setting $dA = dk = 0$ in (A.1) and applying Cramer's Rule, we obtain

$$\frac{dr_1}{d\beta} = (1/D) \begin{vmatrix} f'' & 0 & 0 & 0 & -1 \\ 0 & 2g'' & -2g' & 0 & -(w_1 + 1) \\ 0 & 0 & 0 & 0 & -kw_1 \\ 0 & 0 & 0 & h''(r_2) & -w_2 \\ -2 & -(w_1 + 1) & 0 & -w_2 & 0 \end{vmatrix},$$

so that

$$\text{sign}(dr_1/d\beta) = \text{sign}[-2k w_1 (w_1 + 1) g' f'' h''(r_2)] < 0.$$

Analogously, we have

$$\text{sign}(dr_2/d\beta) = \text{sign}[-2w_2 (w_1 + 1) g' f'' h''(r_1)] < 0,$$

$$\text{sign}(dx/d\beta) = \text{sign}[-2(w_1 + 1) g' h''(r_1) h''(r_2)] < 0,$$

$$\text{sign}(dz/d\beta) = \text{sign}[2 g' \{2h''(r_1) h''(r_2) + (kw_1)^2 f'' h''(r_2) + (w_2)^2 f'' h''(r_1)\}] > 0.$$

(c) Setting $dA = d\beta = 0$ in (A.1) and applying Cramer's Rule, we obtain

$$\frac{dx}{dk} = (1/D) \begin{vmatrix} 0 & 0 & 0 & 0 & -1 \\ 0 & 2g'' & 0 & 0 & -(w_1 + 1) \\ \lambda w_1 & 0 & h''(r_1) & 0 & -kw_1 \\ 0 & 0 & 0 & h''(r_2) & -w_2 \\ -w_1(1-r_1) & -(w_1 + 1) & -kw_1 & -w_2 & 0 \end{vmatrix},$$

so that

$$\text{sign}(dx/dk) = \text{sign}[2 w_1 g'' h''(r_2) \{-(1-r_1) h''(r_1) + k\lambda w_1\}] > 0.$$

In a similar manner, we obtain,

$$\text{sign}(dz/dk) = \text{sign}[w_1 (w_1 + 1) f'' h''(r_2) \{-(1-r_1) h''(r_1) + k\lambda w_1\}] > 0,$$

$$\text{sign}(dr_1/dk) =$$

$$\text{sign}[-w_1 \{4\lambda g'' h''(r_2) + (\lambda(w_1 + 1)^2 h''(r_2) + g''(2kw_1(1-r_1) h''(r_2) + 2\lambda(w_2)^2)) f''\}] = ?,$$

$$\text{sign}(dr_2/dk) = \text{sign}[2w_1 w_2 f'' g'' \{-(1-r_1) h''(r_1) + \lambda k w_1\}] > 0.$$

■