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# **Microcredit and Women's Empowerment: Through the Lens of Time Use Data from Rural India**

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## Abstract

This study examines the impact of microcredit on male and female time use and draws on this analysis to explore the linkages between credit and women's empowerment. A study of time use can help understand these linkages because credit targeted at women with the intent of influencing their livelihoods must also influence the way they allocate their work time. Its other advantages are that it does not suffer from much time lag and can be objectively measured. We use survey data from rural India. Our findings show that while microcredit has little impact on women's time use, it helps their husbands shift away from wage-work, which is associated with bad pay and low status, to self-employment. We find that this is because women's loans are typically used to enhance male ownership of household's productive assets. Further, we find that only women who use loans in self-managed enterprises are able to allocate more time to self-employment. We conclude that if credit is to increase the value of women's work time then it is not access to loan but use of loan that matters. Specifically, women's control over loan created assets is critical.

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## 1. INTRODUCTION

Supporting poor women via microcredit has become central to poverty reduction strategies across the developing world. Underpinning this trend is an implicit model of the empowered woman who invests money in a successful enterprise, uses the income to enhance the nutritional status of her family, educates her children and begins to participate in major family decisions (Ackerly, 1995). This ideological construct has been so forceful that many of the microcredit institutions lend to female clients only and nearly 85% of all clients worldwide are women (Daley-Harris, 2007). The relationship between microcredit and empowerment, however, is intensely debated in the literature (Kabeer, 2001; Garikipati, 2008a). This study contributes to the debate by examining one specific outcome of credit intervention, namely, changes in the allocation of household's work time. We use survey data from rural India.

India's microcredit program was launched in 1992 and, like several other programs around the world, mainly targets poor rural women. Credit groups, referred to as Self-Help-Groups (SHGs), consists of 10-15 women who come together from a similar socio-economic background. Group formation is facilitated by NGOs, but the primary focus of the scheme is credit with little attempt at capacity building. After six months of regular savings, groups become eligible for bank credit. NABARD, India's apex rural bank, provides 100% re-finance to the lending institutions. Repayment rates are consistently over 95% when compared to other rural modalities which are around 40% to 65% (World Bank, 2003; 2005; 2006). With around 40 million clients and an average annual growth rate of 112.2% between 1999 and 2007, it is the biggest and the fastest growing microcredit scheme in the world (Garikipati, 2008a).<sup>2</sup>

With respect to the relationship between microcredit and women's empowerment, the evidence emerging from India is extremely conflicting. In a series of studies that use data from SHG-clients, covering 11 states, Puhazhendi (2000) Puhazhendi and Satyassi (2000) and Puhazhendi and Badatya (2002) conclude that women have experienced significant externalities into personal and social relations. Swain and Wallentin (2009) compare SHG-clients with non-clients from five states and find that while both groups became more empowered over time, the change for SHG women was significant. Reporting evidence from a randomized evaluation, Banerjee et al. (2010) find no effect of microcredit access on women's decision-making. Examining the impact of NGO-led institutions, Hunt and Kasynathan (2001) find that if credit programs are to support women then there must be a greater emphasis on strategies that transform gender relations. Similar results are reported by EDA (2005), who find that cultural burden could restrain the potential for empowerment and Leach Sitaram (2002), who find that excluding male relatives from the credit program can antagonize them and be detrimental to the women concerned. Investigating the impact of different lending technologies, Holvoet (2005) finds that credit alone is insufficient to produce an impact on women's decision making pattern and to be beneficial it needs to be channeled through groups and combined with training. Garikipati (2008) compares SHG-clients with non-clients from Andhra Pradesh (AP) and finds that access to credit alone does not matter for empowerment, it is the way in which credit is used that counts.

This research contributes to this literature by focusing on one specific outcome of credit intervention. It examines the impact of microcredit on male and female time allocation decisions. The focus is on how both men and women respond to credit intervention and hence how they are impacted upon. We collect detailed time use data

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<sup>2</sup> For a brief history of India's rural financial sector see Garikipati (2008a).

from men and women who belong to poor households in rural AP, India. Around 40% of the households surveyed had the female head participate in the microcredit program.

Ever since the economic theory of the household was pioneered by Becker (1965) and Gronau (1973), a good deal of research has gone into the study of household's time allocation behavior in developing countries. The determinants of women's market participation, in particular, have received much attention (Mueller, 1984; Khandker, 1988; Skoufias, 1993; Fafchamps and Quisumbing, 1998; Rose, 2000). Studies have also specifically examined how male and female time allocations respond to new economic opportunities in rural areas (von Braun and Webb, 1989; Jacoby, 1993; Paolisso et al., 2002; Newman, 2002). Given the level of interest, it is surprising that hardly any work has been done to understand the impact of microcredit on household's time allocation. One possible reason for this is the difficulty in obtaining rigorous time use data from clients and comparable non-clients. The only exception to this is Pitt (2000), who examines the effect of microcredit, by gender of participant, on the household's mix of agricultural contracts and the supply of male agricultural labor for the landless poor in rural Bangladesh. Pitt, however, focuses on male time use only, because cultural restrictions imposed on women in rural Bangladesh imply that their involvement in income-generating activities is rather negligible (Pitt 2000).

If rigorously collected, time use data can be valuable in understanding the impact of microcredit. Of the various indicators that can be affected by an inflow of credit, time use decisions are likely to change almost immediately, the changes are also likely to become more noticeable over time as the duration of participation in the credit program increases. Moreover, where credit affects long term livelihood decisions, the changes in time use are likely to be permanent. The direction and magnitude of these changes can throw light on whether credit is likely to have the desired impact. The other advantage of time use is that it is an objectively measurable indicator – as opposed to several other impact indicators that require subjective judgment – either on the part of the respondent or the researcher(s). Furthermore, if woman's time use is expected to change so as to increase the value of her time, then it can be viewed both as a *process* that facilitates empowerment as well as an *outcome* that indicates empowerment – this goes to the heart of the debate on what is the best way to measure empowerment (see Kabeer, 2001; Karin; Malhotra, Garikipati, 2010).

In this study, the idea that credit may influence the value of women's work time is captured by differentiating the types of market-work done by individuals into two broad categories: self-employment and wage-work.<sup>3</sup> Market-work is defined as any work that brings income (in the form of cash or kind) into the household; self-employment is defined as work on productive assets owned by the household like land and cattle or family business; and wage-work is defined as work done for daily wages. We argue that differentiating market-work in this way for poor rural communities is

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<sup>3</sup> Studies examining women's time use patterns tend to focus on the determinants of their market participation only. Little attempt is made to differentiate the types of market-work done by women. This approach is appropriate for situations where women's market participation is rare because of exogenous constraints and studying factors that may help overcome these is critical for policy. For instance, Khandker (1988) rejects differentiating the types of market-work done by women in rural Bangladesh. He argues that once women start work, it is fairly easy to switch between different types of work. This is possible, given that in Bangladesh, women face substantial cultural barriers to working outside the domestic sphere. The idea is that once women transcend these barriers, the type of work they do is not difficult to choose, provided they can access such work. In the case of rural India, as in the case of several other developing countries, where women's market-work is not stigmatized and significant numbers work outside their households, it is important to go beyond participation and examine the factors that help improve the value of their work time.

important because wage-work is associated with bad pay and arduous working conditions and is also considered socially debasing.<sup>4</sup> It is mainly done by people from lower economic classes without access to sufficient productive assets that can help them earn a living.

Historically speaking, female participation rates in rural India have been high (Central Statistical Organization, 1995). Most of the rural women workers, however, are compelled to take up badly paid and socially demeaning agricultural wage-work. According to the India Census, 43.4% of rural women workers are agricultural laborers when compared to 27.4% of men (Government of India, 2001). Furthermore, in several states of India, like Andhra Pradesh, Karnataka, Maharashtra and Tamil Nadu, women have overtaken men in worker numbers. Census data shows that women are taking over wage-work as men move into self-employment.

The main reason for this trend is that despite favorable inheritance laws, the patriarchal norms established across much of the Indian sub-continent ensure that women are excluded from having rights over family's arable land. Barring some regional variations, this is more or less the case across much of rural South Asia (Agarwal, 1994). This is especially concerning since it is well established that land as a productive asset is a critical determinant of women's economic wellbeing, social status and empowerment (Agarwal, 1994; Rao, 2007; Allendorf, 2007). Meager land holdings means it is usually men, who as owners, retain working rights in family land and women are left to take up what work they can find. This is usually agricultural wage-work. The conditions surrounding this type of work can be detrimental to their welfare (da Corta and Venkateshwarlu, 1999; Garikipati, 2008b).

In this context, lending to women is expected to help them invest in non-farm enterprises, which in turn allows them to shift their work time from wage-work to self-employment which is considerably better remunerated and is associated with higher social status. This is likely to enhance the value of their incomes, improve their self-esteem and empower them. The linkages that take women from accessing credit to spending more time in self-employment are especially important for poor rural women who have limited livelihood options. As their time becomes more valuable, women may spend less time in wage-work and housework. The impact that lending to women is likely to have on male time use is somewhat more ambiguous. Straightforward income and substitution effects suggest that they should reduce the time allocated to market-work and spend more time in housework. However, cultural norms may dictate otherwise. Male time in self-employment may also increase as a result of their involvement in the investments made using women's loan. This study examines some of these linkages.

For the purpose of this enquiry, all members of the household are assumed to make time use decisions simultaneously. Estimating such a system of decisions is complicated by the large differences found across households, both in number of household members and the types of relations. The effect of lending to women on household time allocation is captured indirectly in two ways. First, time allocation outcomes for men and women from SHG households are compared with outcomes for men and women from households in the control group. Second, to focus on the issue of whether microcredit increases women's time in self-employment, reduced-form determinants of the type of market-work done by women are estimated for those receiving SHG loans.

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<sup>4</sup> Pitt (2000) differentiates market-work similarly and for similar reasons but, as mentioned earlier, his analysis does not include women's time use.

The plan for the paper follows. Section 2 describes the questionnaires used in the fieldwork and the resulting datasets. Section 3 gives an overview of the time use outcomes by gender and participation in the credit program. Section 4 presents the empirical models used to investigate the impact of microcredit on male and female time use. It also provides the descriptive statistics of the variables and discusses the results. Section 5 explores the reasons for the observed results. Section 6 concludes.

## 2. FIELDWORK AND DATA

Fieldwork was carried out in villages of the Mahabubnagar district – a drought-prone district in the southern state of AP. Over 45% of its rural households live below the poverty line (Government of AP, 1996). The state government has resolutely pursued the SHG program as part of its poverty-alleviation strategy with the twin objectives of promoting livelihood diversification and women's empowerment. As a result, Mahabubnagar has one of the oldest, biggest and fastest growing SHG programs in India (NABARD, 2003).

The data were collected between 2001 and 2003 in three separate rounds as part of a larger study that investigated female labor market participation and issues surrounding pro-poor growth. All the survey villages have an active SHG program. Interviews were carried out by six enumerators, three men and three women, who were at least graduates and trained in basic survey techniques. Interviews were always carried out by a group of two: one male and one female. The author participated in over one third of all interviews and also carried out all the focus group interviews.<sup>5</sup>

During the *Kharif* season in 2001 and again during the *Rabi* season in 2002, data were collected from 302 households that were randomly selected from a population of married couple households where both male and female heads of household were economically active.<sup>6</sup> Ten *de facto* male or female headed households and one income outlier were dropped from the analysis. Of the remaining 291 households, the female heads of 117 households participated in the SHG program (completed at least one loan cycle) and the remaining 174 were not in the program. From each household, either the male or the female heads were randomly selected for interview such that approximately equal number of men and women were consulted. In the remainder of this paper, these surveys are referred to as 'household surveys'.

Data from the household surveys include detailed modules on demographic characteristics of household members, their economic activities, asset holdings, credit program participation, household decision making and respondent's time use. Time use data were collected using the 24-hour recall method. This method is considered more accurate when compared to others because it is more detailed and it is easier for respondents to recall what they did the day before.<sup>7</sup> Around 4% of the respondents reported the previous day to have been 'unusual' (for instance, they visited a doctor or relatives living outside the village). In these cases, respondents were asked to recall details from the last 'routine' day. In all cases, this was no more than four days prior to the interview. The aim was to capture the activities that were routine to the particular agricultural season.

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<sup>5</sup> For more details on survey protocol see Horrell et al. (2008).

<sup>6</sup> *Kharif* and *Rabi* are the two main agricultural seasons in South Asia. The *Kharif* crop is the monsoon harvest and is usually sown with the beginning of the first rains in July. The *Rabi* crop is the spring harvest and is usually completed by mid-June.

<sup>7</sup> For a review of time use measurement methods and issues surrounding these see Juster and Stafford (1991).

Detailed time use data was obtained for 145 women and 146 men across two typical days and seasons. On average, households consist of 6.2 members with an average landholding of 2.5 acres. Of the survey households, 60.3% earn an average monthly net per capita income below the poverty threshold of Rs 262.9 for rural AP (Planning Commission, 2001).<sup>8</sup> While there is some evidence of livelihood diversification, households mainly rely on agricultural incomes. A total of 58 women (40%) and 104 men (71.2%) spend most of their work time in self-employment, while 77 women (53.1%) and 38 men (26%) spend most of it in wage laboring. While majority of the men and women were either self-employed or worked for wages, a small proportion of men (18.69%) and women (10.37%) did a bit of both. Self-employment mainly included work on own farm and with livestock. In addition, some men and women also run their own businesses, like a petty shop, making local liquor or tailoring. Wage laboring was mainly on-farm but some men also worked off-farm (construction, transport or as an employee in a petty shop). The remaining 10 women (6.9%) and 4 men (2.7%) report no market-work and have been excluded from further analysis. Data from the household surveys are used to compare time allocation decisions of men and women from SHG households with those from non-SHG households.

During 2002, an additional survey was conducted with members of all the SHGs that had completed at least one loan cycle. A total of 397 married women belonging to 27 SHGs were interviewed as part of this survey. This survey was conducted mainly with the objective of investigating the paradoxical findings that emerged from the household survey. For the rest of the paper, this is referred to as the 'SHG survey'.

The SHG survey data included modules on household characteristics, primary market-work of the SHG woman and her husband and use and repayment of SHG loans. Given various constraints, detailed time use data could not be collected in this survey, instead the focus was on collecting information regarding the types of market-work that men and women did. This is likely to give an accurate idea of how men and women spend most of their work time, given that most men (81.69%) and women (89.63%) report doing only self-employment or only wage laboring in the household surveys. On average, groups composed of 14.7 members and had completed an average of 3.78 loan cycles. The average loan amount was Rs 26138.2 per group or Rs 1777.7 per women and this only occasionally varied from cycle to cycle. Loans were usually divided equally among group members and in just two SHG had members pooled their loans for joint projects. Loans were mainly used to meet household's productive and consumption requirements and in some cases to finance self-managed enterprises. The repayment rate was reported to be 100%. SHG households had average landholdings of 2.5 acres and 52% of them fell below the poverty threshold. In this sample, 63 (15.9%) women reported self-employment as their primary market-work and 296 (74.6%) women reported wage-work as their primary work. The remaining 38 (9.6%) women reported no market-work and were dropped from further analysis. Data from the SHG survey are used to study the determinants of the type of market-work done by SHG women.

During 2002 and 2003, we also conducted a complementary series of participatory focus group and individual interviews with 38 respondents of the above surveys. Stratified random sampling technique was used to select respondents for these interviews. All the SHG-survey respondents were grouped into four categories based

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<sup>8</sup> There is an intense debate surrounding these official poverty figures (for details see Deaton & Drèze, 2002). Here, income is net of costs but not of loan repayments.

on their loan use. Around 10 women were selected from each of these four groups for the focus groups. The unstructured interviews were designed to focus on experiences that could not be captured by conventional survey techniques. They are used to further understand the findings of this study.

### **3. CREDIT PROGRAM PARTICIPATION AND TIME USE BY GENDER**

As mentioned earlier, detailed time use data were collected in the household surveys from the male or the female respondent from married households. For the purpose of this study, routine activities carried out by men and women are broadly divided into *Self-employment*, *Wage-work*, *Housework* and *Leisure*. *Self-employment* includes work on household's agricultural and non-agricultural assets. *Wage-work* includes both farm and off-farm work for which wages were paid on a daily basis.<sup>9</sup> *Housework* includes time spent in all reproductive work, including childcare, care of elderly and house repairs. *Leisure* includes time spent in sleeping, recreational activities like visiting friends and relatives in the evenings, but does not include time spent in routine activities like personal care and eating food.

Table 1a shows the time spent in these activities by the surveyed men and women. The time use is in hours averaged over two typical days, one from each of the two main agricultural periods: *Kharif* and *Rabi*. A gendered pattern of time use is apparent immediately. The *t*-statistic of comparing the mean of male time use variables with female time use variables differs significantly. Men work around 2 hours less than women and consequentially enjoy more leisure. Women also did most of the housework, clocking up over 4 hours when compared to 30 minutes of male time in similar jobs. These differences are comparable to other studies for developing countries (Khandker, 1998; World Bank, 2001; Newman, 2002).

The striking observation from our time use data is that although women spend less time in market-work than men, they spend nearly 60% of this in wage-work which is significantly more than men. Furthermore, they spend far less time in self-employment than men, who spend nearly 75% of their market time in this type of work. The suggestion here is that women work mainly for wages, while men work mainly on own assets. This 'gender based division' of market-work for rural India has been observed by other studies as well (Chaudhry, 1994; da Corta and Venkateshwarlu, 1999). The population census data for India also corroborates this finding. According to census figures, by 2001, 43.4% of female workers were classified as agricultural laborers when compared to 27.4% of male workers (Government of India, 2001). This trend of feminization of agricultural wage-work is stronger in the south. For instance, according to the census for AP, by 2001, 60.7% of female rural workers were agricultural laborers when compared to 37.8% of male workers.

Lending to women may help challenge the gendered work patterns observed in the time use data. Women could use their loans to buy productive assets, which may help of value of their market time improves, they may also be able to bargain for a reduction in their domestic burdens. As a first step towards investigating whether lending to women has resulted in such a shift, we compare the time use by men and women from SHG households with those from non-SHG households.

Table 1b shows male and female time use by credit program participation of the female head of household. With respect to the 135 female respondents, the table shows

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<sup>9</sup> Note that nearly all the wage-work reported was of this type. Two of the respondents reported as working for a government office – but they were not included in the main analysis.



that the time use variables do not differ much when comparing SHG women with non-SHG women. For the 142 male respondents, however, the amount of time spent in self-employment, wage-work and leisure differ significantly when comparing men whose wives' are SHG members with those whose wives' aren't. The *t*-statistic for time spent in self-employment is positive but that for wage-work and leisure is negative. This suggests that men with SHG-wives spend more time working, specifically do more self-employment and do less wage-work and enjoy less leisure as compared to the averages of these variables for the men with non-member wives. Note that these differences become shaper when we compare households that have been in the SHG program for over three years with non-participating households.

The time use outcomes presented in Table 1a and 1b suggest two things. First, there is a gender based division of market-work – women mainly do wage-work and men mainly self-employment. Second, participation in the credit program does not help women move away from wage-work but it helps their husbands spend more time in self-employment. In other words, lending to women seems to deepen the gender based division of market-work by helping men consolidate the amount of time they spend in self-employment. Clearly, these results require further investigation. What follows is a detailed econometric analysis of all factors that determine male and female time use to see if these preliminary results hold in a multivariate world.

TABLE 1a. Male and Female Time Use (hours per day)

Activity	Male-respondents, <i>n</i> =142	Female-respondents, <i>n</i> =135	<i>t</i> -statistic
<i>Self-employment</i>	6.00 (4.05)	2.66 (3.25)	<b>7.60***</b>
<i>Wage-work</i>	2.33 (3.19)	3.48 (3.09)	<b>-3.51***</b>
<i>Housework</i>	0.50 (0.92)	4.30 (1.84)	<b>-21.64***</b>
<i>Leisure</i>	9.94 (2.04)	8.82 (1.32)	<b>5.45***</b>

\*\*\* Significant at the 1% level.

Notes: Standard deviations are given between parentheses.

*t*-statistic compares mean values of variables for men and women in the sample.

Source: Author's calculations based on household surveys conducted in *Kharif* 2001 and *Rabi* 2002. Note that the total hours do not add up to 24 because time spent on routine tasks like eating and personal care have not been included.

TABLE 1b. Time Use, by Gender and Credit Program Participation (hours per day)

Activity	Male-respondents, <i>n</i> =142			Female-respondents, <i>n</i> =135		
	SHG <i>n</i> =61	Non-SHG <i>n</i> =81	<i>t</i> -statistic	SHG <i>n</i> =50	Non-SHG <i>n</i> =85	<i>t</i> -statistic
<i>Self-employment</i>	6.97 (4.35)	5.27 (3.66)	<b>2.47**</b>	2.70 (3.05)	2.64 (3.37)	0.10
<i>Wage-work</i>	1.77 (3.13)	2.77 (3.40)	<b>-1.91*</b>	3.58 (3.31)	3.42 (2.96)	0.29
<i>Housework</i>	0.47 (0.83)	0.52 (0.99)	-0.32	4.50 (1.92)	4.19 (1.79)	0.93
<i>Leisure</i>	9.55 (2.06)	10.23 (1.98)	<b>-1.99**</b>	8.73 (1.61)	8.87 (1.17)	-0.59

\* Significant at the 10% level, \*\* Significant at the 5% level, \*\*\* Significant at the 1% level.

Notes: Standard deviations are given between parentheses.

*t*-statistic compares mean values of variables for men and women in the sample.

Source: Same as Table 1a.

#### 4. DETERMINANTS OF MALE AND FEMALE TIME USE

##### *The empirical models and description of the variables*

In this section, data from the household surveys is used to investigate the determinants of male and female time use. The focus is on testing whether microcredit helps women spend more time in self-employment which is associated with better pay and higher social status as compared to wage-work. This is a particularly relevant enquiry for rural India because, as discussed before, women here are more heavily involved in

agricultural wage-work when compared to men, who spend most of their work time in self-employment.

One aim of the analysis is to separate the substitution effects of asset incomes on time use from the bargaining effects. In this analysis, substitution effects are the direct outcome of an increase in woman's income from assets that result from access to credit, while bargaining effects are the outcome of an increase in woman's agency. To the extent that asset incomes influence women's behavior in a pure economic sense, we expect to observe her doing more self-employment and less of wage-work or/and enjoy less of leisure. And to the extent that asset incomes influence behavior through a bargaining effect via a change in her agency, we expect to observe a fall in the time she spends on housework. Whether or not this translates into more housework for her husband depends on the (cultural) norms that determine how domestic responsibilities are distributed.

The determinants of time use are estimated separately by gender, because the aim is to understand how the male and female time use decisions from SHG households differ not from each other but from members of the same gender from non-SHG households. The linear-in-the-variables equation used to estimate the determinants of respondent's time allocation is of the form

$$T_{ij} = \alpha_T H_i + \beta_T V_i + \varepsilon_{ij} \quad (1)$$

where  $T_{ij}$  is the time that respondent  $i$  allocates to task  $j$ . We consider a total of four tasks: *Self-employment*, *Wage-work*, *Housework* and *Leisure*, and hence four time use models are estimated for men and women separately.  $H_i$  is a vector of household characteristics (e.g., age and education of respondent),  $V_i$  is a vector of village characteristics,  $\alpha_T$  and  $\beta_T$  is a scalar parameters to be estimated and  $\varepsilon_{ij}$  is an unobserved error term reflecting, in part, unmeasured determinants of  $T_{ij}$  that vary over households. The household and village characteristics used in the models are given below.<sup>10</sup>

- *Duration*: In the female time use models, it indicates the number of years the woman has been a member of the credit program. In male models, it indicates the length of his wife's membership. Non-members in all cases are coded as zero.
- *Age<sup>2</sup>*: Respondent's age measured in years. Squared term in age is included to examine the nonlinear effect of age.
- *Education*: The educational background of the respondent. It takes the values 0 (= illiterate), 1 (= high school) and 2 (= beyond school).
- *Sons*: Number of sons the respondent has.
- *Daughters*: Number of daughters the respondent has.
- *H-land*: The amount of wetland owned by the husband in acres.
- *W-fallback*: Coded as one if wife's maternal family owned more than 3 acres of wetland. This variable is used as a proxy for the wife's fallback position. It may also indicate whether the woman was given dowry at the time of marriage.<sup>11</sup>

<sup>10</sup> Wages could not be included as a determinant because nearly all wage-work was agricultural, and there was little variation within a gender category. Returns on self-employment had to be computed and this required subjective assumptions regarding land and labor productivity. Computed returns were found to be highly correlated with the amount of wetland owned by the husband ( $r = 0.209$ ,  $p = 0.000$ ). Rather than include wages and returns on self-employment directly, factors that could influence these, such as age, education, landownership and women's participation in the credit program are considered.

<sup>11</sup> Although the practice of giving and receiving dowry is common in the survey area, collecting direct data on dowry proved to be problematic. The practice is illegal and there was a general perception

- *F-head*: Coded as one if the head of the household is female.
- *O-loans*: Coded as one if the household received credit from sources other than the SHG-program in the last three years.
- *Dependency*: The proportion of household members aged 13 or over divided by household size. This number indicates the dependency burden on the working members of the household. A lower number denotes greater dependency.
- *Dwelling*: Coded as one if the external walls of the house are made of concrete and the house has a durable roof (tiles or similar materials) and zero otherwise. This variable indicates the relative economic status of the household.
- *Caste*: Coded as one if the household is from the lower castes (Scheduled Castes or Scheduled Tribes).
- *Market*: A village-level dummy indicating the distance from the main market. Coded as one if the household is from a village is 10 kilometers or more and zero if less.

For *Duration*, a positive sign of the coefficient is expected in the *Self-employment* model and a negative sign is expected in the *Wage-work* model for women: participation in the credit program is likely to increase women's time in self-employment and decrease the time spent in wage-work. For control variables, *Age*<sup>2</sup> and *Education*, a negative sign of the coefficient is expected in the *Wage-work* model for men and women: increases in individual's age and education are likely to decrease the time spent in physically demanding and low-skilled wage-work. In addition, for *Education* and *Dwelling*, a positive sign is expected in the *Self-employment* model for men and women: increases in education and wealth are likely to increase time spent in self-employment. For *H-land*, a positive sign of coefficient is expected in *Self-employment* model and a negative sign in *Wage-work* model for men: increase in access to wetland is likely to increase male time in self-employment and decrease the time in wage-work. Wage-work is less likely to be done by landowners because of low pay and social status associated with it. There are no explicit expectations on the signs of the remaining variables.

#### *Endogeneity of credit program participation*

Studies examining impact of program participation routinely suffer from possible bias due to endogeneity of decision to participate in the program and the unobserved household characteristics. The unobserved heterogeneity between the members of the credit group and non-members includes the unobserved attitudes and characteristics of the husbands, wives, and other family members, including preexisting women's autonomy. It seems quite likely that more autonomous women are more likely to be able to join a credit program but these women are also more likely to spend their time in activities that are better remunerated and of higher status. If this unobserved heterogeneity is not accounted for then their effects will be captured by the variable measuring program participation and cause its statistical effects to be exaggerated.

In econometric terms, this means that in equation (1), the covariate measuring program participation (*Duration*) and other unmeasured casual variables collapsed into the error term  $\varepsilon_{ij}$  are correlated. Hence, using *Duration* as an independent variable is problematic. Consider the following reduced form equation for the level of participation in the credit program, where level of participation will be taken to be the duration of credit program participation,

$$Duration_i = \alpha_D H_i + \beta_D V_i + \mu_i \text{ for } Criterion_i = 1$$

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among the respondents that the survey enumerators being 'young and educated' would be critical of those who admit to have taken or received dowry.

$$Duration_i = 0 \text{ for } Criterion_i = 0, \quad (2)$$

where  $H_i$  is a vector of household characteristics and  $V_i$  is a vector of village characteristics,  $\alpha_D$  and  $\beta_D$  are unknown parameters,  $\mu_i$  is a nonsystematic error that reflects unmeasured determinants that vary over households and  $Criterion_i = 1$  indicates that the household meets the criterion for participating in the credit program.

The time use outcome conditional on the duration of program participation  $Duration_i$  is given as

$$T_{ij} = \alpha_T H_i + \beta_T V_i + \chi_T Duration_i + \varepsilon_{ij} \quad (3)$$

where  $H_i$  is a vector of household characteristics and  $V_i$  is a vector of village characteristics as described above,  $\alpha_T$ ,  $\beta_T$  and  $\chi_T$  are unknown parameters and  $\varepsilon_{ij}$  is a nonsystematic error that reflects unmeasured determinants of  $T_{ij}$  that vary over households. The estimation issue arises as a result of the possible correlation of  $\varepsilon_{ij}$  from equation (1) with  $\mu_i$  from equation (2). Econometric estimation that does not take these correlations into account may yield biased estimates of the parameters of equation (1) due to the endogeneity of credit program participation  $Duration_i$ . In such a case, it is valid to use the estimates to predict values of  $T_{ij}$  given values of  $Duration_i$ , but the estimate does not recover the causal effect of  $Duration_i$  on  $T_{ij}$ .

Several econometric techniques, notably instrumental variables estimation, are available to correct for the possible confounding effects of systematic variation between participants and non-participants.<sup>12</sup> An instrumental variable  $z$  is one that is correlated with the independent variable  $Duration_i$  but not with the error term  $\varepsilon_{ij}$ . The instrument is then used to obtain a consistent IV estimator for  $Duration_i$ .

To construct a valid instrument – such that it is correlated with  $Duration_i$  but not to the error term – the official rules governing the formation of SHGs were used. These rules and their implementation in practice are described below.

The formation of SHGs is governed by explicit policy directives from NABARD. The prevailing rules require that groups consist of members who are from similar socio-economic background, which in rural India means sharing cultural affinity in terms of caste grouping and belonging to a similar wealth or income stratum (NABARD, 2003; NABARD, 2007). NABARD proactively encourages the adoption of these rules by bank official and NGOs involved in group formation via its training material (see NABARD, 2007).

Various studies suggest that serious consideration is given to these rules during the formation of credit groups. In his study of SHGs in Gulbarga district of Karnataka, Harper (2002) describes how bank managers are anxious to ensure that women forming groups share close caste ties. Badatya et al. (2006) also mention such practices in their study of SHGs in three districts of AP, viz. Chittoor, Nizamabad and Warangal. Our survey data also confirms that women from a neighborhood have an increased probability of forming a group if they belong to a similar socio-economic background. Explaining the need for this policy by way of outlining the ‘ills’ of groups that have

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<sup>12</sup> The IV technique and other methods are discussed in Heckman (2008). For studies that have used the IV technique, among others, see Pitt and Khandker (1998) and Pitt et al. (2006). The econometric methods used in our analysis are essentially the same as those presented in Pitt et al. (2006), without the village fixed effects.

women from different socio-economic backgrounds, Mr Pradhamaan Achari, the bank manager of Sanghameshwara Grameen Bank (bank serving the survey area) writes, “These groups are difficult to manage and are likely to split up because of lack of unity among the women” (email contact on 19/11/2002).

Focus group interviews suggest that women preferred to form SHGs with others from their caste and wealth group due to reasons of trust and cultural affinity, but also to minimize the transaction costs associated with screening and monitoring group members as encumbrances related to caste and class hierarchies did not have to be maintained when members belonged to a similar background. Describing her relationship with others from her group, here is what one SHG woman says.

Caste is very important when you are in a group. Look at our group – we are all from the same caste and look how well we work...because we already know and understand each other. I just know that they (members of the group) will not cheat me. (G9W1)

Her (a member of G9W1’s SHG who was from similar wealth group) house is directly in front of mine. We are like sisters...if you don’t find me in my house, you will find me in hers... So when there was the talk of forming an SHG in our neighborhood, we both decided to be in the same group. (G9W1)

Harper (2002) reports similar behavior among women forming groups in Angul district of Orissa. In their report on assessment of SHG bank-linkage program, Kropp and Suran (2002) also observe neighborhood and caste affiliations among groups they interviewed. MYRADA (2002) also makes similar observations for SHGs in Boodhikote district of Karnataka.

In our sample, all SHGs were neighborhood groups which meant that women from the same neighborhood came together to form groups and the average group size was around 15 members. Furthermore, 72.79% ( $n = 397$ ) of SHG members belonged to the same sub-caste as the majority in their group. We use these two pieces of data to construct a relevant instrument. This exercise needed utmost care as caste can also influence time use. We had to come up with an instrument which did not measure woman’s caste category directly but instead gave us a measure of the probability of a woman joining a neighborhood credit group with others from a similar social background.

With this in mind, we wanted to identify the number of households within a neighborhood cluster that belonged to similar social background. We began by identifying the different neighborhood clusters within each village. For this we used the electoral roles which list addresses associated with specific neighborhoods. The electoral roles were also used to identify the caste category of all the households within each neighborhood. Using only the broader constitutionally recognized caste classifications gave us little variation within a neighborhood, so sub-castes were used for this exercise. For instance, under the caste category of Scheduled Tribes, in the survey villages, we have 3 sub-castes: Chenchu, Lambada and Yerukali. Table A1 in the Appendix lists all the sub-castes from the villages surveyed.

Using this information we constructed the following instrument, *InstCaste* – a dummy variable coded as one if the respondent belonged to a sub-caste that had at least 15 households in his/her neighborhood. Note that this instrument does not capture an individual’s caste category (and hence the ability or inability to use time in a certain way) but only the number of households within an individual’s neighborhood who belonged to similar social background.

To illustrate the identification strategy used by this study, consider Figure 1 that depicts a neighborhood cluster. Colored-in houses belong to sub-caste  $x$  and uncolored houses belong to sub-caste  $y$ . In this neighborhood there are a total of 17 houses that belong to sub-caste  $x$  and 4 that belong to the sub-caste  $y$ . For the instrumental variable *InstCaste*, a household from sub-caste  $x$  takes the value 1 and a household from sub-caste  $y$  takes the value 0. *Ceteris paribus*, household from  $x$  sub-caste have a relatively higher probability of forming a neighborhood credit group with 15 other households from a similar background when compared to households from  $y$  sub-caste.

Two-stage instrumental variable estimation of the determinants of male and female time use can be accomplished by treating as indentifying instruments a variable for program choice interacted with all exogenous variables. The idea is that all of the exogenous variables have an effect on self-selection into the program only for those with sufficient number of within caste households in their neighborhood – as only they are able to effectively decide whether or not to participate – but influence time use outcomes for all. Parameter identification requires that living in a neighborhood with sufficient number of within caste households (the eligibility criterion) does not affect the time use outcomes conditional on program participation, although a person’s caste itself may affect time use outcomes. It is important to note that the variable *Caste* is not an exclusion restriction here. It is one of the independent variable in the vector  $H_i$  of equation (3).

In the first stage, the endogenous covariate *Duration* is regressed on all exogenous variables, including the identifying instrument as follows

$$Duration_i = \alpha_D H_i + \beta_D V_i + \delta_D InstCaste_i + \mu_i \quad (2')$$

Note that for women who live in neighborhoods with insufficient number of within caste households ( $InstCaste_i = 0$ ), duration of program participation is deterministically zero ( $Duration_i = 0$ ). The predicted values from these regressions are obtained. We run the above regression separately for men and women in the sample and report the results in Table A2, Appendix. The second-stage in the two-stage least squares estimation is simply the estimation of equation (3), but after replacing  $Duration_i$  with the predicted  $Duration_i^p$ . The predicted values for men are used in the male time use models and the predicted values for women in the female time use models. The time use equation for male and female respondents can be written as

$$T_{ij} = \alpha_T H_i + \beta_T V_i + \chi_T Duration_i^p + \varepsilon_{ij} \quad (3')$$

Standard two-stage least squares estimation provides consistent estimates of this model. We use the *ivregress* (2SLS) command in STATA to compute the time use equations.

FIGURE 1: Illustrating the identification strategy: A neighborhood cluster with two sub-castes



### *Data description and empirical results*

Table 2 provides descriptive statistics of all the variables used in the empirical analysis by gender and SHG membership. The table shows that the statistics for most of the variables included in the empirical model do not differ much when comparing SHG members with non-members – suggesting that the treatment and control groups are comparable. The only significant differences are in case of female respondents with respect to the variables *Dependency* and *Market*. For these variables, the *t*-statistic of comparing the mean of the members with non-members differs significantly. SHG women are more likely to come from large households with fewer working members and are more likely to live in villages further away from the nearest market town as compared to the averages of these two variables for the non-members.

Table 3a and 3b provides the results of the second-stage time use regressions for male and female respondents respectively. Each column represents a separate time use model, which examines whether membership of the credit program affects the time used by the respondent in that particular activity. The central result from the time use models is that lending to women affects their husband's time use by helping them spend significantly more time in better remunerated and socially respectable self-employment and less time in wage-work. However, it fails to help women challenge the conventional demands surrounding their work and leisure. In particular, the coefficient for *Duration* is found to be statistically significant in three of the four male time use models: (3-1), (3-2) and (3-4). It has a positive sign in (3-1), but a negative sign in (3-2) and (3-4). Of the control variables, the coefficient for *Age*<sup>2</sup> is statistically significant in (3-1), (3-2), (3-5) and (3-6); *Education* in (3-2) and (3-4), (3-5), (3-6) and (3-8); *Sons* in (3-7); *H-land* in (3-2) and (3-7); *Dependency* in (3-1), (3-2) and (3-7) and *Market* in (3-7).

With respect to duration of credit program participation, the results suggest that men whose wives are SHG members spend more time in self-employment and less time in wage-work even when measured against the impact of other variables. They also spend less time in leisure when compared to men whose wives are not SHG members. These relationships are likely to be strengthened as duration of membership increases. It is likely that, as a result of their wives' SHG membership, their returns from self-employment have increased when compared to that of wage-work and hence they have shifted their work time from wage-work to self-employment. And given that the opportunity cost of leisure is higher for them when compared to men who work mainly for wages; they seem to be substituting leisure for work as a result of it becoming more expensive. It is worth pointing out here that husband's of SHG women still have significantly more leisure time than their wives. Program membership does not impact on the self-employment that women do and there is weak evidence to suggest that it may actually increase their involvement in wage-work.

The other determinants of male and female time use are more or less in line with theoretical expectations. Age affects men and women similarly. It has a positive effect on time spent in self-employment but a negative effect on time spent in wage-work. Education has a negative effect on the amount of wage-work that men and women do, suggesting that better educated individuals may have other work opportunities available to them or that better educated people may avoid wage-work. It has a positive effect on the time women spend in self-employment, suggesting that education may enhance women's ability to seek self-employment opportunities. It also has a positive effect on amount of leisure men and women enjoy. This may be an income effect, reflected in the ability of better educated individuals to earn a higher income. It may also indicate that better educated individuals place a higher value on leisure relative to consumption. Land ownership has a negative effect on male time in wage-work. Given the socially debasing nature of wage-work, land owning men are expected to shun this type of work. Having sons and the amount of land owned by the household have a positive effect on the time women spend in housework, suggesting that the cultural asymmetries around sharing of housework by men and women worsen with having sons and as household's wealth improves. Having a greater proportion of working members in the household affects the time men spend in self-employment negatively, but affects the time in wage-work positively. This is expected as the household's productive assets are likely to be fixed. Living in the village further away from the main market has a positive effect on the women's time in housework. This is at least partly because large number of households in this village rely on traditional fuels like cow pats and women spend substantial amounts of time preparing these.

Sensitivity analyses are carried out to test the robustness of the results. The time use models are re-estimated with *Age* and *H-land* increased by 5% and different cut off points for maternal landownership were used to construct the variable *W-fallback*. The coefficients for *Duration* remain relatively stable to these changes.

Our results from the time use models compare with the findings of other studies. The study by Pitt (2000) which examines the impact of microcredit on male time use, finds strong evidence to suggest that participation in microcredit substantially increases male own-cultivation through sharecropping, coupled with a significant increase in male hours in self-employment and a reduction in male hours in wage-work. He also finds that female credit effects are larger than male credit effects, both in increasing sharecropping and male self-employment and reducing male wage labor. While Todd (2001) does not examine the impact on time use directly, she finds a noticeable shift in employment patterns of microcredit households from irregular, low-paid daily labor to family business, with livestock being the most widely acquired productive asset.

Overall, our estimates indicate that women work for significantly longer hours when compared to their husbands and spend most of their work time in low status activities like wage-work and housework and microcredit does not allow them to break away from this pattern. Men, on the other hand, work mainly in self-employment and their wives' participation in credit program helps them deepen this commitment. This indicates that although SHG program targets women, the real beneficiaries are their husbands.<sup>13</sup> The next section investigates this paradoxical result further.

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<sup>13</sup> One of the reasons why households may divert credit to men is because the returns earned by men may be higher than those earned by women. This has been an ongoing theme in the microcredit literature. For instance Berger (1989:1021) notes that "On average, women's microenterprises have lower sales revenues, fewer assets, and smaller profit margins than men's." Unfortunately, the survey data does not allow further exploration of this issue.



TABLE 2. Descriptive Statistics of the Independent Variables Used in the Time Use Models

Variable	Male-respondents, <i>n</i> =142			Female-respondents, <i>n</i> =135		
	SHG <i>n</i> =61	Non-SHG <i>n</i> =81	<i>t</i> -statistic	SHG <i>n</i> =50	Non-SHG <i>n</i> =85	<i>t</i> -statistic
<b>INDIVIDUAL CHARACTERISTICS</b>						
<i>Age</i>	38.46 (8.96)	36.99 (9.41)	0.95	35.84 (6.62)	37.89 (8.88)	-1.42
<i>Education</i>	0.77 (0.92)	0.53 (0.88)	1.57	0.14 (0.45)	0.06 (0.28)	1.28
<i>Sons</i>	1.23 (1.19)	0.99 (0.99)	1.32	1.78 (1.22)	1.56 (1.15)	1.03
<i>Daughters</i>	1.08 (1.14)	1.33 (1.39)	-1.15	1.00 (1.07)	0.92 (0.99)	0.45
<i>H-land</i>	2.74 (4.84)	2.27 (3.05)	0.66	1.92 (2.57)	2.01 (2.19)	-0.23
<i>W-fallback</i>	0.38 (0.49)	0.30 (0.46)	1.01	0.32 (0.47)	0.27 (0.45)	0.61
<b>HOUSEHOLD CHARACTERISTICS</b>						
<i>F-head</i>	0.00 (0.00)	0.01 (0.11)	-0.87	0.10 (0.30)	0.16 (0.37)	-1.04
<i>O-loans</i>	0.21 (0.41)	0.25 (0.43)	-0.47	0.30 (0.46)	0.20 (0.40)	1.32
<i>Dependency</i>	17.18 (12.27)	17.03 (9.33)	0.08	14.95 (7.70)	19.25 (11.06)	<b>-2.42**</b>
<i>Dwelling</i>	0.21 (0.41)	0.16 (0.37)	0.80	0.12 (0.33)	0.15 (0.36)	-0.53
<i>Caste</i>	0.31 (0.47)	0.26 (0.44)	0.68	0.36 (0.48)	0.29 (0.44)	1.24
<i>Market</i>	0.59 (0.50)	0.47 (0.50)	1.43	0.68 (0.47)	0.37 (0.48)	<b>3.69***</b>

\* Significant at the 10% level, \*\* Significant at the 5% level, \*\*\* Significant at the 1% level.

Notes: Standard deviations are given between parentheses.

*t*-statistic compares mean values of variables for men and women in the sample.

Source: Author's calculations based on household surveys conducted in *Kharif* 2001 and *Rabi* 2002.

Table 3a. Determinants of Male Time Use, *n* = 142 (Second-stage Regressions)

PROGRAM RELATED VARIABLE	3-1	3-2	3-3	3-4
	<i>Self-employment</i>	<i>Wage-work</i>	<i>Housework</i>	<i>Leisure</i>
<i>Duration (est)</i>	<b>0.494 (3.30)***</b>	<b>-0.214 (-2.24)**</b>	0.007 (0.22)	<b>-0.192 (-2.53)**</b>
<b>INDIVIDUAL CHARACTERISTICS</b>				
<i>Age<sup>2</sup></i>	<b>0.0001 (1.75)*</b>	<b>-0.001 (-3.23)***</b>	-0.0001 (-0.99)	0.0001 (1.52)
<i>Education</i>	-0.237 (-0.59)	<b>-0.258 (-1.91)**</b>	-0.129 (-1.36)	<b>0.531 (2.60)***</b>
<i>Sons</i>	-0.148 (-0.44)	0.017 (0.05)	0.008 (0.11)	0.270 (1.56)
<i>Daughters</i>	-0.011 (-0.04)	0.055 (0.24)	0.076 (1.12)	-0.024 (-0.17)
<i>H-land</i>	-0.007 (-0.08)	<b>-0.075 (-1.71)*</b>	0.008 (0.36)	0.004 (0.09)
<i>W-fallback</i>	-0.797 (-1.08)	0.297 (0.50)	-0.114 (-0.65)	0.138 (0.37)
<b>HOUSEHOLD CHARACTERISTICS</b>				
<i>O-loans</i>	-0.512 (-0.64)	0.021 (0.03)	-0.158 (-0.84)	0.086 (0.21)
<i>Dependency</i>	<b>-0.071 (-1.93)*</b>	<b>0.053 (1.79)*</b>	0.004 (0.46)	0.016 (0.88)
<i>Dwelling</i>	0.739 (0.81)	0.282 (0.38)	-0.204 (-0.94)	-0.351 (-0.75)
<i>Caste</i>	0.061 (0.08)	-0.391 (-0.62)	0.048 (0.26)	-0.176 (-0.44)
<i>Market</i>	0.720 (1.07)	-0.662 (-1.22)	0.107 (0.67)	0.346 (1.01)
<i>Constant</i>	<b>5.078 (3.84)***</b>	<b>4.234 (3.97)***</b>	<b>0.596 (1.91)*</b>	<b>8.738 (13.01)***</b>
Wald chi-squared (12)	26.37	25.47	5.68	16.09
Root MSE	3.799	3.066	0.900	1.932

\* Significant at the 10% level, \*\* Significant at the 5% level, \*\*\* Significant at the 1% level.

Note: *t*-statistics are given between parentheses.

The variable *F-head* was dropped from the male models due to lack of variation.

Table 3b. Determinants of Female Time Use,  $n = 135$  (Second-stage Regressions)

	3-5	3-6	3-7	3-8
	<i>Self-employment</i>	<i>Wage-work</i>	<i>Housework</i>	<i>Leisure</i>
<b>PROGRAM RELATED VARIABLE</b>				
<i>Duration (est)</i>	0.037 (0.27)	0.042 (1.16)	0.011 (0.14)	-0.046 (0.82)
<b>INDIVIDUAL CHARACTERISTICS</b>				
<i>Age<sup>2</sup></i>	<b>0.001 (2.28)**</b>	<b>-0.001 (-2.18)**</b>	-0.000 (-0.13)	0.000 (0.42)
<i>Education</i>	<b>1.23 (1.75)*</b>	<b>-1.945 (-2.59)**</b>	0.251 (0.58)	<b>0.858 (2.68)**</b>
<i>Sons</i>	-0.287 (-1.12)	0.073 (0.30)	<b>0.258 (1.83)*</b>	0.033 (0.32)
<i>Daughters</i>	0.290 (0.93)	-0.337 (-1.13)	0.015 (0.09)	0.013 (0.11)
<i>H-land</i>	-0.060 (-0.48)	0.023 (0.20)	<b>0.134 (1.93)*</b>	-0.055 (-1.09)
<i>W-fallback</i>	0.345 (0.56)	-0.216 (-0.36)	0.287 (0.83)	0.0003 (0.00)
<b>HOUSEHOLD CHARACTERISTICS</b>				
<i>F-head</i>	0.694 (0.87)	-0.215 (-0.28)	-0.197 (-0.45)	0.039 (0.12)
<i>O-loans</i>	-0.165 (-0.25)	-0.191 (-0.30)	0.246 (0.67)	0.272 (1.00)
<i>Dependency</i>	-0.010 (-0.31)	-0.016 (-0.53)	<b>0.029 (1.73)*</b>	0.013 (1.00)
<i>Dwelling</i>	0.932 (1.12)	-0.688 (-0.87)	0.277 (0.60)	-0.340 (-1.00)
<i>Caste</i>	-0.796 (-1.31)	0.312 (0.54)	0.135 (0.40)	0.255 (1.03)
<i>Market</i>	-0.143 (-0.25)	-0.193 (-0.35)	<b>0.985 (3.09)**</b>	0.087 (0.37)
<i>Constant</i>	1.381 (0.89)	<b>5.724 (3.88)***</b>	<b>2.426 (2.84)**</b>	<b>8.373 (13.34)***</b>
Wald chi-squared (13)	15.03	15.03	23.32	16.01
Root MSE	3.060	2.917	1.690	1.242

\* Significant at the 10% level, \*\* Significant at the 5% level, \*\*\* Significant at the 1% level.

Note: *t*-statistics are given between parentheses.

## 5. WOMEN'S LOAN USE AND THEIR TIME USE

### *Some preliminary observations*

In this section the data from the SHG survey are used to understand why lending to women helps their husbands spend more time in self-employment and less time in wage-work but does not help them do the same. The focus is on investigating whether the way women's loans are used affects their time use, where loan procurement alone failed to do so.

Women's loans were mainly used to meet household's requirements (84.7%,  $n = 359$ ) and only a small proportion of the SHG women used their loans in business they manage or help manage (15.3%).

Of loans used on household requirements, they were primarily used as working capital in household farms or businesses (61.3%), also to buy or improve assets like land and livestock (10%) and towards consumption (13.4%). These figures indicate that the demand for credit within the household is high (see also Mahajan and Ramola, 1996). Typical examples of working capital are to buy a motor for irrigating land or a pair of plough bullocks or equipment for a small family business. The noteworthy point here is that loans used in household's productive activities ultimately result in enhancing male assets. This is because land is almost always owned by men (less than 3% of household land was owned by women) and most family businesses are also controlled by men. In this respect, loans procured by women are contributing to widening the existing resource divide between men and women.

Of loans used on women controlled businesses, given the small loan size (Rs 2000 to Rs 3500); women tend to invest in similar businesses which meant severe competition and low profitability (also see Berger, 1989). Women typically bought livestock like chickens and goats or started petty vendor shops selling tea, groceries or

a tailoring business. Just two SHGs had pooled their loan together in order to start a group business.

As mentioned earlier, the SHG women were asked about their and their husband's primary market-work. Table 4 provides an overview of the relationship between loan use and main market-work for SHG women. The table shows that 87.3% ( $n = 55$ ) of women who used their loans in own-enterprise report self-employment as their main market-work while less than 2% of them report this to be wage-work. This, combined with results from the previous analysis, suggests that loan use and not loan procurement is an important determinant of female time use. The table also shows that less than 5% ( $n = 304$ ) of the women using loans in household activities report self-employment as main market-work while an overwhelming 95.1% of them report this to be wage-work. The suggestion here is that although women's loans are used to enhance household assets, they lack co-ownership in these assets – in that they are unable to spend their time working on these assets.

### *An econometric analysis*

This section presents an econometric analysis of the factors that may determine SHG women's market-work. The conditional probability of women being self-employed, conditional on the duration of program participation  $Duration_i$  is

$$Selfemployment_i = \alpha_s H_i + \beta_s V_i + \chi_s Duration_i + \varphi_i \quad (4)$$

where  $Selfemployment_i$  is a dummy variable that takes the value one if the woman reports self-employment as her main market-work and zero if she reports this to be wage-work,  $H_i$  is a vector of household characteristics and  $V_i$  is a vector of village characteristics,  $\alpha_s$ ,  $\beta_s$  and  $\chi_s$  are unknown parameters,  $\varphi_i$  is a nonsystematic error that reflects unmeasured determinants that vary over households. Of the household and village characteristics used in the equation,  $Duration$ ,  $Age^2$ ,  $Education$ ,  $H-land$ ,  $W-fallback$ ,  $F-head$ ,  $Dependency$ ,  $Dwelling$ ,  $Caste$  and  $Market$  are as described earlier. Three additional variables described below are also included:

- *Own-use*: Coded as one if the woman used loan in an enterprise managed by her solely or in partnership with others and zero otherwise.
- *Peer-effect*: Indicates the proportion of women in the respondent's SHG who report self-employment as their main work. This is a proxy for the influence exerted by respondent's peer group in encouraging her to take up self-employment.
- *Sons*: Coded as one if the woman has one or more sons.

We are once again confounded with the endogeneity problem described earlier that precludes the use of the variable  $Duration_i$  directly. The econometric methods used to tackle the endogeneity of credit program participation are essentially the same as before with the difference that to obtain the IV estimates we use IVprobit, an estimation procedure that fits models with dichotomous dependent variables where the regressor is endogenously determined. In the first-stage equation of the two-stage IVprobit estimation, the endogenous regressor is instrumented using ordinary least squares,

$$Duration_i = \alpha_D H_i + \beta_D V_i + \delta_D InstCaste_i + \mu_i \quad (2')$$

The first stage regression is presented in Table A2 of the Appendix (column 3). The second-stage, like before, is simply the estimation of equation (4), but after replacing  $Duration_i$  with the predicted  $Duration_i^p$ . It is written as

$$Selfemployment_i = \alpha_s H_i + \beta_s V_i + \chi_s Duration_i^p + \varphi_i \quad (4')$$

We use the *ivprobit* command in STATA to compute this equation. For *Duration*, *Own-use* and *Peer-effect* a positive sign of the coefficient is expected: the probability of woman doing self-employment is likely to increase if the woman participates in the credit program, uses her loan in a self-managed enterprise and as the proportion of women doing self-employment in her SHG increase. The expectation on the signs of *Age*<sup>2</sup>, *Education* and *H-land* are as before. There are no expectations on the signs of the remaining variables.

Table 5 provides descriptive statistics of all the variables used in the empirical investigation for SHG women by their loan use. The table shows that the statistics for *Self-employment*, *Duration*, *Peer-effect*, *Age*<sup>2</sup>, *H-land*, *W-fallback*, *F-head*, *Dependency* and *Dwelling* differ significantly when comparing women who use loans in own-enterprise with those who do not. Women who invest in own-enterprise spend significantly more time in self-employment, have been SHG members for fewer years, have other members in their credit group doing mainly self-employment, are somewhat older, enjoy better fallback positions, have husbands who own relatively more wetland, are more likely to be considered as head of the household, live in households with lower dependency burdens and which are relatively better-off when compared to the averages of these six variables for the women who use loans on household needs. Taken together, the suggestion here is that it is mainly women from better-off household with somewhat better household statuses who are able to invest in their own-businesses.

Table 6 provides the results of SHG women's main market-work model. Overall, the results indicate that loan use plays a significant role in determining women's market-work. In particular, statistically significant coefficients are found for *Own-use* and *Peer-effect*. Both variables have the expected sign. None of the control variables have statistically significant coefficients – although some like *Education*, *Son* and *H-land* come very close.

With respect to loan use, the results show that if women use their loans in an enterprise they manage, the probability of self-employment being their main market-work increases. With respect to the effect of woman's peer group, the results show that if others in the woman's credit group are mainly self-employed, the probability of the woman spending her market time in a similar way increases. Taken together with the earlier results from time use models, the suggestion here is that although loan procurement alone is unlikely to influence woman's time use, how she uses her loan influences her time use significantly. If her loan is used in a business that she manages or helps manage then this is likely to have a significant beneficial impact on the way her market time is spent – specifically, this will help her spend more time in better remunerated and socially superior self-employment.

To test for the robustness of the relationship between woman's loan use and time use, we exploit the fact that some households were surveyed in both the 'household surveys' and the 'SHG survey'. A new sample is created by matching households included in both surveys. A 'matched household' had either the husband or the wife interviewed in the household surveys and the wife interviewed in the SHG survey. Although 106 households were included in both the surveys, only 73 definite matches were found – with 39 men and 34 women respondents in the household surveys. For these men and women, we have the 24-hour recall time use data (from the 'household surveys') and detailed loan use data (from the 'SHG survey'). All respondents in this sample report as participating in market-work. This sample is used to check if the

results regarding primary market-work hold when detailed time use data is considered.<sup>14</sup>

Table 7 provides the detailed time use for men and women using the matched sample by loan use. The table shows that when comparing women who use loans in own-business with women who do not, the *t*-statistic for the variables *Self-employment*, *Wage-work* and *Housework* differ significantly. The results show that women who use their loans in own-business spend more time in self-employment and housework but less time in wage-work when compared to the averages of these three variables for the women who use loans on family requirements. The results on self-employment and wage-work suggest a direct substitution effect and support our earlier findings, but the result on housework requires some deliberation. Standard economic theory suggests that the time woman allocates to housework falls as a result of the indirect bargaining effect of an increase in her income as she increases time in self-employment. In our sample, women doing self-employment save nearly an hour when compared to those working for wages, but instead of enjoying more leisure; they spend this extra hour on housework. If greater involvement in housework is a free choice, then such work itself is producing positive utility for women and this is greater than the utility received from similar amount of extra leisure. A more likely explanation is that as a result of more flexibility in their work schedules, women are compelled to accept extra household responsibilities. Whatever the reason for the extra hour spent in housework may be – it is apparent that women are unable to use the leverage of microcredit to bargain for less housework. The division of housework is so entrenched in patriarchal norms that exogenous factors like credit are ineffective in helping women bargain away from it.

With respect to male time use, the table shows that, statistically speaking, there are no differences between the ways men use their time, irrespective of their wives' loan use. Although these differences are not statistically significant, men whose wives invest in own-businesses are seen to spend more time in self-employment and less time in wage-work than others. This may reflect the possibility that men whose wives use loans to start their own-businesses may not be excluded from accessing their wives' assets and are able to work on these. Note that an earlier result suggested that women lacked co-ownership of male owned assets and were excluded from working on these even where they had invested their loans in these assets (see Table 4). The reverse, however, does not seem to hold. Men it seems are not excluded from working on female owned assets in the same way as women are excluded from male assets.

The focus group interviews were useful in further understanding the diverse experiences of those SHG women who used their loans in household needs and those who used it in own-businesses. G3W7, G3W11, V2W6 and V11W3 are women whose loans were used as working capital in family farms and G5W12, G7W2 and V4W9 had voluntarily used their loans to avert a household crisis. The experiences of these women indicate that they retained little influence over the assets and incomes created from their loans. Before obtaining loans, some of these women worked on family farms or within their households, but now find themselves working as wage laborers mainly to meet repayments. Women's wages were, in fact, the main source of repayment in around 70% of all cases. Interviews indicate that these women were resentful at this perceived fall in status. Here is what some of these women said.

I was happy working in my home and on the farm (before joining the group), but now I have to go for *kulie pani* (wage-work) everyday. Sometimes I think I should leave the group, so I can

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<sup>14</sup> Despite the small size of this sample, the time use data for these men and women resemble the time use data for men and women from the full sample closely. Details from author on request.

stop this *chakiri* (drudgery)...I know I have to clear all my debts before I can talk like this. (G3W11)

I gave my (loan) money to my husband to buy a motor for the farm, but this was a mistake. He does not discuss anything with me now-a-days...he feels that if he tells me anything, I will pester him for money. Instead of helping me with repayments, he asked me to go for *kulie pani* (to repay the loan). (V11W3)

My husband is actually a good man, but lack of money is an evil thing – it can change people. He used to hand over every *paisa* (penny) to me... But after he got TB and I had to use the SHG loan to pay his hospital bills – things have changed. He does not give me all his money – only what I need for the house – he thinks I will use it to repay the loan. He even goes to the *zamindar* to collect my wages. (G5W12)

On the other hand, women like G6W14, G7W7, V7W1 and members of G9 who use their loans in own-businesses perceived a positive change in their statuses. They spoke about their newly found confidence in their ability to earn incomes independent of their husbands and without recourse to wage laboring. They felt a change not only in the attitudes of their family members but also the society at large.<sup>15</sup> Here are a couple of examples:

*Mahalaxmi* (name of V7W1's group, but also that of the Hindu Goddess of Wealth) has made me what I am today. I manage not one but two businesses now. I cook meals for the *aganwadi* (pre-school group) and in the afternoons I manage a tea-shop.... I could not imagine even two years back that one day I will own a mobile phone – but I need it for my business. The *aganwadi* teacher has to call me every morning to tell me how much food to prepare. (V7W1)

I have changed. Everyone around me has changed. We are now business-women. We have to deal with all sorts of people in our fertilizer business... At first, people only saw us as women – but now they are used to us. They know we run a good business – they respect us for this...My son wants to start a business of his own. He comes to me for advice. (G9W1)

Where women's loans are diverted into household needs, these mainly enhance their husband's asset holdings and help them spend more time in self-employment. Not only are women unable to access these assets to improve the value of their work time, but they have little claim over the incomes from these assets. Several either continue to work for wages or have taken up wage laboring mainly to repay loans. Such work is not only physically arduous and badly paid, but is also associated with low social status. Women who use their loans to start or enhance their own-businesses have entirely opposite experiences. They have improved their asset holdings, are able to spend more time on better remunerated self-employment and are gaining in confidence that is likely to enhance their agency and empower them. These findings suggest that if credit interventions are aimed at forwarding the empowerment agenda, then women retaining control over loan created assets is a critical condition.

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<sup>15</sup> Note that very few women who managed their own enterprise reported any actual profits after repayments. Of the two SHGs that had started joint ventures, one was profitable (a fertilizer shop), but the other reported a small loss (a rental business that catered to special occasions like weddings etc).

Table 4. SHG Women's Primary Market-work by Loan Use

Loan use	Own	Family farm	Household	Consumption	Number of
Market-work	enterprise	or business	assets		cases
<i>Self-employment</i>	48 (13.37)	11 (3.06)	2 (0.56)	2 (0.56)	63 (17.55)
<i>Wage-work</i>	7 (1.95)	209 (58.22)	34 (9.47)	46 (12.81)	296 (82.45)
<b>Total numbers</b>	<b>55 (15.32)</b>	<b>220 (61.28)</b>	<b>36 (10.03)</b>	<b>48 (13.37)</b>	<b>359 (100)</b>

Notes: In case of multiple loan uses (9.32%), the primary use is recorded.

Percentages are given between parentheses.

Source: Author's calculations based on household surveys conducted in *Kharif* 2001 and *Rabi* 2002.

Table 5. Descriptive Statistics of the Variables Used in the Women's Primary Market-work Model

	Own-use (n=55)	SHG women (n=359) Household-use (n=304)	t-statistic
<b>DEPENDENT VARIABLE</b>			
<i>Self-employment</i>	0.87 (0.34)	0.05 (0.22)	<b>23.53***</b>
<b>PROGRAM RELATED VARIABLE</b>			
<i>Duration</i>	3.61 (1.32)	5.29 (3.73)	<b>-6.05***</b>
<i>Peer-effect</i>	35.64 (20.61)	10.08 (16.56)	<b>8.70***</b>
<b>INDIVIDUAL CHARACTERISTICS</b>			
<i>Age</i>	34.49 (10.67)	30.08 (9.19)	<b>2.87***</b>
<i>Education</i>	0.15 (0.40)	0.14 (0.37)	0.07
<i>Son</i>	0.89 (0.31)	0.87 (0.34)	0.46
<i>H-land</i>	0.97 (1.62)	0.44 (0.95)	<b>2.34**</b>
<i>W-fallback</i>	0.47 (0.504)	0.24 (0.426)	<b>3.27***</b>
<b>HOUSEHOLD CHARACTERISTICS</b>			
<i>F-head</i>	0.13 (0.34)	0.04 (0.20)	<b>2.53**</b>
<i>O-loans</i>	0.11 (0.315)	0.09 (0.290)	0.39
<i>Dependency</i>	15.90 (9.89)	12.69 (6.70)	<b>2.31**</b>
<i>Dwelling</i>	0.31 (0.466)	0.13 (0.311)	<b>2.80**</b>
<i>Caste</i>	0.27 (0.45)	0.28 (0.45)	-0.06
<i>Market</i>	0.62 (0.49)	0.57 (0.50)	0.68

\*\* Significant at the 5% level, \*\*\* Significant at the 1% level.

Notes: Standard deviations are given between parentheses.

t-statistic compares mean values of variables for men and women in the sample.

Source: Author's calculations based on household surveys conducted in *Kharif* 2001 and *Rabi* 2002.

Table 6. Determinants of SHG Women's Primary Market-work,  $n=359$  (Second-stage regression)

Dependent Variable: <i>Self-employment</i>	
6-1	
SHG women ( $n=359$ )	
<b>PROGRAM RELATED VARIABLE</b>	
<i>Duration</i>	0.029 (0.32) <sup>a</sup>
<i>Own-use</i>	<b>2.640 (7.51)***</b>
<i>Peer-effect</i>	<b>0.039 (4.79)***</b>
<b>INDIVIDUAL CHARACTERISTICS</b>	
<i>Age<sup>2</sup></i>	0.0000 (0.33)
<i>Education</i>	0.609 (1.53)
<i>Son</i>	0.706 (1.41)
<i>H-land</i>	0.165 (1.43)
<i>W-fallback</i>	-0.061 (-0.16)
<b>HOUSEHOLD CHARACTERISTICS</b>	
<i>F-head</i>	0.027 (0.05)
<i>O-loans</i>	-0.403 (-0.86)
<i>Dependency</i>	0.015 (0.79)
<i>Dwelling</i>	0.412 (1.20)
<i>Caste</i>	-0.156 (-0.49)
<i>Market</i>	-0.424 (-1.29)
<i>Constant</i>	<b>-3.625 (-4.28)***</b>
Wald chi-squared (14)	88.93

\* Significant at the 10% level, \*\*\* Significant at the 1% level.

Note: *t*-statistics are given between parentheses.

Source: Author's calculations based on household surveys conducted in *Kharif* 2001 and *Rabi* 2002.

Table 7. Male and Female Time Use by Loan Use ((hours per day)

Activity	Male ( $n=39$ )			Female ( $n=34$ )		
	Own-use ( $n=16$ )	Household-use ( $n=23$ )	<i>t</i> -statistic	Own-use ( $n=11$ )	Household-use ( $n=23$ )	<i>t</i> -statistic
Self-employment	8.10 (3.59)	7.61 (4.15)	0.39	4.98 (1.74)	2.64 (3.22)	<b>2.25**</b>
Wage-work	1.03 (2.56)	1.22 (2.67)	-0.23	0.64 (1.95)	3.93 (3.36)	<b>-3.01***</b>
Housework	0.46 (0.85)	0.55 (0.89)	-0.32	5.30 (0.93)	4.32 (1.45)	<b>2.03**</b>
Leisure	9.02 (1.35)	9.54 (2.02)	-0.90	9.03 (1.84)	8.62 (1.61)	0.66

\*\* Significant at the 5% level, \*\*\* Significant at the 1% level.

Notes: Standard deviation are given between parentheses.

*t*-statistic compares mean values of variables for men and women in the sample.

Source: Author's calculations based on household surveys conducted in *Kharif* 2001 and *Rabi* 2002.

## 6. CONCLUDING COMMENTS

Poor rural women in many developing countries are pushed into marginal employment opportunities mainly because of poverty but also because of patriarchy which constrains their rights to own land and other significant household assets. Such opportunities are usually associated with bad work and pay conditions and, often, are also deemed social debasing. In such situations, lending to women can have a beneficial impact by enabling them to invest in productive assets and improve the value of their work time. This may also lead to improvements in their situations and statuses. This expectation drives microcredit to the forefront of the fight against women's poverty and empowerment. This study provides a rare empirical insight into whether credit improves the value of women's work time. It uses survey data from villages in India to examine the impact of microcredit on male and female time use.



Our findings suggest that access to credit alone is unlikely to improve the value of women's work time; it is the way in which women use their credit that matters. Improving the value of women's work time requires that women use their credit in ways that will help enhance their control over productive assets.

We find that women's loans are mainly used to improve household's productive assets and because these are typically owned by men – women's loans ultimately benefit men. We find that men with wives in the credit program spend significantly more time in self-employment and less time in wage-work when compared to others. It is only when the focus shifts to how women use their loans (as opposed to procurement alone) that impact of microcredit on their time use becomes apparent. In particular, women who use their loans to start or enhance businesses that they operate – in other words, enhance their ownership of productive assets – are seen to spend significantly more time in self-employment.

From a policy perspective, our findings suggest that, if improving women's situation is a policy concern for microcredit programs, then it is important to explore mechanisms that influence loan-usage rather than focus solely on disbursement of credit. While changing the patriarchal notions surrounding ownership of household's productive assets is likely to remain a long term objective, a more achievable paradigm that provides the first steps towards such change may be to focus on assets bought with women's loan money. Where women's credit is used to procure or enhance productive assets, it is conceivable that providers can persuade households to accept greater female control over such assets. This is likely to give them greater rights to access such assets for work and repayments and challenge their sale. In the longer term, this may also influence women's bargaining positions within the household and their statuses.

While these findings provide an initial step towards better understanding of the potential of credit on time use with the available data, much further research is required. Importantly, the crucial aspect that needs to be incorporated into time use studies is the returns on male and female enterprises. If returns on female businesses are indeed lower than returns on male ones then there is a need to reassess the obsessive targeting of women clients.

## APPENDIX

Table A1. List of Sub-Castes in the Survey Villages

Scheduled Tribe	Scheduled Caste	Other Backward Caste	Others Caste
Chenchu, Lambada, Yerukali	Madiga, Mala	Bagham, Baliga Chakali, Golla, Gouda, Housula, Jangam, Kammari, Katika Mangali Medari Mudhiraj Muslims* Padmasali Tamballi Telugu Veddera	Kappu, Komitee, Reddy

Table A2. Determinants of Duration of Credit Program Participation (First-stage regressions)

Variable	DEPENDENT VARIABLE: <i>Duration</i>		
	A1-1 (For 3-1 to 3-4)	A1-2 (For 3-5 to 3-8)	A1-3 (For 6-1)
<b>INSTRUMENTAL VARIABLE</b>			
<i>InstCaste</i>	<b>4.638 (16.20)***</b>	<b>4.399 (17.44)***</b>	<b>0.237 (20.78)***</b>
<b>PROGRAM RELATED VARIABLES</b>			
<i>Use-own</i>	-	-	-0.107 (-0.27)
<i>Peer-effect</i>	-	-	<b>-0.046 (-6.57)***</b>
<b>INDIVIDUAL CHARACTERISTICS</b>			
<i>Age<sup>2</sup></i>	0.0003 (1.28)	0.0003 (1.34)	0.00006 (0.37)
<i>Education</i>	0.203 (1.24)	0.139 (0.43)	0.312 (0.75)
<i>Sons</i>	-0.033 (-0.23)	<b>-0.180 (-1.71)*</b>	-0.305 (-0.86)
<i>Daughters</i>	<b>-0.318 (-2.71)*</b>	-0.019 (-0.15)	-
<i>H-land</i>	0.022 (0.60)	-0.040 (-0.79)	<b>0.223 (1.97)**</b>
<i>W-fallback</i>	0.199 (0.66)	0.347 (1.36)	-0.367 (-1.03)
<b>HOUSEHOLD CHARACTERISTICS</b>			
<i>F-head</i>	-	0.128 (0.39)	-0.484 (-0.91)
<i>O-Loan</i>	0.217 (0.66)	0.404 (1.47)	-0.514 (-1.27)
<i>Dependency</i>	0.019 (1.26)	<b>-0.030 (-2.29)**</b>	0.003 (0.17)
<i>Dwelling</i>	0.436 (1.13)	-0.365 (-1.07)	<b>-0.707 (-2.04)**</b>
<i>Caste</i>	-0.106 (-0.33)	0.067 (0.27)	-0.188 (-0.71)
<i>Market</i>	<b>0.548 (1.99)*</b>	<b>0.394 (1.65)*</b>	-0.287 (-1.15)
<i>Constant</i>	-0.410 (-0.75)	0.556 (0.89)	0.114 (0.22)
No. of observations	142	135	359
Adjusted R-squared	0.7016	0.7355	0.6038
Root MSE	1.5638	1.2605	2.2159

\* Significant at the 10% level, \*\* Significant at the 5% level, \*\*\* Significant at the 1% level.

Notes: *t*-statistics are given between parentheses.

The variable *F-head* was dropped from the male models due to lack of variation.

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