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Microenterprise Lending to Female Entrepreneurs: Sacrificing Economic Growth for Poverty Alleviation?

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Abstract: This research compares the performance of female and male entrepreneurs in a microenterprise credit program in Guatemala. Previous research and field practice has suggested that targeting credit at female borrowers allows for more substantial increases in household welfare, but that male entrepreneurs may more aggressively expand enterprises when given access to credit. In this paper, we develop a model that shows that increases in value of home time during childbearing years for women may substantially account for gender differences in responses to credit access. Empirical results from Guatemalan survey data yield estimations consistent with the predictions from our model.

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I. Introduction

The last two decades have witnessed an astounding proliferation of microenterprise credit programs throughout the developing world. In the coming years, the number and scope of such programs will greatly increase. As development policy makers and the poor alike have become weary of costly and wasteful large-scale development projects, microenterprise finance has rapidly emerged as a primary tool for alleviating world poverty. The success of the Grameen Bank in Bangladesh and the ACCION-affiliated credit programs in Latin America richly illustrate how the productivity of the poor in less developed countries can be unleashed through millions of small injections of credit.

Providing credit to the poor serves a dual purpose. As borrowed capital is invested in a small enterprise, it often results in significant short-term increase in household expenditure and welfare (Pitt and Khandker, 1998). However, a second goal of microenterprise credit programs is to spur economic growth in the informal sector through fostering increased capitalization of businesses, employment creation, and long-term income growth. This paper examines the possible trade-off between these goals, especially as they relate to the increasing practice of targeting credit at female entrepreneurs.

A large and growing number of recipients of microenterprise credit are women. For example, female entrepreneurs comprise 93 percent of the Grameen Bank's current portfolio of 1.2 million borrowers, an increase from 39 percent in the early 1980s. Female entrepreneurs regularly make up greater than half of borrowers in ACCION-affiliated credit programs in Latin America, and the share of female borrowers has continued to grow over time (Inter-American Development Bank, 1997).

There are several important reasons for the dramatic increase in credit targeted at female entrepreneurs in developing countries. The first is the increasing proportion of women in both developed and developing countries involved in entrepreneurial activity. In Canada, for example, the number of female entrepreneurs tripled between 1976 and 1994 (Cohen, 1996), such that today women account for one in three entrepreneurs in the Canadian economy. Tokman (1989) describes the increasing "feminization" of the self-employed informal sector in Latin American countries in recent decades. Berger (1989) estimates that women own or operate roughly one-third of all informal sector businesses, though of course data on women's self-employment is notoriously poor in developing countries. Most likely the share of women in informal business has increased dramatically in recent decades. Reasons for the feminization of informal sector include the limited absorptive capacity and difficulty of entry into the formal sector for women, macroeconomic dislocation and adjustment (especially during the 1980s), and changes in household gender norms. All of these factors have led to a growing percentage of households worldwide that are supported solely by women (Berger, 1989; Clark, 1991).

A second explanation for the rising proportion of female borrowers in credit programs is that, along with issues of economic growth, the NGO-dominated microenterprise credit industry has often specifically sought to address issues of women's empowerment in developing countries. Much recent research has shown that access to credit generates a form of economic empowerment which can greatly enhance a woman's self-esteem and status within the family (Goetz and Gupta, 1995). Separate empirical studies by Hashemi et al. (1996) and Amin et al. (1998) have explored the relationship between women's empowerment and participation in microcredit programs. Using empowerment indices such

as a women's independent decision-making ability within the household, freedom from restrictions on daily activity, and increased authority and household decision-making, the studies find that women in Bangladesh with access to credit score higher than women without credit access, even after controlling for self-selection effects.

In addition, many NGOs and other development institutions prefer to direct credit toward women since studies show that when credit is given to women, it has a greater impact on household welfare than credit directed toward male borrowers. Jiggins (1989), for example, portrays the female enterprise as an institution whose primary purpose is to ensure subsistence consumption for members of the household, in contrast to male enterprises, in which returns are often higher, but more risky. McKee (1989) and Downing (1990) note the strong relationship that typically exists between a woman's entrepreneurial income and family welfare, revealing that women have a particular propensity to redirect earnings from a microenterprise to household and children's needs. Pitt and Khandker (1998) show, in a sample of poor households in Bangladesh, that household consumption expenditure increased 18 *taka* for every 100 additional *taka* borrowed by women while the increase was only 11 *taka* for every 100 *taka* borrowed by men. They also find that credit for women had a positive effect on both girls and boys schooling.

An important question, however, is whether this increase in household welfare comes at the expense of economic growth. If so, then targeting credit at women in developing countries may embody a trade-off of long-term economic growth for poverty alleviation, and more immediate improvements in welfare. McKee (1989) argues that "... micro-entrepreneurs are often seeking modest improvements in the stability and level of their earnings, and do not necessarily give high priority to business expansion through

reinvestment of profits at the expense of consumption. Women in particular, may prefer to allocate earnings to improve housing or their children's education."

There is currently a heated debate in the literature over whether this trade-off exists. Downing (1990) describes gender differences in investment behavior: while male borrowers tend to invest in a single relatively high-yielding project, women tend to diversify their entrepreneurial activity to guarantee a subsistence level of household income. Studies such as Matienzo (1993) show significantly higher rates of return on capital and enterprise expansion by male borrowers. Yet, some such as Clark (1991) assert that "women who do have access to the benefits of microenterprise assistance programs perform as well as or better than their male counterparts in generating employment and operating their businesses." Other studies such as Blumberg (1989) are more critical of male entrepreneurs, arguing that men have a higher propensity to spend earned income on clothing and entertainment for themselves while women have a tendency to invest their earnings in the food, clothing, and human capital of their children. This debate spills over into the discussion over microenterprise sustainability (see Mosley and Hulme 1998, and Morduch 1998): Does targeting lending to the very poor preclude full cost-recovery because the returns on their projects are too low to repay high interest rates?

This paper seeks to contribute to this debate in two ways. In Section II we present a simple model of a household enterprise, which is intended to clarify potential differences in male and female entrepreneurial behavior, particularly in terms of their responsiveness to credit. Predictions from the model show that differences in the entrepreneurial behavior between men and women may stem from differences in initial scales of production, labor supervision costs, and differences in the marginal value of home time relative to the marginal

value of income. In Section III of the paper we then compare the insights of the model with data from an ACCION-affiliated credit institution in Guatemala. We perform estimations on first-hand survey data of 342 entrepreneurs in western Guatemala. Our results show that while there are significant differences between female and male-owned enterprises in terms of employment generation, female entrepreneurs overall show little statistically significant difference from their male counterparts in their ability to generate increases in sales. The differences that do exist in employment generation seem to be mainly attributed to the time constraints placed on women during childbearing and childrasing years. Section IV offers a summary of the results of the paper and policy implications for field practice.

II. A Simple Model of a Household Enterprise

Consider a model of a household enterprise for which there are three inputs: capital, hired labor, and an entrepreneur's own labor. The entrepreneur (male or female) is faced with two constraints: a time constraint equal to unity (the waking hours of a single day), and a working capital constraint equal to Ω. The entrepreneur faces cost outlays of *r* per unit of employed capital, *K*, and a wage for each unit of hired labor, *L,* also set equal to one. The entrepreneur's time can be spent in home activity, *m,* self-employed labor, ℓ, and labor supervision in the amount of $s \in (0,1)$ per unit of employed labor, *L*, so that $m + \ell + sL = 1$. We will assume that the entrepreneur's utility function has arguments in both net income (enterprise output minus profits and wages), Φ, and home activity, *m*. We also assume that capital makes own and hired labor more productive, and that there are diminishing returns to

increases in a single input and to home activity.[1] The entrepreneur thus faces the maximization problem

$$\max_{K,L,\ell,\lambda} Z = \Phi(K, L+\ell) + h(1-\ell-sL) - rK - L + \lambda(\Omega - rK - L)$$

with first order conditions given in (1-4):

(1) $$\frac{\partial Z}{\partial K} = \Phi_1 - (1+\lambda)r = 0$$

(2) $$\frac{\partial Z}{\partial L} = \Phi_2 - (1+\lambda) - sh_1 = 0$$

(3) $$\frac{\partial Z}{\partial \ell} = \Phi_2 - h_1 = 0$$

(4) $$\frac{\partial Z}{\partial \lambda} = \Omega - rK - L = 0$$

Our purpose is to focus on the insights that the model provides into differences in behavior of female in male entrepreneurs. We do this by first making some general assumptions about gender asymmetries in traditional societies. Using the model, we then see how these general assumptions about behavior translate into specific differences between behavior of male and female entrepreneurs. We will concern ourselves with how important gender asymmetries affect two measures of enterprise growth: increases in *hired* labor and increases in *gross income* in the household enterprise. These measures of growth are of primary concern to NGOs operating credit programs in developing countries because they are closely related to the commonly articulated goals of economic growth and poverty reduction, respectively.

[1] Specifically, $\Phi_{12} > 0, \Phi_{11} < 0, \Phi_{22} < 0,$ and $h_{11} < 0.$

In nearly all developing countries, male and female entrepreneurs differ substantially in their access to credit. While credit access is notoriously poor in the informal sector in developing countries even for male entrepreneurs, in the absence of intervention in credit markets, access to credit is particularly poor for women (Jiggins, 1989; World Bank, 1989; Clark, 1991). This creates a substantial restriction on the size of many female enterprises. In the first-order conditions given in (1) and (2), λ represents the shadow value of working capital to the household enterprise. As seen in (1) and (2), as the shadow value of working capital increases for women, the equilibrium level of capitalization and hired labor in the female informal sector enterprise declines. This may help explain the vast number of female household enterprises in developing countries that are operated solely through self-employed female labor.

Even apart from the central issue of credit access, there are other important gender asymmetries that may have important effects on the size and growth of female enterprises. In traditional societies, the marginal value of home activity is routinely higher for women than for men, especially at low levels of *m*. Norms in traditional societies often dictate that women be the primary caregivers to children, having primary responsibility for preparation of meals, and household chores. This renders the function $h'(\cdot)$ quite steep at low levels of *m* for females relative to males in most developing country households, however the value of this function will be influenced by social norms (see Kevane and Wydick, 2001). The extreme case of $h'(\cdot) = \infty$, would imply a constraint against female entrepreneurship. A "flatter" $h(\cdot)$ function, more likely in the case of male household heads, allows for more substitutability between home and work time.

We can use the first-order conditions of the model to look at the impact of differences in the value of home time between female on male enterprises *ex ante* to credit provision. The marginal value of home time enters the first-order conditions in (2) and (3), governing the optimal allocation of own labor and hired labor within the enterprise, respectively. In both instances, a higher marginal value of home time for women implies that female enterprises will utilize less own labor and less hired labor, and are therefore likely to be smaller than those operated by male entrepreneurs. This is consistent with the descriptive data from the Guatemalan survey presented in Table 1. Female enterprises have a mean of 0.73 employees before credit access compared to a mean of 1.02 for male enterprises.

A third asymmetry between male and female entrepreneurs in traditional societies are societal norms that may make it more difficult for women to act as supervisors of hired labor. These norms may make it particularly difficult for women to hire and supervise male workers. The inability, or at least reluctance, of a female entrepreneur to discipline a negligent male employee may lead to moral hazard problems in the workplace. Adding additional workers to an enterprise, especially after a certain level, often begins to tax the management skills of less-educated entrepreneurs in the informal sector. Women, often at a disadvantage with respect to men in terms of education and leadership experience, may consequently face disadvantages in worker supervision. As seen in (2), a greater cost of supervision, s, for women constrains the equilibrium size of women's enterprises.

We now examine *changes* in the household enterprise that come as a result of access to credit. Totally differentiating equations (1-4) yields the following set of equations given in matrix notation:

(1'-4') $$\begin{bmatrix} \Phi_{11} & \Phi_{12} & \Phi_{12} & -r \\ \Phi_{21} & \left(\Phi_{22}+s^2h_{11}\right) & \left(\Phi_{22}+sh_{11}\right) & -1 \\ \Phi_{21} & \left(\Phi_{22}+sh_{11}\right) & \Phi_{22}+h_{11} & 0 \\ -r & -1 & 0 & 0 \end{bmatrix} \begin{bmatrix} dK \\ dL \\ d\ell \\ d\lambda \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \\ -1 \end{bmatrix} [d\Omega]$$

Defining the 4x4 matrix in (1'-4') as *A*, we find through Laplace expansion that the determinant of $|A|$ is negative, given the standard assumptions that $\Phi_{11}\Phi_{22}-\Phi_{12}\Phi_{12}>0$. Using Cramer's rule, we can calculate the effect of improved access to credit on employment creation within the household enterprise. Modeling increased credit access as a relaxation of the credit constraint, dividing (1'-4') by $d\Omega$, and solving for $\frac{\partial L}{\partial \Omega}$, we find that

(5) $$\frac{\partial L}{\partial \Omega}=\frac{-1}{|A|}\cdot\left[\Phi_{11}\Phi_{22}-\Phi_{21}{}^2+\Phi_{11}h_{11}-r(1-s)\Phi_{21}h_{11}\right]>0,$$

or that hired labor increases in an enterprise with expanded access to credit. Equation (5), however, also reveals the effect of the marginal value of home activity on enterprise employment. If the function *h* reflecting the utility of home activity displays minimal concavity ("a woman's chores are never done"), then h_{11} is close to zero, and the effect of better credit access on generating employment in female enterprises is significantly reduced by the last two terms in (5). Conversely, when the *h* function is highly concave, h_{11} is large, and this reflects a limit to a woman's duties at home. As seen in (5) when h_{11} is large, this amplifies the effect of access to credit on employment creation. From (5) we can also show that $\frac{\partial^2 L}{\partial\Omega\partial s}<0$, implying that if female entrepreneurs face higher supervision costs, the impact of access to credit on employment generation is smaller.

The model also yields an expression for the direct effect of access to credit on gross income (a key variable in the Guatemalan survey data). Using Cramer's rule as in (5), it is

also straightforward to show that $\frac{\partial K}{\partial \Omega} > 0$ and that $\frac{\partial \ell}{\partial \Omega} > 0$. Thus we know that the change in gross income with a small increase in credit access given in (6) is unambiguously positive when the credit constraint is binding, or

$$\frac{d\Phi}{d\Omega} = \Phi_1 \frac{\partial K}{\partial \Omega} + \Phi_2 \left(\frac{\partial L}{\partial \Omega} + \frac{\partial \ell}{\partial \Omega} \right) > 0 . \tag{6}$$

Note that the impact of access to credit on income generation is similar to the impact on employment generation: positive, yet high supervision costs will dampen the positive effect of increased credit access ($\frac{\partial^2 \Phi}{\partial \Omega \partial s} < 0$). We now compare the predictions of the model with the Guatemalan data.

III. Guatemalan Survey Data Results

The Guatemalan data is taken from a 1994 survey of 358 entrepreneurs in western Guatemala. The current study utilizes information from 342 of these entrepreneurs for whom appropriate data for this study was available. The sample is composed of 260 borrowers of FUNDAP, an ACCION-affiliated microenterprise lending institution which began lending in the region in 1988, and 82 entrepreneurs displaying very similar characteristics to the FUNDAP borrowers, but who were located in areas just outside the reach of FUNDAP's credit program. Thus the 82 non-FUNDAP entrepreneurs serve as a control group.

Each entrepreneur was a member of a borrowing group consisting of three to six members. The 260 FUNDAP borrowers belonged to 137 borrowing groups, 76 of which were male borrowing groups, 14 of which were female borrowing groups, and 47 of which were mixed-gender groups. Table 1 provides statistics on the management of borrowed

capital within the group, propensity of mutual financial assistance within the group in repayment of loans, and the average number of days late with payments in the groups history of a typical (3-month) loan. Gender differences between borrowing groups are interesting: female borrowing groups displayed the fewest instances of misuse of funds, but in female groups less mutual financial assistance was given among group members in repaying loans. Overall, the lower instances of moral hazard allowed female groups to outperform the male borrowing groups, averaging nearly one day per loan less in arrears than their male counterparts. Performance was worst among the mixed-gender groups. As seen in Table 1 instances of misuse of funds were highest in mixed-gender groups, intra-group financial assistance was lowest, and mixed-gender groups ranked last in arrears performance. These data indicate that female entrepreneurs are at least as capable at managing credit as their male counterparts, if not more so. Table 2 gives logit estimations similar to those contained in Wydick (1999), which, controlling for a host of other group characteristics, show very little statistically significant difference in the performance of male and female borrowing groups, except that the male groups appear to provide more intra-group insurance.

We turn now to the discussion of the effects of the credit program on employment and sales. Descriptive statistics and definitions of variables for the 358 entrepreneurs are given in Table 3. Most interesting are the differences between the 94 female entrepreneurs and the 264 male entrepreneurs. The average age of the women included in the survey is nearly equal to that of the men, 37.0 years and 35.9 years, respectively. Interestingly, the female entrepreneurs in the sample are slightly more educated than the male entrepreneurs; the average number of years of formal education for women being 4.38, while for men it is 3.63.

Female entrepreneurs tended to be more heavily located in the urban areas and were somewhat less likely to be engaged in manufacturing activity than the male entrepreneurs (i.e. more likely to be engaged in retail trade). The average years of credit access to the sample was also nearly identical, just over two years. The average initial loan size for male borrowers (1132 quetzales) was larger than the average initial female loan (781 quetzales), and this difference persisted such that current loans sizes among borrowers were also quite different, with 2082 quetzales for men and 1493 quetzales for women (the exchange rate during this period was roughly 5.5 quetzales per US dollar). As mentioned previously, the number of hired laborers in the female enterprises is significantly smaller than the number in male enterprises. Before credit, the average number of employees in a female entrepreneur's enterprise was 0.69 compared to 1.06 within a male entrepreneur's enterprise. The absolute change in employment (after receiving access to credit) is also about two-thirds as much for women; but the percentage changes in employment are roughly equal (about 70%). Initial levels of sales are similar between men and women, while the percent change in sales is lower for women (60% versus 75%).

One problem endemic to this kind of study is that of selection bias, *i.e.* that borrowers in the credit program may share unobservable personal characteristics which are different than those of the control group. While it is impossible to create a perfect control group based on unobservables, the *observable* characteristics of the control group were extremely close to those of program participants. In both the treatment and control groups, the average age was approximately 36 years old. Female entrepreneurs made up approximately one fourth of both program participants and the control group. Mean monthly sales were US$371 for program participants and were US$432 for members of the control group three years before the

survey. Mean years of formal education were 3.26 and 4.86 years for program participants and the control group, respectively. Thus the control group, selected from areas not yet targeted by the program, was perhaps slightly more educated with slightly larger enterprises.

Table 4 presents results from five estimations that explore the determinants of change in employment in microenterprises. The dependent variable is the difference between current employment and previous employment. A tobit procedure is used since approximately 30% of the entrepreneurs experienced no change in employment, creating a truncation in the distribution of the dependent variable. (We also estimated the equations using a Poisson maximum-likelihood regression and using ordered-probit, both reflecting the integer nature of the data , i.e. number of employees rather than hours worked. The other techniques yielded essentially similar results.) Simple Chow tests on OLS specifications suggest that specification (1) is better than separating the sample by gender, but that separating is better for differentiating between small-scale producers *productores* (e.g. handicrafts, candles) and retail traders known as *comerciantes*. We have chosen to present various pooled and separated results, and in column (4) the pooled regressions with gender dummies. (For retail traders *no* variables are significant, so we do not present separate results for them.)

One special feature of the sample, that makes assessment of the effects of credit less than straightforward, is that survey data for borrowers in the credit program yielded before and after changes with respect to when they joined the credit program. Among program participants, 79 had been in the program one year or less, 89 for two years, 44 for three years, 23 for four years, and 14 for five or more years; with the average being 2.32. For the control group, the survey attempted to capture changes in variables over the previous three years. Thus, the time frame for before-after comparisons differs among respondents. Entrepreneurs

who had received credit for *n* years reported on employment and sales changes over that *n*-year period, while the control group reported changes in employment over three years. We control for these differences in 'cohorts' with the variable TIME, that varies from 0.1 to 6 (for those who joined one month previously to those who joined six years previously). The TIME variable captures any secular trend in the overall economic environment. During the period considered, 1988-1993, the economy of Guatemala was relatively stable, displaying only moderate growth. We would expect then to find that employment and sales grew more for those reporting growth over a longer period. As the table shows, TIME is positive and often significant in the various specifications; the longer the time between the current period and the reference period for previous employment, the larger is growth in employment.

We do not transform the growth numbers into annual growth rates, because the effects of credit may be felt most in the first year of credit provision and less thereafter, *i.e.* the relation is non-linear. We capture this by including a squared term TIMESQCR. While this variable is insignificant in most regressions (and hence dropped), it does turn out to be important for *productores*, and so we include it in that regression. The sign is negative, as expected; all else equal, longer time in the credit program (after the first year or two) does not continue to generate large increases in employment.

The key variables in these estimations are CRED, a dummy taking a value one if the entrepreneur was a member of the credit program, CREDFEM, in which a dummy taking the value of one for female entrepreneurs is interacted with CRED, and AGEFEM, which interacts the female dummy with the age of the entrepreneur. CRED is uniformly positive and highly significant. Regarding gender differences in employment generation, Table 4 shows that female entrepreneurs in general are less likely to see employment growth; the

effect on FEM is large, significant, and negative (particularly so for *productores*). AGEFEM is significant and positive, revealing that older female entrepreneurs realize more employment growth in their enterprises than younger female entrepreneurs.

A comparison of the credit program effects by age for men and for women can be seen in Figure 1. These figures contain the predicted increases in employment generated from the tobit estimation (4) in Table 4. The estimations generate predictions of the number of employees in an enterprise given the censored distribution of the dependent variable (see Maddala (1983) p. 159). The expression used to generate the predictions from our model is given by

$$E(y_i) = \mathbf{\Lambda}\boldsymbol{\beta}'\bar{\mathbf{x}} + \sigma\lambda \tag{7}$$

where y is the change in employment within an enterprise, $\mathbf{\Lambda}$ and $\boldsymbol{\lambda}$ in (7) represent, respectively, the normal distribution and density functions evaluated at their sample means, $\boldsymbol{\beta}'$ is the vector of tobit-estimated coefficients, $\bar{\mathbf{x}}$ is the vector of sample means of independent variables (except for age which is varied across ages 20 to 64 and dummy variables which take values of 0 and 1 where appropriate), and σ is the standard error of the estimation.

Figure 1 uses the estimations in Table 4 column 4 to show the predicted differences in increases in employment for participants and non-participants in the credit program by gender. First note that for non-participants the predicted number of employees added to enterprises is greater for male than for female entrepreneurs at every age level of the entrepreneur. However, for credit program participants, these differences change dramatically. Holding all other variables constant at the sample means, predicted employment generation for female borrowers in childbearing years (generally through the

20's for Guatemalan women) is significantly lower than that for men. However, the predicted number of added employees for female entrepreneurs in the credit program continues to increase for women until it peaks at age 42, while the figure for men peaks at age 30. After age 33, the predicted number of employees added for women actually passes that for the men, reaching a peak of 1.01 employees added at age 42 and then slowly declining.

A life-cycle consistent with the predictions of our model is clear in the data: While in their 20's male entrepreneurs are predicted to add from 0.20 to 0.35 more employees than female entrepreneurs of the same age. But from approximately age 45 to age 60, female entrepreneurs are predicted to add about 0.35 to 0.5 more employees to their enterprises than their male counterparts. It is important to remember, however, that the predicted values in Figure 1 are generated holding all variables except age and participation in the credit program constant at the sample means. Male entrepreneurs, for example, are much more apt to be *productores*, who are more likely to add employees to their enterprises than *comerciantes*, and thus in actuality the number of employees actually added to enterprises may be skewed more toward males.

Table 5 presents results of similar regressions explaining the change in sales of the enterprise. The Chow tests here indicate that pooling is appropriate, but we present the separated samples also for comparison with Table 4. Again the variable TIME is positive and significant in most regressions. The variable CRED, the dummy for participation in the credit program, is again significant and positive. The dummy variable for URBAN is negative; there seems to be less growth in sales in the urban areas. Lastly, in these regressions the EDUC variable, measuring the education of the entrepreneur, is significant

and positive, especially for men. Importantly, these estimations show no significant differences between men and women, with respect to change in sales over the reporting period.

The estimations in Tables 4 and 5 show the highly significant effect of years of credit access on both employment and income generation for both male and female borrowers. The regression results suggest a positive impact of credit access on employment and sales generation. Loans to *productores* (small-scale manufacturers) are more effective at stimulating employment than loans to *comerciantes* (retailers), as shown by the significance of the PROD dummy in the estimations. However, there is no statistically significant difference between the two types of enterprises in changes in gross sales. There is some evidence that rural borrowers generate employment and sales at a greater rate than urban borrowers.

Differences do indeed exist between the responses of male and female entrepreneurs to credit, especially with respect to employment generation. We interpret these differences as stemming from changes in the marginal value of home activity through the stages of a woman's life. Interpreted in light of our model, until the age at which a female entrepreneur's children are grown, her marginal value of home activity h_1 is very high and displays very little concavity (h_{11} is very low), rendering the supervision of labor very expensive at all levels of economic activity. For women past this age, reduced demands in home activity allow them to realize increases in hired labor within their enterprises equal or greater than that of men in the Guatemalan data sample. These results also support the notion that it is the high marginal value of home time for women during certain periods of their lives, rather

than higher supervision costs for all women, which acts as the principal constraint to growth of the female enterprise.

In summary, the Guatemalan data show young male entrepreneurs to be more aggressive in generating employment than older male entrepreneurs, but older women to be more aggressive in generating employment than younger women or older men. Job growth in the informal sector is generated by younger men and older women. Controlling for other factors, the results in this study indicate no statistically significant difference in the ability of female and male entrepreneurs to generate increases in business sales within an enterprise upon provision of increased access to credit.

IV. Conclusions for Development Policy

This research has sought to address a question in the development literature over whether targeting microenterprise credit at women involves sacrificing economic growth in favor of poverty reduction and the welfare of children. If this trade-off exists, where specifically does it occur? Our research suggests that targeting microenterprise credit at women, in certain circumstances, does appear to embody a trade-off of economic growth in favor of poverty reduction. The empirical results presented here show that during childbearing years and years in which women must allocate much of their time to caring for children, female entrepreneurs are restricted in their ability to generate employment within their enterprises compared to other entrepreneurs in the sample. Nevertheless, it is among this subset of women for which increases in income are likely to have the greatest positive effect on the welfare of children (Pitt and Khandker, 1998).

Among women past their mid-thirties, however, this trade-off does not appear to exist. The Guatemalan data show the rate of increase in hired labor in the enterprises of older women to be on par with those of men, although absolute increases in hired labor are slightly smaller because of the smaller size of women's enterprises. Moreover, our results indicate no statistically significant difference in increases in business sales after credit provision between female and male entrepreneurs. Thus, while the predictions of our model hold well for differences in changes in enterprise employment, they do not hold for differences in business income generation.

The research also suggests focusing on the sharp concavity that exists in the production function of household enterprises in developing countries. It is a mistake to assume that sustained microenterprise financing can routinely take household enterprises from a size of one or two employees to a size of, say, twenty to thirty employees. The Guatemalan data show that the typical case is for an entrepreneur is to move from self-employment or maybe from a single hired laborer, to perhaps two to three hired laborers. After this point continued access to credit begins to display heavily diminishing returns with respect to both increases in hired labor and increases in income for both male, as well as female, entrepreneurs. Nevertheless, as this performance is replicated across a large number of borrowers, it can result in quite significant increases in household welfare and employment in a given area targeted with microenterprise credit.

A number of suggestions for development policy flow from the results presented here. First, development practitioners involved in microenterprise lending schemes should not steer credit away from women, based on a belief that their enterprises are likely to grow more slowly than those operated by male entrepreneurs. If a given region is experiencing

abnormally high rates of infant malnutrition, for example, a strategy specifically targeting credit at young women may be entirely appropriate. Second, if female entrepreneurs' preferences heavily favor investment in the well-being of children (Blumberg, 1989), microenterprise lending institutions may be able to "double dip" by targeting credit at middle-aged women; younger grandmothers are likely to have low marginal supervision costs, but are also likely to direct profits toward the welfare of grandchildren. Third, there is no evidence from this study which indicates that female entrepreneurs face a disadvantage with respect to men in the area of income generation or in the area of loan repayment; in fact, there is evidence presented here that suggests that repayment rates may be greater among women. Lastly, it is important for development practitioners not to become overly optimistic about the prospect of being able to realize soaring levels of growth in individual microenterprises such that they can be "graduated" into formal sector financing. A realistic and worthy goal for microcredit programs is to bring about moderate increases in employment generation and household income, along with great improvements in the financial stability of the enterprise. These marginal improvements in the economic well-being may be enough to allow the (hopefully better educated) children of these entrepreneurs to lift their households into more substantial increases in welfare.

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Figure 1: Predicted Increase in Employees by Age of Entrepreneur: Men and Women

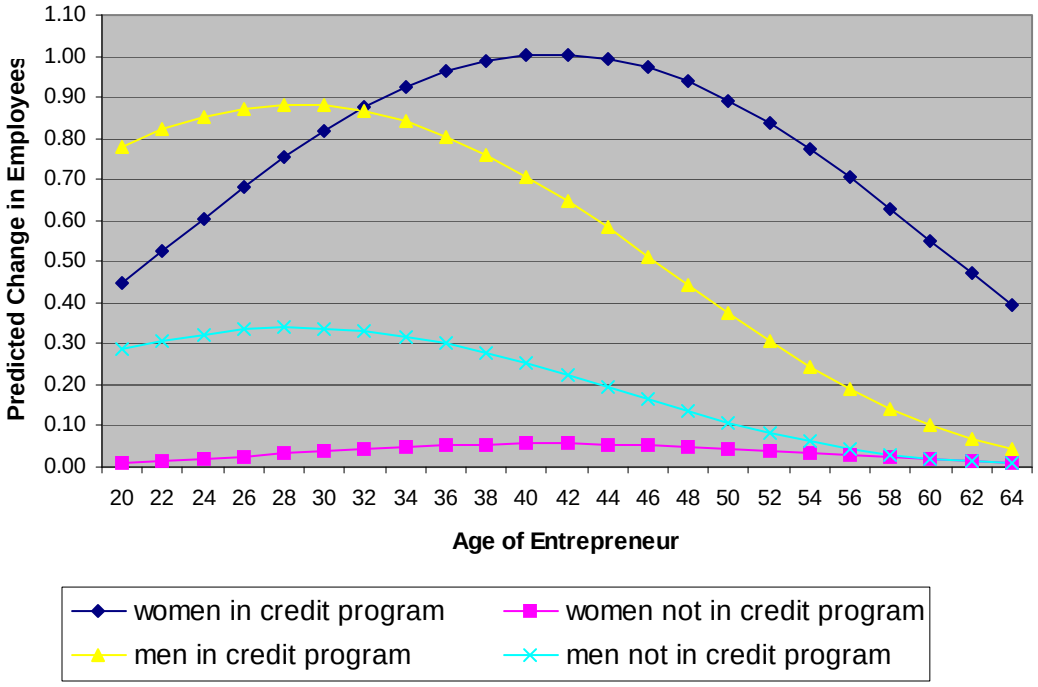

Table 1: Descriptive statistics on borrowing groups and performance

	all groups	female groups	male groups	mixed groups
no instances of loan misuse	.73	.86	.72	.70
propensity for intra-group insurance	.52	.42	.62	.38
average number of days in arrears per loan in group history	4.26	3.19	4.09	4.85
number of groups	137	14	76	47

Table 2: Logit estimates on determinants of group performance

	1 mitigation of moral hazard			2 provision of mutual insurance (logit)			3 overall group repayment			Explanation of Variables:
	coeff.	std.err.	sig.	coeff.	std.err.	sig.	coeff.	std.err.	sig.	
CONSTANT	-0.945	1.608		-2.746	1.755		13.563	5.829	**	
ALLWOM	0.793	0.936		0.413	0.804		-2.573	3.120		Dummy =1 if borrowing group all female members
ALLMEN	0.497	0.524		1.307	0.522	**	-1.219	1.980		Dummy = 1if borrowing group all male members
YRSKNOW	-0.001	0.028		-0.080	0.032	**	-0.076	0.105		Years members were acquainted before group foundation
SOCACT	-0.350	0.448		-0.047	0.475		3.035	1.728	*	Dummy =1 if group share social activities
PRESSR	0.893	0.474	*	-0.078	0.497		-3.241	1.849	*	Dummy = 1 if willingness to pressure others to repay
DIFFSS	-1.064	0.469	**	0.095	0.530		0.297	1.930		Dummy = 1 if members feel applying sanctions difficult
MEM	0.520	0.474		0.763	0.494		-0.963	1.690		Number of members in the borrowing group
CORRECT	1.541	0.682	**	-0.114	0.638		-2.833	2.275		Dummy = 1 if state moral obligation to repay group loan
GTFRNDS	0.358	0.749		-0.045	0.841		-1.405	2.912		Dummy = 1 if say repay to stay on good terms with group
AVGDIST	-0.182	0.295		-1.027	0.375	**	0.256	1.166		Average distance in kilometers between members' businesses
KNOWSAL	0.853	0.483	*	0.914	0.480	*	-3.164	1.780	*	Dummy = 1 if members know weekly sales of other members
SAMEBUS	-0.904	0.508	*	1.000	0.501	**	1.530	1.850		Dummy = 1 if members engaged in same line of business
OTRLOAN	0.702	0.767		-0.182	0.671		-1.676	2.620		Dummy = 1 if at least one members has other credit access
YRSG	0.170	0.185		0.431	0.219	**	-0.828	0.704		Age of borrowing group (in years)
Log-likelihood	-65.66			-61.58			-83.26			
	137			137			137			

* Significant at the 90 percent level of confidence

** Significant at the 95 percent level of confidence

*** Significant at the 99 percent level of confidence

Table 3: Sample Statistics

	1 whole sample		2 men only		3 women only		variable definition
	mean	std. dev.	mean	std. dev.	mean	std. dev.	
AGE	36.19	10.10	35.88	9.71	37.00	11.10	age of entrepreneur
EDUC	3.83	3.18	3.63	2.95	4.38	3.70	years of education of entrepreneur
URBAN	0.32		0.22		0.60		1=in urban area, 0=in rural area
PROD	0.72		0.80		0.51		1=*productor* 0=*comerciante*
CRED	0.79		0.78		0.81		1=in credit program 0=not in program
TIME	2.15	1.37	2.17	1.31	2.10	1.51	years since joined credit program (for credit prog. participants only)
FLOAN	1033	2881	1132	3311	781	1241	amount of first loan (in USD) (for credit prog. participants only)
LLOAN	1916	3366	2082	3852	1493	1491	amount of last loan (in USD) (for credit prog. participants only)
EP	0.96	1.47	1.06	1.47	0.69	1.45	initial number of employees
ECH	0.69	1.33	0.77	1.29	0.48	1.40	change in number of employees
SALESP	2227	3714	2244	3630	2175	3969	initial sales of enterprise (in USD)
SALESCH	1592	5133	1697	5702	1291	2939	change in sales of enterprise (in USD)
FEM	0.27						1=female 0=male
N	342		248		94		

Table 4: Tobit estimates of determinants of change in number of employees

(Coefficients are marginal effects, evaluated at sample means.)

	1 whole sample			2 men only			3 women only			4 whole sample			5 *productores* only		
	coeff.	std. err.	sig.	coeff.	std. err.	sig	coeff.	std. err.	sig	coeff.	std. err.	sig	coeff.	std. err.	sig
Constant	-2.844	0.800***		-4.390	1.084***		-1.264	0.968		-2.546	0.802***		-3.240	1.267 ***	
EDUC	0.017	0.019		0.010	0.023		0.026	0.023		0.019	0.019		0.025	0.031	
AGE	0.059	0.037		0.158	0.057***		-0.014	0.043		0.060	0.038		0.106	0.060 *	
AGE2	-0.090	0.049*		-0.249	0.079***		0.025	0.054		-0.105	0.052**		-0.172	0.083**	
URBAN	-0.139	0.166		0.111	0.206		-0.442	0.239*		-0.138	0.166		-0.252	0.262	
PROD	0.986	0.182***		0.945	0.236***		0.513	0.231**		0.943	0.181***				
TIME	0.238	0.149*		0.317	0.185*		0.132	0.193		0.240	0.143*		0.500	0.233**	
CRED	0.806	0.315**		0.841	0.376**		0.926	0.485*		0.660	0.306**		1.296	0.491***	
TIMESQCR	-0.027	0.025		-0.038	0.030		-0.018	0.038		-0.028	0.024		-0.066	0.041*	
FEM										-1.653	0.609***		-2.677	0.995***	
AGEFEM										0.027	0.013**		0.055	0.022**	
CREDFEM										0.801	0.459*		0.959	0.716	
log-L	-412.15			-313.50			-87.30			-407.79			-360.87		
n	342			248			94			342			247		

Table 5: OLS estimates of determinants of log change in sales

	1 whole sample			2 men only			3 women only			4 whole sample			5 *productores* only		
	coeff.	std. err.	sig	coeff.	std. err.	sig	coeff.	std. err.	sig	coeff.	std. err.	sig	coeff.	std. err.	sig
Constant	3.751	1.810	**	2.900	2.173	**	5.993	3.375		3.589	1.911	**	2.860	2.643	
EDUC	0.143	0.054	**	0.183	0.066	*	0.053	0.098		0.132	0.054	**	0.086	0.074	
AGE	0.029	0.087		0.075	0.105		-0.080	0.168		0.040	0.089		0.150	0.114	
AGE2	-0.075	0.109		-0.110	0.130		-0.004	0.209		-0.068	0.109		-0.210	0.146	
URBAN	-1.204	0.451	*	-0.840	0.543		-1.690	0.941	*	-1.094	0.466	*	-1.015	0.603	
PROD	-0.373	0.448		-0.405	0.548		-0.652	0.839		-0.450	0.450				
TIME	0.319	0.131	**	0.181	0.160		0.556	0.235	**	0.308	0.131	**	-0.193	0.546	
CRED	1.396	0.397	***	1.281	0.456	**	2.255	0.842	**	1.271	0.451	**	0.215	1.139	
FEM										0.884	1.417		1.194	1.888	
AGEFEM										-0.056	0.033		-0.047	0.047	
CREDFEM										0.824	0.866		0.245	1.295	
TIMSQCR													0.077	0.095	
adj. R^2	.072			.045			.121			.080			.027		
n	342			240			94			342			247		