

Women's Assets at Marriage and their Microenterprise Profits: Evidence from Tanzania

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Abstract

Outside of a unitary household model, demographic characteristics of a household affect its household production decisions. However, there is little evidence on the relationship between a woman's status within her household and her microenterprise profits. I use the share of household assets given to the couple upon marriage that originated from the woman's family as a measure of bargaining power, and show that women with higher bargaining power have more profitable microenterprises. Because most microenterprises are begun after a woman is married, assets at marriage avoid the reverse causality that would result if a woman's microenterprise success raises her bargaining power. This result is consistent with a moral hazard model in which a woman uses less inputs that are personally costly in her microenterprise (such as her own effort) if she knows she has less control over its profits. While there are potentially omitted variables correlated with assets at marriage and women's bargaining power, the negative correlation between women's assets at marriage and her tendency to hide the enterprise from her husband supports the household bargaining interpretation.

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1 Introduction

Workers in the developing world, particularly in Sub-Saharan Africa, are frequently self-employed. For instance, 47 percent of people who work outside the home in Sub-Saharan Africa are self-employed, while only 12 percent work for wages (World Bank, 2012).¹ Women are particularly likely to be self-employed; in Tanzania, for instance, 80 percent of microentrepreneurs are female (Bardasi, 2010). In a household production context, a unitary or Pareto efficient household should make its production decisions in order to maximize total household income, regardless of the identity of the household member who is in control of the production process. As a result, the profit of a microenterprise run by a female entrepreneur should be determined by factors like her own entrepreneurial ability and the overall household's access to credit and labor, but not her influence over the spending of the income.

However, there is evidence that developing-country households do not make Pareto-optimal production decisions. For instance, Udry (1996) shows that plots farmed by women in Burkina Faso have 20 percent lower productivity because of lower input intensity. He estimates that reallocating fertilizer from male to female plots could increase the household aggregate output by 6 percent. Udry suggests that women fear expropriation from husbands if their plot earns too much income. Similarly, Goldstein and Udry (2008) find that productivity of land farmed by women in Akwapim, Ghana is lower than that of land farmed by males because of a lower rate of fallowing, which women are reluctant to undertake because their property rights are more insecure than those of males. While these papers suggest that the overall low bargaining power of women can help explain the lower average profitability of female-managed farms, these models also have implications for within-gender productivity difference. In particular, if some women have relatively more bargaining power than others, these women may be better able to resist expropriation and have higher business profits.

This paper documents a correlation between the assets at marriage of a woman and her microenterprise profits using the baseline survey for a randomized control trial of a virtual business incubator (VBI) in Tanzania. Assets at marriage have been theoretically and empirically linked to a women's bargaining power within a household (Quisumbing and Maluccio 2003; Thomas et al. 2002; Quisumbing et al. 2000), and indeed in this sample are related to marital outcomes reflecting female empowerment. A woman who came into marriage with greater assets both has greater control over resources with the marriage and a better outside option should the marriage dissolve, both of which improve

¹The remaining percentage were either employers (4 percent) or non-paid employees.

her bargaining power within the marriage. Using assets at marriage importantly avoids reverse causality concerns, since almost all microenterprises in the data began after a woman is married.

I propose a theoretical model that is consistent with the correlation between a woman's assets at marriage and her microenterprise profits, as well as with other patterns found in the data. The model shows that if there is imperfect income pooling within a household, the microenterprise inputs which are unobserved to the husband a woman are affected by her bargaining power within the household. Motivated by anthropological and econometric evidence that income is not perfectly observed within households (Falen 2003; LeMay-Boucher and Dagnelie 2009; Boozer et al. 2009; Anderson and Baland 2002) and that hidden income is spent differently than observed income (Ashraf 2009; Castilla 2012), the model allows women the possibility to hide microenterprise income from their husbands and thus direct them towards their own preferred usage. However, as long as hiding has some cost (real or psychic) than women with lower bargaining power will still have lower microenterprise profits than women with higher bargaining power.

Of course, a woman's assets at marriage presumably affect many elements of her environment that also determine her microenterprise profits. For instance, women with lower bargaining power in the household probably have smaller social networks and restricted mobility (Ypeij and Ypeij 2000; De Mel et al. 2009a). While I will be unable to rule out all of these indirect effects conclusively, I can exploit the detailed information on the women and their business to investigate some of the most obvious stories. For instance, women with lower bargaining power are no less likely to take out loans than women with higher bargaining power, and pay no greater interest rates, conditional on taking out a loan. The fact that women with lower bargaining power are more likely to hide their enterprise from their husbands fits provides further evidence that bargaining over household income helps explain the lower microenterprise profits of women with lower assets at marriage.

While there is a growing academic interest in the relationship between gender and microfinance, given the policy interest in lending to and otherwise supporting female owned enterprises, this literature has focused on differential input costs such as the shadow value of time (Kevane and Wydick, 2001) or access to savings technology (Dupas and Robinson, 2009). Other research has tested whether female-owned enterprises have higher returns to capital than male-owned enterprises, which would suggest that women have less access to capital, but has instead found lower returns to capital in female-owned enterprises (De Mel et al. 2009a; McKenzie and Woodruff 2008). This paper instead suggests that some female-owned microenterprises are constrained in size even if the entrepreneur has

similar access to inputs as women running more profitable businesses. The results suggest that improved training or access to input markets may not help women with low bargaining power who have less incentive to increase the size of their businesses. Instead, policies that increase women's bargaining power, such as legal reforms equalizing the ability to own and inherit property, should prompt women to devote more energy to their microenterprise once they have more control over its profits.

2 Model

In this model, which I outline here in enough detail to provide intuition for the testable implications, but do not solve completely, a household member (namely, the wife) first chooses the level of a vector of inputs e to put into her microenterprise. Reflecting the findings of focus groups with female entrepreneurs who described taking out loans and engaging in other business activities without the knowledge of their husband, I assume that input usage is not observable to the husband. Inputs have cost $c(e)$ that is increasing in each element, but whose second derivative is unknown and could vary by input.² Importantly, the cost to each input is born privately (or more generally, the woman cannot be fully compensated for the cost); the wife's effort during the hours at the microenterprise is one example of such an input. Income is an increasing function of inputs $Y(e)$. The wife's utility function $u(Y)$ is increasing and sufficiently concave such that the compound function $u(Y(e))$ is concave even if $Y(e)$ is convex.

After production, a woman decides what fraction $(1 - \lambda)$ to add to the household income, hiding the remaining λ . Hiding income occurs a cost $h(\lambda Y)$, representing both the psychic cost of hiding income, the potential anger of the husband if the income is discovered, and any practical actions taken to hide income.

The wife values income which is shared at a rate $\alpha \leq 1$, which reflects both her bargaining power over the income and the extent to which her preferences over household spending diverge from her husband's. Utility is additive and separable in hidden and non-hidden income, and the costs of inputs and hidden income:

$$U_{wife} = U(\lambda Y(e) + (1 - \lambda)\alpha Y(e)) - c(e) - h(\lambda Y(e))$$

The wife chooses e and λ to maximize her utility, yielding first order conditions (for an

²For instance, cost could be increasing and concave if there are returns to buying input in bulk (larger loans, for example). Cost could be increasing and convex for inputs that represent an entrepreneur's effort, which comes with increasing opportunity cost of time.

interior solution)

$$U'(\lambda Y(e) + (1 - \lambda)\alpha Y(e))(\lambda + (1 - \lambda)\alpha)Y'(e) = c'(e) + h'(\lambda Y(e))Y'(e) \quad (1)$$

$$(1 - \alpha)Y(e) = h'(\lambda Y(e))Y(e) \quad (2)$$

Together these equations imply that as α increases (the wife's control over household resources increases), then

- Input usage e increases
- Profits increase
- The proportion of income hidden λ decreases

3 Data and Empirical Strategy

3.1 Survey

The data in the project come from the baseline survey of the Tanzania Virtual Business Incubator trial implemented by Tanzania Gatsby Trust (a local NGO working in consortium with IMED, SIDO-WED, Kwanza collection); AIDOS (Italian NGO, Technical advisor); and WB team including members of the AFTPM Gender Unit and PRM-Gender. The trial was designed to provide business training to 821 poor female entrepreneurs in Dar es Salaam, Tanzania. The women targeted for the intervention are those whose businesses have been established for at least 1 year, working in certain sectors considered to have growth potential, and those willing to pay upfront commitment fees.

The baseline was conducted before treatment was assigned and a small gift (a shawl or business instrument of similar value) was given to all respondents. In addition to information on the inputs, history, and profits of the microenterprise, the survey provides information on the entrepreneur's household and the health, education, and employment of all its members, her marital history and standing within the household. The baseline survey took place July-August 2010; the endline is being conducted in summer 2012.

Since the dataset come from a baseline survey of entrepreneurs interested in business training (and who may have been encouraged to participate by the implementing NGO, it represents a selective sample of microenterprise owners. Moreover, this selection is related to the proposed model; women with low bargaining power may choose not to enroll in training precisely because they know they will reap fewer of the benefits of a more profitable enterprise. However, this selection works against finding a relationship between

assets and marriage and microenterprise profits if it compels some of the women with particularly low bargaining power (and presumably particularly low enterprise profits) not to volunteer.

3.2 Summary Statistics

Table 1 describes the characteristics of the microenterprise owners in the sample. The women are on average 42 years old and well educated, with an average of 9.9 years of education, but also have an average of 3.2 children each. They are also heavily involved in their communities. Forty nine percent are in self-help groups and 28 percent are in ward or clan committees. Overall 91 percent are in at least one group. However, many of them have suffered symptoms of poor mental health in the last week, such as little interest in daily activities (42.5 percent), feeling down (29.3 percent) or feeling bad about herself (14.4 percent).

Fifty eight percent of women are currently married, almost entirely in monogamous marriages; an additional 3.7 percent is cohabitating. Of the remaining women, most have previously lived with a man but are currently divorced (1.8 percent of the sample), separated (9.8 percent) or widowed (15.9 percent). Finally, 10.7 percent have never been married. When questioned about their relationship with their current husbands or previous partners, there are considerable numbers of women who report conditions such as needing permission to seek health care for herself (33.0 percent), restricted contact with family or friends (20.1 percent) or a husband who needs to know where she is at all times (40.1 percent).

Table 2 provides summary statistics describing the businesses run by survey participants. The most common sectors are light manufacturing (32.3 percent of businesses), followed by retail and food sales and services (23.0 percent), livestock husbandry (16.0 percent) and food processing (15.7 percent). Respondents work on average 36 hours per week in the business, but there is high variance. Figure 1 depicts the distribution of working hours per week. While 21.9 percent of the sample works 10 or fewer hours per week, many work long hours: 19.1 percent work 60 or more. These are frequently combined with other activities, however: 64.4 percent of respondents report caring for children or the elderly while participating in the business, and only 15.2 percent report no other task while conducting business for the microenterprise.

The median profits for the previous year were 1,080,000 TSH, equivalent to 722 USD based on the August 2010 exchange rate. Figure 2 converts these profits into an hourly wage (based on typical reported hours worked) in order to compare microenterprise

VARIABLE	mean	std dev	min	max	N
years education	9.935	3.704	0	17	811
age at current marriage	23.627	7.494	7	59	694
age	42.883	9.371	19	69	813
ever separated	0.158	0.365	0	1	821
can do all ADL's	0.717	0.451	0	1	807
number children	3.229	1.802	0	11	751
typical daily hours housework	2.534	2.711	0	21	821
<i>current marital status</i>					
currently married (monogamous)	0.562	0.496	0	1	819
currently married (polygamous)	0.020	0.138	0	1	819
currently cohabitating	0.037	0.188	0	1	819
currently separated	0.098	0.297	0	1	819
currently divorced	0.018	0.134	0	1	819
never married	0.107	0.310	0	1	819
widowed	0.159	0.366	0	1	819
<i>group membership</i>					
self help group	0.496	0.500	0	1	818
rosca	0.367	0.482	0	1	818
microfinance	0.119	0.324	0	1	817
ward or clan committee	0.282	0.450	0	1	816
political group	0.180	0.385	0	1	816
belongs to any group	0.912	0.283	0	1	819
<i>mental health: within the last week, respondent self-reports</i>					
little interest in daily activities	0.425	0.495	0	1	816
feels down	0.293	0.455	0	1	817
feels bad about self	0.144	0.352	0	1	817
feels tired	0.469	0.499	0	1	816
thoughts of harming self	0.071	0.257	0	1	817
<i>relationship with husband/last partner</i>					
restricts her contact with family or friends	0.201	0.401	0	1	750
husband must know where she is	0.401	0.490	0	1	748
need permission for healthcare	0.330	0.471	0	1	745
neglect	0.195	0.396	0	1	749
jealous	0.295	0.456	0	1	745
suspicious	0.153	0.360	0	1	747
ever suffered domestic violence	0.176	0.381	0	1	801

Table 1: Characteristics of Microenterprise Owners in Sample

VARIABLE	mean	std dev	min	max	N
business years in operation	6.719	6.345	0	38	818
business hidden from spouse	0.208	0.406	0	1	718
owner operates another enterprise	0.365	0.482	0	1	821
business located at home	0.377	0.485	0	1	819
business has display	0.514	0.500	0	1	821
business has any advertising	0.492	0.500	0	1	821
caregiving during business operation	0.644	0.479	0	1	821
has training	0.195	0.397	0	1	815
sales exhibit seasonal pattern	0.478	0.500	0	1	807
inputs ever stolen	0.194	0.396	0	1	813
can show written records	0.510	0.500	0	1	819
can show written budget	0.392	0.489	0	1	801
<i>labor inputs</i>					
weekly hours	36.160	20.930	0	60	813
family workers (full time)	0.202	0.699	0	11	821
non family workers (full time)	0.575	1.253	0	9	821
family workers (all)	0.346	0.921	0	11	821
non family workers (all)	0.989	2.020	0	30	821
any employee	0.475	0.500	0	1	821
<i>capital inputs</i>					
log (capital)	11.792	2.443	0	17.382	821
took out loan to begin business	0.275	0.447	0	1	821
loan to begin was bank loan	0.292	0.456	0	1	226
interest rate	1.283	3.714	0	54.032	221
<i>formality</i>					
business has tax number	0.278	0.448	0	1	818
business has BRELA registration	0.215	0.411	0	1	815
gives customers a receipt	0.177	0.382	0	1	821
business has bank account	0.389	0.488	0	1	817
business has credit line	0.699	0.459	0	1	806
<i>sector</i>					
other	0.130	0.337	0	1	814
livestock husbandry	0.160	0.367	0	1	814
food processing	0.157	0.364	0	1	814
light manufacturing	0.323	0.468	0	1	814
retail and food sales or services	0.230	0.421	0	1	814

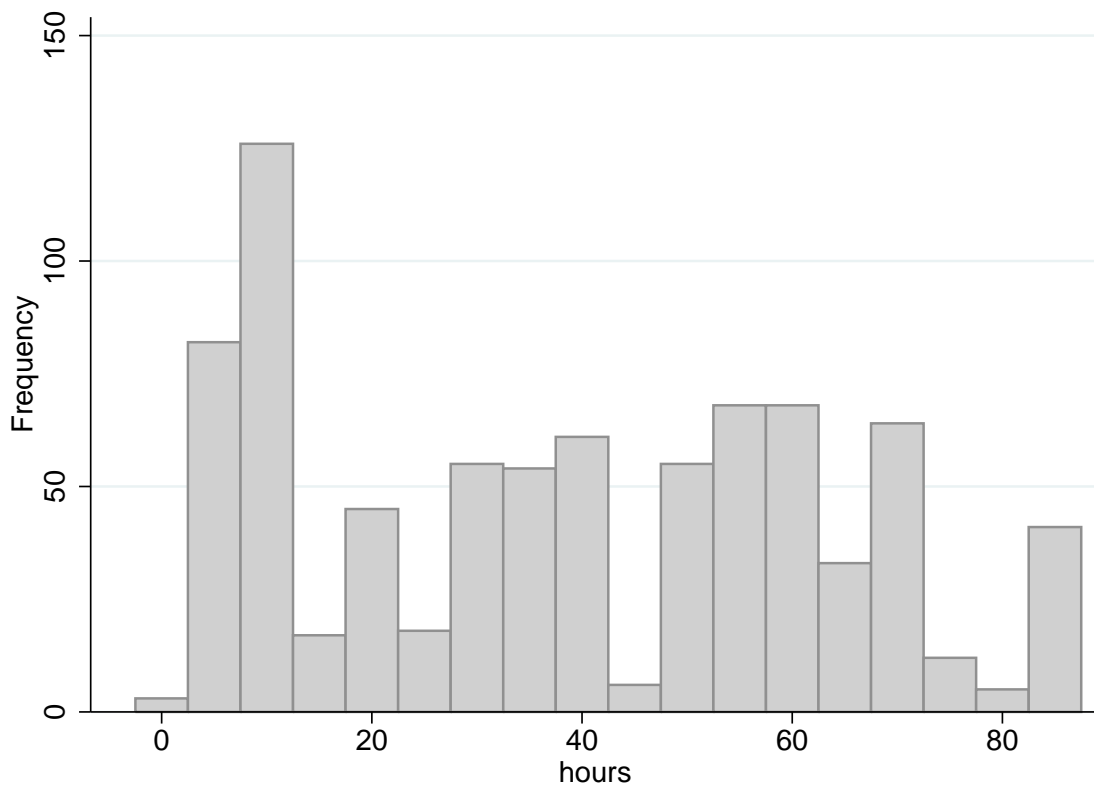


Figure 1: Reported hours of work in a typical week

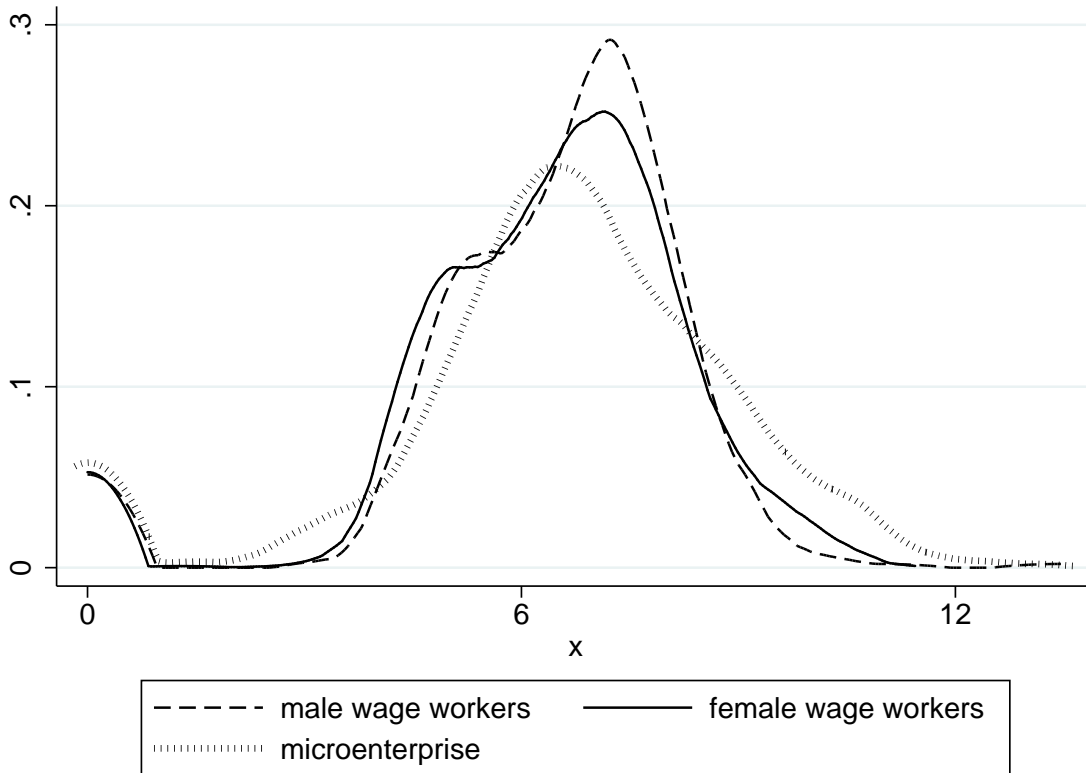


Figure 2: Earnings distributions of wage workers vs microenterprise owners

earnings and wages. While the average hourly earnings are slightly higher for wage earnings ($P = 0.147$), the bigger difference in the distributions is in the variance. Entrepreneurs are over-represented at both the high and low ends of the earning distribution; indeed, the standard deviation of their wages is significantly higher than of wage workers ($P < 0.001$).

3.3 Key Variables

While details of each of the variables used in the analysis are provided in appendix A, I discuss the construction of a few key variables here. The key measure of bargaining power is the assets a woman brings into marriage. I include both the total reported value of “all of the gifts given by you and your family to your spouse’s family” and “all property (houses, money, household goods, land) brought to the marriage” by the bride. Women answer this question about their current partner, if currently living with a man, or their most recent partner, if they are not currently living with a man but have done so in the

past. Since the model pertains to the current bargaining between a woman and her partner, however, I will investigate whether the relationship differs based on whether women are currently married.

The key outcome variable is microenterprise profits. Following De Mel et al. (2009b), who argue that direct reports of profits are less noisy than subtracting expenses from revenues, I use the respondent's answer to the question:

What was the total income the business earned in the last financial year (Jan 1, 2009 – Dec 31, 2009) after paying all expenses (expenses include the wages paid to employees and income paid to the entrepreneur only if the latter was paid as a regular salary). That is, what were the profits of your business last year?

Since this measure does not include the opportunity cost of unpaid labor, I test the robustness of the results to an alternate measure that assumes that family labor (full or part time) is paid according to the average wage rate of the corresponding labor category who are paid. There is relatively low prevalence of missing data or zeros for this question; 26 respondents neglected to answer the question (3.2 percent of the respondents) and another 45 (5.5 percent of respondents) reported zero profits. No respondents reported negative profits.

I construct the capital measure as the sum of the reported cost to purchase an item “of similar condition” of 21 types of “business equipment and other property and utilities that you use in your business activities”: lights/lamps, electricity, mobile phones, landlines, cash register, company car or mini-bus, two-wheeler, bicycle/cart, security system, lockable storage area, fan/AC, lock for production area, running water, toilet, computer, internet/email, copy machine, printer, table, chairs, and weighing scale.

3.4 Empirical Strategy

The main set of regressions examines the effect of pre-marriage bargaining power on the microenterprise outcomes. I use the total assets brought into marriage by the woman – conditional on total assets brought by both the husband and wife – as a measure of the bargaining power. Accordingly, I regress

$$Y_i = \beta_1 \log(\text{assets}_{\text{wife}}) + \beta_2 \log(\text{assets}_{\text{wife}} + \text{assets}_{\text{husband}}) + \varepsilon_i \quad (3)$$

where the Y_i 's include both measures of profits and intermediate measures such as measures of inputs or the formality of the business.

For outcomes such as formality for which there are multiple measures³, I use multiple correspondent analysis for easier interpretability to construct a single index of the relevant outcomes. Similar to principal component analysis for continuous variables, multiple correspondent analysis projects multi-dimensional matrices of data onto independent subspaces that explain the maximum possible variation in the data. I take the dimensions of the first principle subspace, as an aggregate measure of formality or other composite inputs.

A consideration in interpreting the β_1 in equation 3 is the possibility that even after controlling for total assets given to the couple by both families in order to capture differences in the overall wealth of both families, women who enter marriage with a greater share of these assets may be unobservably different than women who enter with less assets. For instance, it is possible that daughters of parents who contributed more assets to the couple relative to the husband's family may have also have received higher human capital investments. Table 3 investigates this possibility. Indeed, women who entered marriage with a greater share of total assets given to the couple had higher schooling. Since the survey does not have detailed data on pre-marriage human capital investments, I cannot control for the different levels of pre-marriage human capital investments of women bringing various levels of assets into marriage. Instead, in section 4 I will consider the possibility that these human capital investments translate into differences in entrepreneurial ability, which may explain the relationship between assets at marriage and microenterprise profits.

4 Results

4.1 Main Outcomes

I first confirm that women entering marriage with more assets have higher bargaining power within marriage. Table 4 confirms that women who bring a greater share of assets into marriage report better treatment, higher belief in women's decision-making capacity, lower incidence of domestic violence, and higher usage of condoms. They do not experience any lower rates of depression or have any fewer offspring, however. They spend marginally fewer hours per day on housework ($P = 0.123$).

I next examine the relationship between assets at marriage and microenterprise profits. The first column of table 5 shows a positive and statistically significant relationship

³For example, whether the business has a tax number, BRELA registration, or bank account. See appendix A for a full list.

DEPENDENT VARIABLE	mother		father		father		age
	education	education	education	age at marriage	polygamous	age	
log (assets from wife's family)	0.106*** [0.040]	0.020 [0.016]	0.020 [0.022]	0.117 [0.084]	-0.001 [0.005]	0.130 [0.101]	
log (assets from both families)	-0.028 [0.043]	0.013 [0.017]	0.004 [0.024]	-0.067 [0.089]	0.004 [0.006]	-0.181* [0.107]	
mean of dependent variable	9.935	1.462	2.299	23.627	0.361	42.883	
Observations	711	708	708	681	718	713	
R-squared	0.018	0.015	0.004	0.003	0.001	0.004	

Standard errors in brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 3: Women's Assets at Marriage and Pre-Marriage Characteristics

DEPENDENT VARIABLE	ever violence	trust index	ever used condom	decisions index	depression index	number of children	typical daily hours on household
log (assets from wife's family)	-0.013*** [0.004]	0.030 [0.021]	0.009* [0.005]	0.064*** [0.023]	0.021 [0.021]	0.003 [0.020]	-0.047 [0.030]
log (assets from both families)	0.006 [0.005]	0.006 [0.022]	0.000 [0.005]	-0.048** [0.024]	-0.029 [0.022]	-0.015 [0.021]	0.024 [0.032]
mean of dependent variable	0.172	0.000	0.222	0.000	0.000	3.229	2.534
Observations	721	695	671	702	715	693	721
R-squared	0.017	0.011	0.015	0.012	0.002	0.002	0.004

Standard errors in brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 4: Women's Assets at Marriage and Post-Marriage Characteristics

between a woman's assets at marriage and the profits of her microenterprise. The effect is large: a 10 percent increase in assets provided by the woman's family (holding constant total assets) is associated with a 1.21 percent increase in profits. Interestingly, total assets provided to the couple (conditional on assets from the wife's family) do not matter, suggesting that total assets of the family do not serve to loosen credit constraints in female-owned businesses.

Having established that women with higher assets at marriage have on average higher microenterprise profits, I next consider other microenterprise outcomes that can provide some suggestive evidence on the mechanism between the correlation. Table 5 also reports the relationship between assets at marriage and other business characteristics. As predicted by the theoretical model, women with more assets at marriage are less likely to hide their business from their spouse. They are no more likely to have their business at home, but have been operating their business for longer. Table 6 examines the relationship between assets and marriage and the sector choice of the entrepreneur. Women with higher assets at marriage are significantly less likely to enter livestock husbandry and retail/food sales than light manufacturing, and moderately less likely ($P = 0.150$) to enter food processing.

4.2 Inputs

The model predicts that women with lower assets at marriage use inputs less intensively than women with more assets at marriage because their return from the resulting profit is lower given that they have control over it. There are several different potential categories of inputs that may showcase this effect – capital, labor, and efforts to formalize. Which of these categories of inputs might be affected by assets at marriage is determined in part by the marginal revenue products of each of these inputs. For instance, if the production function is close to a Leontief production in capital – as would be the case if most businesses are in sales, which require a stand to operate but little additional capital – then capital might not respond to differences in bargaining power. Such inputs would both have low variance and would contribute relatively little to profit.

Table 7 examines the variance and explanatory power over profits of capital, hired employees, own hours of the entrepreneur, and the formality index. The entrepreneur's own efforts contribute little to profits; the coefficient on own hours in the profit regression is not significant and the r-squared is only 0.003. Hired labor explains much more variation in profits than capital, its r-squared of 0.040 is considerably greater than the r-squared of capital of 0.012, and there is a much higher coefficient of variation. Formality also ex-

DEPENDENT VARIABLE	log(yearly profits)	years in operation	business based at home	business hidden from spouse
log (assets from wife's family)	0.121*** [0.040]	0.122* [0.072]	0.002 [0.005]	-0.011** [0.005]
log (assets from both families)	-0.038 [0.043]	-0.104 [0.076]	-0.004 [0.006]	-0.001 [0.005]
mean of dependent variable	12.949	6.719	0.377	0.208
Observations	718	705	720	718
R-squared	0.004	0.026	0.001	0.004

Standard errors in brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 5: Women's Assets at Marriage and Business Characteristics

SECTOR	livestock		retail and food		
	husbandry	food processing	sales	other	other
log (assets from wife's family)	-0.067* [0.034]	-0.051 [0.036]	-0.069** [0.033]	-0.022 [0.041]	
log (assets from both families)	0.061* [0.037]	0.021 [0.038]	0.022 [0.034]	0.051 [0.045]	
Percent in sector	13.02	15.97	15.72	22.97	
Observations	715	715	715	715	

Base category = light manufacturing (32.31 percent of sample). Standard errors in brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 6: Women's Assets at Marriage and Microenterprise Sector

plains a greater amount of the variation in profits; the r-squared in a regression with the formality index as a is 0.030.

I next look at the impact of assets of marriage on each of these categories of inputs, with particular attention to the input categories that explain a large share of the variation in profits. The information from the survey on interest rates paid by the surveyed women provides some evidence on whether women with less assets at marriage have lower profits because they use inputs less intensively or because they must pay more for the inputs the inputs. That is, if women are credit constrained, those who brought more assets into marriage may have better access to working capital for their businesses. Possibly their assets at marriage are productive assets that could be used directly in the microenterprise, or possibly they can better use these assets as collateral to access loans to buy other assets. Then, even though the reported measure of profits nets out the total cost of capital, women who pay a lower rental rate for capital would utilize it more heavily and report higher profits net of payment to rent capital.

However, table 8 shows that there are both no differences in the amount of capital used, and the price (the interest rate on loans) paid to the capital the entrepreneur does have. Specifically column 1 shows that both women's assets at marriage and total assets have zero effects on the total capital used. While women with greater assets from both families are marriage are more likely to take out a loan to begin a business, increases in the share of assets from the women's family do not affect whether she took out a loan. A woman with a greater share of assets from her own family is moderately more likely to have taken out a loan from a bank ($P = 0.109$), conditional on taking out a loan to start the business. This result previews the greater engagement of enterprises run by women with more assets at marriage in the formal sector shown in table 10. However, since the interest rate is no lower in businesses that have taken out a loan from a bank ($P = 0.432$), this does not necessarily reflect better access to capital.

Table 9 suggests that differential use of labor resources also do not explain the lower microenterprise profits of women with less assets at marriage. There are no differences in total employees or own hours of work in the microenterprises run by women with greater assets at marriage. I also check for differential use of family labor, which may be cheaper to hire due to lower transactions costs or higher effort of family labor (and indeed has been suggested as a reason for lower female microenterprise profits, see Ypeij and Ypeij (2000)); women with more assets at marriage do use moderately more family labor ($P = 0.140$). However, conditional on total labor, family labor does not predict profits, so it appears to be no cheaper or more effective than overall labor.

I also check for differences in the business owner's entrepreneurial skill or overlap-

DEPENDENT VARIABLE	standard deviation	coefficient of variation	beta	se(beta)	r-squared
log(K)	2.443	0.207	0.164	0.052	0.012
log(own hours)	0.817	0.243	0.247	0.158	0.003
log(hired employees)	0.667	1.147	1.087	0.187	0.040
formality index	1.724	(mean zero)	0.363	0.075	0.030

Table 7: Input Categories and their Contribution to Profits

DEPENDENT VARIABLE	log(total capital)	took loan to begin	conditional on taking out a loan, from bank	conditional on taking out a loan, interest rate
log (assets from wife's family)	0.004 [0.028]	-0.006 [0.005]	0.014 [0.009]	0.032 [0.087]
log (assets from both families)	-0.001 [0.030]	0.015*** [0.005]	0.000 [0.010]	-0.042 [0.097]
mean of dependent variable	11.792	0.275	0.292	1.283
Observations	721	721	197	193
R-squared	0.000	0.016	0.033	0.001

Standard errors in brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 8: Women's Assets at Marriage and Capital

DEPENDENT VARIABLE	log(total employees)	log(own hours)	log(family employees)	caregiving overlaps with business	self-ranked enterprise skill index	has training
log (assets from wife's family)	0.008 [0.007]	-0.006 [0.009]	0.007 [0.004]	0.003 [0.005]	-0.005 [0.040]	0.001 [0.004]
log (assets from both families)	-0.004 [0.008]	0.020** [0.010]	-0.008 [0.005]	-0.002 [0.006]	-0.015 [0.042]	0.000 [0.005]
mean of dependent variable	0.5818	3.3602	0.1867	0.6443	0.000	0.1951
Observations	721	721	721	721	721	716
R-squared	0.002	0.010	0.004	0.000	0.001	0.000

Standard errors in brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 9: Women's Assets at Marriage and Labor

ping duties, which might explain lead to higher profits, even absent differences in the amount of hours she works. These factors may also differ in women with differential power within the household, who may end up with more caretaking duties within the household, which might overlap with her entrepreneurial efforts and lower the effectiveness of time spent at her business. However, there are also no differences in whether the entrepreneur has training, how highly she ranks her entrepreneurial ability, or whether she engages in caretaking of children or the elderly while operating the business.

By contrast, table 10 depicts large increases in formality and visibility in the businesses run by women with greater assets at marriage. I look individually at measures of formality with respect to the government (BRELA registration, tax number), relations with financial organizations (bank account, credit line), and the running of the business (record-keeping, budgeting), and publicity (whether the business has a display and advertises), and an index constructed with multiple correspondent analysis. On all of these dimensions, businesses run by women with greater assets at marriage are more likely to be formal. These result are not driven by differences in profitability, years of operation, or education of women with more assets at marriage. Controlling for profit level in the regression where the outcome is the formality index leaves the coefficient on the wife's assets essentially unchanged ($\beta_1 = 0.0691$), and the P-value is still less than 0.001. The differences in formality could reflect the hidden nature of the businesses run by women with less bargaining power in the home. If formalizing or publicizing the business increases the chances that the husband will discover the business or its full scope, a woman with say over household resources may be less likely to undertake these actions. Alternatively, formalization could be profitable, but take effort to undertake, and thus be less appealing to women with lower bargaining power and less power over the spending of profits.

5 Conclusions

This paper documents a correlation between a woman's assets brought into marriage and the profits of her microenterprise. While this result cannot be assumed a priori to be causal, it does not appear that the differences in profits explained by differences in access to inputs or in entrepreneurial ability. Women with more assets at marriage are also less likely to hide their businesses from their spouse, consistent with a household bargaining model in which women with higher bargaining power have less need to hide income from their spouse since household spending is in greater accordance with their preferences anyway.

DEP VAR	can show written records	can show written budget	business has tax number	business has BRELA registration	offers customers a receipt	business has a bank account	business has a credit line	business has a display	business does any advertising	formality index
<i>Panel A: Unconditional on Business Characteristics</i>										
log (assets from wife's family)	0.014** [0.006]	0.013** [0.005]	0.011** [0.005]	0.009* [0.005]	0.015*** [0.004]	0.015*** [0.005]	-0.003 [0.005]	0.012** [0.006]	0.011** [0.006]	0.076*** [0.019]
log (assets from both families)	-0.009 [0.006]	-0.016*** [0.006]	0.000 [0.005]	0.000 [0.005]	-0.006 [0.004]	0.006 [0.006]	-0.011** [0.005]	-0.014** [0.006]	0.004 [0.006]	-0.031 [0.020]
Observations	719	702	718	715	721	719	713	721	721	687
R-squared	0.009	0.011	0.017	0.013	0.027	0.051	0.025	0.008	0.026	0.033
<i>Panel B: Conditional on Business Characteristics</i>										
logassetsw	0.011** [0.006]	0.012** [0.006]	0.005 [0.005]	0.006 [0.005]	0.011** [0.004]	0.014** [0.005]	-0.004 [0.005]	0.010* [0.006]	0.010* [0.006]	0.059*** [0.019]
logtotalassets	-0.011* [0.006]	-0.018*** [0.006]	0.002 [0.005]	0.000 [0.005]	-0.004 [0.004]	0.005 [0.006]	-0.011** [0.005]	-0.011* [0.006]	0.004 [0.006]	-0.028 [0.020]
logyprofits	0.015*** [0.005]	0.008 [0.005]	0.018*** [0.005]	0.007 [0.004]	0.008** [0.004]	0.015*** [0.005]	-0.001 [0.005]	0.007 [0.005]	0.005 [0.005]	0.066*** [0.018]
educ	0.020*** [0.005]	0.009* [0.005]	0.027*** [0.005]	0.023*** [0.004]	0.027*** [0.004]	0.013** [0.005]	0.015*** [0.005]	0.003 [0.005]	0.016*** [0.005]	0.125*** [0.018]
yearsoperate	-0.006** [0.003]	-0.008*** [0.003]	0.001 [0.003]	0.000 [0.002]	0.002 [0.002]	0.002 [0.003]	0.006** [0.003]	-0.001 [0.003]	-0.008*** [0.003]	-0.008 [0.010]
Observations	698	682	696	693	699	697	691	699	699	667
R-squared	0.05	0.032	0.088	0.062	0.102	0.077	0.04	0.009	0.056	0.126
mean Dep Var	0.510	0.392	0.278	0.215	0.177	0.389	0.699	0.514	0.492	0.000

Standard errors in brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 10: Women's Assets at Marriage and Formality

The proposed model has several lessons for policymakers interested in raising microenterprise profits for women. The first lesson is that the current policy focus on access to capital and other inputs, or attempt to improve their entrepreneurial ability, will be less effective among women who put less effort into their microenterprise because they have less control over its resulting spending. More optimistically, however, this model suggests that initiatives to improve a woman's bargaining power (such as legal reforms improving their ability to hold assets) can also improve microenterprise profits by improving the marginal gains to the woman of income from that enterprise.

References

- S. Anderson and J.M. Baland. The economics of roscas and intrahousehold resource allocation. *The Quarterly Journal of Economics*, 117(3):963–995, 2002.
- N. Ashraf. Spousal control and intra-household decision making: An experimental study in the philippines. *The American Economic Review*, pages 1245–1277, 2009.
- E Bardasi. Promoting women's entrepreneurship -tanzania virtual business incubator. 2010.
- M.A. Boozer, M. Goldstein, and T. Suri. Household information: Implications for poverty measurement and dynamics. Technical report, Mimeo, 2009.
- C. Castilla. Ties that bind: The kin system as a mechanism of income-hiding between spouses in rural ghana. 2012.
- S. De Mel, D. McKenzie, and C. Woodruff. Are women more credit constrained? experimental evidence on gender and microenterprise returns. *American Economic Journal: Applied Economics*, pages 1–32, 2009a.
- S. De Mel, D.J. McKenzie, and C. Woodruff. Measuring microenterprise profits: Must we ask how the sausage is made? *Journal of Development Economics*, 88(1):19–31, 2009b.
- P. Dupas and J. Robinson. Savings constraints and microenterprise development: Evidence from a field experiment in kenya. Technical report, National Bureau of Economic Research, 2009.
- D.J. Falen. Paths of power: Control, negotiation and gender among the fon of benin. 2003.
- M. Goldstein and C. Udry. The profits of power: Land rights and agricultural investment in ghana. *Journal of Political Economy*, 116(6):981–1022, 2008.
- M. Kevane and B. Wydick. Microenterprise lending to female entrepreneurs: Sacrificing economic growth for poverty alleviation? *World Development*, 29(7):1225–1236, 2001.

- P. LeMay-Boucher and O. Dagnelie. Within beninese households: how spouses manage their personal income. Technical report, mimeo, IAE-CSIC, 2009.
- D. McKenzie and C. Woodruff. Experimental evidence on returns to capital and access to finance in mexico. *The World Bank Economic Review*, 22(3):457–482, 2008.
- A.R. Quisumbing and J.A. Maluccio. Resources at marriage and intrahousehold allocation: Evidence from bangladesh, ethiopia, indonesia, and south africa*. *Oxford Bulletin of Economics and Statistics*, 65(3):283–327, 2003.
- A.R. Quisumbing, B. De La Briere, International Food Policy Research Institute. Food Consumption, and Nutrition Division. *Women’s assets and intrahousehold allocation in rural Bangladesh: Testing measures of bargaining power*. International Food Policy Research Institute, 2000.
- D. Thomas, D. Contreras, and E. Frankenberg. Distribution of power within the household and child health. *Santa Monica: RAND. Mimeo*, 2002.
- C. Udry. Gender, agricultural production, and the theory of the household. *Journal of Political Economy*, pages 1010–1046, 1996.
- World Bank. Supporting self-employment and small-scale entrepreneurship. 2012.
- A. Ypeij and J.L. Ypeij. *Producing against poverty: female and male micro-entrepreneurs in Lima, Peru*. Amsterdam University Press, 2000.

A Variable Definitions

<i>Variable</i>	<i>Construction</i>
Can do all ADL's	Can do each of the following "easily": walk 5 kilometers; carry a 20L bucket for 20 meters; run a short distance; work a half-day; stand up from a sitting position (chair); bow, squat, and kneel
Depression index	First principal component of MCA done with the following binary variables-- has felt at least several days in the last 2 weeks: Little interest or pleasure in doing things; Feeling down, depressed or hopeless; Trouble falling or staying asleep, or sleeping too much; Feeling tired or having little energy; Poor appetite or overeating; Feeling bad about yourself – or that you are a failure or have let yourself or your family down; Trouble concentrating on things, such as reading the newspaper or watching television; Moving or speaking so slowly that other people could have noticed? Or the opposite – being so fidgety or restless that you have been moving around a lot more than usual; Thoughts that you would be better off dead or of hurting yourself in some way
Trust index	First principal component of MCA done with the following binary variables: spouse/partner has ever to restrict you from meeting your friends; restrict you from communicating with family; insists on knowing your whereabouts at all times; neglects you or does not treat you well; becomes angry when you talk to another man; is suspicious; expects you to ask for permission before seeking health care.
Decisions index	First principal component of MCA done with the following binary variables – believes wife should have say in the following decisions: large household purchases; daily household purchases; personal (for wife) purchases; borrowing money; lending money; children's education; health purchases or choice of a health clinic; wife's choice of occupation; when to visit family or friends; wife's working hours; participation in groups; how to spend money earned from women's own work
Interest rate on loans	$(\text{amount to be repaid}/\text{amount loaned})^{(1/\text{duration in months})}$
Self-ranked enterprise skill index	First principal component of MCA done with the following categorical variables – skill in the following is at least: poor, neither poor nor good, good, very good: finding employees; managing employees; managing the budget, bookkeeping; accessing credit and finance; labor laws and other regulations; registering the business and obtaining permits; taxes
BRELA registration	Registered with Business Registration and Licensing Agency, a government agency set up to facilitate the process of investing in businesses (ILO 2002)

Table 11: Construction of Key Variables