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Lars Ivar Oppedal Berge and Armando Jose Garcia Pires*

Abstract

In this paper, we analyze two puzzles on entrepreneurship and gender. First, a number of field experiments in developing countries on business training and business grants have shown that it is very difficult to raise entrepreneurial outcomes for female entrepreneurs. Second, women tend to be over-represented in the informal sector in developing countries, and in particular in microfinance institutions. We present a simple model of entrepreneurship that aims to explain these two puzzles. In the model, entrepreneurship arises from the interaction of ability, access to capital and labor investments. To this, we add two social norms that are widespread in developing countries (but not only): women have domestic obligations that restrict the time they can dedicate to their businesses (while men do not); and women have less access to capital than men. Consequently, women self-select into the informal sector since it requires less capital and labor investment. The model also indicates that raising entrepreneurial capabilities of time-constrained women in just one or two dimensions, like ability (via business training) and capital (via business grants), might not be sufficient to promote entrepreneurial success. We present evidence that supports these hypotheses using data from a field experiment in Tanzania with microfinance clients.

Key words: Field experiments, Entrepreneurship, Social Norms, Gender.
JEL Classification: A13, L26, O12, O16, O17, O55.

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1. Introduction

A central puzzle in the microfinance and entrepreneurship literature is that several interventions aiming at stimulating entrepreneurship (such as business training and business grants) fail to raise females' income and business profits, much more so than for men¹. A closely related puzzle is why females are overrepresented in the informal sector, and in particular in microfinance institutions².

In this paper, we propose a simple model of entrepreneurship, which can contribute to explain both puzzles. In addition, we also present some evidence with data from a field experiment with business training and business grants in Tanzania, which supports the main findings of the model.

In particular, we use a standard model of entrepreneurship developed by Lucas (1978), and Evans and Jovanovic (1989)³. In this model, potential entrepreneurship arises from the combination of capital ownership, business ability, and labor employment⁴. Accordingly, individuals with higher business ability, more capital, and more labor investment are more likely to become entrepreneurs.

To this standard model, we add two social norms that are prevalent in many developing countries. First, women, contrary to men, have domestic obligations (like cleaning, cooking, taking care of children), which limit the amount of time that they can dedicate to their businesses (including, for example, time for business networking). Second, women have access to less capital than men, since they have less collateral. Several studies present

¹ See for instance, Berge et al. (2014); Field et al. (2010); Drexler et al. (2012); Bruhn and Zia (2012); Giné and Mansuri (2011); Karlan and Valdivia (2011); de Mel et al. (2012, 2014); Banerjee and Duflo (2011); and Klinger and Schündeln (2011). Oosterbeek et al. (2010) and Huber et al. (2014), in turn, look to the effects of business training early in life.

² For evidence, see for instance Morduch (1999); Hermes and Lensink (2007); Cull et al. (2009); and Rijkers and Costa (2012).

³ See also Mesnard and Ravallion (2006), and Alby et al. (2013).

⁴ Clearly, other factors can affect entrepreneurship as well, such as learning, risk preferences, and competitive attitudes. See Jovanovic (1982); Cabral and Mata (2003); Hurst and Lusardi (2004); Atolia and Prasad (2011); and Berge et al. (2015).

evidence of the pervasiveness of these two social norms in developing countries⁵.

In addition to gender, we also consider the question of formality and informality, since this is central to entrepreneurship in developing countries. In this regard, we assume that entrepreneurs have to decide to enter either the formal or the informal sector. The difference between the formal and the informal sector is that the former requires more capital, it incurs higher fixed/entry costs, and pays higher wages than the latter. The empirical evidence supports the distinction between the formal and the informal sector along these lines⁶.

The data used in this paper, as mentioned above, comes from a randomized field experiment among small-scale entrepreneurs in Dar es Salaam, Tanzania. The field experiment was conducted in collaboration with one of the leading microfinance institutions in Tanzania, PRIDE. For further information on this field experiment, see Berge et al. (2014). A distinguishing feature of this field experiment is that it had three treatment effects: business training only; business grants only; and business training together with business grants. In other words, the field experiment tried to influence two constraints usually associated with micro entrepreneurs: business-abilities, and access to capital.

The theoretical model has a series of predictions that we test with the data generated from the field experiment. In particular, the main predictions of the model are the following. First, formal entrepreneurs are more able, and therefore produce more profits, than informal entrepreneurs. Second, since informal entrepreneurs are more capital and ability constrained than formal entrepreneurs, interventions that promote entrepreneurs' access to capital, and

⁵ See, for instance, Potash (1986); Agarwal (1994); Saito (1994); Udry (1996); Dey-Abbas (1997); Johnson (2004); Sen (1990); Dasgupta (1993); Pitt and Khandker (1998); Mammen and Paxson (2000); and Van Tassel (2004).

⁶ See for instance Boeke (1953); Lewis (1954); Agénor (2005); Mandelman and Montes-Rojas (2009); Vollrath (2009); and Fergusson (2013).

business ability might have a strong impact on informal entrepreneurs. Third, female entrepreneurs self-select into the informal sector⁷. Fourth, female entrepreneurs tend to have lower profits than male entrepreneurs. Fifth, increasing female entrepreneurs' access to capital and business ability may not improve the profits of their businesses if they are time-constrained due to domestic obligations. Conversely, raising access to capital and entrepreneurial ability is expected to have large impact amongst female entrepreneurs that are not time-constrained.

To understand why business training and business grants might only have an effect on female entrepreneurs that are not time-constrained, note that entrepreneurship in our model is made of three dimensions, capital investment, ability, and labor investment. If only two of these dimensions are lifted, let us say ability (via business training) and capital (via business grants), female entrepreneurs that are time-constrained might still not be able to grow.

The data from the field experiment confirms the main predictions of the theoretical model. In particular, we find that the business training and the business grant have no impact for time-constrained female entrepreneurs. On the other hand, the business training and the business grant do have a positive impact for female entrepreneurs that are not time-constrained⁸. Furthermore, we find that, irrespective of gender, the intervention has seemingly a larger impact on informal entrepreneurs than on formal entrepreneurs. Accordingly, since informal entrepreneurs have potentially larger restraints in terms of access

⁷ Emran et al. (2006) present an alternative explanation for why women self-select into the informal sector (in particular microfinance): missing labor markets for women. Accordingly, since women suffer discrimination in the formal labor market, they have no other choice than working or being entrepreneurs in the informal sector.

⁸ The importance of time constraints on entrepreneurship has been somewhat neglected in the literature. There are some notable exceptions, however. See for instance, Bolton and Dewatripont (1994) for theory; and Bandiera et al. (2007, 2011a,b) and Bloom et al. (2011) for empirical evidence. Note however, that our results differ from those in Fafchamps et al. (2014). Fafchamps et al. (2014) find that a business grant only had impact on the female entrepreneurs that already had higher profits at the start of the intervention. In turn, we find that a business grant and business training only have an impact on female entrepreneurs that are not time-constrained.

to capital and ability than formal entrepreneurs, business training and business grants can have a larger effect on them than on formal entrepreneurs.

In this sense, our results have policy implications. Reducing capital and business knowledge constraints of women in developing countries might not be sufficient to promote successful female entrepreneurship in these countries. If possible, development interventions aiming to promote female entrepreneurship should also target social norms, like the burden of domestic obligations that fall on women, since these limit their capacity and potential as entrepreneurs⁹. Another implication is that entrepreneurial interventions on business ability and access to capital should target younger females, since they are more likely not to have settled too deeply into existing gender-roles. Similarly, interventions on business ability and access to capital should focus more on informal entrepreneurs given that they face larger constraints than formal entrepreneurs and the potential impact of these interventions can therefore be larger, especially for the higher ability informal entrepreneurs.

The rest of the paper is organized as follows. In the next section, we introduce the base model and its main implications. We then present data from the field experiment. In section 3, we discuss the empirical strategy. In section 4, we present the results from our study. In section 5, we draw the main conclusions.

2. The Model

We model an economy with two sectors, the formal sector (F) and the informal sector (I). As we have argued in the introduction, this type of dual economy is very pervasive in many developing countries. The sector of activity

⁹ McMullen (2011) defend that a market based approach to entrepreneurs in development countries needs to be complemented with institutional and cultural interventions. This diagnostic seems to be in accordance with our results. Alvarez and Barney (2014), also highlight that entrepreneurial activities are context dependent. As a result, entrepreneurial development interventions need to be tailored to each specific context.

is indicated by a subscript s , with $s = F, I$. We divide potential entrepreneurs according to gender, man (M) and woman (W). Gender is indicated by a subscript i , with $i = M, W$. Each potential entrepreneur has an ability level θ . In the following, we consider a set of socio-cultural norms that are common in many developing countries.

Socio-cultural norm 1: women have to work at home (for example, taking care of children, cleaning the house, cooking, shopping), while men have no domestic obligations. We assume that this socio-cultural norm implies that women can dedicate less time to their businesses. We denote L_i the amount of labor supplied by entrepreneur i , with $i = M, W$. We assume that $L_M > L_W$.

Socio-cultural norm 2: men have access to more capital than women. This may result from the fact that men have more collateral and consequently have access to more capital from financial institutions. In turn, women have less collateral and have to recur, for instance, to microfinance institutions. We denote K_i the amount of labor supplied by entrepreneur i , with $i = M, W$. We then assume that $K_M > K_W$.

In addition to these two social norms, we also make a series of assumptions related to the dual economy, formal versus informal.

Assumption 1: the formal sector has higher fixed costs than the informal sector. It is acknowledged, for instance, that the formal sector pays higher taxes and requires (costly) licenses to start a business. We denote T_s as the fixed costs in sector s , with $s = F, I$. We therefore have that $T_F > T_I$. Consequently, there are higher barriers to entry in the formal sector.

Assumption 2: the formal sector requires more capital than the informal sector. This is so because the formal sector is more technologically advanced and is more capital intensive. We then have that $K_F > K_I$. As a result, in order to enter the formal sector, an entrepreneur needs to have access to more capital than an entrepreneur in the informal sector.

Assumption 3: wages in the formal sector are higher than wages in the

informal sector. We denote w^s as the wages in sector s , with $s = F, I$. In this way, we have that $w_F > w_I$. Evidence shows that this is usually the case in many developing countries (Fields, 2011).

The production function in sector s ($s = F, I$) of a firm owned by an entrepreneur i ($i = M, W$) with ability θ equals:

$$Y_{is} = \theta_{is}(K_{is})^\alpha(L_{is})^{1-\alpha}, \text{ with } \alpha \in (0,1) \quad (1)$$

Profits of entrepreneur i ($i = M, W$) in sector s ($s = F, I$):

$$\text{Max}\pi_{is} = \theta_{is}(K_{is})^\alpha(L_{is})^{1-\alpha} - w_s L_{is} - r_s K_{is} - T_s \quad (2)$$

Where r represents the price of one unit of capital.

The first order condition (FOC) in relation to labor investments (L_i) equals:

$$\frac{d\pi_{is}}{dL_{is}} = \frac{(1-\alpha)\theta_{is}K_{is}^\alpha}{L_{is}^\alpha} - w_s \quad (3)$$

Moreover, the second order condition (SOC) equals:

$$\frac{d(\pi_{is})^2}{d^2L_{is}} = -\frac{(1-\alpha)\theta_{is}K_{is}^\alpha}{L_{is}^{1+\alpha}} < 0 \quad (4)$$

As such, the SOC is always satisfied.

Solving equation (3) for L_{is} , we obtain:

$$L_{is} = \left(\frac{(1-\alpha)\theta_{is}}{w_s}\right)^{\frac{1}{\alpha}} K_{is} \quad (5)$$

Substituting in the profit expression, we get:

$$\pi_{is} = \frac{\alpha}{1-\alpha} \left(\left(\frac{(1-\alpha)\theta_{is}}{w_s^{1-\alpha}} \right)^{\frac{1}{\alpha}} - r \right) K_{is} - T_s \quad (6)$$

In the next section, we evaluate the consequences for entrepreneurship of the model above.

3. Implications of the model

In this section, we examine the effects on entrepreneurship of the two social norms assumed in the theoretical model. We can see that an individual i , with $i = M, W$, becomes entrepreneur in sector s , with $s = F, I$, if $\pi_{is} > w_s$, i.e.: if he/she earns more as an entrepreneur than as a wage earner. Solving for equation $\pi_{is} > w_s$ for θ_{is} , we have that the threshold level of productivity that

makes it profitable for an individual to become an entrepreneur in sector s , with $s = F, I$, is:

$$\hat{\theta}_{is} = \left(\frac{w_s + T_s + r_s K_{is}}{K_{is}} \right)^\alpha \frac{w_s^{1-\alpha}}{\alpha^\alpha (1-\alpha)^{1-\alpha}} \quad (7)$$

The threshold value of ability ($\hat{\theta}_{is}$) in equation (7) varies with gender and sector of activity. We can now compare the different threshold values of ability ($\hat{\theta}_{is}$) that make it profitable for an individual to become an entrepreneur. We can look at this from two perspectives: formal versus informal (keeping gender constant); and men versus women (keeping sector of activity constant). In the following, we assume that $r = r_F = r_I$, given that we have no prior knowledge about the interest rate in the formal and the informal sector¹⁰.

The difference between the threshold levels of productivity for the formal and the informal sector (keeping gender constant) equals:

$$\hat{\theta}_{iF} - \hat{\theta}_{iI} = \frac{1}{\alpha^\alpha (1-\alpha)^{1-\alpha}} \left[\left(\frac{w_F + T_F + r K_{iF}}{K_{iF}} \right)^\alpha w_F^{1-\alpha} - \left(\frac{w_I + T_I + r K_{iI}}{K_{iI}} \right)^\alpha w_I^{1-\alpha} \right] > 0 \quad (8)$$

Since $w_F > w_I$, $T_F > T_I$, and $K_F > K_I$, then $\hat{\theta}_{iF} > \hat{\theta}_{iI}$. In other words, entrepreneurs in the formal sector need to have higher ability. This can be seen more clearly in figure 1. For a given level of access to capital, entrepreneurs in the formal sector need to have higher productivity than entrepreneurs in the informal sector. This means that entrepreneurs with higher productivity self-select into the formal sector.

First implication of the model. Formal entrepreneurs are more able and can therefore generate more profits than informal entrepreneurs.

Second implication of the model. Since informal entrepreneurs are more constrained in terms of access to capital and ability, interventions that target these two constraints should have larger effects on informal entrepreneurs than on formal entrepreneurs.

In turn, the difference between the threshold levels of productivity for male

¹⁰ Cull et al. (2009) and Sun and Im (2015) report cases of microfinance institutions with very high interest rates. This could indicate that interest rates in the informal financial sector are higher than in the formal financial sector. Note that if this is the case, the results in our model are strengthened.

and female entrepreneurs (keeping sector constant) equals:

$$\hat{\theta}_{Ms} - \hat{\theta}_{Ws} = \frac{w_s^{1-\alpha}}{\alpha^\alpha(1-\alpha)^{1-\alpha}} \left[\left(\frac{w_s+T_s}{K_{Ms}} + r \right)^\alpha - \left(\frac{w_s+T_s}{K_{Fs}} + r \right)^\alpha \right] < 0 \quad (9)$$

Since $K_M > K_W$, then $\hat{\theta}_{Ms} < \hat{\theta}_{Ws}$. In other words, male entrepreneurs do not need have as high ability as female entrepreneurs. The reason for this is that males are not time-constrained. Figure 2 shows the gender effects of our model: for a given level of access to capital, female entrepreneurs need to have higher productivity than male entrepreneurs. Similarly, for a given level of entrepreneurial ability, female entrepreneurs need to have access to higher levels of capital. As a result, female entrepreneurs find it more difficult to enter the formal sector.

Third implication of the model. Female entrepreneurs self-select, and are therefore over-represented, into the informal sector.

Fourth implication of the model. Female entrepreneurs tend to have lower profits than male entrepreneurs.

Fifth implication of the model. Since female entrepreneurs are constrained in terms of both access to capital and the time dedicated to their businesses, interventions that target entrepreneurs' access to capital and ability might not have any effect on female entrepreneurs. However, for female entrepreneurs that are not time-constrained, these interventions can have a positive impact.

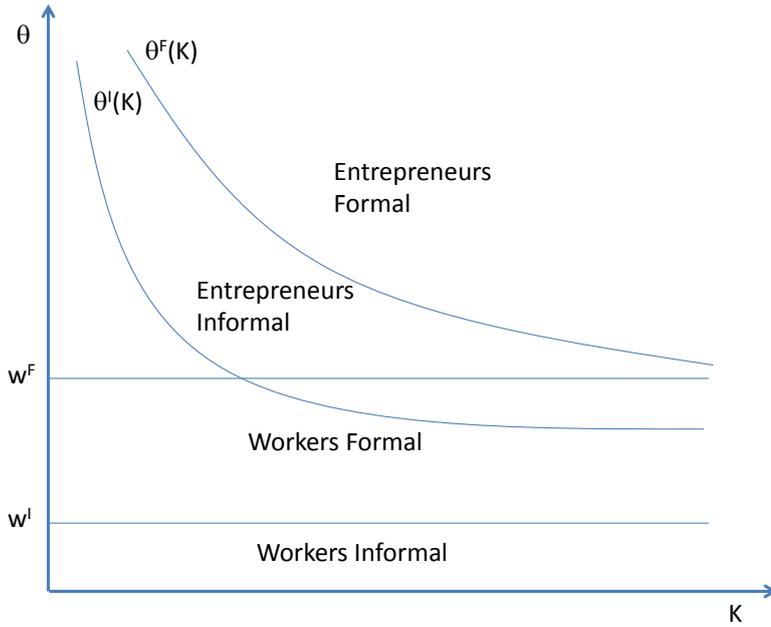


Figure 1: Threshold Level of Productivity: Formal versus Informal

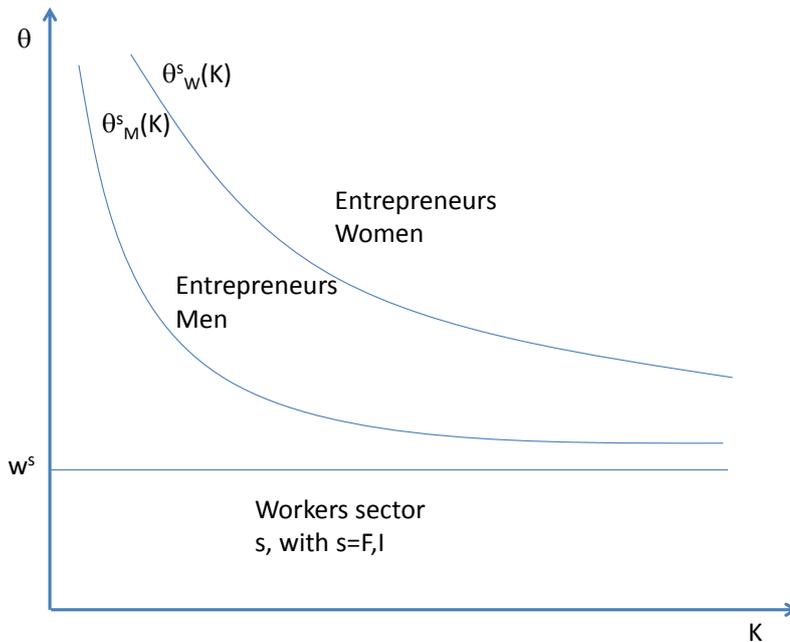


Figure 2: Threshold Level of Productivity: Men versus Women

Next, we proceed to the empirical part of the paper. We start by presenting the data and then test empirically the main implications of the model.

4. Sample and data

The data we use in the empirical part was obtained from a field experiment with business training and business grants conducted in Dar es Salaam,

Tanzania. In this field experiment, some entrepreneurs received business training, others a business grant, and the others both business training and a business grant. The control group received neither a business grant nor business training. Berge et al. (2014) explain this field experiment in detail.

In this paper, we use the same sample as in Berge et al. (2014) of 644 small-scale entrepreneurs all members of one of the leading microfinance institutions in the country, PRIDE. Most of these entrepreneurs are involved in small-scale commerce (running a small kiosk, having a stall at the market) or different sorts of service activities (hairdressing, small restaurants), with a few also involved in light manufacturing (tailoring, carpentry, brick making) or agriculture.

The clients in PRIDE are organized in loan groups of five entrepreneurs, and 10 loan groups make up a “market enterprise” group. All members of the market enterprise group are jointly responsible for each others’ loans in the microfinance institution, in the case of someone’s default. There are 349 loan groups represented in our sample. The control group in our sample (the entrepreneurs that received no business training nor business grants) consists of 199 individuals. In turn, 193 entrepreneurs received business training only, 126 were offered the business grant only, and 126 received both treatments (business grant plus business training).

5. Empirical strategy

In this section, we describe the empirical strategy. We first look at a set of variables related to entrepreneurial activity on the sample analyzed. For instance, we study sales, profits, number of businesses, formality of the business, sector of activity, number of employees, loans, investments, business practices (like record keeping, marketing), business knowledge, working hours, age, education, and business contacts. We analyze this data from the prism of gender and formality. In other words, we look at whether male and female

entrepreneurs differ along these dimensions and do the same for formal and informal entrepreneurs.

We then examine what business variables are correlated with profits and other business outcomes and choices (such as investments, loans, working hours, business knowledge, education, and formality). We do this analysis again for male and female entrepreneurs and for formal and informal entrepreneurs.

The last exercise we perform is to look at the experimental evidence. In particular, we regress profits on the treatment variables. As we have discussed above, there are three treatments: business grant only; business training only; and business grant plus business training. We then consider the effect of treatment when it is interacted on the one hand with the number of working hours, and on the other hand when it is interacted with formality.

6. Results

In this section, we report the empirical results in the paper. Table 1 shows the descriptive statistics in terms of gender (left side) and formality (right side). We can see that some statistically significant differences arise between female and male entrepreneurs. Male entrepreneurs compared to female entrepreneurs have higher sales, higher profits, are more likely to run formal businesses, are less likely to run informal businesses, are less likely to work in services, are more likely to work in manufacturing, have higher business knowledge, have lower education, and work more hours.

The descriptive statistics in relation to gender are then mostly in accordance with the assumptions and the implications of the theoretical model. In fact the variable working hours shows that male entrepreneurs tend to work on average about one day more a week than female entrepreneurs. The summary statistics also confirms the third and fourth implications in our model,

namely that female entrepreneurs are over-represented in the informal sector and that female entrepreneurs have lower profits than male entrepreneurs.

In terms of formality, we have the following statistically significant differences. Compared to entrepreneurs that run informal businesses, entrepreneurs that have formal businesses have higher sales, higher profits, more employees, higher loans, higher investments, are more likely to keep business records, have longer working hours and have higher levels of education.

Again, these descriptive statistics in terms of formality are also in accordance with both the assumptions and the implications of the theoretical model. First, as we assume in the theoretical model, formal entrepreneurs have more access to capital than informal entrepreneurs. Second, as shown by the first prediction from the theoretical model, formal entrepreneurs generate more profits than informal entrepreneurs, possibly due to the former having higher ability, as demonstrated by the fact that they have higher education.

Table 1: Descriptive statistics by gender and formality

	Means		p-values Female= Male	Means		p-values Formal= Informal
	Female	Male		Informal	Formal	
Sales	2187.64	3062.518	0.01	2148.815	3692.660	0.00
Profit	531436	618.217	0.03	520.657	705.213	0.00
Businesses	1.547	1.527	0.7	1.528	1.585	0.36
Formal Businesses	0.315	0.22	0.05	0	1.148	0.00
Informal Businesses	1.327	1.212	0.08	1.528	0.437	0.00
Commerce	0.697	0.703	0.88	0.703	0.683	0.64
Service	0.441	0.257	0	0.376	0.38	0.94
Manufacturing	0.111	0.234	0	0.147	0.176	0.42
Employees	1.033	1.18	0.28	0.972	1.479	0.00
PRIDE loan	772.275	766.667	0.78	759.363	809.155	0.03
Investments	172.177	249.937	0.11	168.802	305.68	0.01
Record keeping	0.661	0.667	0.89	0.631	0.775	0.00
License	0.171	0.207	0.29	0	0.831	0.00
Marketing	0.485	0.498	0.57	1.442	1.563	0.16
Business knowledge	0.694	0.722	0.04	0.704	0.704	0.98
Working hours	59.483	67.919	0	60.127	70.394	0.00
Age	37.924	37.302	0.4	37.807	37.366	0.57
Education	8.04	7.734	0.07	5.297	4.479	0.01
Business contacts	1.038	17.514	0	12.518	12.958	0.83
Observations	422	222		502	142	

Note: The table reports average values from the baseline survey in 2008 for all entrepreneurs in the survey (644 observations), by gender. p-value is from a two-sided t-test of equality. Sales: Monthly sales, in thousand TZS. Profit: Monthly profit, in thousand TZS. Businesses: No. of businesses. Commerce, Service, and Manufacturing: Share of clients involved in each of these sectors. Employees: Number of employees. PRIDE loan: Size of loan in PRIDE, in thousand TZS. Investments: Business investments during the last year, excluding additions to stocks, in thousand TZS. Net borrower: Indicator variable taking the value one if the sum of all loans is larger than all savings. Record keeping: Indicator variable taking the value one if the entrepreneur reports keeping records. License: Indicator variable taking the value one if at least one of the businesses is licensed. Marketing: An index of marketing initiatives during the last year, from zero (no initiatives) to one (initiatives on three dimensions). Business knowledge: Test of business skills, share of correct answers. Working hours: Working hours per week. Age: The age of the entrepreneur, in number of years. Education: Number of years of schooling. Muslim: Indicator variable taking the value one if the entrepreneur is Muslim.

Table 2 shows the correlation between profits and a set of business indicators and business characteristics. We show these correlations for the whole sample (column (1)), divided by gender (columns (3) and (4)), and divided by formal status (columns (5) and (6)).

For the whole sample (column (1)), we can see that profits are positively and statistically significant correlated with investments, loans, level of service, commerce as sector of activity, working hours, number of employees, formal sector, and male entrepreneurs. If we look at the female entrepreneurs (column (2)), we have that the same pattern holds, with the exception of formality that is now not statistically significant. In turn, for male entrepreneurs (column (3)) the same pattern holds with the exception of investments that are now not statistically significant, service that is now negative but statistically insignificant, business knowledge that is now statistically significant with a positive impact on profits, and working hours that are now not statistically significant. This last result seems worth highlighting, since it shows that male entrepreneurs, contrary to female entrepreneurs, are clearly not time-constrained.

In terms of formality, we have the following. For formal entrepreneurs (column (4)), the following variables have a positive and statistically significant impact on profits: loans, service and commerce sectors, number of employees, and level of education. In turn, there is a negative and statistically significant correlation between profits and female entrepreneurs. For informal entrepreneurs (column (5)), the same pattern arises with the exception that now investments have a positive and statistically significant effect, the service sector is no longer statistically significant, working hours have now a positive and statistically significant impact, which is also the case for business knowledge

Table 2: Correlates of Profits

	(1) Profit	(2) Profit, Females	(3) Profit, Males	(4) Profit, Formal Entrepreneurs	(5) Profit, Informal Entrepreneurs
Investments	0.000** (0.000)	0.000** (0.000)	0.000 (0.000)	0.000 (0.000)	0.000*** (0.000)
PRIDE-Loan	0.000*** (0.000)	0.000** (0.000)	0.001*** (0.000)	0.001* (0.000)	0.000*** (0.000)
Service	0.136** (0.065)	0.177** (0.080)	-0.007 (0.127)	0.264* (0.151)	0.093 (0.072)
Commerce	0.471*** (0.074)	0.437*** (0.090)	0.516*** (0.125)	0.568*** (0.167)	0.437*** (0.080)
Working Hours	0.003*** (0.001)	0.004*** (0.001)	0.001 (0.002)	-0.003 (0.002)	0.005*** (0.001)
Employees	0.128*** (0.030)	0.125*** (0.041)	0.128*** (0.036)	0.112*** (0.033)	0.134*** (0.038)
Education	0.010 (0.011)	0.005 (0.013)	0.015 (0.019)	0.053** (0.022)	-0.005 (0.012)
Business Knowledge	0.241 (0.181)	0.077 (0.225)	0.516* (0.300)	-0.246 (0.401)	0.367* (0.200)
Formal	0.176** (0.071)	0.097 (0.093)	0.293*** (0.110)		
Female	-0.107* (0.061)			-0.293** (0.132)	-0.044 (0.070)
Constant	11.635*** (0.210)	11.701*** (0.239)	11.397*** (0.381)	12.417*** (0.465)	11.508*** (0.223)
Observations	644	422	222	142	502
R ²	0.189	0.166	0.254	0.256	0.177

Table 3 presents other correlates of business practices, besides those related to profits¹¹. We can see that investment is positively and statistically significant correlated with having a formal activity, being active in the service sector, having more employees, and being a male entrepreneur. In turn, loans are positively and statistically significant correlated with having a formal activity and working fewer hours (showing substitutability between capital and labor). Working hours are positively and statistically significant correlated with formal activity, lower loans (again showing substitutability between capital and labor), being active in the service sector, having more years of education, and being a male entrepreneur. Business knowledge, in turn, is negatively and statistically significant correlated with being active in the commerce sector, level of education, and being a female entrepreneur. Education is negatively and statistically significant correlated with the formal sector, being active in the service sector, and business knowledge, but positively and statistically significantly correlated with working hours. Finally, formality is positively and statistically significantly correlated with loans, investments, working hours, and negatively and statistically significantly correlated with the service sector, and the level of education.

¹¹ In appendix, we show the correlates of working hours by gender.

Table 3: Correlates of Business Practices

	(1)	(2)	(3)	(4)	(5)	(6)
	Investment	PRIDE- Loan	Working Hours	Business Knowledge	Education	Formal
Formal	92.739* (50.309)	52.172** (24.006)	11.830*** (2.723)	-0.015 (0.015)	-0.943*** (0.294)	
PRIDE-Loan	0.052 (0.092)		-0.009** (0.005)	0.000 (0.000)	-0.000 (0.000)	0.000** (0.000)
Service	140.577** (62.317)	27.692 (21.679)	10.376*** (2.640)	-0.010 (0.015)	-0.515* (0.284)	-0.067* (0.038)
Commerce	-27.643 (59.721)	37.043 (22.677)	3.812 (2.503)	-0.038** (0.015)	-0.139 (0.256)	-0.017 (0.038)
Working Hours	0.005 (0.969)	-0.702** (0.350)		0.000 (0.000)	0.013*** (0.004)	0.003*** (0.001)
Employees	56.166** (26.278)	4.936 (6.682)	-0.973 (0.619)	0.006 (0.005)	0.030 (0.066)	0.031** (0.013)
Education	-8.171 (9.360)	-1.695 (3.600)	1.326*** (0.426)	-0.007*** (0.002)		- 0.021*** (0.006)
Business Knowledge	-58.379 (127.695)	92.019 (62.792)	9.166 (6.553)		-1.985*** (0.681)	-0.096 (0.100)
Female	-96.866* (54.446)	0.457 (21.510)	-9.128*** (2.349)	-0.027* (0.014)	-0.308 (0.245)	-0.010 (0.036)
Investments		0.011 (0.021)	0.000 (0.003)	-0.000 (0.000)	-0.000 (0.000)	0.000* (0.000)
Constant	189.970 (175.139)	702.270*** (60.378)	54.024*** (7.479)	0.734*** (0.033)	6.575*** (0.694)	0.116 (0.113)
Observations	644	644	644	644	644	644
R ²	0.082	0.025	0.087	0.040	0.058	0.076

We now present some experimental evidence using the theoretical model as guidance. In particular, we focus on the second and fifth implications of the theoretical model. The second implication of the model says that we should expect interventions that improve entrepreneurs' access to capital and ability to have a strong impact on the informal sector. The fifth implication of the model, in turn, says that such interventions might not have any impact on time-constrained females. However, for females that are not time-constrained the intervention can even have a strong impact.

We start by looking to the fifth implication. Table 4 shows treatment effects for the full sample (column (1)), as in Berge et al. (2014). In turn, columns (2) to (7) show treatment effects according to the working hours that entrepreneurs dedicate to their businesses. We can see that for the full sample the intervention only had an impact for male entrepreneurs that received both the business grant and the business training. In turn for female entrepreneurs there was no impact. The same result is true for entrepreneurs that work more than 30 hours, 40 hours, and 60 hours a week. However, for entrepreneurs that work more than 70 hours a week the impact of the business training and business grant is similar for male entrepreneurs and female entrepreneurs. Moreover, for entrepreneurs that work more than 80 hours a week the result is reverse in the sense that now there are no statistically significant effects for male entrepreneurs but there are positive, large, and statistically significant effects on female entrepreneurs. This shows that for female entrepreneurs that are not time-constrained, business training and business grants can have a positive and large impact.

Table 4: Treatment Impacts and Working Hours

	(1) Original Estimates	(2) Working Hours >30	(3) Working Hours >40	(4) Working Hours >50	(5) Working Hours >60	(6) Working Hours >70	(7) Working Hours >80
Training & Male	0.128 (0.147)	0.079 (0.155)	0.062 (0.163)	0.020 (0.194)	0.024 (0.223)	0.083 (0.257)	-0.127 (0.356)
Grant & Male	0.080 (0.140)	0.038 (0.147)	0.079 (0.148)	0.105 (0.167)	0.195 (0.176)	0.085 (0.261)	0.006 (0.332)
Training + Grant & Male	0.501*** (0.168)	0.418** (0.184)	0.317* (0.190)	0.284 (0.205)	0.462** (0.224)	0.513* (0.267)	0.513 (0.317)
Training & Female	0.035 (0.121)	0.065 (0.134)	0.040 (0.135)	0.010 (0.153)	0.031 (0.164)	0.072 (0.187)	0.215 (0.230)
Grant & Female	0.072 (0.132)	0.265* (0.136)	0.269* (0.138)	0.079 (0.147)	0.187 (0.170)	0.074 (0.189)	0.312 (0.245)
Training + Grant & Female	0.059 (0.132)	0.169 (0.148)	0.171 (0.155)	0.135 (0.170)	0.262 (0.206)	0.433* (0.220)	0.742*** (0.268)
Observations	602	511	472	399	333	266	187
R ²	0.241	0.243	0.278	0.319	0.349	0.331	0.400

Table 5, in turn, shows the impact of the intervention based on formality. We can see that for the full sample the business training and the business grant have a positive and statistically significant impact. However, if we divide the sample between the entrepreneurs that are formal and informal, we have that the intervention only has a positive and statistically significant effect for informal entrepreneurs. This shows, as predicted by our model, that the intervention is more valuable for the entrepreneurs that are more capital and ability constrained.

Table 5: Treatment Impacts and Formality

	(1) Full Sample	(2) Informal Entrepreneurs	(3) Formal Entrepreneurs
Training	0.092 (0.094)	0.088 (0.106)	0.074 (0.217)
Grant	0.089 (0.101)	0.085 (0.121)	0.065 (0.235)
Training + Grant	0.194* (0.102)	0.242** (0.117)	0.034 (0.220)
Observations	602	464	138
R ²	0.191	0.185	0.264

7. Concluding remarks

In this paper, we have presented an entrepreneurship model where entrepreneurship is made up of three dimensions: capital investment, ability, and labor investment. We show that when entrepreneurs are constrained along these dimensions and only two of these dimensions are lifted, say ability (via business training) and capital (via business grants), entrepreneurs that are time-constrained might still not be able to grow.

We then argue that in many (but not only) developing countries, female entrepreneurs are often constrained with respect to the time they can dedicate to their businesses, due in particular to domestic obligations.

We then present some evidence that confirms the main predictions of the theoretical model. In particular, using experimental evidence from an intervention in a microfinance institution in Tanzania, we show that business training and business grants only had a positive impact on women if they were not time-constrained.

The question that arises is whether female entrepreneurs that are not time-constrained are essentially different from female entrepreneurs that are time-constrained. We may think, for example, that the more motivated female entrepreneurs self-select into being non-time-constrained female entrepreneurs. In this situation, these non-time-constrained female entrepreneurs could be labeled as high power female entrepreneurs, while the time-constrained female entrepreneurs could be labeled as survival female entrepreneurs. Alternatively, it can be argued that the female entrepreneurs that are not time-constrained simply do not face these restrictions. For instance, it might be the case that female entrepreneurs that are not time-constrained are not married, or do not have children, or that their household is quite equal in terms of gender rights.

Also, our empirical results show that entrepreneurial intervention can have large effects on informal entrepreneurs, since these are more constrained in

terms of access to capital and business ability. The question of self-selection arises, however, once again. Is it so that formal entrepreneurs are more motivated, or that informal entrepreneurs face constraints that are very difficult to overcome? Answering these questions is central to promoting entrepreneurship in developing countries, and we believe that this represents opportunities and challenges for future work.

8. Appendix

Table A1. Hours – by gender

	(1) Hours b/se	(2) Hours Female sample b/se	(3) Hours Male Sample b/se
Dummy if at least one bus. has a license 08	9.284*** (2.972)	11.256*** (3.904)	5.973 (4.326)
Investments08(in 1000TZS)	0.000 (0.003)	-0.001 (0.004)	0.001 (0.004)
Loan at PRIDE 08(in 1000 TZS)	-0.009* (0.005)	-0.008 (0.006)	-0.009 (0.007)
Dummy for service bus.08	9.870*** (2.700)	11.505*** (3.361)	7.119 (4.401)
Dummy for commerce bus.08	3.769 (2.552)	5.301 (3.466)	1.359 (3.967)
No. of paid employees08	-0.896 (0.634)	-0.895 (0.694)	-0.848 (1.372)
Years of education	-0.808 (0.602)	-0.937 (0.735)	-0.515 (1.048)
Business Knowledge08	8.411 (6.741)	15.581* (8.740)	-1.675 (10.493)
Female	-9.486*** (2.384)		
Constant	68.745*** (7.263)	52.817*** (8.841)	76.796*** (11.941)
Observations	644	422	222

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In this paper, we analyze two puzzles on entrepreneurship and gender. First, a number of field experiments in developing countries on business training and business grants have shown that it is very difficult to raise entrepreneurial outcomes for female entrepreneurs. Second, women tend to be over-represented in the informal sector in developing countries, and in particular in microfinance institutions. We present a simple model of entrepreneurship that aims to explain these two puzzles. In the model, entrepreneurship arises from the interaction of ability, access to capital and labor investments. To this, we add two social norms that are widespread in developing countries (but not only): women have domestic obligations that restrict the time they can dedicate to their businesses (while men do not); and women have less access to capital than men. Consequently, women self-select into the informal sector since it requires less capital and labor investment. The model also indicates that raising entrepreneurial capabilities of time-constrained women in just one or two dimensions, like ability (via business training) and capital (via business grants), might not be sufficient to promote entrepreneurial success. We present evidence that supports these hypotheses using data from a field experiment in Tanzania with microfinance clients.

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