

Business Skills, Capital and Control Constraints in Small Enterprise Development: Midterm Results from an Experiment in Uganda¹

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Preliminary results, please do not disseminate

Abstract:

Recent research suggests that small enterprises face a number of challenges to growth, including lack of skills, capital constraints and poor self-control. This paper presents the results of a randomized experiment involving micro-enterprise owners in central and northern Uganda to determine the constraints to growth. Among a pool of business owners that expressed interest in expanding their enterprises, individuals were randomly selected to receive business skills training, loans, cash grants or a combination of these programs. They were then followed quarterly for one year to determine the effects on business and household outcomes. This is, to the author's knowledge, the first experiment conducted in which loans were randomly distributed in a population. The results are mixed. Male-owned businesses benefit from loans but not cash, and female-owned businesses, benefit only from cash grants. Consistent with other work on the role of family pressure in developing countries depressing economic returns, the results are sensitive to how close family members are: women without family members living nearby benefit from grants, loans and trainings, while women with family nearby do not benefit from any intervention and are significantly hurt by loans. There is no familial effect on men. Development of the market, individual ability or patience also have no effect on outcomes for men or women.

JEL codes: O12, O16, C93, J16, L26, M53

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1 Introduction

Small businesses are of vital importance in poor countries with limited formal employment options: sustaining these businesses is critical for household economic security and growing the businesses is key for employment generation and general economic growth. Recent research suggests small enterprises face a number of challenges to growth, including a lack of owner business skills, capital constraints and poor self-control. This paper presents the results of a randomized experiment with micro-enterprise owners in central and northern Uganda to determine the constraints to growth. Businesses were randomly selected to receive loans, cash grants, loans with business skills training or cash grants with business skills training. The businesses were followed quarterly for one year to determine the effect on a number of business and household outcomes.

The ILO conducted the training using their "Start and Improve Your Business" (SIYB) curriculum, a materials-based training program for established entrepreneurs who want to improve the management processes of their businesses. Cash grants were \$200 and unconditional, though the ILO agent who delivered the money instructed the recipient that the money should be used for the business. Loans were delivered by PRIDE Microfinance at a discounted interest rate of 20% and ranged from \$175 to \$225.

The sample selected here is different from the average business as participants were selected from a baseline and tracking survey after expressing interest in expanding their business, receiving ILO trainings and loans. Due to this focus, the businesses are directly comparable.

To improve on power, the businesses are being followed repeatedly for one year after the interventions. The results presented here represent the first follow-up, which was conducted 6 months after the intervention completion. A significant effort has also been made to reduce attrition rates, which are kept at 10% for the first round.

The effects of the different programs are divided across men and women. In a simple intention-to-treat analysis, men benefit from loans but not the grants or training, while women benefit from grants but not loans or training. The results do not divide along a number of pre-specified lines that are common in the literature. Market development does not seem to matter for the impact of

loans, while individual ability and patience don't affect any treatments. Consistent with a model of family pressure in developing countries depressing economic returns, the results are sensitive to how close family members are: women without family members living nearby benefit from grants, loans and trainings significantly, while women with family nearby do not benefit from any intervention and are significantly hurt by loans. There is no familial effect on men.

Unemployment and lack of formal sector jobs is a significant problem in Africa. Governments and international NGOs have thus begun focusing on small enterprise development to help spur job and wealth creation. However, as mentioned earlier, there is not much evidence on what helps businesses grow. The experiments described in this paper include a number of popular options employed by governments and NGOs to help business expansion.

This paper contributes to a number of literatures. First is the effect of human capital development on business outcomes. There is reason to believe business owners are missing a number of skills and leaving profits on the table. Bloom, , et al. (2013) test the effects of management services given to large Indian textile firms and find very large effects on firm outcomes. The majority of studies on small businesses, though, find positive effects of trainings only on knowledge and attitudes, with little or no effect on profits and sales (Cho , et al. 2012, Karlan and Valdivia 2006, Bjorvatn and Tungodden 2010, Gine and Mansuri 2011, Karlan, Knight and Udry 2012). The value of such trainings for existing small businesses is in doubt. The results obtained in this study largely confirm these findings, though only for the short run.

The second literature is the role of physical capital infusion for business growth. Male led firms have been observed to have high returns to cash transfers (de Mel, McKenzie and Woodruff 2008). While new female entrants have made good use of cash grants (Fafchamps , et al. 2012 and Blattman, Fiala and Martinez 2013), the results for female existing-business owners has not been positive. Fafchamps , et al. (2012) argue the lack on effect for women is due to self-control issues, not family pressure. Counter to this claim, I find large effects of cash grants on women who do not have family living nearby.

A third literature is the effect of microfinance on firm and household outcomes. Recent experimental studies have failed to find a positive business growth effect for microfinance (Banerjee , et al. 2013, Fischer 2012, Augsburg , et al. 2012). There also appear to be zero effects

on household consumption growth (Crepon , et al. 2011, Desai, Johnson and Tarozzi 2011, Angelucci, Karlan and Zinman 2013). I find some evidence of positive effects of microfinance in the short run, though the effects for women are negative when family pressure is too close.

Finally, I contribute to the literature on how the characteristics of entrepreneurs predict business outcomes. Recent research on firm owner deaths suggests that entrepreneurs have a big effect on the success of their business (Becker and Hvide 2013). I look at the effect of individual ability on business outcomes and find some small but important effects of individual characteristics on firm success.

This paper proceeds as follows. Section 2 discusses the context and interventions introduced. Section 3 discusses a model of investment choice with control constraints. In section 4, I present the experimental design. Section 5 describes the data and empirical strategy. The results are presented in Section 6. Section 7 concludes.

2 Model of Business Constraints

Small business owners face a number of constraints on expansion of their enterprises. In this section, I discuss some of the theoretical concerns with regard to business expansion and discuss why we might expect differential returns between men and women from grants and loans. I discuss this in the framework of a model that incorporates individual ability, patience and family pressure.

Consider an entrepreneur that owns a business with a production function that faces decreasing returns to scale. The entrepreneur has a time discount rate that determines how patient she is to realize returns in the business. The entrepreneur also has a family who can produce either pressure to spend capital in the family or support to the business through labor. The business is operated in a market where transport costs are high enough that most trade happens within a specific radius. There are no credit and savings constraints, though interest rates for loans and family pressure on savings are both high. Savings though cannot be used to obtain a market interest rate due to lending constraints, specifically concerns about repayment. Finally, due to

social norms, the gender of the entrepreneur could be a constraint. In most societies in Africa, Asia and Latin America, men and women have strongly defined roles in the household. Men are relatively unconstrained to conduct business activities and can often take family members as workers and household cash for the business. Women are often very constrained. When they are able to work outside the home, they are often still responsible for household chores, spending on family needs such as clothing, schooling and health, and are last to be able to use household assets for the business.

If the entrepreneur does not face time, family, gender or market constraints, she will invest into the business until the marginal rate of return on investment is equal to the market interest rate. If the market interest rate is very high, as is often the case in developing countries, then this investment will still be optimal given the market conditions, though investment will be relatively low. I next look at how each of the possible constraints described here, time, family, gender, market and credit, can affect business returns.

Time constraints mean that a business owner is not able to wait for the returns to her business and so cannot invest optimally. Impatience would thus result in income being spent for short-term goals rather than long term investment. Empirically this can be hard to measure as schooling and health spending could be used as long-term investment in individuals or as a misuse of cash on hand.

Family constraints, likewise, could lead to suboptimal investment if money is being spent not for the business but on the needs of the household. Extended family can also put pressure on cash in some societies where communities expect that people not just support their immediate family but also siblings and cousins.

Family can also help increase investment in a business. Families can provide household assets, such as cash, tools and labor. Obtaining access to these can be difficult in some families, while in others they are considered natural to use in the business.

Market constraints exist in a number of forms. In older, more developed markets where there are high levels of competition, there may be little return to investment as expansion may mean new competitors that have more experience. In this case, small-scale businesses that are highly

specialized may perform better. Newer markets may then have greater room for expansion and growth, though access to clients may be difficult. In markets where transportation costs are very high, trading will be concentrated closely around the market, meaning there is also less room for expansion. This problem is more likely to arise in newer markets where trade has not happened until recently. There may also be high market segregation based on individual characteristics such as gender and ethnicity, where one group does not want to trade with another. This could then further restrict the ability to expand.

Credit constraints exist in different extents dependent on the ability of individuals to access extant credit markets. In markets where interest rates are high, optimal investment may mean there is no business expansion for most businesses. In cases where collateral conditions are very high, people may not have access to the assets necessary to obtain credit.

Gender cuts through each of the above-mentioned constraints. Family pressure for women is normally much higher than for men. If there is a bias toward male sellers or if the market is difficult to operate in due to family constraints, markets can also be difficult for women. Credit constraints can also be more onerous for women if they are not able to exert enough control over savings or household assets that could be used for collateral.

The model of business development outlined in this section presents some direct hypotheses that can be tested in the context of the experiment presented here. The model first suggests that if patience is a problem for people, it should be negatively correlated with outcomes. Family constraints are likely high for women while low or even positive for men. Market development could be important, especially if there are high transportation or transaction costs or extremely decreasing returns to capital. Relieving onerous credit constraints would help increase investment. For most of these, we would expect very different outcomes for men and women.

3 Experimental Design

The experiment was designed as a multi-arm experiment in order to directly test the effect of different interventions on business outcomes. It was also divided across regions in order to test the effect of market development.

3.1 *The Interventions*

In the central region, individuals were randomly divided into six groups: (1) those who were offered a cash grant of \$200, (2) those who were offered a loan of between \$175 and \$225, (3) those who were offered business skills training with a cash grant equal to \$200, (4) those who were offered business skills training and a loan of between \$175 and \$225 and (5) a control group. For the northern region, individuals were randomly divided into three groups: (1) those who were offered a loan of between \$175 and \$225, (2) those who were offered business skills training with a loan of between \$175 and \$225 and (3) the control group.

The ILO conducted the trainings using their Start and Improve Your Business (SIYB) training program. This very popular training program reached 4.5 million people in 100 countries from 2003 to 2010 (Lieshout, Sievers and Aliyev 2012). Researchers have evaluated the trainings experimentally twice before. First, Mano , et al. (2011) looked at the effect of giving training to 53 small business owners. In keeping with other training results, they found survival rates increased, as did business practices, but only a heterogeneity analysis showed effect on profit. de Mel, McKenzie and Woodruff (2012) also use the SIYB training on female business training and cash grant in Sri Lanka. They found no effect for those already in business for training, but some initial effect for the grants that disappears after the second year. There is also increased entry for those without business and some income growth.

A local microfinance organization, PRIDE Microfinance, provided the loans. Unknown to the participants, the loans were guaranteed by the ILO as the sample came from all businesses that expressed interest in a loan. These businesses may not have fit the lending requirements of PRIDE, and so a guarantee was decided upon to mitigate risk. PRIDE normally provides loans

with an interest rate of 26% and requires 100% collateral. Lenders reduced the interest rate to 20% and described as a special promotion to individuals. For those who were not able to provide 100% collateral, PRIDE agreed to accept 50% collateral instead. This special promotion was designed to encourage participation in the loan program and to reflect what a subsidized loan program would be like.

The ILO delivered the cash grants were through PRIDE bank accounts. The ILO then contacted individuals to attend information meetings explaining how the cash grant program would work. They were then asked to open a free savings account, where the money would be deposited. It is not possible as part of this design to separate the effect of savings accounts versus cash grants. As will be discussed in detail later, take-up for the grants was surprisingly not universal.

The trainings have thus been evaluated previously and have presented mixed results. It was decided not to pursue a pure training treatment arm, but instead use trainings as a potential augmenting effect on the use of cash grants and loans to test if training can increase the effects of decreasing capital constraints through better business management practices.

3.2 Market Development

There is also a significant difference across Uganda in terms of market development. From 1986 to 2007, a 20-year civil war between the Government of Uganda and rebels left the north of the country highly underdeveloped. Incomes and wealth are significantly lower in the north than in any other part of the country (Sewanyana 2010), and market structure is severely limited (Fiala 2010). Since 2007, the north has been experiencing a large amount of growth, with expanded trade from both Sudan (north of Uganda) and the capital to the south helping to fuel this expansion. Increased income has also meant increased interest in market interactions, with the main trading town in the north, Gulu, experiencing significant growth.

In contrast, the central region has experienced 25 years of peace. Economic and market growth has been steady throughout this time period. The businesses are also larger, and the owners are

more likely to report having accessed a loan in the past. I take advantage of this difference in market development to test the differential effect of business expansion programs.

3.3 Selection

Businesses in both regions were selected through a listing exercise. Approximately 3,200 businesses in the central region and 1,400 businesses in the northern region were surveyed quickly to gather information on entrepreneur ability, size of business and demographics of the owners. The selection of the final businesses to be in the samples was based on the criteria of desire to grow and interest in the ILO training and loan program. After the baseline, 2,400 business owners met these criteria. Due to contracting delays with the implementing organizations, a second baseline survey was conducted to determine if individuals were still interested in the programs, further reducing the sample to 1,600 individuals. Individuals were then randomly selected and split into the seven categories.

This selection was done to ensure each arm of the study is fully comparable. While this could lead to a select sample of business owners, it is a sample that is of immediate interest to researchers as I have eliminated businesses that are not interested in expansion and have expressed a willingness to use finance to do so.

4 Data

Data collections include a main baseline survey conducted in February 2012, followed by a smaller follow-up baseline in May 2012 that collected only information on interest in the programs and business revenues, expenses and profits. The interventions were then given to individuals from July to September 2012. A follow-up data collection was conducted in March 2013, and a total of three additional endline data collections are planned. This section first details the characteristics of the businesses as measured in the main baseline survey and tests the balance of characteristics for those selected into the different samples. I then discuss how these

businesses differ from other businesses in the same areas. I end by presenting attrition analysis on the first endline survey.

4.1 Baseline Data and Balance

Table 1 presents the summary statistics from the main baseline of the businesses and business owners that are included in the final sample. The business owners interviewed are more likely to be female (61%) than male and predominantly range in age from 24 to 35. The majority of business owners are also married (69%) and report being literate (77%). A significant number (26%) report having received some kind of business-skills training in the past.

The majority of businesses (67%) report having at least one employee and keep written records of some kind of their business (59%), though a significant number report only keeping the records “in their head” (32%). Average revenue in the last 4 weeks was 714,000 USH (approximately \$285), though this includes a significant amount of variation, with some businesses reporting exceptionally high revenues. Last month profits for the businesses averaged 300,000 USH (\$120) and showed a much lower variation, though there is still some.

Business owners were also asked a number of basic intelligence and ability questions. In a number recall question, enumerators read off a list of 8 numbers and asked owners to repeat the numbers back to them from memory. On average, the business owners were able to repeat 4 numbers back. Four math questions were also asked, though most business owners were able to respond correctly to them.

Before informing them of the intent of the survey to identify businesses that wanted loans and training, business owners were asked if they had ever taken loans (47% said yes). A range of assets questions were also asked with the intent of developing an asset index using principal component analysis. This is normalized at 0, and there is significant variation in the number of items people own.

The main benefit of a randomized design is the balance of characteristics between treatment and control samples. While it is impossible to comment on the balance of unobservable

characteristics, it is important to test for the balance of observable characteristics as these can be used as controls during the final analysis. The results of a balance test for each of the four arms of this study suggest that randomization worked well. In expectation, 10% of the variables should be significant at the 90% level or better. Of the 34 variables of interest collected during the baseline, 3 are significant for the grants only arm, 3 for grants and training, 2 for loans only and none for loans and training (table not shown). The variables that are significant are not critical variables for the analysis, though they are included in the analysis as controls.

4.2 *Selection into the Final Sample*

I drew the individuals that compromise the sample used for the experiment from those who expressed interest in both loans and trainings in the baseline and tracking surveys. This presents a select group of people. I next look at correlations between the interest of individuals in receiving the two interventions and some basic demographics. The analysis addresses the population in the tracking survey. The regression conducted on individual i uses OLS on the following model:

$$I_i = \alpha + \beta X_i + \gamma R + \varepsilon \quad (1)$$

Where I is a person's expressed interest in the program, X is a range of characteristics, R is a region dummy, and ε is the error term.

The results are not displayed here, but they suggest that an individual's interest in receiving a loan is not well correlated with sex, marriage status, literacy or revenue. It is positively correlated with broad age categories, suggesting that older business owners are more likely to want a loan, whether the person received training in the past, and the number of individuals the business employs. Also, individuals in Gulu are much more likely to be interested in loans, perhaps due to the newness of the markets, opportunities for expansion, and/or the lack of business loan options in the north.

While a causal argument cannot be made here, it appears that there are some broad conclusions that can be made about interest in loans. Interestingly, neither sex nor marriage status predicts

interest. Age and previous training is associated, which suggests that experience with the loan process may be important.

An individual's interest in training presents a contrasting story. Age, marital status, number of employees and revenue are not significantly related to interest. Being female and literacy level are both positively significant, but previous training and being from the north are both negatively associated. These correlations do not paint an especially clear picture of those interested in training, but clearly women and more educated people are interested in acquiring more skills.

4.3 First Endline Data Attrition

I made significant efforts to follow-up businesses for the endline data collection. Of the 1597 business owners we tracked for the first follow-up survey, we found 1437 (90%). Not all of the businesses we found were still in business. We thus have profit data on 1269 (79%) businesses. Table 2 presents the results of an attrition analysis on observable characteristics of individuals from the baseline survey to test for selection into attrition.

The results suggest that business characteristics do not matter for selection, though some individual characteristics do. Older people are more likely to be found, as well as those with more employees. People in both grants interventions were also easier to find. There is also significant selection into the districts. Buikwe, Jinja and Mukono (left out of the regression) are in the central region, while Gulu represents the northern region. As expected from issues encountered in the field, people were much easier to find in Buikewe, Jinja and Gulu than they were in Mukono.

The results suggest that the characteristics of businesses that we are most interested in do not predict attrition. There are still a number of potential unobservable characteristics that may predict attrition. To help minimize the effects of this selection, I conduct a bounding exercise in section 5.4 to test the strength of the results on different assumptions about the missing sample.

5 Results

To test the differential effects of each program, I run the following intention to treat (ITT) regression model:

$$Y_i = \alpha + \beta T + \gamma X_i + \delta R + \varepsilon \quad (2)$$

Where i refers to an individual, Y is the outcome of interest, T is a matrix of dummy variables for which treatment an individual belonged to, X is a matrix of individual controls, R is a region dummy, and ε is the error term.

There are also a number of pre-specified heterogeneity analyses that I will conduct. These include the differential sex, regions, ability and family pressure measures. The new ITT effects model is:

$$Y_i = \alpha + \beta T + \nu T \times H + \lambda H + \gamma X_i + \delta R + \varepsilon \quad (3)$$

Where again i refers to an individual, Y is the outcome of interest, T is a matrix of dummy variables for which treatment an individual belonged to, X is a matrix of individual controls, R is a region dummy, and ε is the error term. H is a heterogeneity measure of interest and is included both as a control and as an interaction term with treatment.

5.1 Take-Up

Take-up of training and loan programs have been problematic in the literature. This evaluation faced similar problems. Individuals in the sample come from people who answered yes to two questions: “The ILO is looking for people willing to take a class to help improve their businesses. It takes 5 days and is completely free. Would you be interested?” and “A local microfinance organization is looking for people who are interested in taking out loans to expand their businesses. These loans would be about 500,000 USH. Would you be interested?” These questions were asked twice, once during the baseline census and once during a quick mini

baseline follow-up survey. To be included in the sample, individuals had to answer yes to both questions both times they were asked.

Despite the indication of interest, only 71% of people invited to attend the trainings actually attended. This is similar to other studies, as summarized in McKenzie and Woodruff (2012). Out of 14 studies they survey, only 4 had attendance above 80%. Most vary from 39% to 75%. Bruhn and Zia (2012) and Valdivia (2012) worked only with businesses that expressed interest in training but only had attendance of 39% and 51%, respectively.

Take-up analysis for training is presented in Table 3, column 3. Only past experience with having attended trainings predicts whether the person attended the currently offered training. This is positive and very significant, suggesting that these people felt a strong interest in receiving more training. In addition to the quantitative differences between take-up, a qualitative follow-up survey identified a number of other reasons people did not take the loans. Most people reported that the time away from the business necessary for the training was too difficult for them. The ILO made efforts to schedule evening and half-day sessions, but this was still not going to work for some business owners.

Take-up was likewise problematic with loans. Of those who were offered the loans, 40% accepted. This is again similar to the literature on loan take-up, which finds lower than expected take-up after people have expressed interest. Karlan, Morduch and Mullainathan (2010) document a number of microfinance studies that have take-up rates of between 2% and 80%.

Table 2, column 1 presents the take-up analysis for the loans. Only age and district predict whether people took the loans. Older people were more likely, as were people in the central region. Qualitative evidence also suggests that the implementing agency did not do a sufficient job of reaching out to participants, who remained confused about the program.

Most surprising was that grant take-up was not universal. This was money that was to be given to the businesses without a repayment requirement and with no strings attached. Still, only 71% of those selected took the money. Table 2, column 2 presents the take-up analysis for the grants. Women are more likely to take the grants, while older people are less likely.

The qualitative evidence on grant take-up presents a cautionary tale for organizations interested in unconditional cash transfers. The ILO was to inform people of their selection to receive the grants. They decided to do this first by phone, which was not effective as people did not believe the caller. The ILO then organized information sessions, but people did not show up universally due to suspicions that the offer was not to be believed.

5.2 *Main Outcomes*

Table 4 shows the results of estimating Equation 2 for business profits. The equation is estimated first in columns 1 and 2 with and without controls on the full sample of businesses. The results for level profit effects are not statistically significant for the standard thresholds, though the effect of loans and training are nearly significant.

I then explore the differential returns for men and women by interacting the treatment dummies with whether the business owner is female in column 3. The effects of loans and loans with training on men is now statistically significant and large. These effects are offset entirely for women, suggesting there is no effect from the programs.

Columns 4 and 5 look at the effects of the program by splitting the sample between men and women respectively. The effects of loans and loans with training are still present for men. However, women now show a statistically significant effect for the grants with training.

The final columns in Table 4 repeat the analysis, but with the natural log of profits, rather than level effects. This means that businesses that reported 0 or negative profits have been dropped from the sample. Taking the log though helps with reducing the effect of outlier businesses. The results are much less significant, with only grants for women showing any significance.

In addition to profit outcomes, there were a number of other outcomes pre-specified as being of interest. These are presented in Tables 5A and 5B. There is some effect on business planning for men with loans only but not for any other program. There also appears to be a negative effect of the loans only and grants only program on whether men engage in marketing.

There is no effect of the programs on hours people worked, though there are some positive effects on the number of employees male run businesses employ. The effect on family employees is small and not significant.

The most interesting results come from whether the person engages in other work outside of the business and the total income from that work. For men, all of the programs increase the likelihood that they engage in other work beyond the business. This effect is not present for women. Interestingly, the total income from other work is negatively associated with the programs for men. The results suggest that men used the money they received to start or expand other businesses that appear to be less efficient than before there was investment.

The effect of the programs on value of stock and tools offers another clue as to why men did not benefit from the programs. Despite having received additional capital, treated men report having lower value of items on hand, again suggesting that they used the opportunity of the money to invest in other businesses.

The last three columns in Table 5B look at the effect of the programs on profits in normal, good and bad months in levels. Men report significant positive effects for all three from the loans and loans with training programs. The effect for women is 0 in all categories.

5.3 Region Effects

The design allows for a comparison of the effects of the programs across two different regions with very different market development. Table 6 presents the results by the different regions. The results of pooling the sample in columns 1 to 3 show no significant effect from the programs, nor any differential effects by region. Columns 4 and 5 separate the results between the central and northern regions. The central region results are consistent with previous findings: men benefit from the loans, while women benefit from the grants. As the northern region did not include a grant intervention, it is only possible to compare the results of loans and loans with training. The results are likewise significant and positive for men.

The final two columns look at central and northern effects with log profits and are consistent with other findings that loans helped men in the central and northern regions, while women benefited only from the grants.

Contrary to expectations, the results of regional effects suggest that there is not a differential effect of the program between the central and northern regions for loans, though there may be some differential effect of the training for men. Men in the northern region without training are not seeing a positive effect from the loans.

5.4 Family Effects

In order to test the effect of family pressure on outcomes, Tables 7A and 7B look at the effect of family member presence in the same district using level and log profits, respectively. The results are largely consistent across the two tables and suggest that family presence is driving the lack of results for women.

Column 1 of Table 7B looks only at outcomes for men when interacting the programs with a dummy of whether the business owner reported that family members live in the same district. The results do not change for men: loans and loans with training are both positively associated with returns.

Column 2 presents the results for women. There are now large, positive effects from loans with training, grants and grants with training. These results are all reversed when the woman reports having a family member close by. The effect of loans only when having close family members is in fact negative, suggesting that while loans alone may not have an effect on business outcomes for women, they can be in fact hurtful for women with family who is nearby.

The remaining columns in Tables 7A and 7B largely confirm the story presented above.

5.5 *Patience Effects*

To test the effects of individual patience levels on profit outcomes of businesses, Table 8 presents the results of interacting the different programs with a measure of patience, divided for men and women.

Columns 1 and 2 look at log profits effects for men and women, respectively. None of the results are now significant, though the signs are largely similar to previous results. There are no consistent results with interacting patience, except that patient men with grants are associated with lower profits. The effects for level profit levels in columns 5 and 6 show the familiar positive effects from loans and loans with training for men and positive effect of grants for women.

In columns 3, 4, 7 and 8 I include the interaction with family closeness along with patience. The results are consistent with the family only and patience only interactions: the effects for women are driven by closeness of family and are not important for men.

6 Conclusion

The problem of how to push businesses to expand, especially female-owned businesses, has been a pressing problem for researchers and policy makers. The experiment presents some evidence on why business owners fail to invest and expand, and what can be done to alleviate these problems.

Family pressure in developing countries has long been a problem for women. Keeping cash in hand is difficult when there is pressure to spend money on school fees, health care and funerals. The evidence presented here suggests that these pressures matter a lot for women who want to expand their business but have family members nearby asking for money. Unsurprisingly, men often do not face the same pressures.

Counter to other evidence on microfinance, loans have been shown here to have dramatic effects on business outcomes for men and women who do not have family members nearby. This result

is not being driven by market structure or individual characteristics. Why then might these results be so different than what has been found in the literature thus far?

The most likely reason is the selection of businesses in this sample. These are business owners who have expressed an interest in growing their businesses further. Most have had loans in the past but are clearly looking for additional credit to expand their businesses.

This study also looks closely at one of the major constraints to business expansion: family pressure. While the results suggest this is not a significant problem for men, the effect on women is clearly very large.

Finally, the results presented here suggest a mixed result from training. There is not a differential effect of training for men. There is though an important effect for women. Women who received loans only and have family close by are seeing much lower returns to their business, while those who also received training and have close family are experiencing little or no effects. The training appears to help counter the negative effects of family pressure, putting them back to the position of not having received any additional capital at all.

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Table 1: Summary statistics for baseline variables

Variable	N	Mean	Std. Dev.	Min	Max
Female	1579	0.611	0.488	0	1
Age 18-23	1584	0.119	0.324	0	1
Age 24-29	1584	0.336	0.472	0	1
Age 30-35	1584	0.292	0.455	0	1
Age 36-41	1584	0.133	0.339	0	1
Age 41-50	1584	0.121	0.326	0	1
Married	1580	0.690	0.463	0	1
Literate	1574	0.766	0.424	0	1
Previous training	1566	0.257	0.437	0	1
Employees	1567	0.665	1.335	0	23
Employees hours worked	1043	43.622	77.378	0	672
Does not keep records	1576	0.057	0.232	0	1
Keeps records on computer	1576	0.027	0.161	0	1
Keeps written records	1576	0.594	0.491	0	1
Keeps record in head	1576	0.317	0.466	0	1
Last month's revenue	1584	714,195	699,730	35000	3,000,000
Average months revenue	1563	1,087,282	5,753,165	3000	220,000,000
Last month's profit	1546	307,241	772,091	-40000	20,000,000
Average month's profit	1525	388,563	1,527,083	0	50,000,000
Stock value	1484	2,379,135	7,479,871	0	150,000,000
Value of liabilities	1147	177,263	712,057	-1000000	10,000,000
Longest string of numbers recalled	1570	4.108	2.105	0	8
Math questions answered correctly	1573	3.532	0.593	0	4
Had a loan previously	1570	0.473	0.499	0	1
Asset index	1536	0.000	1.620	-1.371	28.061

Table 2: Attrition analysis

Variables	Found
Female	0.173 [0.255]
Baseline age	0.119* [0.077]
Baseline married	-0.17 [0.293]
Baseline literacy	0.165 [0.364]
Baseline training	-0.062 [0.704]
Baseline employees	0.142* [0.050]
Baseline revenue	0 [0.569]
Baseline profits	0 [0.462]
Baseline number recall	-0.002 [0.967]
Baseline math score	0.124 [0.333]
Tracking revenue	0 [0.362]
Tracking profit	0 [0.766]
Baseline stock value	0 [0.962]
Baseline assets	-0.063 [0.116]
Loans only intervention	0.294 [0.140]
Loans and training intervention	0.158 [0.417]
Grants only intervention	0.867*** [0.003]
Grants and training intervention	0.439* [0.071]
Buikwe district	0.796*** [0.000]
Gulu district	0.714*** [0.000]
Jinja district	0.512* [0.066]
Observations	1,299

Table 3: Program take-up analysis

Variables	(1) Loans	(2) Grants	(3) Training
Female	-0.001 [0.970]	0.078 [0.134]	-0.007 [0.881]
Baseline age	0.032** [0.050]	-0.111*** [0.000]	0.020 [0.290]
Baseline married	0.038 [0.377]	-0.019 [0.712]	-0.049 [0.310]
Baseline literacy	-0.015 [0.753]	-0.067 [0.290]	-0.010 [0.854]
Baseline training	0.037 [0.374]	0.057 [0.334]	0.135*** [0.007]
Baseline employees	0.000 [0.982]	0.010 [0.585]	0.004 [0.834]
Baseline revenue	0.000 [0.655]	0.000 [0.182]	-0.000 [0.666]
Baseline profits	-0.000 [0.524]	-0.000** [0.034]	-0.000 [0.117]
Baseline number recall	-0.005 [0.572]	-0.002 [0.917]	0.013 [0.235]
Baseline math score	0.038 [0.258]	0.061 [0.224]	0.004 [0.915]
Tracking revenue	0.000 [0.698]	0.000 [0.727]	-0.000 [0.168]
Tracking profit	0.000 [0.881]	0.000 [0.379]	0.000 [0.533]
Baseline stock value	-0.000 [0.559]	-0.000 [0.370]	-0.000 [0.660]
Baseline assets	-0.008 [0.412]	0.005 [0.841]	0.032* [0.096]
Buikwe district	0.267*** [0.000]	0.092* [0.099]	0.039 [0.496]
Gulu district	-0.053 [0.229]		0.052 [0.340]
Jinja district	0.405*** [0.000]	0.083 [0.301]	-0.014 [0.878]
Observations	667	337	444
R-squared	0.119	0.103	0.053

Table 4: Outcomes on business profits

Variables	Pooled			Male	Female	Pooled			Male	Female
	Profits last month	Profits last month	Profits last month	Profits last month	Profits last month	Ln profits last month	Ln profits last month	Ln profits last month	Ln profits last month	Ln profits last month
Loans only	112,892.615 [0.210]	81,496.343 [0.354]	314,858.439** [0.029]	298,626.769 [0.142]	-52,987.157 [0.452]	0.004 [0.963]	0.034 [0.723]	0.154 [0.327]	0.179 [0.275]	-0.025 [0.828]
Loans and training	139,350.248 [0.127]	139,379.366 [0.115]	364,699.662** [0.011]	362,027.073* [0.073]	18,432.345 [0.795]	0.072 [0.464]	0.092 [0.336]	0.169 [0.283]	0.200 [0.221]	0.080 [0.501]
Grants only	89,002.364 [0.436]	60,408.293 [0.599]	-132,176.852 [0.477]	-269,411.674 [0.315]	218,401.957** [0.018]	-0.107 [0.389]	0.076 [0.544]	-0.144 [0.474]	-0.235 [0.271]	0.330** [0.034]
Grants and training	104,385.013 [0.330]	40,654.812 [0.710]	189,555.153 [0.257]	64,280.153 [0.789]	29,212.560 [0.745]	-0.186 [0.110]	0.020 [0.866]	0.104 [0.569]	-0.033 [0.867]	0.083 [0.584]
Loans only x female			-373,498.063** [0.040]					-0.196 [0.323]		
Loans and training x female			-361,194.103** [0.048]					-0.122 [0.539]		
Grants only x female			289,466.535 [0.206]					0.347 [0.163]		
Grants and training x female			-240,287.874 [0.254]					-0.137 [0.553]		
Female		-169,655.992** [0.011]	24,778.377 [0.857]				-0.266*** [0.000]	-0.202 [0.183]		
Controls	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Observations	1,228	1,108	1,108	430	678	1,225	1,132	1,132	442	690
R-squared	0.002	0.072	0.083	0.085	0.061	0.005	0.159	0.164	0.140	0.158

Table 5A: Full outcomes

Variables	Plan for business	Engages in marketing	Child missed school	Engages in other work	Total other income	Hours worked	Number of employees	Number of family employees
Loans only	0.057* [0.071]	-0.103* [0.087]	-0.005 [0.937]	0.100 [0.160]	-674,684.635** [0.017]	1.533 [0.661]	0.175 [0.291]	0.038 [0.641]
Loans and training	0.014 [0.664]	0.079 [0.194]	0.090 [0.159]	0.168** [0.018]	-537,269.314* [0.057]	3.943 [0.259]	0.398** [0.016]	0.133 [0.101]
Grants only	0.014 [0.734]	-0.162** [0.040]	0.103 [0.249]	0.222** [0.015]	-514,573.098 [0.159]	-1.511 [0.742]	-0.035 [0.870]	0.019 [0.855]
Grants and training	0.029 [0.449]	0.033 [0.636]	0.047 [0.543]	0.187** [0.023]	-648,888.209** [0.049]	0.117 [0.977]	0.288 [0.134]	0.141 [0.134]
Loans only x female	-0.033 [0.418]	0.109 [0.156]	0.067 [0.391]	-0.066 [0.463]	671,686.919* [0.061]	-0.179 [0.968]	-0.415** [0.047]	0.027 [0.789]
Loans and training x female	0.005 [0.900]	-0.026 [0.739]	-0.050 [0.520]	-0.153* [0.088]	570,541.239 [0.112]	-4.060 [0.362]	-0.545*** [0.009]	-0.102 [0.319]
Grants only x female	0.046 [0.374]	0.124 [0.204]	-0.116 [0.266]	-0.245** [0.030]	428,099.281 [0.341]	3.574 [0.527]	-0.306 [0.244]	-0.005 [0.969]
Grants and training x female	-0.009 [0.848]	-0.007 [0.941]	0.025 [0.789]	-0.069 [0.509]	574,966.917 [0.166]	5.294 [0.304]	-0.593** [0.015]	0.036 [0.764]
Observations	1,183	1,157	991	1,108	1,108	1,126	1,108	1,108
R-squared	0.022	0.082	0.053	0.051	0.023	0.031	0.219	0.052

Table 5B: Full outcomes continued

Variables	Value of stock	Value of tools	Revenue last month	Expenses last month	Profits last month	Profits in a normal month	Profits in a good month	Profits in a bad month
Loans only	1123213.814 [0.230]	-650,393.321* [0.090]	104,860.995 [0.848]	-378,361.374 [0.124]	314,858.439** [0.029]	289,679.829 [0.130]	252,706.006 [0.364]	126,773.581* [0.080]
Loans and training	-700,596.022 [0.457]	-788,404.382** [0.041]	1816578.775*** [0.001]	310,136.321 [0.211]	364,699.662** [0.011]	662,552.246*** [0.001]	595,793.254** [0.033]	146,491.178** [0.042]
Grants only	-3198894.335** [0.011]	-1395732.711*** [0.007]	-865,436.056 [0.226]	-645,842.009** [0.044]	-132,176.852 [0.477]	-256,192.755 [0.305]	-316,807.672 [0.385]	-91,958.468 [0.332]
Grants and training	-858,215.225 [0.442]	-1025937.949** [0.023]	83,419.270 [0.897]	-100,891.241 [0.727]	189,555.153 [0.257]	160,359.167 [0.473]	99,474.517 [0.761]	114,908.116 [0.178]
Loans only x female	-1238150.475 [0.291]	214,254.418 [0.664]	-404,336.851 [0.561]	348,421.526 [0.263]	-373,498.063** [0.040]	-438,799.166* [0.070]	-461,672.945 [0.190]	-145,022.108 [0.115]
Loans and training x female	924,066.204 [0.433]	446,986.885 [0.365]	-1853441.015*** [0.008]	-114,186.280 [0.716]	-361,194.103** [0.048]	-760,722.997*** [0.002]	-739,534.562** [0.036]	-137,380.569 [0.134]
Grants only x female	4301143.756*** [0.005]	941,541.253 [0.149]	1005878.526 [0.254]	775,635.495** [0.049]	289,466.535 [0.206]	272,881.933 [0.375]	370,771.053 [0.408]	253,611.236** [0.030]
Grants and training x female	1768858.894 [0.199]	678,696.222 [0.249]	5,712.636 [0.994]	489,439.895 [0.178]	-240,287.874 [0.254]	-361,973.660 [0.198]	-160,348.992 [0.696]	-85,716.794 [0.423]
Observations	1,084	913	1,135	1,117	1,108	1,139	1,147	1,085
R-squared	0.278	0.099	0.060	0.065	0.083	0.107	0.091	0.087

Table 6: Profit outcomes by region

Variables	Pooled region			Central region	Northern region	Central region	Northern region
	Pooled gender	Male	Female	Pooled gender	Pooled gender	Pooled gender	Pooled gender
	Profits last month	Profits last month	Profits last month	Profits last month	Profits last month	Ln profits last month	Ln profits last month
Loans only	-32,398.927 [0.793]	61,415.397 [0.839]	-59,310.859 [0.539]	529,201.564** [0.018]	74,532.882 [0.606]	0.373* [0.089]	-0.028 [0.896]
Loans and training	105,517.949 [0.393]	356,144.413 [0.239]	-13,482.777 [0.888]	378,720.774* [0.095]	378,307.081*** [0.009]	0.168 [0.455]	0.295 [0.172]
Grants only	116,544.860 [0.365]	-209,616.782 [0.469]	236,113.249** [0.026]	-140,649.452 [0.555]		-0.222 [0.342]	
Grants and training	97,677.560 [0.431]	129,669.738 [0.626]	47,173.208 [0.649]	157,449.697 [0.471]		0.040 [0.854]	
Loans only x female				-532,927.942* [0.070]	-130,199.096 [0.461]	-0.483* [0.092]	0.085 [0.747]
Loans and training x female				-314,202.602 [0.290]	-386,206.927** [0.028]	-0.206 [0.480]	-0.138 [0.601]
Grants only x female				414,764.265 [0.179]		0.473 [0.117]	
Grants and training x female				-92,306.113 [0.749]		-0.026 [0.929]	
Loans only x central region	229,543.439 [0.194]	441,351.934 [0.278]	18,316.370 [0.898]				
Loans and training x central region	74,067.992 [0.678]	-18,410.788 [0.964]	69,542.773 [0.628]				
Observations	1,108	430	678	699	409	715	417
R-squared	0.073	0.090	0.061	0.073	0.200	0.172	0.156

Table 7A: Level profit outcomes by distance from family

Variables	Male Pooled Profits last month	Female Pooled Profits last month	Male Far family Profits last month	Male Close family Profits last month	Female Far family Profits last month	Female Close family Profits last month
Loans only	294,009.041 [0.366]	62,697.974 [0.561]	268,029.790 [0.536]	234,005.217 [0.184]	52,315.648 [0.663]	-122,174.613 [0.152]
Loans and training	439,591.723 [0.183]	197,523.324* [0.075]	419,851.877 [0.340]	285,526.853* [0.092]	197,925.259 [0.110]	-103,204.374 [0.218]
Grants only	-247,058.920 [0.501]	336,928.205*** [0.006]	-380,662.086 [0.444]	-216,878.993 [0.434]	355,842.380** [0.011]	133,701.537 [0.298]
Grants and training	198,001.446 [0.577]	185,346.559 [0.118]	70,236.529 [0.883]	-44,524.646 [0.843]	183,081.222 [0.174]	-172,756.746 [0.174]
Loans only x close family	-22,477.990 [0.957]	-193,083.150 [0.177]				
Loans and training x close family	-140,675.371 [0.736]	-296,658.572** [0.040]				
Grants only x close family	-68,054.088 [0.900]	-209,039.456 [0.239]				
Grants and training x close family	-251,663.033 [0.602]	-312,240.460* [0.073]				
Close family	-124,489.830 [0.706]	118,060.513 [0.278]				
Observations	428	674	190	238	324	350
R-squared	0.091	0.071	0.117	0.159	0.091	0.090

Table 7B: Ln profit outcomes by distance from family

Variables	Male Pooled	Female Pooled	Male Far family	Male Close family	Female Far family	Female Close family
	Ln profits last month	Ln profits last month	Ln profits last month	Ln profits last month	Ln profits last month	Ln profits last month
Loans only	0.386 [0.155]	0.195 [0.286]	0.423 [0.152]	0.120 [0.577]	0.192 [0.330]	-0.213 [0.156]
Loans and training	0.473* [0.086]	0.456** [0.015]	0.457 [0.128]	0.041 [0.843]	0.484** [0.017]	-0.161 [0.277]
Grants only	-0.134 [0.664]	0.574*** [0.006]	-0.138 [0.686]	-0.395 [0.242]	0.612*** [0.008]	-0.000 [0.999]
Grants and training	0.230 [0.438]	0.281 [0.163]	0.199 [0.538]	-0.345 [0.213]	0.334 [0.131]	-0.295 [0.189]
Loans only x close family	-0.282 [0.419]	-0.406* [0.093]				
Loans and training x close family	-0.414 [0.234]	-0.620** [0.011]				
Grants only x close family	-0.272 [0.546]	-0.545* [0.069]				
Grants and training x close family	-0.579 [0.153]	-0.483 [0.102]				
Close family	0.247 [0.370]	0.294 [0.111]				
Observations	426	673	189	237	323	350
R-squared	0.130	0.130	0.186	0.112	0.106	0.193

Table 8: Profit outcome by patience levels

Variables	Male	Female	Male	Female	Male	Female	Male	Female
	Ln profits last month	Ln profits last month	Ln profits last month	Ln profits last month	Profits last month	Profits last month	Profits last month	Profits last month
Loans only	0.427 [0.241]	-0.149 [0.559]	0.613 [0.141]	0.157 [0.575]	600,088.034 [0.168]	-156,182.958 [0.297]	577,638.465 [0.248]	-47,426.981 [0.775]
Loans and training	0.404 [0.263]	-0.184 [0.476]	0.638 [0.125]	0.184 [0.524]	637,177.407 [0.140]	-97,671.311 [0.520]	692,436.943 [0.165]	72,897.392 [0.669]
Grants only	0.322 [0.484]	0.164 [0.601]	0.523 [0.313]	0.467 [0.172]	5,647.456 [0.992]	403,464.530** [0.029]	60,382.782 [0.922]	527,938.355*** [0.009]
Grants and training	0.270 [0.522]	-0.214 [0.483]	0.604 [0.208]	0.066 [0.845]	-127,197.726 [0.801]	-123,506.067 [0.486]	-5,839.886 [0.992]	46,178.710 [0.815]
Loans only x close family			-0.258 [0.463]	-0.417* [0.089]			-4,708.735 [0.991]	-199,545.988 [0.168]
Loans and training x close family			-0.415 [0.238]	-0.636** [0.010]			-149,258.706 [0.723]	-304,167.046** [0.037]
Grants only x close family			-0.360 [0.431]	-0.563* [0.062]			-105,767.261 [0.847]	-232,992.281 [0.191]
Grants and training x close family			-0.594 [0.145]	-0.485 [0.103]			-228,589.607 [0.638]	-319,034.457* [0.069]
Close family			0.243 [0.380]	0.315* [0.090]			-131,318.347 [0.692]	126,370.094 [0.248]
Loans only x patient	-0.084 [0.484]	0.025 [0.766]	-0.090 [0.455]	0.012 [0.890]	-118,459.186 [0.407]	38,310.209 [0.442]	-115,779.224 [0.422]	41,825.971 [0.407]
Loans and training x patient	-0.076 [0.531]	0.100 [0.241]	-0.065 [0.589]	0.106 [0.215]	-114,642.184 [0.427]	43,817.479 [0.382]	-105,370.017 [0.469]	47,950.996 [0.342]
Grants only x patient	-0.240 [0.119]	0.043 [0.672]	-0.243 [0.119]	0.042 [0.681]	-105,834.551 [0.566]	-67,365.501 [0.262]	-114,381.709 [0.540]	-66,004.689 [0.274]
Grants and training x patient	-0.139 [0.329]	0.089 [0.386]	-0.145 [0.311]	0.083 [0.417]	75,994.828 [0.654]	60,440.374 [0.312]	75,265.971 [0.659]	55,851.505 [0.354]
Observations	425	671	423	667	427	672	425	668
R-squared	0.132	0.128	0.139	0.136	0.094	0.073	0.100	0.083

