

Is the household a constraint for female entrepreneurs in poor countries?

A field experiment in Tanzania

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Abstract

This master's thesis analyzes whether the household is a constraint on married female entrepreneurs, relative to male entrepreneurs. The research is based on an experiment conducted in Tanzania by NHH using PRIDE microfinance clients, and the data comes from the corresponding surveys attached to said experiment. My hypothesis is that the household is a larger constraint to the businesses of married females than it is for the businesses of married male entrepreneurs, and that this constraint is what prevented their businesses from experiencing the positive benefits associated with the business training from the experiment. Using economic theory from household decision-making models, I show how theoretically, women could be disempowered in the decision-making process and even potentially penalized if or when their business does well. The quantitative and qualitative data from the surveys reinforce this theory, as the household constraint is illustrated from the questions and data using the proxy indicators of a time constraint and a decision-making constraint. They show that the household is a greater constraint for women than it is for men, and that the training does not relax this constraint, meaning that the household is a significant and possibly primary constraint on the businesses of married female entrepreneurs. This is crucial in explaining the lack of positive effects from the training on the businesses of married women.

Preface

The irony of being a single, western, male student, writing and hypothesizing about married, African, female entrepreneurs, is not lost on me. However this thesis has been in the works for many years, and is the culmination of a distinct chapter in my life. It all began in the fall of 2006, during my junior year at St. Olaf College, in the small town of Northfield, MN. James Hosea visited and gave a presentation on NHH and the different programs and degrees they offered. This made a big impression on me; however it remained in my mind only a very distant possibility to pursue. After graduating and working in the corporate world for a couple years, I decided to relook at going for my Master's degree. It was then that I first found out about the on-going research experiment that Bertil Tungodden and Kjetil Bjorvatn were conducting in Tanzania. After coming to Norway, Bertil and Kjetil graciously invited me onto the team, and last summer (2011) I went down to Tanzania to help conduct the last follow-up survey for the experiment. The data collection process in the field was an invaluable experience. Being able to see hundreds of the businesses of microfinance clients and extensively interview them first-hand is an experience that only few researchers ever have. Being one of those few, I feel it is my responsibility to share those insights and stories, in the hopes that from this, we can tailor our aid, education, policies, and financing to better fit the realities of their situations.

This thesis has been both a challenging and rewarding process. There are a few people in particular who I am indebted to for their assistance, advice, and encouragement along the way: My supervisors, Bertil Tungodden and Kjetil Bjorvatn, for their constant guidance during the often tedious thesis writing process, and for bringing me on board the experiment; Their colleagues, Lars Ivar Oppedal Berge and Erik Sørensen, for lending me their expertise and help along the way; My Norwegian team members down in Tanzania, Jonas, Martin, Sara, Bjørg, Fredrik, and my brother Jonathon, for making that trip such a memorable time; In addition, to my Tanzanian team members, for your patience in translating for us and sharing your knowledge and expertise with us.

Asante sana. Mpaka baadaye, kwaheri.

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1. Introduction

“Human beings are endowed with endless potential. Society simply had not given these individuals the opportunity to scratch the surface of their potential. We concluded right from the beginning that all human beings are entrepreneurs—but only some lucky ones have found out.”¹ With this philosophy, Muhammad Yunis has catapulted microfinance to the forefront of economic development discussions, and it has become almost a panacea for all poverty alleviation problems. He postulated that the poor were natural entrepreneurs, evidenced by their ability to survive, and that all they needed to lift themselves from poverty was the right to have access to basic financial tools. However, while there have been some individual success stories, the overall impact of it has been minimal despite the estimated \$30 billion in commercial capital that has been invested in it over the past decade.² Most still struggle at the subsistence level, using microfinance as a consumption smoothing tool, rather than what it was designed for. This has led to the realization that relaxing the financial capital constraint might not be enough to enable people to lift themselves from poverty.

In 2008, NHH collaborated with the PRIDE Microfinance Institution in Tanzania to study what the effects were of business training on micro-entrepreneurs in a developing country. The objective was to analyze whether relaxing the Human Capital constraint would amplify their returns to microfinance. In the results, it was found that the training did indeed have a positive effect, increasing the profits and/or sales of the businesses of the male entrepreneurs by 20-30%, furthermore that the human capital constraint appeared to be more binding than the financial capital constraint. However, there were little to no effects on the businesses of the female entrepreneurs from the business training.³ From this experiment, it seemed to suggest that for female entrepreneurs, there was an additional constraint that appeared to be blocking the positive effects from the business training.

During my interviews with the microfinance clients, it became quickly apparent to me that a significant portion of the time and resources of the female entrepreneurs was spent on the household. The purpose of this paper is to analyze whether the household is that external

¹ Yunis, Muhammad (2009)

² Bateman, M. (2010)

³ Berg et al (2011)

constraint which is blocking the positive effects from the business training. Both the married male and female clients are affected by this household constraint, however, because male clients were able to apparently overcome this constraint, it appears that this constraint might not be as equally binding on male clients as it is on female clients. So the first research question will be:

1. Is the household more of a constraint on female entrepreneurs, relative to male entrepreneurs?

If this constraint is equal for both males and females, then there must be some other external constraint which is binding female entrepreneurs. If, as expected, the household is more of a constraint for female entrepreneurs, then the case for the household being that significant constraint can still be considered. The second research question analyzed will be:

2. Does the training relax this constraint for married female entrepreneurs?

While the training did not have an effect on females, it theoretically could've relaxed the household constraint. If the training relaxes this constraint, then it would suggest that despite the household constraint being diminished, there is some other external constraint which was more binding. However if the training is unable to relax this constraint, it would strongly suggest that the household is a significant binding constraint on married female entrepreneurs, and would help explain the lack of positive effects on their businesses.

The body of this paper will be structured as follows: Section 2 will present various economic theory models to explain the dynamics of the household decision-making process. This will help us determine in what ways the household could be a constraint; Section 3 will describe the experiment, providing the setting in which the experiment was carried out in, in addition to reviewing the past findings from the interventions; Section 4 describes the methodology of the experiment, and how the use of randomization enables us to use causality when analyzing the data; Section 5 reviews the quantitative data from the experiment and uses that data to help answer the two main research questions; Section 6 discusses what the findings mean for future policy considerations, and presents some alternatives to microfinance that might be better equipped to face the realities of the lives of married female entrepreneurs; Section 7 concludes and highlights the different areas where further research will be needed.

2. Perspectives in Literature

When focusing on the effects of the household as a constraint on married female entrepreneurs, it is important to have an understanding of the dynamics of the household. In this section we will look at what economic theory has to say about the different dimensions that are at play within the household decision making process. From there, we will assess what these models would predict in our research analysis, and see if and how the household could be a constraint on married female entrepreneurs.

2.1 Unitary Models

The Unitary Models were the first approach to explaining the decision making process within the household. These models were developed in the 1950s-1980s. Their defining characteristic was how they treated the entire household as if it were a single decision maker. They included a pooled budget constraint with an assumed pooled total household income, and a cumulative utility function that included everyone's utility in the household. The first model in this line of theory was the Consensus Model (Samuelson 1956) which had a maximizing single utility function for the household. The household heads would have a joint budget constraint from their pooled income. Therefore the expenditure patterns of the household would be unaffected by which individual brings in the income, because the consumption and expenditures would only be affected by the total household income. The other popular model was the Altruistic Model (Becker 1981) which attempted to explain how a consensus is reached in the unitary model and how the household resources were distributed. It assumed perfect information, and like the consensus model, also had a pooled household income. The head of the household, who is assumed to be altruistic, would then divide the income for each family member's consumption in such a way that it would motivate them to continue to seek to maximize the family income.⁴ One important prediction associated with this model regards the effects from a change in the income of one of the spouses. It predicts that an increase in the income of the wife will be followed by a reduction in the transfers from the altruistic head of the household to her. In this model, both of

⁴ Lundberg & Pollak (1996)

the spouses' consumption must benefit from this increase in income, and the only way the husband can increase his consumption is by subsequently reducing the transfers to his wife.⁵

With both of these unitary models, there was no room for household conflict because they didn't allow room for individual preferences when deciding the household consumption. The assumption of perfect information in the models also made it hard to use this theory in practical applications where perfect information is rarely found. Bergstrom expounded on the Altruistic Model by introducing what he referred to as the Lazy Rotten Kid problem. It dealt with the situation in the household for when there is asymmetric information. He stated that the way in which the income was distributed could be a de-motivating factor for the household members, especially in the cases when they receive only a portion of the income they generate while having to incur the full disutility of the work.⁶

2.2 Non-Unitary Models:

The non-unitary models came in response to the unitary models. They argued that the view of the household as a single unit conflicted with the basic microeconomic foundations of individual choices and preferences.

2.2.1 Cooperative Bargaining Models

The main non-unitary models most commonly used were referred to as the Cooperative Bargaining Models. These models treat the decision making within a household as a bargaining process between the household heads, using the cooperative Nash game theory. The individuals each have a separate utility, are able to make binding commitments, still have full information and perfect communication, and the models allowed for them to have individual preferences which can affect the household choices.⁷ Because the individuals have the ability to make

⁵ Ermisch (2003)

⁶ Bergstrom (1989)

⁷ Ermisch (2003)

binding commitments and have full information, all outcomes of the models are predicted to be Pareto⁸ efficient.⁹

Lundberg et al (1997) tested if there was indeed a separation of utility between the husband and wife. By separating the utility, you could allow for the case that each parent may not value the welfare of their child equally. She analyzed the effects of a policy change in UK. Between 1977-1979, the Child Tax Allowance (which was seen as an increase in the take-home pay of the father) changed to become the single Child Benefit (which was paid directly to the mother). According to a typical unitary model, this change wouldn't affect the expenditures of the household. However, if mothers' preferences towards the children were higher than the fathers', and if the change in the individual income affected their bargaining power within the household, then the switch of benefits from the father to the mother could increase the household expenditure on children. Lundberg found this to indeed be the case, and that it provided evidence against the unitary model. It further suggested that children do better when mothers control more of the family resources.¹⁰ Much research has been done that also proves this to be the case, and is one of the reasons for why microfinance is focused on females rather than males.

2.2.2 Non-cooperative Bargaining Models

In the cooperative bargaining models, a Pareto efficient outcome is predicted due to the assumptions of binding agreements (in consumption, labor supply, and allocation) as well as perfect information. However, real life application of this theory was difficult because of these assumptions which rarely hold true. The non-cooperative bargaining models were not dependent on these assumptions, but rather focused on what would happen when there were self-enforcing equilibria to decide the allocations within the household. Because of that, they allowed for Pareto inefficient outcomes.

Dubois & Ligon (2003) tested to see if intra-household allocation did in fact lead to efficient distributions. They were able to present evidence that suggested that not all household allocation decisions led to a Pareto efficient outcome. Taking data from an experiment in the Philippines,

⁸ A situation is said to be Pareto efficient when there is no way of making additional improvements or distribution adjustments to make one party better off without making the other party worse off. This theory is used throughout economics as a means of evaluating the efficiency of economic systems. (Jehle & Reny, 2001)

⁹ Lundberg & Pollak (2008)

¹⁰ Ermisch (2003)

they were able to reject the hypothesis of intra-household allocation efficiency upon observing that the allocation of the food expenditures, calories, and protein, was significantly related to the realizations of the individual's off-farm earnings.¹¹

Udry (1995) was able to show a similar Pareto inefficient allocation outcome in Kenya. Udry observed agricultural production in Africa, carried out on plots controlled by different members of the household (One owned by the husband, and one by the wife). Traditional household allocation models (cooperative bargaining models) imply that allocation of the variable resources (labor and fertilizer) would be distributed in the most efficient way to maximize production on both plots, leading to Pareto efficiency. However, Udry found that plots controlled by women yielded a significantly lower output (about 30% lower) than those controlled by men. This was due to higher labor and fertilizer inputs per acre in the lots controlled by men. This would appear to contradict the Pareto efficiency of household allocation because the household could achieve higher output by either reallocating some factors of production from plots controlled by men to plots controlled by women, or by reallocating the land from the women to the men. Udry suggests a new conflict model to explain this situation where household allocation does not lead to Pareto efficiency.¹²

In addition to allocation, lack of complete information and communication has also been shown to lead to Pareto inefficient outcomes. Ashraf (2009) was able to show how having the possibility of private information and limited communication between spouses would be needed in the models to be able to make more realistic assumptions about the household decision process. Using a set of experiments in the Philippines, Ashraf was able to focus on the conditions under which intra-household decisions are taken, especially conditions when information could be kept private, or when communication between spouses was limited. By doing so, Ashraf showed exactly how information and communication could affect the household decision making process, something that hadn't been built-into bargaining models before.

The experiment was set up in the form of a money transfer to the spouses, where the choices were: deposit it into a private account, or publicly take the money out to use towards consumption/cash. The settings were controlled to either make it a public choice among the spouses or a private choice by limiting the communication between them. Ashraf found that men

¹¹ Dubois & Ligon (2003)

¹² Udry (1995)

were more likely to deposit the money in their private account when the choice was private and communication limited, while committing the money to consumption when their decision was public to their spouse. This held true even when the amount that could be deposited in the account was decreased compared to the amount they could publicly take out in cash.¹³ The interesting thing here is that this appeared to be not a gender issue but rather a control issue. In the Philippines, it is a cultural norm for the women to control the financial and savings decisions in the household. So in the households where men were in control of the savings and financial decisions, the same decision effect was found with the women in the household.

2.3 Application of Theory

Having reviewed the various models of household decision making, the next step is to see what the models would predict for the present analysis. Under the Unitary models, they would seem to imply that the household would be a constraint for both the males and females equally, due to their pooled preferences and income. Both would be interested only in maximizing the total utility of the household for the most efficient outcome. Therefore they would allocate their resources of both time and capital to the house and their businesses in such a way as to produce the highest total income. However, we saw how this would only hold true as long as there wasn't asymmetric information. With the Lazy Rotten Kid problem, the way in which the altruistic head of the household allocates the resources could cause de-motivation. When the husband sees that the wife is bringing in additional income, he reduces his transfers to her, shifting more of the household expenses to her responsibility. This effectively reduces her share of the income. She would then be experiencing the full disutility from having the additional work while experiencing none of the benefits. For the analysis, this de-motivation factor could be the cause for the married females businesses not growing. Essentially, she would be penalized if her business does well, and that could de-motivate her from wanting to further apply the training to grow and expand the business.

From the non-unitary models, the predictions would vary based on whether they are cooperative or non-cooperative. In either case of these bargaining models, the bargaining power of the spouses would be effected by who controls the finances or how much each of them contribute to

¹³ Ashraf (2009)

the household income. In the experiment conducted by Ashraf in the Philippines, they found that based on the culture, women controlled the finances. The results of the experiment led to some Pareto inefficient outcomes when men tried to hide the money. In places like Kenya or Tanzania, they have the opposite gender norms, with men tending to control the financial decisions. That could explain why secret savings groups and clubs are so prevalent there, so that women can “hide” extra income they might have from their husbands. If women are disempowered, they may not be able to completely implement the business changes from the training, or may not have complete control in the decision of what to do with their profits. The next step is to consider the experiment and see if the data can confirm any of the predictions from the theory.

3. Field Intervention

The Tanzanian field experiment began in the summer of 2008. It was carried out by NHH in coordination with PRIDE microfinance (Promotion of Rural Initiatives and Development Enterprise). This section will give some basic background on Republic of Tanzania, as well as PRIDE itself, to provide the setting in which this experiment was carried out. It will then cover the two intervention areas of the actual experiment: Human Capital Intervention and Financial Capital Intervention. Finally it will review the past surveys and the findings that came from the previous research done by Berge et al (2011).

3.1 The Experiment Setting

3.1.1 Tanzania

The United Republic of Tanzania is located on the east coast of Sub-Saharan Africa and is considered one of the more stable of the countries in that area, both politically and economically. According to the World Bank, the strong GDP growth of 5 to 7% the past decade has been due to mining, construction, and communication sectors among others. Despite these growth areas, around 80% of households in Tanzania still depend on agriculture as their primary economic activity, and poverty rates have declined only slightly during the past decade. In addition, high population growth rates have put increased pressure on their already strained power, transportation, health, schools, and food infrastructures. However, one of the bright spots in their development has been their success in reducing infant mortality rate by almost 50% between 1991 and 2010, as well as their ability to achieve a primary school enrollment rate of 95.4%, an increase of over 40% from 2000.¹⁴ In regards to the financial sector, overall, access to financial services remains low, especially for the low income and rural population. In a 2009 Finscope survey, they found that 56% of adults were excluded from both formal and informal financial service providers. Only 12% had a bank account, and Microfinance organizations¹⁵ were only able to provide access to about 4%. Surprisingly 27% had access to an informal¹⁶ financial service provider. Additionally they found that 94% of the population worked outside of the

¹⁴ World Bank Country Brief

¹⁵ This refers to those Microfinance Institutes that are formally registered, albeit not regulated.

¹⁶ This includes groups such as Rotating Savings and Credit Associations and Village Community Banks

formal employment sector.¹⁷ With regards to the key to future growth and poverty reduction, IMF reported: “In the long run, only the private sector can generate economic growth, create jobs, and thus reduce poverty. But private-sector-led growth will require a better business environment and governance that is reinforced by modern regulation and an efficient court system.”¹⁸

3.1.2 PRIDE

PRIDE (Promotion of Rural Initiative and Development Enterprises) has around 70,000 clients, making it the largest microfinance institution in Tanzania. It was started in 1993 and received most of its funding from NORAD (Norwegian Agency for Development Cooperation) and Sida (Swedish International Development Cooperation Agency). Most of its borrowers have businesses of less than \$700 and operate in the informal sector which is estimated to support 60% of the economically active population of Tanzania. In order to join PRIDE, one must already have a business operating, and join a self-selected solidarity group of five members. They then have a compulsory weekly loan meeting as well as a compulsory savings program that helps to act as part of the loan insurance.¹⁹

3.2 The Interventions

In 2008, NHH kicked off a study in coordination with PRIDE, to investigate the constraints of human and financial capital on poor entrepreneurs in Dar es Salaam. They were able to perform separate treatments in the form of business training and a business grant to study the effects from both on the PRIDE microfinance clients. In that way, they could determine which of these constraints the primary constraint was for the poor entrepreneurs: lack of business knowledge or lack of financial capital. The experiments and surveys were conducted in two of the PRIDE branches in Dar es Salaam, Magomeni and Buguruni, with each having about 7500 clients.²⁰

3.2.1 Human Capital Intervention

The business training intervention was set up to as a randomized field experiment, and took place on a weekly basis between August 2008 and January 2009. This training consisted of 21

¹⁷ Finscope Survey (2009)

¹⁸ Nord et al (2009), p 7

¹⁹ PRIDE website: www.pride-tz.org

²⁰ Berg et al (2011)

sessions, 45 minutes each, and was held after the mandatory weekly loan meetings which the clients attended at their local PRIDE branch office. It was developed by the Entrepreneurship Centre at the University of Dar Es Salaam and the classes were taught by their staff. The topics of the course were geared towards building entrepreneurship skills and stimulating business growth. These topics included such things as business record keeping, marketing, customer service, managing employees, financing, etc. In addition to the training, a lab experiment was also used to help determine the effects of the training on the entrepreneurs' business knowledge and their mind-set.²¹

3.2.2 Financial Capital Intervention

To determine if the lack of capital was a constraint or if it could help amplify the effects of the training, a business grant was given to a subset of trained and untrained participants in March of 2009, six weeks after the training ended. The grant amount of 100,000 TZS²² was approximately equal to the cost of sending one participant through the training.

3.3 Past Surveys

As part of the experiment, three surveys were conducted to gather data about the participants, their businesses, and their households.

A baseline survey was conducted between June and July of 2008 prior to the interventions. This helped confirm the randomization²³ of the selected treatment groups and allowed them to determine that any variations between the two groups afterwards would be caused by the interventions. They found that the average entrepreneur was about 38 years old, with 8 completed years of schooling. In their small business, they typically hire only one worker, with only 20% of the businesses being officially registered with the government and thus the majority operating in the informal sector. Commerce is the most common sector (kiosks, market stalls) with about 70% of the clients, 38% are involved in the service sector (small restaurants and repair shops), and 15% in manufacturing (example, furniture making or brick making). Females dominate the service sector, while males dominate the manufacturing sector.

²¹ Berg et al (2011)

²² At the time the grant was handed out, the exchange rate was \$1=1300 TZS. So this granted was about \$77.

²³ Section 4.1 will provide an explanation of the theory of randomization.

Table 1 below gives a summary of these statistics.

Table 1: Group Characteristics

	Men	Women	P-values
Age	37.30 (0.59)	37.92 (0.40)	0.375
Education	7.73 (0.14)	8.04 (0.11)	0.082
Married	0.748 (0.03)	0.566 (0.02)	0.000
Children	2.61 (0.13)	2.96 (0.09)	0.025
Loan size (2008)	766,667 (16,009)	772,275 (11,614)	0.777
Sales (2008)	3,062,518 (228,591)	2,187,640 (182,218)	0.004
Profits (2008)	625,206 (34,305)	538,664 (20,417)	0.044
Number of businesses	1.53 (0.04)	1.55 (0.03)	0.696
Percentage in Commerce	0.703 (0.031)	0.697 (0.022)	0.874
Percentage in Service	0.257 (0.029)	0.441 (0.024)	0.000
Percentage in Manufacturing	0.234 (0.029)	0.111 (0.015)	0.000
Employees	1.180 (0.102)	1.033 (0.082)	0.277
<i>N</i>	222	422	

Note: Table reports the average means from the 2008 baseline survey. Age: The age of the client in number of years. Education: The number of years the client attended school. Married: The percentage of clients who are married. Children: The number of children the client has. Loan Size: The size of the initial loan from PRIDE, in TZS. Sales: The monthly sales from the businesses of the client, in TZS. Profits: The monthly profit from the businesses of the client, in TZS. Number of businesses: The number of businesses the client owns. Percentage in Commerce, Service, and Manufacturing: The percentage of clients involved in each of these sectors. Employees: The number of employees the client employs. Standard Errors in parentheses.

A post-intervention survey was conducted the following summer in June-Aug 2009. This follow-up survey was able to reach 530 of the original 644 treatment clients. From the survey data, they were able to study the short-term effects from the training and business grant on the entrepreneurs businesses.

In the summer of 2011, I took part in the third and most recent survey to help gather data on the long-term effects of the training and grant. It involved a team of 7 researchers working with local translators to interview the clients. The survey usually took place at the entrepreneur's place of business or at their home and lasted an average of 90 minutes. The questions were focused on the entrepreneur's old and current businesses, their estimated and calculated sales and profits, business investments and changes, employees, sources of income, etc. In addition to focusing on their businesses, it also looked at their household investments, living conditions, consumption, and happiness, among other areas.

3.4 Past Findings

From the previous surveys, Berge et al (2011) were able to come to three conclusions on the effects of the business training and the business grant on male and female entrepreneur businesses, based on the data that was collected post-intervention.

1. Human Capital Intervention (business training) had an effect on male entrepreneurs, while there was no effect on females, and there was no effect from the financial capital intervention (business grant) on the business performance of either male or female entrepreneurs.
2. The increased business performance in males was seen through an increase in sales and profits, but not in profit margins.
3. Human Capital intervention improved the business knowledge in both males and females, as well as leading to a change in mindset (risk and self-confidence), closing the gender gap. However there still existed a gap in willingness to compete, with females being less willing to compete than males.

From these conclusions it appears that the primary constraint for men was the lack of business knowledge rather than the lack of financial capital. Once they were able to relax that constraint, male entrepreneurs were able to improve their business, seen with an increase in sales and/or profits. For women however, we observe that neither business training nor financial capital was the primary constraint, as there was little to no effect on their sales or profits from either. That means that the primary constraint was some additional external constraint that was blocking the effect of the training. In the next section we will review the empirical methodology of the experiments to help show how we can imply causality in the varied effects. In analyzing whether the household might be that external constraint on female entrepreneurs, we will analyze the data to show why there must be an external constraint and whether the household is that constraint.

4. Empirical Methodology

We have now examined the setting that this experiment was carried out in, we have looked at the microfinance organization that the clients were part of, and we have observed the various treatments of the experiment as well as the surveys and preliminary findings. We will now examine the methodology of the experiment and how the data from the experiment can be used to help determine causality in studying the differences between the treatment and control groups. These differences (the effects) will help us answer the question: Is the household more of a constraint to married female entrepreneurs in Tanzania, relative to married male entrepreneurs.

4.1 The use of Randomization

When doing an impact assessment, the goal is to determine what the effects are of a treatment. In the case of this experiment, once the business training and business grant were provided, the question became: What is the effect of the training and/or business grant on PRIDE microfinance clients? However, it is hard to identify causality when comparing pre and post treatment effects for a single group. When addressing the issue of causality, the first question that needs to be answered is: How would microfinance clients participating in the treatment have fared without the treatment? Or another way of putting it: How would those not in the treatment, have fared with the treatment?²⁴ It is difficult to follow just one group over time and compare pre and post treatment statistics, because there are other factors and inputs that may have changed and which may have an impact on this data. Other factors to consider would be change in age, experience, marital status, children, natural business trajectory, etc. To help avoid this dilemma, a common strategy is to use two groups, one that receives the treatment, and a control group that has no exposure to the treatment. In this way, we can compare the average impact of the business training and/or grant on the treatment group to a similar control group who hasn't been exposed to the training or grant.

However, one problem that still persists when trying to infer causality is the issue of selection bias. Duflo et al define selection bias as the result of pre-existing differences between the two groups. These pre-existing differences could be both observable and non-observable. People who sign up for the treatment may already be more motivated, more competitive, have more mature

²⁴ Duflo et al (2006)

businesses, be in a different poverty class, etc, than those who are classified for the control group. Therefore, any differences in the outcomes between the two groups could be due to these pre-existing differences.

One way to completely remove this selection bias is by using randomization in the selection process. The randomization ensures that both groups will be equal on both observables and non-observables. By randomly assigning individuals to the treatment and control groups you ensure that the assessment provides an unbiased estimate of the impact from the treatment. In this way, you could then postulate that, had neither group received the treatment from the training and/or grant, their average outcomes would have been expected to have been similar.²⁵

To formally lay this out, consider the following mathematical equation²⁶:

$$E(Y_{i1}|T_i = 1) - E(Y_{i0}|T_i = 0)$$

Where $T_i = 1$ is a person assigned to a treatment group and $T_i = 0$ is a person assigned to the control group; while Y_{i1} is the outcome for a person if assigned to a treatment group and Y_{i0} is the outcome for a person if assigned to the control group. Then this equation would be the expected difference in average outcomes of the treatment group and control group. To see if both groups are identical, we can now rewrite this equation as:

$$= [E(Y_{i1}|T_i = 1) - E(Y_{i0}|T_i = 1)] - \underbrace{[E(Y_{i0}|T_i = 1) - E(Y_{i0}|T_i = 0)]}$$

With randomization, this part will equal 0 since both groups would be identical. Without randomization however, this bracket would be the selection bias.

We can rearrange this as:

$$E(Y_{i1}|T_i = 1) - E(Y_{i0}|T_i = 0) = E(Y_{i1}|T_i = 1) - E(Y_{i0}|T_i = 1)$$

²⁵ Duflo et al (2006)

²⁶ This equation follows the general structure from Angrist & Pischke (2009)

Finally, we can rewrite this in the following manner:

$$E(Y_{i1}|T_i = 1) - E(Y_{i0}|T_i = 0) = E(Y_{i1} - Y_{i0}|T_i)$$

Observed in Data

The Counterfactual definition of Causality

Therefore, what we observe in the data (the difference in average outcome in the treatment group and control group) will equal the counterfactual definition of causality (the difference in outcome for a person if he gets treatment or does not get treatment). The counterfactual definition of causality is of course purely hypothetical, since either a person has training or he doesn't, it would be impossible to measure. However, thanks to randomization, we can now measure this hypothetical difference by using the difference in data from the treatment and control groups, which will give us the average impact of the treatment.

To implement randomization into this experiment, NHH was able to piggy-back onto the randomization process that PRIDE had already implemented. When a new microfinance client enters PRIDE, they are randomly assigned a day where they are required to come to their PRIDE branch for a weekly group loan meeting. The experiment used this randomization selection by randomly picking two meeting days as the days where the group members would receive the treatment. Two other days were then picked as the days where the group members would be part of the control group. By having separate days, this helped to further reduce the possibility of exposure to the control group.

4.2 Summary of Group Characteristics

Having seen how and why randomization was used in the structure of the experiment, we will now examine the characteristics of the group, using data from the baseline survey, pre-treatment. In the lending structure at PRIDE, they had three levels for the loan size on the group lending ladder. New members must 'graduate' from each level before transitioning to a higher loan size. Once a member has successfully completed the group lending ladder (in addition to other requirements) they have the opportunity to apply for group loans with added flexibility and size and finally for a higher individual loan. For the experiment, NHH chose to focus on the second and third steps of the group loans which represented loans between 500,000 and 1,000,000 TZS. The reason for excluding the lowest step was due to the high turn-over or burnout rate at that

step. Of this group, they were able to initially interview 644 clients, 319 belonging in the trained group, and 325 in the untrained group. For the business grant treatment, 252 clients were randomly chosen to receive this grant, representing 126 each from the trained and untrained groups.

Table 2 gives a summary of comparison characteristics between married women in the control group and married women in the trained group. The corresponding P-values will help us determine if there are any significant pre-treatment differences between the two groups. If there are, we can then use to characteristics as control variables in subsequent regressions.

Table 2: Group Characteristics – Married Women

	Non-trained Married Women	Trained Married Women	P-values
Age	38.04 (0.71)	36.82 (0.68)	0.221
Education	8.3 (0.18)	7.75 (0.18)	0.033
Children	3.09 (0.12)	3.08 (0.15)	0.959
Loan size	765,385 (21,083)	750,459 (22,637)	0.630
Employees	0.977 (0.13)	0.743 (0.09)	0.152
Number of Businesses	1.55 (0.05)	1.57 (0.06)	0.776
<i>N</i>	130	109	

Note: Table reports the average means of married women from the 2008 baseline survey. Age: The age of the client in number of years. Education: The number of years the client attended school. Children: The number of children the client has. Loan Size: The size of the initial loan from PRIDE, in TZS. Employees: The number of employees the client employs. Number of businesses: The number of businesses the client owns. Standard Errors in parentheses.

From this data summary, we can see that the biggest pre-treatment differences between the control and treatment group for women is with their age and education, with women in the

control group being over a year older and having about a half a year of additional education than the women in the treatment group.

4.3 Importance of Interventions in studying External Constraints

The goal and design of this experiment was to study which was a bigger constraint: Human Capital (Business Training) or Financial Capital (Business Grant). This was done by relaxing one or both of the constraints and then using the subsequent data to analyze which constraint, when relaxed, had the bigger effect on the business of the microfinance client. In seeing that the removal of one or both constraints had little to no effect on married women, while men were able to positively gain from it, we can say then that some other external constraint is blocking those positive effects of the training and/or grant on married females.

In this next section, we will assess to what extent the household represents an external constraint on married female entrepreneurs. That the household is a constraint on male and female entrepreneurs is no mystery at all. However, is it a bigger constraint on females? Why were married men able to overcome this constraint and take advantage of the training, but not married women? Did the training relax this constraint for married women? Using both the quantitative and qualitative data collected from all three surveys, in addition to the theories of household dynamics and decision-making processes, we will analyze these questions and see what answers we can garner from the data.

5. Quantitative Analysis

To see if the household is indeed a significant constraint to married female entrepreneurs, the next step will be to look into the quantitative data that was collected in the three surveys during the experiment (2008, 2009, and 2011). It is safe to assume that the household demands of responsibilities and duties affect both men and women. However, men were able to overcome this constraint, suggesting that either this is not a primary constraint for women, or that the constraint is higher for females than males. So the first question to analyze will be: Is the household more of a constraint to females, relative to males? If this is the case, then the case for the household being a primary constraint can still be considered. If it is not the case (If the household constrains both males and females equally), then there must be some other external primary constraint for females.

5.1 Is the household more of a constraint to female entrepreneurs, relative to male entrepreneurs?

In using the data to analyze this question, we will look for survey questions that can be used as indicators for a household constraint. To do this, we should consider first, how the household can be a constraint. The most obvious constraints to the husband and wife would be due to responsibilities and duties in the household. These will be referred to as time constraints, as these responsibilities and duties would take them away from their business. Then, there are also decision-making constraints. Referring back to the theories of household decision making models, according to the non-cooperative bargaining model, lack of control of household finances might suggest a disempowerment when it comes to household decisions and even possibly business decisions. Initially we will abstract the treatment effect to study this constraint, so in this section we will only use data from the baseline survey or from the control group.

5.1.1 Time constraint Indicators:

There are two questions in the survey that can be used as indicators of how much the household is being a constraint on the time of the married entrepreneurs.

Hours worked per week

The first question we can use asked, how much time the client spent working in their businesses. Taken from the 2008 baseline survey, we were able to quantify the total number of hours each client worked in their various businesses. Since this was the baseline survey, none of the participants had received any of the interventions, business training or business grant. Because we are looking for evidence of household constraint, we will only look at married men and women. For married men, the mean average of time spent working in their businesses was 69.15 hours per week. This may seem high, but keep in mind that many microfinance clients operated more than one small business. For married women, the mean average of time spent working in their businesses was 58.94 hours per week. Interestingly, this is over 10 hours per week less than married men, of time spent on their businesses. This is consistent with there being a bigger time constraint on married women, relative to married men.

Business distance from home

For the second proxy for a time constraint, we will use a question that asked them how far their business was located from their home. If women have more duties and responsibilities at home than men, that would explain why they were unable to work as much in their business as men. This constraint would also affect their decision of where to locate their business. This question was from the 2011 survey, so we will now separate the control and treatment groups. The question asked them for the amount of time it took to get from their home to their business either by foot, or if it was too far to walk, by dala-dala (aka, city bus). For married men in the control group, this equated to an average mean of 23.38 minutes by foot and 47.8 min for the ones who had to take the dala-dala. For married women in the control group, they had an average mean of 11.42 minutes by foot, and 16.09 by dala-dala. Additionally there is the possibility that the business is located in the home itself. In this case, the rate of married females in the control group with a business at home was 22% higher than the rate for married men in the control group. So not only did women have their businesses at home more often than men, but even when their business was not at home, it was still located much closer. By foot, their businesses were closer by almost 12 minutes, and with a dala-dala they were closer by over 30 minutes. If women feel that they have to be at home or close to home because of their responsibilities there, this would limit the types of businesses they could start and run in addition to limiting their choice of market and overall market size.

Considering these two time constraint indicators together, we can clearly see that the household is a bigger time constraint on women than it is for men. This is apparent in the amount of time they can put towards their business as well as their business location. Table 3 gives a summary of these findings. As well as highlighting the differences in the indicators between men and women, this table also shows that these all of these differences are in fact statistically significant. While this is not a causal proof of constraint, it is however consistent with the predictions of the household decision models.

Table 3: Average Means of Time Constraint Indicators for the Control Group

	Married Men	Married Women	P-values
Work hours (2008)	69.15 (2.01)	58.95 (1.88)	0.000
Distance by foot	23.38 (4.82)	11.42 (1.80)	0.005
Distance by Dala dala	47.8 (7.11)	16.1 (3.26)	0.000
Business at home	0.072 (0.03)	0.3 (0.04)	0.000

Note: This table reports the average means for time constraint indicators of married clients in the control group. Work hours: The number of hours worked per week, from the 2008 baseline survey. Distance by foot: The amount of time, by foot, it takes to get from their home to their business, in minutes. Distance by Dala dala: If the business is too far by foot, then the amount of time, by dala dala (city bus), it takes to get from their home to their business, in minutes. Business at home: Indicator variable taking the value of one if the client reports having a business located in their home. Standard Errors in parentheses.

5.1.2 Decision-making constraint indicators:

The next step is to consider the indicators of a Decision-making constraint within the household. In the theory of household decision making models, control of the finances can be affected by either bringing more income than the other spouse or, by nature of the culture, being the altruistic head of the house. The control of the finances is then seen as giving that spouse more bargaining power when it comes to making household decisions or even business decisions. If, as is expected due to the culture of Tanzania, women have less control than men, then they may be constrained from making the proper decisions within their own business after the training, or they may be constrained in making the choice of what to do with their profits, how much to

reinvest, etc. To analyze the decision-making factors within the household, we will now look at an additional lottery experiment as well as questions from the most recent survey. Because both of these are post-intervention, we will again focus on just the control group for the moment.

Household economic decision-maker

The first step is to see who has more control of the financial decisions within the household. Because the 2011 survey was very extensive, looking into the client’s business as well as their household, there are a few questions that pertain exactly to this situation. The first question pertains to financial decision maker within the household:

<p>A: In a marriage, the husband typically makes all major investment decisions.</p>	<p>B: In a marriage, the wife typically has the power to make major investment decisions</p>
<p>Which statement do you agree most with? (A/B)</p>	

From the way this question was phrased, we would expect there to be a huge gap between the men and women for those in agreement with statement A. Even if the husband controls the finances, not many wives would say that their husband makes all the major financial decisions. As expected, for married men in the control group, 92% of them agreed with statement A, that the husband typically makes all major investment decisions. For married women in the control group however, 67.5% of them actually agreed with statement A. This number was much higher than expected, and does suggest that there is some form of constraint.

Support from spouse

If the husband has control over the financial decisions of the household, as the above results seem to indicate, then this would align with the unitary Altruistic Model in the household decision making theory. In that model, the husband, as the altruistic head of the household, would be in charge of distributing the pooled family income to the family members. A second question asked them how much support they received from their spouse. If men are in control of the household finances, then they would be expected to be the ones giving support to their wives, not the other way around. This was overwhelmingly the case, with only 4.48% of married men in the control group getting support from their wife. The average mean of this support was just 5,237 TZS per month. For married women in the control group, 59.82% of them received

support from their husband. The average mean for this support was 105,221 TZS per month. When interviewing the clients, we found it common that married women would often get this support from their husband to cover household expenses, such as food, clothing, school fees for the children, and other household consumption expenditures.

Business decision-maker

The next question tries to ascertain if this household financial control of the husband extends to the wife’s business as well:

<p>A: Married female PRIDE clients would not grow their business much after business training because their husbands make all important business decisions</p>	<p>B: Married female PRIDE clients would grow their business a lot after business training because they are in control over their businesses</p>
<p>Which statement do you agree most with? (A/B)</p>	

In this case, 33% of the married men in the control group agreed with statement A, while only 8.3% of the married women in the control group agreed. While the number of married men in agreement with statement A is still somewhat high, overall this would seem to suggest that the financial control of the household does not extend to the big business decisions of the wife’s business and that the wife is still largely in control. However, we are still unsure if this would apply to the profit from the business, as that could still be seen to be part of the overall household income, in which case the husband would have control over that. If that were the case, then according to the Lazy Rotten Kid theorem discussed previously,²⁷ the women might become demotivated as they experience the full disutility of work with only the partial benefit.

Lottery Experiment

In the most recent survey from the summer of 2011, an additional experiment was included in the form of a lottery. Each survey participant was automatically entered into this lottery for 100,000 TSZ and they were then given the option of signing up one additional person. The only requirement was that both would be contacted if either had the winning ticket. For a married client, this meant that if they signed up their spouse for the lottery, they would double the chance

²⁷ Bergstrom (1989)

that their household would win the lottery. However, this would also mean that if they won the lottery, their spouse would know that they won and how much they won. The purpose of the experiment was to see if there was any treatment effect on their decision of whether or not to sign up another person and who that person would be. If the training was really effective in giving women more control in their household and over their business, thus empowering them, it may affect their decision to sign up their spouse if it meant he would find out if and how much she won.

Referring back to the theory section, we discussed a similar experiment conducted in the Phillipines (Ashraf 2009). In that experiment, it was found that the spouse that lacked control of the household finances, was more likely to keep the money private, even if it meant getting less money.²⁸ In the case of this lottery experiment in Tanzania, 57% of the married men in the control group chose their spouse as the additional person to sign-up. While only 39% of the married women in the control group chose to sign up their spouse, choosing rather to sign up another family member, friend, or no one at all. This again would suggest some form of disempowerment, or constraint in the household decision-making process to married women.

Table 4 gives a summary of the Decision-Making Constraint Indicators and their corresponding P-values. As with the time constraint indicators, the differences between the men and the women are all statistically significant, or in the case of the household economic decision maker, very nearly significant.

Table 4: Average Means of Decision-making Constraint Indicators for the Control Group

	Married Men	Married Women	P-values
Household Decision maker	0.921 (0.03)	0.675 (0.11)	0.110
Support from Spouse	5,237 (3,717)	105,221 (9,423)	0.000
Business Decision maker	0.333 (0.06)	0.083 (0.03)	0.000
Lottery choice	0.567 (0.06)	0.387 (0.04)	0.022

²⁸ Ashraf (2009)

Note: This table reports the average means for decision-making constraint indicators of married clients in the control group. Household Decision maker: Indicator variable taking the value of one if the client is in agreement with statement A (In a marriage, the husband typically makes all major investment decisions). Support from Spouse: The amount of monthly support the client receives from their spouse, in TZS. Business Decision maker: Indicator variable taking the value of one if the client is in agreement with statement A (Married female PRIDE clients would not grow their business much after business training because their husbands make all important business decisions). Lottery Choice: Indicator variable taking the value of one if the client chooses to sign up their spouse for the lottery. Standard Errors in parentheses.

5.2 Does the training relax this constraint for married female entrepreneurs?

We have now shown how the household is a constraint for married female entrepreneurs, and how that constraint is greater for females than it is for males. The next step is to see if the training relaxes this constraint for female entrepreneurs. If the training is able to relax this constraint, then it would show that the household is still not the main constraint for married female entrepreneurs, and that there must be a different, external primary constraint affecting them. Important to keep in mind however is that the training and business grant interventions were not specifically designed for the purpose of relaxing a household constraint. However there are still ways this could theoretically occur as a result of the interventions, perhaps by increasing efficiency, productivity, increasing their ability to contributing more to the household income and thus empowering them in the household decision-making process, in addition to others factors.

As in the previous section, we will again use the same indicators of a household constraint, looking at both time constraint indicators as well as decision-making constraint indicators. Here however, we will now focus on the differences between the treatment group and the control group, paying special attention to the differences between trained married females and control married females. As we have described previously, the randomization of the experiment allows us to now use causal analysis when looking at the differences between the two groups and attribute those differences to the treatment or lack thereof. To help control for any pre-existing differences, we will use control variables (chiefly age, education, and children) where appropriate. The basic structure for the regression analysis will be as follows:

$$Y_i = \alpha + \beta_1 \text{Training} + \beta_2 X_i + \varepsilon_i$$

Training is the dummy variable which takes the value of 1 if the client i is part of the treatment group. X_i represents the various control variables. The treatment effect is reported with and without the control variables. While there is no need to include the controls to get an unbiased estimate, including them helps make the estimate more precise.

5.2.1 Time constraint Indicators:

As before, we will again be focusing on just married males and females, but this time will be including the treatment groups to the analysis. The focus here will not only be on whether the treatment led to a significant difference in these time constraint indicators for females, but whether it was able to close the gap between males and females that we previously saw.

Hours worked per week

Previously we looked at just the 2008 baseline survey and saw how married men worked over 10 hours more per week in their businesses than married women. Now we will add in the data from both the 2009 survey and the most recent 2011 survey. Here I have separated out the trained and control groups. I chose to not to separate out the business grant recipients because that would reduce the sample size too much and further limit it. The focus on the business grant recipients here is not as important because it was only the training which had an effect on men.

Table 5: Hours worked per week

	Married Men	Married Women	Difference
Pre-Treatment (2008 Baseline)	69.15 (2.01)	58.95 (1.88)	10.21
Control Group (2009 survey)	64.64 (2.92)	56.65 (2.36)	7.98
Trained Group (2009 Survey)	65.99 (2.83)	58.56 (2.62)	7.43
Control Group (2011 Survey)	59.42 (3.84)	49.81 (3.02)	9.60
Trained Group (2011 Survey)	60.19 (3.41)	51.50 (3.41)	8.68

Note: This table reports the average means of the hours worked by married clients in the treatment and control groups. These are the results from each of the surveys; 2008 baseline, 2009, and 2011. Standard Errors in parentheses.

We can see from this that in comparing trained married women to married women in the control group, the trained women worked between 1.5-2 hours more per week. However in looking at the gap between men and women, trained married men were also able to improve their hours worked relative to married men in the control groups. So the training closed this gender gap in 2009 by only .5 hours, and by 1 hour in 2011.

We will next run a regression to see if there is any statistically significant causal effect between the training and the work hours for married women.

Table 6: Treatment effect on work hours - Married Women

	Work hours 2009	Work hours 2009	Work hours 2011	Work hours 2011
Training	1.906 (0.595)	-0.319 (0.929)	1.689 (0.723)	1.700 (0.721)
Work hours (2008)		0.287*** (0.000)		0.207** (0.015)
Age		0.0267 (0.917)		0.0768 (0.820)
Education		-1.024 (0.326)		2.078* (0.073)
Children		0.704 (0.565)		0.660 (0.698)
_cons	56.65*** (0.000)	45.83*** (0.000)	49.82*** (0.000)	15.98 (0.345)
<i>N</i>	239	239	239	239

*Note: This table reports the regressions of Works hours in 2009 and 2011 on treatment status for married women. The regressions are first given without controls and then given controlling for previous work hours, age, education, and children. Cluster robust standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.*

The regressions were run without controls first, before adding them in for both the 2009 and 2011 survey data. In both cases, the treatment had no statistically significance effect on the amount of hours worked for married women. Additionally, we observed that the work hours from 2008 were strongly predictive in explaining the amount of work hours in 2009 and 2011.

Business distance from home

In looking at the distance of the business from home, this question was only in the 2011 survey. Previously we looked at just the control group. Comparing that to the trained group now does not reveal any significant changes. For trained married women, their business location was actually 2 minutes closer to home by foot than those married women in the control group. For those trained married women who had to take the dala-dala, they had an average mean of less than 1 minute difference from those in the control group. Finally, 32% of the trained married women had a business in their home, while 29% of married women in the control group had a business in their home.

Here, we will again run a regression to see if there is any statistically significant causal effect between the training and the business location.

Table 7: Treatment effect on business distance from home - Married Women

	Distance by Foot	Distance by Foot	Distance by Dala-dala	Distance by Dala-dala	Business located at Home	Business located at Home
Training	-2.140 (0.369)	-2.403 (0.306)	-0.397 (0.952)	0.0400 (0.995)	0.0303 (0.614)	0.0479 (0.412)
Work hours (2008)		0.0442 (0.282)		-0.0761 (0.495)		0.000594 (0.452)
Age		-0.302** (0.038)		0.0757 (0.795)		0.00822* (0.070)
Education		-0.0491 (0.932)		-0.364 (0.780)		0.0152 (0.313)
Children		-1.420** (0.047)		-0.912 (0.505)		0.0288 (0.257)
_cons	11.42*** (0.000)	25.11*** (0.001)	16.10*** (0.000)	23.34 (0.101)	0.300*** (0.000)	-0.258 (0.170)
<i>N</i>	173	173	116	116	239	239

*Note: This table reports the regressions of Distance by Foot, Distance by Dala-dala, and Business located at Home on treatment status for married women. The regressions are first given without controls and then given controlling for 2008 work hours, age, education, and children. Cluster robust standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.*

The first regression is the time difference by foot of the business from home. Here the treatment actually results in a time decrease, meaning the business is closer to the home. However this is

not statistically significant. Interestingly, we note that among the control variables, the older a person is and the more children they have, the closer their business is to their home. The next regression measures the correlation in time distance by dala-dala, with the final regression measuring the correlation in percentage of those with a business at home. Both of these reveal only minor differences, and these are not statistically significant.

Overall, when looking at the indicators of both hours worked and distance from home, business training does not appear to have significantly relaxed this time constraint of the household for married women.

5.2.2 Decision-making constraint indicators:

The second set of indicators deal with the issue of a decision-making constraint. We saw in the previous section how it appeared that men had control of the household finances and how women showed this constraint in part by wanting to keep potential lottery winnings a secret. We will now compare the answers of the control group with those of the trained group for married men and women, to see if the training helped empower women in the household, gave them more bargaining power in the household decision-making process, or improved their control of the household income.

Household economic decision-maker

Regarding the question of who makes the financial decisions within the household, we find only a minor difference. Here, 50% of the trained married women agreed with this statement, compared to 53% in the control group. Trained men actually saw a greater difference, with 87% agreeing with this statement whereas in the control group this was at a 92% agreement.

Business decision-maker

The next question looks to see if that household control of husband extends to the wife's business as well. We now find that 13% of trained married women agree with this statement, this is up from the 8.3% in agreement in the control group. One possible explanation for this might be because the training may have just made her more aware of this constraint. However, with still only 13% agreement, it is not enough to make it a significant argument.

Table 8 presents the regressions for both questions pertaining to the decision maker, household and business.

Table 8: Treatment effect on Decision-making Indicators - Married Women

	Household Decision Maker	Household Decision Maker	Business Decision Maker	Business Decision Maker
Training	-0.0908 (0.523)	-0.0626 (0.703)	0.134 (0.170)	0.162 (0.176)
Age		0.0157 (0.353)		0.00619 (0.194)
Education		0.0187 (0.659)		0.0307 (0.442)
Children		-0.0368 (0.485)		0.0897 (0.218)
_cons	0.675*** (0.000)	0.0362 (0.963)	0.0833*** (0.001)	-0.690 (0.294)
<i>N</i>	221	221	221	221

*Note: This table reports the regressions of Household Decision Maker and Business Decision Maker on treatment status for married women. The regressions are first given without controls and then given controlling for age, education, and children. Cluster robust standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.*

We can see that there is no treatment affect when it comes to who has control of the household finances. There is a slight treatment affect when it comes to whether the husband also makes the decisions in the wife’s business. However this effect is not a positive effect, it is not a reduction in this constraint, but rather results in a greater agreement to this statement from married trained women. We have postulated that the reason may have been that the training made them more aware of this type of constraint.

Support from spouse

In the question on how much support they receive from their spouse, we actually see the biggest difference. The ratio of married women receiving support remains virtually unchanged at about 60%, however the amount of support is significantly lower for trained married women. In the control group, the average mean of support from their husband came to 105,221 TZS per month. For married trained women, the average mean of support from their husband was 83,018.

Table 9 gives the summary of the regression for this question, highlighting the correlation of the treatment and the decreased support from the spouse.

Table 9: Treatment effect on Support from Spouse - Married Women

	Support from Spouse	Support from Spouse	Support from Spouse
Training	-22202.9* (0.088)	-21496.0* (0.093)	-18743.1 (0.153)
Grant		-25053.0* (0.059)	-24096.0* (0.068)
Age			-454.1 (0.653)
Education			5277.5* (0.098)
Children			2567.4 (0.595)
_cons	105221.1*** (0.000)	114872.7*** (0.000)	79747.9* (0.097)
<i>N</i>	226	226	226

*Note: This table reports the regressions of Support from Spouse on treatment status for married women. The regressions are first given without controls and then given controlling for age, education, and children. Cluster robust standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.*

Here we can see how both the presence of training and the business grant corresponded with significantly less of an amount of support from the spouse when compared to the married women in the control group.

An additional question in the survey might shed some light on this difference. 58% of trained married women agreed with the statement: As a females' business grows, the female gets more responsibility in the household. When asked what these responsibilities included, the responses ranged from paying for school fees, buying food, to paying medical expenses. These were all things that the support from their spouse had been going towards, the household expenses.

Combining these two questions, one could argue that as a trained woman is able to improve her business (through increased productivity or efficiency), the support from her spouse drops. Digging into some of the qualitative data, many of the detailed answers to this question from the clients seemed to confirm this explanation. Devota Wansato was a married mother, operating three small business. In response to this question, Devota stated: *“When men realize his wife is making money, they don’t contribute or they reduce household contribution, which is then*

covered by women.” Juliana Chowo stated a similar problem saying, *“Men tend to reduce the household contribution if women do well in business.”* Yusta Silayo described that the additional responsibility even went beyond the immediate family, *“When the business grows, more of my friends and relatives come to me for money, because they know I have money now.”* Returning to the economic theory, according to Ermisch (2003), in a bargaining and altruistic model of household decision-making, an increase on income in one spouse will result in the decrease of transfers from the other spouse. According to the model, both spouses must benefit from the increased income, and in this case, the only way the husband can benefit from the wife’s income is by decreasing his support to her.²⁹ This would also explain why this business improvement wasn’t reflected in an increase of sales or profits at the time of the surveys. If the wife is now forced to pay for more of the household expenses, she will be forced to use the profits and loans from her business to do so, reducing the possibility of investing those back into the business to make it grow.

With regards to how this affects the household constraint on the wife, there is both a positive and a negative interpretation to this situation. The positive is that, if we take a decreased support from the spouse as a signal of an improvement in her business, then in a traditional bargaining model of household decision-making, she would improve her bargaining position in the household. She would then have more control over the financial decisions in the household. This is also a positive for the children, if she is paying for more of their expenses, as it has been proven that children are better off if mothers control more of the household resources. However this situation is also a negative for her business and actually acts to amplify the household constraint on her business. By having to cover more of the household expenses, this is potentially taking valuable resources and capital away from her business, effectively starving it from future growth.

Lottery Experiment

Finally we come to the lottery experiment. Here we find that the number of women who chose their spouse has actually decreased, with only 35% of trained women choosing their spouse, compared to 39% in the control group. We see an even bigger drop with men, as 44% of the trained men chose their spouse compared to the 57% in the control group. Table 10 shows the regression for the treatment effect on women from this lottery experiment.

²⁹ Ermisch (2003)

Table 10: Treatment effect on the Lottery Choice - Married Women

	Lottery Choice	Lottery Choice
Training	-0.0396 (0.558)	-0.0576 (0.408)
Work hours (2008)		0.000527 (0.641)
Age		-0.0147*** (0.001)
Education		0.00643 (0.709)
Children		0.0131 (0.576)
_cons	0.387*** (0.000)	0.825*** (0.001)
<i>N</i>	217	217

*Note: This table reports the regressions of the clients' Lottery Choice on treatment status for married women. The regressions are first given without controls and then given controlling for 2008 work hours, age, education, and children. Cluster robust standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.*

Adding in the control variables led to a negative treatment effect of about 5.8%. That is, trained married women chose their spouse 5.8% less of the time than married women in the control group. However, this difference is not statistically significant. Overall, the training effect did not appear to significantly relax this constraint.

5.3 Data Summary

From this data we were able to learn that there are both time and decision-making constraints on female entrepreneurs. We saw this in the amount of time they were able to spend working, where their business was located, who controlled the finances, how the transfers from their husbands' decreased when they received training, as well as their perceived need to hide money from their husbands' seen in their lottery choice. We can therefore conclude that there is suggestive evidence that married women are more constrained by the household than married men are, and that the training was unable to relax this constraint. This is crucial in explaining the lack of positive effects from the training on the businesses of married women.

6. Policy Implications

We have now analyzed the data, researching to what extent the household is a constraint on female entrepreneurs in Tanzania. From this data we have been able to suggest that the household does in fact appear to be a significant constraint on married female entrepreneurs, limiting the effects of business training through time and decision-making constraints as well as absorbing valuable business resources. Additionally, we found that the training does not appear to significantly relax this constraint. The two findings may have important policy implications on the field of microfinance. The way the structure is set up now, it appears that the married females have to choose between their household and their business. The implication for future policy will be, how can the financial tools be adapted to help the household and the business of married female entrepreneurs coexist?

What needs to be reevaluated by microfinance organizations and impact assessment studies is the question of: what constitutes success? If the only goal of the entrepreneur is to use the business to support and increase household consumption and improve the quality of living, rather than focusing on growing the business, is this broader reinterpretation of microfinance still success? Depending on what the goals are for microfinance, and what they determine success is, the overall concept will need to be retailored to fit the lives of the married female entrepreneurs. Below are a few financial tools that could be alternatives to microfinance or work in conjuncture with it, as well as a few reinterpretations of the microfinance model that will help it to better address this household constraint.

6.1 Credit unions, Roscas, & MicroSaving

Beck & Ogden stated in the 2007 Harvard Business Review, “Many heads of microfinance programs now privately acknowledge what John Hatch, the founder of FINCA International (one of the largest microfinance institutions), has said publicly: 90% of microloans are used to finance current consumption rather than to fuel enterprise.”³⁰ If the goal is to use the business and loans as a means to support consumption smoothing, then there are better tools than a microfinance loan to do this. Microfinance loans, due to their small size and the lack of credit history and collateral of the borrower, tend to have high interest rates. As microfinance institutions began to shift towards the for-profit model, the goals and purpose of those organizations naturally shifted as well. However, even the most well meaning organizations, when faced with making their

³⁰ Beck & Ogden (2007)

model sustainable, are forced to charge high interest rates. For PRIDE, these rates annualized to 50% interest. When you have business loans with such high interest rates being used for consumption and not investment, it is unsustainable and could eventually lead to default or high indebtedness.

A different approach would be to prioritize using savings and credit associations, or credit unions among married females. These associations tend to have lower interest rates on the loans while at the same time promoting savings. These credit unions are community-based and controlled, where the poor save their money and then lend to each other. One credit union model has each member contributing an agreed upon amount at a weekly meeting. At this meeting, the members then decide how much of the fund to lend, to whom, and the terms of the loan. After an agreed upon length of time, each member then receives back their savings along with a dividend representing the earned interest from the loans. These groups tend to be much smaller than a typical microfinance institution, and because of that, they are able to lend out small loans as well as large loans, enabling them to reach many levels of poverty. Also, because the interest rates are much lower, the loans can be better used for consumption smoothing as well as business ventures.³¹

Another widespread model are Roscas (Rotating savings and credit associations). These tend to be smaller, and are often exclusive to women. In these associations, the women contribute their savings to the group fund at each meeting and each meeting one of the members gets to take the fund as a loan in a predetermined order. The fund or 'pot' continues to be rotated to each member every meeting until each of them has received it. Many of these Roscas also are secret clubs, allowing the women to hide their savings from their husbands. Many of the PRIDE clients that were interviewed were already Roscas members on the side. However there was a perception that these types of savings clubs were riskier. Since these clubs were more informal and smaller than larger microfinance institutions, there was a higher risk that a member might walk away with their money. In addition there is less flexibility in the timing of the loan and the amount in that it is on a set week schedule with a fixed amount.³²

A relatively new model being used is the MicroSavings model. Presented as a viable alternative to MicroCredit, it operates in much the same way as Roscas but with added loan flexibility, and

³¹ Corvett & Fikkert (2009)

³² Anderson & Baland (2002)

with less overhead than most microfinance institutions. One estimate from Jeff Ashe, the leader of Oxfam America's MicroSavings project, puts the startup costs at \$20 per client, compared to \$200 for a typical microcredit borrower.³³ Additionally, unlike the Roscas, where the women only get the loan on a rotating schedule, this model would allow them to take out a loan when needed, improving flexibility for emergency or consumption smoothing situations. Due to its smaller size, it would naturally be less geared towards micro entrepreneurship. However, it is feasible to consider both microsavings and microcredit models working together, and indeed, many microfinance organizations are working towards building up and prioritizing their savings programs.

6.2 India's Kerala model of Microfinance

If the goal is instead to help married women focus on and invest more in their business, then the credit union and Roscas models might be too restrictive in their lending structure. In this case, microfinance still appears to be the best option, however in perhaps a different form that better addresses the reality of the household constraint. In his book, *Why Doesn't Microfinance Work?*, Milford Bateman highlights three major problems of microfinance: The first being that it produces major redundancies in the types of businesses; Secondly that it diverts attention and finances away from Small-Medium size Enterprises (SMEs), where real growth is generated, to these single-owner micro-businesses which are unable to take advantage of economies-of-scale; Third, that it leads to an isolation of the clients.³⁴ During my time with the field research experiment in Tanzania, these problems were very apparent. It wasn't uncommon to drive down a block and see multiples of soda kiosks, tailors, or restaurants, all offering the same services and products. One of the reasons is, because they start out with such a small individual loan, it limits the types of business they can start. In addition, their choice of business is often in an area that they are familiar with or is something they do already in their household. That is why women tend to choose cooking, sewing, etc, and why they often operate it out of their home, regardless if their neighbor is doing the same thing. These types of businesses have a natural ceiling to how much they can grow.

Bateman goes on to present an alternative, using the example of a form of microfinance used in the town of Kerala in India. Like a traditional microfinance model, they also use solidarity

³³ Oxfam America

³⁴ Bateman (2010)

groups to lend to; however, instead of handing out 5 individual loans to the group for five individual businesses, they lend one group loan for one group business. These loans are given out at a local coop bank and the loan is matched by group's own savings, helping promote savings and avoid an over-reliance on loans. In addition, the group business must be signed off by the village council to make sure that it fits within the overarching town development plan, helping to avoid business redundancies and overinvestment in any one industry. Thus, this model seeks to solve three issues in microfinance by building up the interconnectedness of the clients, increasing the size of the business ventures, and working to avoid overinvestment in the types of businesses.³⁵

In addition to helping correct these issues, this Kerala model of microfinance could also help to minimize the constraint of the household that the married females are facing. It would enable women to start a larger businesses that have higher growth potential, while being able to share the workload with 4 others. This workload may have been a deal-breaker if she were to do it on her own as it could conflict with her other responsibilities to her children and household. Also, by tying the interests of the five women together to one business, it would help create a clearer separation between the business and household, helping keep the profits and loans within the business.

6.3 Loan Structure

Lastly, if the goal is to shift the focus towards helping married females start businesses with higher growth potential, then perhaps the typical microfinance loan structure needs to be reevaluated. The way the microfinance loans are set up now more resemble a typical consumer loan rather than a small business loan. Once a borrower is approved for a loan, they have to begin the weekly repayment cycles immediately. This forces the clients into the types of business that produce a fast profit so they can start the repayment immediately. However, those types of businesses also tend to be low growth types of businesses, geared towards short-term volume. By allowing a grace period in the beginning, and extending the loan repayment schedule, you could allow the borrowers to enter into the types of business that may have slower profit, but in the long-term, larger growth & profit. It would help spur more long-term planning in the overall business strategy.

³⁵ Bateman (2010)

7. Conclusion

We came into this thesis with the question of: what is that external constraint on female entrepreneurs that is preventing them from taking advantage of the business training and growing their businesses? The hypothesis was that the household was that external constraint, which was sapping their time and resources away from their business and constraining it from growing. Using economic theory of household decision making models and the quantitative data from the Tanzania experiment, we were able to show that the data strongly suggested this to be the case. Female entrepreneurs were constrained by time, seen in the amount of time they were able to spend on their business; they were constrained in the decision of where to locate their business; they were constrained in their lack of control in the household decision-making process; and they were constrained by having to cover more of the household expenses as their business did better. It was also found that the training was unable to relax this constraint, meaning that for female entrepreneurs, the household is a more binding constraint on their business than the financial and human capital constraints.

That's not to say it's only a negative that the females are having to cover more of the household expenses. Studies have shown that the kids are better off when this happens, and it could allow the husband to either invest more in his business or provide for his family in other ways. However, the way the structure is now, it appears that there are only two choices for female entrepreneurs: Either the household is better off and the business suffers, or the business is better off and the household suffers. We saw in section 6, how it doesn't have to be limited to those two choices. There are other financial tools that may work better as an alternative or in conjuncture with microfinance to help these two aspects of the female entrepreneur's life coexist.

So what can be done to help relax this constraint? In order to keep the business profits invested within the business, the household expenses will need to be covered in other ways. Some microfinance institutions are exploring the concept of microinsurance. Theoretically, this would have significant impact on reducing the use of business profits and loans on the consumption smoothing emergencies. Additionally, further research should be taken to study the effects on a household of a subsidy on school fees (which currently takes a significant amount of their resources). Once a way has been found to relax this constraint, female entrepreneurs will be able to better take advantage of the business training and loans to grow their business and unleash their potential.

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