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Entrepreneurial Saving Practices and Business Investment: Theory and Evidence from Tanzanian MSEs*

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Abstract

What is the relationship between entrepreneurs' saving practices and their investment decisions? We present a simply stylized model that shows that entrepreneur's business investment decision depends on the efficiency of her saving practice, in addition to the productivity, liquidity needs, and the borrowing capacity of the entrepreneurial firm. Utilizing a novel micro & small enterprise survey from Tanzania we test the empirical implications of this stylized model. We find that (1) saving for business purposes and entrepreneurial earnings reinvestment are positively related, and (2) the practice of *saving in a deposit account of a formal financial institution* is more likely to foster reinvestment compared to the practice of *keeping savings within the household*. We also show that the negative impact of saving within-household on investment is more pronounced for life-style entrepreneurs; and also for family members with inherently low intra-household bargaining power - such as females and non-head household members. Our work contributes to the recent debate on the implications of saving instruments in developing countries, and suggests within-household saving practice as a bottleneck to microenterprise performance.

Preliminary Draft

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JEL Classification: D14; G21; O12; O16.

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1 Introduction

In developing countries, intermediation costs and enforcement frictions constrain access to external finance by micro and small enterprises (MSEs) - leaving entrepreneurs' earning retention as a key element for small business growth. But, what explains entrepreneurial decisions to reinvest in their own businesses? Given the limited access to formal financial services, many entrepreneurs use informal mechanisms for saving, borrowing, and liquidity management. In this paper, we utilize a novel dataset from Tanzania to explore whether entrepreneurial saving practices can explain variation in entrepreneurs' reinvestment decisions. Specifically, we gauge whether the decision to save with formal financial institutions, individually (under the mattress), within the household or within informal arrangements, such as ROSCAs, co-varies with the decision to reinvest. We motivate our empirical work with a simple theoretical model that shows that an entrepreneur's investment decisions depend on the entrepreneur's saving practice, in addition to productivity, liquidity needs and borrowing capacity of the entrepreneurial firm.

Saving for business purposes should foster entrepreneurial reinvestment. However, the savings mechanism might be critical for the ability to reinvest. On the one hand, for formal savers the opportunity cost of consuming savings instead of reinvesting them is not only the loss of financial reserves but also the foregone interest income. On the other hand, "within-household savers" might be less likely to reinvest, because they suffer from the redistributive pressure on savings within the household. If the remaining household members are aware of the existence of saving funds, it would be hard to prevent the funds from being exploited for the general consumption needs of the household. In between these two extremes are "individual savers" and "informal savers", for whom we assume the redistributive pressure to be less than for "within-household savers" but more than for formal savers as there are fewer formal constraints for withdrawing their savings. Comparing "individual savers" with "informal savers", we note that although the interest income from informal finance network should have an impact on the opportunity cost of consumption, the inflexibility to withdraw savings at informal financial institutions might offset this income effect and reduce the implications on earnings retention.¹

We present a simple theoretical model to show the relationship between entrepreneurial investment decision and savings practices. We show that entrepreneurs are more likely to invest in their business if they save in a form with easy access to their savings, such as formal savings accounts or personal savings forms. .

To test the empirical relationship between savings patterns and reinvestment decisions, we

¹The rate of return to savings in social saving clubs is typically lower compared to formal financial institutions. For related discussion see Vonderlack and Schreiner (2002) for a discussion. Entrepreneurs saving via informal channels are more likely to have limited access to their savings. For instance, members of ROSCAs cannot access to their saving until their turn comes (see Besley et al. (1993) for a theoretical discussion of ROSCAs), unless there is a relevant secondary market (Calorimis and Rajamaran, 1998). Similarly, moneylenders may postpone repaying the savings or it might be hard to reach them.

use an MSE survey for over 6,000 entrepreneurs undertaken in 2010 in Tanzania. The sample of entrepreneurs surveyed covers a large variety of enterprises in different locations, of different gender, educational profile and sectors. We document that entrepreneurs' saving *practices* do indeed covary with the likelihood of earnings retention at MSEs. The survey design allows us to differentiate between different savings vehicles, including within household savings, saving under the pillow, informal savings club, and formal deposit accounts. Our results reveal that the probability of reinvestment is significantly higher for savers and that when compared against formal deposit account holders, entrepreneurs who give their savings to other household members to keep them safe are significantly less likely to reinvest. Specifically, we find that when we compare the practice of keeping savings *within the household* against the practice of *having a deposit account at a formal financial institution*, the latter is more likely to stimulate earnings retention relative to the former.

We conduct a series of robustness checks to ensure the consistency of our results to the inclusion of additional control variables and alternative model specifications. Furthermore, to address the potential reverse causation of high reinvestment on saving practices we utilize the distance to the nearest bank and entrepreneur's age as instruments in recursive bivariate probit regressions. We use these two instruments, because accessibility to a bank and entrepreneur's age are expected to determine whether the savings will be kept in a bank account or shared with the rest of the household. The coefficient estimates remain stable and significant across all specifications. Finally, we explore the differential effects of saving patterns on reinvestment decision across groups with different intra-household bargaining power and different entrepreneurial motivations. We find that the negative relationship between savings within the household and reinvestment decisions is stronger for entrepreneurs with lower intra-household bargaining power, such as females and non-household heads, and for entrepreneurs who run their own business out of lack of alternatives.

Tanzania is a perfect setting to test the relationship between different saving practices and entrepreneurial investment decisions. Tanzania is a low-income country in East Africa, whose private sector is dominated by micro- and small enterprises. While the financial sector was liberalized in the 1990s and there is a large number of formal financial institutions, access to formal financial services is very low, with only 17% of adults having a formal bank account (World Bank, 2012). Tanzania shares many characteristics with other low-income countries in Africa, including a very disperse population and a high degree of informality.

This paper relates to several distinct literatures. First of all, our study investigates the role of saving practices on business investments in addition to previous studies investigating the determinants of business investment. Past research on finance and entrepreneurial investment has shown that entrepreneurs invest more if they expect high private returns from their investment activity (e.g. Demircug-Kunt and Maksimovic, 1998; Johnson, McMillan and Woodruff, 1998). Moreover, there are several studies investigating the impact of access to external finance on investment for microenterprises (Karlan and Zinman, 2010a; Karlan and Zinman, 2010b; Kaboski and Townsend, 2011; Attanasio et

al., 2012 and Banerjee et al., 2013). We add to this literature by focusing on saving patterns as additional factor explaining variation in reinvestment decisions across micro- and small entrepreneurs.

Our most important contribution is to the growing literature concerning the implications of access to different saving instruments in developing countries. There are increasing number of studies exploring the impact of access to formal banking services and how it affects the level of savings (Burgess and Panda, 2005; Kaboski and Townsend, 2005; Dupas and Robinson, 2013a). A recent experimental study by Dupas and Robinson (2013a) shows that savers in formal bank accounts save and invest more to their businesses than the entrepreneurs who do not save in formal banks. In a companion study (Dupas and Robinson, 2013b), they compare the health investment performance of the women saving via various informal saving instruments and find that some of them boost investment in health. Similarly Brune et al. (2013) evaluate the effect of commitment savings accounts on several outcomes for Malawian cash crop farmers. We contribute to this literature by comparing the investment likelihood of formal savers with different types of informal savers such as individual savers, savers via other household members, ROSCA, informal savings club members and moneylenders.

Our paper also relates to literature on barriers to savings in developing countries (see Karlan, Ratan and Zinman, 2013, for an overview). In addition to geographic, monetary and regulatory barriers, there are significant social constraints on savings behavior, partly related to the position of the entrepreneur within the household. Previous research has linked participation in informal savings services, such as ROSCAs to intra-household bargaining problems (e.g., Besley et al. 1993; Anderson and Baland, 2002). Social constraints can also explain why entrepreneurs save and borrow at the same time. Critically, the literature has shown that the relative position within the household is important for savings and investment decisions. For instance, de Mel et al (2008) show that as the decision making power of women in the household increases returns to capital and investment for women increase as well. Ashraf (2009) in a lab experiment in Philippines documents that subjects are more likely to save the randomly allocated money in their private deposit accounts when their spouse is not aware of the money, while they prefer to consume when the spouse knows about it. Evidence from an experimental study with 142 married couples in Kenya showed that husbands spend privately more when they receive an income shock. But when their wives receive the shock they do not increase their consumption (Robinson 2011). Likewise Schaner (2013) find that well matched Kenyan couples are more likely to use joint accounts instead of costly individual ones. Our study supports these findings by showing that members of the household who have potentially less power in decision making are less likely to turn their household savings into investments.

Unlike many other papers in this literature that discuss randomized control trials (RCTs), our paper relies on cross-sectional survey data and thus faces the usual endogeneity biases. We address these concerns by using instrumental variables and by exploring the differential relationship between savings patterns and reinvestment decision across different entrepreneurial groups. Beyond these methodological differences, however, our analysis also allows a broader exploration of reinvestment

decisions across different savings patterns. In addition, we realize that such savings patterns are the outcome of repeated interactions and persistent habits and are thus harder if not impossible to control under a randomized control trial.

The rest of the paper is organized as follows. Section 2 presents a simple model to show how saving practice can influence entrepreneurial investment decisions. Section 3 discusses the regression set-up and the set of control variables. Section 4 presents the data we use for our analysis. Section 5 discusses our main findings, while section 6 discusses the determinants saving choice, test for reverse causality and heterogeneity in the estimates. Section 7 concludes.

2 A 2-Period Model

We develop a partial equilibrium heterogeneous firms model to study the interactions between entrepreneurial savings and profit reinvestment. In our model entrepreneurial heterogeneity has four dimensions: productivity, liquidity needs, borrowing capacity, and saving practice. In the benchmark model all of these four dimensions are exogenous. We also extend the benchmark model in section 2.5, where we endogenize the saving practice as an entrepreneurial decision. In the following, we first present the economic environment, and then entrepreneur's maximization problem, before deriving the optimal investment behavior. This allows us to derive several testable hypotheses.

2.1 Environment

There are two time periods, 1 and 2 ; a continuum of entrepreneurs indexed by i ; and a good - call it cash - that can be invested, saved or consumed. Entrepreneurs have linear preferences over the life-time consumption such that

$$U_i = c_{1,i} + \beta c_{2,i}, \quad (1)$$

where U is the life-time utility and c_1 and c_2 are consumption levels in period 1 and in period 2 respectively. Letting the rate of return from postponing consumption from period 1 to period 2 be denoted with ρ_i , the optimal consumption plans implied by (1) are described as:

$$\begin{aligned} c_{1,i} > 0, \quad c_{2,i} = 0 & \text{ if } \rho_i < \frac{1}{\beta}, \\ c_{1,i} = 0, \quad c_{2,i} > 0 & \text{ if } \rho_i > \frac{1}{\beta}. \end{aligned} \quad (2)$$

Entrepreneurs are entitled to operate a technology that *could* generate $A_i k_{1,i}$ units of cash-flow at the end of period 2 for each unit of $k_{1,i}$ invested in period 1 - where $A_i > 1$ captures the productivity heterogeneity across entrepreneurs. A high A_i can be associated with better training, education or some

sort of intrinsic ability to manage a firm. The realization of the investment cash-flow is conditional on a liquidity injection that needs to be incurred at the beginning of period 2. Specifically, entrepreneur i 's technology yields $A_i k_{1,i}$ plus an additional $\ell_{2,i} k_{1,i}$ if and only if the entrepreneur is capable of injecting a firm-specific $L_{2,i} = \ell_{2,i} k_{1,i}$ units of cash into his business at the beginning of period 2, with $\ell_{2,i} < 1$. If the entrepreneur fails to inject the working capital, the technology does not yield any return. To summarize, the entrepreneurial technology has the following specification:

$$\begin{aligned} y_{2,i} &= A_i k_{1,i} + \ell_{2,i} k_{1,i} \text{ if } L_{2,i} = \ell_{2,i} k_{1,i}, \\ &= 0 \text{ otherwise.} \end{aligned} \tag{3}$$

We assume that $\ell_{2,i}$ is deterministic and is publicly known at the beginning of period 1². In this production function formulation, $\ell_{2,i}$ captures the expected liquidity needs - for instance working finance requirements of the business - whose size does not affect the return on investment projects as long as it can be financed at the beginning of period 2. We assume that both A and ℓ are drawn independently and identically from a cumulative distribution at the beginning of the period 1.

The capital investment in period 1 is financed by the entrepreneur's endowment ω - which we assume to be homogeneously distributed among all entrepreneurs in the economy. We do not allow for borrowing at the period 1 capital investment stage because our aim is to understand the dynamics behind the probability of earnings retention - reinvestment - at entrepreneurial firms.

The liquidity need $L_{2,i}$ can be financed via two sources:

1. The entrepreneur can borrow, denote it with $b_{2,i}$, up to a θ_i fraction of $L_{2,i}$ in the financial market at a real interest rate 1, where θ_i is an entrepreneur specific parameter capturing the ability to raise liquidity - working capital - finance externally. The borrowing capacity θ is drawn from a cumulative distribution function at the beginning of the period 1.
2. The entrepreneur can save cash from period 1 to period 2, which we will call *saving for business purposes* denoted by $s_{1,i}$, at a rate ζ_i with $\zeta_i \leq 1$. In this formulation, ζ_i captures saving practice (in)efficiency of the entrepreneur. We assume that there are two general saving practice types: Formal (ζ_F) and informal (ζ_I) - to be endogenized in section 2.5. We suppose that $\zeta_F = 1$ for those who save formally, whereas ζ_I is heterogeneous among entrepreneurs with $\zeta_I < 1$ for all I individuals who save informally. The heterogeneity in informal saving (in)efficiency can be motivated, for instance, by the cross-sectional variation in within-household bargaining power, as we will discuss below.

To summarize, the timing of events in both periods is specified as the following:

²The qualitative features of the model would remain identical if we assumed stochastic liquidity shocks which materialize at the beginning period 2.

I. Period 1

1. Entrepreneurial (4-dimensional) types are realized.
2. Capital investment into the production technology.
3. Saving for business purposes.
4. Period 1 consumption.

I. Period 2

1. Borrowing to finance liquidity needs.
2. Liquidity injection: Using borrowed funds and savings from period-1.
3. Cash-flow realization from the production technology.
4. Period 2 consumption.

We would like to note that in this model the exact timing of k investment is not too essential. All we need is that k is invested before the liquidity injection is made. This means allowing parts of the savings for business purposes s to finance k , which can be reached by changing the timing of events (2) and (3) in period-1 timeline, will not alter the qualitative properties of the model that we highlight in section 2.4.

2.2 Feasibility Constraints

The endogenous variables in this model are $c_{1,i}$, $c_{2,i}$, $k_{1,i}$, and $s_{1,i}$. Entrepreneurs maximize life-time preferences delineated at (1) - with respect to the endogenous variables - subject to the following constraints:

$$c_{1,i} + k_{1,i} + s_{1,i} \leq \omega_i, \tag{4}$$

$$c_{2,i} \leq A_i k_{1,i} + s_{1,i} \zeta_i, \tag{5}$$

where (4) and (5) are the budget constraints for period 1 and period 2 respectively.

An immediate implication of this set-up is that if and only if $k_i > 0$, the entrepreneur forecasts that there will be sufficient capacity to finance future liquidity needs. Therefore, iff $k_i > 0$ we have

two additional constraints that need to hold:

$$L(k_{1,i}) \leq s_{1,i}\zeta_i + b_{2,i}, \quad (6)$$

$$\theta_i L(k_{1,i}) \geq b_{2,i}. \quad (7)$$

The inequality (6) is the constraint that ensures that there is sufficient liquidity at the beginning of the period 2 - financed by saving for business purposes ($s_i\zeta_i$) and borrowing (b_i). The inequality (7) is the borrowing constraint associated with the working capital finance.

2.3 Optimizing Behavior

The qualitative properties of this model are as follows. Entrepreneurs who choose a $k_{1,i} > 0$, exhaust their borrowing limit θ_i . This is implied by the assumption that saving is inefficient ($\zeta_i < \zeta_F = 1$) in this economy for informal type of saving practices. Therefore,

$$b_{2,i} = \theta_i L(k_{1,i}), \quad (8)$$

as long as $\zeta_i < 1$.

Then using (6) with equality we get:

$$s_{1,i} = \left(\frac{1 - \theta_i}{\zeta_i} \right) L(k_{1,i}). \quad (9)$$

Equation (9) implies that the lower ζ the higher is the amount saving for business purposes - for those entrepreneurs who choose to invest. But, as we show below a low ζ implies a low likelihood of earnings retention and as a result a low likelihood of saving for business purposes.

Using (9) in budget constraints (4) and (5) yield:

$$c_1 = \omega_i - k_{1,i} - \left(\frac{1 - \theta_i}{\zeta_i} \right) L(k_{1,i}), \quad (10)$$

$$c_2 = A_i k_{1,i} + (1 - \theta_i) L(k_{1,i}). \quad (11)$$

Finally, using (10), (11) and the optimal consumption plans from (2) we can show that the entrepreneur chooses to invest ($k_i > 0$) in period 1 if and only if:

$$\rho_i = \frac{A_i + (1 - \theta_i)\ell_i}{1 + \ell_i \left(\frac{1 - \theta_i}{\zeta_i} \right)} > \frac{1}{\beta_i} \quad (12)$$

2.4 Empirically testable implications of the model

Applying comparative statics at (12) we derive the key empirically testable implication of the model in the following proposition:

Proposition 2.1 *Entrepreneurs with an efficient saving practice (high ζ_i) are more likely to invest.*

Proof Taking the first-partial derivative of ρ with respect to ζ we can see that:

$$\frac{\partial \rho}{\partial \zeta} = \left(\frac{1}{\zeta^2} \right) \left\{ \frac{\ell(1-\theta)(A + (1-\theta)\ell)}{\left[1 + \ell \left(\frac{1-\theta}{\zeta} \right) \right]^2} \right\} > 0.$$

That the (in)efficiency of an entrepreneur's saving practice raises the likelihood of earnings reinvestment will be the key hypothesis of our empirical analysis. However, in order to deepen the empirical validity of our theoretical model, we also provide the following set of propositions.

Proposition 2.2 *Entrepreneurs with a high borrowing capacity (high θ_i) are more likely to invest.*

Proof Taking the first-partial derivative of ρ with respect to θ :

$$\frac{\partial \rho}{\partial \theta} = \frac{\ell \left(\frac{A}{z} - 1 \right)}{\left[1 + \ell \left(\frac{1-\theta}{\zeta} \right) \right]^2} > 0.$$

where $z = \frac{1-\theta}{\zeta^2}$.

Proposition 2.3 *Productive entrepreneurs (high A_i) are more likely to invest.*

Proof Taking the first-partial derivative of ρ with respect to A :

$$\frac{\partial \rho}{\partial A} = \frac{1}{1 + \ell \left(\frac{1-\theta}{\zeta} \right)} > 0.$$

Proposition 2.4 *Entrepreneurs with a low liquidity need expectation (low ℓ_i) are more likely to invest.*

Proof Taking the first-partial derivative of ρ with respect to ℓ we can see that:

$$\frac{\partial \rho}{\partial \ell} = -(1 - \theta) \frac{\frac{A}{\zeta} - 1}{\left[1 + \ell \left(\frac{1-\theta}{\zeta}\right)\right]^2} < 0.$$

In our regression equations we will control for a vector of variables to test the empirical fit our model to the data based on the theoretical results we obtained in propositions 2.2 through 2.4.

2.5 Endogenizing the Saving Practice

Our theoretical model implies that if an entrepreneur's saving practice is inefficient, then she is induced to save a lot which makes postponing consumption from period 1 to period 2 inefficient. Therefore, saving practice of an entrepreneur is likely to be an endogenous variable, where the decision to save formally might be a costly action.

Suppose, there are two saving options available for an entrepreneur as spelled out previously - formal and informal. In order to be able to save formally the entrepreneur needs to sacrifice a utility loss worth of ψ_i units of consumption for each unit of fund deposited formally. The utility loss might be due to social costs (e.g. hiding savings from family members at a bank account) or physical costs (e.g. transportation costs) as well as idiosyncratic factors. The efficiency of the formal saving practice is denoted with ζ_F and the efficiency of the informal saving practice is denoted with ζ_I , where $\zeta_F = 1 > \zeta_I$ for all I individuals who save informally.

Using equation (12), an entrepreneur i is willing to save formally if and only if

$$\rho_F - \rho_I = (A_i + (1 - \theta_i)\ell_i) \left(\frac{1}{1 + \ell_i \left(\frac{1-\theta_i}{\zeta_F}\right)} - \frac{1}{1 + \ell_i \left(\frac{1-\theta_i}{\zeta_I}\right)} \right) > \psi_i, \quad (13)$$

which would hold if (a) the entrepreneur has a low cost of accessing a formal financial institutions and/or (b) a high enough productivity, high liquidity needs and limited access to borrowing.

2.6 Impact Heterogeneity

The entrepreneurial (in)efficiency associated with informal saving practice is expected to be a function of accessibility to savings. Such accessibility constraints could be related to the repayment structure for the case of informal saving networks (e.g. Rotating-Saving-and-Credit-Associations) and within household bargaining power for the case of in-household savings. This implies, for instance, that

entrepreneurs with low household bargaining power would have a lower ζ_I . The bargaining power of an individual could vary according to the position of the individual in the household in developing country contexts. Because of social norms and pressure, for instance female household members, children, and siblings are naturally at a more disadvantageous position than males and household heads in terms of claiming from the common resources of the household. They are less likely to claim money from the common savings pot of the household to finance their liquidity needs thereby reinvesting less likely. We will utilize this intuition in our sample-split empirical analysis in section 6.

3 The Empirical Methodology

We test the hypotheses derived from the theoretical model with a dataset on Tanzanian MSEs. To test whether saving practices affect the decision to reinvest, we use the binary outcome variable *reinvest*, which equals 1 if the entrepreneur invests some of the profits back into business, and estimate the following probit model:

$$Reinvest_i = \alpha + \beta' S_i + \gamma' Controls_i + \epsilon_i, \quad (14)$$

where i denotes the entrepreneur, S is a vector of saving practices comprised of dummy variable(s) which takes the value of 1 if the entrepreneur has the corresponding saving practice (see below for details) and ϵ is the error term. The vector of control variables included in the benchmark regression is composed of an array of entrepreneurial and enterprise characteristics that we discuss in the following.

First, in line with our theoretical model, we control for firms' past borrowing history. Specifically, *Borrowed* is a dummy variable which takes the value of 1 if the entrepreneur has ever borrowed to cover business needs. Businesses that do have access to external finance are expected to reinvest more frequently even in the absence of regular entrepreneurial savings. Second, we conjecture that entrepreneurs with a higher *household income* can save more and as a result reinvest more often. To control for the income effects, we use self reported monthly personal income levels.³

Third, in line with our theoretical model, we control for liquidity needs of the business. We expect businesses with high liquidity needs to be less likely to re-invest as they should put aside more resources to finance their operational needs. We use the share of variable expenses (in August, 2010) in the sales of business at a normal month as a proxy for the need of liquidity.⁴ Fourth, entrepreneurs with

³Each respondent is asked which income range (e.g. TSHS 35 001 - TSHS 40 000 per month) describes their income level best. We use median of that range (e.g. TSHS 37500.5) as the income level of the respondent.

⁴Variable expenses comprises of money spent for business purposes on wages for labour, transport, insurance, finance/loans (repay loans), rent for premises, mobile phone costs, water, landline telephone, electricity. We trimmed the

a high human capital are expected to be more committed to business growth, and to have higher rates of earnings retention. We use the highest level of *formal education* completed by the respondents, as well as an indicator of entrepreneurial training, as this should matter for expected business performance and reinvestment behavior.

Fifth, we control for *gender* and *marital status*, as both can influence investment decisions. Specifically, we expect female entrepreneurs to face more claims on their income from spouse and family members. Similarly, married entrepreneurs might face more claimants on the business profits and might therefore be less likely to re-invest them. Finally, we include sectoral dummies to control for sectoral performance that might explain reinvestment heterogeneity, as well as regional dummies to control for geographic heterogeneity in profitability and reinvestment.

We empirically explore the relationship between specific forms of savings and the likelihood of reinvestment. Specifically, our survey allows us to identify two types of saving practices among Tanzanian entrepreneurs which we classify as follows:

1. *Save formal*: This practice includes the entrepreneurs who save their funds at formal financial institutions such as commercial banks, microfinance institutions or saving & credit cooperatives.
2. *Save informal*: We consider entrepreneurs who do not save formally in this group.

This separation corresponds to the control-treatment group set-up of many randomized control trials that assess the impact of using formal saving products on household and entrepreneurial outcomes. In addition, however, our survey allows a finer classification to exploit the considerable heterogeneity in terms of informal saving practices. Therefore we first divide *saveinformal* into two groups and distinguish individual saving practices and practices involving interaction with other people as follows:

1. *Save informal individually*: A large fraction of entrepreneurs in Tanzania save their funds only in a secret hiding place or piggy bank.⁵ We classify this behaviour as “informal individual saving” practice.
2. *Save informal with others*: We classify the practices of saving funds via informal saving clubs, such as ROSCAs, or moneylenders or within household savers under “saving with others”. We do not include respondents who also save formally in this group.

data for shares in the 1% percentile because of potential wrong entry. Not to lose extra observations. We replaced the missing values with 0 and add a dummy to all regressions equals to 1 if that value was missing. Our main results are similar without trimming and missing variable correction.

⁵Piggy bank is a coin container.

To distinguish whether our entrepreneurs save through people living in the household or people who are not member of a household, we decompose the practice of “*Save informal with others*” further into two groups.

1. *Save with household member*: The group comprises of entrepreneurs who gave their funds to other household members to keep it safe.
2. *Save with people outside household*: The group contains entrepreneurs who save through ROSCAs or moneylenders.

We again conjecture that entrepreneurs in the second group have more control over their savings than entrepreneurs in the first group, especially if they have limited intra-household bargaining power. In our regression analysis, we will use a dummy variable for each saving practice above (see Table 1 below for the descriptions) and work with different samples to compare both savers and non-savers but also different groups of savers in their reinvestment behaviour.

4 The Data

The dataset is based on a novel enterprise survey conducted at the MSE-level in Tanzania. The survey data was collected by the Financial Sector Deepening Trust Tanzania in 2010 from a nationwide representative cross-section of 6,083 micro and small enterprises. The respondents of the questionnaire are entrepreneurs with an active business as of September, 2010. Table 1 presents both detailed definitions of the variables and descriptive statistics of the sample.

- Table 1 about here -

The descriptive statistics in Panel A of Table 1 shows that the average number of employees among Tanzanian MSEs is 1.5 workers, ranging from one (i.e. self-employed) to 80 employees.⁶ However, 97% of entrepreneurs are self-employed. The median initial capital is about 35 USD and average monthly sales are 149 USD. The key question which we exploit to capture entrepreneurs’ earnings retention asks whether *the respondent reinvests some of the profits back into business*. As we present in Table 1, 76% of the sample entrepreneurs engage in earnings retention.

⁶The relationship between business owners’s saving and re-investment decisions might be weak in large businesses because of managerial layers. We test consistency of our main result by excluding the businesses larger than 10 from our sample. Estimates reported in Table 3 do not change

The sectoral breakdown in Panel B of Table 1 exhibits substantial variation: 54% and 30% of the businesses operate in the trade and service sectors, respectively, while 15% of enterprises operate in manufacturing.

Panel C of Table 1 presents characteristics of entrepreneurs and enterprises. About 50% of the entrepreneurs in the sample are female, 10% of the entrepreneurs are single. 30% of the sample entrepreneurs received business related training, and about 87% of the entrepreneurs have less than completed secondary education. 75% of the enterprises are located in rural areas. The median monthly personal income of entrepreneurs is 106 USD.

Panel D of Table 1, finally, presents our variables and descriptive statistics on the financing patterns of enterprises in our sample. Only 18% of all sample entrepreneurs ever borrowed for business purposes; 3% of entrepreneurs in the sample from a bank of MFI, 2% from a semi-formal financial institution, such as a SACCO or village bank and 6% from an informal source, such as money lenders, savings club or family and friends.

Savings, on the other hand, are much more common among the entrepreneurs in our sample. We utilize an extensive margin question asking whether the entrepreneur saves for business purposes, and distinguish savers from the rest of the population: 77% of the entrepreneurs in the sample save for business purposes. However there is considerable heterogeneity among saving practices of Tanzanian entrepreneurs. Informal individual saving is the most popular practice among Tanzanian entrepreneurs. 75% of the savers save informal-individually whereas around 13% of them save formally. Likewise, 13% of the savers do not save at a formal financial institution and instead they save their funds via people outside the household such as members of ROSCAs and moneylenders or give them to household members.

Table 2 presents a correlation matrix concerning the variables of interest for our analysis. The key variables such as “being a saver” and “retaining earnings within the business” exhibit a strong correlation. However, the sign of the relationship seems to be dependent on the saving practice of the respondents. In particular saving via others seems to be negatively correlated with firm reinvestment whereas formal and informal individual savers have higher reinvestment rates. We also note a high correlation among other firm characteristics, such as borrowing and saving activity.

- Table 2 about here -

5 Saving Habits and Reinvestment: Baseline Results

Table 3 reports the marginal effects for the benchmark regression. We use heteroscedasticity robust standard errors and report the standard deviations associated with coefficient estimates in parentheses.

- Table 3 about here -

The results in the first column show that the probability of reinvestment is higher for both groups of savers compared to non-savers. Specifically, *ceteris paribus*, the reinvestment probability of an average Tanzanian MSE who saves informally is around six percentage points higher than for an entrepreneur who does not save, while the reinvestment probability of an average Tanzanian MSE who saves formally is around nine percentage points higher. We also find that entrepreneurs with access to formal loans are more likely to reinvest, while formal business training increases the likelihood of reinvestment in business projects. Female and married entrepreneurs are less likely, while richer entrepreneurs are more likely to invest. Moreover, entrepreneurs with higher liquidity needs, as proxied by variable expenditures, have a lower likelihood of re-investment. Overall, these results are consistent with our theoretical predictions as discussed above and the existing literature.

Our empirical analysis, so far, stresses the significance of *entrepreneurial savings* to foster entrepreneurial reinvestment in business projects and we confirmed that saving related correlations are in line with the findings in the literature. In the next step, we focus on our main research question and we deepen our analysis by studying the implications of saving *practices* on reinvestment. In order to test the predictions from our theoretical model, in this section we rank saving *practices* based on their vulnerability to consumption temptations - as we discussed above - and investigate the implications of the variations in saving methods on the probability to reinvest. Specifically, we rank the “within household savers” as the group for whom the vulnerability to consuming savings is the highest. On the other extreme, we expect the most committed savers to be “formal savers” due to the highest opportunity cost of consumption - resulting from the foregone interest income. Finally, comparing “informal individual savers” with “informal savers with others”, we conjecture that although the redistributive pressure problem is expected to be higher for the former, there would be a potential inflexibility to withdrawing savings when needed associated with the latter.

To investigate the effects of individual saving practices on earnings retention we limit our sample to savers and thus drop respondents who do not save.⁷ The results in column 2 show that “formal savers” are four percent more likely to retain earnings than the “informal savers”. The results in columns 3 show that entrepreneurs that save with others are less likely to reinvest than entrepreneurs

⁷Dropping respondents during the analysis from our sample do not bias our results although some regions and other sector groups drop because of perfect prediction of the regional dummies. When we estimate our model for the same sectors and regions for our 5 baseline estimations, our results are still robust.

that save formally.⁸ Also, entrepreneurs who save informally but individually are not significantly less likely to reinvest when compared to “formal savers”.

Finally, we focus on the group of respondents who save with others. We separately study the investment likelihood of household savers and respondents who save outside the household compared to the investment probability of formal savers. The regression in column (4) keeps only formal savers and household member savers in our sample, while the regression in column (5) keeps only formal savers and outside household savers in our sample. In both cases, we gauge the difference in reinvestment behaviour relative to formal savers. Therefore, the total numbers of observations in these two regressions are 877 and 774 respectively. Confirming our conjecture, we cannot reject the null hypothesis that “with household member savers” reinvest less frequently compared to “*formal savers*”, at the 5% level. Furthermore, we also show that, although the coefficient estimate of *Save with people outside household* variable in the last regression is not significant, the negative coefficient sign is consistent with the argument that the inflexible withdrawal opportunity of “informal savings” might be a barrier to earnings retention.

In summary, our results suggest that informal saving practices are associated with significantly lower likelihood of profits reinvest compared to formal saving mechanisms. It is important to note that the difference in reinvestment probability between formal and informal savers is mainly driven by the inefficiency of within-household savers in converting savings into investment.

In Table 4, we test the robustness of our key result concerning the difference in reinvestment likelihood between formal and within household savers (see column (4) in Table 3) with respect to the inclusion of a vector of additional control variables. First, we add specific dummy variables for different sources of external finance at the start-up of the enterprise: formal, semiformal and informal loans. Our indicator for external finance may not capture the potential implications of access to different sources of finance for reinvestment decisions. Getting loans from a formal financial institution might require a bank account and facilitate formal entrepreneurial savings. However, none of the external financing variables that we include have significant explanatory power for reinvestment likelihood. Second, we control for *entrepreneurial types* by utilizing the answers of to the following survey question “*why did you go to business?*”⁹ As evidenced in the previous literature (Bruhn and Zia 2011), transformational type entrepreneurs are expected have higher rates of investment profitability and earnings retention

⁸Here we consider entrepreneurs who have both types of informal saving practices, “saving informal individually” and “saving informal with others” inside “save informal with others” group. When we estimate specification in column-3 by adding a separate dummy for individuals having both practices and saving only informal with others together saving informal individually, estimates for the first two groups including saving practices with others are negative and statistically significant showing that our results are robust.

⁹Entrepreneurs selected from a list of statements to indicate why they went into business. Multiple choices were available. The answers include: I was fired / lost/retrrenched from a previous job; I couldn’t find a job elsewhere; To support me / my family; To try out a business idea; I believe I can make more money working for myself than for someone else; I had nothing else to do/no other means of survival/no better option; parents / relatives were in business; I saw a good opportunity; I have always wanted my own business; I was encouraged by friends and relatives; I needed to supplement my income; Others, please specify.

rate compared to survival type entrepreneurs. While we do not report the individual dummy variables, some variables enter significant at the 5% level. Third, we add dummy variables to control for the type of the activity the business conducts. The activity of the business (e.g. buying and re-selling it; buying, adding value and re-selling it, providing a service etc.) may change the definition of reinvestment for business owner and timing of the reinvestment. For instance, they may be different for a restaurant owner and market vendor. To control for this factor, we include answers to the question “what does business do?” as dummy variables.¹⁰ Fourth, we include the size of the logarithm of the initial start-up capital, the logarithm of current sales per employee, logarithm of duration business and logarithm of number of workers since these size gauges are expected to determine the growth potential of a business- and hence the profitability of reinvestment. We also control for rural vs. urban location of the enterprise, as the accessibility to infrastructure might affect expectations and derive variations in reinvestment rates. Including all of these control variables does not affect our key empirical finding.

Finally, in column (2) we replace the region fixed effects with district fixed effects to ensure that we are capturing geographical variations well enough that could explain the probability of reinvestment. While our sample becomes smaller, our findings remain.¹¹

- Table 4 about here -

6 Saving Choice, Reverse Causality and Heterogeneity

While controlling for other enterprise and entrepreneurial characteristics reduces the risk that the relationship between savings patterns and the likelihood of reinvestment is a spurious one, we cannot exclude the possibility that our relationship is driven by other sources of endogeneity, including reverse causation. As we shown in our theoretical model, entrepreneurs that are more willing to reinvest might look for savings patterns that ease up their investment efforts. In the following, we focus on the sample of formal and within-household savers one more time since our key result from the empirical analysis of section 5 is that “within household savers” are less likely to re-invest than “formal savers”. For this sample, we investigate the relationship between entrepreneurial saving choices and characteristics, and then offer a test to alleviate endogeneity concerns.

To investigate the determinants of saving choice, we replace the dependent variable *reinvest* with *save within household* in (1) and regress it on our list of control variables as well as two additional

¹⁰We include 4 separate dummy variables for the businesses buying and selling goods; buying, adding value and selling goods; making and selling goods; providing service; and other activities including agricultural ones. Note that when we include district fixed effects the total number of observations in the regression decreases to 650 because some districts are excluded from the regression due to perfect prediction.

¹¹Note that when we include district fixed effects the total number of observations in the regression decreases to 650 because some districts are excluded from the regression due to perfect prediction.

measures: Age of the entrepreneur and distance to bank. Age reduces the possibility of being forced to share savings “within the household”; therefore older agents might be more likely to save formally. The distance to the nearest bank is expected to increase accessibility of “formal savings services”. We estimate two models with two different measures of distance to formal financial institutions. The first one is a subjective distance measure constructed by using the question from the survey: Is there any bank branch in one hour walking distance to your house? However, there might be a concern regarding the subjective measure, as entrepreneurs who search for formal savings instruments are also those who are more likely to know the existence of a bank in the close proximity. Therefore, the correlation between the search intensity and some unobserved characteristics may bias our results. In this reason, we estimate a model with an additional objective distance measure, logarithm of ward level minimum distance to the closest bank branch, MFI or ATM in 2013 which we constructed by data from Financial Services Maps¹².

Table 5 reports the regression estimates for the saving practice choice. In columns (1) and (2) we present the results for models including subjective and objective measures respectively. As we conjecture, the likelihood of saving with household members is higher when entrepreneurs are closer to banks. Moreover, as the age of the entrepreneur increases, he or she is less likely to save with household members. The positive coefficient on the square of age indicates that there is a non-linearity in the age saving practice relationship. As the age of the entrepreneur increases, the impact of the age on the saving practice decreases. The rest of the estimates are also in line with the theory. Entrepreneurs who have access to external finance and entrepreneurs with higher education, better training or high income are more likely to save formally. Finally, female entrepreneurs seem more likely to save in formal institutions - perhaps to escape from redistributive pressures. Also, non-married entrepreneurs are more likely to save formally.

- Table 5 about here -

To circumvent the endogeneity concerns, we use an instrumental variable methodology which makes use of the determinants of saving practice choice. Since our dependent and main explanatory variables are binary, we use a system approach, and utilize the age of the entrepreneur and her distance to the nearest bank as instruments in a nonlinear recursive bivariate probit model.¹³ Specifically the model is formulated as follows:

¹²We used data from Financial Services Map for Tanzania. Data set give geographic coordinates of bank branches, MFIs and ATMs in 2013 at Tanzania. We match this data with the existing geographic coordinates of the wards from which entrepreneurial data is collected with this data. Then we calculated distance of ward to each financial unit and picked the minimum distance.

¹³We also estimate the same model by using 2SLS method. We have the same expected sign for the variable interest but coefficient estimate is unrealistically high and estimates become imprecise as the variance increases. We believe this is because we have both binary variable of interest and dependent variable. Chibus et al. (2012) suggests 2SLS may give very different results and imprecise estimates if number of observations are lower than 5000 (in our case it is 877) and the treatment probability is not very close to 0.5 (in our case it is approximately 0.38).

$$Reinvest_i = \phi + \delta Savehousehold_i + \eta' Controls_i + \sigma_i, \quad (15)$$

$$Savehousehold_i = \lambda + \mu' Z_i + \pi' Controls_i + u_i. \quad (16)$$

We assume that error terms σ_i and u_i are distributed via bivariate normal distribution. So, $E[\sigma_i] = 0$, $E[u_i] = 0$ and $cov[\sigma_i, u_i] = \mu$. We identify the system by using the vector Z which includes the distance to bank measure and age of the entrepreneur as well as its square. Table 6 shows the results. Before presenting the estimates of the bivariate probit model, in columns (1) and (2), we test in unreported regressions the exogeneity of our instruments by introducing the instruments into the benchmark model, where we show that none of the instruments have explanatory power for the probability to reinvest. We also test the joint significance of our exogenous variables in the bivariate probit model: they are jointly significant at the 1 percent level (Chi2=18.30; p-value<0.004). In columns (3) and (4) we present the recursive bivariate-probit estimates by using age in both models, but two different distance measures as our instruments. Also Table 1 in the Appendix shows detailed estimation results for the model.

- Table 6 about here -

The instrumental variable estimations reported in columns (3) and (4) of Table 4 confirm our results. The coefficient estimate of *save with household member* remains negative and significant for both instrument sets. Different measures of distance produce similar results thereby minimizing the concerns regarding the validity of the distance-to-bank proxies. We also note that the estimates for the exogenous variables have the expected signs. The probability to save in the household decreases as the proximity to bank decreases and entrepreneur gets older.

As we discussed in section 2.6, we expect heterogeneous reinvestment responses with respect to the within-household saving practice. Therefore, in order to deepen our analysis and strengthen our identification, we present a set of impact heterogeneity results in Table 7. Specifically, we compare the reinvestment behaviour of entrepreneurs that save within the household with the reinvestment behaviour of entrepreneurs that use formal savings mechanisms across the following three sample splits. First, we split the sample as female and male entrepreneurs. Theory and empirical evidence suggests that social constraints on accessibility of saved funds is lower for women compared to men. Second, we split the sample into two as entrepreneurs that are household heads and entrepreneurs that are spouses, children or siblings. We would again expect the social constraints to be less strong for household heads. Finally, we distinguish between transformational and life-style entrepreneurs. We define the respondents who went into business because they *were fired/lost/retrrenched from a previous job, couldn't find a job elsewhere and nothing else to do/no other means of survival/no better option*

as life-style or survival entrepreneurs, and we consider the rest as transformational entrepreneurs. Transformational entrepreneurs are expected to be more likely to reinvest in their businesses.

The results in Table 7 confirm a differential relationships between household savings and reinvestment decisions. The results reveal that the marginal effects of *Savehousehold* on reinvestment are larger - and more significant - for female, non-head family members and life-style entrepreneurs. While the negative relationship between saving within the household and reinvestment decisions are significant at least at the 10% level for all groups, the economic significance is large for female, non-household heads and subsistence entrepreneurs.

- Table 7 about here -

7 Conclusion

Past research identified several factors that could be important for entrepreneurial investment. In this study, we explored how different entrepreneurial saving practices (i.e. saving via formal financial institutions, individually (under the mattress), within the household or within informal arrangements, such as ROSCAs) are related with the likelihood of reinvestment. To this end, we used a novel survey data set collected from MSEs in Tanzania and distinguished multiple saving practices of entrepreneurs as well their earnings retention behaviour. We motivated our empirical research with a simple theoretical model that shows how different saving practices can influence investment decisions. We have three main results. First, we show that saving and the probability of reinvestment are significantly correlated. Second, we provide evidence that entrepreneurs who save by giving funds to other household members are less likely to reinvest than formal savers. Third, we document that the difference in the likelihood of reinvestment is significantly higher for those entrepreneurs who potentially have low bargaining power in the household and who are survival type entrepreneurs.

Our findings suggest that the entrepreneurs who need to protect their savings from consumption commitments of other household members may benefit most from the introduction of formal saving instruments in low income areas. Therefore, from a development policy perspective, targeting entrepreneurs who have low decision power in the household as well as survival entrepreneurs and facilitating their access to formal saving instruments could be thought as a priority. Our results have important implications for the interactions between enterprise performance and financial access as well. Enterprises that exploit reinvestment opportunities are expected to be more likely to sustain higher productivity levels and survive more often. Access to efficient saving mechanisms in this respect could be key to facilitate enterprise performance in financially developing societies.

Our research raises also some new issues regarding the implications of savings practices of

entrepreneurs. First, why do savers inside households not open a bank account to save? Although we implicitly show proximity to banks as an important factor to save in a formal account, identification of all factors is not in the scope of this study. Second, what is the exact role of pressure inside the household that does not allow earnings retention? These important questions we leave to future work.

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Tables

Table 1: Descriptive statistics for the main variables

| Panel A: Firm characteristics | | Obs | Mean | S.D. | Min | Max |
|----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------|------|-------|-------|
| Reinvestment | Equals to 1 if respondent re-invest some of the profit back to business, 0 otherwise | 6083 | 0.76 | 0.43 | 0 | 1 |
| Employee | Number of employees business has [including owner] | 6083 | 1.47 | 1.61 | 1 | 80 |
| Initial capital | Logarithm of initial capital of the business, in Tanzanian Shillings | 6083 | 10.62 | 2.21 | 0 | 25.33 |
| Panel B: Sectoral breakdown of firms | | % | | | | |
| Trade | | 54.1 | | | | |
| Service | | 30.3 | | | | |
| Manufacturing | | 15.3 | | | | |
| Other | | 0.3 | | | | |
| Panel C: Entrepreneur | | Obs | Mean | S.D. | Min | Max |
| Education | Education level of the respondent, [0 none-6 university] | 6077 | 2.00 | 0.89 | 0 | 6 |
| Female | Equals to 1 if respondent is female, 0 otherwise | 6083 | 0.50 | 0.50 | 0 | 1 |
| Single | Equals to 1 if respondent is single, 0 otherwise | 6083 | 0.10 | 0.29 | 0 | 1 |
| No training | Equals to 1 if respondent has no business related training, 0 otherwise | 6083 | 0.70 | 0.46 | 0 | 1 |
| Rural | Equals to 1 if respondent lives in a rural area, 0 otherwise | 6083 | 0.75 | 0.44 | 0 | 1 |
| Income | Logarithm of personal income level of the respondent in Tanzanian Shillings | 5868 | 11.94 | 1.15 | 9.90 | 15.20 |
| Bank branch within one hour walking distance | Equals to 1 if there is a bank within a one hour walk from the home of the respondent, 0 otherwise | 6083 | 0.30 | 0.46 | 0 | 1 |
| Min. distance to ATM, bank branch, or MFI | Minimum distance of the ward entrepreneur lives to the nearest ATM, bank branch or MFI, in logarithms, at ward level] | 583 | 2.04 | 1.78 | -4.35 | 6.12 |
| Age | Age of the respondent | 6083 | 36.84 | 10.6 | 16 | 91 |
| Panel D: Finance variables | | Obs | Mean | S.D. | Min | Max |
| Save | Equals to 1 if respondent saves for business purposes, 0 otherwise | 6083 | 0.77 | 0.42 | 0 | 1 |
| Save formal | Equals to 1 if respondent saves in a bank account, MFI or SACCO, 0 otherwise | 6083 | 0.10 | 0.30 | 0 | 1 |
| Save informal | Equals to 1 if respondent saves but not in a bank account, MFI or SACCO and, 0 otherwise | 6083 | 0.67 | 0.47 | 0 | 1 |
| Save informal individually | Equals to 1 if respondent saves in a secret hiding place or piggy bank and does not save via other means, 0 otherwise | 6083 | 0.57 | 0.49 | 0 | 1 |
| Save informal with others | Equals to 1 if savehousehold or saveouthousehold equals to 1 and does not save formally, 0 otherwise | 6083 | 0.10 | 0.30 | 0 | 1 |
| Save with household members | Equals to 1 if respondent save via by giving it to a household member to keep it safe and does not save formally, 0 otherwise | 6083 | 0.06 | 0.24 | 0 | 1 |
| Save with people outside household | Equals to 1 if respondent save via by giving it to a non household member or merry go-round and does not save formally, 0 otherwise | 6083 | 0.05 | 0.20 | 0 | 1 |
| Borrowed | Equals to 1 if respondent has ever taken a loan/ borrowed money for business purpose, 0 otherwise | 6083 | 0.18 | 0.38 | 0 | 1 |
| Formal loan | Equals to 1 if respondent took a to set up or take over the business from a bank or MFI, 0 otherwise | 6083 | 0.03 | 0.16 | 0 | 1 |
| Semi formal loan | Equals to 1 if respondent took a credit from an employer , SACCO, Village Bank, local government schemes or donor/NGO to set up or take over the business , 0 otherwise | 6083 | 0.02 | 0.13 | 0 | 1 |
| Informal loan | Equals to 1 if respondent took a to set up or take over the business from family, friends, savings club, money lender or supplier, 0 otherwise | 6083 | 0.06 | 0.24 | 0 | 1 |
| | | 6083 | 0.06 | 0.24 | 0 | 1 |

Table 3: Regressions for reinvestment and saving/saving practices relationship

| | (1) | (2) | (3) | (4) | (5) |
|------------------------------------|--------------------|--------------------|--------------------|-----------------------------|--------------------------|
| Save formal | 0.09*** (0.02) | | | | |
| Save informal | 0.06*** (0.01) | -0.04* (0.02) | | | |
| Save informal individually | | | -0.03 (0.02) | | |
| Save informal with others | | | -0.09*** (0.03) | | |
| Save with household member | | | | -0.12*** (0.04) | |
| Save with people outside household | | | | | -0.04 (0.03) |
| Borrowed | 0.04** (0.02) | 0.05*** (0.02) | 0.05*** (0.02) | 0.05 (0.03) | 0.04 (0.03) |
| Education | 0.01 (0.01) | 0.01 (0.01) | 0.01 (0.01) | -0.01 (0.01) | -0.01 (0.01) |
| Female | -0.03** (0.01) | -0.03*** (0.01) | -0.03*** (0.01) | -0.07** (0.03) | -0.04 (0.03) |
| Single | 0.03* (0.02) | 0.02 (0.02) | 0.02 (0.02) | 0.06 (0.04) | 0.03 (0.04) |
| No training | -0.03*** (0.01) | -0.04*** (0.01) | -0.04*** (0.01) | -0.07** (0.03) | -0.06** (0.03) |
| Variables expenses | -0.08* (0.05) | -0.06 (0.05) | -0.06 (0.05) | -0.03 (0.08) | -0.05 (0.10) |
| Income | 0.03*** (0.01) | 0.01** (0.01) | 0.02** (0.01) | 0.03** (0.01) | 0.05*** (0.01) |
| Observations | 5803 | 4499 | 4499 | 877 | 774 |
| Sample | All | All | Savers | Formal and household savers | Formal and others savers |
| Base category | No saving | Formal Savers | Formal Savers | Formal Savers | Formal Savers |

Notes: Reinvestment is the dependent variable in the estimations. We report estimates marginal effects at mean values for all estimations and robust standard errors are in parentheses. We additionally control for sector and region dummies in the estimations. $p < 0.1$. ** $p < 0.05$. *** $p < 0.01$

Table 4: Robustness checks for reinvestment and save with household member relationship

| | (1) | (2) |
|----------------------------|---------|----------|
| Save with household member | -0.07** | -0.18*** |
| | (0.03) | (0.05) |
| Formal loan | 0.02 | |
| | (0.05) | |
| Semi formal loan | -0.11 | |
| | (0.09) | |
| Informal loan | -0.12 | |
| | (0.07) | |
| Initial capital | 0.02** | |
| | (0.01) | |
| Sales per worker | -0.02 | |
| | (0.01) | |
| Rural | 0.02 | |
| | (0.03) | |
| Size | 0.04 | |
| | (0.03) | |
| Duration | 0.03* | |
| | (0.01) | |
| Observations | 872 | 650 |
| Entrepreneurial dummies | Yes | No |
| Activity Dummy | Yes | No |
| Region FE | Yes | No |
| District FE | No | Yes |

Notes: Reinvestment is the dependent variable in the estimations. We report estimates marginal effects at mean values for all estimations and robust standard errors are in parentheses. We use the sample for Formal Savers and Household Savers and formal savers as the base category. We additionally control for sector and region dummies in the estimations. $p < 0.1$. ** $p < 0.05$. *** $p < 0.01$

Table 5: The estimates for save with household member vs. formal saving choices

| | (1) | (2) |
|-------------------------------------------------|--------------------|--------------------|
| Bank branch within one hour walking distance | -0.13*** (0.04) | |
| Min. distance to ATM, bank branch, or MFI | | 0.03*** (0.01) |
| Age^2 | -0.04*** (0.01) | -0.04*** (0.01) |
| Age^2 | 0.00*** (0.00) | 0.00** (0.00) |
| Borrowed | -0.32*** (0.03) | -0.32*** (0.04) |
| Education | -0.12*** (0.02) | -0.12*** (0.03) |
| Female | -0.10** (0.04) | -0.11** (0.04) |
| Single | -0.15** (0.06) | -0.14** (0.07) |
| No training | 0.02 (0.04) | 0.01 (0.04) |
| Variable expenses/Sales | -0.09 (0.14) | -0.1 (0.15) |
| Income | -0.11*** (0.02) | -0.10*** (0.02) |
| Observations | 877 | 797 |

Notes: Save with household member is the dependent variable in the estimations and formal saving is the base category. We report estimates marginal effects at mean values for all estimations and robust standard errors are in parentheses. We use the sample for Formal Savers and Household Savers. We additionally control for region dummies in the estimations $p < 0.1$. ** $p < 0.05$. *** $p < 0.01$

Table 6: Tests for exogeneity of instruments and Bivariate Probit Estimates for save with household member

| | Exogeneity checks | | Bivariate Probit Estimates | |
|----------------------------------------------|--------------------|--------------------|----------------------------------------------|-------------------------------------------|
| | (1) | (2) | (3) | (4) |
| Save with household member | -0.11*** (0.04) | -0.10*** (0.04) | -0.18** (0.08) | -0.19** (0.09) |
| Bank branch within one hour walking distance | 0.00 (0.03) | | | |
| Min. distance to ATM, bank branch, or MFI | | -0.01 (0.01) | | |
| <i>Age</i> | 0.01 (0.01) | 0.01 (0.01) | | |
| <i>Age</i> ² | 0.00 (0.00) | 0.00 (0.00) | | |
| $\hat{\mu}$ | | | 0.22 (0.21) | 0.28 (0.23) |
| Observations | 877 | 797 | 877 | 797 |
| Exogenous distance measure | - | - | Bank branch within one hour walking distance | Min. distance to ATM, bank branch, or MFI |
| Methodology | Probit | Probit | Bivariate Probit | Bivariate Probit |

Notes: We report estimates marginal effects at mean values for save with household member. We report robust standard errors for columns 1 and 3 and clustered robust standard errors at ward level in columns 2-4 in parentheses. We use the sample for Formal Savers and Household Savers and formal savers as the base category. We additionally control for variables introduced above and region dummies in the estimations. p<0.1. ** p<0.05. *** p<0.01

Table 7: Tests for exogeneity of instruments and Bivariate Probit Estimates for save with household member

| | Gender | | Position in the household | | Entrepreneur | |
|----------------------------|-------------------|--------------------|------------------------------------|--------------------|-------------------|------------------|
| | Male | Female | Other (Child, spouse, sibling etc) | Head | Transformational | Survival |
| Save with household member | -0.12** (0.05) | -0.23*** (0.09) | -0.25*** (0.08) | -0.16*** (0.06) | -0.13** (0.05) | -0.20* (0.11) |
| Observations | 402 | 275 | 213 | 441 | 458 | 148 |

Notes: We report marginal effects at mean values for all estimations from Probit estimations and robust standard errors are in parentheses. We additionally control for introduced above as well as sector and region dummies in all estimations. The numbers of observations are less than original sample because some control variables perfectly predict outcome variables. We estimate all models for comparable subsamples where there is variation in our outcome variable with respect to control variables. We use the sample for Formal Savers and Household Savers and formal savers as the base category. $p < 0.1$. ** $p < 0.05$. *** $p < 0.01$

Appendix

Table A1: Bivariate Probit Estimates

| | Table A1: Bivariate Probit Estimates | | | |
|----------------------------------------------|--------------------------------------|----------------------------|--------------------|----------------------------|
| Dependent variable: | (1) | (2) | (3) | (4) |
| | Reinvestment | Save with household member | Reinvestment | Save with household member |
| Save with household member | -0.81** (0.37) | | -0.87** (0.40) | |
| Bank branch within one hour walking distance | | -0.39*** (0.12) | | |
| Min. distance to ATM, bank branch, or MFI | | | | 0.10*** (0.04) |
| <i>Age</i> | | -0.12*** (0.03) | | -0.11*** (0.04) |
| <i>Age</i> ² | | 0.00*** (0.00) | | 0.00*** (0.00) |
| Borrowed | 0.07 (0.16) | -0.97*** (0.12) | 0.05 (0.17) | -0.96*** (0.13) |
| Education | -0.07 (0.06) | -0.33*** (0.07) | -0.07 (0.07) | -0.33*** (0.07) |
| Female | -0.24** (0.12) | -0.27** (0.12) | -0.31** (0.12) | -0.29** (0.13) |
| Single | 0.25 (0.18) | -0.47** (0.22) | 0.24 (0.20) | -0.45* (0.24) |
| Notraining | -0.32*** (0.12) | 0.05 (0.12) | -0.36*** (0.14) | 0.04 (0.12) |
| Variable expenses | -0.03 (0.33) | -0.25 (0.38) | -0.1 (0.36) | -0.29 (0.40) |
| Income | 0.08 (0.06) | -0.29*** (0.05) | 0.05 (0.06) | -0.28*** (0.05) |
| Constant | 0.05 (1.08) | 8.57*** (0.96) | 0.6 (1.23) | 8.15*** (1.07) |
| Observations | 877 | 877 | 797 | 797 |

Notes: We report bivariate probit estimates. We report robust standard errors for columns 1 and 3 and clustered robust standard errors at ward level in columns 2-4 in parentheses. We use the sample for Formal Savers and Household Savers and formal savers as the base category. We additionally control for region dummies in the estimations. p<0.1. ** p<0.05. *** p<0.01