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Entrepreneurial Saving Practices and Reinvestment: Theory and Evidence from Tanzanian MSEs*

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Abstract

What is the relationship between entrepreneurial saving practices and reinvestment? We develop a model of entrepreneurial finance and show that entrepreneurial reinvestment decisions depend on the efficiency of saving practices. Utilizing a novel micro & small enterprise survey from Tanzania we test the empirical implications of this theory. We find (1) saving for business purposes and earnings reinvestment are positively related; (2) the practice of *saving in a deposit account of a formal financial institution* is more likely to facilitate reinvestment compared to the practice of keeping *savings within the household*. We also show that the negative impact of saving within-the-household on investment is more pronounced 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 informal saving practices as potential barriers to microenterprise performance.

Keywords: Micro- and small enterprises; savings; reinvestment; Tanzania.

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 of saving and liquidity management to facilitate their earnings retention. 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 via other informal arrangements, such as rotating savings and credit associations (ROSCAs), affect the decision to reinvest entrepreneurial earnings. We motivate our empirical work with a simple theoretical model that shows that an entrepreneur's reinvestment decision depends on the entrepreneur's saving practice, in addition to productivity and borrowing capacity of her entrepreneurial firm.

In the absence of easy access to external finance, saving for business purposes should be positively correlated with entrepreneurial investment. However, the saving mechanism itself might be a critical element in determining 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, for instance, the "within-household savers" might be less likely to reinvest, because they suffer from the redistributive pressure resulting from the saved funds being held inside the household. If the remaining household members are aware of the existence of entrepreneurial savings, it can be hard to prevent the funds from being exploited for the general consumption needs of the household. In addition to these two extreme cases, we could also think of the "individual savers" and the "informal finance network savers" as other saving practice types. Comparing "individual savers" with "informal network savers", we note that although the interest income from informal finance networks should have a positive impact on the opportunity cost of consumption and foster investment, the inflexibility to withdraw savings at informal financial institutions might offset this income effect and reduce the earnings retention.¹

¹The rate of return to savings in social saving clubs is typically lower compared to formal financial institutions. For

In order to inform our empirical hypotheses, at first, we present a simple theoretical model to explain the relationship between entrepreneurial investment decisions and saving practices. We show that entrepreneurs are more likely to invest in their businesses if they save in a fashion which allows them easy access to their funds, such as formal savings accounts or personal saving mechanisms.

To test the empirical relationship between savings patterns and entrepreneurial reinvestment decisions, we 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 co-vary with the likelihood of earnings retention at MSEs. The survey design allows us to differentiate between different savings vehicles, including within household saving, saving under the pillow, informal savings clubs, 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 be associated with reinvestment than the former.

We conduct a series of checks to ensure the robustness 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 can explain whether the savings will be kept in a bank account or shared with the rest of the household, but these two variables are not directly associated with reinvestment decisions. The coefficient estimates in the instrumental variable regressions 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

related discussion see Vonderlack and Schreiner (2002). Entrepreneurs saving via informal channels are more likely to have limited access to their savings. For instance, members of ROSCAs cannot access their savings 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.

bargaining power. We find that the negative relationship between saving within the household and reinvestment decisions is stronger for entrepreneurs with lower intra-household bargaining power, such as females and non-household heads.

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 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. Demirguc-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 savings patterns as additional factors explaining the 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 is an increasing number of studies exploring the impact of access to formal banking services on the level of savings (Burgess and Panda, 2005; Kaboski and Townsed, 2005; Dupas and Robinson, 2013a). A recent experimental study by Dupas and Robinson (2013a) shows that entrepreneurs with formal bank accounts save and invest more in their businesses than entrepreneurs who do not save in formal banks. In a companion study (Dupas and Robinson, 2013b), the authors compare the health investment performance of 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 to keep 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, informal savings club members and moneylenders.

Our paper also relates to the literature on barriers to saving 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 saving behavior, partly related to the position of the entrepreneur within the household. Previous research has linked participation in informal savings clubs, 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 saving 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 if their spouse is not aware of the money, while they prefer to consume if the spouse knows about it. Evidence from an experimental study with 142 married couples in Kenya showed that husbands increase private spending if they receive an income shock. But if their wives receive the shock they do not increase their consumption (Robinson 2011). Likewise Schaner (2013) finds 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 theoretical model to show how saving practices 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 of saving choice, tests for reverse causality and studies sub-sample heterogeneity concerning our key estimation results. Section 7 concludes.

2 A 2-Period Model

We develop a partial equilibrium heterogeneous firms model to study the interactions between entrepreneurial saving practices and profit reinvestment. In our model entrepreneurial heterogeneity has three dimensions: productivity, borrowing capacity, and saving practice. In the benchmark model all of the three 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 the entrepreneur's maximization problem, before deriving the optimal investment behavior. This allows us to obtain several empirically 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

$$U_i = c_{1,i} + \beta c_{2,i}, \tag{1}$$

where U is the life-time utility and c_1 and c_2 are consumption levels in period-1 and in period-2 respectively. The parameter β is a discount factor. The linear preference specification is not essential for the qualitative findings of the model. It allows us to solve for the investment likelihood of the

entrepreneur as we will present in equations (11) and (12) below.

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 $A_i k_{1,i}$ - where $A_i > 1$ captures the productivity heterogeneity across entrepreneurs -plus an additional $\ell_2 k_{1,i}$ if and only if the entrepreneur is capable of injecting a firm-specific $L_{2,i} = \ell_2 k_{1,i}$ units of cash into his business at the beginning of the period-2. Firms thus must have the capacity to manage liquid reserves in order to be able to undertake productive investment opportunities. A high A_i can be associated with better training, education or some sort of intrinsic ability to manage a firm. We assume that A is drawn independently and identically from a distribution at the beginning of the period-1. We assume that the liquidity need of the firm can pose an inefficient use of capital. This we can capture with the parameter ℓ_2 . Specifically, $\ell_2 < A_i$ for all i .

To summarize, the entrepreneurial total output at the end of the period-2, which we denote with $y_{2,i}$, has the following specification:

$$\begin{aligned} y_{2,i} &= A_i k_{1,i} + \ell_2 k_{1,i} \text{ if } L_{2,i} = \ell_2 k_{1,i}, \\ &= 0 \text{ otherwise.} \end{aligned} \tag{2}$$

We assume that ℓ_2 is deterministic and is publicly known at the beginning of period-1.² In this production function formulation, $\ell_2 k_i$ 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-2.³

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 period-1 capital investment stage because our aim is to understand the dynamics behind the probability of earnings retention and thus reinvestment at entrepreneurial firms.

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

³This type of a production function specification has been previously utilized in finance and development literature by Aghion et al. (2010): In their dynamic general equilibrium model, the authors introduce a complementarity between the ability to cope with future liquidity needs and current long-term investment and explain the negative correlation between volatility and growth observed in the cross-country data.

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 gross interest rate 1, where θ_i is an entrepreneur specific parameter capturing the ability to raise working capital finance externally. The borrowing capacity θ is drawn from a distribution function at the beginning of the period-1, and is publicly observable.
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 drawn from a distribution function with $\zeta_I < 1$. 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:

I. **Period-1**

1. Entrepreneurial (3-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. Loan repayment.

5. 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 saving 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

$$c_{1,i} + k_{1,i} + s_{1,i} \leq \omega_i, \quad (3)$$

$$c_{2,i} \leq A_i k_{1,i} + s_{1,i} \zeta_i, \quad (4)$$

where (3) and (4) are the budget constraints for period-1 and period-2 respectively. We would like to note that $\ell_2 k_{1,i}$ enters both sides of the constraint (4); and hence, gets cancelled out.

An immediate implication of this set-up is that if and only if $k_{1,i} > 0$, the entrepreneur forecasts that there will be sufficient capacity to finance future liquidity needs. Therefore, iff $k_{1,i} > 0$ we have two additional constraints that need to hold:

$$L(k_{1,i}) \leq s_{1,i} \zeta_i + b_{2,i}, \quad (5)$$

$$\theta_i L(k_{1,i}) \geq b_{2,i}. \quad (6)$$

The inequality (5) is the constraint that ensures that there is sufficient liquidity at the beginning of the period-2 - financed by savings for business purposes ($s_i \zeta_i$) and borrowing (b_i). The inequality (6) is the borrowing constraint associated with working capital finance.

2.3 Optimizing Behavior

The qualitative properties of this model are then 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,

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

as long as $\zeta_i < 1$.

Then using (5) with equality we get:

$$s_{1,i} = \left(\frac{1 - \theta_i}{\zeta_i} \right) L(k_{1,i}). \quad (8)$$

Equation (8) implies that the lower ζ the higher is the amount of savings 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 (8) in budget constraints (3) and (4) yields:

$$c_1 = \omega_i - k_{1,i} - \left(\frac{1 - \theta_i}{\zeta_i} \right) L(k_{1,i}), \quad (9)$$

$$c_2 = A_i k_{1,i} + (1 - \theta_i) L(k_{1,i}). \quad (10)$$

Letting the idiosyncratic 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:

$$\begin{aligned} c_{1,i} > 0, \quad c_{2,i} &= 0 \text{ if } \rho_i < \frac{1}{\beta}, \\ c_{1,i} &= 0, \quad c_{2,i} > 0 \text{ if } \rho_i > \frac{1}{\beta}. \end{aligned} \quad (11)$$

Finally, using (9), (10) and the optimal consumption plans from (11) we can show that the

entrepreneur chooses to invest ($k_{1,i} > 0$) in period-1 if and only if:

$$\rho_i \equiv \frac{A_i + (1 - \theta_i)\ell_2}{1 + \ell_2 \left(\frac{1 - \theta_i}{\zeta_i} \right)} > \frac{1}{\beta} \quad (12)$$

The left hand side of the inequality (12) is the unit rate of return from undertaking an investment project for an entrepreneur i . The right hand side is the unit cost of postponing consumption from period-1 to period-2. The entrepreneurs with high enough $\rho - \rho_i > 1/\beta$ - invest in their projects and consume the investment returns at the end of the period-2. When ρ_i is lower than $1/\beta$, the entrepreneur does not invest and consumes the endowment ω at the end of the period-1.

2.4 Empirically testable implications of the model

Applying comparative statics at (12) we capture 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

$$\frac{\partial \rho}{\partial \zeta} = \left(\frac{1}{\zeta^2} \right) \left\{ \frac{\ell_2(1 - \theta)(A + (1 - \theta)\ell_2)}{\left[1 + \ell_2 \left(\frac{1 - \theta}{\zeta} \right) \right]^2} \right\} > 0,$$

which implies that the rate of return from investing rises with the efficiency of the saving practice of the entrepreneur. A higher efficiency of an entrepreneur's saving practice therefore also raises the likelihood of earnings reinvestment, the key hypothesis of our empirical analysis. $\square$

In order to deepen the empirical validity of our theoretical model, we also provide the following two propositions.

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

Proof Defining $z \equiv \frac{1-\theta}{\zeta^2}$ and taking the first-partial derivative of ρ with respect to θ :

$$\frac{\partial \rho}{\partial \theta} = \frac{\frac{\ell_2}{z} (A - 1)}{[1 + \ell_2 \zeta z]^2} > 0,$$

which implies that the rate of return from investing rises with the entrepreneur's borrowing capacity.

□

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

$$\frac{\partial \rho}{\partial A} = \frac{1}{1 + \ell_2 \zeta z} > 0,$$

where again $z \equiv \frac{1-\theta}{\zeta^2}$, shows that the rate of return from investment rises with entrepreneurial ability.

□

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 investment, or in other words postponing consumption between period-1 and period-2, harder. Therefore, the saving practice of an entrepreneur is likely to be an endogenous variable, where the decision to save formally might be a costly action.

To formalize this argument, suppose that 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. In addressing the potential reverse causation of investment on entrepreneurial saving practice in section 6, we will utilize entrepreneur's *Age*, *Age*², and *Distance* to the nearest bank as instruments in order

to capture the utility loss implied by bank transactions costs.

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) from the entrepreneurial optimization problem, an entrepreneur i is willing to save formally if and only if

$$\rho_F - \rho_I = (A_i + (1 - \theta_i)\ell_2) \left(\frac{1}{1 + \ell_2 \left(\frac{1 - \theta_i}{\zeta_F} \right)} - \frac{1}{1 + \ell_2 \left(\frac{1 - \theta_i}{\zeta_I} \right)} \right) > \psi_i, \quad (13)$$

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

We utilize the theoretical argument we derived at equation (13), when we study the reverse causation of re-investment likelihood on entrepreneurial saving practice in section 6.

2.6 Impact Heterogeneity

The entrepreneurial (in)efficiency associated with informal saving practices 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. ROSCAs) and to 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. For instance, due to social norms and pressures 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 and are therefore less likely to reinvest. We will utilize this intuition when studying impact heterogeneity in section 6.

2.7 Empirically Testable Hypotheses

In our regression equations we will control for a vector of variables to test the theoretical results we obtained in propositions 2.1 through 2.3. Specifically, the empirically testable hypotheses resulting from our model are the following:

1. H_0 : Entrepreneurs who save efficiently (high ζ) are more likely to invest.
2. H_0 : Entrepreneurs with a high borrowing capacity (high θ) are more likely to invest.
3. H_0 : Entrepreneurs with better training, higher education and higher income (high A) are more likely to invest.

3 The Empirical Methodology

We test the hypotheses derived from the theoretical model with a dataset collected from Tanzanian MSEs by the Financial Sector Deepening Trust of Tanzania. 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 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 take(s) the value of 1 if the entrepreneur has the corresponding saving practice (see below for details) and ϵ is the error term. Since our dependent variable is binary, we estimate probit models for all different specifications of (14), and report marginal effects at mean levels for the coefficient estimates unless we state otherwise. The vector of control variables included in the benchmark model 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, and it is a proxy for the θ_i parameter in the theoretical model. Businesses that have access to external finance are expected to reinvest more frequently even in the absence of regular entrepreneurial savings.

Second, we use income level, education and business training history of entrepreneurs as proxies of entrepreneurial productivity A_i . 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.⁴ Entrepreneurs with a high human capital are expected to be more committed to business growth, and to have higher rates of earnings retention. We therefore 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.

Third, although they are not discussed in our model, we additionally control for *gender* and *marital status* as previous studies showed that both can influence investment decisions (Iversen et al., 2006; Ashraf, 2009; de Mel et al., 2009 and Fafchamps et al., 2013). 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. 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 saving 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.

⁴Each respondent is asked which income range (e.g. TSHS 35 001 - TSHS 40 000 per month) describes their income level best. We use the median of that range (e.g. TSHS 37500.5) as the income level of the respondent.

This separation corresponds to the control-treatment group set-up of many randomized control trials that assess the impact of using formal savings 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 *save informal* 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 savings 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.

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 members*: The group comprises of entrepreneurs who give their funds to other household members to keep them 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 the latter 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.

⁵Piggy bank is a coin container.

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.

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.⁷

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

⁷This is computed with the average exchange rate for 2010. If using PPP exchange rates, the corresponding median income would be 288 dollars.

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 borrowed from a bank or MFI, 2% borrowed from a semi-formal financial institution, such as a SACCO or village bank and 6% borrowed from an informal source, such as money lenders, savings club or family and friends.

Saving is a common habit 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 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 Practices and Reinvestment: Main 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. 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, 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 for 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 while the redistributive pressure problem might be lower for the former, there would be a potential inflexibility to withdrawing savings when needed associated with the latter.

Here we also note that we study our main research question by focusing on specific sub-samples of savers in order to present the results clearer, and keep the consistency between the samples used for main estimations, robustness checks and bivariate probit estimates (see below). To show that our estimates are not biased due to this method, we replicate the analysis by using the entire sample. We present the results in Table A1 in the Appendix, and show that our estimates are robust.⁸

⁸The only difference between the results concerns the estimate for save with people outside the household. It is statistically significant at ten percent level due to lower standard error estimates when we use the full sample.

The results in column 2 show that “formal savers” are four percent more likely to retain earnings than the “informal savers”. 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. The results in column 3 show that entrepreneurs who save with others are less likely to reinvest than entrepreneurs who save formally.⁹ 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 independently study the investment likelihood of household savers and respondents who save outside the household compared to the reinvestment 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 baseline empirical results are consistent with our theoretical model showing that inefficient saving practices lead to lower likelihood of reinvestment. They suggest that informal saving practices are associated with significantly lower likelihood of earnings retention compared to formal saving mechanisms. It is important to note that this finding is mainly driven by the difference in the reinvestment likelihood of within household savers and formal savers, for which the difference is most pronounced and statistically significant.

⁹Here 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.

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, semi-formal 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 to the following survey question: “*why did you go to business?*”¹⁰ As evidenced in the previous literature (Bruhn and Zia 2011), transformational type entrepreneurs are expected to have higher rates of investment profitability and earnings retention 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; buying, adding value and re-selling, providing a service etc.) may change the definition of re-investment for business owner and timing of the reinvestment. For instance, they may be different for a restaurant owner and a market vendor. To control for this factor, we include answers to the question “what does your business do?” as dummy variables.¹¹ The estimates for the variables are jointly significant at the 1 percent level. To economize on space we do not report estimates, and they are available upon request. Fourth, we include the size of the logarithm of the initial start-up capital, the logarithm of current sales per employee, the logarithm of the duration of business and the 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 drive variations in reinvestment rates. Including all of these control variables does not affect our key empirical finding.

¹⁰Entrepreneurs 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.

¹¹We 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.

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.¹²

- 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 show in our theoretical model, entrepreneurs who are more willing to reinvest might look for saving practices that support their investment efforts. In the following, we focus on the sample of formal and within-household savers once more 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”. Focusing on only one sub-sample also has a methodological advantage as we need fewer exogenous determinants to identify the relationship. 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 (14) and regress it on our list of control variables as well as on two additional measures denoted by ψ_i in our theoretical model: Age of the entrepreneur and distance to bank. Age increases the bargaining power of the entrepreneur within the household and this implies a U-shaped relationship between age and the choice within household saving. On the one hand, agents are less likely to be forced to save within household as they get older. On the other hand, when they reach an age giving them enough power to protect their savings within the household, they may be more likely to save with household members. The distance to the nearest bank is expected to increase accessibility

¹²Note 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 in Probit estimations due to perfect prediction. Our estimates are robust when we estimate the same model with OLS and do not lose any observations.

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 enterprise 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 of the existence of a bank in the close proximity. Therefore, the correlation between the search intensity and some unobserved characteristics may bias our results. For this reason, we estimate a model with an additional objective distance measure, the logarithm of ward level minimum distance to the closest bank branch, MFI or ATM in 2013 which we constructed using data from the Financial Services Map.¹³

Table 5 reports the marginal effect from probit estimations 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 (0.00038) on the square of age indicates that the age saving with household members practice relationship is non-linear and U-shaped. As the age of the entrepreneur increases, the impact of the age on the saving practice decreases, and getting older increase the probability of saving with household members after the age of 52. The rest of the estimates are also in line with our 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

¹³We use data from the Financial Services Map for Tanzania. This data set gives geographic coordinates of bank branches, MFIs and ATMs in 2013 across Tanzania. We match these data with the existing geographic coordinates of the wards from which entrepreneurial data are collected. Then we calculate the distance of the wards to each financial unit and pick the minimum distance.

to the nearest bank as instruments in a nonlinear recursive bivariate probit model.¹⁴ Specifically the model is formulated as follows:

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

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

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 and use a similar set of controls as in the main specifications.¹⁵ 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 has 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 (Chi-square>20 and p-value<0.001 for both specifications). 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 A2 in the Appendix shows detailed estimation results for the model, including the control variables.

- Table 6 about here -

The instrumental variable estimations reported in columns (3) and (4) of Table 6 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

¹⁴We also estimate the same model by using the 2SLS method. We have the same expected signs for the variables of interest but the coefficient estimates are bigger and imprecise as the variance increases. We believe this is because both the dependent and independent variables of interest are binary. Chibus et al. (2012) suggests 2SLS may give very different results and imprecise estimates if the number of observations is lower than 5000 (in our case it is 877).

¹⁵We do not use sector dummies in the bivariate probit estimations since our model does not converge. However, not using sector dummies does not change our results since our main results shown in Table 3 are robust when we do not control for them.

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 who save with household members with the reinvestment behaviour of entrepreneurs who use formal savings mechanisms across the following two sample splits. First, we split the sample into female and male entrepreneurs. Theory and empirical evidence suggests that social constraints on accessibility of saved funds is higher for women compared to men. Second, we split the sample into entrepreneurs that are household heads and entrepreneurs that are spouses, children or siblings. We expect the social constraints to be less strong for household heads.

The results in Table 7 confirm the differential relationships between household savings and reinvestment decisions. The results reveal that the marginal effects of *Save with household members* on reinvestment are larger - and more significant - for female and non-head family members. 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. Supporting our theoretical predictions, this result implies that entrepreneurs who are in disadvantageous positions in their households are more negatively affected from inefficient saving practices.

- Table 7 about here -

7 Conclusion

Past research has identified several factors that are important for entrepreneurial investment in developing countries. 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 key empirical 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 across saving practices is significantly higher for those entrepreneurs who potentially have low bargaining power in the household.

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 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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Table 1: Descriptive statistics for the main variables

Panel A: Firm characteristics		Description	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		Number of companies	%				
Trade		3291	54.1				
Service		1841	30.3				
Manufacturing		931	15.3				
Other		20	0.3				
Panel C: Entrepreneur		Description	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		Description	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 2: Correlation Matrix: Pairwise correlations among selected variables

	Reinvestment	Save	Save formal	Save informal individually	Save informal with others	Save with household members	Save with people outside household	Borrowed	Education	Female	Single	No training	Income
Reinvestment	1												
Save	0.09*	1											
Save formal	0.07*	0.18*	1										
Save informal individually	0.05*	0.62*	-0.38*	1									
Save informal with others	-0.03*	0.18*	-0.11*	-0.39*	1								
Save with other household members	-0.04*	0.14*	-0.08*	-0.29*	0.74*	1							
Save with people outside household	0.00	0.12*	-0.07*	-0.25*	0.64*	-0.03*	1						
Borrowed	0.06*	0.12*	0.30*	-0.09*	0.03*	-0.01	0.05*	1					
Education	0.07*	0.13*	0.24*	-0.04*	0.02	0.02	0.01	0.17*	1				
Female	-0.06*	0.00	-0.05*	0.03*	0.00	-0.10*	0.11*	0.03*	-0.10*	1			
Single	0.02	0.00	0.00	0.01	-0.01	0.00	-0.01	-0.04*	0.07*	0.01	1		
No training	-0.02	-0.06*	-0.08*	0.02	-0.04*	-0.04*	-0.01	-0.10*	-0.12*	0.00	0.00	1	
Income	0.13*	0.12*	0.19*	-0.02	0.01	0.02	-0.02	0.12*	0.19*	-0.24*	-0.02	0.00	1

Notes: * Significant at least 5 percent level

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 members				-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	0.04** (0.02)	0.03 (0.02)	0.03 (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)
Income	0.03*** (0.01)	0.02** (0.01)	0.02** (0.01)	0.03** (0.01)	0.05*** (0.01)
Observations	5,803	4,499	4,499	877	774
Sample	All	All	Savers	Formal and household savers	Formal and others savers
Base category	No saving	Formal Saving	Formal Saving	Formal Saving	Formal Saving

Notes: Reinvestment is the dependent variable in the estimations. We report marginal effects estimates 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: Estimates for reinvestment and save with household members relationship-additional control variables

	(1)	(2)
Save with household members	-0.07** (0.03)	-0.18*** (0.05)
Formal Loan	0.02 (0.05)	
Semi formal loan	-0.11 (0.09)	
Informal loan	-0.12 (0.07)	
Initial capital stock	0.02** (0.01)	
Sales per worker	-0.02 (0.01)	
Rural	0.03 (0.03)	
Size	0.04 (0.03)	
Duration	0.02 (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 marginal effects estimates at mean values for all estimations and robust standard errors are in parentheses. We use the sample of formal savers and household savers. Formal saving is 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 members vs. formal saving choices

	(1)	(2)
Bank branch withing one hour walking distance	-0.13*** (0.04)	
Min. distance to Atm, bank branch, or MFI		0.04*** (0.01)
<i>Age</i>	-0.04*** (0.01)	-0.04*** (0.01)
<i>Age</i> 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)	-0.10** (0.04)
Single	-0.14** (0.06)	-0.14* (0.07)
No training	0.02 (0.04)	0.01 (0.04)
Income	-0.10*** (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 marginal effects estimates 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 members	-0.11*** (0.04)	-0.10*** (0.04)	-0.19** (0.09)	-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)		
$\hat{\mu}$			0.23 (0.23)	0.28 (0.26)
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 marginal effect estimates at mean values for save with household member and instruments. 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 of formal savers and household savers. Formal savers is 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: Heterogeneity in the effect of saving with household members on reinvestment

	Gender		Position in the household	
	Male	Female	Other (Child, spouse, sibling etc)	Head
Save with household members	-0.12** (0.05)	-0.22*** (0.08)	-0.22*** (0.08)	-0.16*** (0.06)
Observations	402	275	213	441

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

Appendix

Table A1: Estimates for reinvestment and saving/saving practices relationship by using full sample

VARIABLES	(1) reinvest	(2) reinvest	(3) reinvest
Save formal	0.09*** (0.02)	0.09*** (0.02)	0.09*** (0.02)
Save informal	0.06*** (0.01)		
Save informal individually		0.07*** (0.01)	0.07*** (0.01)
Save informal with others		0.01 (0.02)	
Save with household members			-0.01 (0.02)
Save with people outside household			0.04 (0.03)
Borrowed	0.04** (0.02)	0.04** (0.02)	0.04** (0.02)
Education	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)
Single	0.04** (0.02)	0.04** (0.02)	0.04** (0.02)
No training	-0.03*** (0.01)	-0.03*** (0.01)	-0.03*** (0.01)
Income	0.03*** (0.01)	0.03*** (0.01)	0.03*** (0.01)
Observations	5,803	5,803	5,803
Sample	All	All	All
Hypothesis	p-values	p-values	p-values
H_0 : Save formal-Save informal=0	0.0723	-	-
H_0 : Save formal-Save informal individually=0	-	0.1819	0.1763
H_0 : Save formal-Save informal with others=0	-	0.0011	-
H_0 : Save formal-Save with household members=0	-	-	0.0004
H_0 : Save formal-Save with people outside household=0	-	-	0.0662

Notes: Reinvestment is the dependent variable in the estimations. We report marginal effects estimates 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-values are calculated by using Chi-square estimates. p<0.1. ** p<0.05. *** p<0.01

Table A2: Bivariate Probit Estimates

Dependent variable:	(1) Reinvestment	(2) Save with household members	(3) Reinvestment	(4) Save with household members
Save with household members	-0.81** (0.37)		-0.86** (0.41)	
Bank branch withing 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)	-0.98*** (0.12)	0.05 (0.17)	-0.97*** (0.13)
Education	-0.07 (0.06)	-0.33*** (0.07)	-0.07 (0.07)	-0.34*** (0.07)
Female	-0.24** (0.12)	-0.27** (0.12)	-0.31*** (0.12)	-0.28** (0.13)
Single	0.25 (0.18)	-0.47** (0.22)	0.25 (0.20)	-0.44* (0.24)
No training	-0.32*** (0.12)	0.05 (0.12)	-0.36*** (0.14)	0.04 (0.12)
Income	0.08 (0.06)	-0.28*** (0.05)	0.06 (0.06)	-0.27*** (0.05)
Constant	0.05 (1.07)	8.51*** (0.97)	0.56 (1.23)	8.08*** (1.08)
Observations	877	877	797	797

Notes: We report bivariate probit estimates. Robust standard errors for columns 1 and 3 and clustered robust standard errors at ward level in columns 2-4 are 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. $p < 0.1$.

** $p < 0.05$. *** $p < 0.01$