ESSAYS IN MICROFINANCE- AND SOCIAL NETWORK-DRIVEN MARKETING
AT THE BASE OF THE PYRAMID

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# ABSTRACT

L. Lin Ong: Essays in Microfinance- and Social Network-Driven
Marketing at the Base of the Pyramid
Under the direction of Sridhar Balasubramanian

In the past thirty years, microfinance has innovated the provision of financial services to microenterprises (businesses with five or fewer employees), growing aggressively to a USD $50 billion industry. A marketing lens gives us the empirical and theoretical foundations to understand this field, providing the tools to synthesize the ideas of social capital, microfinance, and networks into managerially important insights. I explore these concepts using a novel dataset assembled from surveys, personal networks, interviews, administrative banking data, and a randomized control trial (RCT) of microentrepreneurs in Kenya, where microenterprises are estimated to represent over 20% of the country's total employment.

Essay one builds on the relationship marketing literature's identification of commitment as critical to maintaining successful business-to-consumer relationships. I find a positive relationship between household consumption and client commitment – however, this includes not only commitment to the firm, but also to their loan peers. This has implications for MFI client strategy, motivation to cultivate both positive client commitment towards the firm as well as social capital within the client's intra-firm network.

The second essay tackles an endogenous question: which came first, social capital or financial success? Although social capital is commonly accepted in economic development theory

as a key driver of financial success, the methodological difficulty of studying its causal impact leave a gap in the literature. I use a RCT to administer a financial training, providing a channel to improve financial success. While we find that the training does significantly impact financial literacy and MFI financial measures, we do not find any moderating impact of baseline social capital on financial outcomes. This study provides a counterargument to the conventional wisdom that social capital increases efficiency of entrepreneurial information acquisition and application.

These dissertation results provide an alternative view about the importance of social capital at the BoP: although social capital is a part of financial success, it doesn't appear to have the causal impact previously theorized. Through an innovative dataset and rigorous experimental methods, this dissertation provides one of the first quantitative, network-based studies of social capital at the BoP. Implications for managers, policy makers, and researchers are discussed.

To my parents, Siew Huang Tan and Say Kee Ong,
who have taught me more through example than any degree can provide.

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well as their many clients who agreed to be surveyed for my research. I hope my work may be able

to give back in some small way.

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# LIST OF ABBREVIATIONS

BoP          Base of the Pyramid

LDC          Less-developed country (UN designation)

MFI          Microfinance institution

MSMEs        Micro, small, and medium enterprises

MSEs         Micro and small enterprises

NBFI         Non-bank financial institution

NGO          Non-governmental organization

PAR          Portfolio at risk

RM           Relationship marketing

SNA          Social network analysis

# OVERVIEW AND DISCUSSION

Microfinance institutions (MFIs) provide a significant amount of support for microenterprises (businesses with five or fewer employees) in developing economies worldwide (de Mel, McKenzie, and Woodruff 2008). By providing access to financial products as well as supporting networked connections, MFIs serve as developers of marketing channels within Base of the Pyramid (BoP) marketplaces. When these low-income entrepreneurs are economically successful, they are able to smooth and increase consumption, make long-term business investments, and optimally break the cycle of poverty at the bottom of the pyramid (Armendáriz and Morduch 2005). Therefore, MFI clients' economic success in the marketplace is a critical metric for firm success, and is the key outcome that we focus on in our research. Using a peri-urban Kenyan MFI as the study context, we look at how microfinance and social networks can be used to understand marketing to a BoP client base, and how marketing actions can lay the groundwork for longer term managerial success. The MFI we partnered with focuses not just on short run operational and financial objectives but also on enhancing the overall economic success of clients, allowing for expansion of their marketing strategy in order to increase the competitiveness of the firm.

In this first section, I provide a brief overview of the social capital, microfinance, and network literature and discuss it within the context of marketing exchange. Then, in the first

study, I build on the relationship marketing (RM) literature that identifies commitment as critical to maintaining successful relationships. I argue that different forms of commitment play a role in MFI success. Specifically, I propose that microentrepreneurs that are successful are so through both commitment to the firm which funds them as well as their connections to their intra-firm social network which provides emotional, informational, and resource support, and find a positive relationship between strong relationships and household consumption.

In the second paper, I attempt to unravel the endogenous question of whether social capital impacts financial success at the Base of the Pyramid. Although an established part of economic development theory (Narayan and Cassidy 2001; Vajja and White 2008), it is difficult to distinguish whether one is more wealthy because they are well-liked, or if one became well-liked because they were more wealthy than their peers. I look at this difficult issue through the novel provision of a mechanism of financial success, a financial education module, which is designed to help microfinance clients keep better business records and therefore, increase their financial resources. Delivery of this module is randomized in order to eliminate issues of self-selection into the training, as well as to obtain a balanced sample of social capital between treated and untreated clients. Through conducting a difference in difference estimation on the pre- and post-treatment survey data, we identify that this short module does have a significant impact on increasing conceptual understanding of recordkeeping, as well as on some measures of loan-related financial success. However, when we use an individual's starting level of social capital to moderate the impact of this intervention, we find no significant effect on one's ability to apply new ideas towards financial success. This result is counter to the conventional wisdom surrounding social capital and economic development, and one of the few Base of the Pyramid studies to look at

social capital in a quantitative methodological context. To my knowledge, I am the first to apply a RCT to look at the causal mechanism between social capital and financial success.

**Social Capital**

Social capital, a concept with its roots in sociology, is generally defined as the resources and ideas one can obtain from direct connections and their further connections (the extended social network), and the norms of reciprocity and trustworthiness that arise from these contacts (Fine 2003). Although the concept has experienced a resurgence in recent years, partially attributable to the rise of researcher computing power and interest in online social networks (James Moody and Paxton 2009), the concept has a long history, first introduced in early 20th century to explain the intangible assets present in a social unit (Hanifan 1916). Today in the social sciences, researchers across a broad variety of disciplines have embraced the concept, including business, economic development, sociology, education, and political science (Doyle 2007; Kwon and Adler 2014).

Within management and marketing, social capital has been found to positively impact a variety of outcomes such as firm performance (Moran 2005; Swaminathan and Moorman 2009), new product development (Atuahene-Gima and Murray 2007; Mallapragada, Grewal, and Lilien 2012b), business incubation (Totterman and Sten 2005), diffusion of innovations (Arndt 1967; Iyengar, Van den Bulte, and Valente 2011), and knowledge sharing (Cummings 2004; Hansen 1999b; Nahapiet and Ghoshal 1998). By accessing the intangible resources present in social connections, social capital is a valuable resource which allows resources to be utilized with greater efficiency.

One of the benefits of social capital is that it bridges market imperfections by reducing transaction costs within an exchange, whether it be regular operations or new transactions. This is particularly important in transitional economies, where there may be a lack of trust in higher institutions, little formal legal infrastructure to protect businesses, and strong information asymmetries within the marketplace (Batt 2008). To counteract these issues, emerging markets have a high use of social capital, with business transactions centering around ties generated through family linkages, geographic locations, shared ethnic backgrounds, and community-based interactions. By providing the necessary trust, shared social expectations, access to additional sources of information, and informal rules of conduct, social capital reduces transaction costs by allowing market exchanges to occur where there may not be formal mechanisms of control. Finally, as many developing economies grow and become increasingly active in international markets, these shared norms of social capital increasingly enter the international business environment. One such example is the Chinese concept of *guanxi*, the networks of personal influence used in business, which has been identified to serve as a strategic mechanism to counter competitive and resource disadvantages (Xin and Pearce 1996). Underdeveloped legal frameworks in China have fostered the development of social capital networks to complete business-related transactions with other companies and governments, as well as develop social norms around reciprocation, connection, and favor exchange (Atuahene-Gima and Murray 2007; Park and Luo 2001).

Another key benefit of social capital is, once a transaction has been made, social capital provides for enforcement of contractual obligations through sources like peer-monitoring as well as reputational sanctions from network members should compliance be broken (Fafchamps et al.

2011). For those individuals who may be resource-poor, social capital can have an even larger impact on their ability to conduct business as well as personal well-being, providing an important role in enhancing social identity, create a safety net of resources to fall back upon, and help cope with the constraints of poverty and social exclusion (Viswanathan, Sridharan, and Ritchie 2010). The transactive benefits of social capital will be explored further in the next section, where we see how the microfinance industry was able to leverage the idea of social collateral into a replicable, innovative product solution.

**Microfinance**

Microfinance, or the provision of financial products to low-income individuals, is an estimated USD 40-60 billion dollar industry with an estimated global growth rate of 10-15% in 2016 (Symbiotics 2016). Although already significant in size, microfinance has overall market potential for continued growth, as more than 80% of the world lives on USD 10 or less a day, of which an estimated 2 billion people do not use formal financial services, and more than 50% of adults in low income households are unbanked (World Bank Group 2014). Microfinance markets are concentrated in the less developed countries (LDCs) which have underdeveloped financial sectors and a large percentage of the population in poverty. By providing financial inclusion, microfinance gives low-income individuals access to personalized financial services through formal accounts, allowing for smoothing of consumption, management of risk, as well as opportunities for investment in business, education, and health (Mullainathan and Krishnan 2008).

Although local systems to obtain financial capital have always been present, such as loan "merry-go-rounds," ROSCAs (rotating savings and credit associations), loans from family and friends, and local moneylenders, the institutionalization of small-scale financial products and

increased consumer access is one of the key innovations of the microfinance industry. The difficulty of reaching low-income markets as well as incorrect beliefs of low-income consumer needs and wants stopped banks from exploring this market. Developing economies suffer from a variety of market failures: information asymmetry on clients, high transaction costs, difficulty enforcing contracts, and social norms that prevented the poor from interacting with formal financial institutions. However, pioneers such as the Grameen Bank and ACCION International operated under two large shifts in thinking that established the microfinance industry (Yunus 1999). First was the belief that the poor could benefit from financial access. Previous conventional wisdom held that the lack of financial capital owned by the poor and the small scale of their expenditures meant that they had no need for instruments with which to save, spend, insure their crops, etc. Clearly, the current size of the microfinance industry combined with continued growth identifies a strong market demand for the provision of financial services, especially at a small scale. Second, the microfinance industry challenged the assumption that banks could not sustainably serve the poor and make a profit. The high transaction costs incurred by applying established banking norms to the small scale required by low incomes did not allow for sufficient margins for sustainable operation. In addition, without collateral, the poor were thought to be a particularly risky consumer base, with a high risk of default. Yet microfinance, through a series of product and service advances, was able to find ways to profitably address concerns of traditional banking systems while providing tailored products for the poor.

One of the key innovations attributed to microfinance is that of *joint liability*. This innovation in contractual obligation moves some of the burden of enforcement from the bank to the other members of a loan group (Ghatak 1999). Joint liability is expressed within the context of

group lending, where a loan is not made expressly to an individual, but rather is contingent on the repayments of the entire group. If one group member defaults, the entire network of clients is punished. This incentivizes an individual to identify and connect with other individuals with whom they trust to be creditworthy in order to reduce personal risk. From the MFI's side, this acts as a means to address information asymmetry (Brau and Woller 2004). Without formal credit bureaus that rank individuals through mechanisms such as a credit score, the creditworthiness of individuals is unknown to the bank. By using individuals' own knowledge of the quality of other members as a signal of creditworthiness, banks' risk in taking on new clients is reduced. Beyond identifying low-default clients, group lending also allows for maintenance of quality through peer monitoring, allowing additional information flows to self-correct risky behavior.

Joint liability also allows for the inclusion of individuals who are too poor for formal collateral. Instead of using physical capital to secure a loan, clients utilize their precious social capital to gain the trust of their loan group. Loans are repaid during group meetings, which bring all members together in a public area and provide full transparency as to loan disbursement and repayments. These group meetings serve multiple purposes. First, they act a mechanism for third party monitoring, where members can observe the repayments habits of other members and gather information about the quality of their repayment abilities (Burt and Knez 1995). Next, these group meetings reduce the transaction and overhead costs of the MFI by centralizing meetings and reducing the need to build physical infrastructure for group meetings. Instead of having twenty five separate meetings to manage with each client, a loan officer arranges for all twenty five people to meet in a central location and completes all transactions within an hour. Similar to small retail stores in developing economies, the microfinance banks pioneer a novel distribution format which

provides critical "last mile" access to the financial services they offer, which allows for access to difficult to reach populations " (Lenartowicz and Balasubramanian 2009). Finally, they act as a community gathering, where clients socialize and congregate, with many staying before or after the meeting to continue their chatting. This comfort creates an environment that can safely serve clients who may have been stigmatized out of banking in formal locations (such as a bank office), and allows extension of credit to marginalized members of society, such as women.

The growth of microfinance from its early social impact roots to a multi-billion dollar industry has created a diverse array of competitors in this banking marketplace. At one end of the spectrum, we have non-governmental organization (NGO) based banks, which often work with unleveraged capital obtained through donations and grants. These NGOs are primarily in place for a social mission of extending access to finance in low-income populations. Often the more inclusive their social mission, the more difficult the provision of financial products and therefore the higher the expenses. Next are non-bank financial institutions (NBFIs), which take on basic debt in order to operate within the microfinance industry. Although they operate similarly to banks, NBFIs are not formally regulated in many countries and provide a limited set of products – sometimes only offering microloans. Finally, formal banks have entered the space. They are able to offer more products (loans, savings, insurance, etc.), and are able to guarantee loans with their own savings in addition to taking on debt in the marketplace. Overall financial sustainability is of primary importance, although some banks still hold social goals in regards to their microfinance portfolio (Krauss and Walter 2009; Littlefield, Helms, and Porteous 2015).

The microfinance industry shows the potential for innovative products, services, and distribution channels to open up new and profitable markets worldwide. By challenging the

assumptions of what poor consumers want and need, MFIs are able to create intense social change along with increasing financial access to the poor. The incredible growth seen by the industry over the past two decades is both a call to action as well as a caution towards unregulated growth, as the microfinance industry continues to expand the financial sector by building inclusive access to capital (Symbiotics 2016). The many innovations of MFIs created an industry which, at its best, address market failures, create sustainable business practices in difficult circumstances, and provides a multitude of social impacts to the world's most vulnerable populations.

**Networks**

The social network literature is a mix of methodological and theoretical work that explores the importance of network structure among a system of interacting units. An overarching focus of the literature is the idea that associations are interdependent with one another, and therefore contexts shape relations (Wasserman and Faust 1994). From this core foundation, the network concept is then applied to a variety of research areas, with those in the social sciences including power and exchange, political and social movements, development of innovations, economic transactions, social support (including family and health), as well as issues of migration and community (Moody and Paxton 2009). Although some researchers in the network literature have focused analysis solely on patterns of connection, without discussing the content that is passed through said connections (Barabási 2003), academics now recognize the importance of the social meaning inherent in these relations as well as the flows of information and resources between individuals.

A network is a social structure that is characterized through *nodes* (which can be individuals, companies, countries, etc.) that are connected through *ties* (also referred to as edges).

Social network analysis, or SNA, is a broad methodology for mapping and measuring relationships between nodes, investigating patterns in social structures, and identifying how structural properties of a network impact behavior. In contrast, econometric analysis focuses on individuals as independent actors, with distinct attributes, ignoring the social context of the actor. Network analysis shifts the focus of analysis by statistically defining both the ties between individuals (sometimes focusing on one specific individual or *ego*) as well as using this information to describe the characteristics of the entire network. This allows us to numerically understand the interdependence of a network, as well as how the overall environmental macro structure can constrain or encourage certain outcomes for the individuals within the network.

This inherent difference in analysis is reflected through the distinctive data structure and alternative statistical measures used in SNA, which are rooted in graph theory (Kolaczyk 2009). First, network data is stored in an adjacency matrix, which has a row and column for each actor in the network. The value of any cell identifies the relationship between the persons represented by the row and column. At its simplest, the matrix is symmetric and relationships are coded in binary, representing a network where the relationships are show as either present or absent, and each relationship is reciprocated (e.g. if A is connected to B, B is also connected to A). Additional information can be included into these relationships, for instance, instead of being symmetric, the network can show directional connections (e.g. A connects to B but B does not connect to A, which in a friendship network would show that A considers B a friend, but that feeling is not reciprocated). The connection can also be coded to show valence (positive vs. negative), strength (depth of relationship), or type (work vs. personal). This adjacency network of relations is then used to mathematically calculate various summary measures of network position, role, strength,

structural equivalence, transitivity, clustering, and connectivity (Marin and Wellman 2010; Wasserman and Faust 1994).

One key arguments in the network literature is the strength-of-ties, which is primarily concerned with the nature of the connection between two individuals, and defining the differences in types of information, trust, or resources that then can flow through this connection (Rindfleisch and Moorman 2001a). Ties are classified as either strong or weak, with strong ties allowing for greater reciprocity, information sharing, and indebtedness (Granovetter 1973). Generally speaking, strong ties indicate increased levels of interpersonal trust, and therefore sharing of sensitive information, while weak ties give a source of diverse and potentially new information (Frenzen and Nakamoto 1993; Hansen 1999a). This literature has been used to describe and understand managerial outcomes in a variety of situations, such as the promotion of cooperation in dynamic networks (Melamed and Simpson 2016), interfirm cooperation (Rindfleisch and Moorman 2003), and market orientation (Seevers 2010).

Earlier I discussed the social capital literature which, while not necessarily requiring calculation through network analysis, clearly has significant affinity with the methodology. Although social capital can and has been conceptualized in non-SNA terms such as positions of leadership, psychological conceptualization of belonging, dyadic connections, etc., it is inherently a network-focused subject (Lin and Erickson 2010a). Moody and Paxton note that only about 2% of abstracts on social capital explicitly mention networks, and only 4.5% of abstracts on networks explicitly mention social capital (2009). The disconnect between SNA and the social capital literature likely stems from the methodological difficulty of obtaining and analyzing network data, but when combined the areas can provide deeper conceptualizations and predictions. By defining

networks through their mathematical graph-theoretic properties, social capital theories can be more precisely specified, described in full complexity, and then rigorously tested. For example, one recent work looks at the impact of participation in voluntary civic organizations on subject social capital, and finds evidence of some group self-segregation by social class, but also that groups which are diverse across a variety of status dimensions mediate the impact of an individual actor's social class, as well as allowing for access to higher-status individuals in the network (Benton 2016). Results like this provide quantified understanding of dynamic processes within networks, and allow for development of managerial and policy-related interventions to encourage more effective outcomes.

The network literature has achieved significant growth in the past few decades due to an increased interest in network effects and issues of complexity as well as the complementary increase in necessary computing power. While significant gains can be made by using a network analysis lens to look at social, economic, and policy issues, practitioner commitment to the methodological differences is necessary to integrate the use of SNA in cross-disciplinary literature (Jackson 2010). In the next section, I discuss how marketing provides a practical viewpoint to combine the areas of social capital, microfinance, and network analysis to provide theoretical contributions, methodological advances, and actionable managerial outcomes.

**Marketing**

A marketing lens is able to bring together all these concepts through its focus on marketplace exchange (Bagozzi 1975; Houston and Gassenheimer 1981). Using a broad array of research methods for understanding consumers, markets, and marketing activities, the discipline

has strong empirical and theoretical foundations for understanding value delivery systems inherent in marketplace transactions (Stewart 2015). The tools marketing provides allows us to further synthesize the three areas (microfinance, social capital, and social networks) that have strong theoretical overlap and allow us to generate managerially relevant conclusions.

The paradigm of exchange is central to the study of marketing, which analyzes the complexity inherent within the creation and resolution of an exchange relationship. Transfers can include both direct and indirect exchanges, and can include physical goods, as well as intangible things (such as ideas or information), or symbolic aspects (goodwill, rituals, etc.). Although research in marketing initially focused on dyadic exchanges, recognition of multiple-party transactions, hierarchical transfers, and diverse stakeholders provide a robust set of analytics with which to view networks (Houston et al. 2004; Iacobucci and Hopkins 1992).

Using the marketing literature, I am able to view microfinance through an understanding of the system of exchanges within the client network, measurable with network analysis (Achrol and Kotler 1999; Webster and Morrison 2004). The social capital between microfinance clients forms a network of exchanges that transfer respect, information, and power in a low-income environment that inherently has fewer monetary exchanges, and monetizes this capital through the provision of loans from the MFI. To this context, we can further explore the network interactions through the marketing theory of relationship marketing (RM), which posits that repeated business transactions between marketing actors allow for the development of relationships, from which a continuous information flow enhances overall financial performance (Sheth and Parvatiyar 1995). This shift in thinking allows for value creation beyond just the cost of the exchange, and provides a

foundation from which we can analyze the repeated interactions in the MFI network: client-to-client, and client-to-MFI.

In this dissertation, I look at the impact of exchange in two separate essays. In the first essay, I expand on our understanding of relationship marketing by looking at repeated exchanges within a MFI client base. Here I explore the commitment of microfinance clients to the firm alongside their peer-level loan member commitments, and the connection these commitments have to their personal financial outcomes. In the second essay, I evaluate a randomized control trial of a financial literacy training employed by the MFI as a marketing tool to differentiate their loan product. Base of the Pyramid theory posits that an individual's social capital allows them to better navigate the marketplace as well as compensate for low levels of human and physical capital, although endogeneity makes it difficult to untangle whether social capital or financial success comes first. I explore this question with the difference in difference methodology that allows me to isolate causality, using it to answer whether social capital has a moderating effect on the impact of the educational intervention.

**ESSAY I: RELATIONSHIP MARKETING FOR BASE OF THE PYRAMID MARKETS: THE IMPACT OF NETWORKS ON ECONOMIC PERFORMANCE**

**Introduction**

Relationships with individuals and institutions are critical towards sustaining and providing opportunities to managers and entrepreneurs (Palmatier 2008). At the Base of the Pyramid (BoP) – low-income environments found in emerging markets worldwide – these relationships are believed to carry even more weight due to the increased importance of non-physical resources in conditions of scarcity (Cattell 2001; Woolcock and Narayan 2000). As competition increases between multinational firms to connect with consumers at the BoP, comprising 4 billion people and representing a $12.5 trillion market rapidly expected grow in size and purchasing power, establishing relationships with these consumers represents a long-term investment in a globalized customer base (Prahalad 2006). Yet, although these connections are considered important, rigorous studies on social influences in conditions of poverty are scarce due to the complexity of obtaining and analyzing the relevant data. This research represents an early attempt to study the importance of implementing an expanded view of relationship marketing strategies at the BoP, focusing not only on a client's commitment to an organization but also their social relationships within their peer network, and how these are associated with the financial success of the firms they interact with.

Relationship marketing (RM) is formally defined as the process of identifying, managing, and ending relationships with the purpose of enhancing firm performance (Morgan and Hunt

1994). The concept expands the single exchange view of a simple marketing transaction and instead champions a market strategy that adopts and builds on a long-term, multiple-transaction customer and market perspective. RM actions have been shown to support stronger consumer relationships and positive seller performance outcomes (Gronroos 1994; Wulf, Odekerken-Schröder, and Iacobucci 2001), and is particularly critical for the financial and other service-based businesses due to the direct provider-to-client interaction and the trust required when dealing with intangible goods (Lusch, Vargo, and O'Brien 2007). In this study, I use a relationship marketing framework to understand the impact of an entrepreneur's relationships, whether with a firm or with peer entrepreneurs, on their own financial success and thereby the success of the firms they interact with.

Connections between individuals can serve as important channels that carry information, support, and resources, and key positions in a network can create opportunities for powerful brokerage of these assets (Burt 2005; Watts and Dodds 2007). Social capital, broadly defined, is the value of one's social connections that enable access to resources within a social network (Lin and Erickson 2010a; Lin 1999). Although it has been extensively theorized and shown through qualitative analysis that social capital helps alleviate lack of physical capital in low-income environments, the evidence drawing a direct, quantitative connection between social capital and financial wealth is lacking (Della Giusta 2010; Harriss 2002). If relationships can provide key resources to focal individuals, and development of committed relationships is key to firm financial success, can I quantify the impact of social capital on firm financial outcomes? And if so, how does the impact of a client's connections differ if they exist between and among peers (fellow entrepreneurs) rather than with a firm?

Small-scale business operations ("microbusinesses") are run by micoentrepreneurs who typically operate alone or employ five or fewer employees (de Mel, McKenzie, and Woodruff 2008). These micoentrepreneurs play a crucial role in emerging markets. Inside their local marketplaces, these micoentrepreneurs can serve as customers, suppliers, and sellers of goods (Prahalad 2006; Viswanathan, Rosa, and Ruth 2010). Multinational companies often rely on these small businesses to act as the channels of distribution in emerging economies where the channel and supply chain structures are underdeveloped. These micoentrepreneurs not only provide the "last mile" consumer access to a product through a rural kiosk or shop in urban or rural areas, but can also provide raw materials such as coconuts or cacao beans at the beginning of their global supply chain. Further, the growth of such micoentrepreneurs, especially in rural and underdeveloped areas, is seen as a platform for addressing poverty in BoP markets. Correspondingly, from the perspectives of both managing profitable businesses in BoP markets and from a social policy perspective, understanding and optimizing the performance of these micoentrepreneurs and their web of connections is increasingly important. Additionally, these interlinked microentrepreneurs represent a relatively new channel structure that moves beyond both marketing's traditional dyadic view of channel structure (Achrol, Reve, and Stern 1983) as well as more complex vertical channels with multiple stakeholders (Rindfleisch and Moorman 2001b, 2003).

Our work focuses on the microfinance industry, which provides small-scale financial services such as loans to low-income microentrepreneurs. In the decades since its inception, the microfinance industry has established itself as a robust and growing sector with strong customer/entrepreneur demand. The microfinance sector annually manages funds of more than US $10 billion, with current annual growth being pegged at 15% or higher (Symbiotics 2016).

Microfinance provides low-income individuals access to financial services with products that are tailored to their smaller incomes as well as distribution methods that address societal restrictions, allowing access to trustworthy financial products.

The first microfinance banks were created as non-profit organizations and operated without significant competition. With the rapid growth and demonstrated profitability of the microfinancing sector, not surprisingly, the microfinance business model has transformed over time and competition has sharpened within the industry. New entrants into the sector now span the range between not-for-profit organizations and global, for-profit financial institutions. While profitability is now more of a central objective, microfinance institutions (MFIs) often also pursue, in parallel, social missions related to delivering consistent financial access to microentrepreneurs in order to increase their quality of life, increase access to education, or allow them to take advantage of entrepreneurial opportunities. For MFIs, microentrepreneurial success and MFI success are deeply intertwined. If a MFI client is not financially successful, she will not be able to adequately repay her loans and the MFI suffers threat of default or a constraint on firm cash flow. Similarly, if a MFI client is able to invest her money into products that improve her quality of life or provide potential for further revenue generation, this fulfills a MFI's social mission to reduce the burden of poverty on their clients through microfinance provision. MFIs are now increasingly focused on long-term financial sustainability along with aggressive growth in order to stay competitive. This requires MFIs to be even more aware of their local environment, to provide loan products that are tailored to their client's needs and superior to their rival's offerings, and structure and manage the social network in which microentrepreneurs are embedded to the benefit of all parties.

With an understanding of how variables related to social capital, commitment to a firm or organization, and entrepreneurial orientation drive entrepreneurial (and therefore firm) success, MFIs can optimally structure and manage their microfinance networks. Further, with these insights, the MFIs can identify opportunities for helpful interventions related to adjusting the network structure, selectively incorporating new microentrepreneurs, and providing learning and development opportunities for microentrepreneurs that can be scaled within their network.

Our empirical findings indicate that strong connections, whether with the network as an entity or with the people within the network, yield better MFI financial outcomes. In particular, I reveal the importance of a microentrepreneur's social network on outcomes of importance to both the MFI and the microentrepreneur. This research identifies key levers of commitment that impact the financial performance of microfinanced, socially-embedded microentrepreneurs and the microfinance institutions that serve them in a BoP marketplace. Empirically, this is the first quantitative study that I am aware of to use social network analysis to specifically understand the firm-level financial impacts of the microentrepreneurs' commitment to their MFI organization and their commitments to their social network in a BoP marketplace. These insights matter to managers and policy makers as they provide some of the first formal evidence that not only does social capital matter at the Base of the Pyramid, but it also can be linked to better financial outcomes. I further explore the interactions of a client's entrepreneurial orientation on these commitments and these interactions also impact MFI performance. I expect that this analysis will (a) help MFIs better understand and develop patterns of commitment with their clients in order to generate financial gains in the spirit of relationship marketing; (b) structure and manage their intra-firm social network in a way that maximizes the likelihood of financial success; and (c)

develop educational and marketplace interventions that make a microentrepreneur network operate more effectively.

**Hypotheses**

Microfinanced and networked microentrepreneurs in a BoP market comprise an optimal study setting for exploring the implications of organizational and social relationships on individual and market outcomes. This setting provides access to a closely monitored client (microentrepreneur) base that interacts regularly with an organization (the MFI) as well as peers and consumer microentrepreneurs. By developing a strong relationship with clients, MFIs can strengthen loan repayment rates and support long term working relationships with the microentrepreneurs. From the perspective of a focal microentrepreneur, the social network can serve as a support group that can provide motivation, business and financial advice, and emotional support during difficult times, and that can, in turn, receive the same contributions from the microentrepreneur. The extent to which this exchange of benefits takes place will depend on the location and stature of the microentrepreneur within the social network (Granovetter 1973; Hansen 1999b).

Relationships are at the core of networked organizations and quasi-organizational structures such as social networks. The importance of relationships in building mutual trust, knowledge and resource sharing, enforcing positive behavioral norms, and other positive behaviors and outcomes in a business context has been emphasized across functional contexts, including marketing (e.g., Morgan and Hunt 1994), management (e.g., Madhavan, Koka, and Prescott 1998), and operations (e.g., Siemsen, Roth, and Balasubramanian 2008). I develop our theoretical foundations using concepts from the area of relationship marketing (RM), arguing that

microfinance institutions in emerging economies and BoP markets must support the cultivation of long-term relationships that anchor not just the typical firm-to-client interactions, but also client-to-client interactions. I further hypothesize that social connections (as measured by an individual's social capital) are just as, if not more important, to client success as is commitment to the firm, and that these effects of relationship quality are positively moderated by an individual's entrepreneurial orientation. In developing the theory, I define my measures of commitment, differentiating between different types of organizational and social commitment, and describe our measure of entrepreneurial orientation for a low-income context. Finally, I conclude with hypotheses about the impact of commitment on two different measures of performance.

As briefly noted earlier, the microfinancing context provides an ideal setting for the joint study of the implications of client-to-firm commitment and inter-client commitment. However, I expect that the theoretical and empirical findings related to firm and inter-client commitments will be generalizable, with due adjustments, to other, non-MFI organizations with networked client or consumer bases in subsistence marketplaces. For instance, microfranchising, or a scalable, small business at the BoP, leverages the pros of the traditional franchise model (consistency of product, centralized high-level management, business training and support, access to established supply network) but at a scale that allows the poor to own their own business (Jones Christensen, Parsons, and Fairbourne 2010). These individuals work and live in networked communities, and this research adds additional understanding of the context and impacts of an interconnected consumer base.

**Relationship Marketing**

By developing and nurturing relationships in distribution channels, marketing scholars have long recognized the importance of integrating relationship marketing (RM) in management strategy to develop a competitive advantage (Gronroos 1994; Morgan and Hunt 1994). These relational exchanges, or extended, multiple-transaction relationships, are impacted by shared behavioral norms as well as an outlook that constrains short-term profit seeking for the potential of long-term firm performance benefits. By expanding the view of marketing from pure exchange to value creation, marketers acknowledge the impact of multiple stakeholders, potential for business value creation, as well as societal impact (Sheth and Uslay 2007).

From the MFI's perspective, a microentrepreneur is not a passive recipient of a charitable donation. Instead, he or she is both a client for the financial services they provide and someone to develop an ongoing relationship with, in order to effectively serve both the microentrepreneur's and the MFI's goals. It is particularly important for the MFI to establish, develop and maintain these successful relational exchanges through reciprocal transfers of commitment (Gundlach, Achrol, and Mentzer 1995; Morgan and Hunt 1994). In order to better understand the client, create products that meet client's needs, and increase retention of clients, ultimately leading to growth in shareholder value. In the long run, a MFI must seek to develop a profitable, long-term relationship with microentrepreneur clients in the tradition of relationship marketing (Gronroos 1994). The growth in the microfinance industry provides MFIs a promising opportunity to fine tune their marketing strategy: focusing on understanding and serving their client base well over time, which provides long-term benefits for both MFI and client.

The impact of RM on performance is typically conceptualized through four stages: activities, relational assets, relational behaviors, and financial performance (Palmatier 2008). In

this paper I focus on measuring relational assets and the resulting financial outcome metrics. In addition, I expand the model of RM beyond a relationship between a client and a firm to an interpersonal context within the focal firm, allowing for capture of further depth of the impact of customer relationships to firm financial outcomes.

**Relationship with the Firm**

The existing literature offers several intangible relational assets that influence a customer's behavior and have a positive impact on seller's financial performance, such as commitment, trust, reciprocity norms, and gratitude (Moorman, Zaltman, and Deshpande 1992; Rindfleisch and Moorman 2003). To measure an individual's relationship with the MFI organization, I focus on commitment, or the intention to maintain a valued relationship (Anderson and Weitz 1989; Gundlach, Achrol, and Mentzer 1995). The critical role of commitment in moderating marketing relationships has been examined in a variety of exchange situations (Moorman, Zaltman, and Deshpande 1992; Viswanathan, Rosa, and Ruth 2010), and is identified as a key requirement between exchange partners to achieve positive seller financial outcomes (Iacobucci and Hopkins 1992; Wulf, Odekerken-Schröder, and Iacobucci 2001).

Microentrepreneurs in BoP markets are in a particularly challenging situation when it comes to managing their businesses. First, the financial implications of failure can be devastating for low-income entrepreneurs in BoP markets (Jones Christensen, Siemsen, and Balasubramanian 2014). In the absence of fallback options and financial safety nets, a disciplined focus on the business is required to avoid the ever-threatening poverty spiral (Prahalad 2006). If commitment to the MFI organization is strong, a client should be more motivated to focus on the business and

undertake actions that positively impact their financial health, ultimately yielding better financial

outcomes for the MFI. Based on these arguments:

$H_1$: *The organizational commitment of microentrepreneurs positively relates to firm financial success.*

**Social Relationships**

Relationships can be proximate or distal in nature. They can hold with respect to the

organizational entity a client is working with and/or with respect to the people within the

organization that a client interacts with, representing his or her social group. In developed

markets, due to established and efficient supply chains that allow producers to maximize

economies of scale, consumers are typically geographically and psychologically distanced from

organizations they purchase from. In contrast, consumer and producer perspectives are often

interlinked in informal subsistence market settings where microentrepreneurs typically operate

(Sridharan and Viswanathan 2008; Viswanathan et al. 2014). The resulting interdependencies call

for a multi-faceted view of how exchange relationships are balanced between the requirements of

organizational and social relationships (Viswanathan, Rosa, and Ruth 2010). To measure a client's

social relationships I use the concept of social capital, drawn from the strength-of-ties literature in

sociology.

Social capital comprises the goal-directed resources, ideas, and social support accessed

through an individual's social connections and social relations (Lin and Erickson 2010a; Mouw

2006). The concept of social capital is underused in research due to the difficulty of obtaining

network-level data (James Moody and Paxton 2009); however, social network analysis has been

increasingly used as a robust platform for the analysis of the effects of social capital due to its

ability to quantify and calculate measures of the impact of one's connections. Client reliance on social capital can be particularly strong in the BoP context due to the scarcity of monetary resources and technical expertise (Cattell 2001; Iyer, Kitson, and Toh 2005; Matthews 2005). I measure a client's connections within the microfinance organization's client population through two commonly used social capital measures: bonding and brokerage.

A client's bonding in a social network grows as his or her number of connections increase (Houston et al. 2004; Swaminathan and Moorman 2009). A client with a high level of bonding has efficient access to individuals within their immediate network, signaling a redundancy in relationships that generates higher levels of closeness, indebtedness, group monitoring, and deeper understanding through information sharing (Frenzen and Nakamoto 1993; Granovetter 2007). In our research context, clients rely on their trusted relationships to provide assistance when managing their microbusinesses, smoothing cash flows, providing emotional support, explaining systems and procedures, and obtaining information that helps them compensate for a lack of physical resources. Individuals with higher levels of bonding have access to important resources and should be able to leverage such access into increased entrepreneurial success in the form of financial success. Based on these arguments:

$H_2$: *The strength of a focal clients' bonding relationships with other individuals (clients) in the firm's social network positively relates to the firm's financial success.*

In contrast, clients that have brokerage relationships link sparsely connected sections of the social network, thus giving the client access to new ideas as well as powerful opportunities to manage information flow between different groups (Burt 2001, 2004). While the closeness

obtained through bonding allows sharing of sensitive information, it is generally accepted that brokerage gives access to unique, non-redundant sources of information as well as the potential for powerful information and resource brokerage opportunities between different social groups (Hansen 1999b). As Burt (2005, p.17) notes: "people whose networks bridge the structural holes between groups have an advantage in detecting and developing rewarding opportunities. Information arbitrage is their advantage. They are able to see early, see more broadly, and translate information across groups."

With novel information, a client should be able to effectively seek out opportunities and effectively deploy knowledge and resources to achieve greater financial success. Further, sharing new knowledge with members of the social group can help increase that client's standing within the social group. Based on these arguments:

$H_3$: *The strength of the clients' brokerage relationships with individuals (clients) in the firm's social network is positively related to firm financial success.*

**Entrepreneurial Orientation**

A range of situational and individual characteristics that include the psychological, experiential, and human capital domains drive the successful identification and exploitation of entrepreneurial opportunities (Shane and Venkataraman 2000). Specifically, an entrepreneur's attitude towards, and ability to identify and act on opportunities for their business, as captured by their "entrepreneurial orientation," has been shown to be positively correlated with enterprise performance (Covin and Slevin 1988).

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Much of the previous research on entrepreneurial success has focused on developed markets, where individuals' decisions to start their own business are often driven by the desire to take charge of future work styles – i.e., to "be their own boss" – and to control their financial destinies. In strong contrast, individuals in BoP settings often become entrepreneurs not because of personal ambitions and goals, but because a small-scale business provides their only opportunity to generate income. In fact, emerging and BoP markets often show more intensive entrepreneurial activity compared to developed markets, containing up to four times as many early-stage "necessity entrepreneurs" per capita than developed economies (Amorós and Bosma 2014; Brewer and Gibson 2014). Understandably, these necessity entrepreneurs differ along many dimensions from "opportunity entrepreneurs" in developed countries.

I argue that a microentrepreneur's relational commitments in a BoP context are likely to be more influential in driving financial success than his or her entrepreneurial orientation. First, while a strong entrepreneurial orientation will likely drive the self-selection of an entrepreneurial career pathway in developed market contexts, it is less likely to do so with necessity entrepreneurs in BoP markets. Second, while a microentrepreneur may have significant core potential, the effects of an entrepreneurial orientation can be hindered by a lack of bureaucratic support, barriers to small-scale formal market entrepreneurship, difficulty in obtaining resources from conventional financial organizations, blocked access to potential growth paths, and other social challenges including gender-based discrimination and illiteracy (Amorós and Bosma 2014). Therefore, the success drivers previously linked to entrepreneurs in well-structured, developed markets may not fully apply in emerging market situations (Viswanathan, Sridharan, and Ritchie 2010). Even when an entrepreneurial orientation influences financial performance in BoP contexts, it is likely to

exert an influence less in a direct manner and more by enabling the microentrepreneur to better leverage his or her commitment to the MFI and the resources and social connections that are available. Based on these arguments:

$H_4$: *The interaction of clients' entrepreneurial orientation with clients' organizational commitment and clients' social capital is positively related to firm financial success.*

I focus on two sub-constructs that I combine into the concept of entrepreneurial orientation (EO): the owner's personal initiative and their orientation towards a growth goal for their business. I generate this combination measure using two scales: personal initiative (Frese et al. 1997; Unger et al. 2009) and growth goal orientation (Fay and Frese 2001; Frese et al. 1997). Both these measures were developed in the context of a study of business owners in sub-Saharan Africa (Frese 2000), and scale measures are listed in Appendix A. As an aside, while our theoretical focus in on the moderating effects of entrepreneurial orientation, following econometric convention, I also allow the construct to directly affect financial performance in the model specification to capture any main effects.

**Controls**

General environmental and cultural conditions can impact entrepreneurial success (Dean and Sharfman 1996; Karlan and Valdivia 2011). I focus on microentrepreneurs who have been broadly operating within a single culture and business environment. The study design therefore naturally controls for exogenous factors such as macroeconomic conditions, national-level economic shocks, and cross-country variances in culture. The caveat is that these factors must be considered in the context of a broader generalization of the findings.

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Human capital theory posits that experience is translated into knowledge and skills, which can increase an entrepreneur's ability to discover and take advantage of business opportunities (Unger et al. 2011), yet experience is not necessarily a strong predictor of business acumen because time spent learning or working does not always convert itself into superior expertise (Sonnentag 1998; Unger et al. 2009). At the same time, large-scale studies in both developed and developing economy contexts have found that experience has a significant, if small impact on performance (Rauch and Frese 2000). To capture experience, I include age as a control variable. I also include the time the client has worked with the MFI, measured in terms of days since the client's first transaction, as a control in the model. This variable can capture aspects of experience and also account for the time the client has to build personal wealth (a measure of financial success). In addition, Kenya's patriarchal society restricted many older women from accessing educational opportunities. The nationwide advent of free primary schooling introduced in 2003 has increased but not yet equalized investment in female human capital. Therefore, I include the gender of the client as a control variable.

The final model is represented in Figure 1. The model is algebraically detailed in equation (1) below, with subscript $i$ representing a client. As part of the management of the MFI client base, the clients are divided into social groups managed and mentored by a primary loan officer, who serves as their main point of interaction with the firm. All errors were clustered at the loan officer level, $j$. This additionally controls for both the potential impact of loan officers in driving performance, as well as other unmeasured variables related to the geographical focus of the social groups.

$$OwnedItems_i = \beta_0 + \beta_1 OrgCommit_i + \beta_2 SocialCap_i + \beta_3 EntOrient_i +$$

$$\beta_4 EntOrient_i * OrgCommit_i + \beta_5 EntOrient_i * SocialCap_i + Controls_i + \varepsilon_j$$

(1)

## Methods

### Empirical Context

For this research, I collaborated with a microfinance institution that operates in the coastal region of Kenya, in East Africa. The MFI manages its clients using a modification of the traditional Grameen-style microfinance group lending principles (see Morduch 1999 for details regarding Grameen operations). Clients meet bi-monthly in stable lending groups to discuss business and submit loan repayments, interacting with a primary loan officer who manages business with the client group. Loans are repaid with a flat interest rate (11%), which is used to fund MFI administrative activities and to support a client-managed emergency fund that covers a client's outstanding debts in case of death, dismemberment, and other disasters. As of May 2014, the MFI managed approximately 40,000 clients through eight offices in the coastal Kenyan region, and ranked among the ten largest Kenyan MFIs.

Each client, on joining the MFI, is integrated into a lending group. This group meets twice a month for about one hour in a location that is central to its members. The clients are met at the site by the loan officer, who reviews client record books, takes loan repayments, and discusses any outstanding issues. The meetings offer opportunities for some relaxed socialization and information exchange within the client group while business takes place. Loan officers manage the lending groups and form the primary point of interaction between the firm and its clients (Canales and Greenberg 2015).

**Data**

I compiled our data from three different sources. First, I used surveys to measure the relevant psychological and demographic variables of interest. I carefully considered measures used in previous research on microenterprises and low-income entrepreneurs and used established scales when possible. Some of the employed scales were already developed in the context of subsistence marketplaces (e.g. Krauss and Frese 2001, Frese et al. 1997), while others were modified to fit our research context (e.g. Meyer, Allen and Smith 1993). Appendix A provides the scale questions used in our survey. The resulting questionnaire was translated into Kiswahili – the local language – and independently back-translated into English, through two separate Kenyan translators familiar with regional linguistic nuances. The survey was finally reviewed by a panel of six coastal Kenyan locals as well as the microfinance institution to confirm clarity of questions, validity of terminology, and cultural suitability. In addition, due to the high reported illiteracy levels of the subjects, the survey used measurement techniques altered for this context to best capture data and reduce bias in data recording, and enumerators were heavily trained in appropriate surveying techniques for the low-literacy client base (Gau, Jae, and Viswanathan 2012).

We collected the baseline data through a field survey conducted in rural and peri-urban coastal Kenya, obtaining financial, psychological, and relational information from approximately 400 microfinance clients. A team of five local Kenyan enumerators, fluent in English, Kiswahili, and local dialects such as Kigiriama, were personally trained in a series of classroom and field trainings. Teams of enumerators attended loan group meetings and interviewed as many individuals as possible within the meeting, often returning back to the same loan group to interview additional clients. Data collection was completed with a mobile phone-based survey

instrument, Magpi, which is utilized by major international organizations such as the World Bank, UNICEF, and the CDC (Magpi 2015). This initiative lowered surveying costs (specifically, data entry and printing costs), reduced errors related recording and transcription, allowed real-time monitoring and management of enumerator progress (including the identification of location and speed of enumeration), facilitating immediate feedback to and from the principal investigator who monitored the survey uploads in real time.

In parallel with the survey data, I collected social network data through ego network sampling. Each "ego," or client, was asked for their contacts, or "alters" given a series of social and business interaction prompts. Names generated through this exercise were matched with a database of MFI clients to generate a network adjacency matrix, mapping out each client's network of social and business connections within the MFI's client base (see Appendix B for a list of prompts and Figure 2 for a visualization of the MFI's network). I constructed an adjacency matrix to capture the relational data, where the clients in the network were listed in a symmetric matrix as both the first row and first column, with a connection between any two clients identified with a 1 and non-connection with a 0 within the matrix. This network represents the web of a microentrepreneur's social connections against the backdrop of which economic activity is conducted in the BoP market. I used social network analysis methods to calculate our measures of social capital from this adjacency matrix, and appended those measures to the survey data at the individual client level. Analysis was completed on the final dataset using the STATA 13, UCINET 6, and R 3.1.1 software packages. I describe each of our measures next.

**Dependent Variables**

As discussed earlier, microentrepreneurial success and MFI success operate in parallel. The "double bottom line" of most MFI charters defines success to include both financial and social impacts, which is an expansion on the mission of most financial institutions. In broad terms, success means a MFI remains financially stable while simultaneously generating a positive economic and social impact to its client base.

I considered using client default as a measure of client quality, as default on a loan is the ultimate financial failure within a MFI's books. However, this MFI has a 95% loan repayment rate. While observers unfamiliar with the microfinance industry often find this low default rate surprising, it is consistent with other MFIs operating in BoP markets. Specifically, I only had two defaults within the specified timeframe within our dataset, providing insufficient variance on this dimension to make it interesting and usable from a research perspective. Therefore, rather than client default, I focus on the important metric client wealth.

**Personal wealth** – Wealth is a difficult construct to measure in subsistence economies. Unlike developed contexts, where cash held in bank accounts and regular transfers of income are easy to identify and track, subsistence entrepreneurs usually have volatile patterns of income that may be held in a variety of cash and non-cash sources and therefore may not be easily identifiable by the MFI client (Collins et al. 2009). The lack of formal savings accounts makes it particularly difficult for individuals to safely save. Cash is often immediately spent on pressing needs and wants, can easily be stolen, and is sometimes disbursed in response to social pressure from relatives and friends. Often money is exchanged for a less liquid good that can either be resold later, serve as a status symbol, or used to generate additional income (e.g., livestock), which allows the money

to remain "safe." To measure personal wealth owned by the client, consistent with previous research on BoP markets (Jones Christensen, Siemsen, and Balasubramanian 2014), I use the marketplace monetary value of a series of potentially revenue-generating goods owned, as identified by the clients. Our analysis of personal wealth revealed some marked outliers – specifically, 19 individuals owned multiple vehicles, leading to personal wealth levels ten times the upper bound of the overall group. In these cases, there were clearly other sources of income that dominated the earnings from microentrepreneurial activity. These individuals were removed from the data set, yielding a final sample of N=368.

**Independent Variables: Organizational Commitment**

An individual might maintain a relationship with an organization for multiple reasons. Therefore, commitment to the MFI is often multifaceted. I focus on the two most distinct components of commitment discussed in the literature – affective and continuance commitment (Meyer, Allen, and Smith 1993; Meyer and Allen 1991). These types of commitment are not mutually exclusive, but can be experienced by the same client to varying degrees, so are therefore measured concurrently for each subject.

**Affective Commitment** – Affective commitment is desire-based; where an individual is emotionally attached to and identifies with the organization and the individual "wants" to stay with the organization. This affective attachment to the organization is beyond the organization's physical worth to the individual, creating an emotional bond and a felt want to continue the relationship with the organization.

**Continuance Commitment** – In contrast, continuance commitment reflects a felt need to remain connected to the organization because of the high perceived costs of breaking the relationship. This logical view of commitment, that is "I maintain this relationship because of the benefits it provides me," implies a calculation and comparison of the profit from continuing the relationship and the costs of leaving.

A microentrepreneur's commitment to continuing a business relationship with a MFI can be driven by both types of commitment: a general, emotional desire to maintain ties as well as a calculated, necessity-based need to keep the relationship strong. I measured affective and continuance commitment during the individual-level round of surveys, using the scales developed by Allen and Meyer, slightly adjusted to reference the MFI in our study context.

**Independent Variables: Social Capital**

There are multiple ways to operationalize social capital, but the most widely accepted measures within the network analysis field involves two specific types of social capital that provide different but complementary resources to an individual: bonding and bridging (Burt 2001). The ego network portion of the survey generated a network adjacency matrix, which I used to derive these social network calculations.

**Bonding** – To measure bonding, I use a measure of an individual's network degree centrality, that is, the number of connections that the individual has with other clients in the MFI. The higher a client's degree centrality, the more connected they are within the network (Wasserman and Faust 1994).

**Bridging** – To measure bridging, I use Burt's measure of network constraint, an index that measures the extent to which a person's contacts are mirrored by other network members (Burt 2004). This is calculated as network constraint $C_i$ of ego $i$, which is computed by summing all measures $c_{ij}$ of $i$'s dependence on contact $j$:

$$C_i = \sum_j c_{ij}, i \neq j$$

The dependence measure $c_{ij}$ is computed by summing the proportion of direct connection $i$ spends on contact $j$ ($p_{ij}$) as compared to the proportion they spend on all other indirect ($p_{iq}p_{qj}$) contacts in the network, where $q$ is a contact in the network that has a connection to $j$ but not to $i$.

$$c_{ij} = \left( p_{ij} + \sum_q p_{iq}p_{qj} \right)^2 \quad i \neq q \neq j$$

**Results**

I present summary statistics from our survey in Table 1. The demographics of the surveyed clients are consistent with local demographics of coastal Kenya, which has a higher percentage of Muslims than the rest of the country. In addition, the higher percentage of women (91%) in the sample is expected as the MFI prioritizes lending to women due to their greater likelihood of (a) investing funds for the household and in children's welfare as compared to male MFI clients, and (b) demonstration of higher loan repayment rates (Pitt and Khandker 1998), and is consistent with Grameen-style microfinance management. I present means, standard deviations, minimum and maximum variables, as well as correlations of our measures in Table 2. Scale reliability coefficients – presented in Table 3 – are acceptable, ranging from 0.676 to 0.813 (Peterson 1994). In Table 4, I

present the empirical findings from the estimation of the model. The models were tested using a Generalized Estimating Equation (GEE) approach with errors clustered by loan officer groups.

**Hypothesized Effects**

*Organizational Commitment*

In partial support of $H_1$, I find that continuance organizational commitment has a positive impact on client's financial well-being, as measured by the monetary value of goods they own (b = 0.169, p < 0.05). Affective commitment does not have a significant impact. Neither affective nor continuance commitment has a significant impact on client reliability.

This result is interesting because it reveals that an emotional attachment with the MFI does not drive performance even when the clients are poorly educated on average. Rather, it is the more calculated, logical commitment to the relationship on the part of the client that drives longer term performance and the creation of wealth.

*Social Commitment*

Consistent with $H_2$, I find that a client's level of bonding has a positive impact on client financial success (b = 0.195, p < 0.01).

In support of $H_3$, a client's level of bridging, or connections with diverse network members, also drives positive outcomes. Specifically, a client's level of bridging positively influences financial success, as measured by the accumulated asset base (b = 0.140, p < 0.05). Overall, social capital within the social network emerges as a key driver of importance for both the client and the MFI.

*Entrepreneurial Orientation*

As expected, entrepreneurial orientation does not have a significant direct effect on performance. Considering $H_4$, a higher entrepreneurial orientation plays a moderating role by increasing the effect of affective commitment on financial success, measured by the accumulated asset base of the client (b = 0.226, p < 0.05). This interaction between entrepreneurial orientation and affective commitment has a large effect size compared to other effects. Further, there is some evidence that when entrepreneurial orientation is high, the positive effect of continuance commitment on financial success, measured by the accumulated asset base of the client, is marginally weaker (b = - 0.113, p < 0.1).

Finally, our control measures of gender and age are insignificant. The length of time the client has been with the MFI is also insignificant for the client wealth outcome.

**Additional Analysis and Robustness Checks**

Kenya has an active mobile money economy, with over 62% of Kenyans transferring money using mobile devices in 2014. This easy access to nationwide cash transfers has significant economic repercussions, reducing geographic restrictions on channels of financial support (Littlefield, Helms, and Porteous 2015). To account for the potential impact of mobile cash transfers in assisting loan repayments or related financial transactions, the model was estimated with an indicator variable capturing whether the client reported receiving cash transfers from people outside their immediate household. Second, I re-estimated the model after taking into account whether the client had a working spouse, which could also impact the financial situation of the household. For example, in cases where there is more than one breadwinner it would be expected that they could purchase more goods with multiple household incomes. Finally, cycles of indebtedness can occur when a MFI client is unable to repay their loan. In these situations, a client

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can possibly take another loan from a competing institution in order to avoid delinquency on the first loan, resulting in over-indebtedness (Roodman 2012). I ran a third analysis taking into account whether the client self-reported a loan from another MFI. Our findings were unchanged across these three robustness checks.

**Discussion**

What drives the performance of microfinanced entrepreneurs in BoP markets? In this study, I empirically addressed this question by considering the economic performance impacts of clients' organizational commitments to their microfinance institution, the bonding and bridging roles they play in the client social network, and the moderating effects of their entrepreneurial orientation. Although previous studies have discussed the role of social capital in the microfinance arena, this is the first field-based research that I know of that quantitatively analyzes a client's social network and connects that analysis with performance measures related to both the client and the MFI in the BoP context.

Our theory was drawn from multiple literatures, including those on social capital and social network analysis, relationship-driven marketing, commitment formation, and entrepreneurship. Our usable data encompassed 368 entrepreneurs, and was collected using a two-part survey that yielded individual client-level data as well as an adjacency matrix representing each client's own social network within the microfinance organization's client base. This primary data from the field was augmented with secondary financial transaction data sourced from the MFI's archival records.

Our first finding related to the positive linkage between continuance commitment to the MFI and financial well-being, as measured by the household's asset base. A calculated and logical commitment to the organization, rather than an emotional attachment, was linked to superior financial performance on the part of the client. Existing research has highlighted the notion that low-income women are often "pessimistic about the long-term stability of their households" (Venkatesh 2006, pg. 53). Given the preponderance of women in the client network, our finding possibly highlights a highly instrumental perspective that women adopt with respect to their MFI-related business activities. In contrast, affective commitment to the MFI has no role to play in driving either aspect of performance. This insignificance may be driven by an inability and/or unwillingness to build an emotional bridge with the MFI, some of which may stem from a historical lack of access to financial resources when poor families were in need. This lack of emotional bridging may be exacerbated by stories of discrimination and exclusion told by those who have ventured outside poor neighborhoods and returned (Venkatesh 2006).

Client consumption is a particularly important and apt dependent variable instead of the developed market's commonly used measure of income, or cash on hand. When a client is low-income, with significant income insecurity, the fungibility of cash becomes an asset rather than a liability. Due to the liquidity of cash, it is vulnerable to being stolen or becomes a target for neighbors and relatives to request (Collins, Morduch and Rutherford 2009). In order to manage this potential issue, poor consumers often "cash in" their cash for a less-fungible resource, that is, they buy something with the cash that could potentially hold its value but is not as liquid. In addition, the lack of education within our client base means that recall and estimation of profits or income is untrustworthy at best. Due to the low income nature of our subject base, we feel it is

important to quantify client's quality of life, which we do through our measure of client consumption of a basket of goods that can be deployed into income-generating uses, as well as provide a level of respectability and social status through their ownership. This is tied to the current value of these goods through a survey of individuals in the area that identifies the current market rate for these items in the secondary market, where our clients would purchase these goods. For more information on the basket of goods, please see the survey in Appendix E.

Both bonding and bridging positively influence each of the financial performance measures. This highlights the central importance of building a strong social network to anchor microfinancing initiatives. Highly bonded clients are well known within their group, which can potentially place them in a position of natural leadership with their peers. Potentially, this higher profile can, in and of itself, discipline repayment behavior, in order to maintain social status or a connection with the other clients. Over time, disciplined repayment can also lead to a larger allocation of loans from the MFI, resulting in an increase in business activity and personal wealth (note that time with the MFI was controlled for in our analyses). On the other hand, clients who serve as bridges between otherwise disconnected groups can bring new business and market knowledge to their focal group. I particularly want to note that the impact of social network commitment is significant at 3.5-3.6 additional loan payments per client, depending on the type of social capital used. Given the firm's average of two weeks per planned payment cycle, a better-connected entrepreneur results in an increase in almost two month's worth of client payments more for the MFI, a significant amount both for cash flow and information transfer between the MFI and the client.

An interesting question that arises here, and one that deserves additional research, is: to what extent, and under what conditions, is such knowledge shared with the focal group? Unique entrepreneurial knowledge can help the client improve her own business performance (as shown in the findings), but group performance will benefit only when such knowledge is shared. On the positive side, such sharing will lead to increased bonding capital and a sense of reciprocity whereby the client insures herself from future disruptions because she can call on the group members for help. On the negative side, such knowledge sharing can empower other group members, eroding the information advantage of the bridging client, and potentially increasing competition for the limited funds from the MFI and/or the same community's own resources.

The fact that entrepreneurial orientation does not impact outcomes, except through its interaction with affective commitment, is interesting. As noted earlier, perhaps this is because resource constraints are the foremost concern for the clients, overshadowing the potential impact of entrepreneurial orientation. If survival is one's primary focus, ability to take risks or look into the future may not provide valuable assistance. Alternatively, it might be that an entrepreneurial orientation is important, but the behavioral outcomes associated with such an orientation are severely restricted within the BoP environment that I focus on. Some level of an entrepreneurial orientation may be required to catalyze the launch of a business. However, once the business has been established, the development of hard skills in finance, marketing, and other functional areas may be of more immediate importance to entrepreneurs in BoP settings in order to maximize their entrepreneurial orientation (Anderson-Macdonald 2014). Regardless, entrepreneurial human capital development at the BoP is becoming an increasingly important topic for international

development practitioners and NGOs, and further exploration of the nuances of this finding are necessary.

**Managerial and Research Implications**

Our analysis and findings offer specific insights for managers. First, taken together, the findings related to the influence of commitment and social capital suggest that towards driving performance, MFIs should avoid overly emphasizing the relationship between the client and itself – especially on the affective dimension, and instead consider strengthening their client networks.

Second, in the specific context of social capital, our findings suggest that managers must seek ways to increase both the bonding and bridging capital of their lending network clients. Of course, not every client will ultimately rate highly on each type of social capital. However, the insights suggest that managers would benefit from proactively designing and managing network structures towards encouraging bonding between clients, and from strategically building bridging connections across isolated groups. Interestingly, the research on social networks has largely analyzed networks as a "given" – structures with exogenous specifications whose implications and effects are then studied. However, in contexts like the one I examine, the manager has the ability to proactively influence network formation and evolution.

Third, MFIs often focus on dual objectives related to their financial performance and to the economic development of their client base. Our research adds to deepening the understand of impacts to both financial and social outcomes. In that context, foundations and other philanthropic organizations can also use our findings to better identify effective MFIs that are

investing in their client bases. They can use this understanding to evaluate the MFIs currently receiving the competitive funds that they award, and to help design their own MFIs.

From a research perspective, our findings offer insights into the operation of social network-based business operations in BoP settings. As evident in the structure of this study, intensive field-based research is critical towards developing deep insights in this area. Our findings reveal new perspectives into how variables related to different kinds of organizational commitments, multiple types of social capital, and entrepreneurial orientation independently and interactively drive financial outcomes in BoP microfinance operations.

Apart from the findings themselves, the analysis reveals some clear and interesting opportunities that deserve research attention. First, building on the proactive perspective towards network building discussed above, researchers can examine how social networks should be best designed to achieve specified objectives. At least in settings similar to the one that I study, it is clear that managers have considerable leeway in sizing the social networks, allocating clients across networks, and creating bridging connections across sub-parts of the network. A simple example of where such an opportunity exists to manage client social networks is when the MFI, which is growing at a rapid rate, expands to new geographical locations. Three caveats must be kept in mind here: the first is that the objectives related to the social network will play a key role in determining the optimal structure, and these objectives can vary widely across situations. Stated differently, the context of network design is important. The second caveat is that the answer to this challenge cannot simply be to increase the degree of bonding, bridging, and other forms of social capital across the board. Humans have limited cognitive capacities and temporal resources, and the egos and alters in the network will quickly be overwhelmed by such an approach. The third caveat is

that, in structuring and populating the network positions, individual characteristics and traits of the network players must ideally be taken into account. For example, the characteristics that define an individual who is effective at bridging may be different from those that define an individual who is effective at bonding. Again, this perspective departs from the existing views of (human) networks that largely default to evaluating them as organic, naturally evolving entities. In networks that have naturally evolved, it is not clear that the network positions of individuals necessarily enable them to contribute most effectively. While some shifts in their network positions and roles may occur over time, it is again not clear that the network will ever achieve the potential of one that is strategically designed and populated from the outset.

The second research opportunity relates to approaching the modeling of network outcomes differently. During our field research, it became clear that network members (the MFI clients) worked diligently to express their innate abilities given that they operated in a harsh economic environment that offered limited financial support. Their social networks were critical in enabling them to do thrive in conditions of scarcity and create social safety nets in places where they did not otherwise exist. I were not surprised, therefore, that characteristics such as entrepreneurial orientation, that have been demonstrated to be influential in more developed business and market contexts, ultimately did not surface as influential drivers of performance, potentially because low levels of hard business skills or infrastructural support. I propose that going forward in these contexts, researchers may want to consider adopting models that incorporate a "bottleneck" perspective wherein some of the variables that are present at low levels can play the role of constraining factors that do not allow other variables to exert their predicted influence. For example, in examining how motivation, opportunity, and ability drive knowledge sharing, a

constraining factor model where a subset of these variables is present at a low level and effectively bottlenecks the other variables has been shown to better explain the data than a conventional linear model or a multiplicative model that permits interactions (Siemsen, Roth, and Balasubramanian 2008).

Our research has specific limitations. First, I focus on the microfinance industry in one specific location, and therefore these results must be applied with ample caution to other contexts that have different relationship structures or different metrics for success. In addition, while client wealth is a key benchmarks for MFI success, additional measures may also be relevant and deserve study, depending on the context. Second, I employ a cross-sectional survey, which cannot formally identify causality. I control for numerous factors in the study, both by including formal controls and by clustering errors by loan officer. However, as with all such research, I cannot conclusively rule out the influence of unobserved factors.

Social networks, as channels for information sharing and resource access, have sustained and developed individuals, communities, and civilizations across time. This research enhances our understanding of the market channels that comprise social networks of microfinanced microentrepreneurs, an increasingly popular and important form of the supply-demand interface in developing economies. I hope that the perspectives and findings advanced in this paper catalyze additional research and managerial interest in the area.

**Figure 1: Model of hypothesized effects**
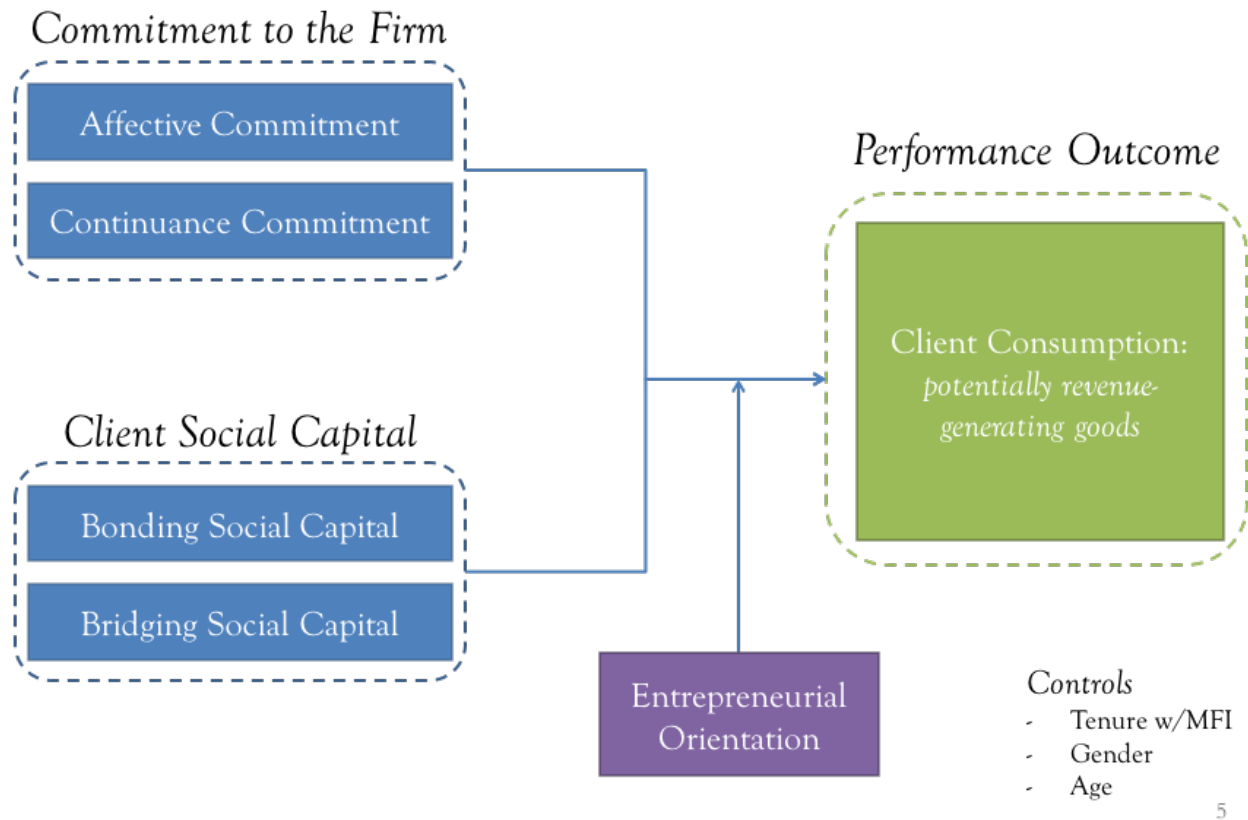
**Figure 2: Initial visualization of microfinance network from survey**
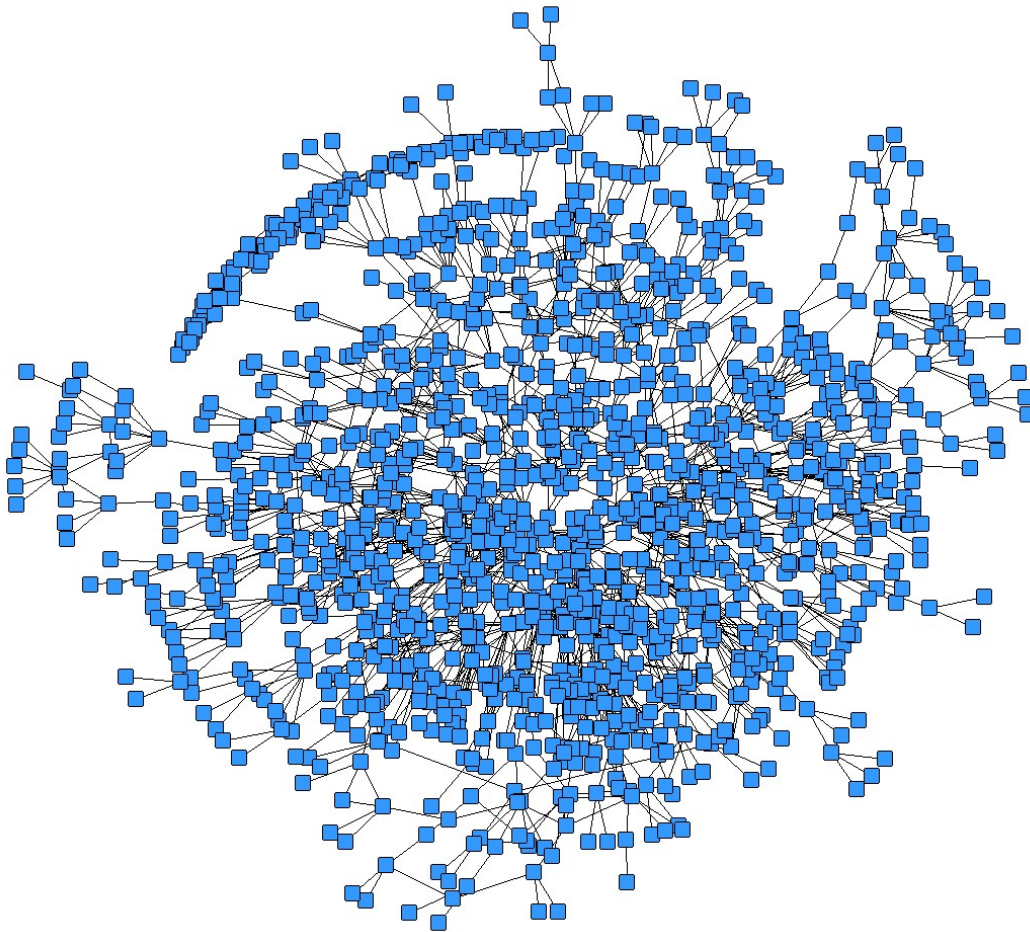
**Table 1: Survey summary statistics**

|                    | Mean  | SD   | Min   | Max   |
|--------------------|-------|------|-------|-------|
| Household size     | 4.53  | 2.28 | 1     | 15    |
| Age                | 36.73 | 9.92 | 20    | 79    |
| Female             | 0.91  | 0.28 | 0     | 1     |
| Homeowner          | 0.51  | 0.50 | 0     | 1     |
| Self-Employed      | 0.79  | 0.41 | 0     | 1     |
| Number of children | 3.08  | 2.13 | 0     | 12    |
| Network degree     | 4.22  | 2.11 | 1     | 12    |
| Network constraint | 0.42  | 0.22 | 0.109 | 1.125 |

**Table 2: Correlations and summary statistics of key variables**

|  |  | Mean | SD | Min | Max | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | *Affective commitment (AC)* | 1.6 | 0.5 | 1 | 4.8 | - | | | |
| 2 | *Continuance commitment (CC)* | 2.31 | 0.79 | 1 | 6 | 0.487 | - | | |
| 3 | *Bridging social capital* | 0 | 1 | -1.4 | 4.34 | 0.004 | 0.032 | - | |
| 4 | *Bonding social capital* | 0 | 1 | -1.53 | 3.71 | -0.041 | 0.017 | -0.709 | - |
| 5 | *Entrepreneurial Orientation* | 0 | 0.98 | -2.47 | 1.7 | -0.49 | -0.313 | 0.049 | -0.006 |

**Table 3: Psychological scale reliability**

|  | Scale reliability coefficient | Avg. inter-item covariance | # scale items |
|---|---|---|---|
| *Affective Organizational Commitment (AC)* | 0.813 | 0.203 | 5 |
| *Continuance Organizational Commitment (CC)* | 0.676 | 0.407 | 6 |
| *Personal Initiative (PI)* | 0.705 | 0.184 | 6 |

**Table 4: Effects of organizational and social network commitment on MFI success metric**

|  | *Client Wealth* |
|---|---|
| **H1 ~ Organizational Commitment** | |
| Affective commitment (AC) | 0.067 |
|  | (0.12) |
| Continuance commitment (CC) | 0.169** |
|  | (0.07) |
| **H2 ~ Client Social Capital** | |
| Bonding | |
| Degree Centrality | 0.195*** |
|  | (0.07) |
| Bridging | |
| Burt's Constraint | 0.140** |
|  | (0.07) |
| **H3 ~ Interaction with Entrepreneurial Orientation** | |
| Entrepreneurial Orientation (EO) | -0.065 |
|  | (0.29) |
| EO * AC | 0.226** |
|  | (0.11) |
| EO * CC | -0.113* |
|  | (0.07) |
| EO * Bonding | 0.199 |
|  | (0.32) |
| EO * Bridging | 0.010 |
|  | (0.03) |
| **Control Variables** | |
| Time with MFI | 0.000 |
|  | (0.00) |
| Gender | -0.231 |
|  | (0.17) |
| Age | -0.003 |
|  | (0.00) |
| Constant | 9.998*** |
|  | (0.29) |
| Observations | 368 |

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

**ESSAY 2: The Myth of Social Capital in Microentrepreneur Networks:
Financial Success Insights from a Randomized Field Experiment**

**Introduction**

Social capital, defined as the opportunities available through one's network of connections (Kwon, Adler 2014), offer low-income consumers a way to alleviate other capital constraints (such as financial, physical, and human) through the opportunity to access information and resources within their personal networks (Caudell, Rotolo and Grima 2015). International development scholars consider social capital as key in low-income environments to encourage successful entrepreneurial growth, obtain resources to smooth consumption within communities, and a structure to identify patterns of exclusion (Woolcock and Narayan 2000). In the entrepreneurship literature, social capital has been shown to help founders reduce time to product release (Mallapragada, Grewal, and Lilien 2012a), increase access to information (Lin 2001), and provide a route to additional resources (Fleming et al. 2007). Despite the existence of theoretical and case-study based work in emerging markets (Narayan and Cassidy 2001), there is little literature which quantitatively links social capital to financial outcomes in a Base of the Pyramid (BoP) social network.

One reason why network analysis studies of social capital in developing markets is sparse relates to the difficulty of obtaining network-level data within this context. Collecting detailed network data is costly, and the subject pool often is difficult to reach due to geographic or

educational barriers. Many studies that look at social capital at the Base of the Pyramid instead rely on "convenience" proxies such as identifying traditional village leaders (Miller and Mobarak 2015), geographically central households (Beamn et. al, 2014), or asking for self-described measures such as trust, sociability, and togetherness (Narayan and Cassidy 2001). However, data from developed country samples indicates that representative individuals within a network tend to misunderstand the overall network structure, an individual can be geographically central but socially disconnected, and self-reported psychological descriptions teach us about the individual, but not the network (Friedkin 1983, Krackhardt 2014). Thus, by mapping a social network using data from network members rather than from these proxies, scholars can better identify the network position of individuals within communities. As a reflection of this best practice, this study uses an extensive, multi-wave field survey to identify the composition of the client network within a microfinance institution, a major source of resources for microentrepreneurs. In addition, as the microfinance institution (MFI) both determines and develops client social networks as part of its management procedures (described further in the paper); the question of how personal networks and social capital relate to individual financial success has valuable managerial implications for an organization which relies on social ties as part of its core strategy. This study, to our knowledge, represents the first randomized control trial that connects a quantitative view of a microentrepreneur's social network directly to their financial history.

The question of whether social capital impacts financial success at the Base of the Pyramid is inherently endogenous: is a microentrepreneur more likely to be wealthy because she has a position of power within a network, or is her network position the result of greater initial wealth? Direct effects of social capital in cross-sectional regression tell us that social capital can explain

some of the variance, but do not allow us to make conclusions about causality. In order to test this, I embed our question about the financial impact of social capital within the mechanism of a financial education intervention conducted in partnership with a MFI in Mombasa, Kenya. Our mechanism of change is as follows: I hypothesize that this education intervention will have a positive impact on a subject's financial recordkeeping and loan repayment success. If social capital really does have an impact on financial success, the positive impact of the recordkeeping training must be moderated by the individual's pre-intervention level of social capital. By randomizing the provision of this financial training, I am able to accurately identify treatment effects through comparison with a control group, and avoid self-selection bias for the financial training.

Previous research in emerging economies has focused on entrepreneur access to financial capital, arguing that alleviation of entrepreneur capital constraints was the key barrier to success (for a review, see Karlan and Morduch 2009). Recently, scholars have begun calling for an increase in human capital as an equally important driver of firm growth and development, as deploying human capital well can increase the productivity of other inputs (Bruhn, Karlan and Schoar 2010). A smaller proportion of formally educated workforce leads to less managerial capital in emerging economies, and this deficit has broad implications for the effectiveness of input factors as well as long-term firm growth. Relatedly, a growing body of literature in marketing, economics, and psychology highlights the notion that consumers are often susceptible to decision making errors within the financial domain, regularly not recognizing that they lack key information necessary for optimal judgment (Lynch 2011). These basic financial decisions make up the core of microentrepreneur decision-making, and this effect may be exacerbated in the harsh conditions of Base of the Pyramid: where investment in human capital is low, and/or when consumers have an

increased cognitive load (Lusardi and Mitchell 2013). In the past decade, interest in integrating business and financial literacy trainings into low-income communities has soared within development economics as well as the non-profit space, as a channel to increase microentrepreneur financial performance as well as the overall social impact of such ventures (Berge, Bjorvatn and Tungodden 2015, Gaurav, Cole and Tobacman 2011, Drexler, Fischer and Schoar 2014).

From an empirical perspective, this paper represents a groundbreaking randomized controlled trial (RCT) quantitatively investigating microentrepreneur social capital (as measured through network analysis rather than proxies), and connecting it to microentrepreneur financial outcomes. By using a randomized experiment, we address issues of endogeneity related to social capital and financial success. Through several rounds of field surveys and ego-network surveys, then matching these data with verified third-party administrative banking data, our novel panel dataset allows us to test hypotheses that would otherwise be impossible to study quantitatively. The results provide theoretical, substantive, and empirical insights for marketing and management scholars, as well as for NGO managers and development officers.

**Literature review and hypotheses**

This research lies at the intersection of three topics which impact the field of marketing and entrepreneurship: social capital, small-scale entrepreneurship at the Base of the Pyramid, and entrepreneurial training. We study these within the context of a Kenyan microfinance organization, which operates as a bank giving small-scale loans to low-income entrepreneurs (or "microentrepreneurs" due to the small size of their businesses). This next session goes into each of these areas in detail.

**Social capital**

The general premise of social capital is that better-connected individuals are more likely to receive benefits through access to new ideas and resources within their network (Lin and Erickson 2010b; Moran 2005). Client reliance on social capital has been observed as particularly strong in the BoP context due to the scarcity of monetary resources and technical expertise, as well as potential exclusion from typical resources such as government support (Cattell 2001; Iyer, Kitson, and Toh 2005; Matthews 2005). Social capital is particularly important in microfinance as it forms the basis of the industry's innovative group lending contract, where individuals use social collateral instead of monetary collateral to secure and monitor their loans, leading to greater interdependence within an already socially-focused society (Armendáriz and Morduch 2005). Although there are many ways to potentially measure social capital, it is generally agreed that linking the concept of social capital with social network analysis allows researchers the tools of measurement, methodological rigor, and expansive conceptual theory to better understand, quantify, and analyze social reality (James Moody and Paxton 2009).

The premise behind this work suggests that better-connected individuals within a network – those that enjoy a higher level of social capital – are more likely to receive higher returns due to a powerful position and access to new ideas (Adler and Kwon 2002, Kwon and Adler 2014). In this study, we examine how two different types of a microentrepreneur's social capital impacts his or her learning and financial decision making. Social capital can be broken down into two types: (a) capital derived from *bonding* which encompasses close relationships and dense clusters of individuals who are connected with each other, and (b) capital derived from *bridging* which connects individuals to different subgroups of individuals. We measure social capital by mapping

the formal structure of the microentrepreneurs' network ties and calculating our bonding and bridging measures, which will be discussed further in the methods section. This approach has been proven to be a powerful predictor of social capital benefits; yet due to its methodological difficulty, it remains a relatively under-explored research area (Mouw 2006). A review of research the social network domain notes that "only 4.5% of abstracts for articles on social networks mention social capital, and just about 2% of those on social capital explicitly mention social networks" (Moody and Paxton 2009).

Previous research in networks recognizes the significance of a subject's connectivity within a network, with empirical and simulation studies providing further insight to the social capital literature. For instance, when looking at company crowdsourcing sites that allow users to see other individuals' ideas, highly clustered (bonded) networks are found to reduce innovative thinking (Stephen, Zubcsek, and Goldenberg 2015). Referral networks of physicians were shown to be significantly influenced by the behavior of respected opinion leaders in bridging positions, when choosing what drugs to prescribe (Nair, Manchanda, and Bhatia 2010). A series of computer simulations identified how the structure of social influence may decrease the relative importance of well-connected, powerful individuals in relation to a critical mass of individuals, providing a counterpoint to the the general hypothesis that "influencers" control the spread of new ideas or products (Watts and Dodds 2007). Finally, Goldenberg, et al. use data from a large online social network and find that members with a large degree of bonding (acting as a hub for many people) actually had a larger-than-average overall impact on adoption of digital goods (Goldenberg et al. 2009).

**Microenterprise**

The formal definition of a microenterprise is a small business that employs five or fewer employees and is often bankrolled using microfinance funds. The majority of developing country microenterprises are small, family-based companies that only employ one or two individuals, encompass a wide variety of non-agricultural businesses (such as retail, food preparation, and services), and operate within the informal economy. There are an estimated 70 to 100 million microenterprises worldwide, which provide goods, services, and employment to the most vulnerable populations around the world (International Finance Corporation, 2013). Although microenterprises are small in employment and output, in most of the least developed countries (LDCs) these microenterprises represent a majority of each nation's businesses, provide a significant amount of a market's goods and services, as well as employ a majority of the local population (Jones Christensen, Parsons, and Fairbourne 2010). Their prevalence and impact on the most vulnerable populations make them key drivers of economic growth, employment, and stability, and of wide concern to governments and international development organizations (Schumpeter 1934, Martin, McNally and Kay 2013).

While the term "entrepreneurship" may bring to mind high growth businesses such as those in Silicon Valley, it is important to note that many, if not most of these developing country microentrepreneurs practice necessity entrepreneurism. This term identifies a business where entrepreneurial pursuit is not focused on the psychological or monetary rewards of entrepreneurship, but instead attempted due to a lack of other wage-earning opportunities, social restriction from other jobs, or a mismatch in the educational background required to compete for employment in the formal sector. For many at the Base of the Pyramid, creating their own business

is the only way an individual can generate income, and so an individual is forced into self-employment. Microentrepreneurs are often only concerned with providing enough money for their household's daily needs, focusing on small-scale stability of the business rather than looking for potential growth. These subsistence outcomes are in clear contrast to the concept of a lifestyle business, which seeks comfortable growth outcomes with an aim of sustaining a certain level of consumption, or a growth business, which focuses on expansion, extreme returns to investment, and scalability of the core business idea.

However, even microentrepreneurs that may be interested in moving their businesses beyond the subsistence level may find additional barriers to growth. Many microentrepreneurs are low-literate, having attended little or no schooling, and receiving no formal business education. In addition, social barriers to obtaining further human capital development may exist around seeking additional education: social stigma from their own group, discriminatory policies or views based around their sex, social class, or other factors, and social exclusion from the groups who control access to human capital development opportunities. Next, we look at opportunities to develop entrepreneurs' human capital in order to increase the effectiveness and impact of entrepreneurial activities.

**Entrepreneurial training and financial literacy**

The process of identifying and exploiting potential lucrative market opportunities is fundamentally risky, and entrepreneurship has a high rate of failure (Shane and Venkataraman, 2000). With global recognition of the importance of entrepreneurship, a growing number of training programs seek to increase entrepreneurs' capabilities, ranging from business incubators to formal academic curricula to coaching programs. These entrepreneurial trainings reflect the belief

that by investing in the human capital of entrepreneurs, quantity and quality of businesses produced can be increased, resulting in a lower entrepreneurial failure rate, increased productivity of the resources utilized, and amplified growth and innovation for the overall economy. However, evaluating the impact of these programs is difficult, with studies that are often methodologically weak and/or show outcomes inconsistent to these claims (Weaver et al., 2006, Peterman and Kennedy, 2003). Nonetheless, a recent meta-analysis of entrepreneurship education and training (EET) indicates a significant and positive relationship between EET and human capital assets ($r_w$ = 0.217) as well as entrepreneurial performance ($r_w$ = 0.159) (Martin, McNally and Kay 2009).

For microentrepreneurs at the Base of the Pyramid, the small scale of microenterprises and low levels of entrepreneur formal education requires training that focuses on basic financial literacy skills. Financial literacy is a worldwide issue, with only one in three adults showing an understanding of basic financial concepts (Klapper, Lusardi, and Mitchell 2015). Among the poor, financial literacy is low in most, if not all, developing countries, acting as a further obstacle to beneficial financial decision making and full financial inclusion (Klapper, Lusardi, and van Oudheusden 2016). Recent research in the marketing, economics, and finance literatures examine how individuals make financial spending and investment decisions, and how human biases create potential for sub-optimal decision making. Financial decisions encompass a diverse set of consumer choices, from large-scale, one time purchases to small, repeated decisions that add up to a significant overall impact (Prelec and Loewenstein 1998, Spiller 2011, Himmelstein et al. 2009). Not only do these financial choices encompass general monetary spending such as consumer purchase and savings behavior, but the financial decision literature also examine how consumers choose financial products such as insurance, savings, and loans (Lynch et al 2010). Financial

literacy directly impacts consumer welfare due to the impact household financial decisions have on present and future consumption (Lynch 2011). This impact is particularly significant at the Base of the Pyramid, where the lack of backup funds and other social and financial safety nets result in stronger, potentially fatal negative outcomes when a financial decision is unfavorable (Banerjee and Duflo 2011). We do note that, although subsistence entrepreneurs may lack reading and financial literacy skills, microentrepreneurs continuously leverage a variety of market communications in their complex social system to mitigate potential downsides from low financial literacy, such as: speaking with other businesses and clients, using a variety of counting and memorization practices, and bargaining techniques (Viswanathan, Gajendiran, and Venkatesan 2008).

Seminal research in microfinance assumed that the main constraint to microentrepreneur success was lack of access to capital and financial markets (De Mel, McKenzie and Woodruff, 2008, Paulson & Townsend 2004). This is heavily influenced by the philosophy of Nobel Laureate Muhammad Yunus, the founder of microfinance pioneer Grameen Bank. He actively discouraged his organization from training clients, saying: "I firmly believe that all human beings have an innate skill. I call it the survival skill. The fact that the poor are alive is clear proof of their ability. ... So rather than waste our time teaching them new skills, we try to make maximum use of their existing skills. Giving the poor access to credit allows them to immediately put into practice the skills they already know—to weave, husk rice paddy, raise cows, pedal a rickshaw. And the cash they earn is then a tool, a key that unlocks a host of other abilities and allows them to explore their own potential. Often borrowers teach each other new techniques that allow them to better use their survival skills. They teach far better than we ever could" (p 170-171, Yunus 1999).

However, in an increasingly competitive market, microfinance institutions are looking beyond the traditional credit offerings to add entrepreneurial business training to their products, in order to improve client retention rates and increase the effectiveness of credit given (Karlan and Valdavia 2011). "Credit with education" is an integrated model that combines loans with a training component, exploiting the existing microfinance infrastructure to efficiently add on educational services[1]. By augmenting clients' business skills in addition to providing start-up capital, microentrepreneurs should be better equipped to effectively deploy capital, identify exploitable entrepreneurial opportunities, manage inventory and cash flows, weather unforeseen risk, and decrease costs (Freedom from Hunger 2016).

A small but growing body of literature focuses on the effectiveness of financial training on micro and small enterprises in developing countries. The increased accessibility of financial products for low-income consumers is one step towards increasing consumer welfare through consumption smoothing, but often reaches a consumer who is ill-equipped to understand these complex products. For particularly at-risk subgroups such as low-educated consumers or low-income women, the required knowledge investment may come at too high of a cost, given their existing constraints on time, energy, and resources (Lusardi and Mitchell 2013; Mani et al. 2013). At the Base of the Pyramid, simpler trainings which focus on basic concepts or "rules of thumb," rather than formal business and accounting terminology have been shown to help mitigate the

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[1] Note that this training is not necessarily financial, and it can include topics such as health, nutrition, and women's empowerment. One established program is *Freedom from Hunger*, which combines village banking credit and savings with informal adult education on a variety of topics (child and maternal health, nutrition, etc.). One of the benefits of a "credit with education" project is that these services can be integrated at a relatively low cost into existing local banking infrastructure, a partnership allowing for an increased value-add to a MFI's social impact goals. The *Freedom from Hunger* curriculum has been rolled out to 17 countries, impacting more than 1.6 million clients (Freedom from Hunger 2016). See Dunford and Denman (2001) for additional details.

high cognitive loads brought on by poverty and low human capital development (Drexler, Fischer, and Schoar 2013).

Focusing on current research at the Base of the Pyramid shows, just as in more developed economies, mixed outcomes to financial training, likely due to the difficulty of enacting lasting consumer change. As the differentiation in results are often subtle and there is a diversity of financial outcomes of interest, I will discuss each study individually, concentrating on randomized control trials due to their methodological rigor and ability to draw conclusions of causality. These papers are summarized in Table 1. In the first randomized evaluation of a financial savings program, surveys in India and Indonesia find strong positive correlations between financial literacy and savings behaviors. However, a related savings intervention enacted through an experiment in Indonesia found no effect in changing behavior within the overall population, although subjects with the lowest levels of financial literacy were slightly more likely to open savings accounts after the training (Cole, Sampson, and Zia, 2010). Another study in India found that financial literacy training is not enough to mitigate lack of developed numeracy skills, identifying a possible combined educational pathway to increase the human capital of their client base. This study also finds that a training does significantly impact awareness, familiarity, and attitudes towards financial products, suggesting that trainings are important but only in a context where clients are provided with the correct tools with which to exploit their knowledge (Carpena, et al., 2011). A female-focused record-keeping training in Peru found that the addition of weekly thirty or sixty minute classes over one to two years found little to no evidence of change in measures of business revenues, registration for formal business licenses, employment, or profits. However, the study found increased client retention for those who had received the training, as well as integration of

taught business concepts in daily practice (Karlan and Valdivia 2011). An experiment with microfinanced entrepreneurs in Bosnia and Herzegovina show that enrollment in a comprehensive business and financial education program is associated with significant changes in basic financial knowledge and improvement in business practice and investment in existing businesses, although strikingly, no significant treatment effects on enterprise start-up or survival (Bruhn and Zia, 2011). Looking at a complex financial product, rainfall insurance, a RCT conducted in India compared financial education with three marketing treatments: a money-back guarantee, a demonstration of the refund mechanism (millimeter measurement of rainfall), and providing additional information in the form of a weather forecast. This study found that financial education doubled the adoption of rainfall insurance (from 8% to 16%). This is in contrast to only one marketing promotion which significantly increased demand, the cash back guarantee, while the other two marketing interventions were insignificant (Gaurav, Cole, and Tobacman 2011). Finally, in an experimental comparison of formal business education to a more basic rule-of-thumb based training, the basic program (but not the formal training) led to improvements in financial practices and revenues for microentrepreneurs in the Dominican Republic (Drexler, Fischer, and Schoar 2013). Although the results in these studies are often mixed, heterogeneous treatment effects consistently appear, regularly showing an increased educational or business benefit to the most vulnerable microentrepreneurs: lower-educated or lower-literacy clients.

A review of the entrepreneurship training literature for microentrepreneurs show generally positive, if varied results linking entrepreneurial training and financial outcomes. In an environment where barriers to entrepreneurship and growth are particularly severe (lack of human capital, limited access to financial markets, low infrastructural and legal support), a recent set of

randomized studies identify a mixed bag of significant positive and insignificant outcomes associated with entrepreneurial training, indicating further room to explore the area. In the next section, we discuss in detail our measures used in this study.

**Measures**

This essay uses both individual- and network-level attributes of microentrepreneurs in a Base of the Pyramid setting. A microentrepreneur in this context owns a microenterprise: a small-scale business, usually operating in a country's informal sector, and employing five or fewer people. We look at two different categories of outcomes: the first is direct success of the intervention itself, outcomes specifically related to record keeping. Second, we have bank-reported financial outcomes that we link to the intervention, metrics measured separately by the microfinance institution. We finally look at whether social capital, as measured through financial analysis, has a direct or moderating impact to these overall outcomes. Correlations for all measures used can be found in Table 2.

**Record keeping**

We look at two outcome measures to identify if the financial training was a success. First, we use a self-reported measure of *financial record keeping*, that is, whether the client currently keeps records for their primary business. Next, we ask for *comprehension of the training materials*, by asking the client to describe what to do with the records, once they have them. This open-ended question response is transcribed by the enumerator, then manually coded into a binary variable by a separate researcher. The variable is noted as a one if the client can accurately describe how to make business decisions using their financial records, and a zero if they cannot. Both of these questions are important because they identify whether treated individuals increased their recordkeeping

overall due to the intervention, and more importantly, whether the training resulted in content comprehension.

**Financial success**

We focus on three measures of financial success, calculated through the microfinance repayment records of the microentrepreneur. By using a method of measurement for these outcomes external to the client survey, we address possible common method variance, or the potential inflation of correlations between measures collected using the same methodology (Podsakoff, et al. 2003). We calculate these measures over the twelve month period prior to each survey.

First, we look at whether the number of *client repayments* in the year following the intervention had any change when compared to the year prior to the intervention. Client repayments allow us to understand the repayment consistency of a client, and in conjunction with the next measure, also allow us to identify whether a client is able to effectively manage their relationship with the MFI to reduce their personal indebtedness.

Our next measure is *amount of total disbursement of loans*, and this is the amount in new loans the client obtains from the MFI in the year following the treatment, as compared to the loans taken out the year before. Clients who are better able to manage their finances should be able to increase the productivity of their loans and avoid cycles of needless over-indebtedness, thus needing fewer dollars (Schicks 2011). From the perspective of the MFI, this measure represents a partial fulfillment of the social mission of most MFIs- as many MFIs exist to help men and women at the BoP improve financial savvy. Certainly, MFIs encourage some amount of consistency in

client behaviors and MFIs need clients to take out loans, but no MFIs benefit when community members become over-indebted.

Finally, we look at whether the client had any *late payments*, which we measure as a binary variable that notes whether the client had any late payments in the relevant time period. Late is defined as a payment which is entered into the system 30 days after the payment is due, an industry standard measurement which is used to calculate the total "portfolio at risk, 30 days" or PAR30. From the perspective of the MFI, this measure (like Total Disbursement described above) also offers data on client quality and on operational excellence; it is expensive to engage in collections and a large number of late payments in a system can indicate poor selection or monitoring by the organizational staff.

Although we considered using loan default as an obvious critical measure of client financial health, our dataset had only four defaults in the two-year period of focus, forcing us to discard this as a potential outcome variable. This MFI, like many others, has a high repayment rate of approximately 95%, so a lack of defaults is not unsurprising.

**Social capital**

As discussed earlier, social capital comprises the resources, ideas, and social support accessed through an individual's social connections and social relations (Lin and Erickson 2010a; Mouw 2006). We measure a client's connections within the microfinance organization's client population by computing two commonly used social capital concepts: *bonding* and *brokerage*. We use social network analysis methodology on our dataset of all reported client-to-client connections,

calculating these measures at the level of each individual client (also referred to as the ego in network literature).

A client's *bonding*, or tight connections to their immediate social network, grow as his or her number of connections increase, and so we measure bonding through an ego's network degree, or the number of connections an individual has within the network (Houston et al. 2004; Swaminathan and Moorman 2009). A client with a high level of bonding has efficient access to other individuals within their network, signaling a high level of closeness with their group and a redundancy in relationships (e.g., my connections are also likely connected to you). These redundancies mean that an individual in the network has multiple unique paths to other members of the network, allowing for quick information saturation and opportunities for group monitoring (Frenzen and Nakamoto 1993; Granovetter 2007). In our research context, clients rely on their trusted relationships to provide assistance when managing their microbusinesses, lend cash to smooth consumption, contribute emotional support, explain systems and procedures, and obtain information that helps compensate for a lack of physical resources. Individuals with higher levels of bonding should have relationships which provide access to and permission to use important resources, and should therefore be able to leverage such access into increased entrepreneurial and financial success.

In contrast, clients that have brokerage relationships link sparsely connected sections of the social network, thus giving the client access to new ideas as well as powerful opportunities to manage information flow between different groups (Burt 2001, 2004). This brings us to our second measure of social capital, *brokerage*, which is calculated through network constraint, a summary measure representing the extent to which an individual's connections are connected to

one another. In contrast to the closeness generated through bonding that allows the fast saturation of information within a network, brokerage gives an ego access to unique, non-redundant sources of information as well as the potential for powerful information and resource brokerage opportunities between different social groups (Hansen 1999b). We calculate this using the network constraint $C_i$ of ego $i$, which is calculated by summing all measures $c_{ij}$ of $i$'s dependence on contact $j$ (Burt 2000):

$$C_i = \sum_j c_{ij}, i \neq j$$

The dependence measure $c_{ij}$ is computed by summing the proportion of direct connection $i$ spends on contact $j$ ($p_{ij}$) as compared to the proportion they spend on all other indirect ($p_{iq}p_{qj}$) contacts in the network, where $q$ is a contact in the network that is connected to $j$ but not to $i$. Here $p_{ij}$ represents the strength of ego $i$'s connection between contacts $i$ and $j$ as a ratio to $i$'s connections to the rest of the network.

$$c_{ij} = \left( p_{ij} + \sum_q p_{iq}p_{qj} \right)^2 \quad i \neq q \neq j$$

As Burt (2005, p.17) notes: "people whose networks bridge the structural holes between groups have an advantage in detecting and developing rewarding opportunities. Information arbitrage is their advantage. They are able to see early, see more broadly, and translate information across groups." With novel information, a client should be able to effectively seek out opportunities and constructively deploy knowledge and resources to achieve greater financial success. Further, sharing new knowledge with members of the social group can help increase that

client's standing within the social group, leading to a virtuous cycle of increased social capital for the individual.

In order to provide additional robustness to our testing of social capital, we also include two other non-network analysis measures of social connection. First, we look whether an individual has been elected to a position of leadership within their loan group. Membership in civic associations has long been theorized as a mechanism for generating social capital (Putnam 1995), and development economics has consistently used local leadership positions as a proxy for village-level social capital. These special roles within the microfinance institution (chairperson, secretary, treasurer, or center chief) are democratically elected by the other members of the loan meeting group, representing individuals who have a higher level of trust and respect within the group. Finally, we ask from whom the client learned to keep records, which we code as a one if the listed name is easily identifiable as a Yehu-affiliated individual, and a zero if otherwise. In order to make a conservative estimate of this measure, we only positively code names that can be directly tied to loan officers or our own training intervention (e.g. we did not track individual names which may be affiliated with Yehu members).

**Control variables**

We control for five variables. First, we include a subject's age, given that time may increase the experience an individual has accumulated as a business owner, and therefore may impact their ability to be financially successful. We also include a squared age term as we hypothesize the impact of age is unlikely to be linear, that is, we can expect some maximum benefit from experience that may then begin to decline due to cognitive load or age-related differences in formal schooling. Next, we control for the sex of the subject. Although our subject pool is primarily

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female due to the MFI's focus on female business owners (93.6% over both surveys), previous research has identified a positive impact of female clients on measures of loan repayment and home investment (Khandker 1998, Armendariz and Morduch 2007). In addition, our qualitative research with this subject group identified some differences within business types between female and male clients, although the sample size is small. We also include a marker which identifies whether an individual self-reports as the head of their household, as this was the one demographic variable that was found to be significantly different between those in our first round survey who were randomized for treatment, and those who were not (See Table 3 for the list of demographic variables). Finally, we use a measure of length of time with the MFI (days since first transaction) to control for an individual's tenure with the MFI. This length of time is a factor that impacts the amount of loan an individual is able to obtain: as a client generates a positive creditor relationship with the MFI, they increase their trust with the organization and are eligible to take out increasingly larger loans. Including this measure allows us to control for increases in loans that are tied to tenure with the MFI rather than actions taken by the microentrepreneur. Together, these variables allow us to control for significant, recognizable differences between MFI clients.

**Field experiment methodology**

There is little quantitative research that examines the connection between an individual's social network (as quantified by network analysis) and their financial success. This is likely due to both the difficulty of collecting said data as well as the endogenous nature of the success-network question, where isolating the effect of one's social network is impossible to detangle from financial success through cross-sectional observation or historical data analysis.

There are multiple potential research issues when looking at network impacts on financial success. Foremost is the issue of reverse causality: are people who are better at making connections (e.g., with higher social capital) then primed to be financially successful, or do people who are financially successful then increase their contacts, as others flock to their economic strength? In order to manage the endogeneity around this question, we embed our study within a randomly assigned financial recordkeeping training, and test whether social capital has a moderating impact on the effect of the intervention. Receipt of the training intervention should give a subject the tools to more efficiently use their microfinance capital, therefore increasing their baseline level of financial success. By looking at whether social capital moderates the impact of the training on client financial success, we isolate whether social capital is the pathway that allows our treated subjects to better utilize this new information, leading to higher entrepreneurial success.

The randomization of the training offering also allows us to manage additional issues of bias, particularly the potential issue of self-selection into a training program and the need for a valid counterfactual group to compare our treated group to. Self-selection occurs when clients who choose to obtain additional training differ on both observable and non-observable factors. Although the researcher can control for differences in observable values such as gender and level of education, there still may be the potential for omitted variable bias. This occurs when there exist non-observable factors which differentiate those who choose to take a program from those who do not seek this training out. For instance, microentrepreneurs who choose to go through the program may be fundamentally different than those who do not seek out such a program, in terms of work ethic, entrepreneurial ability, or even expected returns to the business. Since the researcher is unable to control for these differences, we must instead provide a valid

counterfactual, that is, an equivalent population who show us what could've happened to individual financial success without the business training, and then compare the outcomes from the trained group to this counterfactual. By randomizing provision of our financial training, we remove the potential for self-selection into the training group. Similarly, by choosing individuals at random within a relatively large population of subjects, we should then have a group of treated and untreated individuals that are similar, and in both observable and non-observable factors.

These critical identification issues are addressed through use of the randomized control trial (RCT) methodology, which is considered the superior standard for identifying causal effects in field study settings (Angrist and Pishke 2009; Glennerster and Takavarasha, 2013). By randomizing the provision of our financial record keeping training to a sample of microentrepreneurs, we can address these issues of omitted variable bias, self-selection, and reverse causality that can bias our outcomes.

To test our questions of financial success, we randomize our training at the level of the microfinance client. Our RCT was executed in multiple phases: (1) pre-treatment measurement of outcome, network, and control variables for the sample (2) qualitative interviews and development of an appropriate training opportunity (3) random assignment of microentrepreneurs into a treatment or control group (4) provision of the financial training intervention to those randomly assigned into treatment (5) post-treatment survey, again measuring outcome, network, and control variables (6) collection and integration of MFI administrative banking data, which were used as primary outcome measures. Through this RCT we constructed an extensive, novel dataset for analysis, combining survey, network, and financial transaction data. This section gives an in-depth

description of the methodology behind this work. See Figure 1 for a visualization of the study design.

**Research context & experimental setting**

The year before data collection began, we met with management and board members of a Kenyan-based microfinance institution (MFI) to discuss research goals. During this time, we also met with loan officers, reviewed administrative materials, and shadowed loan meetings in order to directly observe the research context. The MFI was particularly interested in offering a training to increase the managerial capabilities of their clients, to not just help them become better financial stewards (which would increase their value to the MFI), but also as a marketing opportunity to differentiate their loan product from other, local microfinance competitors. Due to the low-margin nature of the industry and the lack of external support (e.g. without a significant economic development grant to fund the training), the MFI emphasized that they wanted to test a training that would be low cost and feasible to be rolled out with minimal infrastructural changes to the organization. This initial fieldwork provided significant knowledge which helped contextualize our research, as well as shape the design of the experiment.

We conducted our experiment with clients of the microfinance institution operating in and around the city of Mombasa, Kenya. Mombasa is a diverse, international port city serving active Indian Ocean trade routes, with an equatorial climate and a population of approximately 1.2 million people. The central part of Mombasa is located on a densely developed island immediately off the coast of Kenya, and is surrounded by the large and sprawling peri-urban and rural greater Mombasa area which extends to all sides of the coastal mainland around the island. Although Kenya functions as a technological and financial hub for East Africa, showing consistent

GDP growth at about 5-6% annually, unemployment is still high at approximately 40% with about 40-50% of its citizens living in poverty (CIA 2016). The MFI's clients operate throughout this area, with the majority of the clients in the peri-urban area outside of the central city (see Figure 2 for a map).

This MFI operates within a hub-and-spoke model, where the MFI main office functions as the central hub. The administrative staff in the main office support seven local offices, which maintain their own separate geographic territories. A local office houses five to fifteen loan officers, who manage approximately 30-40 loan groups each. Twice a month, loan officers travel to hold loan repayment meetings for a specific loan group, allowing the officer to efficiently serve multiple clients, reduce geographic boundaries to financial access, answer any business questions they might have, and provide an opportunity for the clients to socialize within their loan group. A loan group is made of 10-25 loan clients, who may have one to five currently outstanding loans each, as well as a handful of training members who do not currently have a loan, but attend loan meetings in preparation for joining the group. The loan officers at this institution travel four days a week within their geographic zone, conducting up to nine loan meetings a day. See Figure 3 for a visual depiction of the MFI structure.

**Experimental design**

We worked closely with the MFI to develop a measurement strategy that fit their organizational structure and allowed us to efficiently focus our surveying. After completing significant research through interviews and discussion at the main administrative office, we focused our survey on three local offices. Within these we randomly selected seven loan officers to work with, and from their management portfolios we randomly chose a subset of 35 loan groups

to survey. Local Kenyan enumerators, trained by the project PI, were sent to these loan group meetings to survey clients during their meeting, utilizing a survey which inquired about a client's individual- and network-level information (see Appendix B for a full list of the network questions). In the second round of data collection, in-depth interviews were conducted with both microfinance clients and their loan officers to understand motivations underlying financial record keeping. This qualitative data helped us to develop the appropriate intervention and gain a deeper understanding of the study context (see Appendix C for sample responses). After the second round was completed and results reviewed, we identified a subset of the first round survey offices that formed a representative sample of the overall geographic distribution of our original survey. From these offices, a customized financial literacy training was randomized at the client level, which will be explained further in the randomization methodology section. The intervention was offered approximately six months after the initial survey, and a follow-up survey which paralleled the first survey was offered to the same population approximately six months after the intervention.

**Randomization and blocking methodology**

The structure of this experiment's randomization design allows us to identify whether the financial record keeping treatment has significant impact on microentrepreneurs: first, whether a cost-effective training such as this one might change an individual's own financial recordkeeping ability, and through that, impact his or her own banking success. Secondly, the experiment allows us to identify how social capital interacts with these impacts, in a quantitative, causal manner that is impossible to test otherwise.

Thirty-three loan groups within the sub-offices surveyed in the first part of the research were randomly identified to receive the financial education module. The loan groups chosen for

the treatment formed a subset that had represented a similar geographic distribution of sub-offices measured in the original baseline survey. Loan groups were not pre-informed that they were selected for training randomization in order to avoid biasing meeting attendance.

Within each loan group, clients were identified for training through individual-level randomization, where 50% of clients were selected for training. To avoid any external influence in randomization, a pre-randomized allocation list was created in advance using random number generators, and the trainer identified individuals using a pre-generated "pick" and "skip" directive based on the client's seating arrangement during the loan meeting. This allowed for assignment to the treatment to be uncorrelated with factors directly associated with that day's meeting.

Given the possibility that loan meeting groups may have self-selection on unobservable characteristics, randomization of individuals within loan groups resulted in "blocking" of the sample, or splitting of the sample into two groups with similar observable characteristics. For instance, say our MFI is made of only two loan groups, and the characteristic of interest is history with the MFI. In our example, one group has members who have been banking continuously together for ten years, while the other group is a year old. By blocking, or randomizing *within* the loan meeting group, we are able to create a more likely similar treatment and control groups. In this example, blocking would result in 50% of our sample with a tenure of ten years and the other half with a tenure of one year. Contrast this with randomizing at the level of the individual, but without distinguishing by loan group. Although the possibility is low, randomly picking 50% from the entire pool of clients could potentially give us a sample which is entirely from one loan group. This would give us two potential sample groups: one with an average tenure of either ten years or

one group with only a year with the MFI. While randomized correctly under our assumptions, these sample groups are overall unrepresentative of the subject pool.

In order to correct for these potential issues when randomizing by individual over the entire sample, we randomized at the level of the individual, but within pre-selected loan groups. By blocking the randomization at the loan group level, we therefore ensure that the control and treatment groups are more likely to be balanced, than if we were to randomize at a higher level. This technique is more efficient than post-randomization controls for block-level variables that may impact the final outcome due to the equal proportion of treated and untreated units within a block (Duflo, Glennester, and Kremer, 2006).

**Intervention**

The financial literacy intervention (the "treatment") was developed using a combination of (a) current research on best practices in financial literacy training (for an overview, see: McKenzie and Woodruff 2012; Xu and Zia 2012) (b) qualitative client and loan officer interviews described further in the "Data" section and (c) input from the MFI regarding trainings that would be both managerially relevant as well as practically feasible for loan officers to conduct without needing to get additional grants from NGOs, etc. Specifically, the MFI was interested in creating a cost-effective, efficient training that would be implementable within their client base without significant disruption to current operations.

Given these considerations, we developed an intensive one-session treatment focused on simple to remember and easy to apply "rule of thumb" financial management techniques rather than traditional accounting language, a practice shown to be more effective for implementation by

low-literacy and low-income clients (Drexler, Fischer, and Schoar 2013). As previous entrepreneurial training RCTs have shown mixed effects for training outcomes, and our client base was focused on low-education individuals, the simplicity of content was paramount in our work. The instruction was held in Kiswahili, the local dialect and national language, by a teacher who was trained directly by the principal investigator. By managing the training of the teacher, I was able to maintain quality of the teaching while reducing the overall cost of the program (e.g. not having to hire external trainers).

Specifically, the financial literacy training encompassed four main points: understanding profit and loss, separation of business and personal accounts, financial record keeping, and the use of financial records to make business decisions. Although this may seem very basic, training of this level was required as many of the clients had never had formal business training, and concepts such as profit and loss were required in order to set an equivalent baseline for all individuals obtaining the training. The training itself took 60-90 minutes depending on the size of the group and their base level of understanding. When possible, the randomized clients completed their transactions with the loan officer first, and then were taken off to the side to obtain the training while the remainder of the clients completed their business, in order to minimize disruption of the loan group and maximizing the time available for training.

Teaching methods included lecture, discussion, play-acting, and group work, utilizing both visual aids and worksheets in order to encourage interaction and engagement with the literacy materials. A variety of different examples were integrated within the training to address clients who might have different levels of personal skill. Finally, to reduce barriers to recordkeeping adoption and emphasize the importance of keeping said records, each participant obtained four copies of a

financial record-keeping ledger booklet during the training. These books were simple, but personalized for the MFI in order to increase the uniqueness of the gift. In order to empower participants, they were given the instructions to use the books in whatever way they felt was best, to record their own work and/or to give some of them away should they want to teach others what they had learned.

Once randomly chosen by the trainer, the clients had a choice to opt out of the training. A small minority, only 7.6% of clients given the option to attend the class chose not to continue forward, with the most common reason being that they had another commitment immediately after the loan meeting and therefore could not stay. The financial literacy training lasted roughly 1-1.5 hours and was integrated into one session of the client's bi-monthly loan group meeting. After the educational intervention, the trainer made three follow-up calls with each trained client to answer any questions they might have: after one week, one month, and then two months. This allowed for a low-cost yet individualized way to connect with the clients, emphasize the content of the training, and answer any additional questions.

**Participant summary statistics**

Our training focused only on clients of the microfinance institution, who were randomly selected within four local offices. Looking at pre-treatment descriptive statistics, our participants were primarily female (92.3%), which was expected, given the women-first strategic focus of the MFI. Subjects were generally older (mean = 37.94 years old), with 43.7% identifying as the head of their household, and approximately 2/3 of our sample educated at the primary school level or illiterate. The majority of clients (93%) had children, with an average of 3 children each. The average client also had significant experience with the MFI (mean = 2.3 years), which is excellent

given the level of competition in the market, and had three loans currently outstanding at an average of about 30,000 KES per loan ($345 USD). Our sample is split into 1/3 Muslim and 2/3 Christian, reflecting the diverse religious background of the Mombasa area. Finally, the majority of our subject pool (58%) worked in some sort of commercial business (reselling used clothes, operating a grocery stall), 19% in a service-focused industry (hairdressing, tailor), and 17% specializing in prepared foods (frying potatoes, running a restaurant, etc.)

Comparing differences across subsamples, we find no large differences in these observable characteristics between the pre-treatment group and who was randomized into the treatment and the non-treated clients. Our only significantly different variable was whether the individual was the head of their household, which we included in our control variables in order to account for the difference. Similarly, when looking at the overall subject pools for our pre-treatment and post-treatment groups, we see no significant difference between the descriptive statistics for these clients. This similarity between samples is consistent with successful randomization, as there are no systematic differences in baseline characteristics across the randomly assigned financial treatment condition. Since the randomization appears to be successful, we assume that there are also no unobservable, systematic differences between our treated or untreated groups, such as preferences or latent financial ability. For additional descriptive statistics on the study participants, please go to Table 4 for a comparison between treated and untreated groups, as well as Table 5 for a comparison between pre-treatment and post-treatment groups.

**Data and estimation methods**

 **Individual and network surveys: Clients**

The first survey was two-part, enumerator administered questionnaire, measuring relevant quantitative psychological, demographic, and network variables. We carefully considered perspectives and measures used in previous research on microenterprises and entrepreneurs, using established scales when possible. Some of the employed scales were already developed in the context of subsistence marketplaces (e.g.: Krauss and Frese 2001, Frese, et al. 1997). We adapted other scales to render them appropriate for our research context (Meyer, Allen and Smith 1993). The scales were subject to additional review and modification as needed to establish their contextual relevance.

The resulting questionnaire was translated into Kiswahili – the local language – and independently back-translated into English, through two separate Kenyan translators familiar with regional linguistic nuances. The survey was finally reviewed by a panel of six coastal Kenyan locals as well as the microfinance institution to confirm clarity of questions, validity of terminology, and cultural suitability.

We collected baseline survey data beginning in 2013 through a field survey conducted in rural and peri-urban coastal Kenya. Data collection was completed with a team of local enumerators using a mobile phone-based survey instrument called *Magpi*, used by other international development organizations such as the Red Cross, World Bank, and UNICEF. By implementing surveying using this novel electronic tool, our methodology enjoyed several advantages over traditional, paper-based surveys. This initiative reduced surveying costs such as data entry and paper printing, as well as reduced errors related to recording and transcription. In

addition, *Magpi* allowed real-time monitoring and management of enumerator progress (including the identification of location and speed of enumeration), which not only diminished the potential of enumerator falsification but also permitted immediate feedback from the principal investigator, who monitored the survey uploads in real time. Enumerators worked primarily in teams of two or three when visiting their loan meetings to conduct surveys.

The enumerators were fluent in both Kiswahili and English, and most of them were also fluent in local dialects such as Kigiriama. In addition, due to the high reported illiteracy levels of the subjects, the survey used measurement techniques altered for this context to best capture data and reduce bias in data recording (Gau, Jae and Viswanathan 2012). Enumerators were directly trained by the paper's principal investigator, in an intensive weeklong training that included both classroom and field work.

The final round of surveying was completed in June 2014, approximately twelve months after the first survey and six months after the treatment, with a procedure that mirrored the original baseline field survey. Subjects who had been given the survey in May 2013 were identified and re-administered the survey questionnaire. A randomized subset of subjects who had not received the baseline survey was also surveyed in this round, to identify if significant differences existed between the first round subjects and the rest of the group. No significant differences were identified across general demographic variables (see Table 5 for comparisons). Not every subject in the first survey was able to be re-surveyed, due to factors such as absenteeism, travel from the area, or pregnancy, although every available effort was made to re-survey the original cohort. These efforts included, but were not limited to attending their loan meetings, individually cross-checking the original cohort list with the loan officers to confirm enrolment, phone call reminders directly

to the subjects from their loan officers, having members of their cohort contact absentee individuals, and walking to their listed place of business. Three attempts were made to survey each microentrepreneur. At that stage, the enumeration became too costly and was terminated.

**Network data**

Along with the individual-level survey data, we also collected ego networks from each of the surveyed individuals through a series of interaction prompts (see Appendix B for specific questions) that generated a list of individuals the client primarily interacted with. Names generated through this exercise were matched with a database of MFI clients, then their unique identifiers within the MFI were used to create a parallel network adjacency matrix of unweighted, undirected ties. This matrix represents the connections of a MFI client with other members of the institution's client network, and was used to compute network analysis measures with the UCINET 6 and R 3.1.1 software packages.

**Qualitative interviews: Clients and loan officers**

Six months after the first survey and six months before the follow-up survey, we conducted in-depth informational interviews in the field with a randomly chosen subset of microentrepreneurs and loan officers. The interviews, which were all conducted on the ground in Kenya, explored typical business practices, key goals, and challenges faced by the microentrepreneurs. Interviews were conducted in Kiswahili and lasted approximately 30 minutes (see Appendix C for a sample of responses). With the loan clients, conversations were broadly focused on their business management techniques. Interview scripts were purposefully developed to (a) generate a deep understanding of the microentrepreneurs' motivations underlying financial record keeping, and (b) gauge their understanding of, and openness to, learning additional

financial recordkeeping skills. When possible, enumerators visited clients at their place of business, noting their context of work as well as their specific record keeping techniques and habits.

Interviews with loan officers probed the business management issues they observed while interacting with their clients. The interviews also explored (a) the additional skills the loan officers believed their microentrepreneur clients needed to have in order to increase the likelihood of becoming financially successful, and (b) the personal skills the loan officers thought they themselves needed to further develop in order to better serve and manage their clients.

A total of 43 clients and 10 loan officers were interviewed over a two-week period, at which point the interview content began to exhibit theoretical saturation and qualitative data collection was determined to be complete (Mack, et al. 2005). Findings from the qualitative data collection will be discussed later, in the results section.

**Administrative banking data**

The third-party administrative banking data was obtained directly from the computer-based records of the microfinance institution, resulting in 4.9 million transactions for the entire MFI for the five-year period ending in May 2014. By using field data in conjunction with administrative transaction data provided by the microfinance institution from their banking records, we reduce common method variance and can check for individual level bias (such as recall bias). Transaction data was consolidated into three key variables, measured for each client, by year: number of payments, sum of disbursements, and number of late payments. These measures represent repayment trends and client strength, important measures of financial success. Survey names were matched to the MFI's banking data through name-based fuzzy matching, and any clients who were

not identified as a current banker with the MFI (e.g. active in the past two years) were dropped from the dataset. Nineteen clients were identified as owning more than one million KES worth of physical goods (such as cars and motorbikes), and these outliers were dropped from the dataset as their financial outcomes would be less impacted by participation with the MFI and instead likely insulated due to their pre-existing personal wealth.

The dataset used for calculations was then consolidated from these four sources: the pre-treatment survey, the pre-treatment network survey, the post-treatment survey, and banking data provided by the MFI. The final dataset contains 428 and 367 clients in the pre-treatment and post-treatment surveys respectively, with 96 treated individuals overall.

**Results**

**Initial graphical evidence**

First, we graphically describe the raw difference in recordkeeping and financial success outcomes both before and after the financial education treatment in Figure 4. We see financial record keeping almost doubling during our reporting period, with 61.4% of the survey subjects reporting that they keep records, an increase from 33.4% in the pre-treatment timeperiod.

When asked about the purpose of making business decisions from financial records, we find that subjects' ability to explain how records can be used for business decisions also changed significantly within the research time period, with subjects who could explain how records could be used for business decisions rising from 37.1% to 64.2% in the time between pre- and post-treatment (Figure 5). Finally, looking specifically at the subset of subjects who self-identified as

keeping records in the pre-treatment survey, we also see an increase in those who use records to make business decisions.

These model-free observations are consistent with our hypotheses, and show initial support for the efficacy of the educational intervention. However, they do not specifically provide an understanding of causality, nor do they control for factors that may be unobserved but constant over time. In order to address these issues, we use a difference in differences (DiD) approach to control for the potential of time-related trends and unobserved differences in the treated and untreated groups.

**Qualitative interview results**

The interviews identified that most clients did not keep records mainly due to literacy restrictions, but clients still felt they were able to carry out their daily business and earn a living. Sixty-three percent of interviewed clients were not able to identify their profit and loss when asked; however they consistently expressed the idea that as long as they were able to obtain the cash to provide for their family's basic needs, further knowledge was unnecessary. Most clients' businesses are either fully or partially home-based, in order to eliminate additional expenses such as business rent. The majority (70%) of clients had only one or two businesses, although the microentrepreneurs who had more than one business usually had a clear primary income business and viewed the other business(es) as merely backup (See Figure 6 for number of businesses for each client). Initial funds to start up these businesses were primarily obtained through their MFI loans, and clients consistently expressed their dependence on the MFI for giving them the opportunity to take on work.

Clients also heavily rely on each other's ideas and resources to expand their businesses. A reliable theme emerged around the inception of new businesses, which were almost always identified through observation from their neighbors or other businesses they came in contact with. By observing success through another individual's work, clients are able to reduce the overall risk of starting a business, although at the expense of non-differentiation. In addition to support for ideas, clients often asked to use their connections' property in order to help grow their business. For instance, one client said, "if I do not have a verandah to sell my wares, I will ask my friend to use hers. She will not charge me for usage as she understands everyone needs to work and earn a living." The client base showed significant interdependence within their business communities, allowing them to gain resources and ideas as they built their microenterprises.

The majority of clients interviewed (40 clients) were female, with only three male interviewees. This is consistent with the overall demographics within the MFI's client base, which strategically focuses on women. Although the sample size is small, an interesting observation is that the women's businesses were usually smaller-scale and lower-skill (prepared food vendors, resale shops) than the men's. The three male clients operated businesses which were not only higher margin (retail shop, palm wine brewer, and a landlord with a secondary shop), but were also very growth-oriented (see Table 7 for a list of the types of businesses represented in the qualitative survey). In the short term, the women's low-skill businesses are easier to manage with a faster return on investment; however, the overall profitability and potential for sustained growth is low. This may be due to the lack of formal education and cultural constraints imposed on the women.

In the interviews, clients identified a broad range of ideas to help increase the productivity of their ongoing businesses, ideas that appeared to have practical application while taking relatively

modest assistance to implement. In addition, the clients had strong interest in obtaining different perspectives on achieving success at their different businesses, likely due to the high competition within the microenterprises due to business-type saturation within the microenterprise space. The client's lack of skill combined with a desire for knowledge creates a strong opportunity to offer additional training, knowledge sharing, and business counsel to increase the productivity of these small-scale businesses.

The loan officer interviews revealed significant heterogeneity in both their desire and ability to provide additional assistance to their clients. Many loan officers were willing and interested to provide additional business support to their clients, and understood that they were a trusted, primary source of the clients' financial information. For instance, when asked about teaching financial skills, one loan officer answered, "Yes, I do – in fact, I am currently training my clients on one skill right now." Another loan officer noted that in order to answer questions about business issues, she would meet with clients on Friday, which is typically scheduled as an in-office day when she is not required to go into the field and work.

However, many officers noted that they were often constrained by a lack of time to address these issues beyond the basic loan meetings, noting the tight scheduling of weekly meetings and travel time required to go from meeting to meeting. Because of this, any informal training given by the loan officer often came at a personal cost of significant time and energy, if at all possible. Finally, in our interview, we tested the officers verbally on basic financial literacy skills, and found knowledge to vary significantly from officer to officer. Without a basic level of business understanding, loan officers cannot effectively help and advise clients with questions about growing their businesses, diversifying ventures, and managing their financial issues.

This qualitative study helped us further understand the microentrepreneur clients and, more specifically, provided deep insights into the development of the financial training intervention as well as a need to control for the loan officer a client is exposed to, due to the potential for differences in management style and educational opportunities provided. In addition, the qualitative interviews gave us managerially relevant information to bring back to the MFI for their own administration of their client base.

**Regression analysis**

We have data from a randomly selected, treated group of subjects and an untreated control group, from both before and after the educational treatment. This allows us to isolate the incremental effect of the financial recordkeeping treatment, controlling for any unobservable time trends. We use a difference-in-difference method with errors clustered at the level of the loan officer to evaluate the treatment effect[2]. Our data is divided into two time periods, a pre-test period and a post-treatment period, which allow us to view differences over time and identify causality.

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[2] As described in the qualitative interview results section, our research identified that loan officers had both a large stated impact on their clients, who looked to them as a trusted source for support and guidance, although the loan officers themselves were not a homogenous group. For instance, there was a significant difference in business skills knowledge within the loan officers, which, at best, would impact the level of support they could provide to their clients, and at worst, might result in the dissemination of incorrect financial information that might negatively impact their clients' businesses. In addition, congruent with previous research in microfinance, we identified that the independent nature of loan officers (working and traveling alone through a large geographic area) resulted in officer-specific flexibility in managing the loan groups, which may impact the financial outcomes we study. Finally, loan officers were assigned specific geographic areas to manage, and we did not control for location differences in our direct model. Due to the potential heterogeneity caused by the loan officers, and assuming that errors were uncorrelated across loan officers, we cluster the errors at the level of the loan officer. Failure to control for within cluster correlation can lead to overly small standard errors, and reduce the precision of the point estimate (Cameron and Miller, 2013).

This section reports our analysis outcomes. First, we ask whether the treatment had an impact on a client's recordkeeping. We expect an impact although it might be modest, due to the brief nature of the intervention. However, if a small, low-cost intervention like the one completed in our experiment can be effective, this will have significant impacts for MFIs who operate with very low margins and limited resources. Second, we ask whether the treatment had an impact on firm-level measures of financial success, as identified through the bank's transaction data. Finally, we look at whether social capital had a heterogeneous impact on our client's financial success measures, and discuss the implications for MFIs and other group-based organizations at the Base of the Pyramid. As noted earlier, errors are clustered at the level of the loan officer to control for any management differences that loan officers may have with their loan groups. In addition, loan officers are responsible for specific geographic areas, so this error clustering also accounts for any potential geographic differences that may impact the treatment effect.

We assume that in period $t$ ($t$ = 1 or 2) for subject $i$, our dependent variables of interest are represented by $Y_{it}$. Due to the clustering of the standard errors at the loan officer level, $l$, we use OLS and probit instead of seemingly unrelated regressions (SUR). We estimate equations for recordkeeping and financial outcomes given the provision of the financial training. The basic model to quantify the difference-in-difference response by treatment for each dependent variable is represented as:

$$Y_{it} = Time_t + Treatment_i + (Time_t \times Treatment_i) + controls_i + e_{tl}$$

Here, Y is the dependent variable of interest (such as "recordkeeping comprehension), and the subscripts refer to individual client $i$, timeperiod $t$, and loan officer $l$. We capture the time

effect with $Time_t$, an indicator variable denoting whether $t$ is the post-treatment time period. $Treatment_i$ is an indicator variable denoting whether the subject was given the financial training treatment. Our key variable of interest is the interactive term ($Time_t \times Treatment_i$), which captures the effect of the education treatment on the outcome measure, while controlling for time trends.

**The effect of a financial education treatment on recordkeeping**

Table 8 shows the results of our probit regressions on our recordkeeping outcomes, both with and without the controls. Overall, results are stable both with and without controls, so in this paper we report results with controls. Looking at the probit results, we see our recordkeeping intervention increases a microfinance client's ability to describe how to make business decisions from financial records by 56.8%. In contrast, in itself, the recordkeeping intervention does not significantly increase the individuals who actually keep records. Although the lack of sustained recordkeeping is disappointing, it is not entirely unsurprising as previous research has shown that financial knowledge trainings find varied outcomes in terms of consumer behavior change, in both developed and developing economy contexts (Miller et. al, 2015). The significant increase in comprehension of the content of the training, e.g. how to make business decisions from financial records, is highly encouraging and shows that this less educated cohort of subjects is very receptive to the information presented, even within such a brief training.

**Treatment impact on financial success measures**

Similarly, initial results from the intervention show that the financial training is significant in contracting the size of loans disbursed from the MFI, reducing the average disbursement sum by 9,172 KES ($138 USD), or 31% of the average loan disbursal (29,733 KES) during the study term (For results, see Table 8). We see a significant decrease in number of payments between those who

received the training and those who did not, by about four payments over the year. Finally, the odds of having one or more late payments goes up 31% for those who received the treatment.

**Does social capital have a moderating effect?**

To explore the impact of social capital on how individuals in networks manage finances, as evidenced by individual measures of financial success, we include our measures of bonding and bridging social capital as direct effects within our main model (Table 9), with lower-order social capital interactions excluded for brevity:

$$Y_{it} = Time_t + Treatment_i + (Time_t \times Treatment_i) + SocialCapital_{it}$$
$$+ (Time_t \times Treatment_i \times SocialCa\,ital_{it}) + controls_i + e_{tl}$$

First, we see that the intervention impact remains significant and consistent, over our three measures of financial success: count of payments reduces by 4.659 payments in the year, loan disbursement reduces by 9,942 KES ($149 USD), and the probability of late payment goes up by 29%. In particular, our payment count measure increases slightly in both size and significance, and disbursement sum increases in estimate size. Interestingly, our direct social capital effects operate counter in sign to the intervention, with a significant increase of about half a payment per year for those with high bonding social capital, and a 95% decrease in the possibility of having a late payment by the measure of one's bridging social capital.

To examine whether response to the financial training depends on the social capital of the client, we expand the equation to include the three-way interaction between *time x treatment x social capital*. The model now becomes the following (with lower-order social capital interactive terms excluded for brevity):

$$Y_{it} = Time_t + Treatment_i + (Time_t \times Treatment_i)$$

$$+ (Time_t \times Treatment_i \times BridgingSocialCapital_{it})$$

$$+ (Time_t \times Treatment_i \times BondingSocialCapital_{it})$$

$$+ BridgingSocialCapital_{it} + BondingSocialCapital_{it} + controls_i + e_{tl}$$

Once the three-way interaction is included, we no longer have significance in either the direct impact of social capital or the moderating (interacted) impact of social capital on the treatment.

Although using network analysis is the most thorough measure of social capital as measured by the client's network position, we look at two other potential measures of social capital to corroborate our findings. First, we test whether a binary variable representing whether the client has been elected to a position of leadership within the group, is significant when interacted with our treatment. Group leadership represents both civic engagement, which has been argued to be a part of social capital, as well as a level of respect and support from the other members of the client's microfinance social network. The results of these regressions are shown in Table 11, where again we see some significant direct effects with the inclusion of group role, increasing payment count by 3.5 payments a year and disbursement sum by 9,831 KES, but without any significant moderating effects with training x time.

Finally, we look at another measure of social learning from their network, whether they learned their financial record keeping from a Yehu-affiliated loan officer (Table 12). If they are noting learning from social sources within the group, this gives some support towards potential social contagion. The direct effect is significant for increasing count of annual payments by 4.8 payments a year, but again, there are no moderating effects with the financial education training.

**Robustness checks**

In order to check the robustness of our results, we look at several other factors that could potentially impact the outcome of our financial training and also an individual's financial outcomes with the bank. These include a client's human capital (as measured by formal education), their starting level of physical capital, and whether they have potential outside sources of cash flow. For these three checks, we find that our intervention results are significant and stable.

Human capital is traditionally studied as a key input factor in the economic production function, either through the amount of labor available in market or an individual's education level. When included in our equation as education, the effect of the treatment remains consistently significant, both reducing the amount of loan disbursed as well as reducing the number of payments paid to the MFI. In addition, we see a consistent direct impact of education for all three outcomes, specifically, for the college educated clients in the MFI's client pool. However, the impact of the financial recordkeeping treatment is not moderated by the client's level of education (which we treat as a continuous variable for ease of interpretation), with the interaction term (*time x treatment x educationlevel*) insignificant.

Continuing with the theme of financial management as evidenced in consumer spending, we look at the impact of previously owned goods (physical capital) on an individual's financial success outcomes. Physical goods are often used as de facto "savings accounts" – that is, purchasing some larger scale items converts cash into less fungible but still potentially money-generating goods. When the dollar value of a basket of goods is added to the equation, the effect of the financial treatment is significant across all three markers of financial health. While the interactive

effect of the value of goods with the treatment (*time x treatment x valueofgoods*) is statistically significant for late payments, the point estimate is not practically significant.

Kenya has an active mobile money economy, with over 62% of Kenyans transferring money using mobile devices in 2014. This easy access to nationwide cash transfers has significant economic repercussions, reducing geographic restrictions on channels of financial support (Littlefield, Helms, and Porteous 2015). To account for the potential impact of mobile cash transfers in assisting loan repayments or related financial transactions, Equation 2 of the model was estimated with an indicator variable capturing whether the client reported receiving cash transfers from people outside their immediate household. When including this indicator variable, findings remained stable.

Next, we re-estimated the model after taking into account whether the client had a working spouse, which could also impact the financial situation of the household. For example, in cases where there is more than one breadwinner perhaps the consistency of repayments is tied to the spouse's income and success rather than the MFI client's own business outcomes. Findings remained stable with the inclusion of whether a client had a working spouse.

Finally, cycles of indebtedness can occur when a MFI client is unable to repay their loan. In these situations, a client can possibly take another loan from a competing institution in order to avoid delinquency on the first loan, resulting in over-indebtedness (Roodman 2012). We ran a third analysis taking into account whether the client self-reported a loan from another MFI into the main model, and our findings remained stable overall.

Thus, for all five robustness checks over all three financial outcome variables, our findings remained stable and we are confident in the robustness of our findings.

**Discussion**

This study investigates how a financial education treatment impacts a low-income client's ability to keep and comprehend concepts related to financial record keeping, change their own financial behavior, and how their social connections within their loan groups interact to impact those outcomes. To accomplish these research goals, we developed a unique dataset which combined multiple rounds of rich survey data, subject's ego-networks, and microfinance transaction data. By looking at clients within a randomized control trial, we conduct a difference in difference analysis of actual financial outcomes in response to this financial training intervention. The findings have important implications for managers, NGOs, and marketers interested in the Base of the Pyramid.

While it is a surprise that this study shows that there is no moderating impact of base levels of social capital, it provides a robust counterpoint to the generally accepted narrative that social capital is a key causal component of an individual's financial success outcomes. This is a very interesting outcome as it shows the first quantitative evidence that social capital may not be as big of a factor in gaining wealth as previously identified. Although social capital is a useful theory for understanding the importance of social networks when using qualitative methods to study low income populations, this study allows us to expand on our understanding of the importance of these social flows. While we are not arguing against the importance of social capital – many of our results show a strong and significant direct impact of social capital on our financial success measures, identifying that social capital does have a relationship to outcomes. However, it is the

question of endogeneity that my study looks closely at, which is answered through the three-way interaction rather than the direct effect of social capital. In this interaction we find no significant effect.

Without a significant impact, managers in microfinanced organizations now have more information with which to strategize. Our results actually support with some current explorations regarding the mechanics of microfinance, where the core assumptions of group lending are being called into question and some MFIs doing away with the concept altogether, instead giving out individual level loans. By removing social collateral from the equation, these MFIs are assuming that social capital is not nearly as important as the access to capital for these individuals, and that by reducing the social barriers while providing a pathway to capital access, the MFI will still be able to have a financially sustainable business. Some ways managers may be able to use our results are by reducing the constraints on social capital, and instead focusing on the holistic development of their microfinance clients on a variety of other measures of poverty (Sen 2000).

This interesting finding of non-significance opens the door for further research looking at social capital at the base of the pyramid – expanding our understanding of what social capital really means and whether its exalted place in the economic development literature is appropriate. First, it will involve further rigorous quantitative research to add additional support around this finding. Next, if social capital is not part of the causal equation of financial success, then how do we go forward in terms of understanding and designing programs which are based in societies with high social capital requirements? Are there additional measures which better track social capital at the BoP that researchers currently do not account for? Finally, what other causal mechanisms might

better help managers, clients, and other organizations who operate at the base of the pyramid? All of these questions are ones I hope to pursue within this field.

**Economic significance of results**

Due to the microfinance institution's strategic focus on a "double bottom line" of both social and financial sustainability, some of our results may show outcomes that are counterintuitive to the typical manager, but are interpreted as positive by the MFI. For instance, although record keeping does not, in itself, directly impact the financial outcomes of the MFI, it is a critical measure of local social impact which is part of our MFI's overall strategic plan. This MFI has made it a priority to increase the human capital of its clients as a means to differentiate themselves in a saturated microfinance market as well as increase the social impact of their venture. Quantitatively, we can say that the impact of our financial education module appears to have a 26.2% increase in client's reported record keeping, although that figure is statistically insignificant. Within those who were trained by the module, we see a 63.3% (p = 0.00) increase in concrete understanding regarding recordkeeping – that is, the clients were able to articulate and describe how to make business decisions from their financial records. Given that the financial training was both brief (60-90 minutes) and very low-cost, this is an incredible impact from such a short intervention. Should the MFI expand the scope and depth of the training, we would expect even larger managerial capital returns from their investment.

Count of client repayments per year give us a measure of the consistency of a client. The structure of the MFI is such that each loan officer meets with a group of clients bi-monthly, often traveling to remote areas to meet the clients in areas by their home or business. This allows for a highly efficient method to serve clients in diverse areas, collecting funds and answering client

questions, but can result in issues if a client skips a meeting or doesn't pay on time, forcing a loan officer to have to find a way to meet separately with the client in order to complete MFI business. This increases the overhead for the business' operation significantly. If a client is meeting with a loan officer bi-monthly, we would expect about 25 meetings per calendar year, allowing for a few weeks off due to holidays. Overall, we see a significant decrease of about five payment counts from the intervention, perhaps representing a client's ability to better manage their cash through the education, and instead of focusing on repayment consistency, they repay when best serves their own business' needs.

Going hand in hand with reduced number of repayments, we also find that the average loan disbursement for treated clients has also reduced by 9,865 KES ($147.98 USD[3]) in the year following the treatment. This is a significant amount for both the MFI and their clients, as it is 34% of the average loan disbursement during this period (average loan disbursement in our sample is 29,733 KES), and roughly the size of the introductory loan required to establish client relations (10,000 KES). With increased financial management skills, clients increase the efficiency of the capital they are able to obtain, allowing them to better manage their loan disbursement amounts and therefore reduce the possibility of entering a cycle of over-indebtedness. In addition, by reducing the average loan amount per person, the MFI can reach more people with an equivalent amount of capital, increasing the organization's potential financial impact.

Finally, we measure number of repayments that were at least 30 days late for the microfinance client. This is a critical metric as it determines the MFI's "portfolio at risk" (PAR),

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[3] Using the exchange rate on May 1, 2014 of 0.0150 KES to USD.

which is an industry standard measure which refers to loans which are late in their repayments. PAR is used to determine the general credit worthiness of a MFI, is part of the due diligence required by portfolio investors who give the MFI access to capital, and used for external governance by NGOs and other auditing institutions. If a loan has any part of an installment paid late (late being defined by a set number of days in arrears), the entire loan balance is considered to be "at risk" and used in the PAR calculation:

$$\frac{\sum Outstanding\ loan\ balances\ of\ all\ loans\ in\ arrears}{\sum Outstanding\ loan\ balances}$$

PAR is particularly important for MFIs as this is a universal measure for the quality of their loan portfolio, and impacts the interest rates that MFIs can borrow funds at. PAR can be calculated at various days of late payment, with the most common being 30, 60, and 90 days. The microfinance industry best practice is to have a PAR30 (portfolio at risk, payment is late 30 days) of below 5% (MYC4 2012). Since we are looking at a subset of the overall loan portfolio of this MFI and individual-level measures, instead of calculating a PAR30 ratio, we instead count the number of loan repayments per client that are late – allowing us to quantify the client's direct contribution to the MFI's portfolio health.

Overall, the microfinance institution's economic impact from this financial recordkeeping training is both large in size as well as significance. We find evidence that the clients who were given the training are more strategic with their financial health, resulting in significant changes in the measures of payment count, sum of disbursements, as well as late repayments. Although some of the measures may initially seem counterintuitive to a purely profit-maximizing sense, these impacts do show a change that can be identified as a positive social impact on the clients, and

therefore a successful outcome for the MFI's overall strategic goals. Not only does this intervention have an impact on these financial measures, but it also has a substantively large and economically significant impact, given the client context.

**Limitations and conclusion**

Our analysis has some limitations. First, we focused on the client network of the microfinance institution, as this is a social network that has two key qualities: (1) it is managerially controllable and (2) it is strong in trust and commitment to each other (as loan repayment is linked to the group's relationships). However, it is feasible that out-of-client networks provide additional opportunities for learning which were unmeasured by our study and may have impacted the outcomes. Second, our use of network analysis to identify client social capital could be argued to capture other, non-social capital aspects of individual's connections. We address this by including two other potential proxy measures for social capital, leadership positions and social learning, but acknowledge that a concept like social capital may have other potential methods of quantification. Finally, even without social capital's identifiable impact, we still see a doubling of both recordkeeping and comprehension of recordkeeping fundamentals during our study timeframe. Although this specific pathway studied, the moderating effect of social capital through financial education, does not appear to be significant, the increase in recordkeeping outcomes points towards both an openness for human capital enrichment at the Base of the Pyramid as well as further avenues of research on social contagion and learning in low-income environments. One possibility is that in a heavily networked group such as a low-income community, there could be other social channels we are not capturing through which financial learning occurs. With access to richer data and additional testing, we hope these limitations can be addressed in future work.

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As the microfinance industry continues its growth in emerging markets, MFIs are forced to find additional ways to promote and distinguish their product as market competition increases. Many MFIs and NGOs call for services that provide longer term impact to the microfinance clients, to increase the managerial abilities of their clients' and thus, the efficiency of their microenterprises. We conducted a novel randomized intervention in coastal Kenya to look at how a financial recordkeeping training affects client financial success, and how that success is influenced by client level social capital. Social capital is a widely used explanatory variable for the success of microfinance's group lending system, but quantitative studies of the impact of social capital are scarce. In addition, the question of whether social capital impacts financial success is inherently endogenous. We randomly assign microfinance clients a financial learning module, allowing us to identify how social capital interacts with the training, which would be impossible to identify given a different methodological specification.

Our unique and novel study makes several contributions. First, we find that a short financial training provides significant, robust impacts to a client's economic success. This is particularly important for NGOs and MFIs who want to increase the social impact of their offerings, and adds to a small but robust literature on the impact of entrepreneurial training at the Base of the Pyramid. Second, this paper provides marketing academics an example of use of a randomized methodology to look at difficult-to-study consumer phenomena. This RCT approach shows the promise of using an experimental methodology in a Base of the Pyramid context. Finally, contrary to popular belief, we document that a client's base level of social capital does not moderate the impact of the financial training, across three different specifications of social capital. These findings are in contrast to previous qualitative studies which consistently identified social

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capital as a key ingredient in microentrepreneur financial success. While the positive direct effect of social capital in our studies show that social capital does have an impact, the lack of a moderation effect with the intervention does not allow us to claim causality. The use of social capital as a causal mechanism for low-income financial success is, in the context of our financial education training, a myth.

## Table 5: Sample of financial training RCTs at the BoP

| Authors | Title | Publication (Year) | Sample size | Location | Human Capital Intervention | Result |
|---|---|---|---|---|---|---|
| Gaurav, Cole, and Tobacman | Marketing complex financial products in emerging markets: Evidence from rainfall insurance in India | Journal of Marketing Research (2011) | 600 small-scale farms | India | Financial literacy module (compared with three marketing treatments) | Financial education doubled the adoption of rainfall insurance (from 8% to 16%). Only the cash back guarantee significantly increased demand, while the other two marketing interventions were insignificant. |
| Anderson-Macdonald, Chandy, and Zia | The Impact of Marketing (versus Finance) Skills on Firm Performance: Evidence from a Randomized Controlled Trial in South Africa | Working Paper (2014) | 832 firms | South Africa | Intensive, 10 week training in either marketing or finance skills | Significant increases in all performance metrics. |
| Karlan, Knight, and Udry | Consulting and capital experiments with microenterprise tailors in Ghana | Journal of Economic Behavior & Organization (2015) | 160 tailors | Ghana | Received professional consulting assistance from Ernst & Young (compared with additional cash capital) | Change in business practices in short term, but reverted back to old practices after one year. Similar results were found with comparison group that were offered additional cash grants instead of consulting. |
| Drexler, Fischer, and Schoar | Keeping It Simple: Financial Literacy and Rules of Thumb | Americal Economic Journal (2014) | 1,193 loan clients | Dominican Republic | Two different trainings: formal business education and a more basic, rule-of-thumb based training | Standard business education did not have a significant effect, but rule-of-thumb based training showed significant improvement in management of finances, reporting, and overall performance. |
| Sayinzoga, Bulte, and Lensink | Financial Literacy and Financial Behavior: Experimental Evidence From Rural Rwanda | The Economic Journal (2014) | 360 village bank representatives | Rwanda | One week intensive course | Significant and positive impacts on saving, borrowing, and starting a new business. Change in attitude as well as literacy. No effect on HH consumption or spillover effects. |

## Table 6: Correlation table for all variables used

|    | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1  | 1 |    |    |    |    |    |    |    |    |    |    |    |    |
| 2  | 0.853 | 1 |    |    |    |    |    |    |    |    |    |    |    |
| 3  | 0.080 | 0.096 | 1 |    |    |    |    |    |    |    |    |    |    |
| 4  | 0.174 | 0.187 | 0.530 | 1 |    |    |    |    |    |    |    |    |    |
| 5  | 0.015 | 0.008 | 0.189 | 0.106 | 1 |    |    |    |    |    |    |    |    |
| 6  | 0.138 | 0.109 | 0.080 | 0.101 | 0.043 | 1 |    |    |    |    |    |    |    |
| 7  | -0.101 | -0.061 | -0.015 | -0.058 | -0.061 | -0.674 | 1 |    |    |    |    |    |    |
| 8  | 0.074 | 0.084 | 0.178 | 0.171 | 0.047 | 0.148 | -0.054 | 1 |    |    |    |    |    |
| 9  | 0.488 | 0.409 | 0.064 | 0.076 | 0.087 | 0.016 | -0.002 | 0.077 | 1 |    |    |    |    |
| 10 | -0.058 | -0.044 | -0.054 | -0.052 | -0.073 | 0.019 | 0.022 | -0.054 | -0.044 | 1 |    |    |    |
| 11 | -0.065 | -0.050 | -0.080 | -0.065 | -0.074 | 0.010 | 0.020 | -0.080 | -0.037 | 0.968 | 1 |    |    |
| 12 | 0.042 | 0.019 | 0.042 | 0.055 | -0.082 | -0.002 | -0.022 | -0.031 | -0.022 | 0.078 | 0.068 | 1 |    |
| 13 | -0.012 | -0.013 | 0.473 | 0.326 | 0.124 | 0.027 | 0.071 | 0.149 | 0.048 | -0.010 | -0.028 | 0.041 | 1 |
| 14 | 0.008 | 0.022 | -0.067 | -0.059 | -0.007 | -0.008 | 0.049 | 0.006 | 0.124 | 0.082 | 0.082 | -0.224 | -0.044 |

**Legend**

| |
|---|
| 1 - Keeps records |
| 2 - Use records to make decisions |
| 3 - Count of payments to MFI in year |
| 4 - Sum of disbursements from MFI in year |
| 5 - Count of late payments to MFI in year |
| 6 - Bonding social capital |
| 7 - Bridging social capital |
| 8 - Has a group leadership role |
| 9 - Within network learning |
| 10 - Age |
| 11 - Age ^ 2 |
| 12 - Female |
| 13 - Time with MFI |
| 14 - Head of household |

**Figure 6: Visualization of study design**
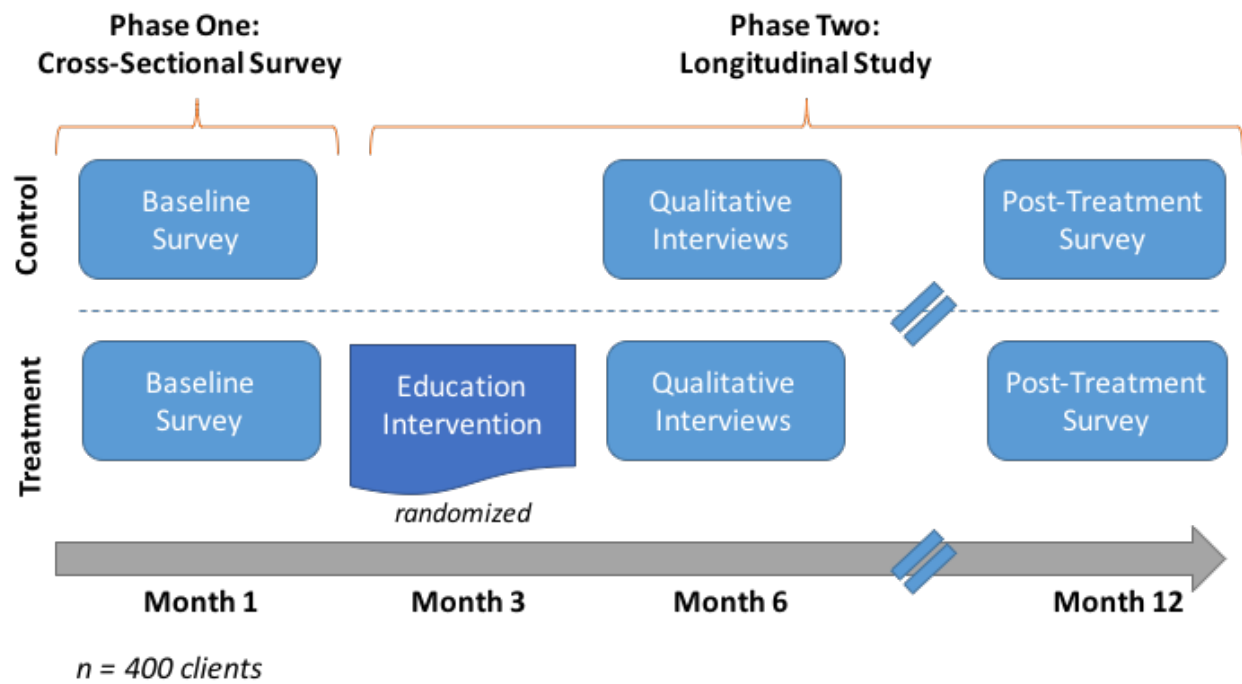
**Figure 7: Map of Mombasa, Kenya**
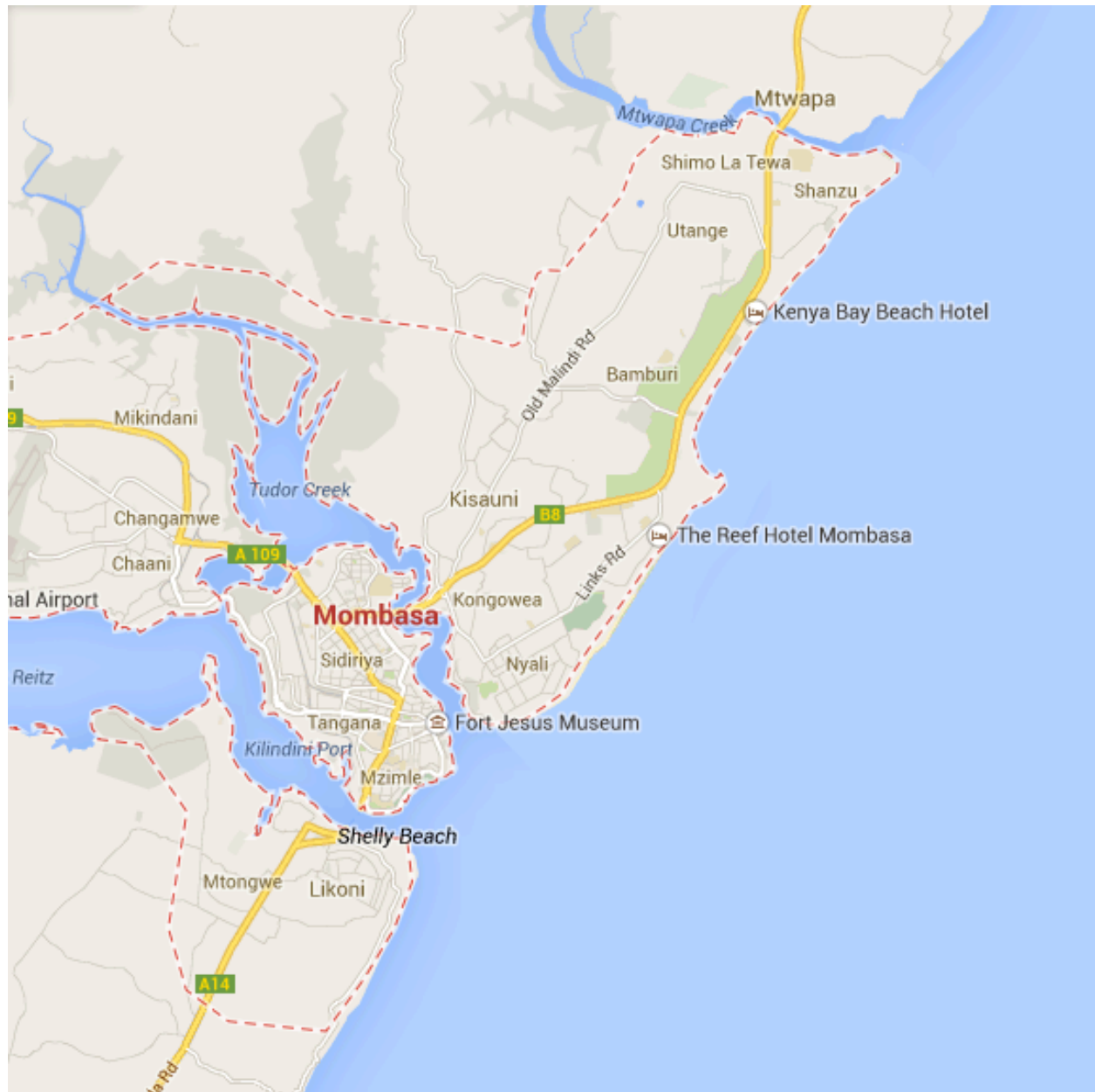


Map via Google Maps, accessed June 1, 2016.

**Figure 8: MFI structure**

~25 women
per community group

15 community groups
per loan officer

4 loan officers
per branch

7 branches

1 management team
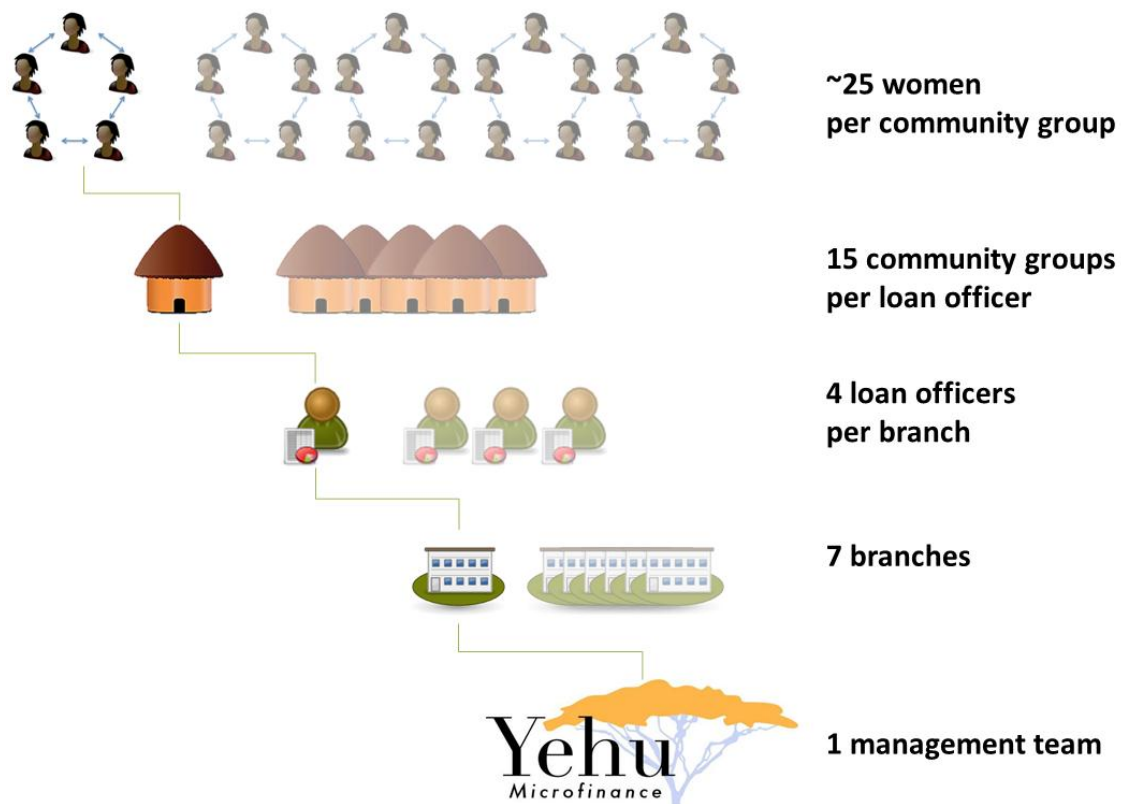
**Table 7: Comparison of treated vs. untreated subjects, pre-treatment time period**

Pre-treatment timeperiod

| Variable | Treated | | Untreated | |
|---|---|---|---|---|
| | **Mean** | **SD** | **Mean** | **SD** |
| Female | 0.93 | 0.26 | 0.92 | 0.27 |
| Head of household | 0.23 | 0.59 | 0.48 | 0.84 |
| Age | 37.64 | 12.70 | 38.00 | 12.76 |
| Education | 1.46 | 0.63 | 1.46 | 0.63 |
| Children | 0.96 | 0.20 | 0.92 | 0.26 |
| Number of children | 3.19 | 2.09 | 3.10 | 2.03 |
| Household size | 4.83 | 2.66 | 4.43 | 2.18 |
| Marital status | 1.41 | 0.89 | 1.49 | 0.94 |
| Homeowner | 0.51 | 0.50 | 0.53 | 0.50 |
| Number of loans | 4.10 | 2.93 | 3.23 | 2.20 |
| Sum of loans | 125,571 | 120,698 | 94,505 | 93,652 |
| Days with MFI | 912 | 581 | 835 | 559 |
| Number of observations | 70 | | 358 | |

| **Religion** | *Treated* | *Untreated* |
|---|---|---|
| Muslim | 32.9% | 37.7% |
| Christian | 65.7% | 60.1% |
| Traditional African | 1.4% | 1.1% |
| Other | 0.0% | 1.1% |

**Table 8: Comparison of pre-treatment and post-treatment descriptive statistics**

Full subject pool

| Variable | Pre-treatment | | Post-treatment | |
|---|---|---|---|---|
| | **Mean** | **SD** | **Mean** | **SD** |
| Female | 0.92 | 0.27 | 0.95 | 0.22 |
| Head of household | 0.44 | 0.81 | 0.28 | 0.53 |
| Age | 37.94 | 12.73 | 38.85 | 10.06 |
| Education | 1.46 | 0.63 | 1.41 | 0.63 |
| Children | 0.93 | 0.26 | 0.96 | 0.20 |
| Number of children | 3.11 | 2.04 | 3.53 | 2.01 |
| Household size | 4.49 | 2.26 | 4.52 | 2.02 |
| Marital status | 1.47 | 0.93 | 1.47 | 0.97 |
| Homeowner | 0.53 | 0.50 | 0.57 | 0.50 |
| Number of loans | 3.37 | 2.35 | 3.58 | 2.50 |
| Sum of loans | 99,586 | 99,092 | 106,454 | 104,136 |
| Days with MFI | 848 | 563 | 843 | 550 |
| Number of observations | 428 | | 367 | |

| **Religion** | Pre-Treatment | Post-Treatment |
|---|---|---|
| Muslim | 36.9% | 33.5% |
| Christian | 61.0% | 65.1% |
| Traditional African | 1.2% | 0.5% |
| Other | 0.9% | 0.8% |

**Figure 9: Model-free Evidence – Before-After Changes in Recordkeeping Variables**



**1: Observational Change in Financial Recordkeeping**
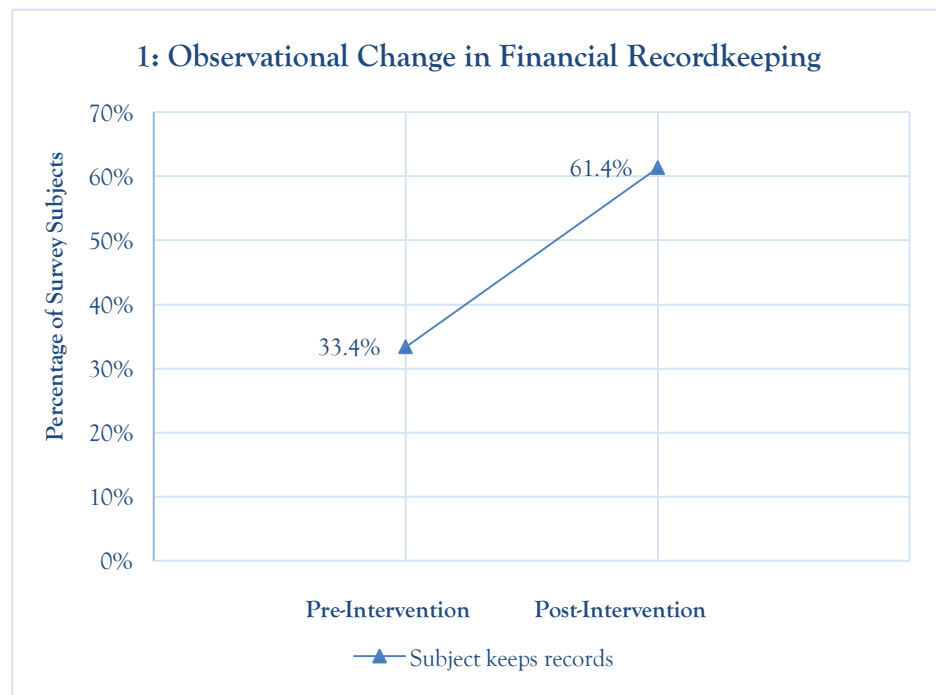
**Figure 10: Model-free Evidence – Before-After Changes in Recordkeeping Comprehension**



**2: Observational Change in Understanding How To Make Business Decisions from Financial Records**
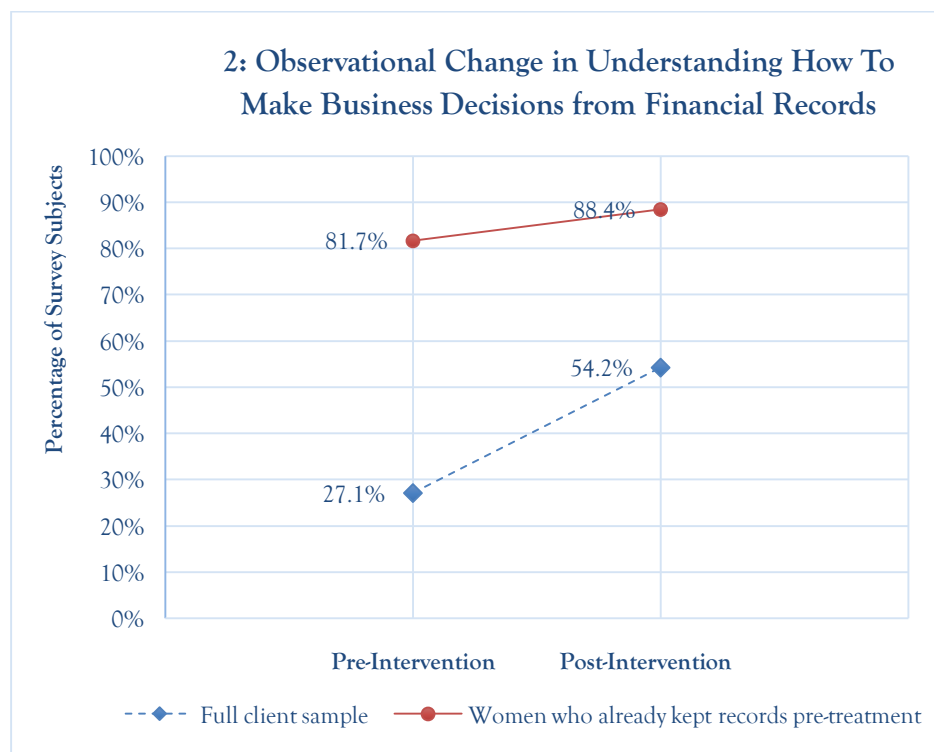
**Figure 11: Qualitative interview subjects: Number of businesses**
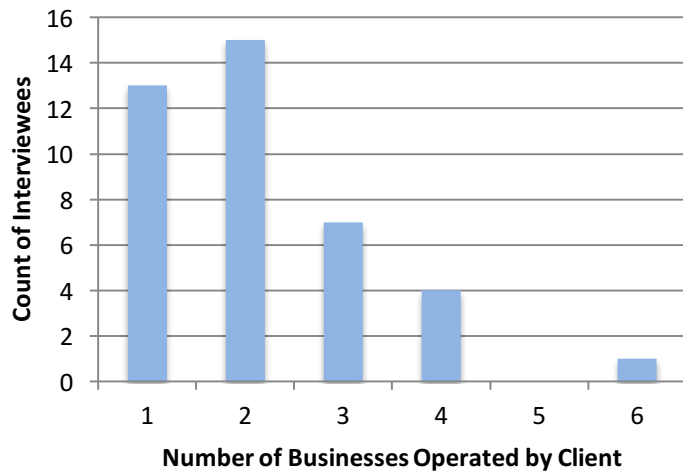


**Table 9: Qualitative interview subjects: Types of businesses**

| Occupation | # |
|---|---|
| Fried food seller | 6 |
| Fishmonger | 4 |
| Small scale food vendor | 4 |
| Charcoal seller | 4 |
| Landlord | 4 |
| Grocery shop | 3 |
| Retailers | 4 |
| Chicken vendor | 2 |
| Tailor | 2 |
| Palm wine seller | 2 |
| Beautician | 1 |
| Bookshop owner | 1 |
| Video shop owner | 1 |
| Lingerie seller | 1 |
| Café owner | 1 |
| Cereal shop owner | 1 |
| Coconut vendor | 1 |
| Pharmacist | 1 |

**Figure 12: Scatterplot of mean-centered measures of bonding and bridging social capital**
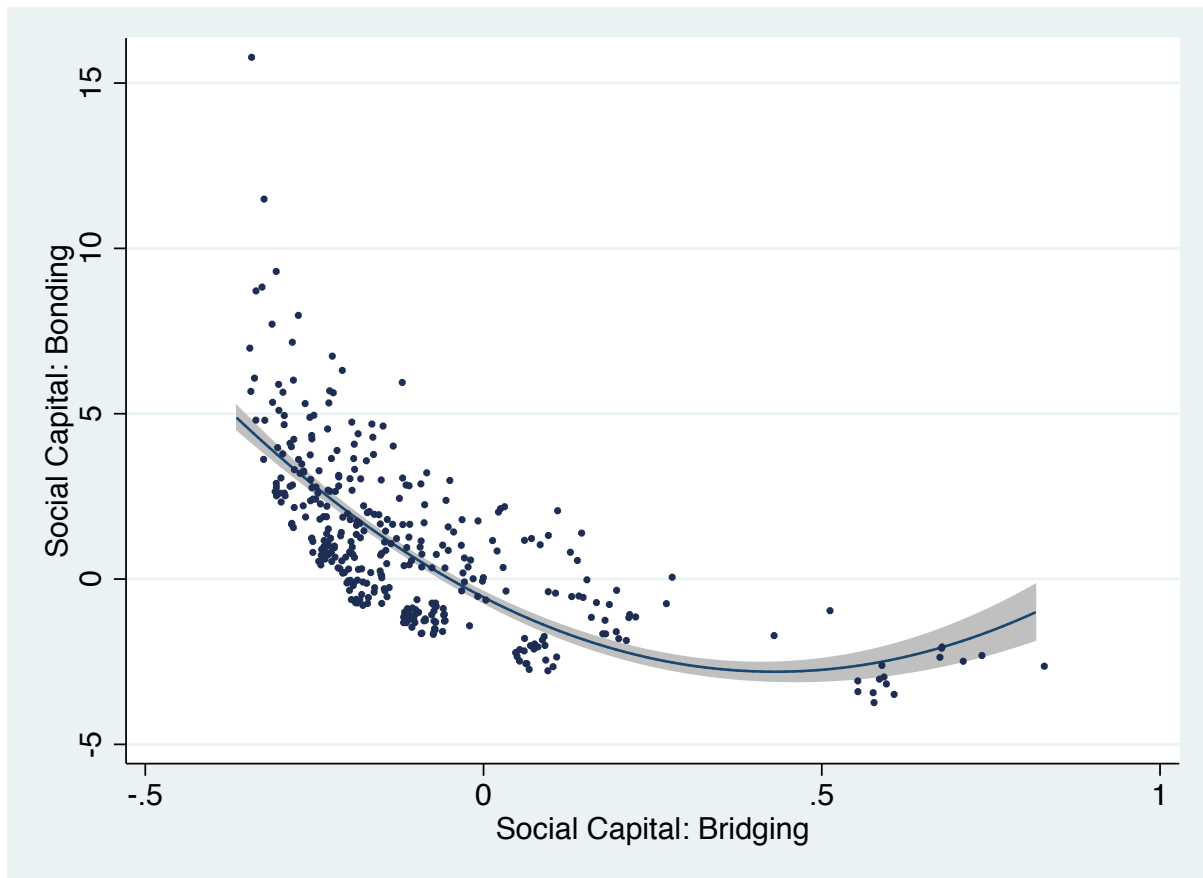
**Table 10: Recordkeeping regression results**

| VARIABLES | (1)<br>records | (2)<br>records | (3)<br>records_decisb | (4)<br>records_decisb |
|---|---|---|---|---|
| 1.time | 0.678*** | 0.723*** | 0.625*** | 0.677*** |
| | -0.132 | -0.13 | -0.127 | -0.131 |
| 1.treat | 0.0953 | 0.13 | -0.17 | -0.135 |
| | -0.163 | -0.157 | -0.19 | -0.18 |
| 1.time#1.treat | 0.214 | 0.219 | 0.570*** | 0.568*** |
| | -0.229 | -0.247 | -0.183 | -0.187 |
| age | | -0.0151 | | -0.0154 |
| | | -0.0152 | | -0.0125 |
| age2 | | 2.29E-05 | | 4.53E-05 |
| | | -0.00016 | | -0.000139 |
| female | | 0.222 | | 0.0748 |
| | | -0.203 | | -0.204 |
| time_length | | 0.000170*** | | 0.000181*** |
| | | -3.91E-05 | | -5.27E-05 |
| headhh | | 0.124*** | | 0.112** |
| | | -0.0457 | | -0.0475 |
| Constant | -0.485*** | -0.367 | -0.629*** | -0.405 |
| | -0.0891 | -0.363 | -0.0829 | -0.288 |
| | | | | |
| Observations | 769 | 761 | 769 | 761 |
| R-squared | | | | |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

## Table 11: Financial outcome regression results

| VARIABLES | (1)<br>pmtcount | (2)<br>pmtcount | (3)<br>disbsum | (4)<br>disbsum | (5)<br>par30b | (6)<br>par30b |
|---|---|---|---|---|---|---|
| 1.time | -0.416 | 1.813 | 12,843*** | 17,973*** | -0.0239 | 0.026 |
|  | -0.977 | -1.105 | -1,155 | -1,384 | -0.0815 | -0.0669 |
| 1.treat | 5.829*** | 4.609*** | 10,511* | 8,716* | 0.0707 | 0.0659 |
|  | -0.97 | -0.842 | -5,254 | -4,390 | -0.117 | -0.133 |
| 1.time#1.treat | -5.147* | -4.147* | -10,900** | -9,172** | 0.276** | 0.308*** |
|  | -2.353 | -1.949 | -3,591 | -3,773 | -0.107 | -0.0957 |
| age | 20.92*** | 0.285* | 36,589*** | -269.7 | -1.240*** | 0.0499 |
|  | -0.973 | -0.148 | -1,671 | -284.7 | -0.0569 | -0.0381 |
| age2 |  | -0.00344* |  | 1.031 |  | -0.000706 |
|  |  | -0.00147 |  | -2.419 |  | -0.000441 |
| female |  | 0.299 |  | 3,667 |  | -0.572*** |
|  |  | -1.413 |  | -5,317 |  | -0.154 |
| time_length |  | 0.0113*** |  | 23.46*** |  | 0.000503*** |
|  |  | -0.000739 |  | -2.072 |  | -0.000165 |
| headhh |  | -0.0264 |  | 755.8 |  | -0.0322 |
|  |  | -0.87 |  | -1,498 |  | -0.0816 |
| Constant |  | 3.522 |  | 17,717* |  | -2.008*** |
|  |  | -3.765 |  | -8,842 |  | -0.631 |
|  |  |  |  |  |  |  |
| Observations | 655 | 648 | 603 | 597 | 769 | 761 |
| R-squared | 0.014 | 0.209 | 0.036 | 0.189 |  |  |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

**Table 12: Social capital interaction regression results – network analysis, bonding and bridging**

| VARIABLES | (1) pmtcount | (2) pmtcount | (3) disbsum | (4) disbsum | (5) par30b | (6) par30b |
|---|---|---|---|---|---|---|
| 1.time | 1.549 | 1.351 | 17,185*** | 16,494*** | -0.00998 | -0.0693 |
|  | -0.998 | -0.878 | -1,903 | -1,785 | -0.0591 | -0.113 |
| 1.treat | 4.559*** | 4.456*** | 8,742* | 9,319* | 0.081 | -0.0509 |
|  | -0.941 | -0.887 | -4,222 | -4,144 | -0.126 | -0.204 |
| 1.time#1.treat | -4.659** | -4.745* | -9,942* | -10,150** | 0.291** | 0.614*** |
|  | -1.804 | -2.458 | -4,440 | -3,554 | -0.121 | -0.237 |
| c_netdeg | 0.481** | 1.239 | 533.4 | 1,781 | -0.0313 | -0.00297 |
|  | -0.192 | -0.728 | -686.9 | -1,311 | -0.0337 | -0.0401 |
| c_netconstr | 0.285 | 10.72 | -2,107 | 14,997 | -0.945** | -0.409 |
|  | -2.482 | -8.553 | -6,479 | -8,445 | -0.453 | -0.444 |
| 1.time#c.c_netdeg |  | -0.934 |  | -1,201 |  | 0.013 |
|  |  | -0.82 |  | -1,731 |  | -0.0886 |
| 1.time#c.c_netconstr |  | -14.92 |  | -25,438 |  | -0.594 |
|  |  | -9.219 |  | -16,517 |  | -0.818 |
| 1.treat#c.c_netdeg |  | -0.442 |  | -4,385 |  | -0.0871 |
|  |  | -2.029 |  | -2,575 |  | -0.202 |
| 1.treat#c.c_netconstr |  | -7.548 |  | -32,177 |  | -2.646 |
|  |  | -16.04 |  | -23,087 |  | -2.228 |
| 1.time#1.treat#c.c_netdeg |  | -0.159 |  | 3,348 |  | -0.0582 |
|  |  | -2.171 |  | -2,683 |  | -0.261 |
| 1.time#1.treat#c.c_netconstr |  | -2.359 |  | 23,338 |  | 2.549 |
|  |  | -17.3 |  | -35,712 |  | -2.649 |
| age | 0.27 | 0.27 | -246.1 | -268 | 0.0415 | 0.0375 |
|  | -0.162 | -0.159 | -288.4 | -256.6 | -0.0407 | -0.0408 |
| age2 | -0.00334* | -0.00324* | 0.76 | 1.211 | -0.000588 | -0.000539 |
|  | -0.0016 | -0.00159 | -2.51 | -2.202 | -0.000481 | -0.000475 |
| female | 0.346 | 0.239 | 3,863 | 3,639 | -0.511*** | -0.537*** |
|  | -1.494 | -1.245 | -5,576 | -5,505 | -0.14 | -0.141 |
| time_length | 0.0112*** | 0.0112*** | 22.81*** | 22.99*** | 0.000525** | 0.000536** |
|  | -0.000714 | -0.000758 | -2.574 | -2.615 | -0.000151 | -0.000147 |
| headhh | -0.178 | -0.175 | 561.5 | 598.2 | -0.0197 | -0.0144 |
|  | -0.87 | -0.806 | -1,553 | -1,568 | -0.0767 | -0.0818 |
| Constant | 4.05 | 3.93 | 17,807* | 17,913* | -1.967*** | -1.876*** |
|  | -4.114 | -3.84 | -8,341 | -8,180 | -0.704 | -0.689 |
| Observations | 630 | 630 | 577 | 577 | 735 | 735 |
| R-squared | 0.212 | 0.221 | 0.181 | 0.188 |  |  |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

**Table 13: Social capital interaction regression results – leadership position**

| VARIABLES | (1) pmtcount | (2) pmtcount | (3) disbsum | (4) disbsum | (5) par30b | (6) par30b |
|---|---|---|---|---|---|---|
| 1.time | 1.843 | 2.111 | 17,891*** | 16,966*** | 0.0245 | 0.0993 |
| | -1.216 | -1.606 | -1,486 | -2,244 | -0.0661 | -0.169 |
| 1.treat | 4.388*** | 4.157** | 8,079 | 18,889** | 0.0638 | 0.194 |
| | -0.771 | -1.539 | -4,456 | -5,989 | -0.135 | -0.227 |
| 1.time#1.treat | -3.838 | -3.854 | -8,246** | -16,775** | 0.311*** | 0.0171 |
| | -2.137 | -3.318 | -3,343 | -5,712 | -0.0939 | -0.296 |
| 1.grouproleb | 3.225*** | 3.462** | 8,279*** | 9,831** | 0.0458 | 0.111 |
| | -0.638 | -1.242 | -1,965 | -3,529 | -0.139 | -0.208 |
| 1.time#1.grouproleb | | -0.661 | | 2,029 | | -0.183 |
| | | -1.566 | | -5,616 | | -0.37 |
| 1.treat#1.grouproleb | | 0.44 | | -22,251** | | -0.306 |
| | | -3.534 | | -8,249 | | -0.411 |
| 1.time#1.treat#1.grouproleb | | 0.218 | | 16,349 | | 0.697 |
| | | -4.636 | | -9,572 | | -0.631 |
| age | 0.235 | 0.234 | -380.5 | -340.3 | 0.0487 | 0.0531 |
| | -0.151 | -0.153 | -303.9 | -325 | -0.0391 | -0.0425 |
| age2 | -0.00286* | -0.00284* | 2.382 | 1.887 | -0.000691 | -0.000743 |
| | -0.00147 | -0.00149 | -2.673 | -2.826 | -0.000455 | -0.000494 |
| female | 0.532 | 0.507 | 4,412 | 4,359 | -0.570*** | -0.585*** |
| | -1.54 | -1.56 | -4,940 | -4,806 | -0.154 | -0.168 |
| time_length | 0.0109*** | 0.0109*** | 22.37*** | 21.97*** | 0.000498*** | 0.000495*** |
| | -0.000717 | -0.000707 | -1.967 | -2.01 | -0.000169 | -0.000165 |
| headhh | -0.00795 | -0.00684 | 737.2 | 708.1 | -0.0316 | -0.034 |
| | -0.831 | -0.829 | -1,667 | -1,606 | -0.0808 | -0.0793 |
| Constant | 3.385 | 3.281 | 16,797* | 15,918 | -2.000*** | -2.091*** |
| | -3.883 | -3.812 | -8,396 | -8,932 | -0.645 | -0.699 |
| | | | | | | |
| Observations | 648 | 648 | 597 | 597 | 761 | 761 |
| R-squared | 0.222 | 0.222 | 0.204 | 0.214 | | |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

**Table 14: Social capital interaction regression results – social contagion from within MFI**

| VARIABLES | (1) pmtcount | (2) pmtcount | (3) disbsum | (4) disbsum | (5) par30b | (6) par30b |
|---|---|---|---|---|---|---|
| 1.time | 1.702 | 2.44 | 17,690*** | 17,099*** | 0.00866 | 0.0209 |
| | -1.033 | -1.364 | -1,331 | -2,077 | -0.0743 | -0.0829 |
| 1.treat | 4.605*** | 6.695*** | 8,709* | 10,260** | 0.0713 | 0.158 |
| | -0.828 | -1.495 | -4,252 | -4,302 | -0.136 | -0.177 |
| 1.time#1.treat | -3.954* | -5.962** | -8,636* | -9,270** | 0.334*** | 0.313** |
| | -1.879 | -2.001 | -3,690 | -3,273 | -0.103 | -0.134 |
| 1.records_yehu2 | 1.537 | 4.759** | 4,144 | 3,933 | 0.208 | 0.326 |
| | -1.309 | -1.987 | -2,620 | -3,844 | -0.134 | -0.242 |
| 1.time#1.records_yehu2 | | -4.019* | | 2,491 | | -0.0774 |
| | | -1.974 | | -4,693 | | -0.247 |
| 1.treat#1.records_yehu2 | | -11.61** | | -8,485 | | -0.51 |
| | | -4.136 | | -6,330 | | -0.642 |
| 1.time#1.treat#1.records_yehu2 | | 9.789 | | 2,441 | | -0.0607 |
| | | -6.59 | | -10,077 | | -0.384 |
| age | 0.294* | 0.316* | -247.3 | -243.1 | 0.0492 | 0.0489 |
| | -0.147 | -0.139 | -280.5 | -281.6 | -0.0394 | -0.0375 |
| age2 | -0.00349** | -0.00368** | 0.885 | 0.825 | -0.000689 | -0.000679 |
| | -0.00144 | -0.00137 | -2.323 | -2.354 | -0.000463 | -0.000442 |
| female | 0.306 | 0.305 | 3,625 | 3,917 | -0.573*** | -0.569*** |
| | -1.395 | -1.468 | -5,405 | -5,519 | -0.15 | -0.159 |
| time_length | 0.0112*** | 0.0112*** | 23.28*** | 23.28*** | 0.000494*** | 0.000494*** |
| | -0.00071 | -0.000603 | -1.992 | -2.032 | -0.000157 | -0.000154 |
| headhh | -0.126 | -0.264 | 484.9 | 473.3 | -0.041 | -0.046 |
| | -0.894 | -0.941 | -1,664 | -1,657 | -0.0766 | -0.0811 |
| Constant | 3.128 | 2.119 | 16,663 | 16,381* | -2.033*** | -2.061*** |
| | -3.691 | -3.463 | -8,976 | -8,504 | -0.638 | -0.581 |
| | | | | | | |
| Observations | 648 | 648 | 597 | 597 | 761 | 761 |
| R-squared | 0.211 | 0.219 | 0.192 | 0.193 | | |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

# APPENDICES

## APPENDIX A: Scales and Measures

Organizational Commitment

*Affective Commitment, from Myer and Allen, 1997*

- I feel like a part of the family at [Focal MFI].
- I feel emotionally attached to [Focal MFI].
- I am proud to tell others I bank with [Focal MFI].
- Interacting at [Focal MFI]has a great deal of personal meaning to me.
- I would be happy to continue banking at [Focal MFI].

*Continuance Commitment, from Myer and Allen, 1997*

- Right now, staying with [Focal MFI] is a matter of necessity more than desire.
- It would be very hard to leave [Focal MFI] now, even if I wanted to.
- Too much of my life would be disrupted if I decided I wanted to leave [Focal MFI] now.
- I feel like I have very few options besides [Focal MFI].
- If I had not already put so much of myself into [Focal MFI], I would consider going elsewhere.
- One negative consequence of leaving [Focal MFI] would be the problem of few alternatives.
- The [Focal MFI] does not help me very much.

Entrepreneurial Orientation

*Personal Initiative, from Frese et al. 1997*

- I actively approach problems.
- Whenever something goes wrong, I search for a solution immediately.
- Whenever there is a chance to get actively involved, I take it.
- I take initiative immediately even when others do not.
- I use opportunities quickly in order to attain my goals.
- I am particularly good at realizing ideas.

*Growth Goal Orientation, from Krauss and Frese, 2001*

Which of the statements applies the most to you? Score as follows: 1 exactly like A, 2 more like A, 4 exactly like B, 5 more like B.

- Business owner A: "I am satisfied as long as my business provides a living for my family and myself."

- Business owner B: "I am satisfied as long as my business keeps growing and becomes bigger."

- Business owner A: "If I earn enough money for my family, that is good enough."
- Business owner B: "I want my business to grow as much as possible."

- Business owner A: "I just do this business as long as I cannot find another, better business."
- Business owner B: "I really like to be a business owner on my own: I don't want to work for someone."

#1-6 [TAKE OUT PAPER NETWORK SURVEY, PEN, and LAMINATED SCALE]

We are going to ask you some questions about people you know, and how you know them. [Show simple network graph on the back of laminated scale during explanation.] If this center dot is you, and the picture represents the people you meet regularly in your free time, when we ask you to list the people you meet in your free time, please try to remember and list them. All this information will be kept strictly private and we will not contact anyone that you mention today. By "know" I mean people who you would recognize on the street and would recognize you on the street and who you have seen recently (in the past two months). After we get people's names we will ask you a few short questions about the people you know.

[NOTE: Write down names on the paper network survey, using a new column for each person. DON'T FORGET TO NOTE WHICH QUESTION THAT NAME IS ASSOCIATED WITH!]"

(1.1) What are the names of the people in your lending group?

Majina ya watu kwa kikundi chenu?

(2.1) Do you have relatives by blood or by marriage who are Yehu clients, but in a different lending or village group?

Je, una jamaa ambao ni Yehu wateja, lakini katika kukopesha tofauti au kikundi kijiji?

(2.2) Do you know other non-relatives who are Yehu clients, but in a different lending or village group?

Je, unajua  wengine wasio Jamaa zako na ni wateja wa Yehu, lakini katika mikopo tofauti au kikundi cha  kijiji kigine?

(3.1) In your free time, whose home do you visit?

Katika muda wako wa ziada,wewe hutembelea nani?

(3.2) Who visits your home in his/her free time?

Nani hutembelea nyumba yako katika muda wake wa ziada?

(3.3) Does your household have a television?

Uko na Televisheni kwako?


If yes, does anyone come over to your house to watch television?

Kama ndiyo, Je, kuna mtu huja kwako kuangalia televisheni?


(3.4) Do you go to anyone's home to watch television? Whose?

Je, wewe huenda nyumbani kwa mtu yeyote kuangalia televisheni? Kwa nani?


(4.1) If you had to make a difficult personal decision, whom would you ask for advice?

Kama unabidi kufanya maamuzi magumu yaki binafsi, nani ungeweza kuomba ushauri kwake?


(5.1) Who within the Yehu network comes to you for advice?

Nani ndani ya wa mtandao Yehu anakuja kwako kupata ushauri?


(5.2) Who within the Yehu network do you go to for advice?

Nani ndani ya mtandao wa Yehu unaweza kwenda kwa ajili ya ushauri?


(6.1) Who are the local leaders living in your village?

Nani ni viongozi wanaoishi katika kijiji chako?

**APPENDIX C: Two sample responses from qualitative interviews (edited down for size)**


**Gender: Female**

**Age: 29**

**Education Level: Illiterate**

**Business Location: Urban**


I only have this grocery shop which is my main source of income.

I am grateful for my business as I have been running it for about one year now. I wake up in the morning and go to the market, come back, set up and sell. Business is never as smooth all the time. It calls for cleanliness and patience and also know how to talk to customers because people are different.

...

When I get the loan money I only use if for my child's school fees and adding goods in my shop.

I have not faced many challenges in my business it's just you to know how to manage your clients, even those that stay too long without clearing their debts. There is always giving of credit to clients. A business without giving credit is not a business.

...

I don't keep records because I do not even know how to write. But if I was to ask anyone to help, that would be my husband.

I would not mind if the loan officers teach me how to manage my business even though I do not have any specific thing I would like to be taught. I also think keeping record is important as this will show you your sales therefore I would keep records if taught how to.

**Gender: Female**

**Age: 33**

**Education Level: Illiterate**

**Business Location: Peri-Urban**

I have had one business. I cook and sell beans and chapatti on the road side not far away from where I live. I have had this business for about 7years now and this is also my main source of income. I sustain my business through the loan money I get from [the MFI] and the merri-go rounds that I am member of.

I have been with [the MFI] for about 2 years and I've also been a member of a different group around the year 2012 where I left due to mistreatment.

I use my loan money for buying household utensils, busying the basic needs and for business expansion.

Some of the challenges I face are non-payments of debts from clients, threats I receives for following up on what I am owed and now I just discovered that I have developed a chest problem due to using charcoal for cooking.

My day at my business starts at 2pm where I prepare the beans and dough; start to cook at about 5pm where I sell these up until about 8pm.

I do not have my own place to sell and so I requested someone if I could use his verandah to cook and sell.

...

My goal is to get a shop where I can cook and sell my food.

I do not keep any record of my money and neither do I know anyone that keeps their records at their business. I don't keep records because I feel like the money I get is too little for record keeping. If I were to ask anyone to help with the record keeping, it would be my husband or the loan officers.

I separate my business and personal money because she I have made it a habit to only use my profit for personal use. In spite of my lack of keeping records, it makes sense for me to keep one as she I feel that it would be good to know my profits and losses and I would start to keep them if and when someone teaches me how to because this will help track my profits and losses.

I would not mind if the loan officers taught me ways to help manage my business.

Its only [more] money that would help me make the running of my business easier.

# APPENDIX D: Splitting the outcomes given high/low levels of social capital

Two-way split on outcomes, given whether level of bonding or bridging social capital is high or low.

| VARIABLES | (1) pmtcount | (2) pmtcount | (3) pmtcount | (4) pmtcount |
|---|---|---|---|---|
| 1.time | 1.073 | 1.917 | 1.556 | -6.353 |
| | (1.178) | (1.894) | (1.287) | (3.665) |
| 1.treat | 6.119*** | 2.419 | 3.834*** | -2.214 |
| | (1.698) | (3.071) | (0.899) | (2.853) |
| 1.time#1.treat | -2.756 | -3.823 | -3.317 | -4.411 |
| | (4.249) | (2.606) | (2.105) | (5.620) |
| c_netdeg | -0.639 | 0.480 | 0.286 | -4.609 |
| | (1.596) | (0.272) | (0.205) | (3.665) |
| c_netconstr | -2.278 | -0.238 | -4.523 | 25.97 |
| | (5.207) | (7.259) | (6.974) | (16.34) |
| grouproleb | 2.728 | 2.794*** | 2.518*** | 12.30** |
| | (1.609) | (0.609) | (0.619) | (4.439) |
| records_yehu2 | 2.881 | 0.214 | 1.196 | -2.180 |
| | (3.203) | (1.031) | (1.327) | (5.950) |
| age | 0.504* | -0.0414 | 0.271 | -0.815 |
| | (0.237) | (0.179) | (0.173) | (0.632) |
| age2 | -0.00480* | -0.000687 | -0.00317* | 0.00838 |
| | (0.00204) | (0.00184) | (0.00165) | (0.00557) |
| female | -1.940 | 2.917 | 0.782 | -9.762*** |
| | (2.336) | (1.668) | (1.462) | (2.298) |
| time_length | 0.0115*** | 0.0107*** | 0.0111*** | 0.00794 |
| | (0.00181) | (0.00131) | (0.000689) | (0.00530) |
| headhh | -0.881 | 0.658 | -0.430 | 3.093 |
| | (0.972) | (1.196) | (0.763) | (2.838) |
| Constant | -3.383 | 8.304 | 1.853 | 11.41 |
| | (6.117) | (5.563) | (4.470) | (31.93) |
| | | | | |
| Observations | 300 | 330 | 595 | 35 |
| R-squared | 0.243 | 0.214 | 0.225 | 0.626 |
| Bonding | Low | High | | |
| Bridging | | | Low | High |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

| VARIABLES | (5) disbsum | (6) disbsum | (7) disbsum | (8) disbsum |
|---|---|---|---|---|
| 1.time | 14,418*** | 18,049*** | 17,392*** | -16,791 |
| | (2,993) | (2,712) | (2,686) | (8,686) |
| 1.treat | 12,989** | 1,777 | 7,365* | 3,654 |
| | (4,869) | (5,856) | (3,880) | (6,296) |
| 1.time#1.treat | -458.1 | -8,307 | -7,262* | -31,113 |
| | (5,032) | (5,743) | (3,445) | (43,484) |
| c_netdeg | 730.6 | 240.0 | -29.24 | 23,382 |
| | (3,730) | (1,013) | (798.1) | (23,469) |
| c_netconstr | 2,782 | -28,855 | -11,846 | 23,038 |
| | (14,619) | (21,514) | (19,045) | (76,611) |
| grouproleb | 7,785 | 7,268*** | 7,964** | 10,909** |
| | (4,225) | (1,801) | (2,346) | (4,055) |
| records_yehu2 | -53.32 | 7,372 | 3,906 | -3,599 |
| | (2,643) | (5,799) | (3,042) | (16,278) |
| age | -542.3* | -214.1 | -331.2 | -1,097 |
| | (284.7) | (489.9) | (316.2) | (1,146) |
| age2 | 4.063 | 0.867 | 1.848 | 12.49 |
| | (2.783) | (4.240) | (2.678) | (12.20) |
| female | 7,795 | 689.4 | 3,735 | 1,226 |
| | (6,747) | (5,516) | (5,893) | (4,331) |
| time_length | 21.08*** | 23.17*** | 22.30*** | -0.845 |
| | (4.205) | (4.611) | (2.843) | (16.91) |
| headhh | -136.3 | 196.7 | 402.6 | -880.5 |
| | (2,041) | (2,456) | (2,033) | (4,061) |
| Constant | 19,268 | 10,756 | 15,168 | 123,791 |
| | (10,624) | (14,485) | (9,976) | (143,608) |
| | | | | |
| Observations | 270 | 307 | 546 | 31 |
| R-squared | 0.220 | 0.199 | 0.201 | 0.358 |
| Bonding | Low | High | | |
| Bridging | | | Low | High |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

|  | (9) | (10) | (11) |
|---|---|---|---|
| VARIABLES | par30b | par30b | par30b |
| 1.time | -0.0442 | -0.0560 | 0.00910 |
|  | (0.269) | (0.163) | (0.0584) |
| 1.treat | 0.0275 | 0.149 | 0.157 |
|  | (0.270) | (0.256) | (0.148) |
| 1.time#1.treat | 0.945** | -0.111 | 0.263* |
|  | (0.460) | (0.275) | (0.142) |
| c_netdeg | -0.0850 | 0.0278 | -0.0215 |
|  | (0.0968) | (0.0493) | (0.0366) |
| c_netconstr | -1.345*** | -0.0486 | -0.595 |
|  | (0.469) | (1.205) | (0.624) |
| grouproleb | -0.336 | 0.178 | -0.00732 |
|  | (0.258) | (0.199) | (0.148) |
| records_yehu2 | 0.478** | 0.136 | 0.220* |
|  | (0.221) | (0.145) | (0.129) |
| age | 0.0373 | 0.0388 | 0.0577* |
|  | (0.0337) | (0.0413) | (0.0333) |
| age2 | -0.000432 | -0.000609 | -0.000825** |
|  | (0.000388) | (0.000504) | (0.000382) |
| female | -0.216 | -0.752*** | -0.524*** |
|  | (0.385) | (0.284) | (0.146) |
| time_length | 0.000673*** | 0.000403*** | 0.000513*** |
|  | (0.000213) | (0.000140) | (0.000151) |
| headhh | 0.0950 | -0.156 | -0.0347 |
|  | (0.109) | (0.163) | (0.0691) |
| Constant | -2.568*** | -1.509 | -2.232*** |
|  | (0.507) | (0.994) | (0.608) |
| | | | |
| Observations | 374 | 361 | 691 |
| R-squared | | | |
| Bonding | Low | High | |
| Bridging | | | Low |

Robust standard errors in parentheses

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Note that we do not have an outcome model for high bridging with the late payment DV due to perfect prediction of failure due to variables specified, so the model cannot be fit.

Two-way split on outcomes, given social capital type #2: whether or not client is in a position of leadership within their loan group.

| VARIABLES | (1) pmtcount | (2) pmtcount | (3) disbsum | (4) disbsum | (5) par30b | (6) par30b |
|---|---|---|---|---|---|---|
| 1.time | 1.351 | 1.728 | 18,504*** | 15,416*** | -0.126 | 0.0644 |
|  | (1.047) | (1.425) | (4,174) | (2,522) | (0.156) | (0.188) |
| 1.treat | 4.640 | 4.325** | -2,651 | 19,275** | -0.0519 | 0.190 |
|  | (2.611) | (1.766) | (5,817) | (6,012) | (0.251) | (0.258) |
| 1.time#1.treat | -4.079 | -4.342 | 149.7 | -18,138** | 0.598* | 0.131 |
|  | (3.838) | (3.353) | (6,768) | (5,706) | (0.311) | (0.294) |
| c_netdeg | 0.292 | 0.508 | -1,449 | 1,745* | 0.0322 | -0.122** |
|  | (0.246) | (0.388) | (1,424) | (805.2) | (0.0330) | (0.0579) |
| c_netconstr | 1.091 | -0.0251 | 26,608*** | 11,697 | -1.026 | -1.154** |
|  | (4.047) | (4.703) | (7,400) | (9,378) | (0.735) | (0.505) |
| records_yehu2 | 0.129 | 2.055 | 8,345 | 434.9 | 0.0531 | 0.398 |
|  | (3.222) | (1.496) | (5,885) | (4,057) | (0.160) | (0.243) |
| age | 0.370 | 0.215 | -1,740 | -125.0 | -0.0145 | 0.0973* |
|  | (0.363) | (0.276) | (1,451) | (518.5) | (0.0414) | (0.0532) |
| age2 | -0.00442 | -0.00274 | 18.57 | -0.122 | 0.000109 | -0.00128* |
|  | (0.00539) | (0.00236) | (19.03) | (4.664) | (0.000371) | (0.000692) |
| female | 3.813 | -2.254 | -2,464 | 9,238* | -0.494*** | -0.551*** |
|  | (2.394) | (1.511) | (8,154) | (4,248) | (0.171) | (0.205) |
| time_length | 0.0112*** | 0.0106*** | 24.52*** | 19.10*** | 0.000300 | 0.000662*** |
|  | (0.00170) | (0.00134) | (4.140) | (2.327) | (0.000194) | (0.000151) |
| headhh | -0.232 | -0.169 | -2,321 | 1,715 | -0.0971 | -0.0172 |
|  | (1.165) | (0.997) | (3,493) | (1,493) | (0.0683) | (0.109) |
| Constant | 0.565 | 6.679 | 56,174 | 9,164 | -0.717 | -3.222*** |
|  | (6.294) | (7.000) | (33,136) | (10,495) | (0.847) | (0.814) |
|  |  |  |  |  |  |  |
| Observations | 251 | 379 | 237 | 340 | 278 | 457 |
| R-squared | 0.182 | 0.218 | 0.179 | 0.225 |  |  |
| Group Leader | Has Role | No Role | Has Role | No Role | Has Role | No Role |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Two-way split on outcomes, given social capital type #3: whether or not client had learned about recordkeeping within their loan group.

| VARIABLES | (1) pmtcount | (2) pmtcount | (3) disbsum | (4) disbsum | (5) par30b | (6) par30b |
|---|---|---|---|---|---|---|
| 1.time | -1.704 | 2.303* | 16,196*** | 16,659*** | -0.219 | -0.00703 |
| | (1.246) | (1.190) | (3,949) | (2,829) | (0.215) | (0.0941) |
| 1.treat | -5.486 | 6.655*** | -802.7 | 10,099** | -0.400 | 0.206 |
| | (3.677) | (1.380) | (10,091) | (4,000) | (0.523) | (0.182) |
| 1.time#1.treat | 4.127 | -6.406** | -3,619 | -9,460** | 0.695* | 0.244 |
| | (8.225) | (1.990) | (12,445) | (3,429) | (0.399) | (0.161) |
| c_netdeg | -0.236 | 0.470** | -147.1 | 253.3 | -0.188 | -0.00132 |
| | (1.022) | (0.165) | (2,593) | (873.2) | (0.115) | (0.0376) |
| c_netconstr | -2.913 | 0.0233 | -7,879 | -2,614 | -2.051*** | -0.751 |
| | (9.282) | (1.909) | (22,570) | (7,019) | (0.629) | (0.493) |
| grouproleb | 1.765 | 3.036** | 15,656* | 5,732** | -0.274 | 0.0561 |
| | (3.387) | (0.968) | (7,156) | (2,020) | (0.219) | (0.194) |
| age | 0.126 | 0.290* | -641.8 | -259.0 | 0.141 | 0.0371 |
| | (0.202) | (0.131) | (1,354) | (177.3) | (0.132) | (0.0490) |
| age2 | -0.000825 | -0.00370** | 7.386 | 0.569 | -0.00208 | -0.000486 |
| | (0.00163) | (0.00115) | (11.08) | (1.598) | (0.00174) | (0.000580) |
| female | 1.579 | 0.145 | 827.5 | 5,947 | -1.269* | -0.336 |
| | (5.130) | (2.269) | (9,580) | (7,074) | (0.724) | (0.229) |
| time_length | 0.0123*** | 0.0104*** | 17.88*** | 22.36*** | 0.000560* | 0.000523*** |
| | (0.00210) | (0.000739) | (3.472) | (2.843) | (0.000288) | (0.000162) |
| headhh | -0.718 | 0.0687 | -684.5 | 601.1 | -0.465*** | 0.0793 |
| | (0.574) | (1.160) | (4,738) | (1,360) | (0.140) | (0.101) |
| Constant | 6.890 | 2.649 | 28,273 | 14,048* | -2.237 | -2.250** |
| | (7.076) | (3.501) | (26,199) | (7,138) | (2.633) | (1.007) |
| | | | | | | |
| Observations | 124 | 506 | 115 | 462 | 139 | 596 |
| R-squared | 0.235 | 0.232 | 0.194 | 0.200 | | |
| Social learning | Yes | No | Yes | No | Yes | No |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

2.#7.2 Let phone search for GPS if available ?
[NOTE: if not available, skip question]

Question Type = GPS
Data Field Name: gps

3.#7.3 This meeting is a part of which Yehu office?

Question Type = radio
Data Field Name: office
Choose one response:

- Kisauni (Kisauni)
- Kaloleni  (Kaloleni)
- Likoni (Likoni)
- Msambweni (Msambweni)
- Samburu (Samburu)
- Mwambalazi (Mwambalazi)
- Tiribe (Tiribe)
- Voi (Voi)

4.#7.4 What is the name of this group meeting location?

Question Type = Text
Data Field Name: loc

5.#7.5 What is the gender of the subject?

Question Type = radio
Data Field Name: female
Choose one response:

- Male (0)
- Female (1)

6.#7.6 Are they wearing a headcovering?

Question Type = radio
Data Field Name: headcover
Choose one response:

- Yes (1)

- No (0)

7.Greetings, my name is _____ and I will be recording the survey information for you today. This should take about 35 minutes and I will ask you questions about yourself, people you know, and then get your opinion on several things. Please stop me if you have any questions or do not understand what the question means.

Habari zenu. Jina langu ni_____ na nina shighuli ya utafiti ningependa kupata maoni yenu leo. Hii itachukua muda kama dakika 25 hivi, name nitawauliza maswali ya kibinafsi, watu unaowafahamu, na nipate maoni yenu. Tafadhali unaweza kuniuliza maswali yoyote na pia kama hujanielewa.

#8.1.1 What is your surname?
Jina Lako la mwisho Ni?

Question Type = Text
Data Field Name: name_sur

8.#8.1.2 Jina lako mwenyewe?
(What is your given name?)

Question Type = Text
Data Field Name: name_given

9.#8.1.3 Je, una jina la utani?
(Do you have a nickname?)

Question Type = Text
Data Field Name: name_nick

10.#8.2 Are you the head of your household, or the spouse of the head of the household?
Je, wewe ndie mkuu wa nyumba yako, au mke wa mkuu wa nyumba yako?

[NOTE: You can be female and still be head of the household]

Question Type = radio
Data Field Name: head
Choose one response:

- Head of the household (1)
- Spouse of the head of the household (0)
- Other (3)

11.#8.3 How old are you now?
Una umri gani sasa?

Question Type = numeric
Data Field Name: age

Min 10
Max 99

12.#8.4 What is your religion?
Je, dini yako ni gani?

Question Type = radio
Data Field Name: religion
Choose one response:

- Muslim (1)
- Christian (2)
- Traditional African (3)
- Other (4)

13.#8.5 What tribe are you from?
Je wewe ni wa kabila gani __

Question Type = Text
Data Field Name: tribe

14.#8.6 What is the highest level of education you achieved?
Ni ngazi ipi ya juu ya elimu umefanikiwa kufika?

Question Type = dropdown
Data Field Name: educ
Choose one response:

- Illiterate/none (1)
- KCPE 2 (Partial) (2)
- KCPE 2 (Complete) (3)
- KCSE 2 (Partial) (4)
- KCSE 2 (Complete) (5)
- Tertiary (6)

15.#8.7.1 How many children have you given birth to are still alive?
Ni watoto wangapi uliojifunga walio hai?

Question Type = numeric
Data Field Name: child_num

Min 0
Max 50

16.#8.8 In total, how many people slept in your home last night?
Kwa jumla, Watu wagapi wali lala katika nyumba yako jana usiku?

Question Type = numeric
Data Field Name: hhsize

Min 1
Max 100

17.#8.10 Are you married/single/divorced?

Umeoa / Bado hujaoa / unatalaka?

Question Type = radio
Data Field Name: maritalstatus
Choose one response:

- Married (1)
- Single (2)
- Divorced (3)
- Widowed (4)

18.#8.10.1. Does your spouse work?
Je mwenzi wako anafanya kazi ipi?

Question Type = radio
Data Field Name: spouse_job
Choose one response:

- Yes, my spouse works regularly (1)
- No, my spouse doesn't work (2)
- Yes, my spouse works sometimes (3)

19.#8.10.2 If so, what is their job?
Kama ni hivyo, ni nini kazi yako?

Question Type = Text

Data Field Name: spouse_jobname

20.#8.11 What is the name of your lending group (group of five)?
Je jina gani ni la kikundi chenu?

Question Type = Text
Data Field Name: lgname

21.#8.12 How did you find out about Yehu? (Friend, Relative, Neighbor, Loan Officer, Other)?
Jinsi gani ulijua kuhusu Yehu?

Question Type = checkbox
Data Field Name: intro
Choose one response:

- Rafiki (1)
- Jamaa (2)
- Jirani (3)
- Afisa Mikopo (4)
- Kigine (5)

22.#8.13 What is the name(s) of the person who told you about Yehu?
Ni yapi majina ya mtu ailkuambia kuhusu Yehu?

Question Type = Text
Data Field Name: intro_name

23.#8.14 Within your lending group, do you have a role? Are you the center chief?

Uko na cheo chochote kwa hichi kikundi? Mwenyekiti, mweka hazina ama mwandishi? Je, wewe ndie center chief?

Question Type = radio
Data Field Name: grouprole
Choose one response:

- Chairperson / Mwenyekiti (1)
- Secretary / Mwandishi (2)
- Treasurer / Mweka hazina (3)
- No role (4)
- Center chief (5)

24.#9.1 Do you own your home?
Je, Unanyumba yako mwenyewe?

Question Type = radio
Data Field Name: homeowner
Choose one response:

- Own (1)
- Rent (0)

25.#9.1.1 Do you rent out rooms to other people?
Je, unakodisha vyumba kwa watu wengine?

Question Type = radio
Data Field Name: rent
Choose one response:

- No (0)
- Yes, I rent out rooms (1)

26.#9.1.2 If so, how many rooms?
Kama ndio, ni vyumba vingapi?

Question Type = decimal
Data Field Name: rent_rooms

Min 0
Max 100

27.#9.2 Do you have the following in your home?
Je, una zifuatazo katika nyumba yako?

[NOTE: Remember to scroll down through whole list!]

Question Type = checkbox
Data Field Name: things
Choose one response:

- Car/Truck Gari/Lori  (Car_Truck)
- Motorbike/Pikipiki  (Motorbike)
- Refrigerator/Jokofu/Friji  (Fridge)
- Electricity/Umeme  (Electricity)
- Television/Televisheni (TV)
- Sofa set/Seti za sofa  (Sofa)
- Bicycle/Baiskeli  (Bike)
- Radio/Redio   (Radio)

- Mobile Phone/Simu ya Mkono Simu  (Mobile)

28.#9.2.9.1 Did you buy any of these purchases in the last six months?
Je, umenunua vitu hivi katika miezi sita iliyopita?

[NOTE: Remember to scroll down through whole list!]

Question Type = checkbox
Data Field Name: things_recent
Choose one response:

- Car/Truck Gari/Lori  (Car_Truck)
- Motorbike/Pikipiki  (Motorbike)
- Refrigerator/Jokofu/Friji  (Fridge)
- Electricity/Umeme  (Electricity)
- Television/Televisheni (TV)
- Sofa set/Seti za sofa  (Sofa)
- Bicycle/Baiskeli  (Bike)
- Radio/Redio   (Radio)
- Mobile Phone/Simu ya Mkono Simu  (Mobile)

29.#9.3 Is this village your native home?
kijiji hiki ni makazi yako ya asili?

[NOTE: That is, the village that you are currently living in your native home?]

Question Type = radio
Data Field Name: home_current
Choose one response:

- Yes (1)
- No (0)

30.#9.3.1 If not, in what district is your native home?
Kama siyo, ni wilaya gani unatokea?

Question Type = Text
Data Field Name: home_district

31.#9.4 How long have you lived in this village?
Muda gani umeishi katika kijiji hiki?

[NOTE: Answer in years. If less than a year = 1]

Question Type = decimal
Data Field Name: home_time

Min 0
Max 100

32.#9.5 Do you send monetary support to relatives in other areas? We will not ask how much.
Je, we hutuma msaada wa kifedha kwa ndugu na jamaa katika maeneo mengine?

Question Type = radio
Data Field Name: outbound
Choose one response:

- Yes (1)
- No (0)

33.#9.5.1 How often?
Ni mara ngapi? Kila mwaka / mwezi / kwa wiki?

[NOTE: Number of times a year]

Question Type = numeric
Data Field Name: outbound_amt

Min 0
Max 100

34.#9.6 Do you receive money from people in other areas? We will not ask how much.
Je, kupokea fedha kutoka kwa watu katika maeneo mengine?

Question Type = radio
Data Field Name: inbound
Choose one response:

- Yes (1)
- No (0)

35.#9.6.1 How often?
Ni mara ngapi? Kila mwaka / mwezi / kwa wiki?

[NOTE: Number of times a year]

Question Type = numeric
Data Field Name: inbound_amt

36.#10.1 Did you work last week?
Ulifanya kazi wiki iliyopita?

Question Type = radio
Data Field Name: work
Choose one response:

- Yes (1)
- No (0)

37.#10.1.1 How many hours a day did you spend working last week?
Masaa mangapi ulitumia kufanya kazi kwa siku wiki iliyopita?

Question Type = numeric
Data Field Name: work_hrsdaily

Min 0
Max 24

38.#10.1.2 How many days a week did you spend working last week?
Ni siku ngapi uklifanya kazi wiki iliopita?

Question Type = numeric
Data Field Name: work_hrsdayswk

Min 0
Max 7

39.#10.2 What is your occupation?
Kazi yako ni nini lipi?

Question Type = Text
Data Field Name: work_name

40.#10.3 Do you work for someone else or do you run your own business?
Unafanya kazi kwa mtu au unafanya biashara yako mwenyewe?

Question Type = radio
Data Field Name: work_self
Choose one response:

- Government (1)
- Private business, not owned by respondent (2)

- Self employed (3)
- Other (4)

41.#10.3.1 If "Other," please specify

Question Type = Text
Data Field Name: work_other

42.#10.4 What businesses do you have? (list all current businesses) ?
Biashara yako ni nini? (Orodha biashara yote ya sasa)

Question Type = Text
Data Field Name: busi_name

43.#10.4.1  How long have you had each business?
Muda gani umefanya bishara hiyo (zote)?

Question Type = Text
Data Field Name: busi_time

44.#10.4.2 Do you employ anyone else in these businesses? How many employees does each
business have?

Je, wewe umeajiri mtu mwingine yeyote katika biashara hizi? Je, unawafanyakazi wangapi kwa kila
biashara?

 [NOTE: If they do not have employees mark 0]

Question Type = numeric
Data Field Name: busi_employ

45.#10.4.3 Are you considering expanding any of these businesses, and how?
Je, wewe ni kuzingatia kupanua yoyote ya biashara hizi, na jinsi gani?

Question Type = Text
Data Field Name: busi_futgrow

46.#10.5 Have you taken any actions to expand or diversify your business in the past six months? If
YES, please list.
Je umechukua hatua yoyote ya kupanua au kukuza biashara yako katika miezi sita iliyopita? Kama
ndiyo, tafadhali orodhesha.

Question Type = Text
Data Field Name: busi_pastexp

47.#10.6 Are there any businesses you are considering opening in the next year?

Je, kuna biashara wewe  unazingatia kufungua katika mwaka ujao?

[NOTE: these are new businesses beyond what they currently do]

Question Type = Text

Data Field Name: busi_futnew

48.#10.7 Do you travel outside the village for work?

Je, wewe husafiri nje ya kijiji kwa ajili ya kazi?

Question Type = radio

Data Field Name: worktravel

Choose one response:

- Yes (1)
- No (0)
- No response (888)
- Do not know (999)

49.#10.7.1 How many days a month are you away from the village?

Siku ngapi kwa mwezi unakuwa nje ya kijiji?

Question Type = numeric

Data Field Name: worktravel_days

Min 0

Max 400

50.#11.1 Do you have one or more outstanding loan, taken for any purpose, from any source other than Yehu? We will not ask how much or where.

Je, una moja au zaidi ya mkopo, ulichukuwa kwa madhumuni yoyote, kutoka chanzo chengine mbali na Yehu?

Question Type = radio

Data Field Name: otherloan

Choose one response:

- Yes (1)
- No (0)
- No response (888)
- I don't know (999)

51.#11.2 How many outstanding loans do you have?

Mikopo gapi bado huja maliza?

Question Type = numeric
Data Field Name: otherloan_outstand

Min 0
Max 900

52.#12.1 Do you have a bank or savings account?
Je, una akaunti ya benki? (Wakati una fedha za ziada, wewe huweka wapi?)?

[INTERVIEWER: probe where extra cash is kept: "When you have extra cash, where do you put it?"]

Question Type = radio
Data Field Name: svngs
Choose one response:

- Yes (1)
- No (0)
- No response (888)
- I don't know (999)

53.#12.2 How many of these accounts do you have?
Uko na akaunti ngapi?

Question Type = numeric
Data Field Name: svngs_no

Min 0
Max 100

54.#12.3 How much have you saved in the past six months?
Kiasi gani cha fedha umeweka kama akiba kwa miezi sita iliyopita?

Question Type = numeric
Data Field Name: svngs_amt

55.#13.1 Do you keep records of your money?
Je, we huweka rekodi ya fedha zako?

Question Type = radio
Data Field Name: records
Choose one response:

- Yes (1)
- No (0)
- No response (888)
- I don't know (999)

56.#13.1.1 May I see your record book, please?

Question Type = checkbox
Data Field Name: records_book
Choose one response:

- Yes, filled out - subject has record book and it is consistently filled out (3)
- Yes, partially filled out - subject has record book and it is partially filled out (2)
- Yes, no entries - subject has record book but it is not filled out (1)
- No, did not bring book (0)

57.#13.1.2 Who taught you to keep records?
Nani alikufundisha kuweka rekodi?

Question Type = Text
Data Field Name: records_who

58.#13.1.3 Are they a Yehu member?

Question Type = radio
Data Field Name: records_yehu
Choose one response:

- Yes (1)
- No (0)

59.#13.1.4 Do you use the records to make business decisions? Explain. [Fill in what they do with the records. If nothing, leave blank]?
Je, unatumia kumbukumbu hizo kufanya maamuzi ya biashara? Eleza.

Question Type = Text
Data Field Name: records_decis

60.#13.2.1 How do you calculate profit and loss? [PROBE] Can you give me an example? Perhaps from your own business?

Question Type = checkbox
Data Field Name: Interv1

Choose one response:

- Yes - subject can provide a definition (1)
- No - subject cannot explain (0)

61.#13.2.2 Do you know how to keep your own financial records? If yes, explain to me how you keep your records.

Question Type = checkbox
Data Field Name: Interv3
Choose one response:

- Yes, subject can explain (1)
- No, subject does not keep records or cannot explain (0)

62.#13.2.3 Are the financial accounts of your business run separately from the accounts of the household?
Je, akaunti zako za fedha za biashara ziko tafauti na zile za nyumbani?

Question Type = radio
Data Field Name: separate
Choose one response:

- Yes (1)
- No (0)
- No response (888)
- I don't know (999)

63.#13.2.4 Why should you separate business and personal expenses? [PROBE] Can you give me an example?

Question Type = checkbox
Data Field Name: Interv2
Choose one response:

- Yes - subject can provide reasoning as to why separation should be done (1)
- No - subject cannot provide adequate explanation (0)

64.#13.3 Do you know how much sales you had from your most active business last month? If so, how much?
Je, unajua kiasi gani ya mauzo wewe ulipata kwenye biashara yako ya kazi zaidi kwa mwezi uliopita?

[NOTE: If they don't know, leave blank]

Question Type = Text
Data Field Name: sales_amt

65.#13.4 Do you know how much profit you had from that business last month? How much?
Je, Unajua ni kiasi gani ya faida ulipata kutokana na biashara hiyo mwezi uliyopita?

[NOTE: If they don't know, leave blank]

Question Type = Text
Data Field Name: profit_amt

66.#14 List 3 numbers, have subject repeat them back. Increase length of number string until subject can no longer repeat back the sequence. Stop at string of 10 numbers. Only repeat number sequence once.

kumbukumbu nzuri: kumbukumbu za tarakimu?
Orodhesha namba 3 , Mwambie mhojiwa azirudie kwa kinyume. Endelea zoezi hilo kwa ku ongeza nambari zigine mpaka mhojiwa anapo shindwa kukumbuka mpangilio wa namba hizo. Simama unapofika idadi ya nambari 10?

[NOTE: Read the sequence and then check the appropriate box that they recalled correctly. Do NOT read the dash ( - ) it is there to make it easier for you to read the numbers. Once they cannot recall a string, stop, and swipe to go to the next question]

Question Type = checkbox
Data Field Name: digit
Choose one response:

- 7 2 0 (1)
- 7 2 0 1 (2)
- 7 2 0 1 - 9 (3)
- 7 2 0 1 - 9 6 (4)
- 7 2 0 1 - 9 6 4 (5)
- 7 2 0 1 - 9 6 4 3 (6)
- 7 2 0 1 - 9 6 4 3 5 (7)
- 7 2 0 1 - 9 6 4 3 5 8 (8)
- No response (888)
- I don't know (999)

67.#15 Take out RAVEN TEST from your packet. Explain #1 as an example, begin recording answers for #2?

[NOTE: Record answers with commas between them, e.g. 2, 6, 7. If subject stops or doesn't know the answer, stop Raven test and swipe to move on to the next question. ONLY ALLOW FIVE MINUTES MAXIMUM FOR THE RAVEN!]

Question Type = Text
Data Field Name: raven

68.#16 Measure number of different ideas generated by each scenario, give a maximum of five minutes for the two questions. NOTE: Separate answers from each question with a comma. TELL THEM: We are going to play a game where I describe a scenario and you imagine some outcomes. Pima idadi ya mawazo mbalimbali yanayotokana na mazingira ya kila aina, Toa dakika tano kwa ajili ya maswali matatu.

#16.1.  Pretend for a moment that you are out of money and that you cannot buy necessary supplies. What would you do?
Fikiria kwa muda iwapo umeishiwa na fedha na kwamba huwezi kununua vifaa muhimu. Utafanya nini?

#16.2.  Pretend for a moment that your landlord tells you to move your shop within two months. What would you do?
Fikiria kwa muda uko na duka na mwenyewe asema uondoke kati ya miezi miwili, utafanyaje?

Question Type = Text
Data Field Name: ideas

69.#17.1 Which of the statements applies the most to you?
Ni yapi ya kauli zifwatazo zinatumika zaidi kwako?

Question Type = radio
Data Field Name: biz1
Choose one response:

- Mmiliki wa biashara A: "Ninaridhika pale biashara yangu inaweza kumudu mahitaji ya familia yangu na mimi mwenywe tu." (0)
- Mmiliki wa Biashara B: "Mimi naridhika pale biashara yangu inakuwa na inazidi kuwa kubwa zaidi na zaidi." (1)

70.#17.2 Which of the statements applies the most to you?
Ni yapi ya kauli zifwatazo zinatumika zaidi kwako?

Question Type = radio
Data Field Name: biz2
Choose one response:

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- Mmiliki wa biashara A: "Kama mimi napata fedha za kutosha kwa ajili ya familia yangu, kwangu hiyo tu inatosha." (0)
- Biashara mmiliki B: "Nataka biashara yangu kukua na kuongezaka sana iwezekanvyo." (1)

71.#17.3 Which of the statements applies the most to you?
Ni yapi ya kauli zifwatazo zinatumika zaidi kwako?

Question Type = radio
Data Field Name: biz3
Choose one response:

- Mmiliki wa biashara A: "Mimi huwa nafanya hii biashara kwasabau sina biashara nyingine ya kufanya" (0)
- Biashara mmiliki B: "Mimi napenda sana kufanya biashara hii na singependa kumfanyia mutu kazi." (1)

72.18.1.        Suppose a young woman works in a factory. She has barely managed to save a very small amount of money. Now her first cousin (the child of one of her siblings) comes to her and tells her that she needs money badly since she has no work at all. How much obligation do you think the factory worker has to share her savings with her first cousin?

Tuseme mwanamke mmoja anafanya kazi katika kiwanda. Kwake imekuwa vigumu  kuokoa kiasi kidogo sana cha fedha. Sasa binamu wake wa kwanza (mtoto wa mmoja wa ndugu zake) akaja kwake na akamwambia kwamba anahitaji pesa vibaya kwa vile yeye hana kazi. Kiasi gani cha wajibu unafikiri mfanyakazi wa kiwanda anao hadi kushiriki akiba yake na binamu wake wa kwanza?

Question Type = radio
Data Field Name: oblig1
Choose one response:

- Wajibu nguvu (1)
- Wajibu si hivyo nguvu (2)
- Hakuna wajibu (3)

73.18.2.        Now suppose in the story it was not her first cousin, but a distant cousin who came to the factory worker and said she had no money. How much obligation do you think the factory worker has to share her savings with her distant cousin?

Sasa tuseme katika hadithi haikuwa binamu wake wa kwanza, lakini binamu wa mbali ambaye alikuja kwa mfanyakazi wa kiwanda na alisema yeye hakuwa na pesa. Kiasi gani cha wajibu unafikiri mfanyakazi wa kiwanda anao hadi kushiriki akiba yake na binamu wake wa mbali?

Question Type = radio
Data Field Name: oblig2

Choose one response:

- Wajibu nguvu (1)
- Wajibu si hivyo nguvu (2)
- Hakuna wajibu (3)

74.18.3.        Some people say that a child should be taught to give preference to a friend or relative, even when others have a more rightful claim. Others say a child should be taught not to break an important rule even for a friend or relative. Do you think a child should be taught to give preference to a friend or relative?

Baadhi ya watu wanasema kwamba mtoto anapaswa kufundishwa kwa kutoa upendeleo kwa rafiki au jamaa, hata wakati mwengine watu wengine ndio wafaa wapate haki yao. Wengine wanasema mtoto anapaswa kufundishwa si kuvunja sheria muhimu hata kwa ajili ya rafiki au jamaa. Unafikiri mtoto wanapaswa kufundishwa kwa kutoa upendeleo kwa rafiki au jamaa?

Question Type = radio
Data Field Name: oblig3
Choose one response:

- daima (1)
- kawaida (2)
- wakati mwingine (3)
- mara chache (4)
- kamwe (5)

75.[TAKE OUT LIKERT SCALE and explain the different answers and that you want their opinion on the next few questions, not to think too hard and answer quickly]?

#19.1 My friends think of me as a good source of information when it comes to new products or buying things.
Rafiki zangu hunichukulia mimi kama chanzo kizuri cha habari inapokuja kwa bidhaa mpya au kununua vitu.

Question Type = radio
Data Field Name: mm5
Choose one response:

- Na Kubali kwa Sana (1)
- Na kubali  (2)
- Sina Uhakika (3)
- Na Kataa (4)
- Sikubali Kabisa (5)

76.#19.2 Right now, staying with Yehu is a matter of necessity more than desire.
Hivi sasa, kukaa na Yehu ni suala la umuhimu zaidi kuliko hamu.

Question Type = radio
Data Field Name: cc1
Choose one response:

- Na Kubali kwa Sana (1)
- Na kubali  (2)
- Sina Uhakika (3)
- Na Kataa (4)
- Sikubali Kabisa (5)

77.#19.3 Whenever there is a chance to get actively involved, I take it.
Wakati wowote kuna nafasi ya kupata kushiriki kikamilifu, mimi hufanya hivyo.

Question Type = radio
Data Field Name: pi3
Choose one response:

- Na Kubali kwa Sana (1)
- Na kubali  (2)
- Sina Uhakika (3)
- Na Kataa (4)
- Sikubali Kabisa (5)

78.#19.4 I like helping people by providing them with information about many kinds of products.
Napenda kuwasaidia watu kupata  taarifa kuhusu aina nyingi za bidhaa.

Question Type = radio
Data Field Name: mm2
Choose one response:

- Na Kubali kwa Sana (1)
- Na kubali  (2)
- Sina Uhakika (3)
- Na Kataa (4)
- Sikubali Kabisa (5)

79.#19.5 It would be very hard to leave Yehu now, even if I wanted to.
Itakuwa vigumu sana kuondoka Yehu sasa, hata kama mimi nataka.

Question Type = radio
Data Field Name: cc2

Choose one response:

- Na Kubali kwa Sana (1)
- Na kubali  (2)
- Sina Uhakika (3)
- Na Kataa (4)
- Sikubali Kabisa (5)

80.#19.6 I use opportunities quickly in order to attain my goals.
Mimi hutumia fursa haraka ili kufikia malengo yangu.

Question Type = radio
Data Field Name: PI5
Choose one response:

- Na Kubali kwa Sana (1)
- Na kubali  (2)
- Sina Uhakika (3)
- Na Kataa (4)
- Sikubali Kabisa (5)

81.#19.7 One negative consequence of leaving Yehu would be the problem of few alternatives.
Moja ya matokeo mabaya ya kuondaka Yehu ni tatizo la njia mbadala chache.

Question Type = radio
Data Field Name: cc6
Choose one response:

- Na Kubali kwa Sana (1)
- Na kubali  (2)
- Sina Uhakika (3)
- Na Kataa (4)
- Sikubali Kabisa (5)

82.#19.9 I actively approach problems.
Mimi nina tatua matatizo yangu kikamilifu.

Question Type = radio
Data Field Name: pi1
Choose one response:

- Na Kubali kwa Sana (1)
- Na kubali  (2)
- Sina Uhakika (3)

- Na Kataa (4)
- Sikubali Kabisa (5)

83.#19.10 I would be very happy to get more loans for Yehu as long as I am working.
Ningependa kupata mikopo zaidi kwa Yehu kama naendelea kufanya kazi.

Question Type = radio
Data Field Name: ac1
Choose one response:

- Na Kubali kwa Sana (1)
- Na kubali  (2)
- Sina Uhakika (3)
- Na Kataa (4)
- Sikubali Kabisa (5)

84.#19.11 I feel like part of the family at Yehu?
Najisikia kama sehemu ya familia ya Yehu

Question Type = radio
Data Field Name: ac5
Choose one response:

- Na Kubali kwa Sana (1)
- Na kubali  (2)
- Sina Uhakika (3)
- Na Kataa (4)
- Sikubali Kabisa (5)

85.#19.12 I like introducing new products and things to my friends.
Napenda kuonesha/anzisha bidhaa mpya na mambo mapya kwa marafiki zangu.

Question Type = radio
Data Field Name: mm1
Choose one response:

- Na Kubali kwa Sana (1)
- Na kubali  (2)
- Sina Uhakika (3)
- Na Kataa (4)
- Sikubali Kabisa (5)

86.#19.13 I feel emotionally attached to Yehu?
Nina hisia ya upendo na Yehu

Question Type = radio
Data Field Name: ac4
Choose one response:

- Na Kubali kwa Sana (1)
- Na kubali  (2)
- Sina Uhakika (3)
- Na Kataa (4)
- Sikubali Kabisa (5)

87.#19.14 Whenever something goes wrong, I search for a solution immediately.
Mara yoyote mambo yakienda vibaya, mimi hutafuta jawabu mara moja.

Question Type = radio
Data Field Name: pi2
Choose one response:

- Na Kubali kwa Sana (1)
- Na kubali  (2)
- Sina Uhakika (3)
- Na Kataa (4)
- Sikubali Kabisa (5)

88.#19.16 People ask me for information about products, or where to get things.
Watu huniuliza kuhusu taarifa za bidhaa, au mahali ya kupata vitu.

Question Type = radio
Data Field Name: mm3
Choose one response:

- Na Kubali kwa Sana (1)
- Na kubali  (2)
- Sina Uhakika (3)
- Na Kataa (4)
- Sikubali Kabisa (5)

89.#19.17 I take initiative immediately even when others do not.
Mimi huchukua hatua mara moja hata wakati wengine hawaja shugulika.

Question Type = radio
Data Field Name: pi4
Choose one response:

- Na Kubali kwa Sana (1)
- Na kubali  (2)
- Sina Uhakika (3)
- Na Kataa (4)
- Sikubali Kabisa (5)

90.#19.18 Too much of my life would be disrupted if I decided I wanted to leave Yehu now.
Mengi sana maishani mwangu yatavurugika kama nitaamua kuondoka Yehu sasa.

Question Type = radio
Data Field Name: cc3
Choose one response:

- Na Kubali kwa Sana (1)
- Na kubali  (2)
- Sina Uhakika (3)
- Na Kataa (4)
- Sikubali Kabisa (5)

91.#19.19 I feel like I have very few options besides Yehu.
Najisikia kama sina mibadla  kando  ya Yehu.

Question Type = radio
Data Field Name: cc4
Choose one response:

- Na Kubali kwa Sana (1)
- Na kubali  (2)
- Sina Uhakika (3)
- Na Kataa (4)
- Sikubali Kabisa (5)

92.#19.20 I feel a strong sense of belonging to Yehu?
Nahisi kuwa na umoja na Yehu

Question Type = radio
Data Field Name: ac3
Choose one response:

- Na Kubali kwa Sana (1)
- Na kubali  (2)
- Sina Uhakika (3)
- Na Kataa (4)
- Sikubali Kabisa (5)

93.#19.21 Being part of Yehu has a great deal of personal meaning for me.
Kuwa sehemu ya Yehu ni muhimu sana kwangu.

Question Type = radio
Data Field Name: ac6
Choose one response:

- Na Kubali kwa Sana (1)
- Na kubali  (2)
- Sina Uhakika (3)
- Na Kataa (4)
- Sikubali Kabisa (5)

94.#19.22 Yehu does not help me very much.
Yehu haina msaada kwangu sana.

Question Type = radio
Data Field Name: cc7
Choose one response:

- Na Kubali kwa Sana (1)
- Na kubali  (2)
- Sina Uhakika (3)
- Na Kataa (4)
- Sikubali Kabisa (5)

95.#19.23 I am particularly good at realizing ideas.
Mimi nina uwezo mzuri wa kutambua wazo la kibiashara.

Question Type = radio
Data Field Name: pi6
Choose one response:

- Na Kubali kwa Sana (1)
- Na kubali  (2)
- Sina Uhakika (3)
- Na Kataa (4)
- Sikubali Kabisa (5)

96.#19.24 If someone asked where to get the best buy on several types of products, I could tell him or her where to go.

Kama mtu akiuliza kuhusu kupata bithaa bora kwa bei mzuri, mimi ni naweza kumwambia aende wapi.

Question Type = radio
Data Field Name: mm4
Choose one response:

- Na Kubali kwa Sana (1)
- Na kubali  (2)
- Sina Uhakika (3)
- Na Kataa (4)
- Sikubali Kabisa (5)

97.You're done! Please thank the subject and dismiss them.

What was the comprehension level of the respondent?

Question Type = radio
Data Field Name: comprehension
Choose one response:

- Very high (1)
- High (2)
- Low (3)
- Very low (4)

98.Please note any other additional things about the interview or client that might be pertinent, including issues and/or interruptions.

If possible, note any interesting stories that they may have told.

Question Type = Text
Data Field Name: Comments

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