A global study between cost reduction, value creation and construction technical service adoption in housing microfinance

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Research Thesis

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List of Abbreviations

AE	Administrative Expenses
BoP	Base of the Pyramid
CA	Construction Advice
CpC	Cost per Client
CTA	Construction Technical Assistance
DIY	Do-It-Yourself
FSP	Financial Service Provider
GLP	Gross Loan Portfolio
HIL	Home Improvement Loan
HILP	Home Improvement Loan Program
HfHI	Habitat for Humanity International
HMF	Housing Microfinance
HMFI	Housing Microfinance Institution(s)
MF	Microfinance
MFI	Microfinance Institution
NBFI	Non-Banking Financial Institution
NGO	Non-Governmental Organization
PE	Personnel Expenses
ROE	Return on Equity
TA	Technical Assistance
UN	United Nations

Introduction

Between 2015 and 2030 our world will hold 1.1 billion new city dwellers, increasing the global urban population by 28 percent, from 4.0 billion in 2014 to 5.1 billion in 2030. Virtually all of this future growth will occur in cities (United Nations, 2014). When examining current processes for accommodating this future population with adequate shelter (including associated services and infrastructure amenities such as sewage, roads, schools, etc.), current housing fulfillment practices and policies are alarmingly insufficient. In addition to future demand, the current housing deficit has not subsided in recent decades due to inadequate formulation of responsive policies and programs, and failure to innovate away from the status quo, business-as-usual approaches. Attempting to convey the magnitude of the current housing crisis, the United Nations Human Settlements Programme (UN Habitat) has calculated that 96,170 housing units must be constructed *each day* until 2030 in order to meet current global demand[1], not to mention the associated infrastructure, policy, legal, and financial services that accompany housing.

For decades, a growing consensus of policy experts and planning officials have recognized that when equipped with proper support frameworks, incremental (alternatively referred as 'self-help' or 'progressive') housing is the most effective- and arguably 'only' intervention capable of adequately responding *at equivalent scale to the challenge*. A great body of research has further studied the broader outcomes resulting from well-planned, community-led incremental construction processes. In addition to producing housing units, self-help processes themselves- in lieu of supply side approaches- can also foster and stimulate a number of social benefits: capacity-building for economic development, improvements to public and family health, increased safety, improved education and tightened social cohesion. It is these "gradual improvements [that] can contribute to the broader goal of community development and slum improvement" (Painter et al, 2006). Therefore, the *act of building itself* builds community.

In the final quarter of the 20th century, however, several innovative concepts emerged for serving the poorest individuals who are systemically excluded from formal financial systems.

[1] https://unhabitat.org/wp-content/uploads/2005/11/GRHS05L2.pdf

Microfinance Institutions (MFIs) were born and their models refined. Eventually, customer demand led MFIs to adjust their processes for financing housing improvements in addition to standard consumer and working capital enterprise loans. As an offshoot of microfinance, Housing Microfinance Institutions (HMFIs) emerged, both as an adjunct, value-add lending service provider for existing micro loan customers. These product off-shoots also cleaved an entire branch of stand-alone entities focused solely on housing loan products.

Yet, despite these gains, the current delivery of loans made through HMFIs are not meeting the scale of customers' needs, satisfying only a trifle of the housing demand. This phenomenon calls into urgent examination which factors might be stifling the supply of housing financial services. The total global BOP housing market is estimated to be $331.8 billion, reportedly bigger than the transportation sector and smaller than energy sector (Hammond et al, 2008). Therefore, commercial opportunities exist in abundance yet are being unfulfilled. Consequently, this shortfall of limited supply and high demand is affecting the potential for higher housing delivery rates and calls into focus which barriers might be preventing the microfinance sector's important contribution in delivering a critical, basic human right: the right to an affordable home.

This paper briefly chronicles the evolution of housing microfinance and the sub-sector's current state as it grapples to reach maturity via scalable, replicable models. While several studies have stated in generalized terms the common constraints that are inhibiting a greater supply of housing microfinance, this paper principally explores the role of Construction Technical Assistance (CTA) services offered by Housing microfinance institutions, and the degree to which they serve as a critical component in successful housing microfinance business models. This paper also explores the external economic conditions that might affect a HMFI's decision to deploy technical assistance, as well as internal indicators that might expose tendencies that govern a housing microfinance institution's decision to add CTA services. Lastly, an opinion survey conducted amongst a global sample of MFIs poses hypothetical conditions to try to gauge the cost and value thresholds necessary for CTA engagement.

It is also important to note, this paper deliberately refrains from examining the important- and ultimate- social outcomes of housing microfinance. Undoubtedly, a home is not only a building block to shelter the bodies of occupants, but a stabilizing haven for cultivating improved livelihoods, communities and societies. Therefore, both housing microfinance and traditional microfinance play an important role for all income and social tiers of society, not only the lowest-income groups.

Therefore, this paper explicitly focuses on the aspects contributing to a lending institution's commercial viability and sustainability. The underlying implication throughout this paper is that improved business models and cost-to-value efficiencies will ultimately lead to greater scale of delivery, and overall, improved social outcomes.

SECTION 2- Literature Review and Research Question Presentation

2.1 Overview of Traditional Microfinance versus Housing Microfinance (HMF)

An expansive amount of research and examination has focused on the microfinance model itself (providing financial services to customers at the lowest income tiers of society who are unserved by traditional banks), as well as the multitude of variants that emerged in the model's global expansion, and model's life cycle of maturity and in some regions, market saturation. Because the microfinance model bridges oftentimes independent sectors of social development, private sector finance, and economics, an even wider ranging degree of scrutiny has been levied on the model, particularly towards the effectiveness of its principle dual aims of alleviating social inequity (through supporting entrepreneurship in customers) and ensuring financial sustainability of the lending institution through the generation of revenues.

Origins of the Microfinance Model

It is widely accepted that the microfinance model originated from a group of forty-two women in Jobra village, Bangladesh, who in 1976 convinced a young economist, Muhammad Yunus, to provide a loan of twenty-seven US dollars. Against the advice of peers and experts, Yunus subsequently founded Grameen ("Village") bank based upon this early case of using existing social norms to activate group-based guarantors. Within a few years Yunus refined the model, soon proving its commercial viability as well as demonstrating evidence of the disproportionate positive outcomes in the lives of the poorest individuals in Bangladeshi society. The model expanded quickly. In 1982, Grameen had over 28,000 customers, and in 1987 Grameen launched operations in Malaysia, internationalizing a standard model (Yunus, 1999). Since then the core principles of the model has been replicated globally with minor variances and adaptations.

Since this time, widespread arguments have been made for and against the overall effectiveness of microfinance on reducing poverty while turning a profit. While these arguments will not be discussed in this paper, one recent study demonstrates that the cumulative, comprehen-

sive effects of microfinance- measured across several decades- contributes negatively to poverty overall, (with widespread examples of shortcomings) (Zhang 2017).

With this stated, a significantly lesser degree of research has explored the effectiveness of the same microfinance model as applied to housing. As we shall see in the next section, a number of experts have claimed the housing microfinance market is consistently impeded by a number of factors (which shall be discussed later), largely stemming from a shortage of financial supply, despite consistently substantial levels of pent-up demand in virtually every global region. But first, it is necessary to briefly understand similarities between housing microfinance and traditional microfinance, as well as the differences and distinguishing factors between the two practices.

Key Similarities and Differences

Key similarities between housing and traditional microfinance demonstrate, in essence, the following core similarities: small loan amounts compared to standard formal sector forms of finance, a low requirement of collateral or initial deposit, usage of market forces in determining interest rates, and creditworthiness based on a customer's cashflow, social reputation and individual character (Goldberg, Palladini, 2010). Specifically, common practice among MFIs entails traditional microfinance loans involving amounts under $100, rarely exceeding $250. Such loans are generally working capital loans used for entrepreneurial activities conducted by the borrower, such as petty trading, which enables the loaning agency to recuperate from the added value of the customer's earnings- both customer and agency benefit from the income-generating activities of the customer and the enabling activities of the lending institution.

Compared to traditional mortgages, in housing microfinance loan amounts are significantly smaller in comparison, making them more similar to microfinance products in scale. Even when customers have the ability to take out a mortgage loan for an entire house, or obtain finance for new home construction, they deliberately choose against this level of commitment, "prioritizing other family and business needs rather than devoting all their repayment capacity to a new home" (Mesarina and Stickney, 2007). Secondly, the authors claim that

customers at low-incomes tend to possess shorter-term time horizons, where they "view and manage their finances within a typical time horizon of no longer than 18 to 24 months" (Mesarina and Stickney, 2007). Therefore, customers themselves possess outlooks dissimilar to traditional mortgage loan customers at middle and upper income-tiers.
For these reasons of customer perceptions, housing MF has evolved to more resemble traditional microfinance than traditional mortgage finance. No or little collateral amounts are usually required, land title is oftentimes not mandatory, and creditworthiness is derived from previous microfinance loan history. In one multi-regional study (Hepner, 2016), over 80 percent of HMFIs require a "credit history" from customers, implying nearly all customers are existing customers with established relationships and payment histories, since formal credit rating systems are unlikely to exist.

Different uses of loan capital

Aside from customer perceptions of finance, the primary differences are also largely due to the practical aspects of the construction process itself. This process, in turn, informs customer's intentions in which they would apply a loan. The cost of building materials, particularly regarding commodities such as cement, can fluctuate significantly in supply and demand economic forces, directly affecting a number of factors: a borrower's capacity, loan amounts as well as payback periods. In some cases, HMFIs of considerable stature have formed partnerships with local building materials suppliers using their purchasing power to lock down fixed prices in exchange for exclusive use by customers. In other cases, HMFIs have actually served as a materials distributor. For example, by its sixth year of operation, an NGO in Mexico, FUNHAVI, reportedly was earning eleven percent of its revenues from direct sales of construction materials to clients (Malhotra, 2003). Therefore, we see in this case, when HMFIs can operate at large scale, they can sometimes leverage strategic positions in the construction materials supply chain. In a country dominated by global cement giant, CEMEX, the HMFI Funhavi presumably bought in volume and still managed to sell to clients at or below retail again benefiting both HMFI and customer.

Therefore, due to building material market dynamics, customer's needs tend to require loan amounts higher than traditional microfinance, with the average housing loan range spanning $200 up to $5,000 USD. In order to remain competitive in the crowded traditional MF mar-

ket, HMFIs have distinguished their offer by positioning their housing products to be as attractive as possible. Examples of these attractive offers include extending loan repayment rates (1.5 to 4 years) and reducing interest rates compared the rates those customers habitually experienced when they took out a working capital loan. Because of the longer repayment periods, the previous social guarantees of traditional MF pose more of a challenge to ensure creditworthiness. Hence HMFIs operate with a more individualized customer and rarely lend in the traditional MF group format for disbursements and guarantees.

Different internal financial realities

In this manner HMFIs offer home loans primarily as value-add alternatives to their standard repertoire of MF products, thereby diversifying their product offer and varying cash inflows for longer term sustainability. Because many MFIs have been feeling increasing internal pressure to prolong their own revenue cycles, products with longer-term returns, such as housing loans, enable them to offset the relatively short-cycle returns obtained by standard MF loans. Even so, not all MFIs can provide housing loans, since these long-term returns first require endowments of longer-term financial capital. Secondary financial markets, which typically provide this source of long-term capital and share the default risk in established formal banking systems, simply do not exist in many emerging economies with nascent or informal land markets. Therefore, multi-product MFIs have typically capped the share of housing products at no more than a 21% share of total portfolio. On average, housing microfinance represents a 16% share of overall portfolios (Hepner, 2016), with the variances demonstrably separated by institutional type: commercial banks possess the smallest portfolio share of housing microfinance products with 10.7 percent, whereas on average NGOs hold 25 percent in their portfolios. One Indian organization, SEWA Bank, operates with an estimated 40% housing loan share of portfolio, (Malhotra, 2003), and this appears to be an anomaly.

This secondary, alternative position that housing loans hold in a MFI's product portfolio could explain one reason housing microfinance has reached limited scale despite high demand and high market potential. Simply put, MFIs are not established on a model suitable for the unique conditions of housing. Further study will be necessary if this prioritization tru-

ly is a determining factor. Yet, several organizations have sidestepped the need for diversification beyond core MF products, and have deliberately specialized in housing financial products as a core business activity with their business models established accordingly. Commonly derived from non-governmental organizations, foundations, and the private sector, many of these emerging housing-only MFIs have typically been officially categorized as non-financial banking institutions (NBFIs), limiting their ability to legally take deposits. This inability might not be a hindrance, however, as these organizations can operate in more nimble manner with less regulation, enabling them to flex and adjust their value propositions, experiment and refine their products to meet customers' changing needs and market circumstances.

> "HMF operators fall into three tiers. The first tier consists of commercial banks and microfinance banks. The second tier encompasses non-banking microfinance institutions that offer credit only, as well as HMFIs and cooperatives. The third tier is made up of unregulated entities such as informal money lenders, community-based savings groups and mutual entities," (de Jager, 2014).

Therefore, when disbursing HMF loans, an institution must carefully consider factors outside of the scope of traditional MF determinants: the householder's intentions for the loan, the quality of supplemental support and resources readily available to her (internal or external to the HMF loan), as well as prior familiarity in the process of construction itself by both customer and loan officer. Simply put, an HMFI has a vested interest in ensuring the feasibility of the project's actualization for the repayment of the loan. Therefore, for these reasons most MFIs tend to reserve housing loans only for known customers with established track-records and relationships. While necessary for reducing risk for individualized loans, the longer development time for building relationships in these reserved lending practices increase cost and resources involved. The aggregate of these selection factors could be an additional explanation for the limited scale of housing MF. As a result, customers' access to finance is severely impeded, countering the basic mission of serving the lowest income tiers in society.

Table 2.1.1: Comparison of traditional microfinance, housing microfinance and traditional mortgages

	Traditional Microfinance (MF)	Housing Microfinance (HMF)	Traditional Mortgage
Average Loan Amounts	$100-300 USD	$200-5,000 USD	Cost of complete home
Loan Repayment Period	3-9 months	1.5 to 4 years	10 to 30 years
Pre-requisities, Collateral Requirement	None to little	Multiple co-signers, collateral substitutes; Land security documents (vs. land title)	Land title, Monetary deposit
Interest rates	High (Market determined)	Lower than MF (Market determined)	Low (Market determined)
Creditworthiness Determination	Social reputation in community	Individually determined as previous MF customer	Individually based, Credit Ratings, Current Income
Repayment capacity	Potential income generation	Current income	Current income
Loan uses	Entrepreneurial/Business activities	Incremental home improvements (home infrastructure upgrades, room expansion)	Complete house purchase or construction
Loan Effects on Borrower	Direct Income	Indirect Income (if home based occupation); increased asset base; improved family health	Increased Asset base

Different impacts for loan recipients

The impacts of traditional MF and housing MF produce similar, albeit indirect, degrees of improvement for individual households, as well as positive macro-level outcomes at a community scale. Since traditional MF tends to focus on entrepreneurship, any positive effects to the customer's life and family are resultant from the income generated from the loan. The customer is able to afford education for her children or purchase medicines, for example. When the home is the base of income activities however, such as petty trading or a room rental, a home improvement loan can amplify the positive outcomes- not only through an increase in income generation for the householder, but also by directly enabling a higher quality home environment for learning (such as improved or initial electrical installation) and improved health (through improved sanitation and household air quality). Malhotra cites a study of Grameen bank's home loan program which concluded, "clients with Grameen homes

equipped with Grameen's construction standards of cement pillars and sanitary latrines had 50 percent fewer incidences of illnesses than those without Grameen houses." He adds that a seventy-eight percent of customers of housing loan program in Bolivia and Guatemala reported improved health due to home upgrades in sanitation, roofing, water, and electrical connections, (Malhotra, 2002). Furthermore, a recent survey conducted by Habitat for Humanity (Hepner, 2016) shows that out of eight criteria measuring the motivations HMFIs offering housing loans, the top two were 'meeting customer demand' and 'generating social impact.' Therefore, we can see that the sector as a whole recognizes that housing microfinance yields more than purely physical housing units and income generation for MFIs.

How and why HMF has evolved away from the MF model

In order to understand how and why HMF has evolved as a specialized, stand-alone product, one must start from the perspective of the customers- low-income householders at the socio-economic Base of the Pyramid (BoP), predominantly residing in countries from economic classifications of low-income to upper-middle-income by the World Bank. Our global population is becoming more urban, as increasingly, householders are re-settling to cities where work opportunities can be obtained, oftentimes finding housing only on the outer, peri-urban fringes or precarious pockets in urban cores such as flood zones or steep hillsides. The rapid expansion of cities of the global south are occurring via the inevitable incorporation of new peri-urban communities, as well as internal population growth, or urban in-migration. Furthermore, the decision to invest in improving one's home commonly arises only after a householder senses a *perception* of permanence- not necessarily upon obtaining official legal title documents. In many cases the householder may have ample funds to build a complete new house, but may strategically opt to improve in selective increments due to uncertainty of tenure. In other cases, a householder will start an initial stage of construction to lay her claim to the property, then commence the long process of securing official legal tenure, while simultaneously upgrading the home in gradual stages of increased durability and permanence. Many other times land tenure can still be *secured* when title cannot be produced. This comes either through written agreement between buyer and seller of land, long-term rental agreement between the client and government, local law qualifying for years on property, or accepted tax payments on property. Considering the non-financial realities, we can see why

incremental behavior is strategic, not just financial, and why a complete home mortgage through formal banks would insufficiently serve a BoP customer's needs.

When an urban householder decides to commence a phase of construction, readily available building materials generally come in the form of industrialized products, such as cement and corrugated iron roofing sheets, obtained through multi-tiered distribution channels. This sourcing method is in contrast to inhabitants of rural contexts where building materials are more likely to be either naturally occurring, sourced close at hand, with fewer intermediaries to drive up costs- (although distribution to remote locations also add cost). Additionally, rural site settings are more likely to enable space for staging and storing building materials, an impossibility in dense urban areas where one must install any received materials immediately in order to enable receipt of another delivery. For these reasons, materials in urban and peri-urban areas are most likely to be imported, heavily taxed, and require transport through dense cities (i.e. vehicle-restricted informal settlements)- all conditions which increase costs. These realities make building materials prohibitively expensive for low-income earners, and disproportionately more costly than labor. High building material costs also affect rental markets since the costs of construction exceed renters' abilities to pay. This compounds into a shortage of rental housing supply, further escalating the affordability and availability of rental unit prices. Due to building materials accessibility, we can see another reason why housing production is predominantly carried out by householders themselves- regardless of income level- outside of formal financial systems. For example, in Morocco, ninety-two percent of urban householders constructed their homes without access to formal finance, (Malhotra, 2002). As a result, housing microfinance models based on an incremental basis strategically fit with a customer's needs.

Traditional mortgage loans

Through these examples we can see why traditional mortgage loans offered via the formal, commercial banking sector have routinely proved insufficient for low-income (and in many cases, moderate income) segments. According to Daphnis, traditional mortgage lending failed outside of the 'western world' largely because the only way low-income borrowers could afford monthly repayments for the high loan amounts were to stretch a mortgage over

extensive periods of time (10-30 years). When sources of funding actually existed to match these payment cycles, poor borrowers were unable to sustain consistency of payment due to the nature of their informal, sporadic income generation. This mismatch between customers operating informally and the standards of formal systems created an innate disincentive for outside secondary mortgage markets to invest in securities backed by such loans, thereby inducing a flawed mortgage system from the start. Hence, the reasons why housing finance is not reaching a wider scale is due to entrenched economic systems. The combination of disincentivized secondary mortgage markets for HMFIs as well as sporadic income generation by customers has pushed commercial mortgage lending in emerging economies to focus only on the wealthiest tiers of society. These top-income customers can mitigate risk via substantial deposits or collateral, and are willing to pay exorbitant interest rates compared to mortgages in developed economies.

Government interventions: direct housing delivery and subsidies

For many, the reflexive response to an acute housing deficit situation might be to expand direct government housing provision. Afterall, it may appear that governments have the means to source financing through taxation, leverage economies of scale and supply tens of thousands of units in efficient and widespread ways, and thereby make an abundant supply of housing units to ultimately bringing down prices to affordable levels for the poorest households. While this approach may have worked in countries with strong institutional capacity, it has done so with mixed results. Furthermore, the actual track record of government delivery in emerging economies in every global region over the past three decades has been meager in both numbers of units produced and in driving down costs per unit. "Many governments have now adopted a more realistic enabling approach towards housing, and are attempting to increase the supply of housing by shifting from a focus on constructing housing to supporting the housing production of others, such as the private sector, cooperative societies, or individual households themselves, with help from various regulatory and financial tools," (UN Habitat, 2008).

Attempts have also been made at government-assisted housing loan programs, such as subsidizing interest rates for the poor, however nearly all have shown little effect despite allocation

of considerable resources. Daphnis describes it thus: “These programs, while sometime useful in a specific national context, tend to be excessively bureaucratized and have never come close to offering a promise for worldwide replication,” (Daphnis, 2004). Furthermore, using an Indian context, Malhotra goes as far as arguing that government subsidies erodes the establishment of effective housing microfinance products made by institutions already highly capable of serving poor customers. “Interest rate ceilings or subsidies, or `debt forgiveness’ policies, by national governments distort overall financial sector policy and constrains the development of viable institutions,” (Malhotra, 2002).

Contrary to Malhotra and Daphnis, the Peruvian government has allocated $1.05 trillion USD from the period of 2003 to 2015 in its Techo Propio program. These non-refundable subsidies assist families’ initial loan payments on a home. Another program, Mivivienda, assists lower-middle and middle-income families in affordable housing down payments. In general, the Peruvian government decreases subsidies as the price of a home increases, directing more resources towards lower income tiers. Despite these funding figures, no additional data was found on the impact in units delivered, nor on the overall housing shortfall among lower and middle classes in Peru.

As we can see, traditional mortgage finance via the private sector, and top-down government delivery has proven limited in positively affecting large proportions of lower income households. From a purely cost basis, the least costly way to improve the abilities of householders to obtain adequate housing is through the expansion of self-build practices. However, this entails strong support systems for improving the quality of construction and ensuring life safety, reducing costs of building materials, innovating pro-poor legal frameworks for land entitlement, and developing new inroads to financial accessibility. Frequently, outside of friends, neighbors and family, the only external financing options available to most householders at the BoP are offered through widely available informal money lenders. While widely considered as unscrupulous, these money lenders use social systems and local knowledge to determine lending rates and ensure repayment.

Increasingly present are microfinance institutions, who enter neighborhoods charging similar or even higher rates than informal money lenders, and can take many years earning the pub-

lic's trust. Yet, despite their growing prevalence, standard microfinance loans are frequently insufficient in funding housing improvements: traditional loan amounts, as stated above, tend to be ineffective in covering the full costs of building materials and labor, even for incremental household upgrades. Furthermore, interest rates with traditional MF would be an impossibility with the larger loan amounts required of construction processes, and the repayment durations too short to be affordable for customers' means. With formal financial sector models proving to be inaccessible, and standard MF interest rates and repayment periods unaffordable, a wide gap in financial access for low and moderate income groups exists. Yet, despite this phenomenon, over 20% of traditional microfinance loans are still used by customers for housing improvements (Daphnis, Ferguson, 2004).

Pent-up demand and opportunities

Whereas traditional MF has focused on entrepreneurial activities, as stated previously, the determination of such MF loan products is influenced by the working capital necessities, profit potential, and/or ability of the customer to generate income. The motivations and needs for householders on the other hand vary widely, with customers emerging from multiple socio-economic tiers influencing demand[2]. For customers living at the lowest-income levels, this pent-up demand can be demonstrated by the total size of the global BoP housing market, a sector which, compared to others, is larger than transportation and smaller than energy. One study shows the total market size of BoP housing spending amounts to US $331.8 billion worldwide, (Hammond et al, 2008). Other authors speculate, "affordable housing finance markets will grow exponentially as 90% of the net increase in world population of 4 billion people by 2050 is projected to reside in the urban areas of developing countries," (Ferguson, Smets, 2009). Tables 2.1.2 through 2.1.4 demonstrate BoP segments per region. Therefore, the demand for housing is severe.

In the Peruvian example of the magnitude of the pent-up demand for housing, Ferguson states, "Peruvian MFIs volume [of deliver] over a 10-year period totaled less than $150m compared to the pent-up market demand of $1.1 billion, where Peru represented the best example of MFIs meeting scale, compared to Mexico and Brazil markets. (Ferguson, 2004).

[2] Demand defined by actual housing units required for fulfillment. Customer 'needs' is different definition

More recently, demand for housing for the wealthier income tiers has plummeted due to over supply, and "years of sustained economic growth have changed the economic make-up of Peruvian society. This enlargement of the country's middle class remains one of the major drivers of housing demand," (Oxford Business Group, 2016). (Refer to Appendix 2.1.0)

Table 2.1.2: Estimated total BoP housing market size (by region)

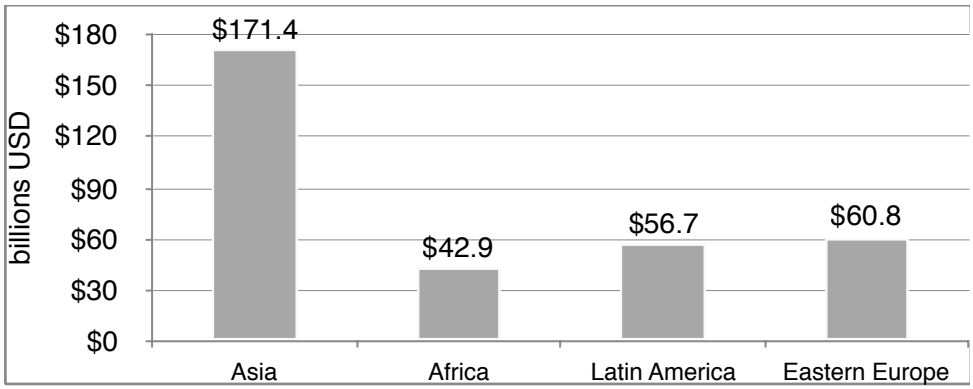


Table 2.1.3: Number of BoP householders spending on housing by region

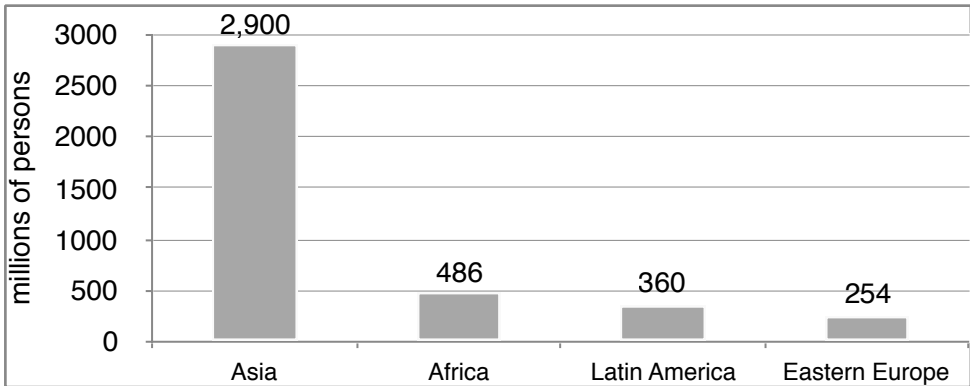
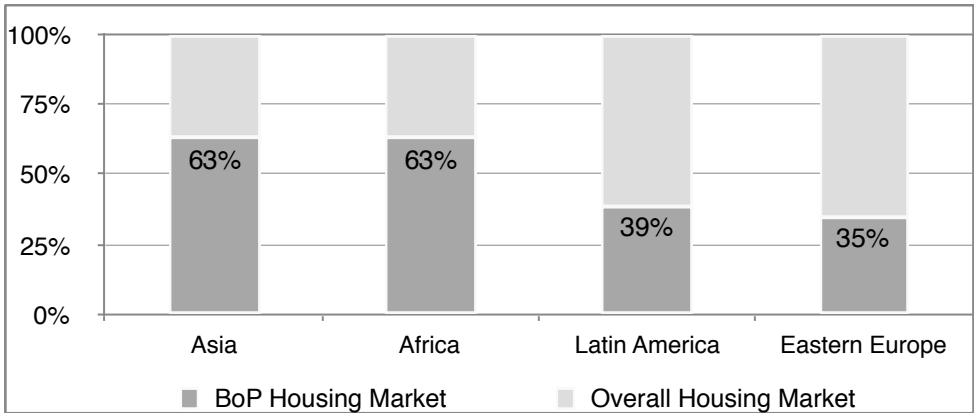


Table 2.1.4: Share of BoP housing market to overall national housing markets (2008)



Source- all tables: (Hammond et al, 2008)

Common MFI Housing products offered

Rarely are microfinance housing loans directed towards funding an entire house construction or acquisition of land. Unlike traditional home mortgages in the formal sector, as explained previously, the application of housing microfinance loans typically are directed toward incremental (also referred to as 'progressive') upgrading of an existing home. Specifically, loans are often diverted into the creation of a room addition, home expansion, improved home infrastructure (i.e. plumbing or electrical service), or other form of home finishing such as installing floor tiles or security grates. In Habitat for Humanity's global survey of 84 HMFIs (Hepner, 2016), 52% of customers reportedly used loans for home improvements/renovations, 30% used loans for small construction projects such as an additional room, 14% used for a complete home, and 4% used loans for land purchase or securing tenure. This form of incremental home construction also enables HMFIs to mitigate risk by distributing capital towards more numerous, smaller, matching loan sizes.

Key Constraints limiting the expansion of the HMFI business model

A large body of literary research on housing microfinance dates in the period from 2000-2005; culminating in 2005 with the United Nations' official International Year of Microcredit. In this period, HMF practices were in nascent stages with outlooks generally based upon the sub-sector's highly optimistic future potential. Despite reports of early constraints, the key constraints cited from these early years still have remained for the most part unchanged.

Literature from more recent years also reflects the slight change in key constraints. de Jager (2016) observed the practices of three African HMFIs, and concluded the following constraints were hampering a wider scale of HMF services:

- *Access to capital:* A financial institution's capacity to make HMF loans was limited by the amount of capital they had available. Housing loans need to be funded with capital that more closely matches the longer-term payment periods.
- *Scale of operations:* "a financial institution needs a very large loan portfolio before it can operate cost effectively and achieve a reasonable rate of return."

Habitat for Humanity's State of Microfinance report (Hepner, 2016) also listed more constraints affecting HMFIs:

•*Regulatory constraints:* In some countries, special regulatory oversight, such as interest rate caps, are installed to protect housing borrowers, but these caps may limit the commercial viability of expanding housing microfinance sector to more households.

•*Market saturation and overindebtedness:* Conversely, in an absence of regulation, an overabundance of credit and high levels of consumer debt can occur. In these environments, institutions naturally withhold the term length and size of housing loans.

•*Political risks and currency volatility:* Currency volatility due to central bank mismanagement or inter-state conflict produces slowdowns of business activity, which subsequently lead to a decrease in demand for loans. The banking sector responds with a more conservative approach to lending, which deprives financial access to even the most reliable borrowers.

•*Rental market:* Affordable, decent rental housing is increasing as a viable option for low- to middle-income households- both for their own living or income generation. However, construction quality, proper rental *contracts* supported by documents such as leasehold title, and enforcement systems need to be established before the rental sector can scale.

•*Tenure security:* Many low-income households do not have formal claim, through a deed or title, to the land on which their home resides. Encouragingly, most financial institutions recognize alternative forms of land ownership, but the use of these forms as risk-lowering collateral remains limited. While formal land title is commonly not required, documentation proving land security in some form is almost always required.

HFMI differentiation through non-financial services

A key tactic HMFIs use to make loan products more attractive to customers as well as differentiate from competitors is to offer a variety of non-financial services as value-add supplements to a housing loan. HMFIs have included non-financial services as a free service, partial charge, or in some cases at full charges. The degree in which non-financial services are offered can reflect both the financial health of the HMFI as well as the competitiveness of the HMF environment, (de Jager, 2016).

Construction Technical Assistance Services

As more MFIs recognized customer demand for housing loan products, they also quickly learned that simply providing funding support was not suitable to ensuring the intended outcomes and overall viability of a housing loan product. Schumann (2004) indicates one case study where MF managers discovered the following common scenarios after dispersing housing loans:

- The loans were often financing projects of poor construction quality, especially in materials used, limited ventilation and drainage.
- Clients sometimes found their loan amounts did not cover the cost of their desired improvement, resulting in half-completed projects
- Loan officers had to pay close attention to a family's existing repayment capacity and debts to make sure they could afford the housing loan. Clients with too much debt, or an incomplete improvement, were less likely to pay their loans on time.

For these reasons, the need for value-added Construction Technical Assistance was deemed necessary in order for HMFIs to both safeguard their loan investments and ensure better quality construction for householders. Twelve years after Schumann's study, it was reported that globally roughly 65% HMFIs offer additional supplementary technical/construction advisory services (Hepner, 2016), either at no-cost or reduced cost to the borrower, with some exceptions where the full-cost of services are shifted to the customer. The same study indicated almost three times as many HMFIs mandate TA for housing loans, as compared to rates of mandating TA for non-housing loans.

The types of construction technical assistance offered include:

- Blueprint drafting
- Construction advice (offered by 74% of HMFI respondents)
- Budgeting (offered by 70% of HMFI respondents)
- Personal/loan finance education (offered by 57%)
- Home maintenance skills
- Legal Advice/Education regarding home ownership/land title

"Construction support (e.g., training in building techniques or providing oversight during construction) allows the financial institutions to ensure better quality of the home improvement," (Hepner, 2016). The benefits of construction technical assistance serve both the HMFI and the customer in the following ways:

- Distinguishes their offer from competitors (MFI benefit)
- Reduces Internal and External Risk (MFI and customer)
- Optimizes materials, use of resources (MFI, customer)
- Strengthens Relationships- repeat customers (MFI, customer)
- Enables Higher Quality, asset value (MFI,customer)
- Reduces costs for customer on construction (customer)

Conversely, the value of CTA services also becomes immediately evident when the practice is omitted. One study evaluating HMFIs in Accra, Ghana (Biitir, 2008) observed that one particular HMFI opted not to offer technical assistance and rarely followed-up on project site visits, which were usually located on the periphery of the city. In this case study, the author discovered a high prevalence of loan mis-use for non-housing functions- which exposes both parties to larger risk. The author argues that improper loan use could be observed and easily corrected with routine technical assistance site visits.

Despite this particular case study, 98% of HMFIs globally follow-up on the housing loan's use in some manner (Hepner, 2016). Considering the time and expenditure a loan officer already commits to servicing loans, it would seem plausible that technical assistance services could be provided during these same follow-up site visits, reducing costs.

Who should provide technical assistance?

In many regions, the role of CTA providers vary according to the program's internal policies, market realities, or governing laws, meaning CTA service provision is not always the role of HMFIs. In Guatemala, a financial service provider, FDLG, "has trained staff in the MFIs to provide the technical assistance to families as part of their lending process," (Stein, Vance, 2008). Therefore, the human resource capacity for CTA provision can be built internally or outsourced to a specialized firm, NGO, or network of skilled homebuilders.

Cross-training loan officers with construction skills

In fact, only 18% of the responding institutions have specialized loan officers dedicated to housing microfinance. Most experienced loan officers are multi-product specialists due to the slim profit margins in which many HMFIs operate, (Hepner, 2016). While this ratio of housing-trained loan officers is relatively low, another research study shows that combining loan officers with technical skills can provide a significant competitive advantage, serving to diminish overall costs, as well as reducing risk through a deeper level of engagement with the householder, (Stein/Vance, 2008). This enables loan officers to recognize potential issues prior to construction and repayment stages, leading to increased loan payment rates at the time of construction follow-up. But simply adding CTA roles to loan officers' workload, is often unfeasible in practical terms. Most loan officers have long been trained in social work, finance or other non-technical fields, so expecting them to become construction advisors may prove limiting, since construction processes and methods oftentimes require direct 'knowledge-by-doing' over many years. These practical realities may be one reason few loan officers possess both skill sets.

The reverse condition, training construction experts with financial know-how, is also shown to be problematic. In one experiment in El Salvador (Schumann, 2004), an HMFI trained two classes of loan officers: a class of six construction experts who received general training in traditional loan officer roles, and a class of traditional loan officers who received training in construction. While both groups took substantially longer to complete their respective weaker areas of expertise, the construction experts were ultimately less successful than the traditional loan officers. Schumann argues, "generalist loan officers have solid financial analysis skills, as well as a profile that allows them to sell loans, advise clients, and ensure prompt repayment." From this one case, we can see the limitations in effectively combining roles of loan officers.

Despite citing the competitive advantages of loan officers cross-trained in CTA and traditional roles, Stein and Vance also mention frequent drawbacks of the duo-role model for both clients and HMFIs. According to the researched lending institutions, customers often had difficulty distinguishing the true motivations of loan officers when receiving advice. At times

a cross-trained loan officer may deliberately or inadvertently leverage decisions favoring the HMFI's financial benefit, overruling a preferred technical solution from the client. Even a perception of this kind of favoritism could undermine trust in the relationship. In other cases HMFI managers have pressured or restricted loan officers from conducting proper technical assistance processes, limiting the quality and effectiveness of the intervention overall, (Stein, Vance, 2008).

In Peru, Latin America's second largest microfinance institution, Micasa, offered no housing construction assistance as reported during a 2002 case study, "to date [loan officers] have not been given formal training in any aspect of construction, while only requiring a construction budget from the customer," (Brown, Garcia, 2002). As a large scale institution with more resources than boutique-level institutions, other non-financial reasons may have prompted Micasa to opt-out of CTA provision, such as the principle of granting the householder freedom of choosing her own construction means and methods.

Ironically, a global study conducted among eighty-three HMFIs eleven years later (Hepner, 2016), noted that seven out of the eight respondent South American institutions still do not offer CTA, an anomaly in comparison to every other global region. Perhaps this regional practice can be explained in regionally specific socio-cultural contexts (such as cultural attitudes of customer skepticism of outsider assistance, or the existence of supportive neighborhood, church groups or peer-to-peer networks), market contexts (the existence of a higher prevalence of alternative sources of construction support such as via private sector materials suppliers and DIY chain stores), or a higher degree of construction knowledge among the general public.

Third-party Partnerships

Considering the trade-offs to cross-training loan officers as a method for reducing costs, other technical assistance programs have reduced costs through partnerships with established entities within the construction sector. Third-party architects involved in the planning and preparation of customer's projects particularly allow a good balance between customer's desires,

the quality of outcomes, and the financial and physical material resources available. "When we design the house with them, we can propose alternative solutions that they would not have thought about," (Perrot, 2016). Yet, skilled architects and engineers are in short supply, especially throughout the Global South, and these professionals typically operate in the more lucrative private sectors, making their services cost prohibitive for most HMFIs.

Alternatively, some HMFIs have forged partnerships with materials suppliers, crediting the loan value in physical building materials, such as bags of cement. This in turn bypasses the need for the customer to source, purchase and transport materials individually. The HMFIs who deploy this technique use it both as a method for monitoring loan use, but also to minimize a loan officer's time and costs during site visits. This partnership method also assists loan officers who lack knowledge in construction techniques, as the supplier already tracks inventory quantities as standard operating procedure.

Similarly, some material suppliers have taken on financial service provider roles through extended consumer credit to customers, even though their expertise in financial management is limited. "These stores reported that their sources of financing typically qualified customers for a maximum of US $1500 in credit, the average cost for the building materials to add one room," (Ferguson, Smets, 2009). Stronger strategic alliances based on each entity's core strengths are needed. Such alliances "build on the comparative advantage of MFIs; their ability to keep in close relationship and work with low-income households. In comparison, large building materials manufacturers and commercial banks face considerable difficulties in working directly in low-income communities," (Ferguson, Smets, 2009).

Costs of Construction Technical Assistance

Despite a reportedly high value of CTA services for both customers and HMFIs, there is ample variance in research whether CTA services ultimately increase or decrease costs for HMFIs, with most reports routinely mention that high costs are the primary factor impeding provision of CTA services, particularly for smaller scale and newly established operations.

Since HMFIs already take on a number of additional administrative expenses (AE) and personnel expenses (PE) in their core activities (such as loan officers, program managers, supervisors, promoters, and back-office staff), specialized CTA practices simply add to this staff expense. CTA personnel include either salaried employees with professional backgrounds in architecture and engineering, or experienced construction managers, contractors and other specialists. Oftentimes, HMFIs outsource these services to third-party partners as mentioned above. Regardless, these staff expenses contribute to the overall AE and PE, which along with loan losses, cost of funds, desired capitalization rates and investment income, staff overhead becomes a critical factor in pricing the annualized effective interest rate of a customer's loan, (Daphnis, Faulhaber (2004).

In a case study conducted in Guatemala, (Leion, 2006) the author breaks down CTA costs of one organization, claiming CTA services constitute a normalized general rate of 3% of the loan value. These expenses comprise primarily of direct costs, along with small percentages of indirect costs as well as a share of interest paid for the cost of investment capital. Specifically, direct costs include CTA personnel salaries, transportation (including depreciation and fuel), as well as document production fees, such as print outs and photos.

Interestingly, 47% of CTA expenses in this study involved transportation costs for the technician to reach various project sites. It can also be safely assumed a substantial amount of transit time is spent in carrying out field verification and advisory processes, valuable time in which customers are not being directly serviced. This lost time not only diminishes the accessibility for customers, but also reduces the overall productivity of a service, in effect indirectly adding cost for the organization. Therefore, transit time from household to household is a key cost driver for delivering CTA services.

Due to the nature of construction processes, low-levels of building quality could lead to potentially severe unintended and compounding outcomes, which affect costs in two ways. Firstly, if CTA advisors provide construction advice for critical structural elements without adequate supervision and follow-up, potential life safety issues could expose the advising entity to partial or total liability. Secondly, home elements which are constructed poorly could generate negative asset value due to the need to remove and replace defective or unsafe elements. For example, if a floor slab of an upper level room addition is poured with an insuf-

ficient proportion of cement in the concrete mixture, a structural failure could result. Removing and re-pouring this slab after occupation could be tremendously costly and disruptive for the homeowner. Similarly, retroactive corrections can oftentimes cost more than original construction done well. For these reasons, CTA for critical elements must be provided with significant minimum levels of supervision and inspection. A low level of guidance may cost an HMFI more than a full level of CTA service.

2.2 Research Design & Hypotheses

While costs are always a background explanation for any model restricted from scaling, few sources have studied with specificity HMFIs' explanations for the apparent cross-sector gap between housing demand and housing fulfillment practices. If mentioned, the reasons in sources reviewed are generalized or speculative. Only several studies researched for this paper have focused on HMFIs' practices in a comprehensive, multi-regional manner, and fewer have attempted to discern common patterns or best practices that might scale in a similar, replicating manner as traditional microfinance.

Contrary to expected outcomes of improved quality with CTA services, Schumann (2004) concluded that a general overall ineffective relationship exists between CTA services and housing quality, while noting positive effects on CTA's effect in controlling costs. These conclusions fall short in describing a sector-wide phenomenon, however, as his analysis is based upon a single survey conducted by one architect evaluating the program of one HMFI (Integral), in one country, El Salvador. The limited sample size from a single institution's practices and the evaluation from a secondary source, is therefore insufficient in extrapolating applications to practices across other regions, let alone the operations of that particular HMFI over time.

Yet, similarly, a 2002 case study exploring the practices of Latin America's second largest MFI in Peru, MiCasa, confirms Schumann's argument: "households can manage portions of the technical process on their own and still achieve an acceptable level of quality, and that households have a strong preference to make their own design decisions." (Brown, Garcia, 2002). This finding further states no apparent correlation between CTA services and housing quality, although the credibility of the report falls short in the fact that its conclusions were drawn from a sample of (10) houses (among roughly 3,000 loan recipients in 2002), and also uses customer self-reporting for evaluation in lieu of a trained technician's quality assessment.

Contrary to these claims, during the same relative period, the Swedish International Development Agency (Sida) published and overview of Central American CTA programs. This report specifically studied the operations of the same program, Integral. Contrary to Schu-

mann's findings, the Sida report summarized in general terms that certain types of HMFIs produce better results than others: "When Sida support has gone directly to non-profit housing finance retailers, the construction assistance programs appear to work well in terms of quality and cost recovery. However, when support has been channeled through a public sector program, results have been mixed," (Daphnis, Faulhaber, 2003).

Arguably, it is important to note at the time of Schumann and Brown/Garcia's conclusions (2004 and 2002 respectively), the HMFI sector was in an infancy stage. Therefore, one can assume the sector has since matured to learn, adapt and share best practices. One can also safely assume that advances in digital technology between 2004 and the present have most likely enabled higher levels of mobile connectivity, data analysis, and knowledge transfer, influencing operational costs for HMFIs. A rapid rise of mobile phone ownership among the BoP customers also occurred in the time since since Schumann's report. Yet, the overwhelming majority of studies in the last decade has indicated a net positive correlation between CTA and housing quality, with further benefits of disaster resilience and increased asset value for the customer. With climate change becoming an increasingly urgent global concern, improved housing quality is increasingly becoming a critically important outcome. It remains to be seen, however, whether a sector-wide positive correlation exists between adoption of CTA services and cost reductions for both HMFI and the borrower.

The Limitations and Opportunities of Scale

Smaller scale HMFIs and start-ups operating with limited or mismatched financial capital, are largely restricted to offering a more substantial number of small housing loans (i.e. for minor household improvements such as the installation of security grills on a householder's windows, plumbing improvements, or installation of tile flooring). Because small-scale HMFIs are under greater pressure to survive and thrive, they must diversify risk by efficiently disseminating large quantities of small loans, which in turn also leads quicker repayment cycles. HMFIs must also operate and attempt to scale their businesses from these small margins, so devoting costs towards hiring or training technical assistance experts greatly impacts opera-

tional costs and poses a direct effect on the number of housing loans offered. This reality for small-scale institutions introduces a number of wider-scale effects:

- Undermines the inception and growth of newcomers in the HMF sector, who might introduce new innovations or increase competition on larger, established institutions who can better leverage larger loan amounts and higher income tier customers.

- Limits the HMFI's ability to 'graduate' alongside a householders' growing means and needs, restricting its abilities to continue the necessary personal relationships required for loan qualification, and possibly severing a householders' ability to establish credibility with larger HMFI.

For these reasons, it appeared CTA services were able to be incorporated more effectively at larger scale operations, when capital resources were better matched with loan payment rates.

While it is clear the costs of CTA are impeding wider adoption of these services, what is not clear is the general degree in which costs must be reduced in order to make these services cost-effective for HMFIs. A quest to determine this cost threshold is our first hypothesis:

> *Hypothesis 1: Cost reduction: Most HMFIs need only a slight- and not considerable-reduction in service provision costs in order to significantly increase adoption of CTA services.*

In addition to higher adoption due to cost reduction, it can be speculated that CTA services can also lead to higher quality housing, and therefore, a higher asset value for homeowners. When used as collateral for obtaining subsequent incremental loans, this higher level of quality can presumably benefit both householders and MFIs. When MFIs work in partnership with customers to leverage resources towards increasing asset value, higher revenues over the long term will be realized. This logic sequence leads us to our next hypothesis:

> *Hypothesis 2: Value increase: By focusing on increasing asset value for the customer, more numerous and better securitized lending opportunities per customer will occur over the long term for the lending institution.*

The next section describes methodologies for testing these hypotheses.

2.3 Data Collection: Methodology & Research Presentation

2.3.1 Epistemological positioning

This research incorporates a quantitative study which serves to determine the cost threshold in which CTA services must be reduced to obtain significantly higher adoption rates. Through a global opinion survey, cost and value perceptions could be collected among a pool of HMFI loan managers.

2.3.2 Data collection

Seventy-one HMFIs in five separate global regions were contacted and invited to participate in a survey of cost to value study of technical assistance services for housing loans. This survey was created in english via the Google Forms software application, and distributed via embedded link in both email as well as the Facebook messenger service to addresses listed on HMFI websites. HMFIs who did not initially respond to the initial email and Facebook effort were resent the same request two-weeks afterwards with a repeat participation request. Remaining non-responders were contacted by telephone where the survey was either dictated verbatim in the conversation with a housing loan credit manager authorized to disclose information, or the six survey questions were sent directly to that contacted housing loan credit manager in the body of an email. Both verbatim and embedded email survey responses were then transferred by the author into the Google Form for single format collection.

2.4 Data Measurement

Although the survey consisted of a total of six quantitative questions to create base results, and an assessment and initial analysis of survey responses was necessary. Once the responses were gathered, a number of statistical analysis methods were used to identify if common characteristics, potential correlations, or patterns exist among CTA service providers.

Pre-Analysis

HMFIs were organized into four categories based their responses related to cost reduction and value increase inquiries. These four categories were then analyzed by sorting responses according to general demographic characteristics, such as Global Region, Years in Operation,

and type of MFI. Once this initial analysis of response data was made, the more thorough statistical analysis exercises could then be achieved (below).

Exercise 2.4.1

This exercise investigated if any correlation exists between the operational size of organizations and provision of CTA services. Public information (annual reports, balance sheets and financial statements) of (25) of (28) participating HMFIs' portfolios was examined according each institution's gross loan portfolio value and compared to the various response groupings. A summary of ratios is shown in results Table 2.4.1.

In order to determine how closely the sample respondents were related, the standard deviation (S) of the gross loan portfolio value (x_i) was determined using the following formula:

$$S^2 = \frac{\sum (x_i - x)^2}{n - 1}$$

Where x_i is the GLP value for the i^{th} respondent, x is the arithmetic mean for the GLP values, and n is the number of the surveyed sample.

Exercise 2.4.2

Furthermore, rather than simply basing this exercise on the total housing portfolio value, another indicator revealing the priority of housing loan activity, or value share of housing operations within each organization was necessary. Therefore, a ratio (r) was created, which compared the housing loan portfolio to the overall gross loan portfolio. This ratio was also necessary for the purpose of removing distortions related to the overall scale of an organization's housing operation, since a small organization with high degree of housing activity may provide more housing loans than a large traditional MFI. Therefore, a higher ratio indicates greater share of housing loans, versus a lower ratio suggesting a low priority of housing activity within the organization. Again, the standard deviation method was deployed to measure this housing loan portfolio to gross loan portfolio ratio.

Exercise 2.4.3

After determining the *r* (housing-to-total-portfolio ratio) and *S* (standard deviation) factors in the sample, it became necessary to return to the survey results and compare how respondents compared and contrasted to a variety of indicators, or independent variables (predictors). These predictors include the following macro-level external factors as well as internal efficiency indicators.

External Indicators:

- *World Bank GNI per capita, PPP*
- *GDP growth (%)*
- *Lending Interest Rate fluctuation during fiscal year studied*

Internal Indicators:

- *Operating Expense Ratio*: This ratio is the combined personnel and administrative expenses, divided by the Period-average gross loan portfolio (average total of loans outstanding over a given period). The purpose of this efficiency indicator is to demonstrate the comparison between how much an MFI earns on loans versus how much it spends in generating and monitoring them, (Rosenberg, 2009).
- *Cost per Client (loan)*: This other efficiency indicator is again based upon the personnel and administration expenses, yet divided by the Period-average number of active clients (or loans) [x GNI per capita]. The purpose of this indicator is to show how much it costs each HMFI to serve each client. By expressing the ratio as a percentage of per capita GNI, this figure reveals how an MFI compares to those in other countries, as well as reduces any distortions by any MFIs supporting a greater share of higher-income customers. (Rosenberg, 2009).

Exercise 2.4.4

Lastly, the two variables CTA providers and Respondent categories were tested using the chi-square (X^2) method to statistically verify whether a significant association between these two variables exist. The four nominal classes of CTA and non-CTA respondents were separated

and configured into a contingency table (see Analysis Table 2.4.4) and examined using the following formula:

$$X^2 = \frac{\sum (O- E)^2}{E}$$

Where O was the number of respondents for each category, and E was the expected number of respondents. Using the contingency table, E was calculated by the product of the row and column subtotals divided by the full total.

The null hypothesis for these variables was:

H_0: The variables CTA provision and Cost Reduction are not related

H_a: CTA provision and Cost Reduction are related

The pre-determined significance level (α) was equal to 0.05, meaning a 95% degree of confidence (c) was sought for the hypothesis answer. See next section for analysis.

SECTION 3- Results & Analysis

3.0. Response Rates and Sample Creation

The initial email and Facebook Messenger messages were submitted to (71) MFIs, spanning (31) countries during a four-week period of June 2017. The initial response came to (6) respondents, for a response rate of 8.4%. After calling the MFIs directly and connecting to housing loan representatives over the course of 6-weeks, the number of respondents increased to (28), for a ultimate response rate of 38.0%.

Of these (28), three respondent MFIs did not publicly disclose its financial data, reducing the number of the sample for analysis to (25).

3.1. Base Results

Responses to the opinion survey are described below, with illustrated response rates indicated in "Chart 3.1.0: Base Results- Opinion Survey Responses" below.

> *Q1: Does your organization provide construction technical assistance (CTA) with housing loans?*

This initial question was answered by all (28) respondents, with (8) claiming "yes," for a existing CTA adoption rate of 28.7%, and (20) claiming, "No," for a 71.4% abstention rate. This CTA adoption rate resembles findings made in a 2016 survey, which reported a 31% technical service rate for housing loans, (Hepner, 2016).

Cost-related Inquiry

Those who answered "Yes" were automatically skipped to the next section regarding value, leaving those who answered "No" to continue with the following question:

> *Q2: If the costs for providing construction technical services decreased by 25%, would your organization then be able to provide these services?*

This second question was answered by all (20) respondents, with (2) answering "Yes" (10.0%), (5) answering "Not Sure" (25%), and (13) responding "No" (65%).

Again, in the survey, those who responded affirmatively were automatically skipped to the next section, while "Not Sure" and "No" respondents were asked a third question:

> *Q3: If the costs for providing construction technical services decreased by 75%, would your organization then be able to provide these services?*

This question was answered by (18) respondents, with (9) answering "Yes" (50%), (2) answering "Not Sure" (11.1%), and (7) responding "No" (38.9%).

Overall, among the original (28) respondents involved in cost-related questions, (19) claim to be willing/able to provide CTA services if substantial cost reductions could take place- making a net CTA adoption rate of 67.9%, exceeding two thirds of all HMFIs. This is compared to an existing adoption rate of 28.6% among the sample, for a net gain of 39.3%.

Value-related Inquiry

This next section of the opinion survey inquired about asset value, or collateral, when customers apply for a loan.

> Q4: *Imagine if two customers requested housing loans from your organization. Both had the same qualifications (monthly income, positive payment history, etc..) yet one had a 25% greater asset value. Would you offer a higher loan amount for that applicant? (Yes/No)*

Question 4 was answered by (20) respondents, with (4) answering "Yes" (20%), (2) answering "Maybe" (10%), and (14) responding "No" (70%).

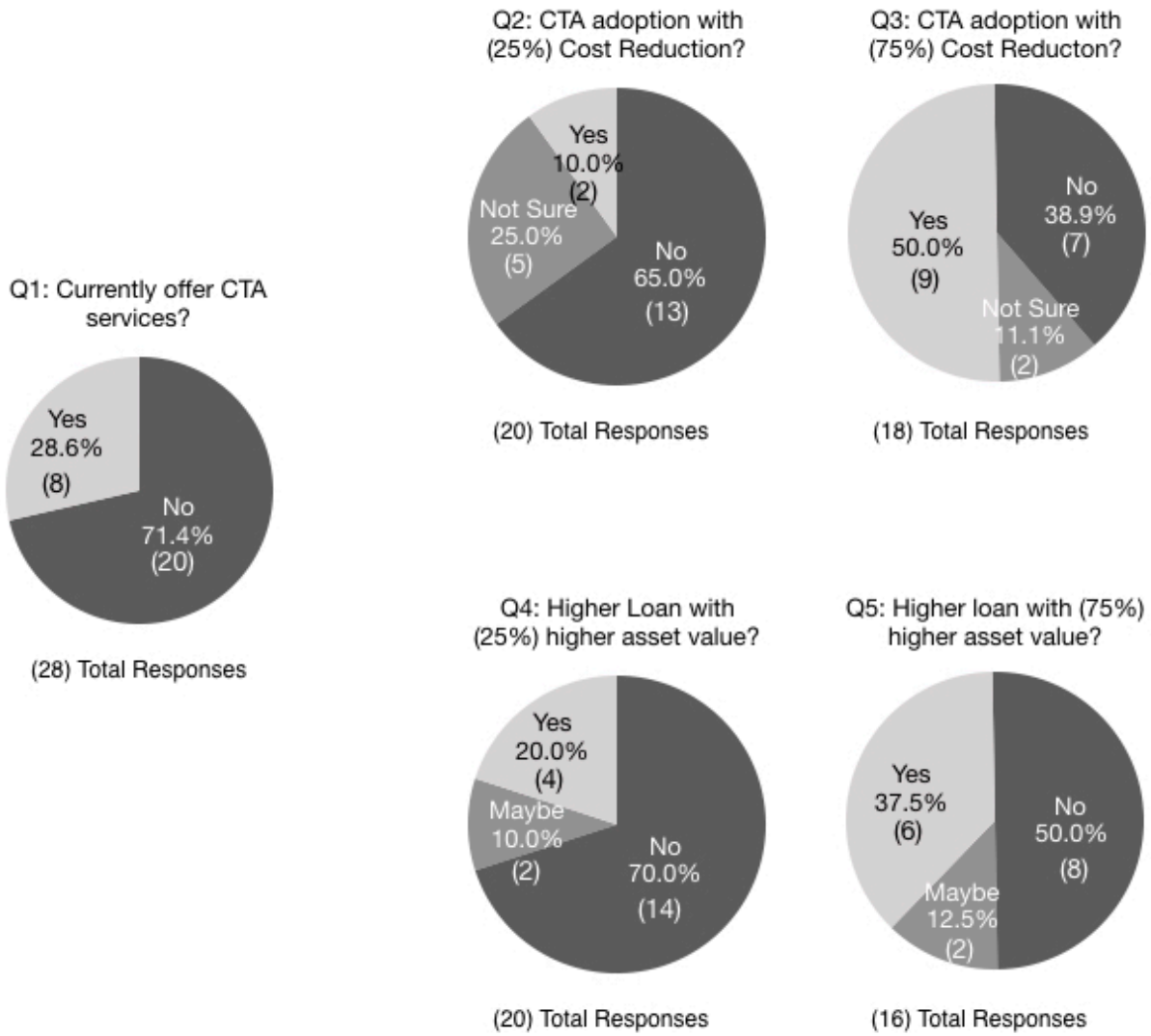
Of the respondents answering "No" or "Maybe," the follow-up fifth question was asked:

Q5: If these same two customers approached your organization, yet one had a 75% greater asset value, would you offer a higher loan amount for that applicant? (Yes/No)

This question was answered by (16) respondents, with (6) answering "Yes" (37.5%), (2) answering "Maybe" (12.5%), and (8) continuing to respond "No" (50%).

Overall, among the (20) respondents who currently do not offer CTA services, (10) respondents, or half, claim that substantially higher customer asset values will positively affect the borrowing capacity of a customer.

Chart 3.1.0: Base Results- Opinion Survey Responses



Other Factors Inquiry

Finally, any respondent offering a "No" response to any question was asked the following sixth and final question from a field of pre-set options, and were also invited to add any qualitative feedback response within 100 characters.

> *Q6: If decreased cost and higher value are not primary factors, what other reasons are preventing your organization from providing technical assistance services?*

(13) respondents chose to answer the following pre-set responses, with two adding other qualitative feedback:

- *"There are already many other sources in which customers can find technical assistance."* (3) respondents
- *"We can't find enough outside expertise who understand construction."* (2) respondents
- *"We do not think it is appropriate to tell customers how they should build."* (2) respondents
- "*We feel CTA is not effective/useful."* (3) respondents
- *"CTA provision is an under financing problem."* (2) respondents

One respondent clarified her organization is not strong in CTA, "We focus on our strengths, which is finance," and added they have no intention to make CTA services into an organizational competitive advantage.

Another respondent from the Caucasus region suggested that CTA services would be more valuable for customers if energy-efficiency advice could be incorporated.

3.2. Analysis of Results

The opinion survey responses were compiled into the following nominal categories to serve as base results for analysis:

- *Current CTA Providers*: MFIs providing CTA services with housing loans
- *25% Reduction Respondents*: MFIs expressing a willingness to adopt CTA services with a slight cost decrease.
- *75% Reduction Respondents*: MFIs expressing a willingness to adopt CTA services with a substantial cost decrease. (Note: "Not Sure" responses were considered equivalent to "No" responses and not included in this category)
- *Cost Irrelevant Respondents*: MFIs unwilling to adopt CTA services no matter the cost reductions.

These categories formed the basis in which a triangulation of statistical analysis (described in the exercises above) could be used. However, before conducting these exercises, it was necessary to first examine more closely the responses themselves according to institutional characteristics: global region, years in operation, and organization type.

Responses by Global Region

The variation of responses by global region was largely uniform, with increasing interest directly related to decreasing costs. An exception, however, was evident in the Latin American & Caribbean region, whose MFIs' interest in higher adoption of CTA services remained unchanged despite progressive cost reductions. This evidence remains largely consistent with a wide share of literary research dating to 2004 and beyond, and verifies that the trend still persists in this region. See Appendix: Table 3.2.1. for further information.

In regards to the interest in increased asset value, all regions showed positive, albeit slight, interest in offering higher loans for higher asset value/collateral. Again, Latin America & the Caribbean region demonstrated the most tepid willingness to consider asset value in the collateral mix, with only one Latin American MFI willing to increase loan value.

Responses by Years in Operation

To a measurable degree, a gradually improving level of interest was largely consistent from all respondent groups regardless of the stage of an MFI's organizational life cycle. The most seasoned MFIs showed the second largest adoption shift for the cost reduction inquiry (38% net change), with three out of four of the '6-10 Years in Operation' MFIs ultimately expressing willingness to adopt CTA services.

Opinions were less optimistic regarding the value increase inquiries, a tendency consistent in all analysis indicators. The most willing MFIs came from the '11-15 Years in Operation' category. Specifically, MFIs maintaining ten, eleven, thirteen, and fifteen Years in Operation revealed themselves as the most adaptive pool. Interestingly, three MFIs of twenty-two, and two at twenty-four Years in Operation also expressed willingness to consider asset value as collateral for qualifying loans. All other MFIs Years in Operation sub-groups showed no change. See Appendix: Table 3.2.2. for further information.

Responses by MFI Type

In regards to organization type, the largest willingness for adopting CTA with reduced costs came from NGOs (60%). Non-banking Financial Institutions showed the second highest degree of interest, far behind at (17%). The two bank respondents remained unchanged, with one of two MFIs from the Other category changing only after the more substantial cost reduction was proposed.

In a degree further to previous indicators, significantly less optimism was expressed regarding the value increase inquiry. The only net change came from a single uncategorized MFI. See Appendix: Table 3.2.3. for further information.

Exercise 2.4.1 Analysis- Gross Loan Portfolio values

This exercise described in the previous section investigated if any correlation exists between the operational size of organizations, measured in gross loan value (GLP), and provision of CTA services. One MFI, MiBanco of Peru, surpasses all others to such a degree that its anomaly position was removed in order analyze the Cost Irrelevant category without this

large distortion. Despite this anomaly, all but four responding MFIs operate a GLP under $50.5 million USD. The standard deviation among all respondents was $150.5 million USD. See Chart 2.4.1 for a depiction of figures. By considerable degrees, the 25% and 75% Reduction respondents were the most tightly positioned sub-groups at ($11.5 million and $42.3 million respectively), but also exceedingly possessed the lowest GLP mean ($9.1 million and $39.8 million respectively), with none exceeding $50.5 million USD. See Appendix: Table 2.4.1 for further information.

Exercise 2.4.1 Evaluation

Clearly, the respondents at either ends of the spectrum possess the greatest variation, and the greatest share of large organizations tend to be positioned at these poles. Expectedly, this evidence affirms that *cost is by far a greater influencing factor in CTA adoption for smaller MFIs than for larger MFIs*. It may also suggest perhaps large organizations may be less adaptive and less willing to make even slight adjustments to their business models due to a finely-tuned model that has proven to work at scale. Further study will be required to confirm or refute these findings.

Exercise 2.4.2 Analysis

The public data in Annual Reports and MFI websites provided the sources for obtaining the share of housing loan value compared to gross loan portfolio. This data could only be obtained from nine of the twenty-eight respondents. Direct requests to MFIs to furnish this information were unanswered. The limited sample of housing portfolio value averaged $112.8 million USD overall, with an average housing to gross portfolio ratio (*r*) of 39.9%. Two MFIs devoted all their financial service activities towards housing, while next highest housing portfolio share was 44.5%. The MFI with the lowest housing share had an (*r*) value of 7.9%. Excluding the two full-housing respondents to reflect typical MFI structures, the average housing-to-gross loan portfolio ratio among the entire sample of respondents was 17.9%. This figure also affirms the average housing share of gross portfolio (15-17%) indicated in another recent research study, (Hepner, 2016).

The standard deviation among the (*r*) values was 33.8% when the two housing-only MFIs were included, and 15.2% when these two respondents were omitted.

Exercise 2.4.2 Evaluation

The small sample of (7) respondents was not sufficient to examine the response groups to a full degree. Further research is needed to identify potential correlations between housing-to-gross loan portfolio value ratios and the provision of CTA services.

Exercise 2.4.3.a Analysis- GNI per capita

Measuring GNI per capita ratios, the standard deviation for all (28) respondents came out to $4,771 (USD). Excluding the two 25% Reduction respondents (an insufficient number for analysis), the least varied group came from the Cost-Irrelevant (those claiming no cost-relation to CTA provision) sub-group, whose standard deviation came to $4,224 USD. Current CTA providers proved the second tightest sub-group with a standard variance of $4,908 USD. The largest variance came from among the 75% Reduction sub-group ($5,646 USD), revealing a range of GNI per capita ratios from $16,130 USD to $1,840 USD. See Appendix: Chart 2.4.3.a and Table 2.4.3.a for further information.

Exercise 2.4.3.a Evaluation

Because GNI per capita (PPP) indirectly indicates general labor rates as well as productivity within an economy, this figure represents not only the borrowing power of customers and loan size for MFIs, but also the internal operating efficiency and loan cost per client within MFI organizations themselves, since larger loans cost less to manage. It is noted the two tightest groups tend to be MFIs with established CTA positions, suggesting perhaps their business models have become more attuned to the macro-economic realities in their respective countries. One could assume that the more established MFIs would naturally be more attuned to macro-economic conditions and set in their positions, however, the pre-analysis section above shows the contrary: 'middle-aged' and 'oldest' MFIs showed the greatest willingness to adopt CTA provision with increasing cost reductions.

Exercise 2.4.3.b Analysis- GDP Growth Rate

The second external measurement in this exercise examined the standard deviation of GDP growth rates. For the entire sample, the standard deviation came to 2.71%, with the widest

variation coming from the 75% Reduction respondents at 3.48%. This category was the only respondent group which exceeded the overall standard variation of the sample. See Appendix: Chart 2.4.3.b. for further information.

Furthermore, the mean GDP growth rates per category were progressively consistent, with the most CTA averse respondents experiencing the smallest GDP growth rates. See Appendix: Table 2.4.3.b. for further information.

Exercise 2.4.3.b Evaluation

While the standard deviation study revealed little in showing a correlation between respondent categories and GDP growth rates, from the evidence of mean GDP growth rate per category it is highly likely that a direct correlation exists between GDP growth rate and provision of CTA services.

Exercise 2.4.3.c Analysis- Interest Rate Fluctuation per term

The third external measurement in this exercise examined the inflation rate change during the fiscal term of MFI's reviewed Annual Report (usually the MFI's fiscal year). For the entire sample, the standard deviation came to 2.97%, with extremities capping the sub-group at +12 percentage points in one country, and -5 percentage points at the bottom limit. Here again, Current CTA providers and Cost Irrelevant respondents showed the least variation in interest-rate fluctuation (+1.00 and 1.13 percentage points, respectively). The widest inflation rate variation over the course of the fiscal year came from the 75% Reduction respondents at +4.93 percentage points. Both 25% and 75% Reduction categories exceeded the overall standard variation of the sample. See Appendix: Chart 2.4.3.c for more information.

In addition to the standard deviation, the average interest rate fluctuation per respondent category was cross-referenced with results showing no progressive pattern. See Appendix: Table 2.4.3.c for figures.

Exercise 2.4.3.c Evaluation

Despite the evidence from the standard deviation method indicating wide variance of interest rate fluctuation among the sample, the average interest rate fluctuation per category shows no correlation between adoption of CTA services and interest rate fluctuation.

Exercise 2.4.3.d Analysis- Operating Expense Ratio

These next series of statistical methods measure the indicators internal to MFIs which demonstrate operational efficiency. The Operating Expense Ratio (OERs) analysis revealed an overall standard deviation of 10.6%, taken from (24) respondents which had published financial statements publicly available. Similar to a number of other external indicators, the Current CTA providers (11.0%) and Cost Irrelevant providers (8.1%) showed variant spreads at or below the overall standard deviation figure. Additionally, those MFIs willing to adopt cost reductions showed 17.3% standard deviation rate in the 25% Reduction category, and 12.0% for the 75% Reduction sub-group. See Appendix: Chart 2.4.3.d for more information.

Similarly, the OER averages per category reflected with same pattern with Current CTA Providers generating an average of 12.4%, and Cost Irrelevant Providers averaging 14.1%. See Appendix: Table 2.4.3.d for more information.

Exercise 2.4.3.d Evaluation

Compared to the overall OER average of 14.9% in the sample, the groups at either end of the spectrum reflected an ongoing pattern of lower averages compared to the 25% and 75% Reduction respondents.

Additionally, similar to external factors, the bookend categories demonstrated tighter groupings. While these differences may be immediately apparent, it is also known that OER tends to favor MFIs providing a share of larger sized loans, versus small loans- which is why this natural distortion is somewhat mitigated by multiplying the ratio by the GNI per capita. Despite this mitigation effort, these facts need to be taken into consideration- coupled with evidence in an earlier exercise in this study which shows MFIs with larger GLPs positioned at

either end of the nominal spectrum. This phenomenon could contribute to some degree for the explanation in lower variance and lower average OERs for the bookend categories.

Assuming the effects of OERs are accurate to reality, however, we can see through the evidence that *MFIs currently deploying CTA services tend to be more operationally efficient* than the overall average by 2.5 percentage points, and on average 1.7% more efficient than MFIs who are unwilling to be influenced by cost in adopting CTA services.

Exercise 2.4.3.e Analysis- Cost per Client (CpC) Ratio

The Cost per Client Ratio analysis revealed an overall standard deviation of 8.1%, taken from the same (24) respondents with financial statements publicly available. Continuing the pattern from other studies, the Current CTA providers (2.7%) and Cost Irrelevant providers (3.1%) showed the tightest variant spreads, again well below the overall standard deviation figure. Additionally, those MFIs willing to adopt CTA with cost reductions showed a 2.2% standard deviation rate in the 25% Reduction category, and an curiously high 12.5% for the 75% Reduction sub-group. After further review, the high rate in the 75% Reduction category was distorted due to an anomaly MFI with a CpC ratio of 39.3%. (This MFI's model is exclusively housing-focused.) After removing this irregularity, the CpC ratio for this category adjusted to 4.2%, a rate not too dissimilar to the Cost Irrelevant category figure. See Appendix: Chart 2.4.3.e for further results.

Exercise 2.4.3.e Evaluation

Similar to other exercises, the CpC averages per category reflected the continued the nearly consistent 'bookend' pattern, where Current CTA Providers generated an average of 1.8%, and Cost Irrelevant Providers averaged 3.5%, compared to an overall CpC ratio average of 3.0%. See Appendix: Table 2.4.3.e for further results.

Exercise 2.4.4 Analysis- Chi-square Test of Independence

Using the results of the opinion survey, a contingency table was devised showing the observed figures (O). (See Table 2.4.4 below.) The expected values (E) were calculated using the method described above in Methodology. With the three-by-two configuration of the

contingency table, two degrees of freedom (Df = 2) was determined, then was combined with a pre-determined significance level ($\alpha = 0.05$), or 95% degree of confidence.

In this case the probability (P) value is determined by referencing the standard Chi-square Distribution Table, which indicates a probability level of 5.991 for (2) Df.

Table 2.4.4- Chi-square Contingency Table

	Current CTA Providers	25% Reduction Providers	75% Reduction Providers	Totals
Using CTA	8	10	19	37
Not Using CTA	20	18	9	47
Totals	28	28	28	84

(E) values	12.333	12.333	12.333
	15.667	15.667	15.667

Exercise 2.4.4. Evaluation

After calculating the Chi-square statistic ($x^2 = 9.951$) using the formula described, the result leads to a probability level (P = 0.0069). Because the P-value is less than the pre-determined alpha level of significance (0.05), the null hypothesis (H_0) was rejected, and therefore, a high relationship probability exists between the two factors in the sample.

Evaluation Summary

We can see evidence of repetitive trends showing commonalities in the 'bookend' categories: Current CTA respondents and Cost Irrelevant respondents. These groups tend to not only demonstrate less variation both in internal operational efficiency and external economic influence, they also nearly consistently average less than the adaptive cost reduction respondents.

From the survey results, we can see that Hypothesis 1 is only partially true. While respondent opinions showed CTA adoption rates did in fact increase with decreasing cost, the

threshold to motivate respondents to make such an adjustment was substantially higher than hypothesized.

Regarding Hypothesis 2, survey respondents clarified that house asset value is not a primary consideration for qualifying loan applicants, as regular cash flow and salaried work held far more weight. While a few MFIs did express a willingness to consider substantial increase in asset value, further study will be necessary to determine if higher asset value ultimately leads to increased revenues for MFIs through larger loan amounts, and increased value for home-owners through a higher quality home. A key factor in asset determination is the issue of land title and whether land markets and laws are sufficiently developed in the jurisdictions to be used as forms of collateral.

SECTION 4- Theoretical and Practical Implications & Limitations for Future Research

From the base results we can immediately see perceptions among HMFIs vary widely regarding not just appropriation of CTA services, but also regarding housing loans themselves. We can infer through the evidence obtained in the research that anomalies by global region do exist, such as Latin America & the Caribbean where MFIs are less influenced by cost in determining CTA service provision.

Practically, this evidence implies that HMFIs in this region can remain competitive without offering CTA services, meaning resources can instead be allocated towards other loan purposes or expanding a wider pool of borrowers. It remains to be seen the degree of added value in which CTA services might create in the Latin American region, where relatively higher purchasing power among citizens and building material supplier markets have an influence. In fact, this leads one to note that a critical component inadequately understood is the degree in which customers themselves value CTA services in each region. Further study is needed in this regard, and can be conducted by measuring a sample of customer's willingness to pay for certain types and levels of involvement of CTA. The primary challenge of such a study will be in obtaining a large enough pool of BoP customers to collect a representative sample.

Through the evidence collected, we can also see no visible correlation between willingness to adopt CTA services and an MFI's Years in Operation. This may imply a number of tendencies:

- Housing microfinance organizations of all ages are continuously seeking to reduce costs and add-value as a general trait.
- Housing microfinance institutions of all ages have yet to establish a firm footing in their housing business model, and are still struggling to achieve balance between commercial viability and social impact.

As expected, regarding MFI type, we can see that NGOs and NBFIs showed the greatest willingness to incorporate CTA services with reduced costs. Given the social mission of NGOs and many NBFIs, compared to standard banks, it is expected that these organizations will

seize any opportunity to carry out its social mission. Additionally, because of this social mission, these two groups tend to be the least interested in seizing assets of customers in the event of default, and for this reason these entities would be the least interested in requiring a home as collateral.

Regarding external factors, several indicators used in the analysis can lead one to reasonably argue that implicit correlations indeed exist between certain macro-economic factors and the surety degree if an MFI will provide CTA services or not. MFIs with unequivocal positions on CTA services were less impacted by external conditions, than those willing to be influenced by cost. It can be theorized that these organizations are more solid in their operations with more sound models, or that second-tier financial markets are more influential on MFIs without clear focus.

It was also reasonably expected to see a consistently greater adoption of CTA services from MFIs operating in higher GDP growth economies, and conversely fewer level of services with smaller growth rates. GDP growth rate is a key indicator of CTA services. Practically, it is also expected to see greater risk taking in higher growth markets.

Regarding internal factors, the same patterns of the bookend respondents remained consistent, showing both tighter standard deviations as well as lower indicator averages. This suggests MFIs in these categories are more secure and efficient in their operations and product offer, and less apt to waver due to the allure of theoretical cost reductions. Unsurprisingly, what this evidence demonstrates is that efficiently managed organizations operating in less volatile macro-environments simply become better businesses.

Limitations in Research

The most evident limitation in all analysis exercises is the relatively small sample of (28) respondents, which particularly limits the ability to formulate common conditions evident throughout the Housing microfinance sub-sector. A larger sample may either support or refute the results, and provide more accuracy in influencing the analysis and conclusions.

The survey communication formats via email/Facebook Messenger as well as phone proved to be both a limiting and enabling factor, as gaining the attention of busy loan managers interrupted from their workday posed a significant challenge. Because of this practical scenario, the survey questions were deliberately crafted to be as simple, universally applicable, and brief as possible. Surely, more lengthy, qualitative interviews may have yielded more in-depth results, but on a practical note, may have simultaneously inhibited a broad-based, multi-regional approach within the limited time parameters of the research study. Furthermore, it was determined early that purpose of the research study is to primarily discover broad, common patterns which may contribute to the establishment of more replicable housing microfinance models that require only minor local adaptations.

Determining the value of CTA services can be obtained using a number of other methods, such as by posing a customer feedback survey among recipients of CTA services, or through in-depth qualitative research. Furthermore, the definition of value can mean different things to different stakeholders. Value in housing is also greatly subjective to regional contexts, as many countries in emerging economies have not developed mature real estate/land markets, and perhaps never will. Therefore, in the absence of real estate markets, the value of collateral is highly subjective and can take a variety of forms.

Data sourced from the MIX Market database, published Annual Reports and independently audited Financial Statements is self-reported, and therefore may be embedded with some level of bias. Despite this normal occurrence, validation of figures is upheld through independent auditors.

Even though questions were presented to qualified housing loan managers, the survey responses are opinions from individuals within organizations and might not represent accurately the organization's actual position.

When sourcing the range of financial products in MFIs' Annual Reports, only (9) of (28) respondents differentiated their product offer in monetary or as percentage of portfolio terms. This in turn limited the ability to quantify the share of housing/home improvement loans

compared to other products, as well as the value that housing products provide for an organization. Such an indicator would also be useful to track over time.

Implications for Reducing Costs of CTA services:

Throughout the academic research and analysis stages, a number of recommendations came to mind, which are presented below:

1. *CTA services may potentially be more cost-effective if deployments are systematically prioritized by HMFIs.*

Since cost recovery of CTA service provision is limited due to the narrow margins of loans, housing repayment periods are longer than traditional MF, and investment capital from second-tier lending institutions is restricted, the first budget cuts are naturally value-add services. Yet, HMFIs wishing to find ways to offer CTA services, can optimize their programs by developing internal policies that selectively deploy CTA services only for the most critical stages- not for the majority or voluntary cases. While selective application is already largely in effect in most HMFI operations, the determinations are often made at the discretion of loan officers' intuition, or through specific requests of customers- instead of via systematic methodologies of prioritization. The following suggestions may further HMFI's abilities to refine and focus their internal prioritization criteria for determining CTA service provision.

HMFIs may wish to limit the application of CTA services only to cases where one or more of the following factors are present:

Project type: Income-generating home improvements

HMFIs can prioritize CTA services for the types of home improvements that stimulate income generation for the customer. This includes the creation of new spaces where business activities can be enabled, or for projects leading to rental income generation. Keep in mind, while it may appear a family may be applying for a loan for the purpose their own habitation, they could also be vacating a previous section to utilize as rental income and might not disclose this intention during the qualification pro-

cess. Identification of this scenario should be queried by the HMFI during the qualification stage. Rental-purposed projects are particular opportunities to devote technical attention not only to new building elements, but towards optimize the income potential of the rental unit- such as advising on more efficient space planning or increasing exposure to customers. By prioritizing CTA services for rental income projects, the practice would also align with the fundamental entrepreneurial missions in all types of MFIs, and can be considered more as business asset investments than home improvements.

Project type: Critical components

Not all elements of a new house require professional advice. Loans used for roofing, interior finishing or window security grills, do not require CTA services. However, loan usage for building elements that are critical for ensuring life safety for occupants as well as neighbors should absolutely receive CTA priority. HMFIs should inquire on the types of intended construction elements during the loan qualification stage, if not doing so already. The critical elements could be classified as elements that are:

- Structural in nature such as foundations, columns, and floor slabs
- Affecting the safe exit (egress) in moments of emergency
- Associated to the planning of domestic infrastructure: plumbing and electrical service in-take feeds, locations of household waste line tie-ins, and appropriate roof drainage routing

Project location: Vulnerable sites

When a householder is seeking to build upon or improve a site that is vulnerable to natural or man-made disasters, such as steep slopes, storm exposure, stormwater run-off zones, or high water flood zones, CTA services should be mandated to ensure the home is constructed in the most resilient and appropriate way possible, and offer best practices for mitigating any potential effects. Fundamentally, a loan that increases a customer's vulnerability should not be granted, and investing in vulnerable sites can put both homeowner and MFI in a difficult position.

Increased resilience would better ensure the permanence of the home over time and increased likelihood for sustained future payment from the borrower. Furthermore, trained CTA assessors could also identify vulnerable sites prior to loan distribution, saving the HMFI from providing an especially risky loan.

Project Location: Zones with higher accessibility

Since the time and expense of transporting a CTA representative from site to site can amount to significant expenditures, limiting the projects which receive CTA services to a designated zone, based on proximity from the office for example, or in clustered proximity to each other can potentially lead to cost and time savings for loan officers.

Project Access: Sharing travel responsibilities with clients

Instead of CTA service providers always visiting each site for one-on-one client interaction, training workshops can potentially be held amongst multiple clients in bulk, either at the place of a client's project site, or at a designated central facility purpose-built for providing these types of training sessions. Furthermore, it could be particularly effective to conduct group trainings at the location of building material suppliers' facilities, reinforcing the relationships with this type of external partner. Clients themselves would be responsible for transporting themselves to these locations, reducing the transport time and expense for CTA advisors who offer advice individually.

2. CTA service delivery can in fact be viable if efficiencies are found

Taking advantage of existing and emerging technology

New technologies that reduce the travel time and site visits for CTA service providers are emerging, albeit unevenly. New software applications on mobile enabled digital tablets allow service providers to quickly and easily draw up home layouts, conduct building material quantity take-offs, and estimate costs. They can upload figures in real-time to loan officers. Such processes could be accomplished during the single, initial site visit, reducing qualification time, benefiting both HMFI and client. Fur-

thermore, technological networks can relay data to building material suppliers. Conceivably, a customer could be able to receive building materials at her doorstep within hours of an initial site visit. LafargeHolcim announced in 2015 the development of a a mobile application along these lines. In Mexico, cement giant CEMEX has developed a similar system called Patrimonio Hoy, which leverages their own cement supplier network and tacks on the additional home loan and technical assistance services. It should be noted CEMEX is an industry production powerhouse as well as distributor, so it has the ample means to leverage its strengths. For the rest of the smaller-scale stakeholders that make up the value chain in low-income housing, such a system could pull together a consortium network of suppliers, HMFIs, and clients to develop this mobile app technology.

Printed manuals on building standards

While printed guidebooks and building standards are already widely prevalent, sharing these manuals among MFIs through regional associations would alleviate individual MFIs from conducting the expense of developing their own. Similarly, an association of MFIs in a particular region can collectively hire local body of experts, including municipal building agencies, to make standard guidebooks applicable to local conditions and building practices.

Hosting group trainings at a variety of locations

As mentioned above CTA workshops can be conducted in bulk, possibly at the fol lowing sites:

- At a 'host' client's home project site
- At a purpose-built location where multiple mock-up displays representing the different stages of construction are shown. Participants receiving training can build the mock-ups, so they 'learn by doing.'
- Or at the location of a building material supplier partner

3. MFIs may benefit from structurally disaggregating housing loan practices from core microfinance loan operations

The multi-product portfolios of HMFIs are often blended with housing loans as well as working-capital business loans. By seeking to combine resources and processes for inherently different products, MFIs may be undermining their abilities to fully succeed in either. MFIs may wish to consider spinning-off housing loan operations at a structural level, either as an independent division or subsidiary organization with separate financial strategies. Such a structural separation may enable each division to develop its core strengths independently without diluting it's resources from all-in-one approach. An independent housing division can leverage the resources of the larger organization on a selective, as-need basis, and core strengths would be bridged only where appropriate.

CONCLUSION

This paper briefly explained how and why housing microfinance evolved as a separate activity from traditional microfinance. We also examined the key characteristics that accompany housing microfinance products, and why they are suited for low-income customers' needs. Furthermore, we defined and explored the core features that make up construction technical assistance (CTA) services, presented arguments for and against their use, and showed various arguments about which entities are best suited to provide these services.

An initial hypothesis was presented which predicted that increased adoption of CTA services could occur with only modest reductions in cost. This was queried through an opinion survey of (28) housing microfinance loan managers from (5) global regions. The results of this cost-related hypothesis partially held true from the collected evidence, as it was found that increased CTA adoption rates would occur only when accompanied with quite substantial- and not slight- reductions in cost of service provision. A second hypothesis was presented suggesting that increased home asset value (generated from the increased construction quality that CTA services bring) could financially benefit both customers and MFIs. However, the many respondents showed little indication that home asset value is used as a factor for collateral. Further study is necessary to determine the long term impacts of CTA services on asset value. While CTA services may not add significant financial value for MFIs, they can add value for customers in other forms, which is an important consideration in fulfilling the social missions of MFIs. Further study of customer perspectives is necessary to determine the degree in which customers value CTA, and how far MFIs can further stretch margins to meet customer needs.

The survey responses revealed no correlations between CTA provision and years in operation, or geographic location- with exception of the Latin American and the Caribbean region which showed the most reluctance in adopting CTA.

Additionally, further analysis was conducted after grouping the MFI survey respondents into nominal categories based on a spectrum of CTA provision and cost reduction amounts. Each respondent was analyzed according to external economic factors as well as internal operatio-

nal indicators. It was consistently discovered that the MFIs with the most anchored positions in CTA provision (either currently offering or fundamentally opposed) were the most operationally efficient as well as least impacted by external influences. These 'bookend' MFIs also averaged the largest gross loan portfolios, compared to the rest where cost is a primary factor in determining the activity level of CTA. Furthermore, a direct correlation was discovered between GDP growth rate and provision of CTA services, with progressively lower adoption rates occurring in lower GDP growth countries.

Finally, this paper described potential implications for use of these findings both at a theoretical and practical level, and finished with a brief list of potential recommendations for achieving cost reductions and higher delivery of construction technical services.

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