



**Projecting Impact of Non-
Traditional Data and Advanced
Analytics on Delivery Costs**

December 2014

Background and acknowledgements

This research effort was carried out by CGAP and McKinsey & Company during April, May and June of 2014. The goal was to credibly estimate the cost implications of applying non-traditional data and advanced analytics to delivery models in under-banked markets. The approach leveraged existing known data on established financial institutions (particularly proprietary datasets McKinsey has developed over many years) and adapted these to project how the cost economics of delivery will change in low-income settings. We were particularly interested to evaluate the potential in markets where there is a fast emerging digital payments infrastructure available. The research, therefore, used Tanzania as the primary country case (though benchmarking also included Kenya). To ground the findings in market realities, the researchers relied on data, perspectives, and experience of providers in Tanzania and Kenya. The researchers are grateful to a number of people and organizations who provided invaluable background perspectives that shaped the research findings. The research team in particular acknowledges the contributions of:

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- FINCA
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- Golden Crescent Assurance
- KCB
- MFS
- Microensure
- National Microfinance Bank
- Omidyar Network
- OnDeck
- Rafiki MFI
- Selfina
- Serengeti Advisers
- Stanbic Bank
- TAMFI
- Tigo
- Tujijenge
- TYME Financial
- Umoja Switch
- Vodacom

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Context and objectives of this research effort

Context

- CGAP's Technology Program works to identify and build viable business models that leverage technology and existing infrastructure to reach poor people with financial services at scale through:
 - a. understanding new products / business models
 - b. understanding the impact of non-traditional data and advanced analytics on financial service delivery
- On b), CGAP aims to develop a forward-looking perspective of how non-traditional data might be integrated into financial service delivery with the goal of providing insights and actionable ideas that lead directly to expanded services to under-served low-income markets
- CGAP partnered with McKinsey to provide an independent perspective breaking out the costs of delivery for several key low-income focused financial products in developing countries and identifying where new data analytics are most likely to improve product economics

Objectives and deliverables

The study undertook to provide an assessment and quantification of opportunities to lower the cost of delivery for key products through the use of non-traditional data and advanced analytics. In doing so we:

- 1 Assessed costs of delivery:** Defined the cost-of-delivery value chain for key products and quantified each cost driver through process- and activity-based analysis
- 2 Pin-pointed and quantified opportunities for leveraging non-traditional data and advanced analytics:** Identified points along value chain for applications of NDAA and quantified potential impact; developed standalone value chain for new liquidity product enabled by NDAA
- 3 Estimated potential impact on financial inclusion:** Determined proportion of un-served market that could be accessed through new product economics and delivery approaches

Executive summary (1/2)

Context: opportunity in using non-traditional data and advanced analytics (NDAA)

- In developing economies, low-income consumers **do not have access to many financial products** due to both a) **suppliers' lack of will and capability to develop products and business models** appropriate to serving the bottom of the pyramid and b) a number of **demand-side barriers** involving price, consumer awareness, and product accessibility
- Low-income consumers in developing countries are **generating increasing volumes of non-traditional data on their behaviors and preferences**, through their use of mobile phones, their physical and mobile payments and transactions, and their retail spending, and these data are being captured, structured, and stored by a variety of institutions and organizations
- Financial services providers in developed and developing countries alike have begun to **structure and analyze these non-traditional data on consumer behavior and preferences** to lower delivery costs, expand customer awareness, and innovate on product design and service models

Study: assessment of the impact of non-traditional data and advanced analytics in serving low-income consumers

- In order to assess the impact of leveraging non-traditional data and advanced analytics, we examined the way in which these applications might **lower the cost structures of two financial products: microloans and microinsurance**. We additionally assessed the potential for these applications to **facilitate the development of new types of liquidity products** tied to transactions accounts
- To gain granular insights in the context of a particular market, **we conducted our research in Tanzania**, a country with low levels of financial services penetration but where mobile money usage is relatively high and where there are enough low-income focused financial products in the market to form the basis for our analysis

continued...

Executive summary (2/2)

- Our analysis suggests that **NDAA could lower delivery costs by 15% to 30%** for lending and insurance products, and **facilitate the development of a low-cost credit line tied to a mobile wallet**:
 - **Lending product:** We estimate that delivery costs for a basic microloan of ~\$180 could be lowered from \$45-60 by \$10-15 (~20-30%), with the majority of savings coming from lower underwriting costs, loan application costs, collections costs and risk costs
 - **Insurance product:** We estimate that delivery costs for both one year credit life and mobile insurance could be lowered from \$4.10-4.75 by \$0.70 – 1.10 (~15-25%), with savings coming primarily from lower customer acquisition costs and more effective underwriting
 - **Liquidity product:** We estimate that NDAA could be used to design an overdraft product that costs \$4.25 – 5.75 or less and a credit line tied to a mobile wallet that costs \$0.80-\$2.50 per product
- In addition to these direct economic benefits, the application of non-traditional data and advanced analytics **makes possible new, more scalable delivery models**
- These improvements to product economics could open **a significant new opportunity for financial institutions interested in accessing new customer segments**: the market opportunity in Tanzania is ~3M households for lending, ~7M policies for microinsurance, and ~15M consumers for liquidity

Path to impact: key success factors

- To successfully realize this opportunity, financial institutions must **manage a number of implementation challenges**, including: adjusting to particularities in their local market context (e.g., privacy regulations), finding the right partner and structure for data sharing, developing organizational capabilities, and managing new risks
- Implementing NDAA will **require an organization to take a staged approach and make investments**, either in existing 3rd party solutions or in internal capabilities like new IT systems and/or analytics talent

Conclusions based on 28 interviews in Tanzania and Kenya with 7 types of institutions

■ Tanzanian institutions
■ Kenyan institutions



Non-traditional data and advanced analytics can lower costs by 15% to 30% for lending and insurance, and will enable development of liquidity products


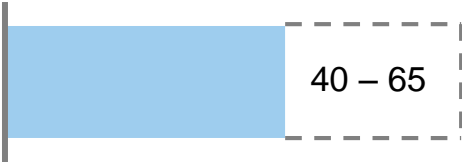


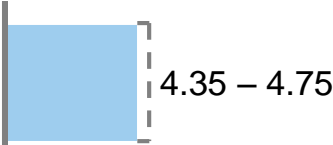
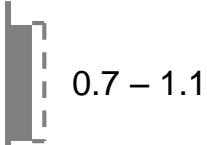

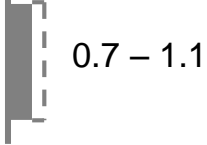

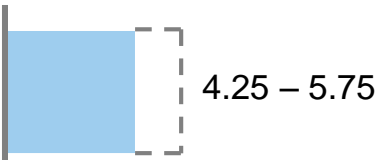
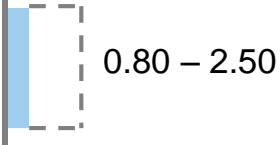
	Specific product description	Baseline delivery costs U.S. \$	Savings from analytics, U.S. \$	Savings % from analytics
Lending Product 	Microloan – one year loan of ~\$180 with interest rate of 30-80% p.a.			20 – 30%
Insurance Product 	Credit life insurance – ~\$6.50 premium for coverage through life of the loan			15 – 25%
	Mobile insurance – 30 day coverage with ~\$1 monthly premiums			15 – 25%
Liquidity Product 	Overdraft facility on bank account – overdraft of \$10 – 200 tied to deposit account Credit facility on mobile wallet – credit line of \$1 – 50 tied to mobile money account	 	<div style="border: 1px solid gray; padding: 5px;"> <i>Savings from analytics N/A for liquidity – baseline product economics enabled through analytics</i> </div>	

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A number of supply-side barriers have limited low-income consumers' access to financial products

Supply-side barriers

Traditional FIs

- Lack of willingness to extend credit to low-income consumers without documented financial history or ability to provide collateral
- Existing suite of financial products either unappealing or too expensive to provide to low-income consumers
- Delivery channels not suitable for cost-effectively serving low-income consumer

Micro-FIs

- Delivery and operating model too high-cost and resource-intensive to serve low-income consumers at significant scale
- Products designed primarily for SMEs and micro-businesses; few products tailored to low-income consumers

MNOs

- Financial services not core to MNO business model and therefore not a priority for new product or business development
- Lacking in ability to independently manage risk in credit or insurance products

Representative quotes

"We do not lend to the mass market. It is far too risky and we've seen too many people get burned" – **Bank executive**

"I'm pretty sure the mass market loans we do offer are not profitable for us" – **Bank CFO**

"The population is distributed across a massive geography. How are we supposed to serve them with 12 branches?" – **Manager of alternative delivery channels**

"We actually extended ourselves too far and couldn't support all the loans we had out; now we are pulling back and raising standards" – **Director of an MFI**

"We only have an operations team of 7 so there's a bit of a limit to how many partners we can support" – **Microinsurance broker**

"In the end we are a telecom operator, not a bank. We just do this mobile payments stuff because it's a cool add-on to our core product" – **Head of MFS at MNO**

"It's really a question of priorities. We know our data is valuable but we have so many other things going on, that it gets left on the back burner" – **MNO Manager of M-commerce**

In addition, there are four primary demand-side barriers to financial inclusion

Research has shown that there are four primary barriers that prevent the poor from accessing formal financial products

Affordability

- Poor consumers typically cannot afford mainstream financial products at the price points at which they are offered, e.g.:
 - Minimum balances on checking accounts
 - Interest rates on loans
 - Premiums on insurance products

Awareness & understanding

- The poor are often unaware that certain financial products are available to them
- They also sometimes lack understanding of how products are structured or how they should be used

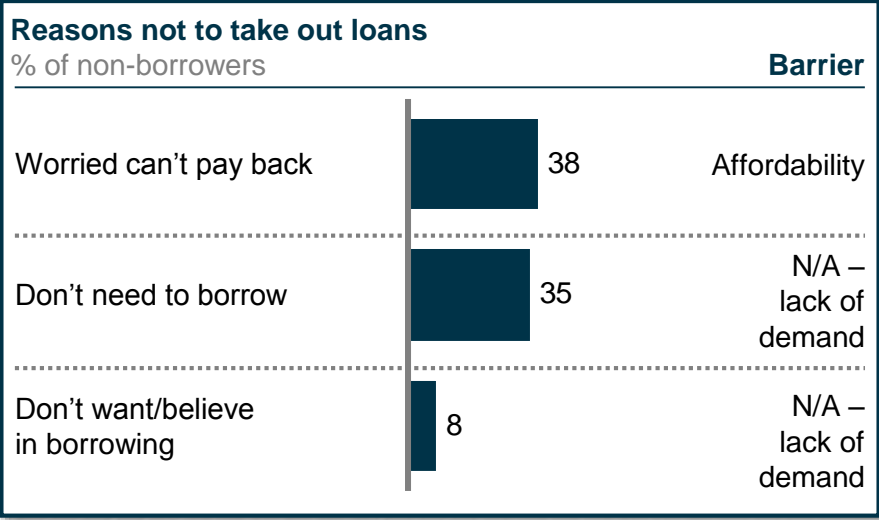
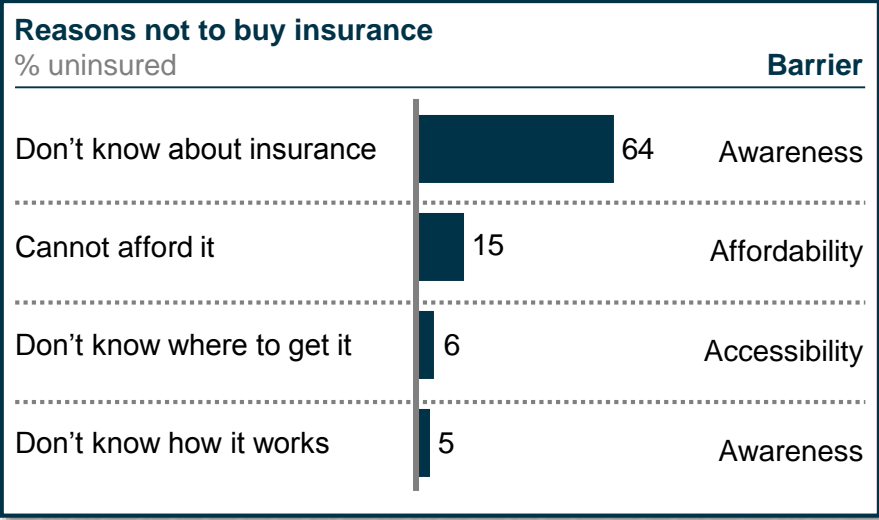
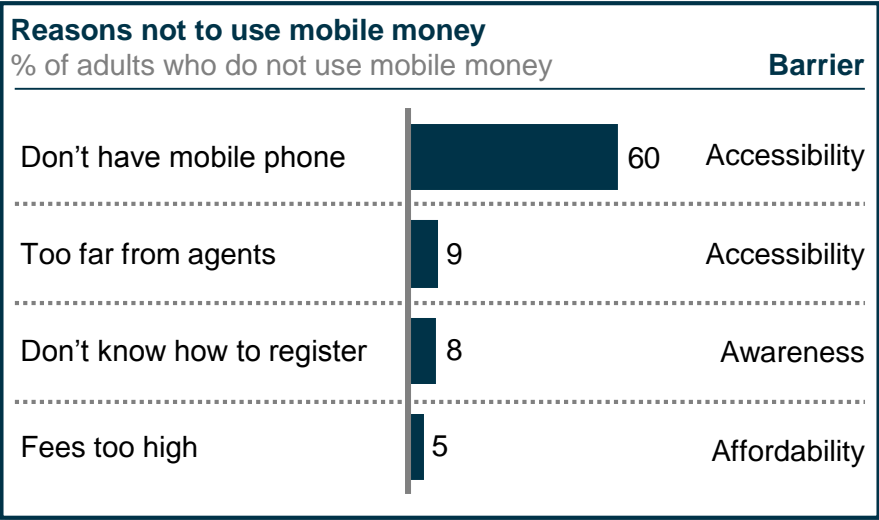
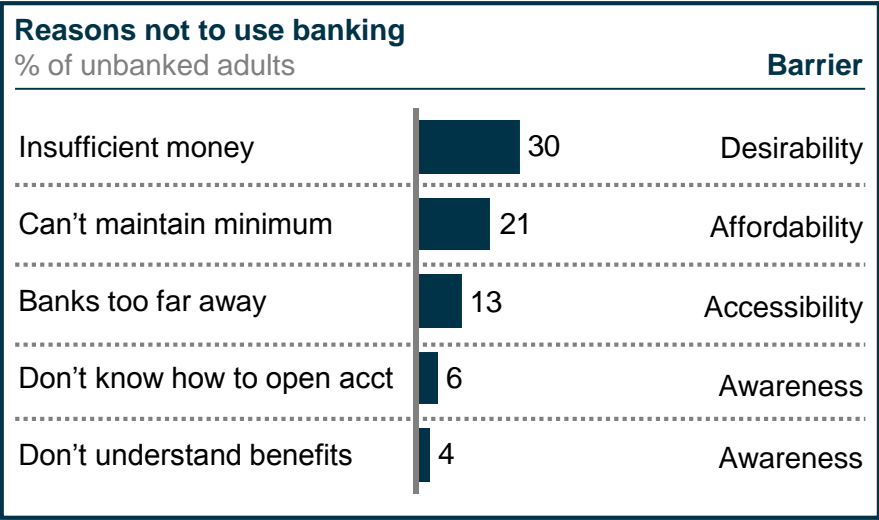
Accessibility

- Financial products are generally offered in urban centers and/or in close-proximity to higher-income customers; this lack of proximity makes it difficult for low-income consumers to gain access to these products
- Lack of access can be particularly prohibitive for products that require frequent physical interaction (e.g., depositing / withdrawing money in checking accounts)

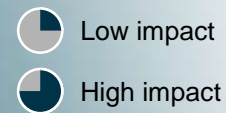
Desirability

- Many financial products are designed and structured without the specific financial needs of low-income consumers in-mind; this often makes them undesirable for low-income customers

Surveys reinforce that these are the primary barriers to financial inclusion



Non-traditional data and advanced analytics can help to address these barriers to financial inclusion



	Products where barrier is most relevant	Explanation of potential data / analytics impact	Potential scale of impact
Affordability	<ul style="list-style-type: none"> Lending product Insurance product Liquidity product 	<ul style="list-style-type: none"> Non-traditional data and advanced analytics can lower delivery costs for many financial products, particularly those that entail some form of risk assessment (e.g., lending, insurance) Lower delivery costs will allow FIs to lower prices and make products more affordable to low-income consumers 	
Awareness & understanding	<ul style="list-style-type: none"> Insurance product Liquidity product 	<ul style="list-style-type: none"> Analytical modeling can help to identify groups of consumers that will be most receptive to marketing and education campaigns Analytics can help to determine which messages are likely to resonate most with consumers 	
Accessibility	<ul style="list-style-type: none"> Transaction / deposit product Lending product 	<ul style="list-style-type: none"> Data on patterns of consumer geo-location and mobility can help companies determine where to locate operations and how best to reach consumers 	
Desirability	<ul style="list-style-type: none"> Liquidity product 	<ul style="list-style-type: none"> Analyses of data that suggest consumer behaviors and preferences (e.g., census data, social media data) can help companies develop products that are likely to meet the financial needs of the poor 	

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There are four key levers through which non-traditional data and advanced analytics can affect profitability









	Description	Example revenue effects	Example cost effects
1 Automation	Automate the completion of straightforward, high-volume and low-complexity tasks by leveraging multiple data sources	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Create automated decision models that take the manual work out of pricing Standardize easily verifiable payout “triggers”; use non-traditional data to identify appropriate triggers and pricing
2 Segmentation	Identify similar traits across customers to build archetypes that are indicative of their needs and ability to pay. Helps to inform product pricing and customer risk profiles.	<ul style="list-style-type: none"> Study transaction and behavioral data to identify which products are the best fit for a customer and tailor marketing and education efforts to improve sales 	<ul style="list-style-type: none"> Use proxy data (e.g., mobile phone history) that is available to develop improved risk profiles for each archetype to improve underwriting
3 Pattern Recognition / Data reconciliation	Reconcile data from multiple sources to track patterns of activity and identify outliers	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Track customer payment patterns and flag possible fraud e.g. customer who usually pays by phone, pays online in one instance Reconcile location data from mobile phone with credit card payments made in a different location to identify fraud
4 Predictive Modeling	Use statistical techniques to analyze ongoing customer behavior and predict probability of future actions	<ul style="list-style-type: none"> Identify certain behaviors that predict customer dissatisfaction and invest more time to retain these customers through better service 	<ul style="list-style-type: none"> Use ongoing repayment on current loan to better assess probability of default of same customer if given a larger loan

Consumers are generating an increasing volume and variety of non-traditional data on their behaviors, even in developing countries

● Very relevant ● Not relevant

Owners	Examples	Relevance to developing countries
Telecoms 	<ul style="list-style-type: none"> • Top-up patterns and monthly bill payments • Calling patterns and history • Mobile payments received/ sent 	●
Utilities 	<ul style="list-style-type: none"> • Payment records (timeliness, overdue payments) • Usage data 	◐
Retailers 	<ul style="list-style-type: none"> • POS data • Loyalty programs 	◑
Government 	<ul style="list-style-type: none"> • Demographic data • Census/ income data 	◐
Financial institutions 	<ul style="list-style-type: none"> • Credit/loan data • Purchasing/income patterns • Defaults/fraud data 	◐
NGOs 	<ul style="list-style-type: none"> • Micro-lending data • Philanthropy data • Health/education 	◐
Information/tech companies 	<ul style="list-style-type: none"> • Peer-to-peer lending • E-commerce data • Volunteered/aggregated data 	◑

As data availability has increased in developing countries, advanced analytics is enabling financial institutions to reach the unbanked and underbanked

Financial services applications of non-traditional data and advanced analytics in developing countries			
Country	Fin. Institution (and partners)	Explanation	Type of analysis
Kenya 	 Safaricom + CBA	<ul style="list-style-type: none"> Customers' mobile top-up and mobile money data are used to evaluate size of initial M-Shwari loan Afterward, M-Shwari repayment data determines size and access to additional lending 	Segmentation Predictive Modeling
South Africa 	 MTN + Bank of Athens	<ul style="list-style-type: none"> Triangulate SIM card usage with bank transaction data to identify irregular patterns and weed out fraud 	Pattern recognition
Mexico 	Traditional retail bank + Major supermarket	<ul style="list-style-type: none"> Retail bank partnered with supermarket to collect data from loyalty cards on retail spending habits Developed predictive models with 200 rules to use spending decisions as input into credit scoring 	Segmentation Predictive Modeling
Tanzania 	 + Vodacom Tanzania	<ul style="list-style-type: none"> Customers' mobile usage data used to assign a credit risk score The score can then be used to assess microloans and other financial products from First Access client institutions 	Automation Segmentation
Brazil 	Traditional insurance co + Major telco	<ul style="list-style-type: none"> A provider of basic life and funeral insurance used mobile phone data to segment customers Segmentations allowed for more focused customer acquisition, exclusion of riskiest customers, and more accurate group underwriting 	Segmentation Predictive Modeling

Select use cases illustrating the potential impact of NDAA

Description	Impact
A Latin American bank uses supermarket data to develop new models for risk scoring	~30% lower credit losses
B Brazilian insurance company identifies groups with highest claims rates and fraud rates using mobile phone data	15-20% increase in profitability
C African mobile financial services provider assigns credit scores for unsecured loan using mobile money usage data	Product recently launched
D North American small business lender uses data analytics and non-traditional data such as online reviews to target customers	30-40% reduction in customer acquisition costs
E Major US insurer leverages social media marketing to drive sales and deepen customer relationships	22% increase in production of sales reps
F US-based consumer finance firm created rapid scoring model using financial data and unstructured social media data	60% reduction in default risk
G Home equity lender incorporated customer relationship data into credit risk models	25% loss reduction; Increased approval rate
H Asian lender evaluates credit risk by analyzing mobile usage data and migration patterns	Model proved predictive of credit risk

A Latin American lender developing a new business to lend to unbanked supermarket customers

Quick facts

Data type(s):	Retail spend data
Data source(s):	Supermarket partner
Lever(s):	<ul style="list-style-type: none"> ✓ Automation ✓ Segmentation Pattern Recognition Predictive analysis

Consumer lending case

Situation

- A universal bank in Latin America traditionally focused on affluent customers, sought new sources of growth potential
- Engaged in a joint venture with a local supermarket

Analysis

- Combined advanced analytics techniques with deep business insights into consumer behavior to develop new models for risk scoring and income estimation
- 3 separate models were built using only supermarket transaction data
 - Risk model: used for pre-screening and selective pre-approval
 - Income model: used to assign lines
 - Need-based segmentation: Used to target customers for specific campaigns

Impact

- The bank successfully entered a new lending market with significant growth potential – the unbanked supermarket customers
- The high performance of the model resulted in ~30% lower credit losses
- The new business is a win-win solution that also creates opportunities for the retail partner

Key Takeaways

Data availability

- As more large retailers enter developing markets there will be an opportunity to integrate retail spend data with mobile data to further reduce delivery costs
- There is some opportunity to use existing POS data
- This data will however not include the SKU level information in traditional retail data

Lending and overdraft

- Retail data will inform refinement of pre-screening, credit assessment and customer acquisitions

Insurance

- Segmentation with retail data can inform underwriting of policies

B Brazilian insurance company refines approach to customer approvals

Quick facts

Data type(s):	Mobile phone data
Data source(s):	Customer; Mobile phone operator
Lever(s):	<ul style="list-style-type: none"> ✓ Automation ✓ Segmentation Pattern Recognition ✓ Predictive analysis



Basic Life Insurance case

Situation

- Large Brazilian insurer was offering basic life insurance and basic funeral insurance products to low income consumer
- Insurer wanted to reduce the incidence of fraud

Approach & Analysis

- Using an analytical model build by a 4 person team, client was able to identify and exclude groups with the highest claims rate and highest fraud rates
- Utilized phone data such as time of phone calls, phone location throughout the day and bill payments information
- Records were obtained from the mobile operator with customers' permission
- The product was sold through a network of distribution partners including mobile phone service providers, banks and cooperatives
- Next extension of this approach is to use the model to offer different pricing to consumers

Impact

- Identified ~10% of applicants as risky and excluded from product
- Fraudulent claims were reduced by 30-40% with a 15-20% increase in profitability

Key Takeaways

Data availability

- Mobile phone data is the most promising source of non-traditional data in Tanzania

Lending product

- Mobile phone data can be used to build customer archetypes by risk level
- This can be used in the pre-approval process to reduce the number of home visits in the underwriting process
- Customer segmentation will help to understand customer needs and automate processes e.g. overdraft determination

Insurance

- Rather than underwriting all customers as one group, use mobile usage data to identify 3-5 underwriting groups
- This will lead to more accurate underwriting reducing risk cost

© Africa-based provider of mobile financial services using data analytics to assign credit scores for unsecured loan

Quick facts

Data type(s):	Mobile phone data
.....	
Data source(s):	Internal data
.....	
Lever(s):	<ul style="list-style-type: none"> ✓ Automation Segmentation Pattern Recognition ✓ Predictive analysis

Consumer lending case

Situation

- Company currently offers an unsecured loan launched early in 2014, in addition to pay-check backed product
- The product is targeted towards current customers who have financial products such as savings accounts with the company, as well as to new customers
- Interest rates will range from 4-8% on a ~\$300 loan
- Customers register with three payments of ~\$4

Approach & Analysis

- Customers are assigned a credit limit and interest rate based on an analytical model designed in-house
- Some of the variables used in creating this credit model include savings balance, bill payments, mobile money spend patterns,, monthly income, average mobile money balance
- Product is marketed directly to customers with sign up via mobile phones

Impact

- Product has just launched and model will be refined as customers continue to use the product
- Currently running an expert model which will reflect customer data over time

Key Takeaways

Data availability

- Mobile phone data is the most promising source of non-traditional data in Tanzania

Lending and overdraft

- Mobile payments data can be used to create risk profiles for consumers
- This will help to exclude those who are not credit-worthy and assign interest rates

Insurance

- Utilize mobile phone data for customer segmentation to improve the underwriting process
- Customer segmentation can also improve understanding of customer behavior, improving marketing effectiveness



D Small business lender uses data analytics and non-traditional data to assign risk scores

Quick facts

Data type(s): Financial data, social media

Data source(s): Business financials, social media sites

Lever(s):

- ✓ Automation
- Segmentation
- Pattern Recognition
- ✓ Predictive analysis

Small business lending

Situation

- Small business lender offers small 8-10 month fixed-term loans
- Collects daily loan payments through automatic account debits

Approach & Analysis

- Data analytics used for modeling of credit risk and underwriting the policies
- Risk score assigned using a variety of inputs including geographic location, credit history, cash flow analysis, UPS shipping data, Yelp reviews
- Analytics are also used to identify businesses that might need a loan in the future and to market directly to these potential customers

Impact

- Company has seen 30-40% reduction in cost of customer acquisition
- Each iteration of credit scoring model improves predictive power by 20-40%

Key Takeaways

Data availability

- In addition to more structured data sources like POS and mobile data, unstructured data such as that from social media sites can help to refine insights into customer behavior and needs
- Data from this source is currently sparse within target market but may become more relevant as internet access improves
- Analysis of this kind of unstructured data is also more difficult requiring higher IT investments



E A major financial services company leverages social marketing to drive sales and deepen customer relationships

Quick facts

Data type(s):	Social media data
Data source(s):	Social media sites
Lever(s):	Automation
	✓ Segmentation
	Pattern Recognition
	Predictive analysis

Insurance case

Situation

- Leading US insurer wanted to empower reps to use social media to better engage with customers at scale.
- Needed a more efficient solution in order to compliantly scale the social program to the entire field team.

Approach & Analysis

- Data mining of social signals that customers and prospects are sharing, i.e, information about key life events and changes
- Individualized reach campaigning based on individual social context and social signals
- Tools/solutions for different types of users, including field representatives, creative services, principal reviewers, and recruiters
- Conducted an extensive field pilot to prove the value. Rolled out to entire base of representative

Impact

- 22% increase in production, compared to control
- Reduced time for content distribution by 75% with a significantly streamlined content compliance process
- Thousands of new leads generated monthly

Key Takeaways

Data availability

- In addition to more structured data sources like POS and mobile data, unstructured data such as that from social media sites can help to refine insights into customer behavior and needs
- This data can be used to improve customer servicing resulting in additional cross sell opportunities and improved customer retention
- Data from this source is currently sparse within target market but may become more relevant as internet access improves



F A US-based consumer finance firm created 60% lower default risk by combining standard & social media data

Quick facts

Data type(s):	Semi-structured text Unstructured text Social media profiles
Data source(s):	Government data Social media
Lever(s):	Automation ✓ Segmentation Pattern Recognition ✓ Predictive analysis



Consumer finance case

Situation

- The company was facing high and growing default rates in unsecured lending
- Review process was largely manual and extremely time consuming, resulting in high customer acquisition costs

Approach & Analysis

- The company partnered with an analytics company to create a rapid scoring model using a combination of traditional sources and social media content

Impact

- Time to complete a review and get an approval rating was reduced from hours to minutes
- Overall default risk dropped by 60%
- An additional 40% of clients that had previously been rejected in the previous model were found to be within the acceptable new, lower risk limits

Key Takeaways

Data availability

- In addition to more structured data sources like POS and mobile data, unstructured data such as that from social media sites can help to refine insights into customer behavior and needs
- Data from this source is currently sparse within target market but may become more relevant as internet access improves
- Analysis of this kind of unstructured data is also more time intensive
- Additionally, in a developing market context like Tanzania, the lack of a universal ID system and poor data quality, present significant challenges in utilizing government data

G Incorporating customer relationship data into credit risk models led to 10%-25% loss reduction

Quick facts

Data type(s): Financial product use

Data source(s): Internal bank data

- Lever(s):**
- ✓ Automation
 - ✓ Segmentation
 - Pattern Recognition
 - ✓ Predictive analysis

Home equity lending case

Situation

- High net-worth customers of the lender were being turned down for home equity (HE) loans
- Of these applicants, more than 15% opened an HE loan with a competitor
- 80% of these customers were existing customers, and more than 50% viewed the client as their primary bank

Approach & Analysis

- Customer relationship variables were incorporated into an analytical model
- The default rate of a customer was found to be closely tied to the strength of the customer's relationship with the bank
- Example variables of this strength include duration of the relationship, number of product holdings, number of weekly transactions, etc.

Impact

- New model helped identify more good opportunities from those not approved (revenue opportunity) and identify more "bads" to not approve (25% loss reduction)
- Approximately 60% of HE customers qualified for credit cards and 95% for auto loans (additional cross-sell opportunity)

Key Takeaways

Data availability

- Financial institutions and mobile money providers can use advanced analytics to develop insights from their existing databases
- 58% of Tanzanians currently use formal financial services suggesting that this data exists for many of target customers
- This approach is however likely to require high time investment in data cleaning and reconciliation

Lending and overdraft

- Internal bank data such as checking account balance, frequency of deposits, savings account use etc. can help to gain a better understand of customer risk profiles



H An Asian lender evaluates credit risk using mobile data and migration data

Quick facts

Data type(s):	Telco subscription and payment data, Demographic data
Data source(s):	Telco, Customers
Lever(s):	Automation Segmentation Pattern Recognition ✓ Predictive analysis

Consumer lending case

Situation

- An Asian lender used non-traditional data to develop an effective credit risk model for new borrowers who lacked formal financial histories

Approach & Analysis

- Developed an innovative credit risk assessment model based on non-traditional data
- Used model to extend credit to previously unbanked individuals
- Customer archetypes were built off customer background data; included migration paths that were inferred from the places of birth and current employment
- Borrowers with higher delinquency rates in telecom payments and with certain payment plans proved higher risk
- As early loan repayment data came in, the lender used that information to test and refine model

Impact

- The model proved predictive of credit risk and allowed the lender to extend credit to new borrowers in a cost-effective way

Key Takeaways

Data availability

- The opportunity to integrate mobile data with government demographic data can significantly improve insights into customer behavior
- However, in a developing market context like Tanzania, the lack of a universal ID system and poor data quality, present significant challenges to this approach
- There may also be regulatory hurdles limiting how government data can be used

Lending and overdraft

- Government data such as tax returns can be used to triangulate information provided by customers

Insurance

- Public healthcare data could be used to gain a better understanding of the risk profiles of consumers



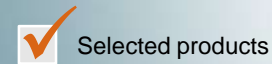
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Focus products were selected based on their current adoption and relevance to financially excluded groups




Products	Pros	Cons
<p>Lending</p> <p>✓ Microloans</p> <ul style="list-style-type: none"> • Small consumer loans • SME / small business loans • Mortgage loans 	<ul style="list-style-type: none"> • High demand among low-income customer segments • Potential for advanced data analytics to significantly lower cost-to-serve, due to risk assessment challenges 	
<p>Deposits</p> <ul style="list-style-type: none"> • Checking accounts • Savings accounts 	<ul style="list-style-type: none"> • Among most “basic” financial products, with high potential demand among low-income customer segments 	<ul style="list-style-type: none"> • Less potential for NDAA to significantly lower cost-to-serve (likely only in acquisition)
<p>Payments</p> <ul style="list-style-type: none"> • Debit cards • Mobile payments 	<ul style="list-style-type: none"> • Among most “basic” financial products, with high potential demand among low-income customer segments • Can be an effective source of non-traditional data 	<ul style="list-style-type: none"> • Less potential for NDAA to significantly lower cost-to-serve (likely only in acquisition)
<p>Insurance</p> <p>✓ Life insurance</p> <ul style="list-style-type: none"> • Health insurance • Property/casualty insurance 	<ul style="list-style-type: none"> • Potential for advanced data analytics to significantly lower cost-to-serve, due to risk assessment challenges • Very little research on impact of advanced data analytics on insurance – findings could be more “groundbreaking” 	<ul style="list-style-type: none"> • Less mature product; limited use-case and empirical evidence
<p>Liquidity</p> <p>✓ Credit line on checking accounts and mobile wallets</p>	<ul style="list-style-type: none"> • Advanced analytics enables low cost design of credit line • High demand among low-income customer segments 	<ul style="list-style-type: none"> • Less mature product; limited use-case and empirical evidence


• **Microloans and life insurance products** are high-demand products where there is strong potential for NDAA to lower costs

• A **credit facility tied to a mobile wallet** has the potential for NDAA to facilitate new product innovation

Tanzania was chosen as target market due to increasing adoption of mobile money and low financial service penetration

Evaluated four CGAP priority countries in sub-Saharan Africa, where there has been a strong emphasis on financial inclusion work and research

 Focus country; details follow

Decision Criteria	Indicators	Kenya	 Tanzania	Ghana	Rwanda
Large underserved population	• % of adults with account at formal institution (2011)	42%	17%	29%	33%
	• % of adults with at least one loan outstanding from a regulated financial institution (2011)	10%	7%	6%	8%
Financial inclusion awareness	• Share of mobile subscribers using mobile to receive money (2011)	67%	20%	2%	3%
	• Share of mobile subscribers using mobile to pay bills (2011)	13%	5%	1%	1%
Data availability	• Internet users (per 100 people)	32	4	17	8
	• Mobile cellular subscriptions (per 100 people)	71	57	101	50
	• Secure internet servers (per 1 million people)	5	1	3	3

Leader in financial inclusion with rich ecosystem and high data availability

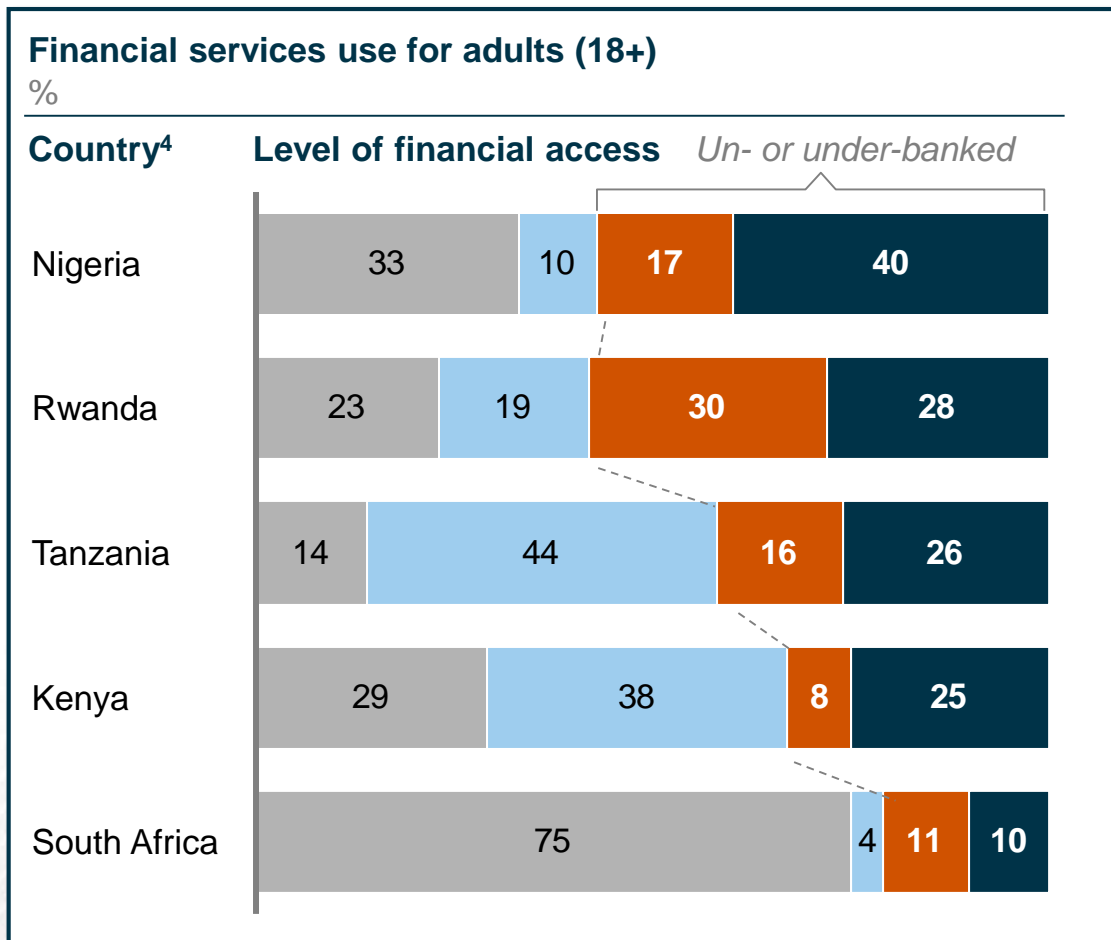
High awareness and rapid growth in adoption of mobile money

Advanced telecom sector; Despite digital insurance product, in early stages of digital finance adoption

Small market with limited digital finance adoption



The level of financial access in Tanzania is similar to that of other African countries; ~40% of the population is un- or under-banked

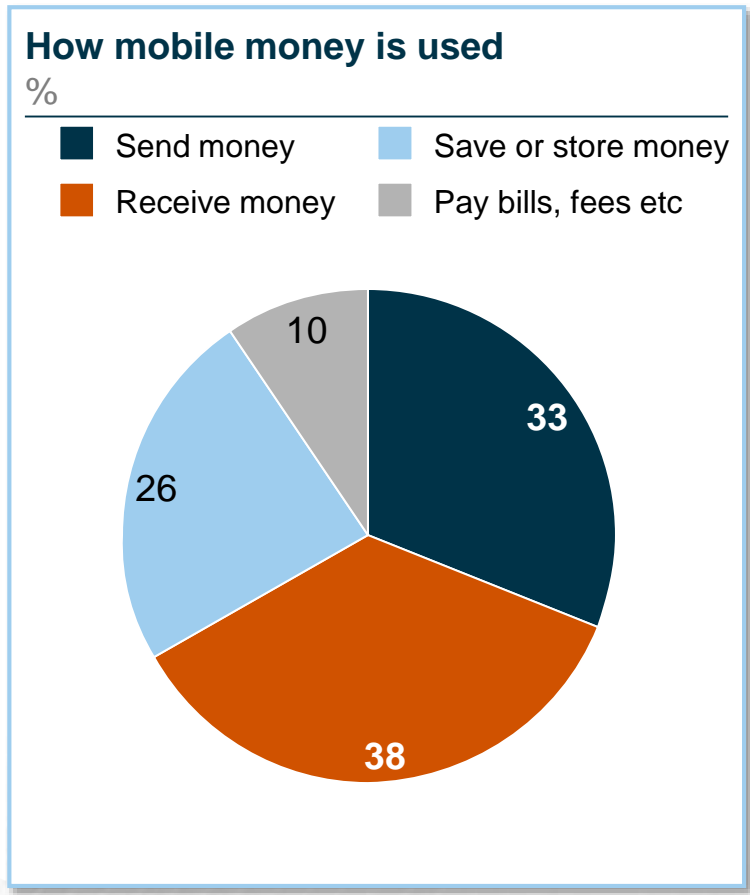
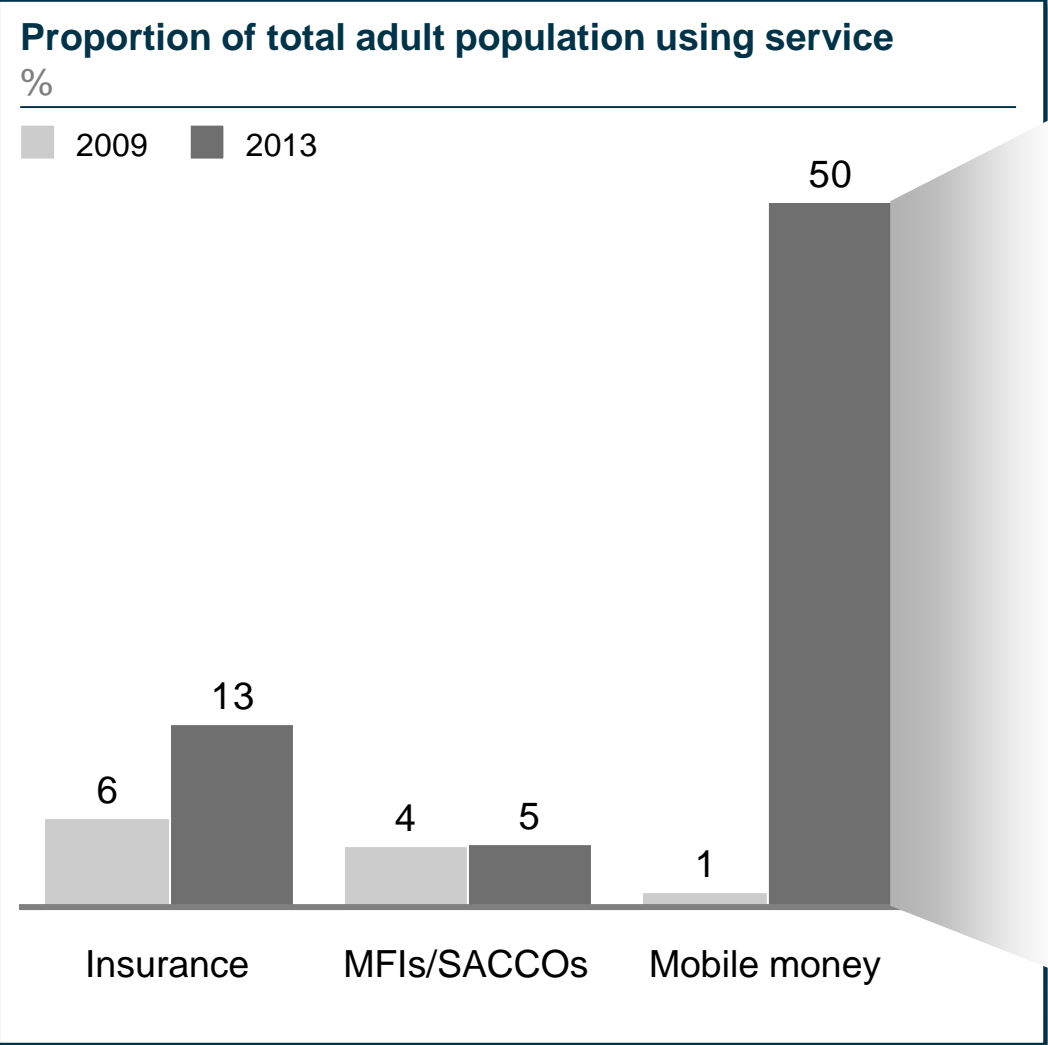


Formal - Bank¹
 Informal only²
 Formal - Non bank¹
 Excluded³

- ~40% of the Tanzanian adult population remains un- or under-banked
- Tanzania has seen rapid growth in the proportion of people using non-bank formal financial services such as mobile money, SACCOs and MFIs; 7% of the population used Formal – Non-banked in 2009 versus 44% in 2013
- This growth has been driven primarily by increased use of mobile money

1 Formal institutions are those that are regulated or officially supervised e.g., commercial banks, postbank, Insurance companies, MFIs, SACCOs, mobile money
 2 Informal services are not provided by a regulated or supervised institution e.g. savings/credit groups, money lenders
 3 Excluded users are those who use friends or family and save at home /in kind
 4 Data for Nigeria and Rwanda from 2012; Remaining data for 2013

Mobile money has been the primary driver of expanded financial inclusion in the last five years

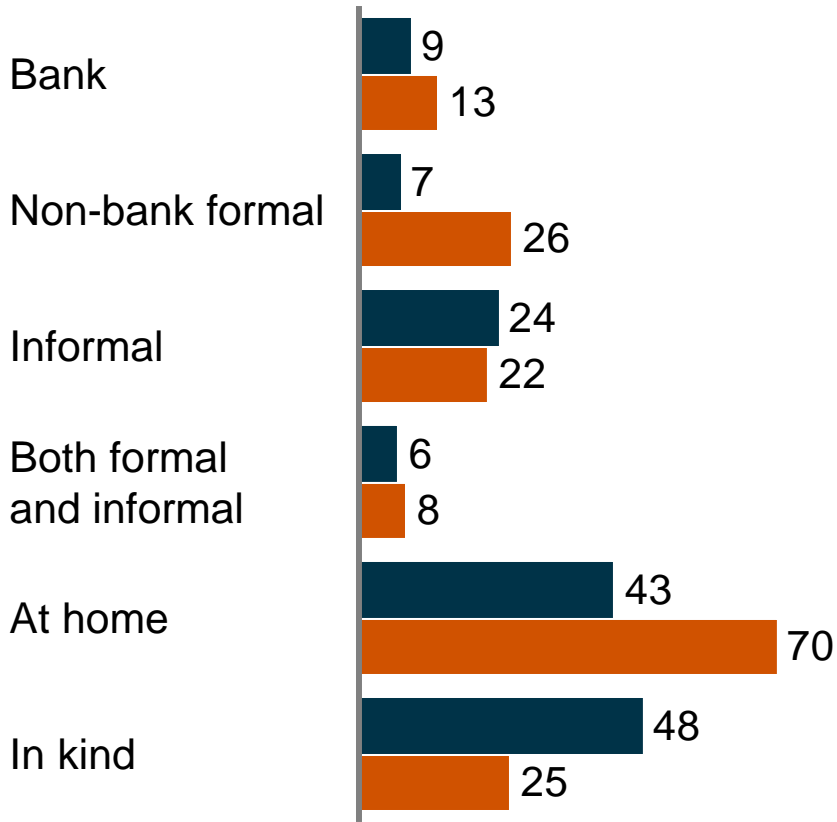


Despite this expanded use of mobile money, most Tanzanians still use informal channels for products beyond payments

Use of informal and formal sources for savings

% of adults aged 16+

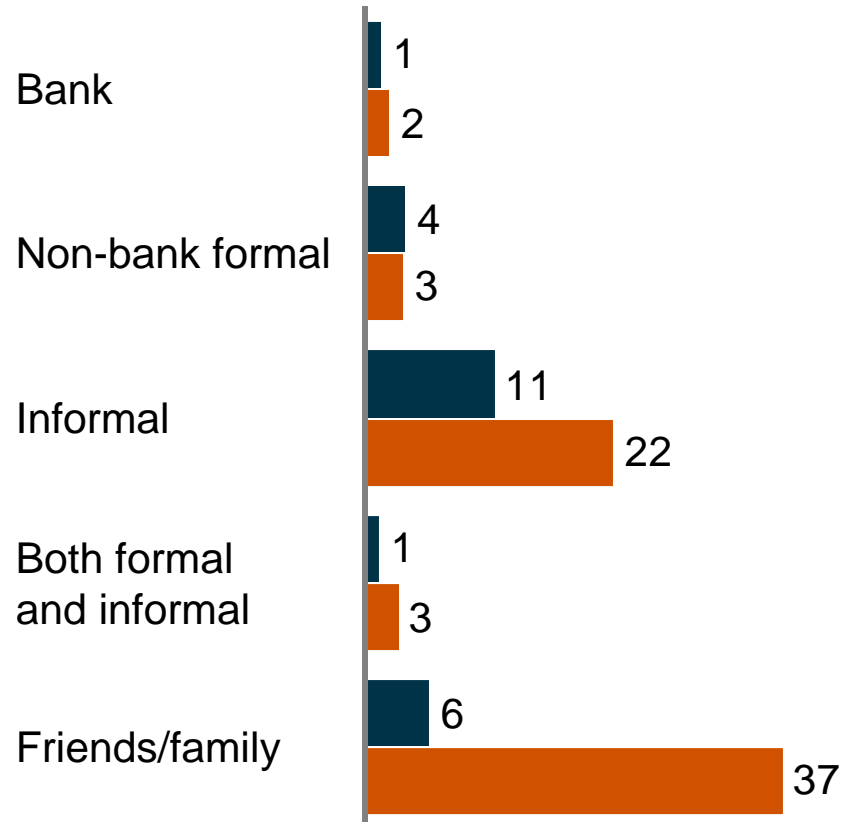
2009 2013



Use of formal and informal sources for borrowing

% of adults aged 16+

2009 2013

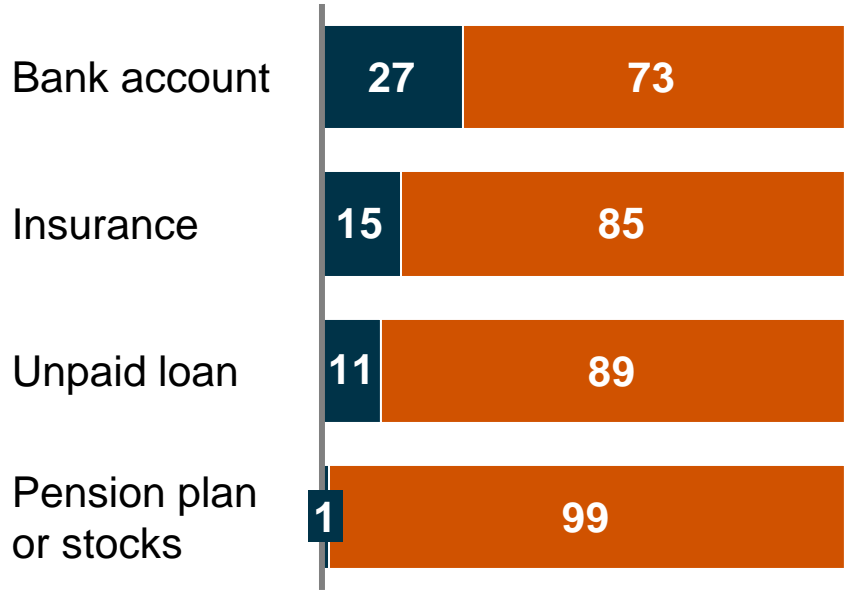


Even most mobile money users do not use formal channels for products beyond payments

Use of formal financial services among mobile money users

% of HHs with mobile money users

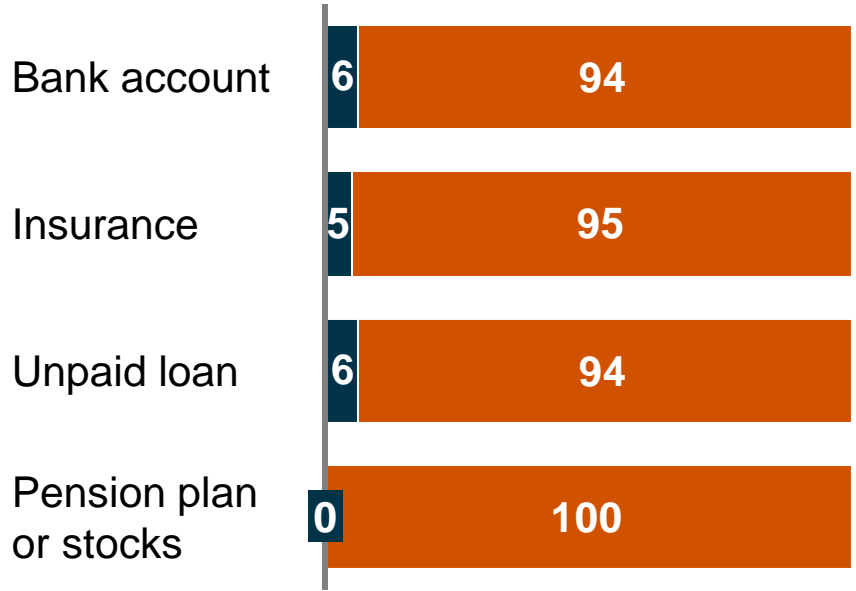
■ Have product ■ Do not have product



Use of formal financial services among non-mobile money users

% of HHs with no mobile money users

■ Have product ■ Do not have product



Target customers for products were low-income, unbanked Tanzanian consumers in the informal sector

% Rough % of adult pop.

The target Tanzanian consumer...

Informal



~80%

Does not work at a formal institution and does not receive regular salaries or wages

Unbanked



~85%

Does not have a financial relationship with a formal banking institution

Low-income



80-90%

Does not earn more than ~\$2 per day

Target group represents ~80-90% of Tanzanian adult population

...helped to define the kinds of products that were modeled

Lending product

Microloan

- Offered by smaller traditional FIs, community banks, and MFIs
- Loan size is ~\$200 on average
- Used for small entrepreneurs and business owners
- Typically requires guarantor(s)

Life insurance product

Credit life insurance

- Microinsurance policy bundled with traditional financial products (often loans)
- Loan fulfillment + cash payout in event of death, hospitalization, and/or catastrophe

Mobile insurance

- Microinsurance covering life and health offered via mobile phone (mobile payment of premiums)

Liquidity product

Overdraft facility tied to bank account

- Pre-approved conditional / temporary overdraft line based on transaction volume in deposit account

Credit facility tied to mobile wallet

- Pre-approved micro-credit facility based on volume of mobile transactions and other mobile usage patterns

The cost baselining methodology involved four steps

	Step 1: Develop baseline value chains for traditional developed economy FIs	Step 2a: Modify to align to African FIs' business models: middle income	Step 2b: Build up cost baselines for African FIs serving low-income customers	Step 3: Adjust and modify baselines for mobile business models (where relevant)
Why included	<ul style="list-style-type: none"> Necessary starting point for building baseline, given strongest data availability and preexisting analyses 	<ul style="list-style-type: none"> Important for making findings generalizable to and resonant with majority of financial institutions in EMs 	<ul style="list-style-type: none"> Important for making findings relevant to products suitable for target consumer demographic 	<ul style="list-style-type: none"> Important for demonstrating the opportunity in combining data analytics with mobile financial services
Activities	<ul style="list-style-type: none"> Develop taxonomies of level 1 and level 2 cost drivers for a "general" retail bank (i.e., Western bank) Approximate annual per product costs for each major driver 	<ul style="list-style-type: none"> Modify taxonomies of cost drivers with any additional activities or costs specific to African banks Adjust cost sizings and ranges according to differences in African bank operations (e.g., lower labor costs) 	<ul style="list-style-type: none"> Conduct in-depth interviews with banks and MFIs in Tanzania & Kenya to identify activities and processes behind each cost driver in value chain Quantify each cost driver based on sum of process and activity costs 	<ul style="list-style-type: none"> Identify activities in value chain taxonomy that may differ in mobile models Where possible, identify activities and processes behind each cost driver to quantify costs across mobile value chain
Sources	<ul style="list-style-type: none"> Internal McKinsey databases and experts 	<ul style="list-style-type: none"> Pre-trip interviews with African banking and insurance company leaders Public and proprietary reports on African banking 	<ul style="list-style-type: none"> Field interviews with Tanzanian & Kenyan retail banks, MFIs, insurance brokers, and underwriters 	<ul style="list-style-type: none"> Field interviews with Tanzanian & Kenyan mobile financial services companies and mobile network operators

- Value chains include variable costs of delivery**, but not financial costs (e.g., costs of funds) or fixed costs (e.g., overhead costs)
- Fixed costs excluded** a) because NDAA unlikely to have an impact and b) because of inherent challenges with accurately allocating shared costs to specific products
- Financial costs excluded** a) because NDAA unlikely to have an impact and b) because of significant differences across institutions (e.g., cost of funding 3% to 25%)




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Non-traditional data and advanced analytics can lower costs by 15% to 30% for lending and insurance, and will enable development of liquidity products

	Specific product description	Baseline delivery costs U.S. \$	Savings from analytics, U.S. \$	Savings % from analytics
Lending Product 	1 Microloan – one year loan of ~\$180 with interest rate of 30-80% p.a.	40 – 65	10 – 15	20 – 30%
Insurance Product 	2a Credit life insurance – ~\$6.50 premium for coverage through life of the loan	4.35 – 4.75	0.7 – 1.1	15 – 25%
	2b Mobile insurance – 30 day coverage with ~\$1 monthly premiums	4.10 – 4.50	0.7 – 1.1	15 – 25%
Liquidity Product 	3a Overdraft facility on bank account – overdraft of \$10 – 200 tied to deposit account	4.25 – 5.75	<i>Savings from analytics N/A for liquidity – baseline product economics enabled through analytics</i>	
	3b Credit facility on mobile wallet – credit line of \$1 – 50 tied to mobile money account	0.80 – 2.50		

1 Cost baseline steps for lending product

Target product

	Lending product		
	Step 1: <i>Develop baseline value chains for traditional developed economy FIs</i>	Step 2a: <i>Modify to align to African FIs business models: Middle income</i>	Step 2b: <i>Build up cost baselines for African FIs serving low-income customers</i>
			
Specific product	Cash installment loan (unsecured & secured)	Paycheck-linked loan (semi-secured)	Microloan (unsecured or semi-secured)
Offering institution	Western banks and lending institutions	Large and mid-tier African banks	African retail banks, community banks, and MFIs
Target customer	Western consumers (all incomes)	Formal sector employee with regular salary	Informal sector, non-salaried
% of Tanzanian population¹	N/A	~5%	~80-90%

¹ Adult population in Tanzania

SOURCE: FinScope Tanzania 2013; expert interviews

1 Value chain for lending product

Cost drivers	Example activities	
Distribution and customer acquisition	<ul style="list-style-type: none"> • Direct marketing (e.g., mailings) • Indirect marketing (e.g., TV, website, branding) 	<ul style="list-style-type: none"> • Sales (commissions for agents, sales support) • Customer education
Loan application	<ul style="list-style-type: none"> • Loan application submission • KYC procedures 	<ul style="list-style-type: none"> • Data entry
Loan processing	<ul style="list-style-type: none"> • Processing and transporting application and supporting documents at branch or back-office • Disbursement of funds 	<ul style="list-style-type: none"> • Loan pre-screening • Data and information follow-up
Origination and underwriting	<ul style="list-style-type: none"> • Risk evaluation and assessment of collateral • Credit scoring • Collateral re-evaluation and credit re-scoring 	<ul style="list-style-type: none"> • Initial model build • Contact and notify credit agencies • Verifying collateral
Loan servicing	<ul style="list-style-type: none"> • Customer support and customer inquiries • Personal data modification 	<ul style="list-style-type: none"> • Repayment schedule adjustments
Loan maintenance	<ul style="list-style-type: none"> • Administration of fees, guarantees and collateral securities • Issuing of statements and annual notices 	<ul style="list-style-type: none"> • Loan portfolio management • Track and report customer data • Loan closing
IT	<ul style="list-style-type: none"> • Labor and infrastructure for sales platforms, data entry and storage systems 	<ul style="list-style-type: none"> • Labor and infrastructure for risk tracking and management systems
Collection	<ul style="list-style-type: none"> • Delinquencies and late-payment management • Reminder handling • Surveillance of nonperforming loans • Claims management 	<ul style="list-style-type: none"> • Conversion of nonperforming loans and prolonging of terms • Seizing and selling collateral
Risk cost	<ul style="list-style-type: none"> • Write-offs from non-performing loans 	

1 Product features and characteristics of lending product

Microloans represent the smallest sized loans offered to low-income consumers in Tanzania

Microloans are typically **offered to low-income adults in the informal sector**; they are intended to help individuals support a small business or enterprise¹

Purpose of loans

- Loans must be used for the purpose of generating cashflow from a small enterprise; loan officers will visit both the business and the residence of the applicant to ensure the legitimacy of the enterprise
- Typically loans will not be granted for personal use e.g., on education, healthcare expenses, capital expenditures, or pre-payment of rents / utilities

Typical structure

- Interest rates: 30-80% per annum (common to charge 6% per month)
- Repayment schedules: Monthly fixed installments over a period of 6 – 12 months
- Loan amounts: TZS75,000 – 3million (\$50-\$1,800); average size is TZS300,000 (\$180)
- Sometimes charge loan origination fee of ~TZS10,000 (~\$6) or 2.5% of loan balance

Offering institutions

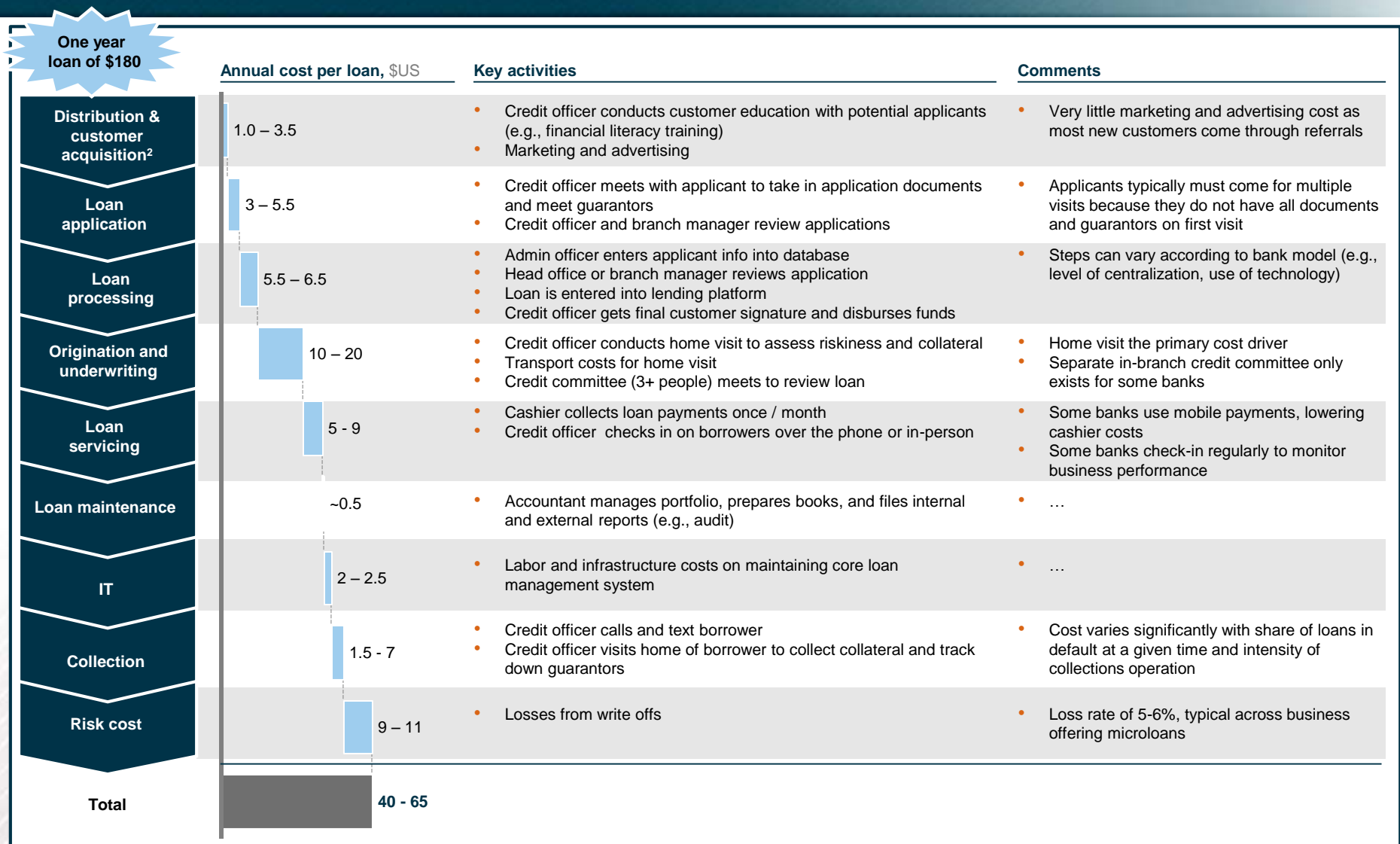
- Microfinance institutions with a direct mandate of lending to the poor (e.g., FINCA, Tujijenge, Selfina)
- Banks with a focus on the mass market or low-income segments (e.g., Access Bank, Akiba Commercial Bank) or with a microfinance arm (e.g., CRDB)

Method of guarantee

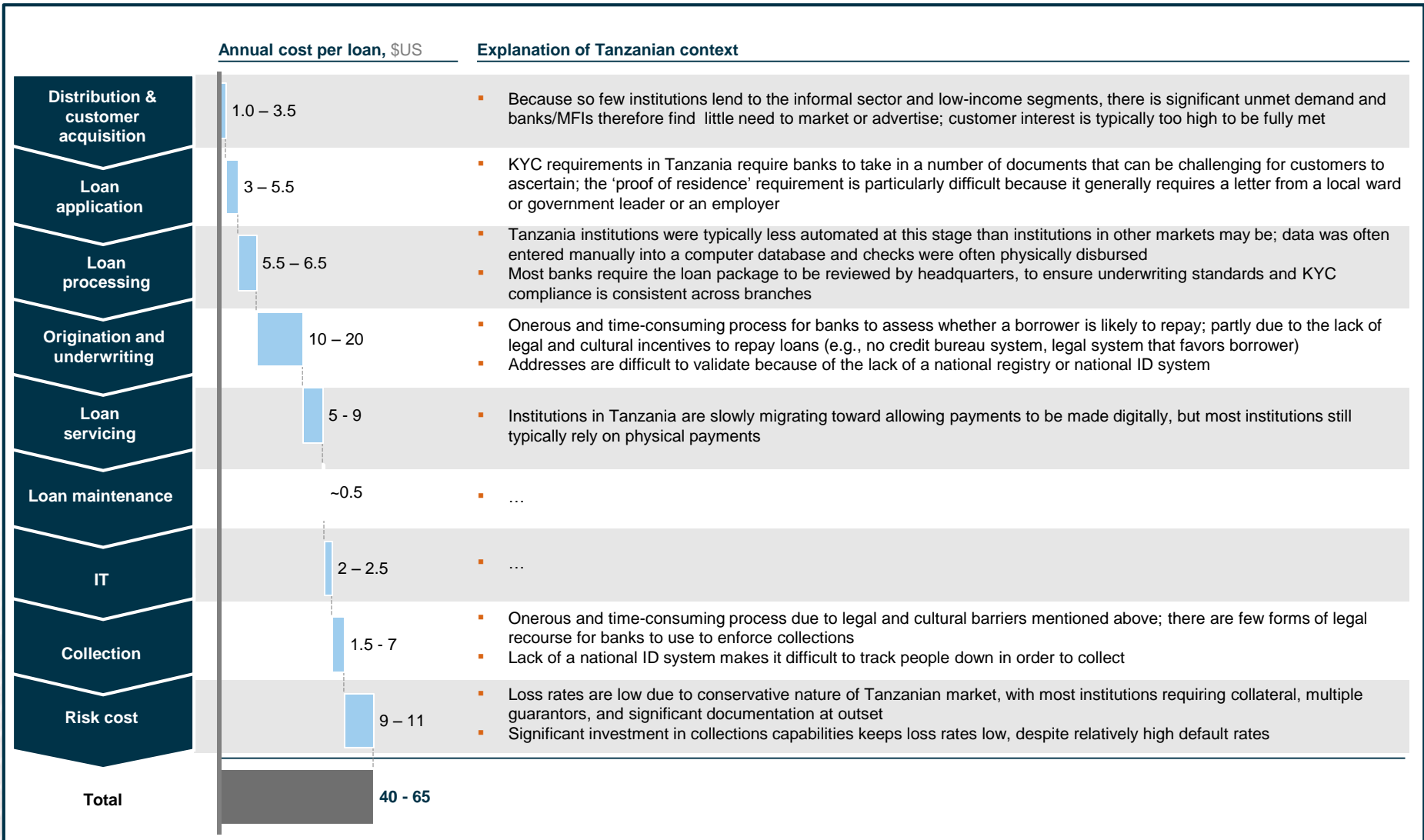
- Banking institution and MFIs in Tanzania typically do not extend credit without some form of security or guarantee; forms of guarantee for microloans include some combination of:
 - Partial securitization through the provision of assets as collateral (equipment, home, vehicle, etc.)
 - Lease-buyback arrangement whereby borrowers lease a piece of equipment, which then serves as the collateral; after the lease is paid off borrower owns the equipment
 - Anywhere from one to three guarantors, which must be (depending on the institution) the borrower's spouse, an employee of a formal institution with a steady salary, and/or another borrower from the financial institution

¹ Almost no institutions offer personal consumption loans not linked to a regular paycheck; microloans represent the closest approximation to an unsecured personal installment loan

1 Baseline delivery costs for lending product



1 The Tanzanian context may have had unique effects on the size of some cost drivers for the lending product

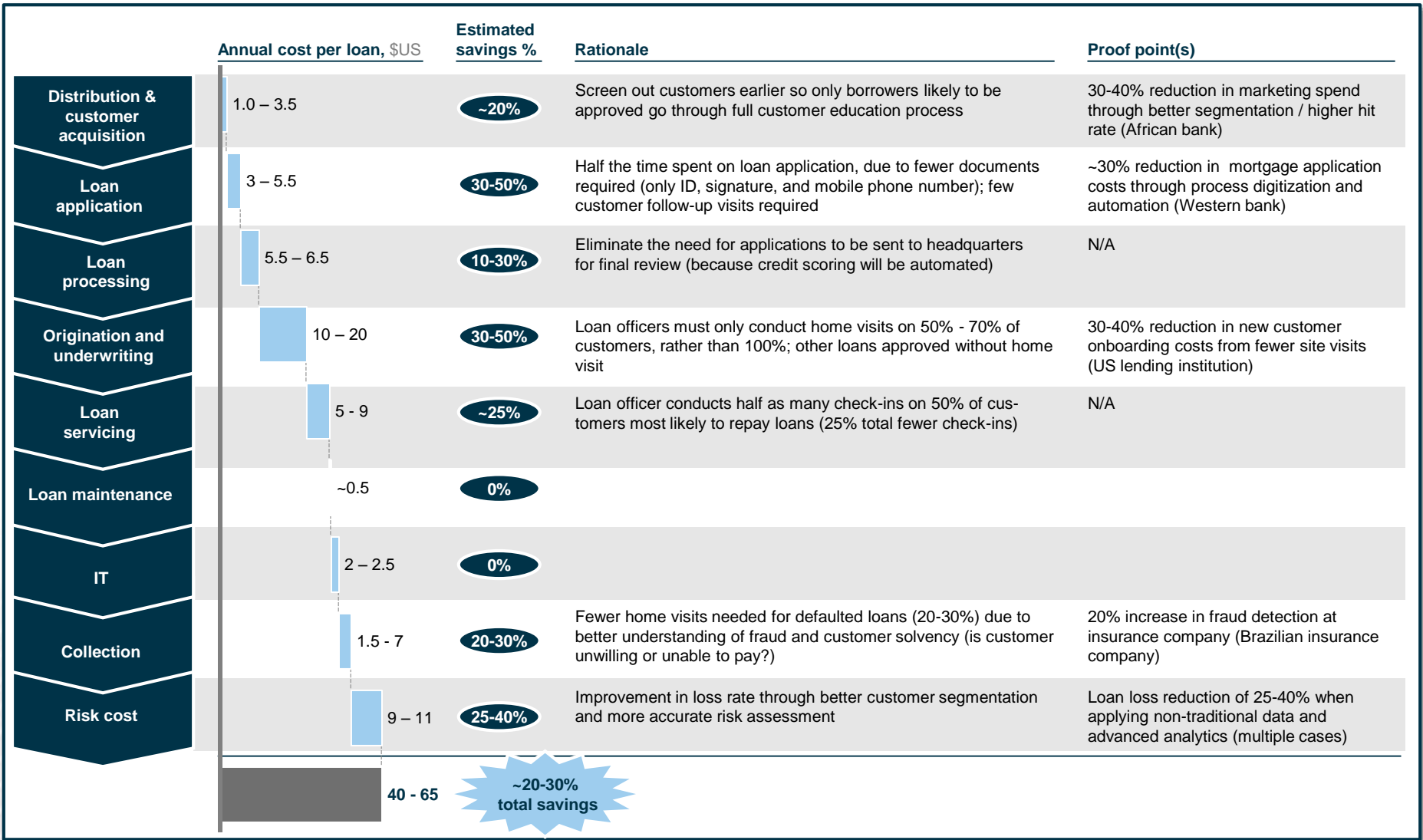


1 Areas in the lending value chain where there are likely to be costs to consumers







	Types of consumer costs	Magnitude of consumer costs
Distribution & customer acquisition	<ul style="list-style-type: none"> Customers must independently seek out banks or MFIs that offer loans, often spending significant time to research potential providers / loans and travel to banks or MFIs to inquire Customer must attend any education sessions required by the bank 	Low costs
Loan application	<ul style="list-style-type: none"> Customers must collect and compile significant material proving identify, residence, and ability to repay loan and must find up to three individuals willing to serve as guarantors Customers must often travel multiple times to bank branches with documents and guarantors 	High costs
Loan processing	<ul style="list-style-type: none"> Primarily bank operations; minimal costs to consumers 	Low costs
Origination and underwriting	<ul style="list-style-type: none"> Customers must receive loan officers at home and/or business, give tour of business facility and demonstrate soundness of business operations, make introductions to neighbors and colleagues, etc. 	High costs
Loan servicing	<ul style="list-style-type: none"> Customer must physically visit branches every month to make loan payments Customer must keep track of loan repayment schedule and prepare for each monthly payment 	Low costs
Loan maintenance	<ul style="list-style-type: none"> Primarily bank operations; minimal costs to consumers 	Low costs
IT	<ul style="list-style-type: none"> Primarily bank operations; minimal costs to consumers 	Low costs
Collection	<ul style="list-style-type: none"> Customer must answer multiple calls from loan officers and explain reason for lack of repayment Customer must manage visits from collections teams, potentially to seize assets, and manage any fees associated with legal proceedings 	High costs
Risk cost	<ul style="list-style-type: none"> Primarily bank operations; minimal costs to consumers 	Low costs

1 Expected impact of non-traditional data and advanced analytics on lending delivery costs



② Cost baseline steps for insurance product

■ Target product

Insurance product				
	Step 1: <i>Develop baseline value chains for traditional developed economy FIs</i>	Step 2a: <i>Modify to align to African insurers business models: Middle income</i>	Step 2b: <i>Build up cost baselines for African FIs serving low-income customers</i>	Step 3: <i>Adjust and modify baselines for mobile business models (where relevant)</i>
				
Specific product	Term life insurance	Term life insurance	Credit life insurance	Mobile insurance
Offering institution	Western insurance companies	Major African insurance companies	Microinsurers and large insurers with traditional distribution partners (e.g., banks, MFIs)	Microinsurers and large insurers with MNO partners
Target customer	Western consumers (all incomes)	Formal sector employees w/ regular salary	Informal sector, non-salaried	Informal sector, non-salaried
% of Tanzanian population¹	N/A	~5%	~80-90%	~80-90%

② Value chain for insurance product

Cost drivers	Key activities	
Marketing	<ul style="list-style-type: none"> Marketing research and development 	<ul style="list-style-type: none"> Customer targeting Marketing spend
Sales and sales support	<ul style="list-style-type: none"> Sales channel management Agent recruiting and training 	<ul style="list-style-type: none"> Agent commissions
Policy Issuance	<ul style="list-style-type: none"> Data entry Application processing 	<ul style="list-style-type: none"> Risk assessment and underwriting Quotation creation and negotiations
Policy Servicing	<ul style="list-style-type: none"> Customer and account servicing 	<ul style="list-style-type: none"> Payments and collections
Claims Management	<ul style="list-style-type: none"> Internal claims management External claims management 	<ul style="list-style-type: none"> Disbursement of funds
IT	<ul style="list-style-type: none"> Labor and infrastructure for IT mainframe and server maintenance 	<ul style="list-style-type: none"> Labor and hardware costs for network and telecom system maintenance
Risk cost	<ul style="list-style-type: none"> Claims paid 	

2a) Product features and characteristics for credit life insurance

Credit life insurance is offered through distribution partners who bundle policies with their products

Credit life insurance in Tanzania is **distributed almost entirely through financial institutions** (banks, MFIs, SACCOs) who bundle the insurance with their core products (loans or deposit accounts); rarely are policies sold on their own as **the economics of the product only work at significant scale** (e.g., tens of thousands of policies)

Purpose of insurance

- The most basic form of microinsurance is credit life, which pays the value of the outstanding loan amount to the lending institution if the borrower dies; many loans come with a built-in credit life policy
- Some FIs have added additional riders to their microinsurance policies, including cash payouts for funeral expenses, hospitalization/disability cover, and catastrophe insurance (which covers the value of the loan if the borrower experiences a catastrophic event like a fire or flood)

Typical structure

- Premium amount: Typically ~1-2% of the value of the loan (or ~\$6.50, given average insured loan size of ~\$400)
- Premium structure: Premiums can be paid one-time (when loan is initiated), annually, or monthly; one-time is most common, due to challenges of collecting premiums on recurring bases
- Length of cover: Duration of the loan (typically ~12 months)
- Payouts: Typically do not exceed amount of loan (e.g., hospitalization cover is only up to loan amount); exception is for funeral cover where there is a small incremental cash payout

Offering institutions

- Credit life insurance is offered through a partnership between three types of institutions:
 - Distribution partner (e.g., FINCA, SACCOs): Provides a large preexisting customer base, which is necessary to achieve product's scale requirements; responsible for sales and (partly) for marketing and policy servicing
 - Broker (e.g., MicroEnsure): Responsible for product design and for most operational components, including marketing campaign design, training of FI employees, policy issuance, and claims management
 - Underwriter (e.g., African Life): Responsible for underwriting the product and bearing the risk, as well as some claims management; must be an accredited life insurance company

2a) Baseline delivery costs for credit life insurance

One year policy with ~\$6.50 annual premium

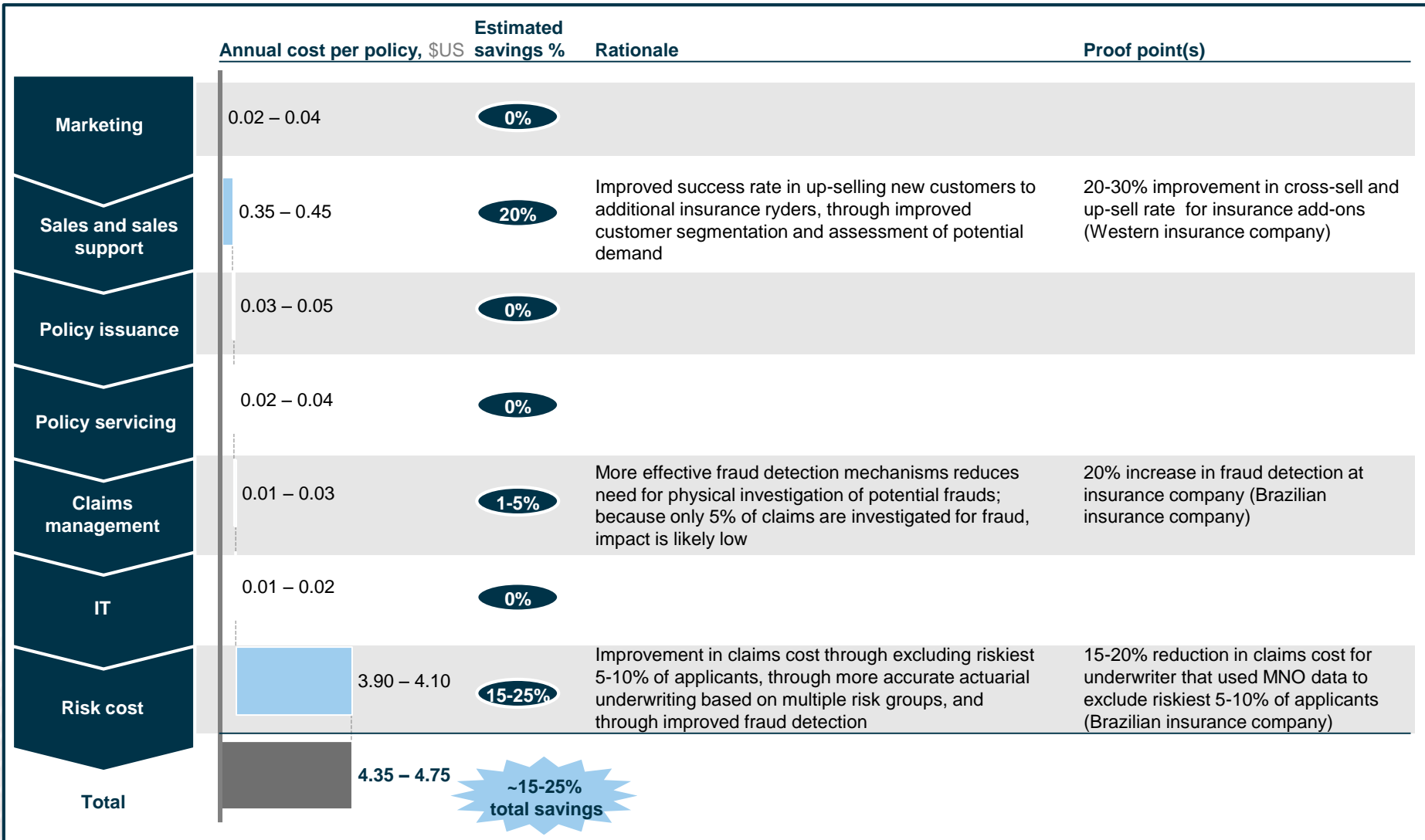
	Annual cost per policy, \$US	Key activities	Comments
Marketing	0.02 – 0.04	<ul style="list-style-type: none"> Broker designs, produces, and distributes marketing material to distribution partner (e.g., pamphlets and signs for placement in branches) 	<ul style="list-style-type: none"> Broad marketing campaigns are not common due to high cost and fact that insurance products are bundled
Sales and sales support	0.35 – 0.45	<ul style="list-style-type: none"> Loan officer or branch banker explains microloan product to customer during loan or account opening; tries to up-sell customer to add additional insurance riders (e.g., hospital cover) 	<ul style="list-style-type: none"> Time spent on sale / customer education can vary depending on level of customer awareness; typically ~15 minutes
Policy issuance	0.03 – 0.05	<ul style="list-style-type: none"> Distribution partner prepares list of all policies sold in a month, and sends to broker Broker reviews list and checks for irregularities; sends to underwriter Underwriter reviews list and enters into database 	<ul style="list-style-type: none"> Very little time spent checking individual policies; list is typically scanned for anomalies
Policy servicing	0.02 – 0.04	<ul style="list-style-type: none"> Distribution partner sends text messages to customers reminding them to claim 	<ul style="list-style-type: none"> Reminders typically sent out 4x per year
Claims management	0.01 – 0.03	<ul style="list-style-type: none"> Distribution partner explains claims process over the phone or in-person to customers wanting to claim Broker receives and packages necessary documents, and investigates potential fraud Underwriter reviews claims package before disbursing funds 	<ul style="list-style-type: none"> Only ~0.25% of outstanding policies file claims Of those that claim only ~5% are investigated for potential fraud
IT	0.01 – 0.02	<ul style="list-style-type: none"> IT costs for underwriting software IT costs for brokers' policy management systems 	<ul style="list-style-type: none"> Much of the process is conducted in Microsoft Excel, keeping IT costs quite low
Risk cost	3.90 – 4.10	<ul style="list-style-type: none"> Claims paid to customers 	<ul style="list-style-type: none"> Claims ratio is ~90% of net premium (e.g., premium after 20% commission to broker and 10% commission to distribution partner)
Total	4.35 – 4.75		

2a Areas in credit life insurance value chain where there are likely to be costs to consumers



	Types of consumer costs	Magnitude of consumer costs
Marketing	<ul style="list-style-type: none"> Primarily FI operations; minimal costs to consumers 	Low costs
Sales and sales support	<ul style="list-style-type: none"> Consumer must spend time with loan officer learning about insurance product features, structure, and terms Because products are bundled, some consumers may end up with insurance who do not want it 	Low costs
Policy issuance	<ul style="list-style-type: none"> Primarily FI operations; minimal costs to consumers 	Low costs
Policy servicing	<ul style="list-style-type: none"> Consumer must independently reach out to loan officer with any questions about policy structure or features 	Low costs
Claims management	<ul style="list-style-type: none"> Consumer must collect all documentation necessary to file claim (e.g., funeral certificate, hospital certificate) and physically bring to financial institution Consumer must liaise with microinsurance broker or underwriter regarding any questions or discrepancies in claim 	High costs
IT	<ul style="list-style-type: none"> Primarily FI operations; minimal costs to consumers 	Low costs
Risk cost	<ul style="list-style-type: none"> Primarily FI operations; minimal costs to consumers 	Low costs

2a Expected impact of non-traditional data and advanced analytics on delivery costs of credit life insurance



2b) Product features and characteristics for mobile insurance

Mobile insurance is offered through an MNO, working with a broker and an underwriter

Mobile insurance in Tanzania is **distributed on MNO networks** and has been offered as both a free product designed to drive usage and loyalty, and as a paid product with regular monthly payments¹

Purpose of insurance

- Mobile insurance has been offered for two purposes: life cover and health cover (for in-patient care only)
- Current insurance offerings are a combination of life and health cover, with the payout limit equal for each type of claim

Typical structure

- Premium amount: Tiered structure from TZS750 (~\$1) per month to TZS10,000 (~\$6) per month
- Premium structure: Premiums paid monthly, guaranteeing cover for next month; most policy-holders only pay for ~5 out of 12 months of the year
- Length of cover: The 30 day period following premium payment
- Payouts: Ranges depending on tier of premium from TZS10,000 (~\$6) to TZS1M (~\$600)
- Other features: Life cover is typically for policyholder and one dependent (e.g., spouse); health cover is only for in-patient care at hospitals in-network

Offering institutions

- Mobile insurance is offered through a partnership between three types of institutions:
 - Mobile network operator (e.g., Tigo): Provides a large potential customer base of current subscribers, which is necessary to achieve product's scale requirements; responsible for marketing; in free model MNO also pays the premium directly to underwriter
 - Broker (e.g., Milvik): Responsible for product design and for most operational components, including sales (generally through call center and physical agents), policy issuance, policy servicing, and claims management
 - Underwriter (e.g., Golden Crescent): Responsible for underwriting the product and bearing the risk, as well as some claims management; must be an accredited life insurance company

¹ Given the lack of success with the free product in Tanzania (the one offering was recently discontinued), modeling has been conducted for the paid product

2b) Baseline delivery costs for mobile insurance

One year policy with ~\$5 annual premium

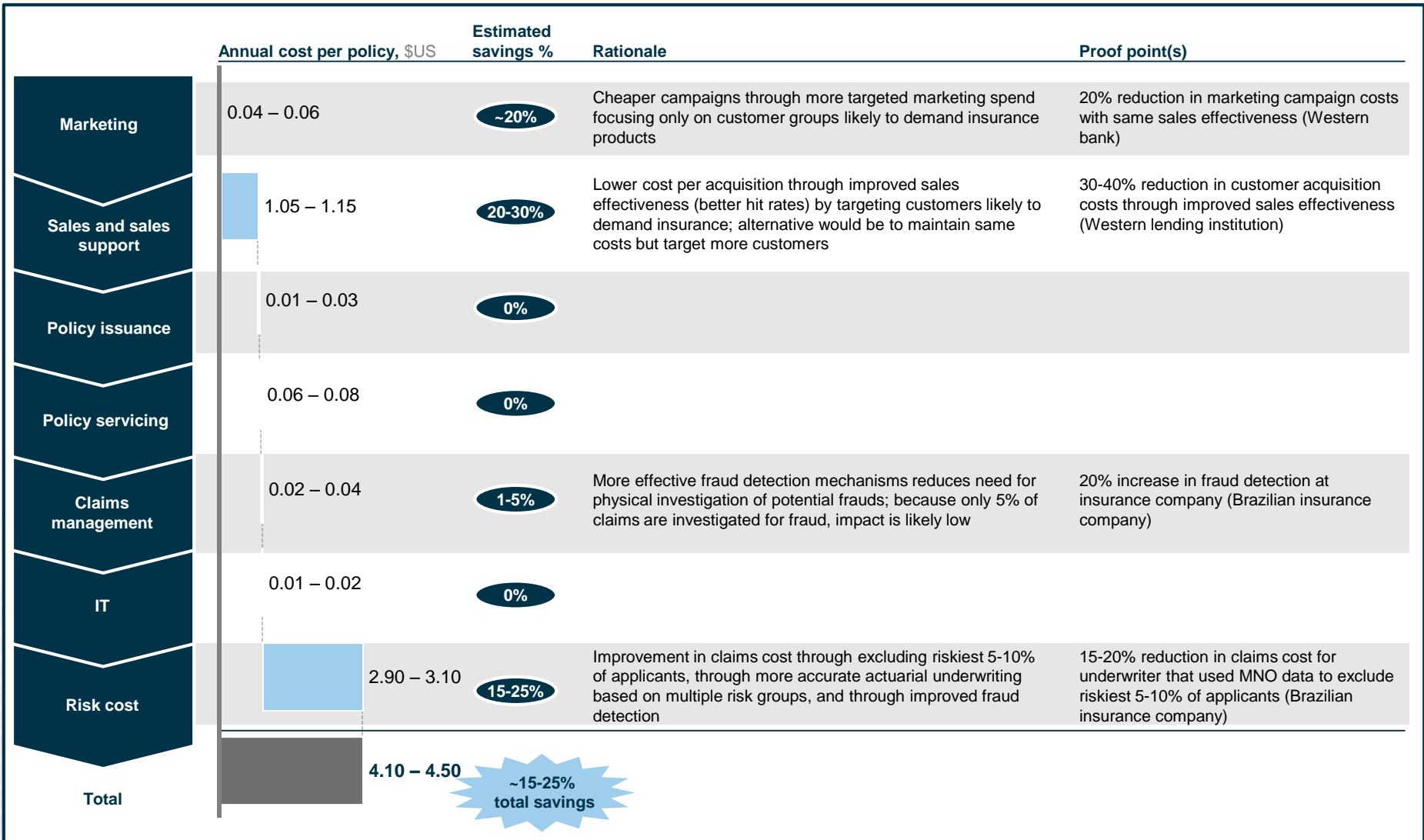
	Annual cost per policy, \$US	Key activities	Comments
Marketing	0.04 – 0.06	<ul style="list-style-type: none"> MNO conducts marketing campaign through TV, radio, events, pamphlets, or posters in distribution outlets 	<ul style="list-style-type: none"> Typically owned / funded by MNO, though broker could also assist with marketing campaign
Sales and sales support	1.05 – 1.15	<ul style="list-style-type: none"> Mobile agents sign up MNO customers who pass through distribution outlets Call center agents conduct outbound sales, based on MNO customer lists 	<ul style="list-style-type: none"> Agents paid on partial commission basis Much of cost is driven by time educating customer on product structure
Policy issuance	0.01 – 0.03	<ul style="list-style-type: none"> Broker or MNO prepares list of all policies sold in a month, and sends to underwriter Underwriter reviews list and enters into database 	<ul style="list-style-type: none"> Very little time spent checking individual policies; list is typically scanned for anomalies
Policy servicing	0.06 – 0.08	<ul style="list-style-type: none"> Broker operates call center to receive and manage customer questions and complaints 	<ul style="list-style-type: none"> Call volume typically low, so one call center agent can support ~40,000 outstanding policies
Claims management	0.02 – 0.04	<ul style="list-style-type: none"> Dedicated claims representative explains claims process over the phone to customers wanting to claim Claims agents gather and packages necessary documents, and checks for potential fraud Underwriter reviews claims package before disbursing funds 	<ul style="list-style-type: none"> Only ~1% of outstanding policies file claims Of those that claim only ~5% are investigated for potential fraud
IT	0.01 – 0.02	<ul style="list-style-type: none"> IT costs for underwriting software IT costs for brokers' policy management systems IT costs for call center systems 	<ul style="list-style-type: none"> Much of the process is conducted in Microsoft Excel, keeping IT costs quite low
Risk cost	2.90 – 3.10	<ul style="list-style-type: none"> Claims paid to customers 	<ul style="list-style-type: none"> Claims ratio is ~60% of premium
Total	4.10 – 4.50		

2b Areas in mobile insurance where there are likely to be costs to consumers







Types of consumer costs		Magnitude of consumer costs
Marketing	<ul style="list-style-type: none"> Primarily FI/MNO operations; minimal costs to consumers 	Low costs
Sales and sales support	<ul style="list-style-type: none"> Consumer must spend time in person or on the phone with sales agents learning about insurance product features, structure, and terms Some consumers proactively seeking insurance will spend significant time seeking out appropriate sources and sales channels through which to buy insurance 	High costs
Policy issuance	<ul style="list-style-type: none"> Primarily FI/MNO operations; minimal costs to consumers 	Low costs
Policy servicing	<ul style="list-style-type: none"> Consumer must independently call into call center with any questions about policy structure or features 	High costs
Claims management	<ul style="list-style-type: none"> Consumer must collect all documentation necessary to file claim (e.g., funeral certificate, hospital certificate) and physically bring to MNO retail outlet Consumer must liaise with microinsurance broker or underwriter regarding any questions or discrepancies in claim 	High costs
IT	<ul style="list-style-type: none"> Primarily FI/MNO operations; minimal costs to consumers 	Low costs
Risk cost	<ul style="list-style-type: none"> Primarily FI/MNO operations; minimal costs to consumers 	Low costs

2b Expected impact of non-traditional data and advanced analytics on delivery costs of mobile insurance



3 Cost baseline steps for liquidity product

Target product

Liquidity product				
	Step 1: <i>Develop baseline value chains for traditional developed economy FIs</i>	Step 2a: <i>Modify to align to African insurers business models: Middle income</i>	Step 2b: <i>Build up cost baselines for African FIs serving low-income customers</i>	Step 3: <i>Adjust and modify baselines for mobile business models (where relevant)</i>
				
Specific product	Deposit account with permanent overdraft facility	Deposit account with permanent overdraft facility	Deposit account with temporary overdraft facility (e.g., contingent on transaction volume)	Credit facility tied to mobile transaction account
Offering institution	Western banks and lending institutions	African retail banks	Mass-market focused African retail banks	MNOs in partnership with banks
Target customer	Western consumers (all incomes)	Formal sector employees with regular salary	Informal sector, non-salaried	Informal sector, non-salaried
% of Tanzanian population¹	N/A	~5%	~80-90%	~80-90%

3 Value chain for liquidity product

Cost drivers	Example activities	
Credit pre-approval	<ul style="list-style-type: none"> Collect and structure data Conduct analyses to determine pre-approved credit limits 	<ul style="list-style-type: none"> Communicate pre-approved lists to sales teams
Marketing & customer acquisition	<ul style="list-style-type: none"> Direct marketing (e.g., mailings) Indirect marketing (e.g., TV, website, branding) 	<ul style="list-style-type: none"> Sales (commissions for agents, sales support) Customer education
Application	<ul style="list-style-type: none"> Fill out and submit application for credit KYC procedures and ID verification Process and evaluate application 	<ul style="list-style-type: none"> Process and evaluate application Data entry
Servicing	<ul style="list-style-type: none"> Customer support and customer inquiries Modify product terms and conditions 	<ul style="list-style-type: none"> Periodically reevaluate credit limits Communicate changes in credit limits
IT	<ul style="list-style-type: none"> Labor and infrastructure for hardware and software used to track payments and conduct credit assessment 	<ul style="list-style-type: none"> Labor and infrastructure for other IT systems (e.g., core banking systems)
Collection	<ul style="list-style-type: none"> Delinquency tracking Repayment reminders and follow-up 	<ul style="list-style-type: none"> Asset seizure (from other accounts)
Risk cost	<ul style="list-style-type: none"> Credit loss and write-offs 	

3a Product features and characteristics of overdraft facility on a bank account

Overdraft facilities on bank accounts are offered to mass market consumers in Kenya, but not in Tanzania

Overdraft facilities on bank accounts typically involve a **small, conditional credit line tied to a mass-market deposit account** (checking or savings account); pre-approval and size of facility are both based on volume and regularity of internal bank transactions and size of average account balance

Purpose of product

- Intended as a source of emergency liquidity for consumers who need immediate access to funds
- Funds can be accessed via multiple channels (e.g., ATMs, phone, agents) and during bank closures (e.g., weekends and holidays) to facilitate quick and easy access to emergency cash

Typical structure

- Overdraft limits of \$10 - \$200
- Customer signs up once in-branch and then renew every year
- Annual maintenance fee of 2% of overdraft limit or \$2 (whichever is greater)
- Usage charge of 10% of amount overdrawn or \$2 (whichever is greater)
- Credit is repaid next time account is funded (i.e., funds are withdrawn from deposit account)
- Late payment fee of 6% on top of nominal interest rate

Offering institutions

- Currently only offered by select retail banks, primarily in Kenya; some Tanzanian banks claim to be developing a product

Key inputs into credit decision

- Frequency and regularity of transactions (i.e., does customer deposit on regular basis?)
- Size of transactions
- Average deposit balance
- Basic demographic data (e.g., gender, age)

3a Baseline delivery costs for overdraft facility on a bank account

Liquidity line of ~\$20 tied to savings account

	Annual cost per loan, \$US	Key activities	Comments
Credit pre-approval	0.15 – 0.25	<ul style="list-style-type: none"> Analytics team conducts credit pre-scoring on ~4,000 existing customers each month and passes along approved customers to in-branch marketing teams 	<ul style="list-style-type: none"> Pre-scoring typically easier on first waves of customers (e.g., low-hanging fruit); later waves of customers require more advanced analytics to pre-score
Marketing & customer acquisition	0.50 – 0.70	<ul style="list-style-type: none"> In-branch marketing teams send text messages to pre-scored customers suggesting they come into the branch to sign-up for overdraft product 	<ul style="list-style-type: none"> Typically no additional marketing or customer acquisition conducted
Application	2.00 – 2.50	<ul style="list-style-type: none"> Credit officer or in-branch banker explains product features and accepts application documents Credit officer or in-branch banker uploads customer information into core banking system 	<ul style="list-style-type: none"> Physical sign-up process typical for traditional product, though could be done remotely with right technology
Servicing	0.70 – 1.00	<ul style="list-style-type: none"> In-branch marketing team sends text message once a year reminding customer to renew overdraft authorization Analytics team re-scores customers once a year 	<ul style="list-style-type: none"> Most customers roll over credit lines from year to year
IT	0.30 – 0.50	<ul style="list-style-type: none"> Hardware and software system to conduct analytics 	<ul style="list-style-type: none"> Typically low IT cost (small share of core banking system)
Collections	0.40 – 0.60	<ul style="list-style-type: none"> Collections team sends multiple text message reminders to customers prompting to re-fund their account Collections team and credit manager seize assets in deposit accounts (savings or checking accounts) 	<ul style="list-style-type: none"> Collections process is relatively light-touch; rare to do home visits or to seize physical collateral
Risk cost	0.20 – 0.30	<ul style="list-style-type: none"> Losses from write-offs 	<ul style="list-style-type: none"> Loss rate of 2-3%
Total	~4.25 – 5.75		

3a Areas in the overdraft value chain where there are likely to be costs to consumers



	Types of consumer costs	Magnitude of consumer costs
Credit pre-approval	<ul style="list-style-type: none"> Primarily FI operations; minimal costs to consumers 	Low costs
Marketing & customer acquisition	<ul style="list-style-type: none"> After receiving text message, consumer must independently research and inquire about overdraft product structure and features to determine whether s/he wants to apply 	Low costs
Application	<ul style="list-style-type: none"> Consumer must collect necessary documents and physically come into bank branch to fill out application and sign necessary forms 	High costs
Servicing	<ul style="list-style-type: none"> Consumer must independently track credit limit and deposit account usage to guarantee that s/he does not accidentally overdraw account and incur a fee 	High costs
IT	<ul style="list-style-type: none"> Primarily FI operations; minimal costs to consumers 	Low costs
Collections	<ul style="list-style-type: none"> Consumer must liaise with credit officer or banker regarding unpaid overdrawn amounts, explaining reasons for lack of funding and plan for repayment Consumer must manage potential complications from future deposited funds being automatically deducted from account 	High costs
Risk cost	<ul style="list-style-type: none"> Primarily FI operations; minimal costs to consumers 	Low costs

3b Product features and characteristics of a credit line on a mobile wallet

A credit line on a mobile wallet would provide a small line of credit tied to a mobile transaction account

A credit line on a mobile wallet would **pre-approve customers for a small line of credit** that they could access in cases of emergency **via their mobile money account or mobile wallet**

Purpose of product

- A source of emergency liquidity or short-term funds for an unplanned personal expense (likely too small to be used for small business expenses)
- Customer could request funds via a text message or code, after which funds would be deposited directly into either a mobile money account or into a mobile wallet tied to a traditional checking account

Potential structure

- Small credit lines of ~\$5-50
- Likely would entail a one-time initiation fee and then a fee-per-use every time credit is accessed
- Customers could be notified of pre-approval via text message and then be asked to accept or decline access to credit line (i.e., no physical touchpoints)
- Could be renewed annually or monthly, also via a text message asking customers to accept or decline
- Credit could either be paid back next time account is funded or could be deducted from airtime next time customer tops up (latter option may be more challenging to implement)
- Some form of interest or fee for customers who do not repay credit within a given period of time

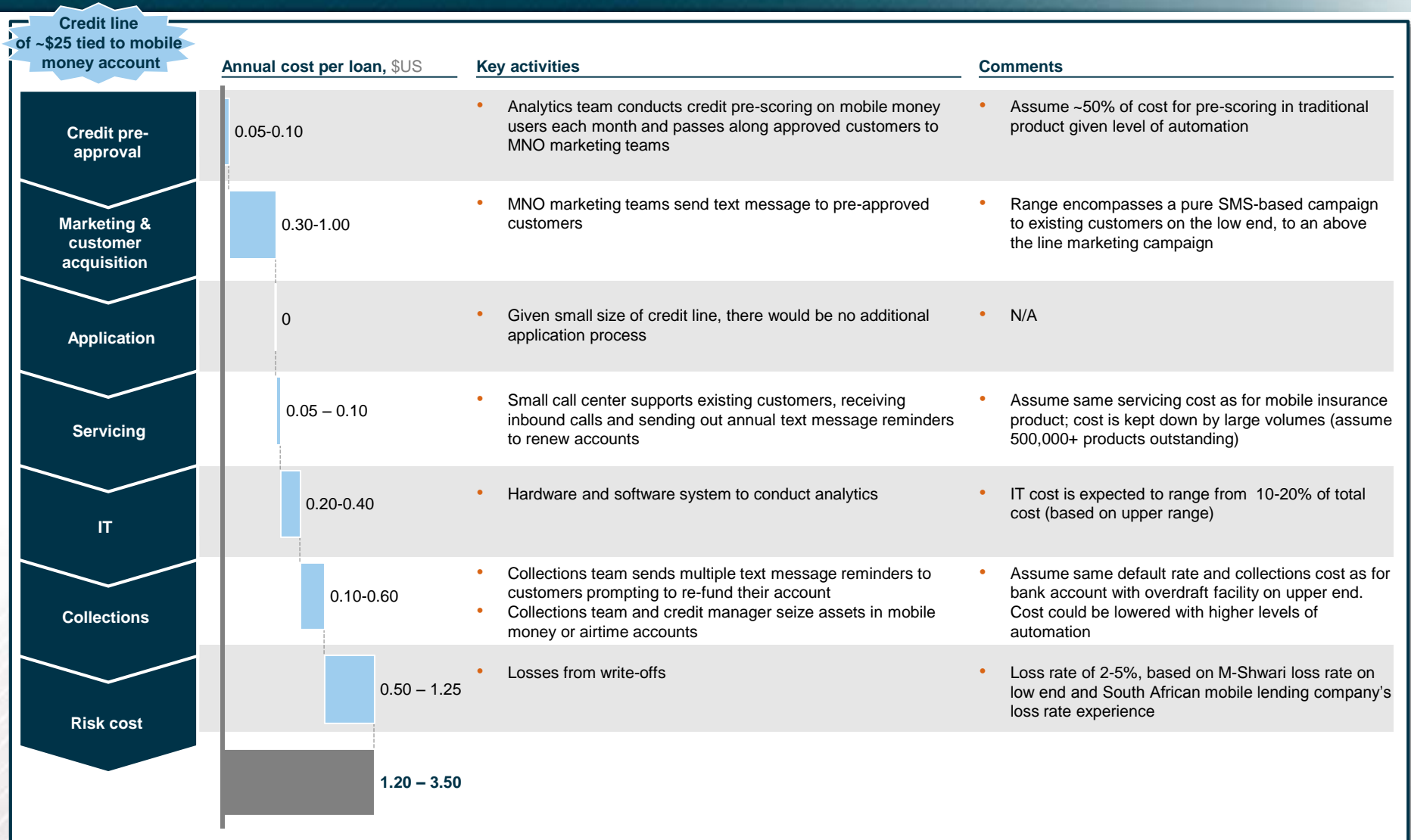
Offering institutions

- Could take one of two structures: 1) collaboration between MNO and FI whereby MNO provides data and facilitates distribution / delivery and FI conducts credit assessment and provides capital; 2) MNO-only model in which MNO conducts credit assessment and provides capital (likely more challenging)

Inputs into credit decision

- Frequency, regularity, and size of mobile transactions
- Average mobile money account balance
- Mobile phone usage data (frequency / location of calls, density of social network, frequency of top-ups)
- Previous credit usage and repayment history (i.e., after customer has started using product)

3b) Baseline delivery costs for credit line on a mobile wallet



3b Areas in the mobile liquidity value chain where there are likely to be costs to consumers



Types of consumer costs

Magnitude of consumer costs

Credit pre-approval	<ul style="list-style-type: none"> Primarily MNO/FI operations; minimal costs to consumers 	●
Marketing & customer acquisition	<ul style="list-style-type: none"> After receiving text message, consumer must independently research and inquire about overdraft product structure and features to determine whether s/he wants to accept or decline 	●
Application	<ul style="list-style-type: none"> Customer must accept or decline access to credit line via a text message or by responding “yes/no” to a text message 	●
Servicing	<ul style="list-style-type: none"> Consumer must call into call center if or when s/he has a question or dispute Consumer cannot accidentally “overdraw” so no need to carefully monitor account balance 	●
IT	<ul style="list-style-type: none"> Primarily MNO/FI operations; minimal costs to consumers 	●
Collections	<ul style="list-style-type: none"> Consumer must liaise with credit officer or banker regarding unpaid overdrawn amounts, explaining reasons for lack of funding and plan for repayment Consumer must manage potential complications from future deposited funds being automatically deducted from account 	●
Risk cost	<ul style="list-style-type: none"> Primarily FI operations; minimal costs to consumers 	●

What did cost modeling capture in this phase?

What was captured in this phase...

...what might be analyzed in a subsequent phase

<p>The discrete variable costs that an institution incurs in delivering a single financial product...</p>	<p>vs</p>	<p>...the integrated and fully-loaded cost of a single product, including variable, financial, one-time, and allocated fixed costs</p>
<p>The cost side of a product's economics for a financial institution...</p>	<p>vs</p>	<p>...the full product economics, including revenue, profitability, and costs to consumers</p>
<p>The annual costs of selling and servicing a standalone product to a new customer...</p>	<p>vs</p>	<p>...the costs of cross-selling / up-selling to existing customers, selling bundled products, or renewing an existing product</p>
<p>The potential for NDAA to lower delivery costs...</p>	<p>vs</p>	<p>...the potential for NDAA to improve effectiveness and/or increase revenue</p>
<p>The potential for NDAA to lower delivery costs...</p>	<p>vs</p>	<p>...investment costs or additional operational costs from building and deploying new capabilities in non-traditional data and advanced analytics</p>
<p>The potential for NDAA to lower delivery costs...</p>	<p>vs</p>	<p>...the integrated impact on the overall business model, including fixed costs, delivery costs, and/or shared costs, from applying NDAA</p>

- Many of these additional costs are highly institutional-specific or depend on the specifics of a particular NDAA implementation plan
- A subsequent phase of work might try to model some or all of these additional costs with a partner institution (potentially as part of a pilot)

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The new product economics from NDAA will allow financial institutions to access new segments of the market

Primary levers to expand market opportunity

Lending Product



- Improved ability to assess and manage risk will help to persuade banks to offer lending products to customers that were formerly considered too risky and expensive to serve
- Lower operational and risk costs will allow banks to offer loans at lower price points, which is a major demand-side barrier to greater lending

Insurance Product



- Lower risk cost from more effective underwriting will allow insurance companies to offer microinsurance products at lower price points, which is a major demand-side barrier to insurance adoption
- Companies will be able to more cost effectively market insurance products and educate customers on benefits, allowing them to access a wider customer base without increasing costs

Liquidity Product



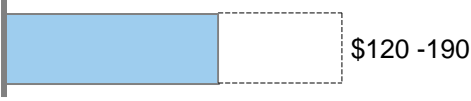


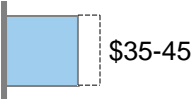





- Non-traditional data and advanced analytics will allow banks to develop and launch a product that otherwise has been impossible to offer while successfully managing risks and costs

Addressable opportunity sized for each product using available market data

Estimation of market opportunity for each product within the low income informal segment in Tanzania

Urban Rural

	Total market opportunity No. of consumers ¹	Total revenue opportunity \$million ²	Key considerations
Lending 		 <ul style="list-style-type: none"> Average loan size: \$180 Average loan duration: 12 months Monthly interest rate: 4% - 6% No. of loans per household: 1 	<ul style="list-style-type: none"> Do I have the infrastructure necessary to effectively distribute large numbers of loans? Do I have the risk management capabilities (e.g., collections teams) to effectively manage risk for a large loan portfolio? Do I have the risk appetite and necessary capital to significantly expand my lending book?
Insurance 		 <ul style="list-style-type: none"> Low end premium: \$5 (mobile insurance) High end premium: \$6.50 (traditional insurance) 	<ul style="list-style-type: none"> Do I have an effective distribution infrastructure or partner to be able to achieve sufficient scale? Do I have the sales resources and wherewithal to effectively educate consumers about insurance policies?
Liquidity 		 <ul style="list-style-type: none"> Credit limit: \$25 Average amount of credit used: \$12.50 Number of credit draws/yr: 1x - 4x Maintenance fee: 2% of credit limit Usage fee: 10% of withdrawal amount 	<ul style="list-style-type: none"> Do I have the resources and wherewithal to invest in new product development and innovation? Do I have the appetite to test and experiment with new product concepts? Do I have the right distribution partner (for mobile product only)?

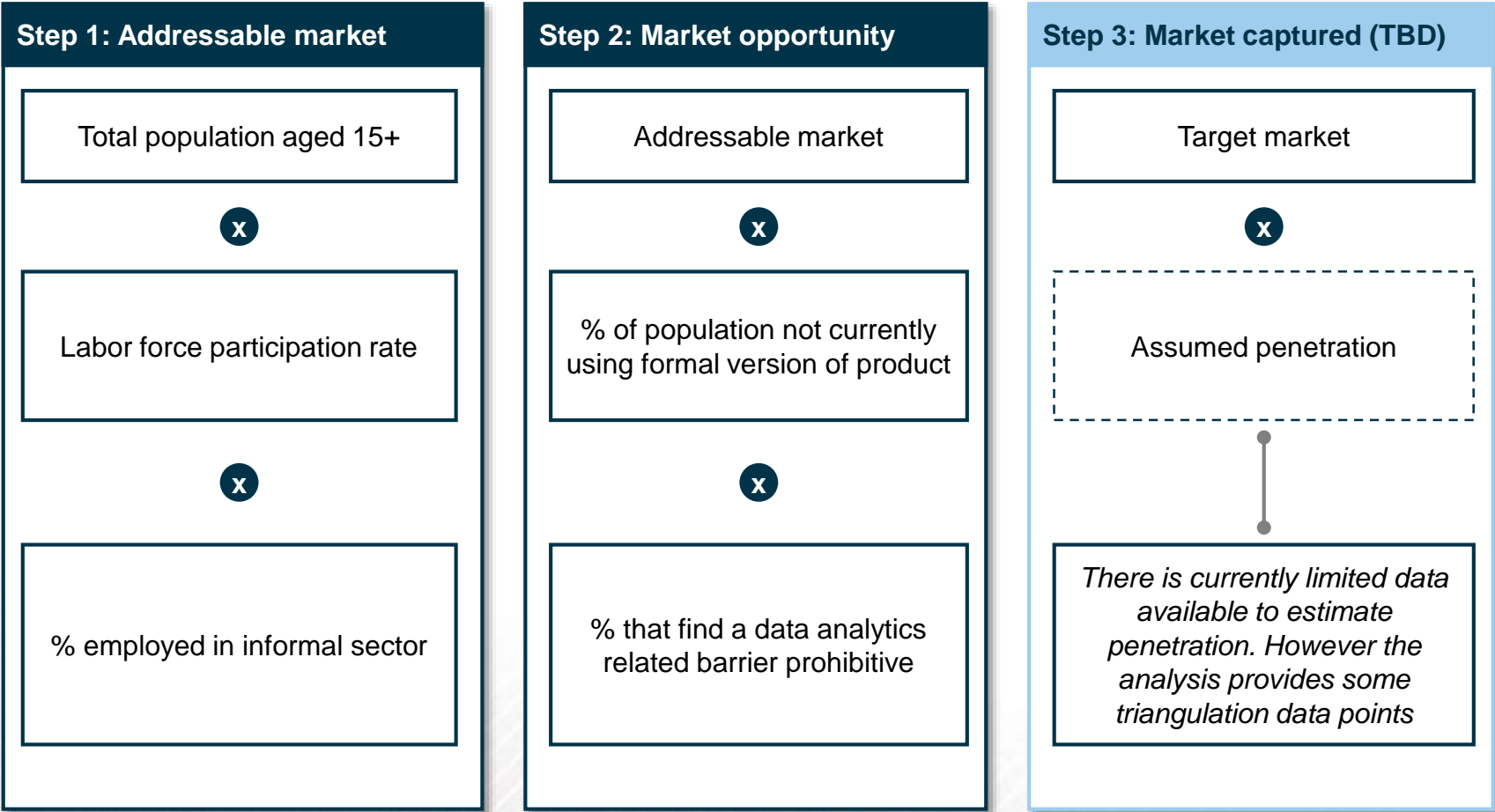
¹ Market opportunity expressed as number of households for lending product, number of policies for insurance and number of consumers for liquidity
² Total market available to all providers. Does not account for percentage captured by any one player.

Companies should weigh a number of considerations across the potential revenue opportunities

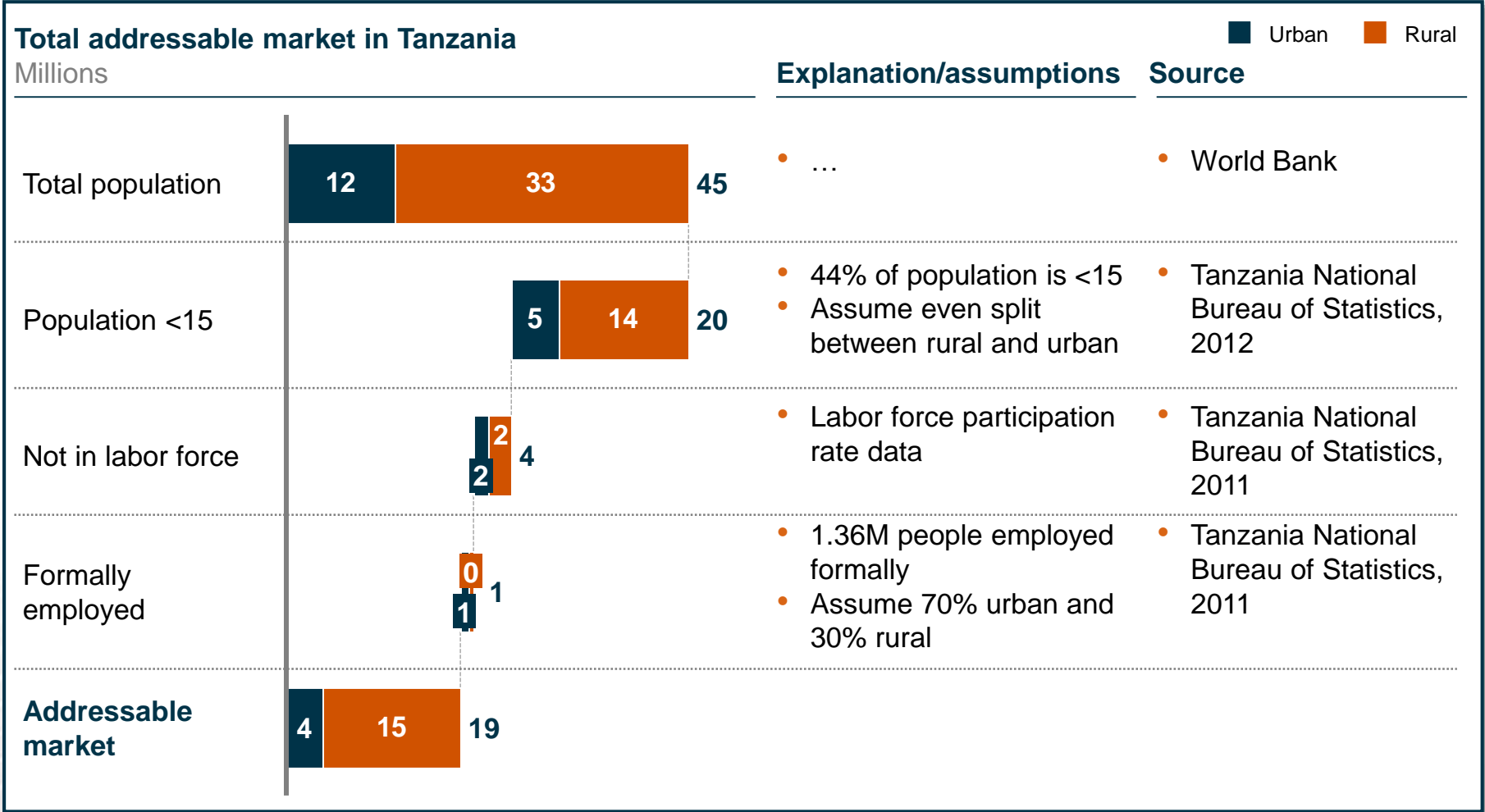
Key considerations in thinking about revenue opportunity

- 1 Which product is likely to generate the highest revenue for my institution? I.e., what share of the market opportunity do I think my institution can reasonably capture?
- 2 Can I leverage learnings from one product opportunity to develop one of the other products (i.e., are there dependencies)?
- 3 Which products can I easily bring to other markets where I operate?
- 4 What are the costs I will need to incur to go after these revenue opportunities? What new infrastructure will I need to build?
- 5 What partners can I work with to go after these opportunities?
- 6 What data assets will I need to access or acquire?

Estimating the market opportunity for each product required a 3-step methodology



There are ~19 million low income economically active adults in the informal sector in Tanzania



The estimated market opportunity for the lending product is ~3 million households

Urban

Rural

xx Market capture range

Total market opportunity for lending product in Tanzania Millions	Explanation/assumptions	Source
<p>Addressable market</p>	<ul style="list-style-type: none"> Addressable market for all products 	<ul style="list-style-type: none"> Team analysis
<p>Consumers currently using formal credit</p>	<ul style="list-style-type: none"> Of surveyed adults, 2.1% and 3.3% use formal and non-bank credit respectively Assumption: Same across urban and rural 	<ul style="list-style-type: none"> FinScope
<p>Consumer using informal or no borrowing</p>		
<p>Consumers interested in a lending product</p>	<ul style="list-style-type: none"> 43.2% of survey respondents said they did not need or want to borrow money Assumption: Same across urban and rural Assumption: remainder of population would be interested in borrowing if product was affordable, met their needs and/or if they knew about it 	<ul style="list-style-type: none"> FinScope Assumption
<p>Credit worthy households interested in a lending product</p>	<ul style="list-style-type: none"> Assumption: ~9.4M household in Tanzania, 2.7 adults per household on average, 34% not credit worthy based on proportion of population considered poor by national standards 	<ul style="list-style-type: none"> Assumption – one loan per household

Bangladesh: 47% of 30M households hold microcredit at any time, 3M have >1 loan
South Africa: Lending penetration among low income consumers is 64%



SOURCE: FinScope, CGAP, Team analysis

The estimated market opportunity for the insurance product is ~7 million policies

■ Urban
■ Rural

xx Market capture range

Total market opportunity for insurance product in Tanzania		Millions		Explanation/assumptions	Source	
Overall Market	Overall market	4	15	19	<ul style="list-style-type: none"> Addressable market for all products 	Team analysis
	Existing microinsurance policies	0	0	1	<ul style="list-style-type: none"> ~500K active policies exist; 80% urban and 20% rural 	Field interviews
	No. of consumers without microinsurance	4	15	19		
Affordability	Consumers for whom affordability is barrier	1	2	3.0	<ul style="list-style-type: none"> 15.4% of survey respondents identified affordability as a barrier to use of insurance Assumption: Same across urban and rural 	FinScope
	Market captured from affordability	1	2	3	<ul style="list-style-type: none"> Non-traditional data and advanced analytics will reduce the cost of delivery of microinsurance making it affordable for some of these consumers 	
Awareness	Consumers for whom awareness is barrier	2	10	12	<ul style="list-style-type: none"> 64.2% of survey respondents said they did not know about insurance Assumption: Same across urban and rural 	FinScope
	Market captured from awareness	2	10	12	<ul style="list-style-type: none"> Non-traditional data and advanced analytics will enable more effective educational campaigns 	Assumption
				+		
		3	12	15	<ul style="list-style-type: none"> Assume that affordability and awareness levers are mutually exclusive and that respondents were only allowed to select one response 	Assumption
				=		
Total market opportunity		1	6	7	<ul style="list-style-type: none"> Assume that ~10% of market are high risk so will be excluded Account for the fact that micro life policies usually cover 2 people on average 	Expert interviews



SOURCE: FinScope, Expert interviews, Team analysis

Ghana: ~3.5 million (~20% of adults) covered by life insurance currently
South Africa: Funeral insurance penetration among low income consumers is 21%

The estimated market opportunity for the liquidity product is ~15 million consumers

Urban

Rural

xx Market capture range

Total market captured by liquidity product in Tanzania Millions		Explanation/assumptions	Source
Addressable market		<ul style="list-style-type: none"> Addressable market for all products 	<ul style="list-style-type: none"> Team analysis
Number of mobile money users		<ul style="list-style-type: none"> <i>Assumption:</i> Market will grow to current mobile penetration rate of 76% in Kenya. Currently ~50% in Tanzania 	<ul style="list-style-type: none"> FinScope
Market captured		<ul style="list-style-type: none"> Market penetration of mShwari in Kenya is 15% providing indication of low end of market capture that can be attained Given the small size of credit line, we assume that market uptake will be high among mobile money users 	<ul style="list-style-type: none"> Assumption CGAP

Current penetration of mShwari in Kenya is 15%

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Financial institutions interested in applying NDAA will have to manage a number of implementation challenges

Implementation challenges to leveraging non-traditional data and advanced analytics

A Market environment

- Laws or regulations restricting data sharing or mandating strict consumer privacy standards
- Structural challenges to lending or assessing risk (e.g., lack of credit bureau)
- Inflexible or strict KYC requirements

B Data access and sharing

- Data that is either unavailable, inaccessible, or poorly structured
- Data owners who are unwilling or unable to share data with third parties

C Organizational capabilities

- A lack of internal talent with the data management and analytical capabilities necessary to build, deploy, and maintain advanced analytics models
- An organizational structure, management culture, and/or set of business processes unsuitable for incorporating NDAA
- IT infrastructure that may not be suitable for supporting NDAA solutions

D Risk management

- New types of risks that arise from the application of NDAA, including:
 - Reputational risk if consumers react poorly to the sharing of personal data
 - Regulatory / legal risk from potentially violating laws on privacy or data protection
 - Modeling risk if new analytical models turn out to be inaccurate

A The enabling environment in a given market will shape how to approach the NDAA opportunity

Key factors that FIs must consider in their market's enabling environment



Factors to consider	Questions to ask	Relevance to data / analytics opportunity
Privacy rules	<ul style="list-style-type: none"> Are there laws or regulations in place restricting institutions from sharing personal data or information on consumers? 	<ul style="list-style-type: none"> Strict privacy laws or regulations can limit the extent to which institutions can share data on consumer behaviors or preferences; sometimes data can only be shared once consumers give permission and sometimes only anonymized data can be shared
Universal identifier	<ul style="list-style-type: none"> Is there a universal identification system in place (e.g., SSN, national ID cards)? 	<ul style="list-style-type: none"> A universal identification system helps to create a healthy lending culture by ensuring that lenders cannot commit fraud by taking out multiple loans under the same name National ID cards can simplify the KYC and application process
Credit bureau	<ul style="list-style-type: none"> Is there at least one independent credit bureau that reliably collects and reports data on consumer lending from all banks and MFIs? 	<ul style="list-style-type: none"> A credit bureau helps to create a healthy lending culture by disincentivizing consumers from committing fraud or defaulting on loans Data from a credit bureau can be an important input or supplement to an advanced analytic model
KYC requirements	<ul style="list-style-type: none"> Are there strict KYC requirements for lending / insurance? Is the regulator willing to relax certain requirements? 	<ul style="list-style-type: none"> Strict KYC requirements can prevent companies from using non-traditional data to facilitate account opening or application An open-minded regulator who understands the financial inclusion benefit might be willing to relax some requirements (e.g., proof of address) or allow for risk-based KYC
Legal system	<ul style="list-style-type: none"> Does the legal system quickly and fairly adjudicate on disputes regarding lending and insurance, particularly loans in default? 	<ul style="list-style-type: none"> A strong, quick, and transparent legal system helps to create a health lending culture by guaranteeing that loan repayment obligations can be upheld in court



B **C**

Financial institutions seeking to leverage NDAA must manage challenges with data and resources / organization

	Description	Examples	Potential resolution	
Data access and sharing	Lack of access to existing data	<ul style="list-style-type: none"> Difficult to access data based on ownership issues (e.g., owned by private company, government, etc.) Concerns about violating privacy rights of customers by releasing data 	<ul style="list-style-type: none"> MNO owns mobile phone data, must be convinced to share it MNO doesn't want to share mobile data for fear of public backlash 	<ul style="list-style-type: none"> Develop ongoing partnership between data owners and users Anonymize data Allow potential customers to "opt-in" to data sharing
	Problems with usability	<ul style="list-style-type: none"> Lack of unique IDs (e.g., SSN) makes it difficult to combine data sets Existing data may not be in a usable electronic format 	<ul style="list-style-type: none"> Difficult to combine mobile data with financial data Paper and pencil records stored in community banks 	<ul style="list-style-type: none"> Recruit data reconciliation experts Launch collection and digitization efforts
	Complex partnership models	<ul style="list-style-type: none"> Solutions require partnership between multiple entities with varying interests and levels of involvement 	<ul style="list-style-type: none"> Developing new credit model requires participation of MNOs, governments, financial providers, retailers, etc. 	<ul style="list-style-type: none"> Establish clear organization and funding structure at outset of project
Organizational capabilities	Access to talent	<ul style="list-style-type: none"> Limited in-house knowledge of the complex analytics required to develop and test models 	<ul style="list-style-type: none"> Financial institution do not currently run any kind of analyses on their data 	<ul style="list-style-type: none"> Involve players with access to non-traditional pools of talent (e.g., academics, third party analytics groups) Invest in training existing employees
	Limited existing infrastructure	<ul style="list-style-type: none"> Existing IT infrastructure is basic and does not have the processing power for advanced analytics 	<ul style="list-style-type: none"> Financial institutions typically run off a core banking system, which is not well-suited to conducting advanced analytics 	<ul style="list-style-type: none"> Ramp up investments in IT infrastructure Outsource required analytics
	Changing mindset and behavior	<ul style="list-style-type: none"> Difficult to convince employees to embrace new way of doing business 	<ul style="list-style-type: none"> Credit officer uncooperative because worried that his/her job will be made redundant by analytical models 	<ul style="list-style-type: none"> Transparent internal communications about short and long terms implications of moving to data analytics approach Vocal support from top and middle managers for the new approach

(B)(C) To manage these challenges, institutions should consider different models for sourcing data and building capabilities

Options for data sourcing and delivery model		
Option	 Pros	 Cons
Financial institution alone	<ul style="list-style-type: none"> Limited data reconciliation required 	<ul style="list-style-type: none"> Data available only for current customers, providing limited insight into low income customers
MNO alone	<ul style="list-style-type: none"> Limited data reconciliation required 	<ul style="list-style-type: none"> Some regulatory limitations on providing financial services
Financial institution partners with another data holder eg MNO, retailers	<ul style="list-style-type: none"> Richer picture of customers Telcos can leverage financial knowledge of banks and banks can leverage telco relationships with consumers 	<ul style="list-style-type: none"> Complicated to manage partnership model and navigate regulatory requirements around privacy Data reconciliation could be complicated
Central data aggregator provides service to financial service provider	<ul style="list-style-type: none"> Avoids duplication of efforts Institutions can leverage non-traditional data without upfront investment in data cleaning and reconciliation 	<ul style="list-style-type: none"> Limited competitive advantage for any player since everyone has access to the same data

Options for building analytics capabilities		
Option	 Pros	 Cons
Develop in-house	<ul style="list-style-type: none"> Retain control of analytics Improved ability to adapt models with experience 	<ul style="list-style-type: none"> Requires significant time and monetary investment since data analytics may not be a core capability
Vendor tools	<ul style="list-style-type: none"> Off the shelf tools that are ready to use immediately 	<ul style="list-style-type: none"> May be too generic to be useful Can be expensive Still need to invest in acquiring or training talent to effectively use these tools
Completely outsource	<ul style="list-style-type: none"> Bank can focus on core capabilities since data consolidation, modeling and insight generation will be handled by a third party 	<ul style="list-style-type: none"> May be prohibitively expensive

Decisions on how to access non-traditional data and implement advanced analytics, leads to a **range of business model archetypes**

B **C**

A number of models in Tanzania that could provide templates for future NDAA applications

Data sharing and analytics business models in Tanzania

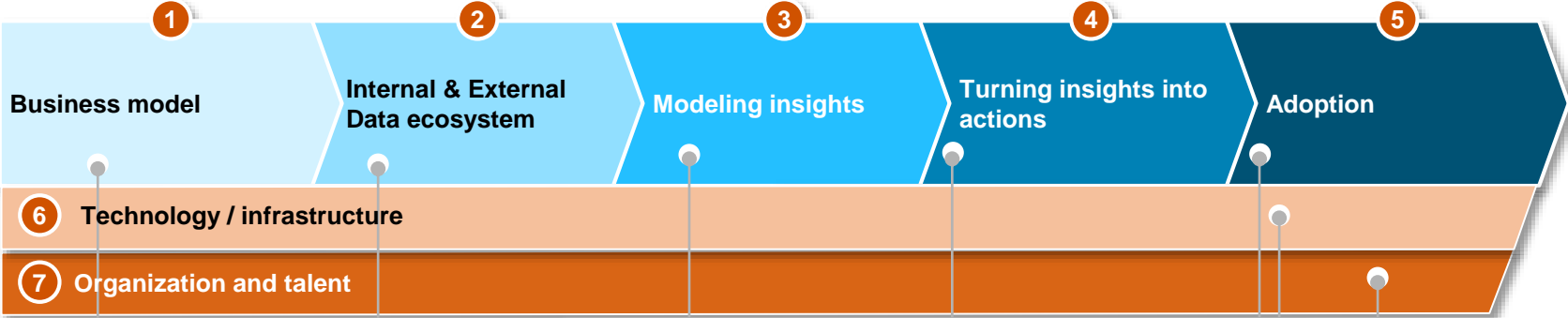
Business model	Explanation	Approach to data sourcing and delivery	Approach to analytics capabilities
<p>MNO</p> <p>+</p> <p>FI</p>	<p>A mobile phone operator partnered with a traditional bank to provide nano-loans tied to savings accounts to consumers via their mobile phones</p>	<p>MNO passed on users' mobile payments and usage data to FI; received sanction from regulator to share data as long as customer gives consent</p>	<p>FI developed credit scoring analytics capabilities in-house by building centralized credit scoring team; MNO did not conduct analytics</p>
<p>FI</p> <p>+</p> <p>3rd party solution</p> <p>← MNO</p>	<p>A financial institution launched a pilot to test the predictive power of a data analytics solution that uses non-traditional data to develop credit scores</p>	<p>3rd party analytics solution sources data from bank internal systems and from an MNO; provider pays the MNO a small fee every time it pulls data on a customer</p>	<p>Analytics is entirely developed and owned by 3rd party, who do not give FI details of analytic modeling (beyond some information on inputs)</p>
<p>MNO</p> <p>+</p> <p>Broker</p> <p>+</p> <p>Underwriter</p>	<p>An MNO partnered with an insurance broker and underwriter to provide mobile insurance to its customers to drive usage and loyalty</p>	<p>MNO provided basic data (e.g., name, phone number, age) to broker and underwriter to help with marketing and to keep track of insured customers, but did not provide detailed data on usage or behavior</p>	<p>Very little advanced analytics conducted due to MNO's unwillingness to share detailed customer information; broker conducted some basic analytics using MNO data to facilitate outbound call marketing</p>
<p>FI-only</p>	<p>Financial institution used internal transaction, account balance, and customer demographic data to pre-approve customers for overdraft lines</p>	<p>Data sourced entirely from internal systems tracking existing customer transactions</p>	<p>FI built internal analytics team to develop, deploy, and refine risk scoring models</p>

D Financial institutions will have to weigh and manage three primary risks that may arise in implementing NDAA

Risks from applying NDAA and potential mitigation levers

Risks	Explanation	Potential mitigation levers
Customer risk	Potential for customers to perceive that their privacy rights are being violated through the accessing of personal data; could erode trust between consumers and financial institution	<ul style="list-style-type: none"> • Design clear and straightforward informed consent process at account opening, which gives consumers the right to allow or deny the accessing of their personal data • Broadly communicate to existing and potential consumers the privacy protection processes and measures that will be used in offering NDAA-enabled products
Regulatory and legal risk	Potential to unintentionally violate consumer protection laws, data sharing rules, or privacy regulations, opening up risk of lawsuits or regulatory sanctions	<ul style="list-style-type: none"> • Design informed consent processes and data protection standards that guarantee consumer information will be used only with permission and will be protected • Actively engage regulators and lawmakers during product development to explain product structure, data protection standards, and benefit to consumers
Modeling risk	Potential for inaccuracies in analytical models, particularly in early stages of rollout, increasing potential exposure to credit losses / claims costs	<ul style="list-style-type: none"> • Conduct multiple test pilots with small amount of capital and small number of customers to refine early models • Conduct staged rollout, beginning with a select number of branches, customers, and/or products • Initially use new models concurrently with existing models to test effectiveness and accuracy

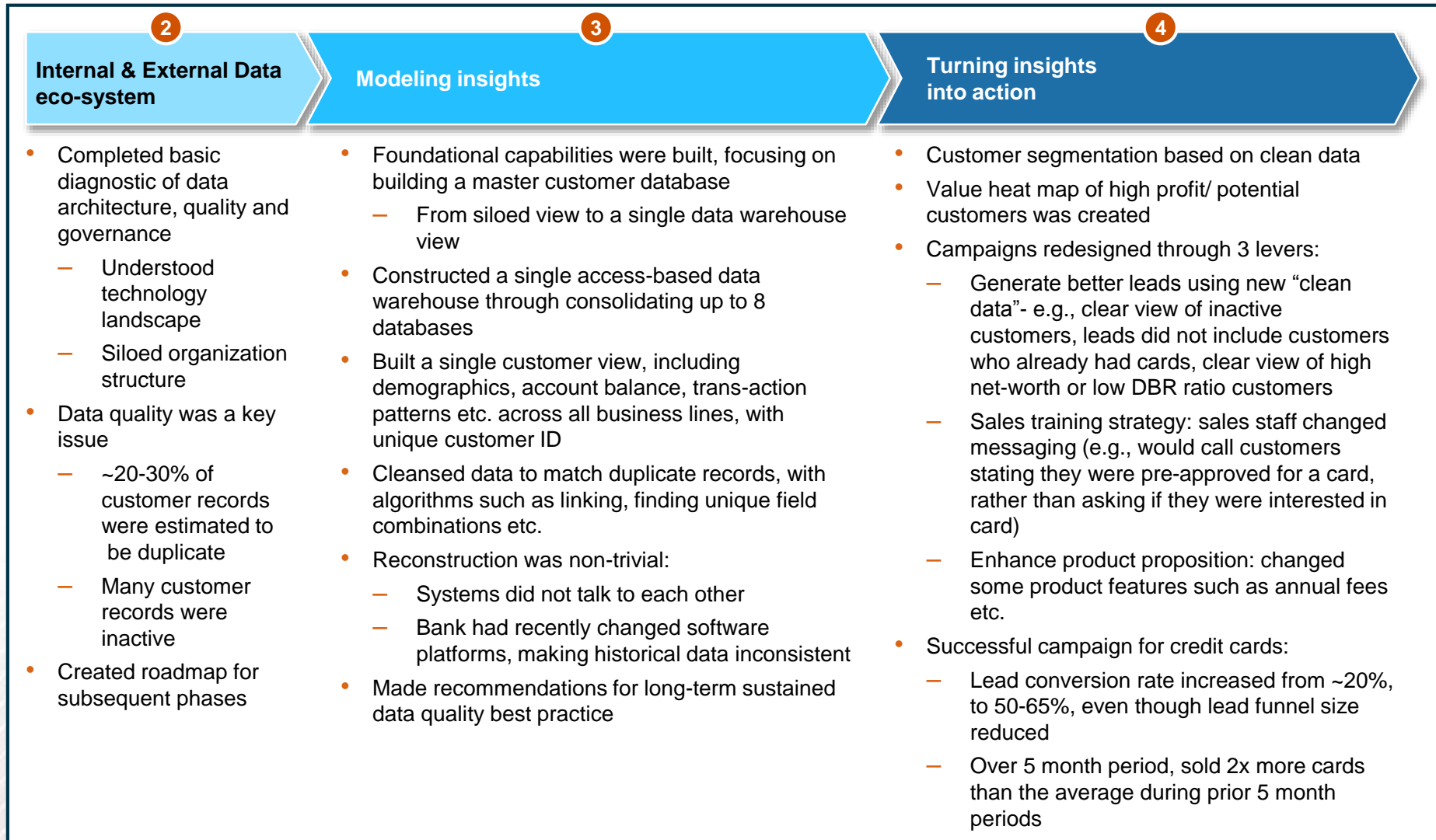
Capability diagnostics and investments should occur across 7 building blocks during implementation



	1	2	3	4	5	6	7
Key activities	<ul style="list-style-type: none"> Clearly articulate business needs for NDAA and assessment of expected impact through pilots Decide on analytics model i.e. develop in-house, outsource 	<ul style="list-style-type: none"> Invest in building, cleaning and managing relevant pools of internal and external data Forge external strategic partnerships 	<ul style="list-style-type: none"> Conduct advanced statistical analyses to drive business insights Disperse codified heuristics in the organization to enhance analytics 	<ul style="list-style-type: none"> Assess and invest in capability to integrate analytically based actions and decision support tools into workflows Assess and invest in capability to quickly redesign processes to embed new rules in the workflow 	<ul style="list-style-type: none"> Develop frontline and management capabilities Proactive change management and tracking of adoption with performance indicators 	<ul style="list-style-type: none"> Invest in hardware and low-level operating system software to store and process data Build or buy software to manage and analyze data 	<ul style="list-style-type: none"> Recruit and train analytics team of 1 manager and 3-5 highly skilled analysts¹ Ensure alignment and commitment of management to new approach
Resources & Investment	3-6 months	TIMING AND DURATION		4-12 months	YEAR ONE INVESTMENT		\$75 - \$130K
		6-12 months	2-4 months	2-4 months	\$200-\$500K		

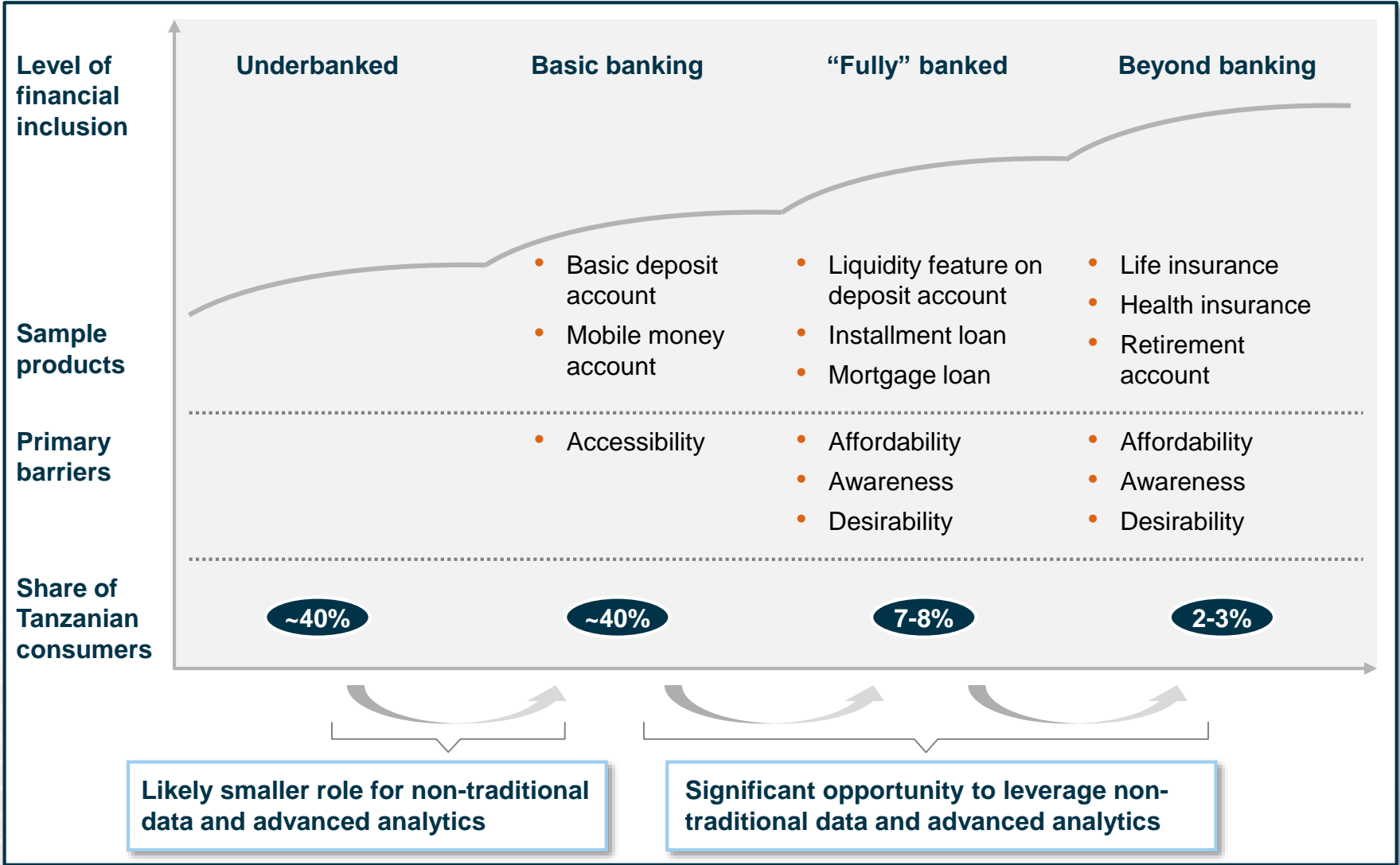
¹ Senior analysts typically earn approximately \$10K/yr. Assume managers make ~3x and analysts make 1.5-2x

Case study: Bank uses customer segmentation to improve credit card sales



Appendix

The most significant opportunity to leverage non-traditional data and advanced analytics may be in deepening access to financial services



Lending in Tanzania: Many low-income Tanzanians take out loans, but few use formal financial institutions

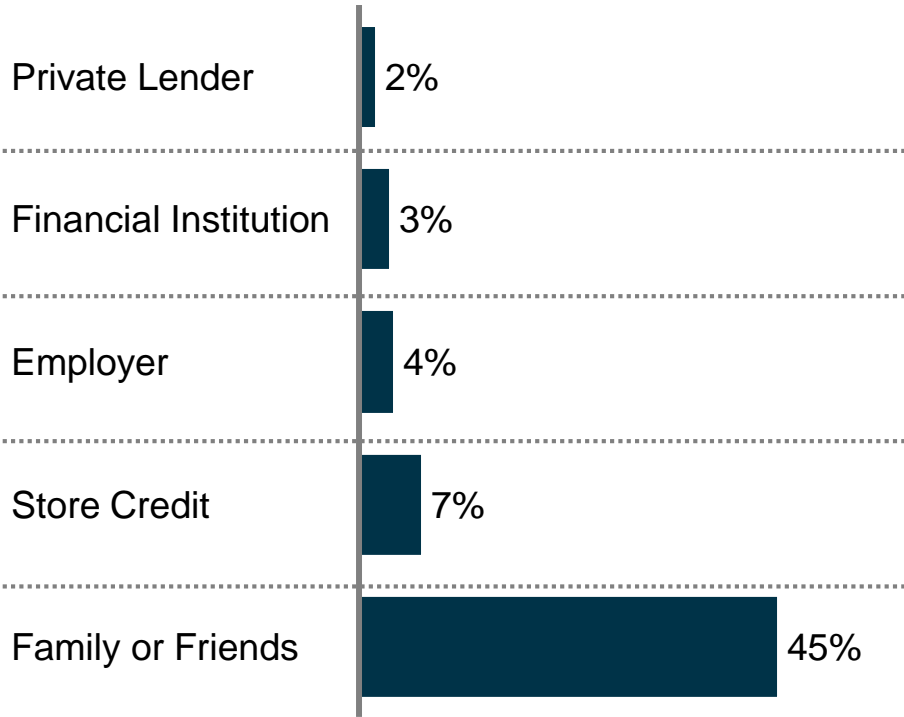
Lending at the bottom of the pyramid

Almost half of low-income Tanzanians take out loans, but few from formal financial institutions ...

... and they use them primarily for healthcare or emergencies

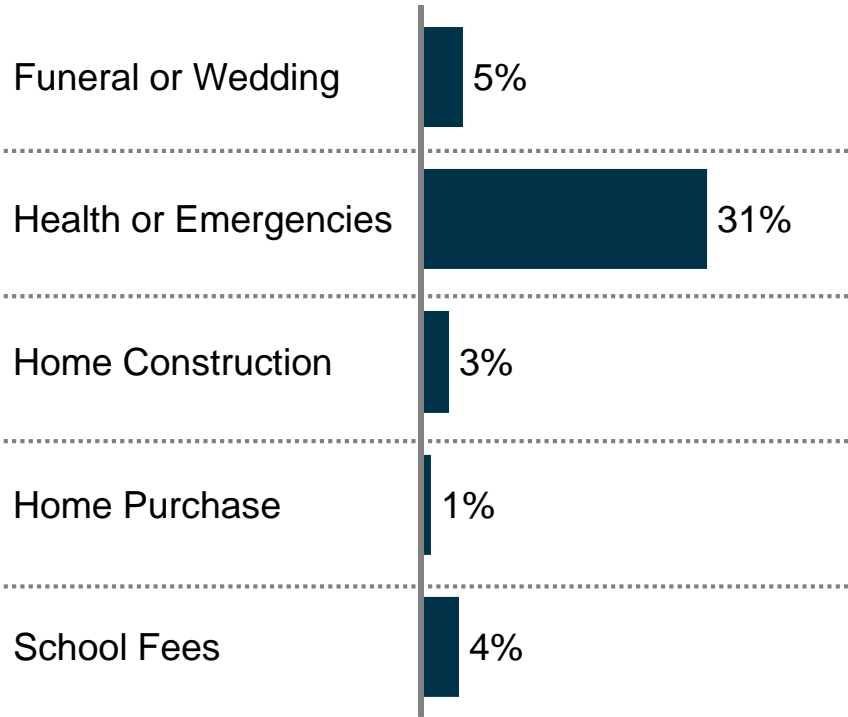
Source of loans

% of low-income¹ population with loan in past year



Purposes of loans

% of low-income¹ population with outstanding loan



¹ Low-income here defined as individuals with income levels in the bottom 40%

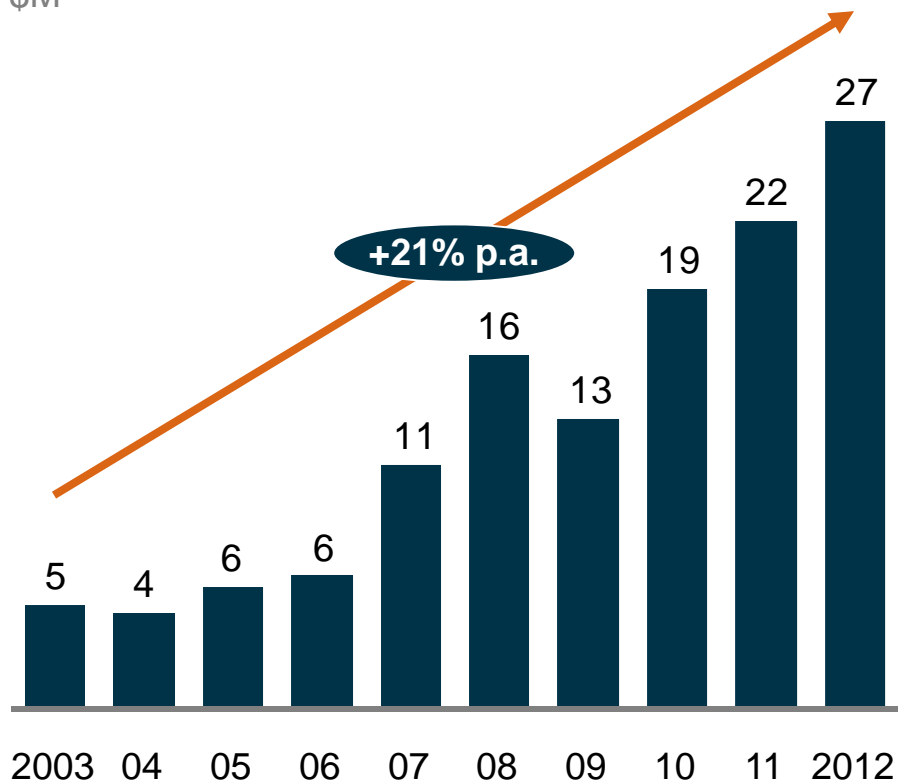
Insurance in Tanzania: Though life insurance has grown at ~20% p.a., it is still underpenetrated compared to African peers

Insurance at the bottom of the pyramid

Life insurance premiums have been growing at a 21% rate over the past ten years ...

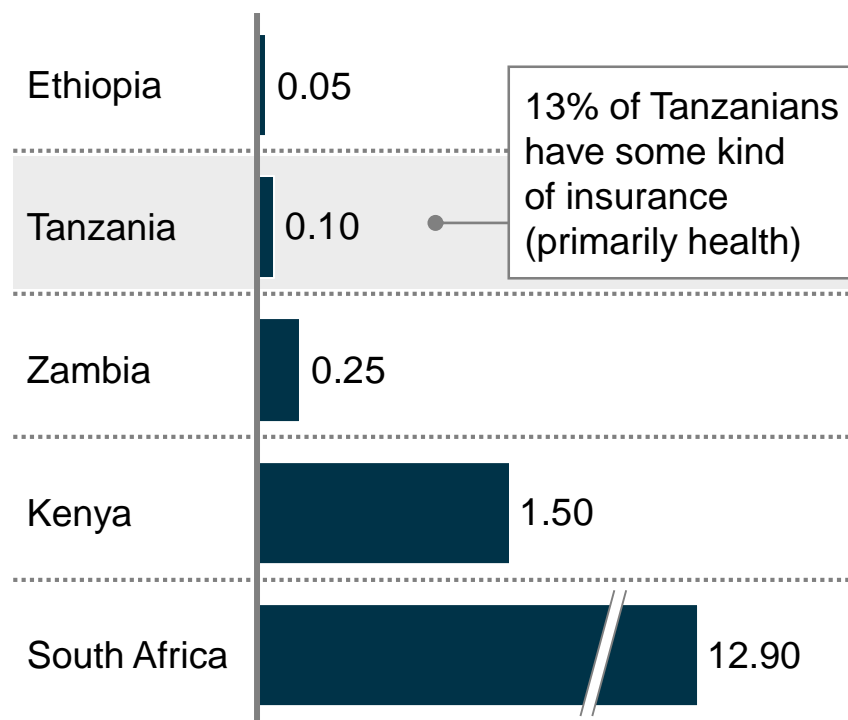
Gross life insurance premiums written

\$M



... but the product remains underpenetrated, even compared to sub-Saharan African peers

Life insurance penetration in sub-Saharan Africa, Premiums as % of GDP



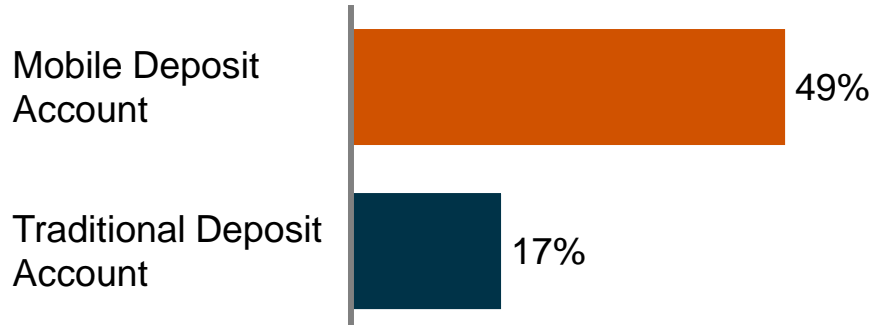
Liquidity in Tanzania: Tanzanian consumers have embraced mobile payments, suggesting potential receptivity to a mobile liquidity product

Mobile money and deposits at the bottom of the pyramid

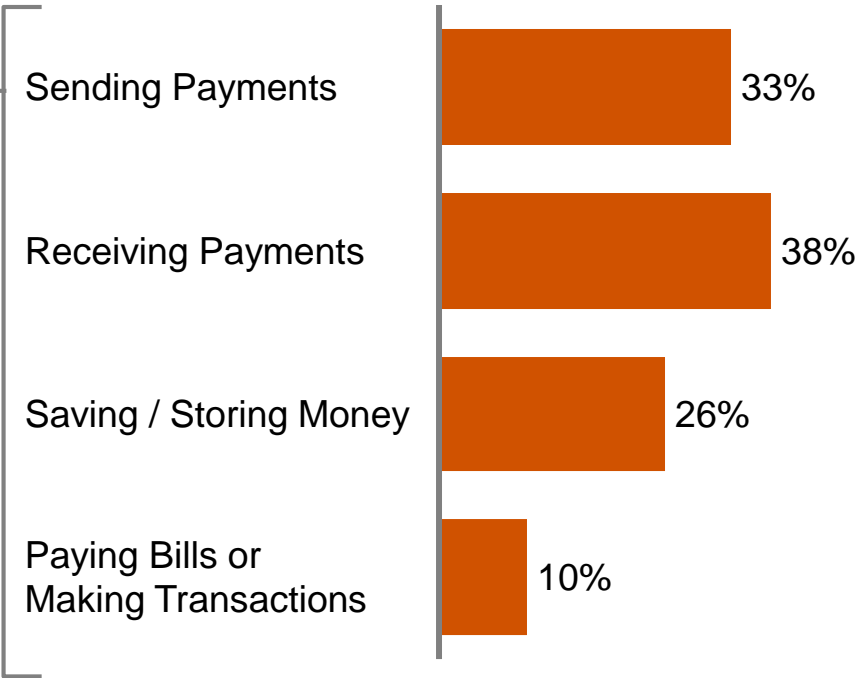
Whereas less than 20% of Tanzanians have traditional deposit accounts, almost half now have mobile accounts ...

... and they use them primarily to make and receive payments, suggesting potential demand for an overdraft line of credit

Deposits penetration
% of population

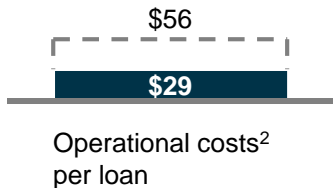
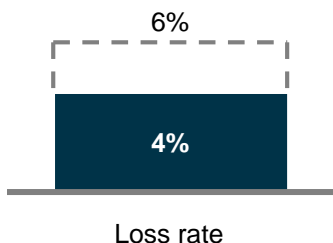
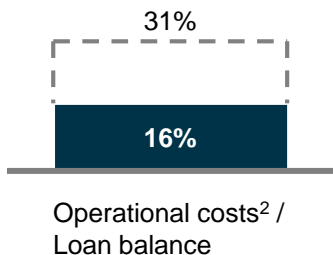


Usage of mobile deposit accounts
% of population

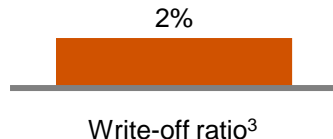
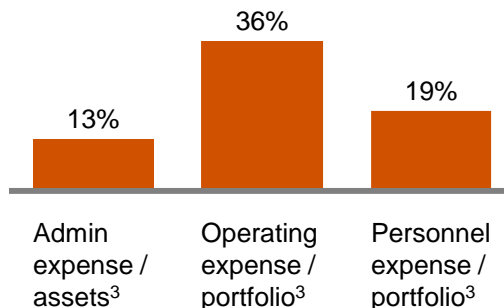


Lending product economics are in line with other analyses of MFI and low-income lending

Ratios / metrics from cost modeling in this research effort



Benchmark ratios and metrics from MIX Market data¹



Comments

- Admin. expense / assets likely lower for MIX because assets are larger than loan portfolio and admin expense includes only some op. cost
- MIX op. expense likely to include some fixed cost, potentially inflating metric
- Personnel expense / portfolio likely best MIX comparison, given most operational costs in value chain are labor-related
- MIX write-off ratio likely lower because SME loans tend to perform better than small micro-loans and SME loans make up larger share of lending portfolio for micro-lending institutions in MIX data
- MIX op. expense likely to include some fixed costs, potentially inflating metric
- SME lending potentially inflates MIX metric because SME loans tend to be more expensive to service (i.e., banks with higher share of SME lending have costs per loan of \$500+)

MIX Market methodology

- Data sourced directly from FIs, who voluntarily provide original financial documents (e.g. financial statements) and fill out questionnaires
- Ratios calculated by MIX using sourced data and standardized methodologies
- Tanzania data set includes data from 22 MFIs and retail banks collected over 15 years

1 From MIX Market data and analysis on micro-lending institutions in Tanzania; sample includes 22 institutions over 15 years (1998-2013); all metrics are medians from last five years
 2 Cost of all operational activities in value chain (all but risk cost)

Additional select use cases illustrating potential business impact of NDAA

Use case	Business output	Impact
1. Churn identification	Red flag for any insured who is at risk of non-renewal and identify right retention strategy aligned with CLTV (incl. proactive outreach, reactive retention, “let go”)	Bottom-line profit increase by 3-5%
2. Marketing mix optimization	Marketing spend allocation strategy for each line of business and product to reduce marketing spend	~20% reduction in marketing spend
3. Hit ratio improvement	Inventory of traits (e.g., skills, motivators and culture) and an adoption plan to increase sales effectiveness	PIF growth rate of 25%
4. “Next product to buy” driven cross-selling / Analytically driven up-selling	Enabling more impactful cross sell discussions by providing agents individual instructions on what product to sell and what sales arguments to use based on “Next Product To Buy” algorithms	Top-line impact of 2-4%
	Identifying targets for coverage up-sell through predictive modeling and match the best up-sell strategy based on customer attributes	Top-line impact of 5-6%
5. Preferred prospect scoring	Preferred prospect score and prospect triage tools to select low risk clients from the universe of applicants	~5-7 % of loss ratio improvement in 5 years
6. “Smart box” technical price	A new tariff rating highlighting the existing loss and profit making segments	~5-6 % of loss ratio improvement

Advanced data analytics ecosystem: Detailed capabilities

