Bank for your Buck: Increasing Savings in Tanzania

Second-year Policy Analysis

Client: National Microfinance Bank (NMB)
Advisor: Professor Jay Rosengard
Section Leader: Michael Walton

Aneth Kasebele and Anne Ong Lopez

Written in fulfillment of the requirements for the degree of Master in Public Administration in International Development, John F. Kennedy School of Government, Harvard University

Picture credit: NMB

Table of Contents

Acknowledgement

We would like to extend our enormous gratitude to a number of people without whom this project would have not been possible.

To our Professors at the Harvard Kennedy School, especially Professor Jay Rosengard and Professor Michael Walton. Thank you for your guidance, for encouraging us to think creatively and for your comprehensive feedback during the different stages of this research project.

We are also indebted to the ASH Center for Democratic Governance and Innovation as well as Degree Programs Student Affairs (DPSA) for their generous funding support for our research travel to Tanzania in January 2016.

Special thanks to the National Microfinance Bank PLC (NMB) in Tanzania and its staff, especially to James Meitaron and Beatrice Mwambijje. Thank you for sharing with us your expert knowledge on retail banking business at NMB, providing access to NMB client database, arranging our branch visits in Dar es Salaam and Pwani and for offering the working space at the NMB headquarters.

We would also like to thank our MPA/ID Director, Carol Finney for her encouragement, motivation and support throughout our time in the program.

Most importantly we extend our thanks to our individual families, this process would have been painful without their continuous encouragement, positive energy and support.

Executive Summary

Formal saving is an important feature of financial services, given its impact on both the individual and country's macroeconomic factors. In Tanzania, the proportion of adults saving cash in formal financial institutions has been decreasing since 2011 despite the increase in proportion of people claiming to save any money.

For retail commercial bank such as the National Microfinance Bank (NMB), mobilizing savings is important for maintaining their loan-deposit ratios. Even though savings account values have been increasing at NMB, the increase has been achieved at a decreasing rate. Motivated with the aim of addressing the question of *how to incentivize Tanzanians to save their money in formal institutions*, we developed prototypes for three behavioral economics inspired savings products and tested them with 59 NMB customers and staff.

We recommend the implementation of all three products: two in the short-term and the third one in the medium term. These first two products are the following: *Saving my Future Income Today* , which requires committing saving a proportion of future earnings increase, and a *Goal-savings card*, which modifies the existing goal oriented savings accounts to reflect the specific saving needs of Tanzanians. The third is *Save&Play*, a savings product with lottery-like features that make savings a fun activity with expectations of winning.

These recommendations consider the following: (1) positive reception of demand by target customers; (2) cost-effectiveness of the products relative to current offered savings products; (3) adequate bank implementation capacity; and (4) positive political landscape to support products launch. Also, our proposed products emphasize the use of alternative channels such as bank agents and mobile phone for service delivery. This is to ensure wider reach even to individuals living far from the nearest NMB branch

1. Introduction

Motivation

Globally, efforts to provide access to formal financial services have been unprecedented in the past decade. In fact, improving access to formal financial services is viewed as a relevant poverty reduction strategy, which is currently spearheaded by various international and national players such as governments, foundations and academics. A few of nonexperimental studies highlight the effect of providing a full-range of financial services (both savings and credit) on income.[1] That is, there is a positive impact of financial inclusion[2] on poverty reduction (Burgess and Pande, 2005), increased investment in education (Prina, 2015), and increased productivity (Brune, et al, 2015).

Savings is an important feature of financial services, given its impact on both the individual and country's macroeconomic factors. With access to appropriate formal savings mechanisms, individuals have the opportunity to use savings as a tool to get formal credit, smooth consumption[3], accumulate capital to start or expand a business, invest in their children's education and health and withstand financial shocks. A systematic review by Pande, et al (2012) further shows that this can pave the way for increase in income. At the macro level, savings can be intermediated in the banking system leading to large domestic savings to facilitate domestic investments and economic growth. For Tanzania with current gross domestic savings at 20.6% of GDP[4], increasing formal savings is important for easing domestic credit constraints.

Savings can be in the form of cash and non-cash. However, it is difficult to get data on non-cash savings in Tanzania. Hence, we concentrate on cash savings. The 2013 data from InterMedia's Financial Inclusion Insight (FII) shows that majority of Tanzanians reported the need to start saving money with the bank (47%) and wanting a safe place to store money (26%) as reasons for starting to use bank accounts. However, only about 4% of bank account owners indicated using their bank accounts to save money for a future purchase or repayment. Majority use their bank accounts to withdraw money (96%), deposit money (85%) and receive money from family (16%), etc. Also, there appears to be a "dump and pull behavior"[5] whereby payment or income received through bank account is immediately withdrawn.

---

[1] Examples include Burgess and Pande (2005) in India, Bruhn and Love (2009) in Mexico, and Dupas and Robinson (2009) in Kenya.

[2] Beck, Demirguc-Kunt, Honohan (2007) defines financial inclusion as the "absence of price or non-price barriers in the use of financial services".

[3] See Deaton, A. (1990) on consumption smoothing.

[4] World Bank. World Development Indicators. 2014.

[5] Term coined by Gateway Financial Innovation for Savings (GAFIS).

As a result, even bank account owners do not benefit from the full-range of financial services availed to them.

Using the World Bank Global Financial Inclusion Index (Global Findex)[6] data, while the proportion of Tanzanians indicating to save money using any financial instrument[7] has increased between 2011 and 2014, only 9% reported saving in financial institutions.[8] The trend for formal savings in Tanzania has actually reversed: the proportion of people saving at a formal financial institution has decreased while the proportion of those saving informally has increased [9,10] (Figure 1). Moreover, Figure 2 shows the proportion of Tanzanians saving money at a formal financial institution lags behind that of sub-Saharan Africa (16%) and is slightly lower than the average for low-income countries (10%).

Figure 1: Households Saving Trends in Tanzania

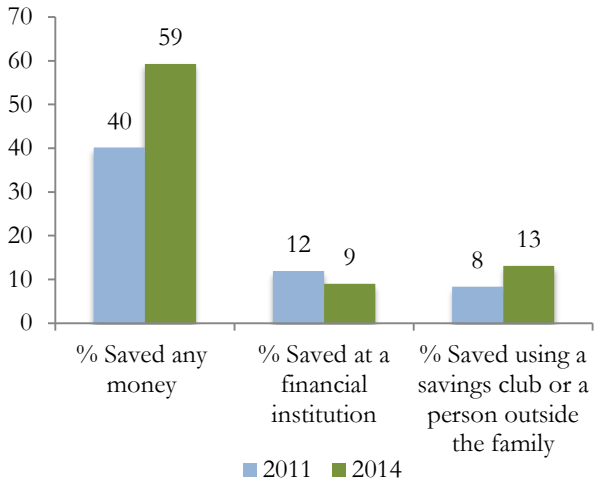
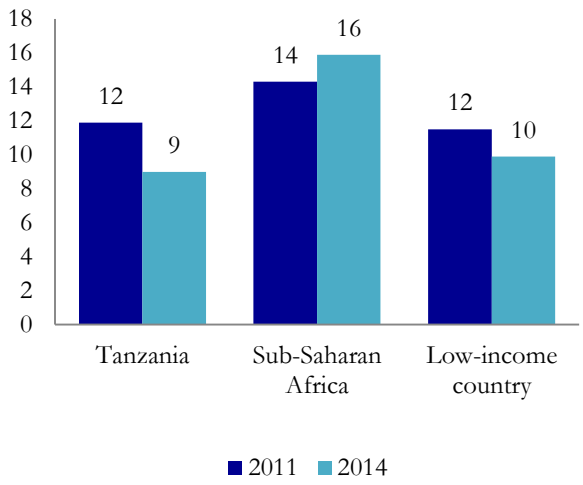


Figure 2. Savings at a financial institution



Source: Global Financial Inclusion Database, April 2015.

However, it is likely that the total amount saved in formal financial system is higher than that saved in the informal system based on the different objectives and purposes the aforementioned instruments serve. A Consultative Group to Assist the Poor (CGAP)[11] report shows that the latest annual balance on savings at home for smallholder farmers in Tanzania is about $18 compared with about 255,000

[6] World Bank. Global Financial Inclusion Database. last updated: April 2015.
[7] Any financial instrument is defined to include banks, Microfinance Institutions (MFIs), mobile money, semi-formal institutions, or through other people.
[8] World Bank Global Findex database includes the post office, microfinance institutions, credit unions, and cooperatives in the list of financial institutions.
[9] World Bank Global Findex defines the different saving methods as follows: formally is when a person saves with a bank or another type of financial institution; semi-formal is when a person saves using an informal savings clubs or a person outside the family; and other methods of saving is when a person is saving in cash at home ("under the mattress") or saving in the form of jewelry, livestock, or real estate (it may also include using investment products offered by equity and other traded markets or purchasing government securities for high-income OECD countries).
[10] The Global Findex methodology excludes about 5% of Tanzanians being served by SACCOS and credit-only institutions (National Financial Inclusion Framework, 2014-2016) as these are not regulated by the Bank of Tanzania (BoT).
[11] Jamie Anderson and Wajiha Ahmed. p.65.

TZS ($114) latest annual balance for active bank clients.[12] These figures are not comparable but provide a snapshot of differences in magnitude of savings balances in the formal and informal systems.

Informal savings groups have benefits to the users. They allow members to reduce pressure imposed on their free cash by family, friends and neighbors and make it possible for members to access lump-sum cash in case of emergencies or save money for a large purchase.[13] In addition, members choose to participate in informal savings groups because of the social value provided by the groups[14] that cannot be realized by saving in a formal financial system. Also, the fear of negative repercussions associated with failing to adhere to savings commitments incentivizes members to honor their goals. That is, the informal savings groups build saving disciplined that is difficult to cultivate when saving individually. Also, by working together to accomplish a financial goal, group members strengthen their social networks because the regular group meetings are also a platform for members to socialize. Therefore, beyond the economic opportunities, savings groups also offer a more fun way for people to save money.

Nevertheless, the use of informal savings instruments has its challenges. Even though some informal savings products may yield higher interest than what may typically be earned from formal institutions, evidence suggests that these options can be high risk and unreliable especially when an individual need to retrieve savings the most.[15,16] Also, informal savings are susceptible to various types of risks, such as theft, particularly for those who save 'under the mattress', or theft by other members in an informal savings group given the unregulated nature of these mechanisms. Moreover, savings in the form of fixed assets run the risks of illiquidity, and as a result may not be able to speedily smooth consumption particularly in times of shocks. [17]

At the aggregate level, a parallel informal saving alternatives costs banks an opportunity to mobilize about 1% of GDP[18] of savings that circulates outside the formal system annually. However, with the convenience of mobile money accounts (which is considered 'formal' by the Bank of Tanzania, BoT), it is possible that people who reported to save but are not saving in either formal or informal channels are using their mobile money account to save. But the finding that less than 1% of users keep money in the

[12] We used the customer database of a large bank in Tanzania (i.e., National Microfinance Bank) and calculated the annual balance for active clients who had a less than 1,000,000TZS increase in savings balance annually between 2013 and 2015.
[13] Invested Development. 2012.
[14] Margaret Irving. p. 17.
[15] Collins, D., Jonathan Morduch, Stuart Rutherford, and Orlanda Ruthven. p. 54-57.
[16] Graham A.N. Wright and Leonard Mutesasira. p. 9.
[17] Ignacio Mas p.3.
[18] Authors' calculations. The assumption made is that the 50% of the population reporting to save but not saving formally are putting aside an average of $20 annually.

mobile account for longer than a month suggest insignificant contribution of mobile money to formal savings.[19] **This raises a policy question: How can adult Tanzanians be incentivized to save their money in formal financial institutions?**

Context

The government of Tanzania acknowledges the importance of savings alongside the provision of loans/credits in increasing financial inclusion. In its 2013 National Financial Inclusion Framework, the government set key targets to be achieved by 2015. These include achieving 50% of adult population with access to formal financial services, 50% using formal services and 25% with two weeks' worth of income in formal savings to be able to address shocks and smoothen consumption.[20] However, findings from the 2014 InterMedia and Global Findex data highlight the achievement of access target but low performance on formal savings target, which speaks to the quality of products and services offered. 60% of Tanzanian adults had access to a bank or mobile money account by the end of 2014; 26% have access to a bank account and 44% have access to a mobile money account.[21] However, only about 6% indicated being able to cover two weeks' of their 'basic personal expenses' using money from their bank account, MFI account (1.4%), and mobile money account (18%).[22]

One of the culprits of low proportion of formal savings is inflation rate. It is arguably that higher inflation rate than the interest rate on deposits discourages people from saving cash formally. This is because of the resulting negative real interest rate that people earn on their savings. Figures 3 and 4 below indicate slightly higher deposits rates in comparison to the headline inflation rate between November 2012 and November 2015. This suggests that there is a stable macroeconomic environment to support growth of formal savings in Tanzania. Also, there haven't been any bank failures in Tanzania in recent decades. As such, macroeconomic trends have not generated lack of confidence in domestic banks.

[19] Nicholas Economides and Przemyslaw Jeziorski. p.5.
[20] Tanzania National Council for Financial Inclusion. National Financial Inclusion Framework. A public-private stakeholder's initiative. 2014 -2016.
[21] InterMedia. Digital Pathway to Financial Inclusion. August 2015.
[22] InterMedia Financial Inclusion Insights 2014 dataset.

Figure 3: Selected Bank Interest Rates

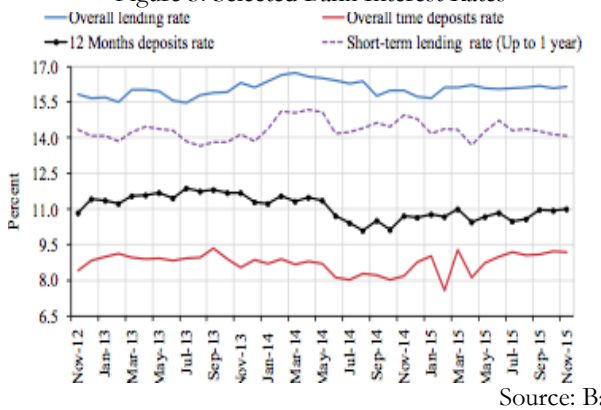
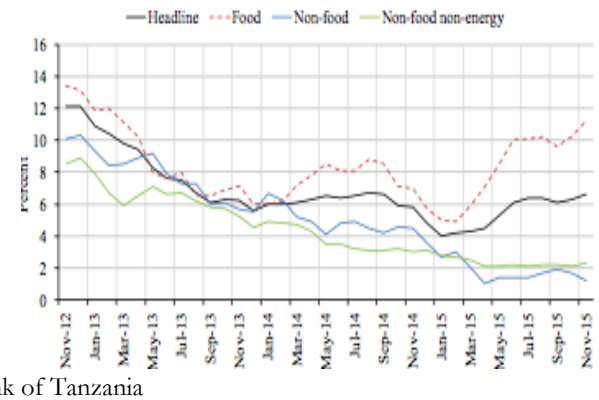


Figure 4: Annual Inflation Development



Source: Bank of Tanzania

Therefore, the low savings products uptake remains puzzling for retail banks in Tanzania. We worked with the National Microfinance Bank (NMB), the largest bank by branch network and profit in Tanzania, to understand formal savings uptake challenges and propose solutions that can be implemented in the short-term as well as in the medium-term.

Analysis of NMB's customer database is aligned with the observed negative formal saving trend. While the value of NMB's accounts has been increasing between 2012 and 2015 (Figure 5), the year-on-year increase is largely on a decreasing trend since 2012. For examples, the value of NMB's Bonus Account (personal savings) balances increased by 26% from 2012-2013; yet the percentage point increased at the decreasing rate to 13% from 2014-2015. Similarly, the value of NMB's Junior Account (children's account) increased by 14% from 2012-2013; but the values increased by a mere 2% from 2014-2015 (Figure 6).

Figure 5: Value of Bank Savings Deposit (Billions TZS), 2012-2015

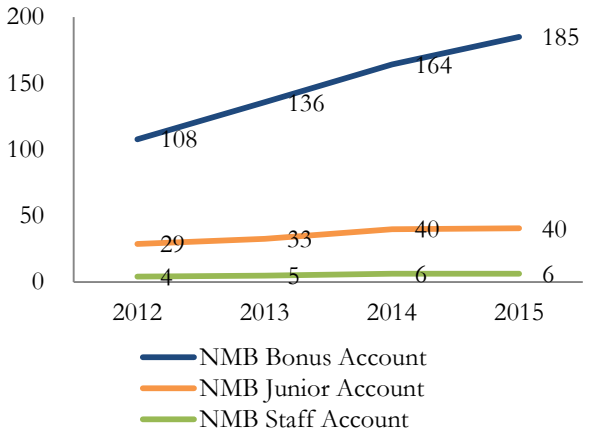
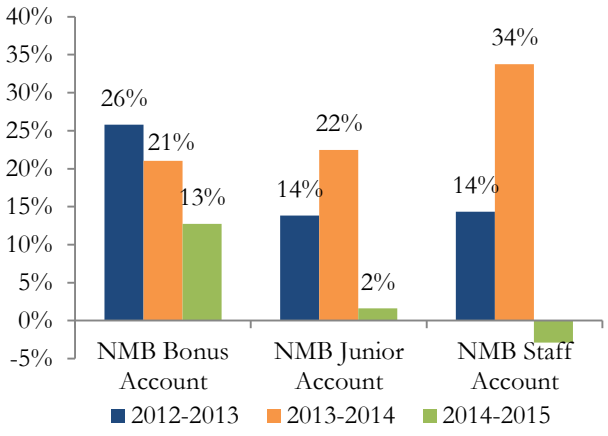


Figure 6: Year-on-year Change in Bank Savings Deposit Value, 2012-2015



Source: NMB Customer Database. 2016.

In line with NMB's needs to increase savings, we developed three savings products prototypes with features aiming to address constraints related to access, pricing and behavioral preferences.

The rationale for working with NMB is due to its position as a market leader in financial inclusion. The pressure to maximize profits while extending services to the unbanked (the double bottom-line mission) requires NMB to constantly innovate. Also, given the tight retail market competition amongst the top three banks (i.e., NMB, Cooperative Rural and Development Bank (CRDB), and National Bank of Commerce (NBC)), it is likely that other banks will mimic the proposed products if implemented and successfully increase NMB's savings deposits. This domino effect to all other banks focusing on retail segments has a potential to increase formal bank savings countrywide.

2. Introduction to the National Microfinance Bank

NMB is a microfinance institution that was established under the National Microfinance Bank Limited Incorporation Act of 1997 from the split of the original NBC to three new entities namely: NBC Holdings Limited, NBC 1997 Limited and NMB Limited. [23] NMB was established for the purpose of extending financial services in rural Tanzania as well as to the urban poor. With about 30% ownership still retained by the government, NMB has both the social and business incentive to help the government device and implement financial inclusion initiatives. The bank has remained committed to the financial inclusion mission even as it expands its offering to large enterprises and high income individuals who demand more sophisticated financial services. NMB has been leveraging its branch and ATM network to reach customers throughout Tanzania. The bank currently has 175 branches, business centers, and quick services across the country and it is the only bank present in 98% of all government districts, with plans to increase its presence in 100% of districts. 40% of all Tanzanians with bank account have their accounts at NMB.[24]

Also, NMB has pioneered innovative distribution channels in the Tanzania banking industry in order to cost-effectively deliver services to its different client segments. It was the first bank to launch an SMS-based mobile banking service, the NMB Mobile. This, together with its Agency Banking license, NMB has a greater potential to mobilizing Tanzanians saving formally.

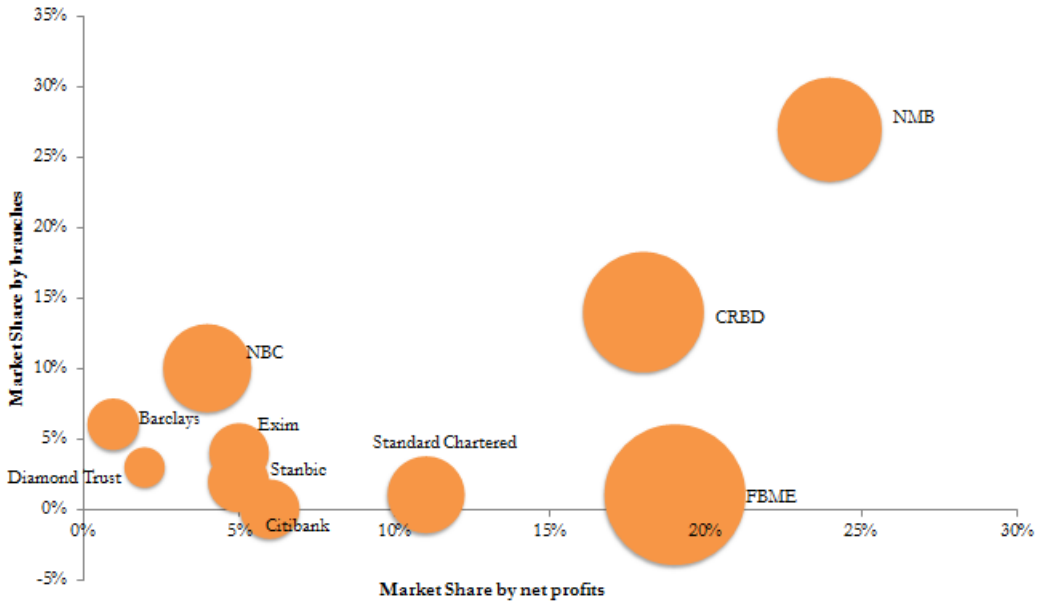
Benchmarking NMB

Despite being the leading bank by branch network and profit ahead of the 34 commercial banks, 16 non-bank financial institutions and 3 deposits-taking MFIs, NMB ranks third by deposits market share as of December 2013 (Figure 7 below). With 12% market share, NMB lags behind Federal Bank of Middle East (FBME)[25] with 21%, CRDB with 15% but is ahead of NBC (8%).[26] Given the nature of FBME business, NMB strongest competitors in the local market remain to be CRDB and NBC.

[23] NMB Annual Report. 2014. See Appendix 1 for further details about NMB.
[24] Rabobank. 2016.
[25] FBME is reported as the largest bank because its head office is located in Tanzania. However, 90% of its bank operational tasks take place in Cyprus. Essentially FBME operates in the market for offshore banking and provide services to high net worth individuals, tax planners and offshore businesses. (sourced from Legalfloris)
[26] The Citizen. 2013.

.

Figure 7: Competitive landscape for the top 10 banks by deposits market share



Sources: Tanzania Banking Survey 2012; Serengeti Advisers.
Note: The bubble reflects market share by deposits.

Therefore, deposits mobilization is paramount for NMB in order to stay ahead of competition among the top three banks. During the last quarter of 2014, NMB launched deposit mobilization campaigns to drive savings and account openings and in order to minimize its loan-deposit ratio. For instance, as of December 2015, NMB's total loans to micro and small businesses (including overdraft/advances) amounted to about 476,000 million TZS (US$ 212 million), whereas current and savings account deposits and fixed deposits totaled to about 295,000 million TZS (US$131 million).[27] This spells a substantial difference between its loan-deposit ratio that NMB wants to minimize, despite a year-on-year growth in loans and deposits of 17% and 18%, respectively.[28]

NMB's leadership in both traditional and alternative distribution channels while maintaining comparable products pricing with CRDB and NBC gives it a competitive advantage in mobilizing savings. As shown in Figure 7 above, NMB claims over 25% of total bank branches in Tanzania, of which 62% are in the rural areas. Also, 40% of all ATMs in Tanzania are owned by NMB bank. The integration with M-Pesa, Tigo-Pesa, Airtel Money[29], MaxMalipo[30], Tanzania Postal Network and NMB agent countrywide allows the bank to provide a connection to over 60,000 cash-in/cash-out points to

[27] Unless otherwise noted, exchange rate used is USD 1.00 to TZS 2,246.10, as of 24 January 2016.
[28] James Meitaron. NMB Business Banking Performance presentation. 2015.
[29] M-Pesa is a mobile phone-based money transfer service launched in 2008 by Vodacom Tanzania after a successful launch by the Safaricom in Kenya in 2007. Tigo-Pesa was launched in 2010 by Millicom International Cellular (MIC) and is known as Tigo in Tanzania. Airtel Money was launched in 2011 by Bharti Airtel.
[30] This is a payment system offering network for the expansion of services through bank card and mobile banking.

its over 1 million users of NMB Mobile.[31] This is important because agent outlets[32] represent over 99% of Tanzania's financial access points.[33] A 2013 GIS Census of Financial Access Points in Tanzania conducted by the Financial Sector Deepening Trust (FSDT) shows that 45% of Tanzanians live within 5km of financial access point.[34] Currently, of the top 10 competitors identified above, only NMB and CRDB have agency banking licenses.

NMB Product Portfolio and Take-up

For personal banking, which is the focus of this report, NMB has three main groups of accounts namely: current (transactional) accounts, savings accounts (short-term) and investment accounts (time fixed deposits). Based on the exploratory survey we conducted with 59 NMB customers in Dar es Salaam and Coastal region (Pwani) as well as our review of NMB client database, majority (85%) of customers have the basic NMB personal current account. A large proportion of interviewed individuals use their accounts to receive payments that they immediately withdraw and transact in cash outside the banking system. Only about 7% of over 1.76 million active NMB customers in 2015 had a savings account and the remaining 93% have a current account. Also, even though NMB has an education goal-oriented savings account, a greater proportion of interviewed respondents claimed to have never heard about goal-savings account from NMB – suggesting lack of awareness among consumers and the need for NMB to assess the effectiveness of information campaigns in reaching out to the targeted beneficiaries of their products. Besides, on the question of whether respondents believed they were saving enough money for the future, 37% indicated saving enough, highlighting the fact that people have the money and willingness to save but are not using the bank to facilitate their savings needs.

[31] Mark Wiessing. NMB Investor Presentation. June 2014.

[32] These comprise of mobile money agents, retail agents of non-bank point of sales (POS) based payment providers, bank agents and merchant POSs, i.e., stores that have a POS only receive payment from their customers and do not offer third party payment services. The reported figure may overstate the total number of registered agent outlets because outlets that offer multiple types of services may be counted in more than one category.

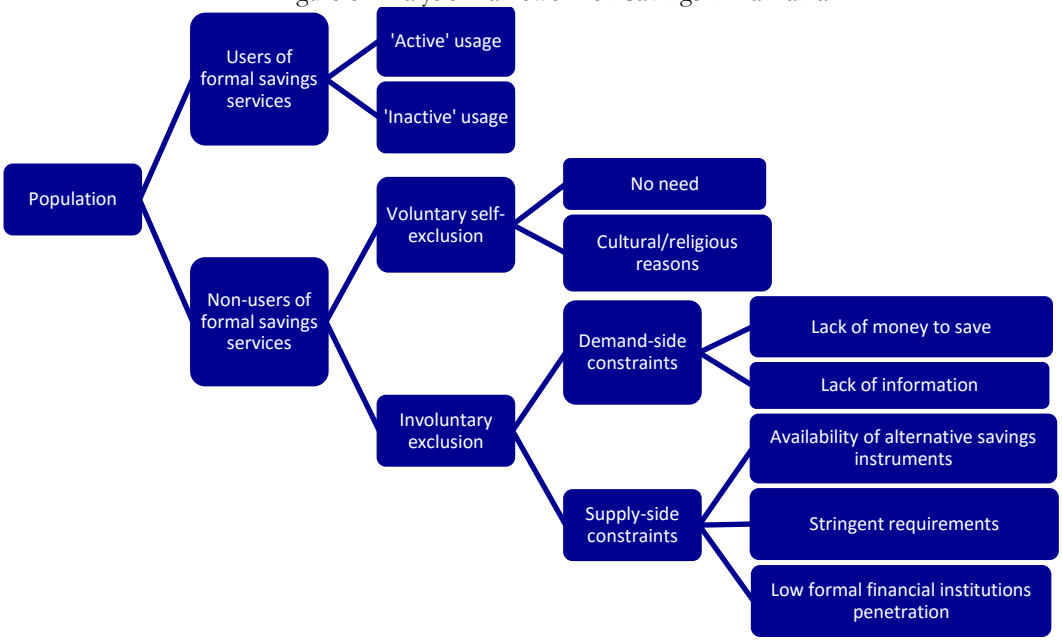
[33] The Bank of Tanzania (BoT) defines financial access points as all physical locations around the country where one can conduct cash in and cash out transactions. Also, BoT defines access areas as area within a given distance of any financial access point.

[34] Census of Financial Access Points. 2013- 2014.

3. Conceptual Framework and Rationale for Savings Product Innovation

We adapted Beck, Demirguc-Kunt, and Honohan (2007)'s framework to analyze the challenge with formal savings in the context of Tanzania. We first distinguish between users and non-users of formal financial services and distinguish non-users between voluntarily excluded and involuntarily excluded. Users of formal savings are those who have physical access to these savings services, and can be further distinguished between those who use these savings accounts actively or inactively. Non-users can be voluntarily excluded (e.g., not needing the savings service) or involuntarily excluded based on their socioeconomic status, etc.

Figure 8: Analysis Framework on Savings in Tanzania[35]

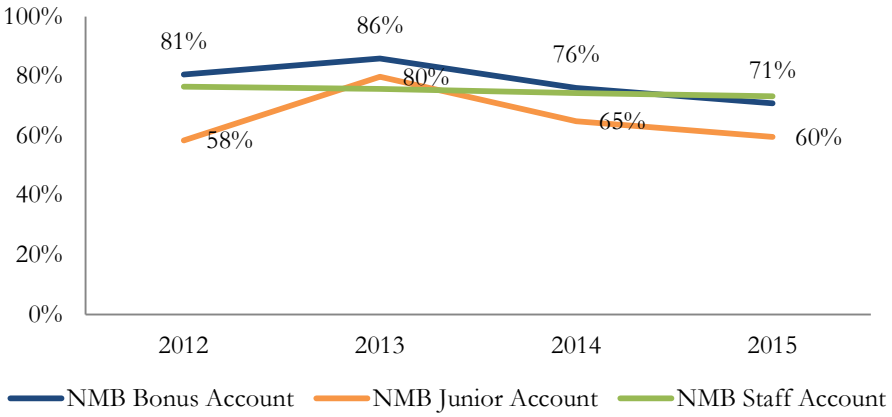


Source: Adapted from Beck, Demirguc-Kunt, Honohan (2007)

In terms of usage of savings instruments, we acknowledge the difficulty of getting accurate measurements of active and inactive usage. To make some approximations, we looked at NMB clients' deposit transaction frequencies: NMB defines its account to be 'active' if there is at least one deposit or withdrawal within a calendar year. The proportion of active savings deposit users ranges between 60% and 71% for the different NMB savings accounts in 2015. These rates have however been decreasing since 2012. For example, NMB Bonus account (personal savings) had 80% active usage in 2012; however, this declined to about 71% by 2015 (Figure 9 below)

[35] Supply-side and demand-side constraints are not mutually exclusive. For example, lack of information can also be due to insufficient information provided by banks on how to open a bank account. It is also difficult to bring out latent reasons why people do not save formally, such as time-inconsistent preferences (i.e., behavioral biases) and intra-household decision making processes on savings allocation (as found in savings literature), given data issues. The framework includes the explicit reasons cited by people in the 2014 Financial Inclusion Insights dataset, as well as the significant determinants to the likelihood of savings (generated using an econometric model in Appendix 3).

Figure 9:Percentage of Active Clients



Source: NMB Customer Database. 2016.

For Tanzania, the top reasons stated by respondents from the Financial Inclusion Insights 2014 survey[36] for not saving formally in banks, MFI, or on mobile money accounts (reflective of involuntary exclusion) are: (1) can save 'through other means', 42%; (2) not having enough money to save, 27%; (3) stringent requirements, 8.5%[37]; (4) not knowing how to open an account (reflective of lack of information), 4.3%; and (5) having 'no formal financial institution close to where I live', 2.8%. These reasons do not significantly differ between urban and rural areas. We categorize these reasons into demand-side and supply-side constraints (Figure 8 above). Note that we further disregarded other constraints such as lack of confidence on macroeconomic management (demand-side) based on the argument that the macro-economic environment is stable and there were no recent bank failures in Tanzania (as these factors will increase the risks of holding cash). Supply-side constraint, particularly discrimination, was also not included given lack of supporting data.

The top most reported reason for not saving formally—can save 'through other means' (42%)—signifies a supply-side constraint whereby people prefer products and services from outside the formal financial system. This may be due to the fact that current bank products are not well designed to meet people's needs or address their behavioral biases. This is supported by our findings from the survey among NMB bank clients: 23% indicated saving money through Merry-Go-Round/savings groups "Upatu" or Savings and Credit Cooperative Societies (SACCOs) within their communities. This is true even among those with a savings account at the bank: 41% indicated saving in informal savings groups. For these respondents, the social pressure to pay their share of contributions is an added commitment device to ensure they save - even when they do not earn any interest on their savings, as it is the case

[36] Authors' calculations from Intermedia's Financial Inclusion Insights 2014 dataset.
[37] Stringent requirements include 'too complicated' paperwork, 3.8%; not having 'a state ID or other required documents', 2.4%; and high registration fees, 2.3%.

with Merry-Go-Rounds. For instance, some respondents said they prefer to be part of a Merry-Go-Round because the phone calls and text messages from money collector "Kijumbe" pressure them to find ways to pay their contributions on time, making saving goal salient. This highlights the fact that some people need to have a mechanism to hold them accountable and constantly remind them of their promises in order for them to accomplish their goal on saving money.

In addition, a large proportion prefers investing extra money in their small business because they stand to potentially earn a higher return than the standard interest rate offered by banks. The inclination towards investing in business even though it is a risky endeavor can be due to higher levels of informality in the Tanzanian economy. This allows people to make higher returns to capital (than when they invest in banks) because either they are not incurring some of the basic costs of doing business such as paying taxes or they are not factoring the labor cost invested in business. Besides, this inclination was further evidenced by the proportion of respondents indicating to use the money to add to their working capital in response to a question about what they would do with the money if they were to win 1,000,000 TZS (US$ 445) in a small lottery. 54% indicated that they will use the money to start a business or add to their working capital. Only 21% and 19% respectively said they would put the prize in the bank account for future use or invest in fixed assets such as land etc. This suggests that saving money in the bank is not a priority even for banked individuals unless the benefits from saving in the bank are disproportionally greater than those realized from the existing alternative means to generate returns.

The second most cited reason for not saving in banks speaks to demand side constraints. 27% report not having money to save as a barrier to using bank savings. This could be a reflection of limited awareness or wrong perception of the existing NMB's savings products especially because most of the products have lower minimum operating balance requirements (5,000 TZS, US$ 2.23) compared to the average deposits that low-income households save at home (US$ 10.86).[38] This, along with the above finding of availability of alternative savings instruments, maybe the binding constraint to formal savings in Tanzania based on the proportions of people citing them as reasons for not saving in a bank.

The remaining reasons are cited by a smaller proportion of adult population (less than 10%) for them to be binding. For instance on access related barriers, Tanzania has made substantial efforts in ensuring that over 50% of adult population have access to formal financial services including bank, formal non-

[38] Jamie Anderson and Wajiha Ahmed. p.65.

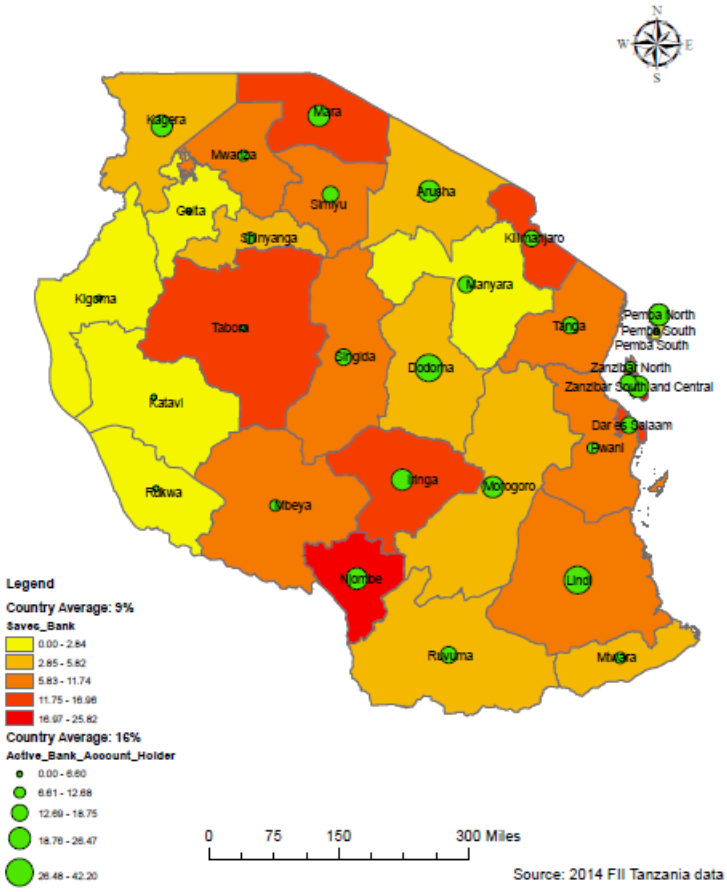
bank, and mobile money accounts as articulated in the National Financial Inclusion Framework.[39] The Framework is a commitment voice from public and private financial inclusion stakeholders in Tanzania, including financial services providers such as NMB. One of the highlighted commitments is to enhance access by reducing costs and increase geographical availability of financial access points. With the aggressive proliferation of mobile and POS-based agents, the number of financial access points has been increasing as indicated by the proportion of people living within 5km of formal financial services providers.

Nevertheless, rural-urban divide and regional disparities are evident in Tanzania. Rural areas, which accommodate over 70% of the Tanzanian population, are disproportionately biased against access to formal financial services, particularly banks. With a country average of 26% with access to a bank account, some regions such as Lindi and Dar es Salaam have disproportionately larger access to bank accounts (58% and 26%, respectively) than Rukwa (7%) or Katavi (5%). These in fact have repercussions on how people, particularly the poor, use their accounts actively[40] and save. Figure 10 shows that regions with a higher percentage of active bank account holders also tend to have a larger proportion of bank savers. In fact, our econometric model results (Appendix 3) show that, for households with average characteristics, having used a bank or mobile money account increases the probability of saving in banks by 6%. Again, even though access may be a significant determinant to the probability of saving in banks, it does not appear as amongst the top reasons cited by people for not saving formally in Tanzania.

Acknowledging that access remains as a potential binding constraint in rural areas, we particularly chose urban and semi-urban areas (Dar es Salaam and Pwani) in Tanzania as target sites for our exploratory survey on innovative savings product design. We find low proportion of people saving formally even in areas where access is not a major problem. For instance, Dar es Salaam with over 99% living within 5 km to the nearest bank branch,[41] the proportion of people with bank savings is 15%, supporting our hypothesis that existence of alternative options or limited information on bank's savings products might be the main barrier to bank savings.

[39] Tanzania National Council for Financial Inclusion (2014) cited examples of policy interventions made, including: (a) issuances of agent banking guidelines and mobile payment regulations to optimize financial service delivery channels; (b) launching of the long-awaited National Identity Card program in 2013 in which a centralized national ID aim to lessen the number of documents needed by an individual to open a financial services account; (c) interoperability agreements between mobile network operators for the expansion of banking agent network and reducing costs to trans-network mobile money transfers; and (d) enhancing financial system soundness through the BoT revision of its 2008 Capital Adequacy Regulations.
[40] InterMedia defines 'active' as one where one has used their accounts within the past 90 days.
[41] GIS Census of Financial Access Points Highlights. 2014. p.26.

Figure 10: Savers in Banks and Active Bank Account Holders in 2014 (%), By Region



Therefore, we reviewed the products offered by NMB and used a survey to understand customers' perception of current products offered and their behaviors in order to propose solutions that have a potential to increase use of NMB bank savings products.

4. Proposed savings products

Goss, et al (2011) shows that successful savings products have the following characteristics: they are (a) convenient, (b) trustworthy, (c) affordable, and (d) offer a balance between liquidity and discipline. It is arguably that informal savings mechanisms have been successful for similar reasons. Therefore, it is important to assess the existing NMB products against these criteria to ensure that these products meet the features of a successful product. This is especially because for low-income individuals, who are more likely to face liquidity constraints, NMB's savings products may compete with informal products available in the individuals' communities. In Table 1 below, we focus our assessment on NMB's savings account. However, for the sake of comparison, we also summarized our assessment for NMB's transactional (current account) and long-term investment account. While investment accounts are a form of savings, the accounts primarily target middle to high-income individuals, who are not our target market in this report.

Table 1: Assessment of Existing NMB's Products

Assessment Criteria[42]	NMB's Products		
	Current Account[43]	Savings Account	Investment Account
Convenience: proximity and flexibility	Not very convenient because on average it takes about 23 minutes to get to the nearest bank branch, costing a customer an average of TZS 1,200 (US$ 0.53) to travel one way to the bank. At the bank the customer waits about 50 minutes to be served due to long queues.[44] A customer may have to forgo a few hours of work in order to access bank services, making the offered products unattractive to the target market.		
Trust: security	Regulation and external supervision enhance the public trust of the products offered. In addition, all deposits are covered by deposit insurance up to TZS 1.5M (US$ 667.82), providing full protection to about 92% of all depositors in the banking industry.[45] This makes bank products the most trusted products for growing savings.		
Affordability: low entry and maintenance barriers	Opening balance ranges from zero for government employees to TZS 15,000 (US$ 6.68) for non-government employees for different types of accounts. For group accounts it is TZS 100,000 (US$ 44.52). Accounts also attracts monthly maintenance fee (ranging from zero for government sponsored accounts to TZS 1,600, US$ 0.71), dormant account fee after 12 months of inactiveness (TZS 2,000 (US$0.89) plus TZS 12,000 (US$ 5.34) account reactivation charge) and cash withdraw charges (TZS 800 (US$ 0.36) at the bank ATM, TZS 3,000	Opening balance ranges from TZS 10,000 (US$ 4.45) Junior (children) saving account to TZS 50,000 (US$ 22.26) for a goal savings account (bonus account). The marketed goals include weddings, school fees and construction. Accounts also attracts dormant account fee after 12 months of inactiveness (TZS 2,000 (US$0.89) plus TZS 12,000 (US$ 5.34) account reactivation charge) and cash withdraw charges (TZS 800 (US$ 0.36) at the bank	Opening balance is TZS 2,000,000 (US$ 890.43) for a selected fixed amount of time, making it unaffordable for low income individuals.

[42] Goss, et al. p.3.
[43] NMB's current accounts include personal account (for everyone and special for individuals in the armed forces), student account, wisdom account, Chap Chap account and group current account (implemented since 2015).
[44] Figures based on our January 2016 survey interviews.
[45] Allafrica.com. 2014.

Assessment Criteria[42]	NMB's Products		
	Current Account[43]	Savings Account	Investment Account
	(US$ 1.34) at the bank teller and TZS 2,500 (US$ 1.11) at other banks ATMs), making this account expensive for low income individuals. The new Chap Chap account with minimal 'know your customer' (KYC) requirements aims to rectify this challenge.	ATM, TZS 3,000 (US$ 1.34) at the bank teller and TZS 2,500 (US$ 1.11) at other banks ATMs). Junior account allows 2 withdrawals per year while goal saving account allows one withdrawal per quarter without a penalty.	
Services: liquidity and discipline	Caters mainly to customers' liquidity needs but products are not designed to instill saving discipline.	Encourages saving discipline with some liquidity provisions.	Encourages saving discipline with flexible liquidity options.

Our analysis above indicates that the current NMB products are relatively inconvenient, as one needs to travel to the bank to access them. While NMB's products pricing are comparable with that of its competitors (CRDB and NBC), they may not be as affordable for low-income individuals. This is because prices impose a higher transaction cost for anyone interested in participating. However, NMB products are trusted for accumulating savings and have some provisions in balancing between liquidity and encouraging savings discipline.

We proposed three products for NMB to develop based on what has worked in other countries and academic research on consumer finance in developing countries. The suggested products modify existing NMB's savings products and expand the portfolio of products that customers can choose from. Evidence shows that demand for formal financial services is higher when the offered services are tailored to the needs of the customers. For instance, Equity Bank in Kenya managed to mobilize a 10-fold increase in both accounts and the value of savings in five years totaling at US$1.2 million in customer deposits across 5 million accounts[46] by designing their products to meet low-income client needs. NMB could potentially achieve similar magnitude of success with appropriately designed products.

Option 1: Saving my Future Income Today (S-FIT)

This product requires committing saving a proportion of future earnings increase and is modeled based on Shlomo Bernatzi and Richard Thaler product, the Save More Tomorrow (SMarT).[47] This product relies heavily on the concept of nominal loss aversion and people's willingness to save when income increases. Empirically, people tend to weigh losses significantly more heavily than gains and the estimated loss aversion are typically close to 2. That is, losses hurt roughly twice as much as gains yield

[46] Radcliffe. p.1.
[47] Thaler and Benartzi. 2004.

pleasure.[48] Loss aversion is associated with low likelihood of saving increased income unless an individual commits saving a certain percentage of the increased income before the income is realized.

The target audience for this product are people who expect their income to increase in the future from either pay raise, bonuses or increase in sales, but are asked to commit today to save a certain percentage of that increase. This is because after the increase in income is realized, the urge to consume the increased income is likely to subdue the willingness to save. This is particularly true for people who are present-biased (i.e., tend to significantly reward self today at the expense of future rewards).

Our empirical analysis shows potential for reaching out to regular-salaried workers in order to increase savings uptake—for households with average characteristics, the predicted probability of saving in banks is largest amongst those with regular salary jobs (9.8%).[49]

The proposed S-FIT product mimics the SMarT products features as follows:

1. Participants are approached about committing their savings rate ahead of time before they realize any increased income from either increase pay or crop sales.
2. The contribution to savings begin with the first increase in income in order to mitigate the perceived loss aversion of a cut in take-home amount if the deduction starts at a later date.
3. Contribution amounts continue to increase as per continued increase in pay or crop sale.
4. Participants can opt out of the program at any time – this is to allow participants to be comfortable with joining the program.
5. Participants have a potential to earn interest in the range of 4%-10% annually after reaching the minimum amount of 50,000 TZS (US$22) in their savings account.
6. There is no deposit charge or monthly service charges. Also, an ATM card will not be issued for this product and enrollment does not guarantee loan approval in the future.

The product will be delivered through the traditional brick-and-mortar banking model. This is because the automatic deduction from payroll or crop sales through direct engagement with a third party entity (such as a cooperative society) eliminates inconveniences on the account beneficiary. The customer does not have to go to the bank to deposit into the savings account. The customer will only need to visit the bank branch to withdraw the money. The inconveniences introduced in order to withdraw the money may act as an additional incentive to ensure customers retain their savings and only withdraw when it is absolutely necessary.

[48] Tversky and Kahneman. p.310.
[49] This is followed by those who are self-employed (2.4%). See probit model results in Appendix 3.

Although we have not encountered documented evidence on implementation of SMarT like products in developing countries, its success in the US warrants attention. In its first implementation, 78% of participants who were offered SMarT joined and after four cycles in the program, participants increased their deferral rates from 3.5% to 13.6%.[50] We developed a leaflet that we used to explain the product to customers and probed on whether they have heard about a similar product in the market and their likelihood of taking this product if NMB was to introduce it in the market.

Figure 11: S-FIT Product prototype (front and back brochure)[51]

Saving my Future Income Today (S-FIT)

Are you willing to commit today to save a portion of your increase in income tomorrow?

How it works

This program requires you to commit a certain percentage increase in your future income or sales from crops into a saving account (at least 10,000 TZS). By signing into the program, you are agreeing for the bank to deduct the agreed percentage from your income and deposit it into a savings account where you can earn at least 4% of interest rate annually. The bank will continue to deduct amount to add into your savings unless you opt out of the program at any point in time.

Who we are targeting

a. Anybody who earns a regular income (e.g., employees) and expects an income increase/pay raise
b. Farmers who expect a percentage increase in crop sales

Frequently Asked Questions

1. When does my savings contribution start?
The contribution to savings begins with the first increase in pay or first realized crop sale.
2. Who do I start earning interest?
You start to earn interest when the savings contribution is at least 50,000 TZS.
2. Is there a monthly deposit charge or any other charges?
There is no deposit charge or monthly service charges.
3. Will an ATM card be issued to me? Can I get after my savings reach a certain amount?
An ATM card will not be issued for this product or a promise of a loan in the future.
4. What happens when an expected income increase did not push through?
The savings account you opened today will remain registered under your name, unless you opt out of the program.
5. Can I monitor progress of this savings account on a mobile platform?
Yes. You can also opt for a paper-based monthly bank statement.

For account opening and queries visit your nearest bank branch or bank agent. Call our customer service hotline +255222322000.

Option 2: Goal-savings card

Goal-oriented savings products allow people to save for a specific purpose in order to defy the fungibility[52] concept of money and address time-inconsistent preferences. In general, people have been observed to save more and spend the money into the designated purpose once they have mentally allocated it into that purpose by moving it away from the most tempting class of accounts such as cash on hand or current accounts.[53] Commitment savings product can also be useful for those who exhibit present-bias preferences—tying one's hands beforehand using goal-oriented savings device can improve one's wellbeing.[54]

[50] Richard H. Thaler and Shlomo Benartzi. p.S_{174}.
[51] Jones, Claire. November, 2014. How you can save some money this week. Available at: http://www.cashloan.net.nz/blog-details.php?id=25&title=how-you-can-save-some-money-this-week. (Source of Pictures in S-FIT brochure)
[52] Richard H. Thaler (p.195) defined fungibility as "money in one account will spend just as well in another".
[53] Richard H. Thaler. p. 196.
[54] See Ashraf, Karlan, and Yin (2006) for their work on commitment savings accounts in the Philippines.

In this case, NMB can launch different products targeting specific goals whose financial needs have often forced families into debt or other forms of financial distress. For the product to be accessible to the different segments of NMB's clients, especially lower income ones, these products can be sold as scratch cards at NMB agents and other retail shops countrywide. The customer can deposit the amount bought towards a specific goal by entering the security code on the scratch card through a mobile phone from anywhere and withdraw from any NMB or mobile network operator (MNO) agents.

The duration of savings and the frequency of deposits would be left up to the customer who will select at the time of product subscription. People who meet and exceed their saving goals will be rewarded with "bonus" interest rate in order to encourage savings discipline. The absence of restriction on time and frequency of deposits give the customers the flexibility to deposit when they can. Also, knowing that customers can withdraw their money at any point in time releases them of liquidity anxieties. A customer has a potential to earn interest in the range of 4% -10% annually after reaching the minimum amount of 50,000 TZS (US$22) in the savings account.

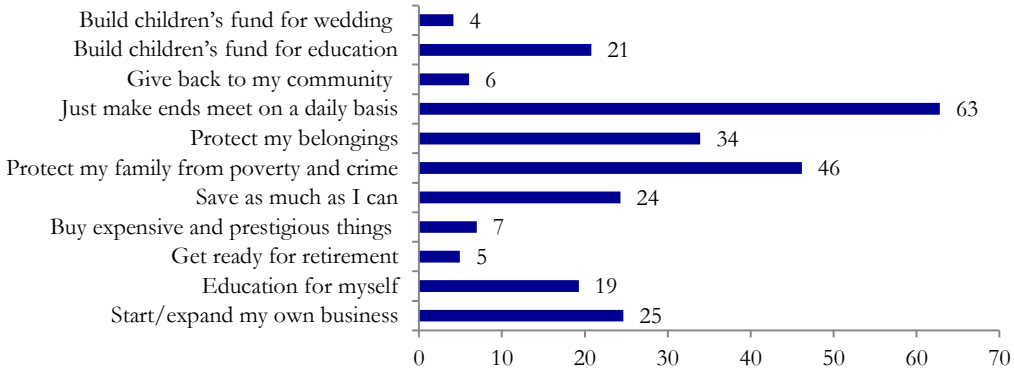
We proposed three goal-oriented products for NMB to introduce based on Tanzanians' saving goals. Figure 12 shows that Tanzanians demand savings mostly for: meeting daily needs (63%), business creation/expansion (25%) and investing in children's education (21%).[55,56] Saving reasons for Tanzanians reflects the Lindqvist (1981) savings motive hierarchy model in that individuals demand savings for such purposes as short-run cash management (i.e., addressing current needs and payments), precautionary saving against unexpected spending shocks, savings accumulation for large down-payments such as on house, and saving to invest in business and other assets.[57]

[55] InterMedia Financial Inclusion Insights Data. 2014.

[56] Saving in order to protect family from poverty (46%) and saving as much as one can (24%) maybe interpreted as accumulating savings to meet needs or invest in education in order to escape intergenerational poverty. However, we cannot confidently interpret what saving "in order to protect my belongings" entail. It could as well mean people save in order to avoid resorting into debts and face a risk of having their collaterals taken away in case of default, but we have not been able to find any follow up insights on this.

[57] Lindqvist, A. 1981. (as cited in De Clercq, et al. 2012). p. 124.

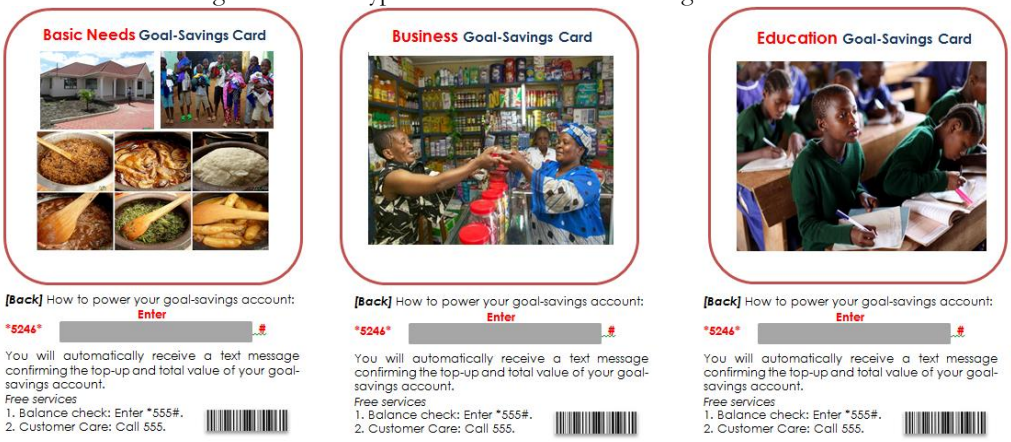
Figure 12: Purposes of Saving among Tanzanians



Source: InterMedia, Financial Inclusion Insights Data. 2014

We used the prototype below to describe the products to the customer and gauge the likelihood of these products meeting customers' needs.

Figure 13: Prototypes of Goal Orientated Savings Card[58,59, 60]



Option 3: Save&Play Prized-Linked Savings (PLS) account

This account incorporates lottery elements to an otherwise standard saving account. Instead of earning compounding interest on the deposits, account holders willingly accept reduced interest paid on a regular account in favor of the probability of winning large amounts of money[61] if they do not withdraw from the account for a given period of time. However, the saver's principal deposit is risk free, which differentiates the proposed "Save&Play" product from a regular lottery gaming. The account owner still has access to the saved amount either on demand or at a future date and only bets a percentage of

[58] Bahath Foundation. 2015. Available at: http://www.bahathfoundation.org/who-we-are/our-mission/. Mobofree. 2015. Nice and Spacious. Available at: http://www.mobofree.com/tanzania/Real-estate-housing/Houses/Nice-and-Spacious/1382331. Uncornered Market. 2011. Tanzanian Food Mosaic. Available at: http://uncorneredmarket.com/photos/picture/5917733379/. (Sources of Pictures in Basic Needs Goal-Savings Card)

[59] Tanzania Investment Centre. Available at: http://www.tic.co.tz/menu/287?l=en. (Source of Pictures in Goal-Savings Business card)

[60] Development Solutions Consultancy Ltd. 2015. Available at: http://www.dsc.co.tz/thoughts/2015/01/what-kind-of-education-does-tanzania-really-need/. (Source of Pictures in Education Goal-savings card)

[61] Kearney et al. p.4.

potential interest payments. Despite the fact that the principal deposit is kept intact, the concept of lottery may not resonate well with those who are highly risk-averse.

Save&Play account has features that are likely to be appealing to most Tanzanians including the population segment currently excluded from formal financial services. While our econometric analysis shows that being poor decreases the probability of saving formally or particularly in banks (between 2% and 4%)[62], tweaking the status quo product designs to acknowledge poverty is a good starting point. Particularly, the lottery-like features would be appealing to low income individuals who would otherwise earn very low nominal interest payments based on the following: low savings amount; high demand for liquidity or relatively short and uncertain deposits timelines to allow their deposit to accumulate compound interest.[63] To majority, the large prize offered by Save&Play account present the possibility of escaping the "poverty trap" and may attract individuals who are excluded from traditional savings products, even if the probability of winning that prize is quite low (Cole et al, 2015).[64] This maybe because lottery characterization of Save&Play accounts offer low-income households the possibility of extremely high returns than would otherwise be unobtainable to them.[65] Indeed, Cole et al. (2015) reports evidence for large uptake of PLS products among cash-constrained and poorer individuals in South Africa.

The experience with PLS accounts in Tanzania is limited. Banks such as Ecobank and First National Bank (FNB) have experimented with campaigns incorporating lottery features on ordinary savings accounts in order to stimulate savings only for a given number of months.[66,67] Also, NMB has run campaigns with lottery features in times of sluggish deposits growth to mobilize the general public to take their deposits to the bank.[68] So far PLS accounts have not been a standard offering for any bank in

[62] All analyses hold right-hand-side variables at their mean values. See probit model results in Appendix 3.
[63] Kearney et al. p.5.
[64] Shawn Cole, Ben Iverson and Peter Tufano. p.2.
[65] Kearney et al. p.5.
[66] The WIN BIG with ECOBANK promotion was open to existing and new customers for six months in 2012. Through the promotion, existing customers automatically earn 50 points while new customers earn 50 points on opening an account with TZS 50,000. To qualify for the monthly draw, both existing and new customers need to build up their balances to TZS 100, 000 that is equivalent to 100 points. A customer who has 100 points qualifies for a monthly draw. Every month 15 winners will emerge from the draws for the next 6 months. Five of these winners will get ipads or laptops depending on their preferences, while remaining 10 will get gift vouchers for clothes, household furniture and electronics or a one-night getaway to Zanzibar. At the end of the 6th months, customers who have a balance of TZS 500, 000 or have increased their monthly balance by TZS100, 000 for the period of the promotion, are qualified for the final grand price of a brand new Hyundai ix35. (ECOBANK Press Conference, June 2012).
[67] FNB Tanzania ran a "Save and Win" campaign between October and December 2015. The campaign provided monthly prize payouts to participants who made deposits on their savings accounts. During this campaign, both new and existing customers got an automatic entry into the draw for every 50,000 they deposited into their savings account so that the more they save the better their chances of winning 5,000,000TZS. (source from: Dailynews. November 2015.)
[68] NMB Internal Memo. Deposit Mobilization Campaign. August 2014.

Tanzania and hence introducing a PLS accounts for a bigger bank like NMB could be a game changer in stimulating a saving culture among Tanzanians. NMB's exploration with PLS accounts is relevant for the Tanzanian context because PLS accounts have proven to be successful in other countries such as Thailand with Bank for Agriculture and Agricultural Cooperatives (BAAC), Indonesia with Bank Rakyat Indonesia (BRI), Nigeria with First Bank of Nigeria (FirstBank), and South Africa with First National Bank (FNB).[69] In Thailand for instance, BAAC offers a lottery style savings card (Om Sap Thawisin Savings Card Deposits). Clients purchase savings cards, and when the card matures in three years, the client withdraws their savings with interest. Clients with savings cards are entered into a lottery for a monetary bonus every three months. Winners are drawn based on the serial number of the card, so the more cards a person possesses, the higher chance they have of winning.[70]

Evidence shows an increase in total savings after banks have introduced PLS accounts into their products portfolio. For instance, FirstBank experienced a 3 percentage-point increase in savings balance compared to balances at a bank without a lottery savings promotion in the short-run even though the difference eventually went down to zero.[71] This suggests that it might take a longer time for a saving culture to be adopted following a shorter promotional campaign. Also, the increase in savings does not happen at the expense of reduced savings in other accounts owned at the bank. Cole et al. (2011) finds no evidence of PLS cannibalizing regular savings, suggesting an overall increase in total savings at FNB. Additionally, Atalay et al. (2012)[72] find an increase in total savings by 12 percentage points on average from introducing a lottery savings based on an online experiment. These results appear to be stronger among participants with lowest savings and income, which are a target for savings mobilization policies. Even though the experimental setting of Atalay et al. (2012)'s study may limit its external validity, the study complements evidence from Nigeria and South Africa that offering savings products with a lottery element may increase total savings overall from both existing and new savers. The fact that PLS accounts have a greater potential in stimulating even individuals in the low-income segment to save is important for Tanzania. Our model estimation on factors influencing take up of formal savings in Tanzania show that being poor, working as a farmer, or having a high household dependency decreases the probability of saving in any form by around 2-8%, 2-11%, and 2-3%, respectively [73] (see Appendix

[69] Tufano (2008) noted that A-Million-a-Month Account (MaMA) was introduced in 2005 and continued to exist until March 2008 when it was legally banned.
[70] Ashraf, Nava, N. Gons, D. Karlan, and W. Yin. p. 17.
[71] Kanz, M. slide.10 - 13.
[72] Atalay, K., F. Bakhtiar, S. Cheung, and R., Slonim.p.17.
[73] All analyses hold marginal effects at their mean values.

3). Therefore, an account such as Save&Play by NMB has a potential to bring people from the lower income segments into formal saving more successfully than an ordinary savings account.

Moreover, prize-linked accounts produce positive externality that serves an additional benefit to the society. Kanz (2013) argues that provision of prizes on savings may enhance long term formal banking interaction and financial capability. He finds a 1.5% increase in transaction frequency and 5% increase in the use of financial products by PLS-account holders a year after the promotional savings in Nigeria. Also, Cole et al. (2011) find an increase of 40 extra MaMA accounts a month after a millionaire winner is announced at winners' branches. This is aside from the effect of winning on prize winners where they found that about 15-18% of winners were likely to have kept their MaMA account 1 year after winning than those who did not win (regardless of the prize size).

Therefore, the potential for welfare enhancement provided by net increased savings and highlighted positive externalities are strong incentives for proposing implementation of Save&Play savings accounts at NMB. Besides, the prizes offered are self-financed from interest earned on savings as opposed to other costlier savings intervention such as on and off deposits mobilization campaigns with prizes or subsidized savings accounts.

Figure 14: Save&Play product prototype and description used to potential customers[74]

Proposed Product Delivery Channels

For the low-income clients, convenience is critical. To overcome the access barrier for some parts of the country, make it convenient for customers to deposit even small amounts on a regular basis, and allow for efficiency and cost-effectiveness while processing small value transactions, NMB can deliver

[74] Mobile World. 2014. Available at: http://mobileworldmag.com/nigerian-networks-ordered-to-suspend-sms-lotteries/. (Source of picture in Save&Play Savings card)

the goal-savings and Save&Play products through a combination of traditional brick-and-mortar model and indirect distribution channels. New accounts can be opened through an NMB bank agent or an NMB bank branch. However, customers can buy their top-up amounts in the form of cards that are similar to gift cards or mobile pre-paid card that are sold in retail stores. The customer would purchase a card, i.e., "buy savings"[75] and deposit the amount into the savings account through a mobile phone that is linked to the customer's savings account. This would make it easy for customers to deposit even a small amount of extra cash into their accounts without having to go to a bank branch. Also, this alternative delivery channel has a tremendous potential to reduce queues especially because long queues was one of the major complaints interviewed customers (30%) indicated to be dissatisfied with from their overall banking experience with NMB.

Moreover, NMB can mimic the reminder message feature from the informal savings. Randomized controlled experiments conducted in Peru, Bolivia and the Philippines have shown the value of reminder messages in helping customers adhere to the commitment savings products routine. [76] The fact that over 70% of Tanzanians own mobile phones makes it possible for NMB to actively engage with customers by sending messages about customers' balances in comparison to their saving goals in order to remind them to save.

By implementing these changes on product features and delivery, NMB stands to realize both the social and economic value. From a customer's standpoint, NMB will help instill saving discipline by making it easier for customers to save, safeguard customer's savings, offer bonuses (interest) on savings and help customers to better manage their cash by allowing them to choose the timeline to meet their saving goal. Moreover, for NMB, these products improve treasury cash management because of improved predictability on deposits and withdrawals. Also, the fact that it is easier to save, savers may be encouraged to accumulate larger savings amounts and maintain larger outstanding balance in their accounts. Evidence from Workers Bank in Jamaica shows that by mimicking the key features of informal savings products, the bank was able to boost the number of accounts from 4,000 to 17,292 and deposits values from US$0.3 million to US$3.36 million between May 1994 to September 1997.[77] Lastly, bringing more users into the formal system may help NMB with screening borrowers from users of these new different accounts. This is based on the assumption that customers who commit and adhere to making regular savings deposits are presumably better borrowers.

[75] Tufano, P. and D. Schneider. p.28.
[76] Karlan, D., M. McConnell, S. Mullainathan and J. Zinman. p.19.
[77] Owens, J. p. 15.

5. Analysis of Policy Options

We adapted Cole, et al (2011)'s financial survey and covered the following categories: demographics, financial services (bank and savings account) ownership, individual's financial management, and behavioral preferences. We further asked questions aiming to elicit feedback from customers on product prototypes to guide our recommendations for NMB in addressing the challenge of formal savings in Tanzania. Given time and budget constraints, we used convenience sampling to conduct our interviews in January 2016. Strategically, we visited 4 NMB branches located in peri-urban areas and interviewed a total of 59 NMB customers as they came into branches and were available to be interviewed. Mbagala branch is located in Dar es Salaam while Bagamoyo, Kisarawe, and Mkuranga branches are located in the nearby Coastal (Pwani) region. 43%, 21%, 14%, and 22% of the respondents come from these locations, respectively. It should be noted that our data analyses are exploratory and not necessarily representative of the country, given the size of the sample and interview locations.

Majority of our survey respondents have either personal current account (85%) or a business current account (9%) and only about 5% have an NMB personal savings account. Based on this, our analyses reflect the preference of respondents who are currently not saving with NMB even though they have access to and can choose to open any of the savings accounts offered by NMB.

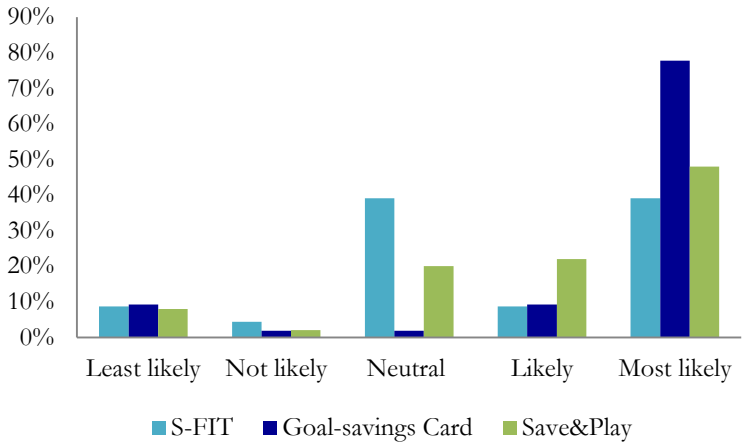
Technical Correctness of the Proposed Options

From a demand standpoint, a 'technically-correct' savings product hinges on the overall likeability of the savings product offered. We showed the prototypes to respondents and asked as to how likely they are to take up each of the savings product if it were to be offered by NMB in the market.[78] Specifically, the question asked, "How likely are you to register and use this savings product if it were to be offered in the market?" The goal-savings card had the overwhelming reception in the 'most likely' category with 78% of respondents, followed by Save&Play with 48%. Reception for S-FIT is largely positive, with about 40% each indicating that they will either 'most likely' take up the product or are 'neutral'.

To further extrapolate the true preferences of respondents, we asked a follow-up question by restricting the choice to 'yes' or 'no'. The question asks, "Will you register and use this savings product if it were to be offered in the market?" Again the goal-savings card had the highest positive reception (87%), followed by Save&Play (73%), and S-FIT (53%).

[78] We only asked respondents to answer their choice for the S-FIT product if they are salaried workers. Otherwise, we only asked them on 2 of the savings products.

Figure 15: Likelihood of Taking-up Savings Product



Purposes for goal savings are primarily geared towards education (67%) and business (51%), whereas reception for basic needs is lackluster (6%). The latter may perhaps be due to the nature of basic needs (particularly food, shelter, and clothing), which is immediate and concerns everyday life. Besides, there are ways to navigate the need to acquire basic needs, such as buying cheap second-hand clothing. However, NMB could fine tune this product and re-test it as 'housing construction/development' savings goal, a need that is pressing for majority of Tanzanians.

NMB currently has a goal savings account for children, namely NMB Junior Account and NMB Bonus Account for other goals such education, weddings and construction. As of 2015 Junior Account and Bonus Account constituted 4% and 2% of all NMB personal accounts, respectively. Plausible reasons for low products acquisition are lack of information, generality in product design (thus rendering the product unclear and unattractive), etc. Respondents positively received the idea of clearly specifying these products and allowing them to deposit even small amounts on their mobile phone or at an NMB agent through purchase of scratch cards.

Prior to introducing our savings product prototypes to the respondents, we ask them about what product or service features would attract them to open a savings account and/or deposit more frequently in order to elicit ideas from them. Many of the responses relate to the role of information, such as explicit information about the benefits of savings and related products offered by NMB, tax payments and related charges/costs on their savings, suggesting the need for NMB to incorporate some basic financial education on its marketing campaigns. In fact, when we asked those who do not have savings account at NMB, 95% are willing to undergo financial literacy training on savings if NMB were to offer one.

Many also talked about flexibility in savings account, such as one that can accommodate 'small' transactions, address the inhibiting savings factor of 'low income', flexibility in withdrawals, minimal

restrictions in savings and time deposits, and attractive annual interest rates that are comparable with the opportunity cost of capital (i.e., investing in business opportunities). Some responses highlight the advantages of savings groups—respondents mentioned, "groups engage all members in making decisions about how they want to save while banks have requirements that have to be met for someone to accumulate savings". NMB can engage customers more by allowing them to choose the type of savings account, frequency and amount to be deposited.

Based on the correlation analyses[79] of our exploratory survey data (Appendix 5), we find that take-up of the goal-savings card is significantly associated with less income. This is not surprising given that the idea of a scratch card and allowing small value deposits is primarily targeted at the low-income segment (i.e., bottom of the pyramid). Furthermore, using cluster analysis (Appendix 6) to segment NMB clients based on demographics and preferences, we find that the cluster/group that has all clients willing to take-up goal-savings has a larger education spending for children and have attained higher education levels, on average. This is despite the lack of differences in income earned with another cluster. This indicates opportunities for NMB to target lower-income parents with the education goal savings product offering.

S-FIT product that is geared towards the employed and middle class is associated with characteristics such as religion (i.e., being a Christian), age (being older), higher income, and spending on education. Based on our cluster analysis, the group indicated willingness to take-up S-FIT did not agree to any fatalistic statements. However, S-FIT take up is negatively associated with longer waiting times to be served in the bank[80] perhaps due to how S-FIT is proposed to work. Unlike goal savings and Save&Play products that would leverage on the agency banking and have an individual actively deposit into the account, S-FIT will deduct increased earnings automatically from existing account to an S-FIT account at the branch. Also, since no debit card will be issued for this account, account owners will need to visit the branch when they need to withdraw money. As a result, those who have experienced longer waiting times[81] in banks may be discouraged to open an S-FIT account, even though the concept is new. However, to address this concern, NMB could tweak this product and allow withdrawals from agents through NMB mobile. Overall, only 5% indicated having heard about the S-FIT concept.

[79] We conducted chi-squared test and Fisher's exact test analyses for association between each of the binary choice of savings products and categorical variable of interest. We also conducted point-bisceral correlation analyses for association between each of the binary choice for savings products and a continuous variable.

[80] Cluster analysis shows groups that indicated they will take-up S-FIT have lower waiting times prior to be served at NMB (Appendix 6).

[81] NMB clients complain about long waiting times in bank branches, suggesting the need to improve service delivery in branches.

Take-up of Save&Play is positively associated with those who are present-biased,[82] being a Christian and negatively associated with spending on health. 60% of those who are present-biased are most likely to use Save&Play. Spending on health is an emergency for many respondents. It is likely that the negative association between health spending and savings products uptake is due to the need for flexibility in accessing money for emergency spending such as health, suggesting the unmet need for micro-insurance in releasing these respondents from worrying about health expenditures.[83]

Summary statistics provide support for behavioral preferences associated with uptake of savings products (Appendix 4). We find that 100% and 82% of those who are considered present-biased will 'most likely' use S-FIT and goal-savings card, respectively. Given the nature of these savings product concept, which is essentially about 'committing' an individual to either saving for their future income or goals, the positive reception among time-consistent[84] people is reasonable. Nonetheless, reception on goal-savings for those who are not considered present-biased is also positive, with 77% indicating they will 'most-likely' take-up the product, suggesting the identified goals resonate with people's needs. In fact, 78% of those who mentioned that they do not have control over their lives will 'most likely' register for goal-savings card (i.e., 25% for S-FIT, and 61% for Save&Play). This suggests the potential for goal savings and Save&Play to offer individuals a sense of control over their financial lives. Conversely, only 30% of those who are not categorized as 'present-biased' will 'most-likely' take-up S-FIT.

We further find that only 43% of risk-averse respondents (i.e., did not play lottery[85]) are 'most likely' to use Save&Play compared with 88% for goal savings card and 50% for S-FIT. This supports the idea that risk aversion can be an inhibiting factor for choosing Save&Play as the potential benefits of winning prizes (to offset a lower interest rate) may not outweigh the benefits of earning a known amount with certainty (i.e., high interest rate) for risk-averse individuals.

Of those who mentioned that they or their household member are part of SACCOs or an informal savings group, reception for savings product prototypes are positive: 50% will use S-FIT, 92% will use the goal-savings card, and 76% will use Save&Play. This implies that the benefits of the savings product

[82] The 'present-biased' dummy is equal to 1 if one has a bigger discount rate 'between now and 1 month from today' than '6 months from today and 7 months from today'. This follows Dupas and Robinson (2013)'s paper on savings in Kenya.
[83] Differences between clusters formed in Save&Play are not much diverse, meaning that it is difficult to highlight particular characteristics of those which would take up Save&Play. Each clusters formed indicated between 70%-80% of take-up rates.
[84] Following Dupas and Robinson (2013)'s paper, one is 'time consistent' if she has the same discount rate across time periods.
[85] To elicit true preferences, we provided actual money (i.e., 1,000 TZS (US$ 0.45) for those who chose the money with certainty and did not play the lottery; and 3,000 TZS (US$ 1.34) or nothing for winning the lottery or not) .

prototypes may attract savings from people currently relying on informal mechanisms to reach their savings goals.

Although our present findings are based on a small sample of already banked individuals, they confirm our hypothesis of the potential for appropriately designed and delivered savings products to increase uptake and active use of formal savings products. Also, our findings suggest goal-savings products to be the most preferred products, followed by S-FIT and then Save&Play. The low ranking of Save&Play could be a reflection of the fact that gambling or betting is not yet part of a common culture in Tanzania.[86]

Finally, we also calculated the net benefit/value of the savings product options and compared that with the status quo benefit. Assuming that a customer deposits 10,000 TZS (US$ 4.45) on a monthly basis, and assuming an annual interest rate of 8%, the net interest earned in a year for both S-FIT and Goal-savings card is 9,600 TZS (US$ 4.27) compared to 1,200 TZS (US$ 0.53) for NMB's existing savings products. Save&Play, where we assumed a lower interest rate of 4%, also provide positive net value to customers (6,000 TZS (US$ 2.67) in net interest earned in a year). (Appendix 7).

Administrative Feasibility for Implementing the Product Options

NMB has established its position in the market in extending financial services to the unbanked and under-banked populations. The bank already has working relationship with MNOs and maintains payroll accounts of other businesses including the government of Tanzania. This essentially means that implementation of any of the proposed products is within the capacity of the bank. Therefore, the administrative feasibility analysis will mainly look into implementation capacity and relative costs among the proposed options.

1. **Status quo:** NMB could continue marketing the existing saving products. However, the low up-take especially among the low-income individuals and the challenge in growing its deposits to complement its lending business makes this option undesirable.
2. **Saving my Future Income Today (S-FIT) account:** NMB has working relationships with different stakeholders such as enterprises and the government of Tanzania on payroll related products and cooperative societies on agriculture financing. NMB can use these relationships as channels for promoting the S-FIT product to organizations staff and beneficiaries. NMB could easily start with introducing this product to its own over 3,000 staff, among whom, a proportion of them might willingly open an S-FIT account to save a certain percentage of their expected

[86] Betting in Tanzania. Viewed January 29, 2016. Available at: http://www.frixo.com/sbook/regions/tanzania.asp.

annual salary increments or bonus. Once NMB staff experience the benefit of this product, they are likely to be good promoters of the product to the civil servants, other enterprises and business that NMB targets for this product. Also, at a later stage NMB can easily tap into farmers' segment through working with cooperative societies to register interested farmers into the S-FIT program.

3. **Goal-oriented savings and Save&Play accounts:** NMB is currently licensed for agent banking and has access to over 60,000 agents through its integration with mobile money provider's agents network. This allows NMB to use this distribution network in "selling" these savings products closer to peoples' reach. Also, the bank has a working relationship with MNOs to easily figure out the service costs for using mobile phone platform to facilitate top-up transactions. Initial conversation with the bank indicated that the ideal of having different types of cards for different accounts would pose logistical challenges on production and distribution. It is administratively feasible for the bank to develop one scratch card that would cater for all prototypes proposed for Option 2 and 3 and have the SMS-based interface with selection of the different accounts eligible for this top-up method as per the prototypes. Based on the success of the recent product launch, Chap Chap account,[87] NMB has the capacity and resources needed to successfully roll-out these products to the market.

   However, the lottery like features of Save&Play account will necessitate the need for this product to be reviewed and be closely monitored by the Gaming Board of Tanzania (GBT), the regulatory body responsible for overseeing, monitoring and regulating the conduct of gaming activities in Tanzania.[88] For instance, FNB "Save and Win" had the selection of monthly winners supervised by GBT. This may add administration hiccups and possible delays to the implementation of Save&Play product proposal.

From a cost perspective, a savings product is said to be feasible when the lending rates of the bank is able to cover the cost incurred in servicing the savings account. NMB currently charges annual lending rates on loans of around 18% to 20% for every Tanzanian shilling it lends to borrowers. Our calculations show that status quo savings product is costing NMB an annual 13% for every Tanzanian shilling deposited in a 20,000 TZS deposit, while this goes up to 18% for a 10,000 TZS deposit.

[87] Chap Chap is an NMB current account developed in 2014 in order to overcome the major barriers to financial inclusion such as lack of financial knowledge, proximity to a branch network and relatively high cost. NMB employed a network of direct sales agents to sign up and crucially activate new accounts in the field, granting new customers immediate access to all of Chap Chap's unique banking and payment services.

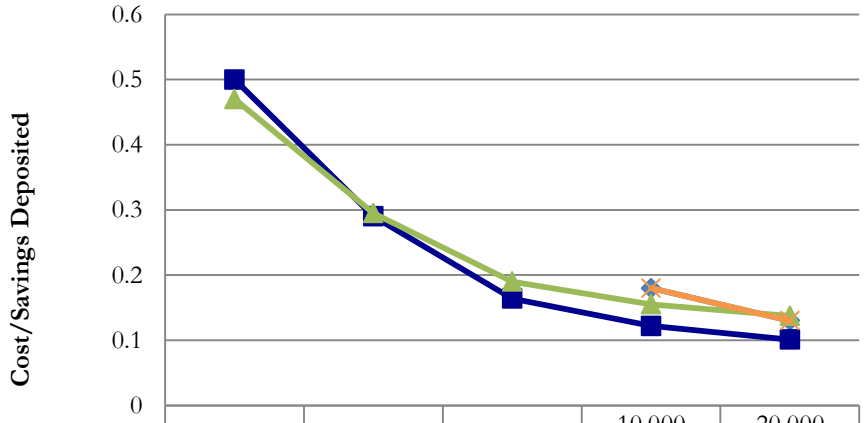
[88] GBT website. Available at: http://gbt.go.tz//index.php?option=com_frontpage&Itemid=1.

Our alternative savings product options show that they are cost-effective (i.e., cost rates are lower than current lending rates), with the caveat that there must be a minimum 5,000 TZS (US$ 2.23) deposit amount (Figure 16). The use of agency banking and other alternative channels to deliver these products makes it cheaper for the bank than status quo products that are delivered through the traditional brick-and-mortal banking model. Goal-savings cards prove to be most cost-effective, and cheaper than the status quo savings product NMB is currently offering—12% for every 10,000 TZS savings deposit and 10% for every 20,000 TZS deposit. S-FIT assumes the same costing rates as status quo, given that S-FIT will use brick-and-mortar banking model. Besides, S-FIT account holders may not be prohibited from depositing money into their savings account (if they wish to do so), apart from the automatic electronic transmission of future income earned.

While Save&Play option can be feasibly implemented from a cost standpoint, it is generally more expensive than the status quo. Furthermore, given the administrative hurdles of implementing Save&Play, the cost provided in our analysis is likely to be under-estimated. This is because we have assumed the same fixed costs for the status quo and all proposed accounts.

Our cost calculations below indicate a negative relationship between variable costs and deposits values. That is, variable costs decrease with higher deposits values. We used NMB's customer database to calculate average deposit frequencies and current interest rates, and used these figures in our cost analysis. We also made assumptions on deposit increases and bank transaction costs in order to arrive at the estimated costs on Figure 16 below. See Appendix 7 for detailed cost calculations.

Figure 16. Total cost to NMB for every Tanzanian shillings (TZS) of Savings Deposited

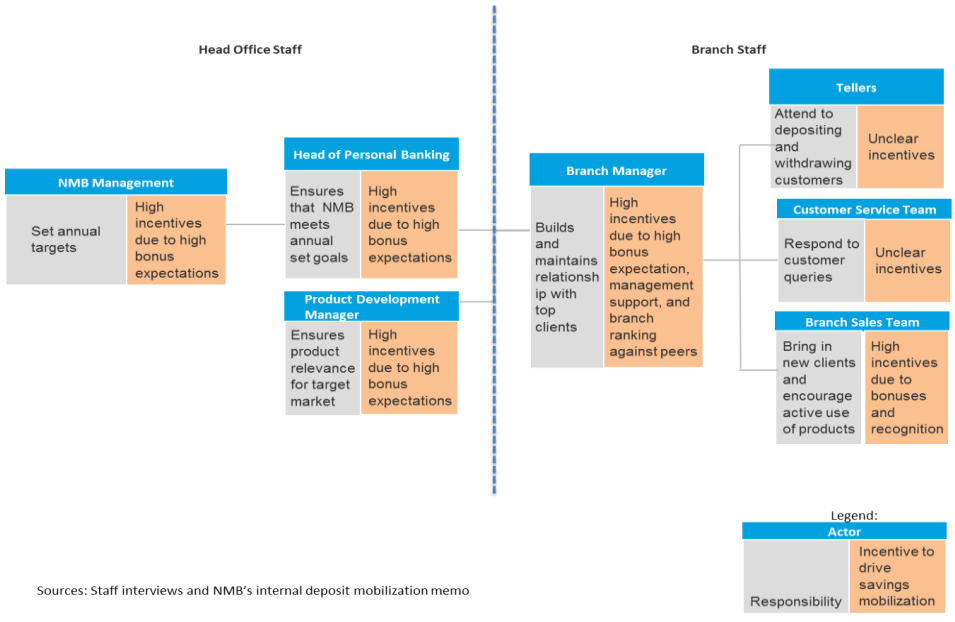


	1,000 TZS	2,000 TZS	5,000 TZS	10,000 TZS	20,000 TZS
S-FIT				0.18	0.13
Goal-savings card	0.50	0.29	0.16	0.12	0.10
Save&Play	0.47	0.30	0.19	0.16	0.14
Status Quo				0.18	0.13

The feasibility of delivering the proposed saving products is also dependent on NMB's internal structure and existing systems for maximizing its double bottom line, i.e., maximizing profit and financial inclusion. Profit maximization is aimed at mobilizing savings, which can be used to provide loans to other clients. Financial inclusion is aimed at recruiting new customers, especially the previously unbanked or underbanked, and maintaining engagement with old customers. Incentives for different actors involved in savings mobilization are provided in order to achieve these goals. Our analysis on Figure 17 below shows that head office staff have clear incentives to mobilize savings, as they receive bonuses upon exceeding targets. Also, head office staff often provide directives to branch staff on savings mobilization campaigns. For branch staff, only branch managers and sales staff have clear incentives for mobilizing savings and customer engagement and recruitment.

On NMB's 2014 savings mobilization campaign, both branch managers and sales staff were given bonus incentives to encourage new customer recruitment, engagement, and mobilize deposits. Also, a bank wide recognition for stellar performance on inter-branch saving mobilization competitions was an added incentive for these staff to meet and exceed the set targets. However, incentives for other frontline staff such as bank tellers and branch level customer service staff are not clear. Given that these staff interact more frequently with customers, it is important for NMB to ensure that they are properly incentivized to inform customers about different savings products offered and convert customers to users.

Figure 17: NMB's Internal Capacity and Incentives for Mobilizing Savings



Sources: Staff interviews and NMB's internal deposit mobilization memo

It is also important for NMB to factor in historical performance on savings mobilization at the branch level in order to understand which branches lag behind and what support is needed before rolling-out the

new products. As per Figure 18 and 19 below, 27% of bank branches or 38 out of 143 branches have shown no increase in savings deposits on the existing savings accounts (NMB bonus and junior accounts) between 2013 and 2015. A list of these branches can be found in Appendix 9.

Figure 18: Changes in Savings Balance, 2013-2014

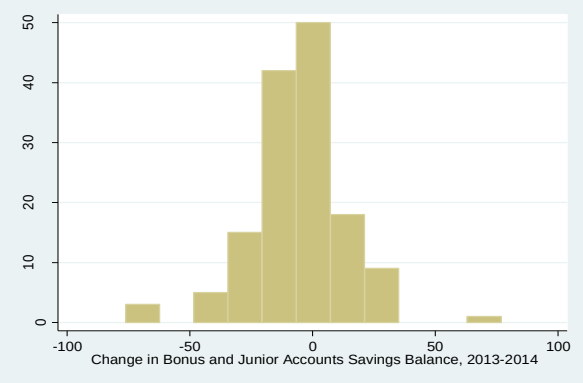
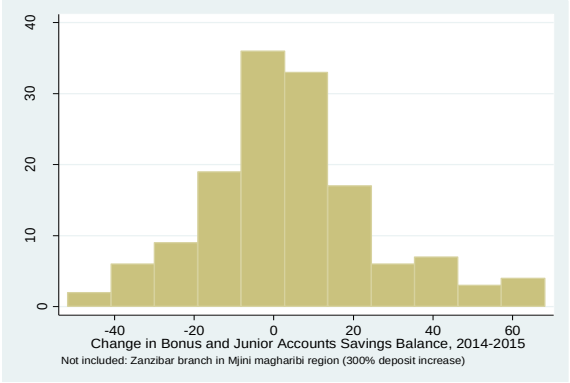


Figure 19: Changes in Savings Balance, 2014-2015



Source: NMB Customer Database.

Political supportability of proposed options

NMB has been internationally recognized as the Best Bank in Tanzania by Euromoney for the past three consecutive years for promoting financial inclusion.[89] As such, products proposal that aims to increase the reach of NMB services and products to a larger population would be consistent with the broader goal of making financial services accessible while generating profit for the bank.

The existing NMB savings accounts appear to be inaccessible to the targeted market based on the percentage of interviewed customers who indicated to have never heard of the savings products either from NMB or any other bank (42%). This may be attributed to the inaccessibility in the marketing message, delivery channels or general lack of awareness for the bank clientele. Our prototypes are in line with NMB's existing savings products, requiring minimal fine-tuning of the existing products to send a clear and direct message that resonates with customer's needs. Our value addition is the proposal to leverage on the mobile phone technology to facilitate small value deposits such as 5,000 TZS (US$ 2.23), which is in line with the bank tenacity to push innovation boundaries in bank service delivery. This will allow the bank to facilitate a large amount of smaller transactions at customers' convenience and a lower delivery cost than relying on brick-and-mortar delivery model.

Also, S-FIT products present an opportunity for the bank to engage with existing customers or acquire customers in large groups. This minimizes per customer acquisition cost and promotes end-to-end selling of bank product, a value proposition with potential to gain substantial internal support.

[89] IPPmedia. 2015.

However, the need to engage with the Game Board of Tanzania in implementing the Save&Play prize linked saving account add intricacies that might make the idea unappealing to the bank. The bank has only run occasional prized linked promotion campaigns to increase customers' deposits. Prizes have been in forms of goods such as bicycles, three wheelers and T-shirts. Even though an offer of 5,000,000 TZS (US$ 2,226) to a winner every month is likely to instigate people to participate in saving, NMB might need to assess whether market conditions can allow them to issue that amount while making profit on interest margins.

Summary of Policy Options

We summarize the three proposed options based on their technical correctness, administrative feasibility and political supportability.

Figure 20: Product Assessment Summary

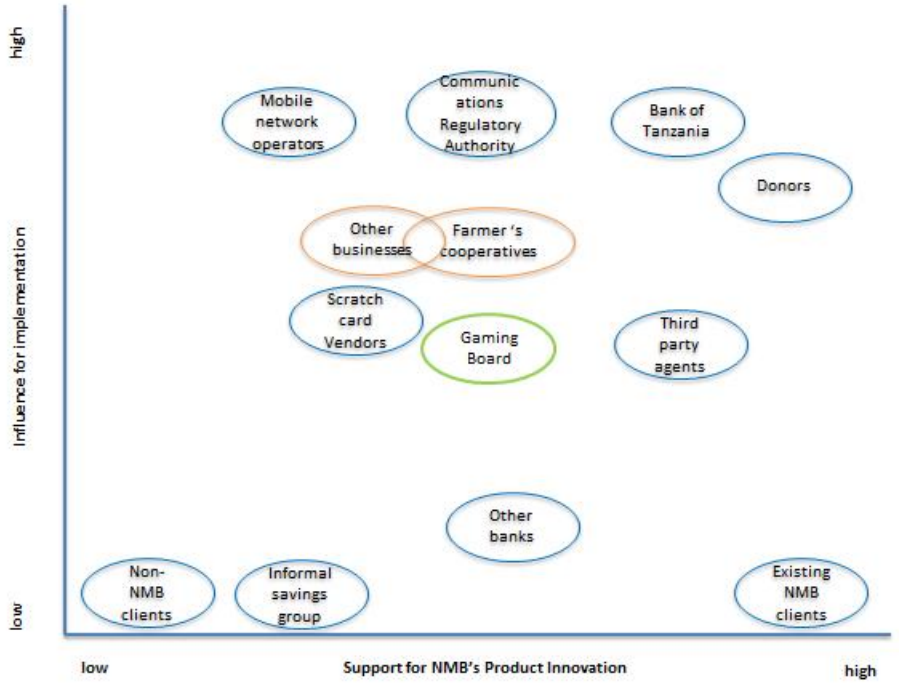
Recommended Options	Option 1: S-FIT product	Option 2: Goal-savings card	Option 3: Save&Play product
Technical			
Is there demand?	↑	↑	↑
Has the option been successful in a similar context?	↓	↑	↑
Administrative			
Are there complete infrastructures to support the option proposed?	↑	↑	↓
Does NMB have internal capacity to implement the option?	↑	↑	↑
Is the option cost-effective compared to existing products?	→	↑	↓
Political			
Does the option require involvement of few stakeholders?	↑	↑	↓
Will the option be supported by these stakeholders?	↑	↑	→

Based on the above table, we would recommend implementing S-FIT and the goal-orientated products first because the likelihood of bringing these products to the market in a shorter period of time is higher. NMB can implement Save&Play products at a later stage after they have cleared the legal and administrative requirements needed for offering this product. NMB may also need to strategize further in order to bring down the cost for every shilling of savings mobilized. This is important for gaining internal management support for launching the product in the long-term, while keeping clients happy with the acceptable interest rates and lottery incentives that appeal to customers.

6. Implementation Roadmap

The implementation of the suggested proposals is going to involve a range of stakeholders. These stakeholders have different motives for supporting NMB's innovation as well as different level of influence in facilitate or hindering implementation of the proposed products. Figure 21 below maps out the identified stakeholders on a support versus influence quadrant. As seen on the figure, influential stakeholders appear to have high support or are indifferent on the proposed innovations, highlighting the likelihood of less implementation interferences.

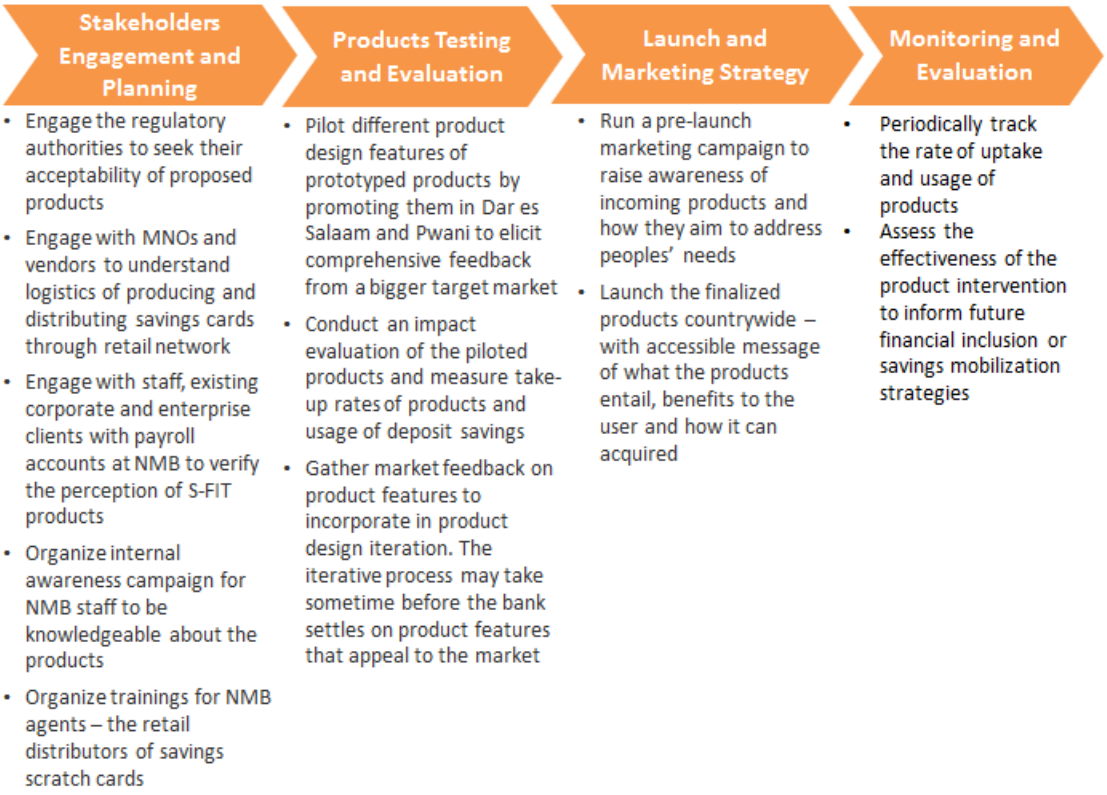
Figure 21: Stakeholder Mapping



Notes: green circles apply for Save&Play only; orange circles apply for S-FIT only; blue circles apply for at least two product options (for example, scratch card vendors is not applicable for the S-FIT option)

Given the push for NMB to constantly innovate and maintain its comparative advantage in a competitive environment especially for low-income households, planning and sequencing the order of different events will be very important for NMB. We are proposing a four-step phased approach to facilitate the implementation bearing in mind the importance of monitoring and evaluating the different stages of the implementation. This phased approach involves short-term and medium-term strategies. Short-term strategies involve stakeholder engagement and planning, and product testing and evaluation of savings product prototypes. The medium-term strategy involves the scaled-up launching of the most responsive innovative products following an informative marketing campaign.

Figure 22: Implementation Roadmap



Source: Authors' elaboration.

Stakeholder Engagement and Planning

This will take the form of identifying and engaging with key partners, key activities, key resources needed, articulating the intervention's value propositions, understanding customers that currently NMB has relationship with who could be the target for some interventions, segmenting customers into different brackets based on their hypothesized needs, evaluate the existing distribution channels, develop the expected cost structure and revenue streams.

Products Testing and Evaluation

Given that our data collection was limited to a smaller sample from the existing NMB customers, it will be important for NMB to test the products through an iterative process in order to elicit customers' feedback on products from a larger base. The input from customers can be used to revise the assumptions made while proposing the inclusion of certain product features. Based on the feedback, there may be the need for either small adjustment or more substantive changes to product features that are not appealing to the consumers.

As part of the short-term strategy, we propose the different aspects of product designs below that can be tested to determine which savings product and delivery channels produce an intended increase in savings for the low to middle-income household (final outcome). The product design features explore individuals' behavioral preferences (i.e., how preferences interact with savings decisions), and how these can be incorporated into NMB's savings product designs. The table below also provides timelines and action mechanisms to support refinement of designs.

Table 2: Product Designs for Testing and Outcomes

Savings Product	Product Design detail/delivery channel to experiment	Intermediate Outcome	Final Outcome
S-FIT	a. Opting in and out of savings commitment	Increase in savings deposit	Households are less vulnerable to financial shocks
Goal-savings card	a. Type of commitment savings offered: education, business, and housing	Increase in savings deposit	Households are less vulnerable to financial shocks
Save&Play	a. Price of interest rate (lower interest rate than normal or same interest rate) b. Type of prizes: money or material prizes (e.g., motorcycle)	Increase in savings deposit	Households are less vulnerable to financial shocks
Indicator	Take-up rates of the savings product offered	Percentage change in savings deposit	Percentage increase in adults with at least with two weeks' worth of income in bank savings
Timeline	3 to 6 months	6 months to 1 year	After 1 year
Data Custodians	Frontline agents and bank branch managers (branch team); product development and evaluation managers	Product development and evaluation managers	NMB management
Actions to be made	If take-up rate is low, agents provide feedback to managers on product features needing refinement	If savings deposit did not increase, branch team engage with clients to understand savings incentives and behavior (including formal and informal use)	If there is no impact, managers conduct focus groups/surveys with clients to understand how the bank can elicit the demand for their savings products

We propose for NMB to conduct an impact evaluation in order to measure the impact of these product designs as presented in Table 2 above. In an impact evaluation, there is at least one group, which is offered the savings product under experimentation (treatment group), and a group which is not (control group). The assignment process into the treatment and control group is done at random to make it possible to observe the counterfactual[90] of the treatment group from the control group. With correct randomization, it is possible to measure the impact of product design features on the intermediate and final outcomes. We have also estimated sample sizes needed for conducting an impact evaluation based

[90] The counterfactual is what would have happened to the treatment group had treatment group not participated in the experiment.

on the NMB customer database. We have assumed randomization at the branch level for easiness of promotional campaigns and other logistical purposes. We have also restricted the type of customers to low and middle-income households. These are customers with a net increase in annual deposit balance of less than 1,000,000 TZS (US$ 445. 21) between 2003 and 2015.

For logistical purposes, we propose the following: conduct impact evaluation at each of the 26 branches in Dar es Salaam and Pwani regions. Our calculations show that a sample size of 38 (19 one control and treatment groups each) is needed for each of the 26 branches to detect a 15% increase in savings, assuming 100% take-up rates and other related power and effect size[91] assumptions. The 15% increase in savings translates to an average annual increase of 167,790 TZS or $75. See Appendix 10 for scenarios calculations.

We noted that NMB has existing mechanisms to elicit customers' feedback. Therefore, the proposed evaluation can utilize the NMB's existing management information systems in order to minimize costs. The end goal of this evaluation is to iterate on product features based on customers' feedback before products are launched on a long-term basis. After this iterative process, NMB should eventually launch products that have demonstrated the largest impact.

Launch and Marketing Strategy

Our engagement with NMB customers highlighted the need for products to be marketed with very direct and clear message in order for the targeted customers to grasp products benefits and eventually use them. Therefore, the marketing campaign for the proposed products need to be accessible in order to reach the targeted market. The bank can also leverage on its marketing campaign to provide basic financial education particularly on concepts of compounding interest rates that may not necessarily be clear to everyone especially the targeted low income individuals. Also, the marketing campaign should be delivered through Radio given its leadership in information source across different age and income groups. 83% of Tanzanians rely on radio for news and information.[92] Utilizing this media for delivery of marketing and financial education content has a potential to reach a wider audience especially among the currently unbanked or under-banked. However, a parallel SMS based campaign can be run to target existing customers for information on the new products.

Finally, the marketing message should explicit highlight the delivery channel (mobile platform) as a potential solution for queues that most customers complained about.

[91] Power is the probability that the intervention correctly detects an effect when the effect actually exists whereas effect size is the magnitude of the intervention, in this case the magnitude of product design on change in savings.
[92] Gayatri Murthy. p. 31.

Monitoring and Evaluation

Post products launch, NMB should monitor the effectiveness of these interventions in helping the bank mobilize deposits from both existing and new customers (those switching from other banks or those who were previously unbanked). This may take a form of periodically tracking the rate of uptake, usage (regularity, frequency and duration of use over time), risk analysis, revenue, cost per transaction, new customer acquisition cost and the overall cost and benefit analysis of products to assess the effectiveness of the intervention. Understanding how the intervention performed on those metrics is important for future-decision making on deposits mobilization and/or financial inclusion strategies.

Conclusion

The past ten years have been phenomenal for NMB in extending financial services to Tanzanian communities. With the bank vision of being the 'preferred' financial service partner in Tanzania together with its mission on pushing for innovation distribution channels, NMB has a great potential to influence the quality of financial services Tanzanians especially the low-income customers can experience. We are proposing the implementation of S-FIT, goal-oriented and Save&Play savings products to reflect NMB's commitment to serving consumers of all income ranges, with a particular attention to low-income consumers. We believe NMB's investment on these products has a tremendous potential in increasing use of formal savings products and in helping the government achieve its target of at least 25% of adult Tanzanians having savings in banks. This is particularly true from the domino effect that NMB is likely to create in the banking industry from this innovation. The value proposition for NMB to undertake these interventions include:

- Helping NMB maximize its double bottom line target;
- Differentiating NMB from other banks who have currently embraced the MNOs attitude to mobile banking by focusing on money transfer services in order to earn non-interest income through fees and commissions;
- Allowing NMB to minimize operational costs and lower the cost of funding as more deposit will be mobilized;
- Strengthening NMB's commitment to low-income customers by accommodating low value transactions;
- Freeing NMB staff to focus on sales and quality of service by moving low value transactions out of branches; and
- Providing an opportunity for NMB to grow its client base, improve client retention rate through improved products and services and achieve its social and business targets.

Appendix

Appendix 1: About NMB

National Microfinance Bank (NMB) is a microfinance institution that was established under the National Microfinance Bank Limited Incorporation Act of 1997 from the split of the original National Bank of Commerce (NBC) to three new entities namely: NBC Holdings Limited, NBC 1997 Limited and NMB Limited (Annual Report, 2014). [93] With 100% government ownership at the time, the NBC break-up was to allow the "new" NBC to be a truly commercial bank serving commercial enterprises and individuals in urban areas while NMB was mandated to extend financial services in rural Tanzania as well as to the urban poor. For NMB to expedite the financial inclusion mission effectively, this meant the vast majority of branch network originally owned by the "old" NBC were allocated to NMB. Therefore, of 120 branches owned by the "old" NBC, 95 were allocated to NMB and 35 to NBC (Cull and Spreng, 2008). [94]

Following the successfully privatization of NBC in 2000, NMB was privatized in 2005. 49 percent of NMB shares were sold by the government to a banking consortium led by the Coöperatieve Centrale Raiffeisen-Boerenleenbank B.A. (Rabobank Group) of the Netherlands. The government retained 51 percent of shares of which 21 percent were later sold through an Initial Public Offering (IPO) in 2008 (Annual Report, 2014). Currently, NMB is listed on the Dar Es Salaam Stock Exchange (DSE) with Rabobank owning majority shareholding.[95]

The bank initially provided payment services, savings accounts and very limited credit services. The bank managed to transform itself within the first 5 years of operations into a fully-fledged retail bank with a range of products targeting different customer segments. Consequently, the bank has been able to expand into credit operations particularly targeting individuals, and micro and small businesses entrepreneurs. Since its privatization, NMB has achieved massive growth. Table 1 below provide a comparative matrix of NMB achievement from its privatization year to end of 2014.

[93] NMB Annual Report. 2014.

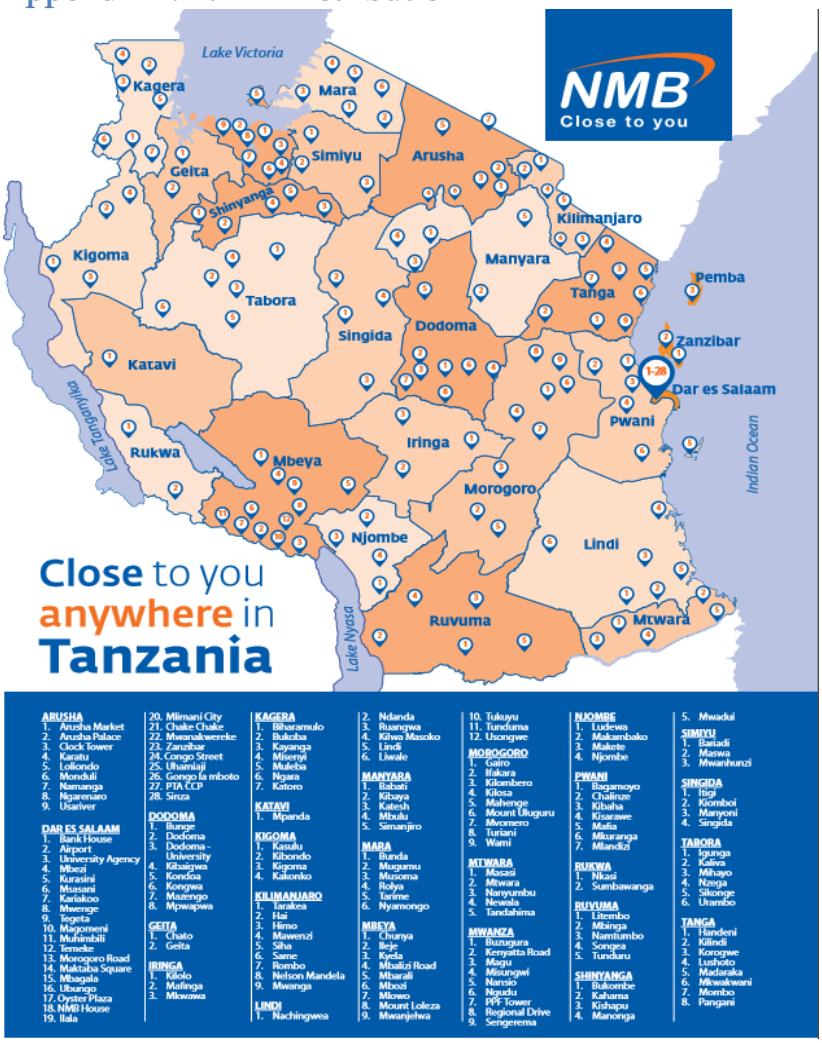
[94] Robert Cull and Connor P. Spreng. Pursuing Efficiency While Maintaining Outreach: Bank Privatization in Tanzania. The World Bank Development Research Group: Finance and Private Sector Team. December 2008.

[95] The ownership structure post the IPO is diversified. 2014 CEO investor presentations highlight the following ownership structure: Rabobank 34.9%, Government of Tanzania Treasury Registrar 31.8% (to be sold down to 30%) and Public Shareholders 33.3% (including consortium members and staff shares).

Table 1: NMB comparative matrix

Privatization time (2005)	By the end of 2014
100% government owned	Listed on DSE with 17,820 shareholders
Had restricted license	Fully licensed commercial bank
600,000	Over 2,000,000 customers
1,500 staff	3,009
0 ATMs	525
0 Debit cards	Over 1.2 million debit cards
No mobile banking	Over 1 million registered mobile banking users
Limited product range • Savings account • Payments	Fully products range • Payment, collections, trade finance • Lending • Savings and deposits • Treasury
About 100 branches	163
Limited technology	Real time online nationwide
Limited growth (maintenance mode)	Continued growth

Appendix 2. NMB Distribution



Source: Data provided by NMB staff, January 2016.

Appendix 3. Who are likely to take-up formal savings: Econometric Results

Probit model is a discrete choice model wherein there is a binary outcome: in this case saves formally/saves in any financial instrument is binary (0/1). Our predictors of interest are discrete/binary, continuous, or categorical (i.e., job). We used the 2014 Financial Inclusion Insights (FII) dataset in this econometric exercise/analysis.

Variables	Description
Saves in any financial instrument	1 if saves using any of the following: (a) formal (bank, MFI, mobile money account); (b) informal/semi-formal financial organizations (cooperatives, SACCOs, village savings group); (c) with other people (e.g., family, friends, neighbors, shopkeepers, money guards), in a safe place at home or self in cash or in-kind assets (e.g., gold); 0 if otherwise
Saves formally	1 if saves formally in either bank, MFI, or mobile-money account; 0 if otherwise
Saves in banks	1 if saves in banks; 0 if otherwise
PPI cutoff	1 if living below $2.50 per day poverty line (at 2005 purchasing power parity); 0 if otherwise (based on Grameen Progress out of Poverty Index)
Ability to maintain economic welfare	1 if indicated yes to any of the following: (a) if anyone in household currently have a savings account (including at a bank, SACCO, informal group) and contribute to it at least once a month; (b) whether household own either cultivated land, real estate, investment stocks or shares; (c) whether anyone in household currently have insurance (medical, car, crop, any other); (d) whether one owns her house (with or without title deed); (e) whether one could get extra money through relatives sending money or by selling assets (in the event of an emergency,); 0 if otherwise
Literacy	1 if has basic financial literacy; 0 if otherwise
Numeracy	1if has basic numeracy; 0 if otherwise
Access to a bank or MM account	1 if has used a bank or mobile money account services (whether personally registered to the account or not); 0 if otherwise
Any id	Government regulation variable: 1 if has any official identification (e.g., National ID, passport, etc.); 0 if otherwise
Farmer	1 if a farmer/farm worker; 0 if otherwise
Job	1 if self-employed and earns income; 2 if earns irregular salary; 3 if earns regular salary (whether for full-time or part-time work); 0 if otherwise
Household dependency	1 if has one household member who are 17 years old or below; 2 if has two; 3 if has 3; 4 if has four or more; 0 if otherwise
Age	Age in years
Education	1 if has no formal education; 2 if has primary education; 3 if has secondary education; 4 if has higher education
Female	1 if female, 0 if otherwise

The table below uses 3 savings definition as binary dependent variables. The predictors of interest include potential supply-side constraints (i.e., whether one has access to banks or mobile money account, whether one possess any KYC-related national IDs), demand-side indicators (i.e., whether one has

insufficient income/below poverty line, whether one has the ability to maintain economic welfare, whether one is knowledgeable in literacy and numeracy), and socio-demographic indicators (whether one is a farmer, job type, household dependency, age, education, gender). Marginal effects are presented below.

VARIABLES	(1) Saves in any Financial Instrument	(2) Saves Formally	(3) Saves in Banks
PPI cutoff	-0.0849**	-0.0444*	-0.0198*
	(0.0336)	(0.0237)	(0.0110)
Ability to maintain economic welfare	0.308***	0.165***	0.0510***
	(0.0420)	(0.0228)	(0.0115)
Literacy	0.0929***	0.126***	0.0266*
	(0.0292)	(0.0240)	(0.0140)
Numeracy	0.0424	0.0394	0.0816***
	(0.0426)	(0.0387)	(0.0164)
Access to a bank or MM account	0.278***	0.365***	0.0604***
	(0.0370)	(0.0331)	(0.0118)
Any id	0.0599***	0.0466***	0.0255**
	(0.0187)	(0.0179)	(0.0100)
Farmer	-0.109***	-0.105***	-0.0201**
	(0.0238)	(0.0178)	(0.00938)
1.Job (Self-employed)	0.127***	0.124***	0.0240***
	(0.0291)	(0.0217)	(0.00755)
2.Job (with irregular salary)	0.0597	0.0565	0.0128
	(0.0430)	(0.0400)	(0.0195)
3.Job (with regular salary)	0.181***	0.152***	0.0978***
	(0.0304)	(0.0256)	(0.0151)
Household dependency	-0.0328***	-0.0246***	0.000388
	(0.00785)	(0.00612)	(0.00280)
Age	0.000249	0.000653	0.000952***
	(0.000688)	(0.000484)	(0.000283)
Education	-0.00512	0.0313***	0.0355***
	(0.0189)	(0.0120)	(0.00796)
Female	-0.00933	-0.0372***	-0.00843
	(0.0164)	(0.0143)	(0.00809)
Observations	2,988	2,988	2,988

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

Appendix 4: Descriptive Statistics[96],[97] of January 2016 Survey Interview on NMB Clients

Female	43.10%	Has personal current account	84.75%
Ever married	86.21%	Has personal savings bonus account	5.08%
Muslim	37.93%	Has personal loan	6.78%
Education		Has personal loan and savings account	1.69%
Some primary education	3.45%	Has personal loan and current account	6.78%
Primary education completed	34.48%	Has business current account	8.47%
Some secondary education	32.76%	Owns a mobile money account	93.10%
Secondary education completed	5.17%	Joined credit union	23.21%
Some university	1.72%	Joined informal club	40.74%
University completed and above	22.41%	Interested in training program	95.35%
Somewhat patient	22.03%	*Average values* | *Median values*	
Present-biased	21.05%	Age	41.43
Time-consistent	36.84%	Fatalism	0.35
Risk-averse	28.07%	Annual Income (TZS)	16,945,085 | 7,560,000
Believes household saves enough	36.84%	Consumption spending	588,352 | 282,000
Type of employment		Household goods spending	262,140 | 95,000
Did not indicate receiving wage/salary from 'working with an institution or other people'	53.45%	Health spending	13,873 | 0
Government employed	27.59%	Education spending	267,097 | 70,000
Privately employed	13.79%	Transportation, communication, and recreation spending	92,492 | 53,000
Self employed	5.17%	Travel time to bank branch (minutes)	22.78
		One-way cost of travel to bank (TZS)	1,188.31
		Waiting time to be served in bank (minutes)	49.66

[96] The 'somewhat patient' dummy is equal to 1 if one prefers 110,000 TZS or less in 1 month to 100,000 TZS today. This follows Dupas and Robinson (2013) on savings in Kenya.

[97] Risk-averse respondents are those who did not play the lottery and chose the money with certainty. Fatalism is based on the agreeability to the 3 statements related to having little control over life, 'good' things not happening to respondent (or family), and having a difficult time of saving money even if one wants to. Average expenditures are expressed in terms of the month. Risk aversion and fatalism notations are based from Cole, et al (2010) paper.

Appendix 5: Correlation Analysis of January 2016 Survey Interview on NMB Clients

Correlation analysis between take-up of saving product (binary) and variable of interest[98]

Point-bisceral correlation	**Goal-savings card**			
	Coef.	t	P	df
Income	-0.4053	-3.1347	0.0029	50

	S-FIT			
	Coef.	t	P	df
Income	0.4720	2.0736	0.0558	15
Age	0.4270	1.8289	0.0874	15
Waiting time in bank	-0.4231	-1.8088	0.0906	15

	S-FIT		
(n=17)	Pearson chi2		Fisher's exact
Muslim	10.4318	Pr = 0.001	0.002
Spent on health	5.8846	Pr = 0.015	0.029
Spent on education	5.8846	Pr = 0.015	0.029

	Save&Play		
(n=41)	Pearson chi2		Fisher's exact
Muslim	2.7820	Pr = 0.095	0.140
Spent on health	3.6211	Pr = 0.057	0.073
Present-biased	4.2281	Pr = 0.040	0.083

[98] Only significant associations (up to 10% level) are posted here.

Appendix 6. Cluster Analysis of Interviewed NMB Clients[99]

Means	take up of Goal-Savings card	age	female	educ	income	muslim	saves enough	somewhat patient	time consistent	present-biased	risk averse	fatalism	member of credit union or club	cost of travel to bank	wait time to be served in bank	health spending	education spending
Cluster 1 (n=7)	0.57	45.29	0.29	2.86	49,300,000	0.43	0.43	0.29	0.57	0.29	0.29	0.38	0.29	271	63.57	6,857	92,143
Cluster 2 (n=16)	1.00	45.69	0.25	4.06	17,800,000	0.31	0.44	0.19	0.44	0.19	0.38	0.33	0.50	875	40.31	15,938	517,031
Cluster 3 (n=27)	0.89	37.93	0.52	2.93	3,294,815	0.37	0.33	0.30	0.22	0.19	0.22	0.41	0.52	1,249	45.19	14,833	88,193

Note: Differences between clusters are significant for the following: take up of goal savings card (**), education (**), income (***), and education spending (**).

Means	take up of Save& Play	age	female	educ	income	muslim	saves enough	somewhat patient	time consistent	present-biased	risk averse	fatalism	member of credit union or club	cost of travel to bank	wait time to be served in bank	health spending	education spending
Cluster 1 (n=15)	0.80	45.53	0.20	4.13	17,900,000	0.27	0.47	0.20	0.40	0.20	0.33	0.36	0.47	800	40.00	17,000	311,500
Cluster 2 (n=7)	0.71	45.29	0.29	2.86	49,300,000	0.43	0.43	0.29	0.57	0.29	0.29	0.38	0.29	271	63.57	6,857	92,143
Cluster 3 (n=18)	0.72	37.83	0.50	2.83	2,673,333	0.39	0.33	0.28	0.22	0.22	0.11	0.56	0.44	1,334	43.44	17,250	57,289

Note: Differences between clusters are significant for the following: take up of education (***), income (***), and education spending (*).

Means	take up of S-Fit	age	female	educ	income	muslim	saves enough	somewhat patient	time consistent	present-biased	risk averse	fatalism	member of credit union or club	cost of travel to bank	wait time to be served in bank	health spending	education spending
Cluster 1 (n=3)	1.00	48.00	0.33	4.33	24,400,000	0.00	0.67	0.33	0.33	0.00	0.33	0.00	0.33	1466.67	6.00	0	290,000
Cluster 2 (n=8)	0.38	32.50	0.50	2.88	2,577,500	0.50	0.38	0.25	0.38	0.25	0.00	0.33	0.75	1026.25	40.13	21,250	69,750
Cluster 3 (n=6)	0.50	39.33	0.00	5.17	15,200,000	0.33	0.67	0.17	0.50	0.17	0.17	0.33	0.50	1033.33	34.50	4,167	491,667

Note: Differences between clusters are significant for the following: age (***), education (***), income (***), and fatalism (*).

[99] The k-means cluster analysis method was conducted, using the default Euclidean similarity (or dissimilarity) measure. Given the limited number of observations, 3 clusters were formed in order to derive more representative conclusions about the data. Analysis of variance test was also conducted to see which variables of interest significantly differ between clusters. Significant differences in the take-up of goal-savings card variable between clusters can be seen (up to 5% level; that is, any difference between those who will take up goal-savings card and those who will not is larger than what is predicted through luck at least 95% of the time). As k-means clustering is sensitive to outliers, we exclude an outlier (which has a significantly higher-than-average value of 220,000,000TZS).

Appendix 7. Comparing Net Benefit of Savings Product Options to a Customer

Savings Product	Monthly Deposit Amount	Number of deposit per year	Interest Rate	Savings after 12 months	Interest Earned in a year	Total Incentive per year	Total travel Cost per year	Net Benefit from saving in a bank
S-FIT	10,000	12	8%	129,600	9,600	0	0	9,600
Goal-savings card	10,000	12	8%	129,600	9,600	0	0	9,600
Save&Play	10,000	12	4%	124,800	4,800	1,200	0	6,000
Status quo	10,000	12	8%	129,600	9,600	0	8,400	1,200

Notes:

a. We take the perspective of a customer depositing 10,000 TZS monthly.
b. We assumed products have the same discount rates.
c. For the Save&Play average incentive of winning a prize, we assumed that the chance of winning per 1,000TZS deposit is 5,000,000TZS prize divided 500,000 deposits.
d. Based on our proposed product features, we assumed zero travel cost for S-FIT, goal-savings card, and Save&Play. Status quo cost to a customer assumes an average 1,200TZS two-way cost of traveling to the bank.

Appendix 8. Cost Framework of Proposed Savings Products[100]

	S-Fit	Goal-savings card	Save&Play	Status Quo
Average Annual Deposit Amount per account				
1,000 TZS per transaction	-	7,380	7,380	-
2,000 TZS	-	14,759	14,759	-
5,000 TZS	-	36,898	36,898	-
10,000 TZS	92,637	55,347	55,347	68,213
20,000 TZS	185,273	110,693	110,693	136,426
Cost of interest rate per account				
1,000 TZS		590	295	
2,000 TZS		1,181	590	
5,000 TZS		2,952	1,476	
10,000 TZS	7,411	4,428	2,214	5,457
20,000 TZS	14,822	8,855	4,428	10,914
Number of deposits per year				
1,000 TZS	-	7.4	7.4	-
2,000 TZS	-	7.4	7.4	-
5,000 TZS	-	7.4	7.4	-
10,000 TZS	9.3	5.5	5.5	6.8
20,000 TZS	9.3	5.5	5.5	6.8
Banking transaction and related cost per deposit				
1,000 TZS	-	420	430	-
2,000 TZS	-	420	510	-

[100] The cost framework used in this analysis is adapted from: Riechers, C. "Sparking Household Savings: Insights from Rwanda." SYPA. March 2012.

	S-Fit	Goal-savings card	Save&Play	Status Quo
5,000 TZS	-	420	750	-
10,000 TZS	1,000	420	1,150	1,000
20,000 TZS	1,000	420	1,950	1,000
Total cost to NMB per account				
1,000 TZS	-	3,690	3,468	-
2,000 TZS	-	4,280	4,354	-
5,000 TZS	-	6,051	7,011	-
10,000 TZS	16,675	6,752	8,579	12,278
20,000 TZS	24,086	11,180	15,220	17,735
Total cost to NMB for every Tanzanian shillings (TZS) of savings mobilized				
1,000 TZS	-	0.50	0.47	-
2,000 TZS	-	0.29	0.30	-
5,000 TZS	**-**	**0.16**	**0.19**	**-**
10,000 TZS	**0.18**	**0.12**	**0.16**	**0.18**
20,000 TZS	**0.13**	**0.10**	**0.14**	**0.13**

Notes:

a. We ignored fixed costs such as account opening, product development and marketing, and NMB revenues earned from withdrawals. These are assumed to be the same for all types of proposed accounts.
b. Current savings product offered (status quo) calculations are our own, and based on current NMB averages.
c. Number of deposits per year is based on the 2015 average NMB deposit frequency for its savings account targeted at salary workers (S-FIT), 2015 average deposit frequency for NMB bonus account for children (Goal-savings card and Save&Play), and 2015 deposit frequency average for all of NMB's savings accounts (Status quo). Deposits for Goal-savings card and Save&Play further assumes the doubling of the 2015 average of 3.7 in a year for up to 5,000 TZS deposit, while assuming that average doubled to a lesser degree (1.5 times) for larger deposits.
d. We followed an average of 8% interest rate currently provided by NMB for all savings product prototypes, except for Save&Play (4%).
e. Bank transaction cost is an estimate of bank service for every transaction. S-Fit follows the status quo model of 1,000TZS. Since goal-savings and Save&Play follows agency banking model, it is assumed that bank service cost is lower and is based on commissions to agents (350TZS per transaction). Related cost include product incentives, such as printing of scratch cards (70TZS each) and 10TZS cost per 1,000TZS to fund 5 million TZS payout assuming 500,000 deposits (100,000 new clients and 400,000 old clients participating in Save&Play).
f. Total cost to NMB per account is calculated as: (banking transaction and related cost per deposit*average deposits per year)+cost of interest rate per account
g. Total cost to NMB for every TZS of savings mobilized is calculated as: total cost to NMB per account/average deposit amount per account

Appendix 9. List of Branches, by Savings Performance (2013-2015)

Branches with negative change in savings in both 2013-2014 and 2014-2015

Branch	Region	Location
Kibaha	Pwani	Rural
Kisarawe	Pwani	Rural
Ifakara	Morogoro	Rural
Bariadi	Simiyu	Rural
Maswa	Simiyu	Rural
Mwanhuzi	Shinyanga	Rural
Misungwi	Mwanza	Rural
Nansio	Mwanza	Rural
Biharamulo	Kagera	Rural
Bukombe	Shinyanga	Rural
Missenyi	Kagera	Rural
Hai	Kilimanjaro	Rural
Same	Kilimanjaro	Rural
Handeni	Tanga	Rural
Korogwe	Tanga	Rural
Lushoto	Tanga	Rural
Simanjiro	Manyara	Rural
Ludewa	Njombe	Rural
Mafinga	Iringa	Rural
Makambako	Njombe	Rural
Makete	Njombe	Rural
Kyela	Mbeya	Rural
Mbinga	Ruvuma	Rural
Mpanda	katavi	Rural
Sumbawanga	Rukwa	Rural
Nachingwea	Lindi	Rural
Newala	Mtwara	Rural
Bank House	Dar es salaam	Urban
Air Port	Dar es salaam	Urban
Musoma	Mara	Urban
Manonga	Shinyanga	Urban
Clock Tower	Arusha	Urban
Madaraka	Tanga	Urban
Mkwakwani	Tanga	Urban
Singida	Singida	Urban
Kigoma	Kigoma	Urban
Mkwawa	Iringa	Urban
Mbalizi Road	Mbeya	Urban

Branches with positive change in savings in both 2013-2014 and 2014-2015

Branch	Region	Location
Kibiti	Pwani	Rural
Mahenge	Morogoro	Rural
Turiani	Morogoro	Rural
Bunda	Mara	Rural
Mugumu	Mara	Rural
Magu	Mwanza	Rural
Chato	Geita	Rural
Mwanga	Kilimanjaro	Rural
Tarakea	Kilimanjaro	Rural
Babati	Manyara	Rural
Monduli	Arusha	Rural
Muheza	Tanga	Rural
Mawenzi	Kilimanjaro	Rural
Kondoa	Dodoma	Rural
Kiomboi	Singida	Rural
Sikonge	Tabora	Rural
Urambo	Tabora	Rural
Kibondo	Kigoma	Rural
Litembo	Ruvuma	Rural
Usongwe	Mbeya	Rural
Tunduru	Ruvuma	Rural
Tandahimba	Mtwara	Rural
Kariakoo	Dar es salaam	Urban
Magomeni	Dar es salaam	Urban
Temeke	Dar es salaam	Urban
Muhimbili	Dar es salaam	Urban
Mlimani City	Dar es salaam	Urban
Msasani	Dar es salaam	Urban
Tegeta	Dar es salaam	Urban
Mount Loleza	Mbeya	Urban

Source: NMB Customer Database.

Appendix 10. Sample Size Calculations with Randomization at the Branch level with Equal Group Sizes

	k=143 branches		k=26 branches	
Panel 1: 100% take-up of savings product	Average branch size required	Sample size per arm	Average branch size required	Sample size per arm
10% increase in savings	6	858	79	2,054
15% increase in savings	3	429	19	494
20% increase in savings	2	286	9	234
Panel 2:80% take-up of savings product				
10% increase in savings	11	1,573	1270	33,020
15% increase in savings	4	572	37	962
20% increase in savings	3	429	16	416
Panel 3: 60% take-up of savings product				
10% increase in savings	22	3,146	not feasible	
15% increase in savings	8	1,144	156	4,056
20% increase in savings	4	572	37	962

Notes and Assumptions:
1. To capture low to middle-income households, we restricted NMB customer database to those who have net increase in annual average deposit balance of less than 1,000,000 TZS (US$ 445.22) a between 2013 and 2015.
2. Used NMB customer database to calculate intra-cluster correlation (ICC) at the branch level (ϱ =0.02)
3. Used NMB customer database to calculate effect size (e.g., δ =0.24 for a 10% increase in savings)
4. Assumes α = .05, power=0.80, correlation between baseline and follow-up measurements=0.80
5. Assumes 1 baseline and 1 follow-up study
6. Cluster k=143 branches includes all NMB branches, k=26 branches corresponds to branches at the Dar es Salaam and Pwani Regions

References

Anderson, J. and Ahmed, W. 2016. "Smallholder Diaries: Building the Evidence Base with Farming Families in Mozambique, Tanzania, and Pakistan." *Consultative Group to Assist the Poor (CGAP)*. Perspectives No. 2.

Allafrica.com. July 11, 2014. "Tanzania: Deposit Insurance Board Defends Its Performance." Viewed March 2, 2016. Available at: http://allafrica.com/stories/201407110823.html.

Aportela, F. 2009. "Effects of Financial Access on Savings by Low Income People." *Banco de México.*

Ashraf, Nava, Natalie Gons, Dean S. Karlan, and Wesley Yin. 2003. "A Review of Commitment Savings Products in Developing Countries."

Ashraf, Nava, Dean Karlan and Wesley Yin. 2006. "Tying Odysseus to the Mast: Evidence from a Commitment Savings Product in the Philippines." *Quarterly Journal of Economics* 121(2): 635-672.

Atalay, K., Bakhtiar, F., Cheung, S. and Slonim, R. 2012. "Savings and Prize-Linked Savings Accounts." *Institute for the Study of Labour (IZA)*. Discussion Paper 6927.

Beck, Demirguc-Kunt, Honohan. 2007. "Finance for All? Policies and Pitfalls in Expanding Access." *World Bank*.

Census of Financial Access Points. 2013-2014. Available at: http://www.financialaccessmaptz.com/downloads/FinAccessMAPBOOK-web.pdf.

Clyde & Co. June 2015. "New Banking and Finance Regulations." Viewed on November 7, 2015. Available at: http://www.clydeco.com/insight/updates/view/new-banking-and-finance-regulations.

Cole, Shawn, Thomas Sampson, and Bilal Zia. 2011. Prices or Knowledge? What Drives Demand for Financial Services in Emerging Markets? *The Journal of Finance* LXVI (6): 1933-1967.

Collins, D., Jonathan Morduch, Stuart Rutherford, and Orlanda Ruthven. 2009. "Portfolios of the Poor: How the World's Poor Live on $2 a Day." *Princeton University Press*.

Dailynews. November 2015. "Bank Rewards Depositors to Encourage Culture of Saving." Viewed 25 January 2016. Available at: http://www.dailynews.co.tz/index.php/business/44045-bank-rewards-depositors-to-encourage-culture-of-saving.

Deaton, A. 1990. "Saving in Developing Countries: Theory and Review." *World Bank* annual conference on development economics, 1989.

De Clerq, B., J.M.P. Venter and C.J. van Aardt. 2012. "An analysis of the inter-relationship between savings product usage and satisfaction using a SERVQUAL framework." Southern African Business Review Volume 16.

Dupas, Pascaline, and Jonathan Robinson. 2013. "Why Don't the Poor Save More? Evidence from Health Savings Experiments." *American Economic Review*. 103(4): 1138-71.

Franklin Allen, et al. 2012. "Improving Access to Banking: Evidence from Kenya."

Gateway Financial Innovation for Savings (GAFIS). Available at: http://gafis.net/dump-and-pull-summary/.

Gayatri Murthy. 2011. "Tanzania Media Environment: Current Access, Potential for Growth and Strategies for Information Dissemination." *InterMedia Survey Institute and AudienceScapes*: Development Research Report.

GIS Census of Financial Access Points Highlights. 2014. Available at: http://www.financialaccessmaptz.com/downloads/FinAccessMAPBOOK-web.pdf.

Graham A.N. Wright and Leonard Mutesasira. 2001. "The Relative Risks to the Savings of Poor People." *MicroSave* – Market-led solutions for financial services.

Goss, Salah, Ignacio Mas, Daniel Radcliffe, and Evelyn Stark. 2011. "The Next Challenge: Channeling Savings Through Mobile Money Schemes." The Mobile Financial Services Development Report. The Bill & Melinda Gates Foundation

InterMedia, Digital Pathway to Financial Inclusion, August 2015.

Intermedia Financial Inclusion Insights 2014 Dataset.

Invested Development. "The Benefits of Informal Savings Groups." April 30, 2012. Viewed March 4, 2016. Available at: http://investeddevelopment.com/blog/2012/04/the-benefits-of-informal-savings-groups/.

IPPmedia. August 2015. "NMB wins award for efforts to boost financial inclusion." Viewed January 27, 2016. Available at: http://www.ippmedia.com/?l=83126.

Irving, M. 2005. "Informal Savings Groups in South Africa: Investing in Social Capital." *Centre for Social Science Research* Paper No 112. The University of Cape Town

Kanz, M. 2013. "Learning by Doing: Can Savings Lotteries Build Financial Capability?" Presentation held at the India-OECD-World Bank Regional Conference on Financial Education, New Delhi, India.

Karlan, D., M. McConnell, S. Mullainathan and J. Zinman. 2010."Getting to the Top of Mind: How Reminders Increase Saving. *National Bureau of Economic Research*. Working Paper No. 16205.

Kearney et al. 2010. "Making Savers Winners: An Overview of Prize-Linked Savings Products." *National Bureau of Economic Research (NBER*) Working Paper 16433.

Legal Floris. "The downfall of FBME Bank." Viewed on January 29, 2016. Available at: http://www.legalfloris.com/the-downfall-of-fbme-bank/.

Lindqvist, A. 1981. A Note on the Determinants of Household Saving Behavior. *Journal of Economic Psychology*, 1(1), 39–57.

Mas, I. 2009. Reframing Micro-finance: Enabling Small Savings and Payments, Everywhere. Financing for Development. Bill and Melinda Gates Foundation.

National Microfinance Bank. 2014. Annual Report 2014.

Nicholas Economides and Przemyslaw Jeziorski. 2015. "Mobile Money in Tanzania."

Owens. J. 2000. Saving Mobilization: Formalizing ROSCAs in Jamaica. Panel IV: Case Studies Promising Practices in New Product Development.

Peter Tufano and Daniel Scheider. 2008. "Using Financial Innovation to Support Savers: From Coercion to Excitement."

Pande, R., S. Cole, et al. 2012. "Does poor people's access to formal banking services raise their incomes? Systematic Review."

Radcliffe, Dan. 2010. "Expanding Customers' Financial Options Through Mobile Payment

Systems: The Case of Kenya." Bill & Melinda Gates Foundation.

Rabobank. Viewed on January 29, 2016. "Providing affordable banking in Tanzania: Moving from the biggest to the best." Available at: https://www.rabobank.com/en/about-rabobank/food-agribusiness/rabo-development/partner-banks/nmb-tanzania.html.

Riechers, C. March 2012. "Sparking Household Savings: Insights from Rwanda." SYPA.

Richard H. Thaler. 1999. "Mental Accounting Matters." *Journal of Behavioral Decision Making*, 12: 183-206.

Richard H. Thaler and Shlomo Benartzi. 2004. "Save More Tomorrow: Using Behavior Economics to Increase Employee Saving." *Journal of Political Economics*, vol. 112, no. 1, pt. 2.

Robert Cull and Connor P. Spreng. 2008. "Pursuing Efficiency While Maintaining Outreach: Bank Privatization in Tanzania." *The World Bank Development Research Group*: Finance and Private Sector Team.

Shawn Cole, Ben Iverson and Peter Tufano. 2014. "Can Gambling Increase Savings? Empirical Evidence on Prize-linked Savings Accounts."

Tversky, Amos, and Daniel Kahneman. 1992. "Advances in Prospect Theory: Cumulative Representation of Uncertainty." *Journal of Risk and Uncertainty,* 5: 297–323.

Tanzania National Council for Financial Inclusion. National Financial Inclusion Framework. A public-private stakeholder's initiative. 2014 - 2016.

The Citizen. 2013. "10 banks control 80pc of market share: study." Viewed on January 23, 2016. Available at: http://www.thecitizen.co.tz/News/national/10-banks-control-80pc-of-market-share--study/-/1840392/1977538/-/yfvwbm/-/index.html.