REPORT

MCC Ghana Impact Evaluation:

Rural Development Project: Financial Services Activity

NORC
at the UNIVERSITY *of* CHICAGO

Acronyms

GoG	Government of Ghana
GRBCIP	Ghana Rural Banks Computerization and Interconnectivity Project
IE	Impact Evaluation
LAN	Local Area Network
MCC	Millennium Challenge Corporation
NORC	NORC at The University of Chicago
RB	Rural Bank
RB APEX	Rural Bank APEX Bank
STL	SuperLock Technologies
VSAT	Very Small Aperture Terminal
WAN	Wide Area Network

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EXECUTIVE SUMMARY

In 2011, the Millennium Challenge Corporation (MCC) contracted NORC at the University of Chicago to assess the impact of up to five activities under the Ghana Compact signed between MCC and the Government of Ghana in August 2006.

The main aim of the Ghana Compact was to reduce poverty by incentivizing economic growth through improvements in the multiple sectors. The evaluation presented in this report covers exclusively the Financial Services Activity known as Ghana Rural Bank Computerization and Interconnectivity Project (GBRCIP) which was a $30,266,099 effort[1] and had nationwide coverage. The initiative was aimed at supporting the overall compact goal of reducing poverty through economic growth and targeted all rural banks (134 by the end of the activity) in the country. Including their agencies and branches, the rural banks at the time of implementation were in five hundred and forty-seven locations, spread throughout the ten regions in Ghana.

The ultimate objective of the GRBCIP was to strengthen and improve capacity of rural and community banks in Ghana to enable them to deliver sound financial services to rural communities in the country. The activity sought to establish a computerized networking system among all rural banks and the APEX Bank Server, thereby improving financial service delivery, operations, and access to information at rural banks with the objective of enhancing the depth and value of rural financial services and widening access to savings services and cash transfers.

The project financed the following inputs: (1) the establishment of Local Area Network (LAN) and Wide Area Network connectivity (WAN) through the VSAT system using satellite (as opposed to radio) technology; (2) one electricity generator per rural bank in most cases, (3) two computers per branch, (4) two printers per branch, (5) T24 software, (6) free of charge user licenses depending on the size of the bank, (7) a 1-day computer appreciation course, (8) a two-week computer training course per user, and (9) other sensitization seminars and workshops.

The evaluation aims to answer the following questions:

- *Did the activity improve the speed and reliability of transactions?*
- *Did the activity improve accuracy and availability of accounts information?*
- *Did the activity reduce transactions and check clearing times?*

These expected improvements aim not only to make bank operations more efficient and potentially less costly per transaction, but also to improve the customer experience and satisfaction with the services offered by the bank, while reducing the incidence of fraud. This, in turn, is expected to increase the number of clients, the number of deposits and credits, and the number of bank operations, among others things.

NORC conducted a mix methods impact evaluation that includes quantitative and qualitative information. The quantitative study examines the impact of computerization and connectivity on several key bank performance indicators, such as: value of bank accounts, number of customers, average deposit per customer, expenses, adjusted assets, and number of staff. We use the

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[1] http://www.mida.gov.gh/pages/view/MCA_Completion_Report.pdf/3/news

available monthly returns from all banks for the period January 2009 – December 2013 as our source of data. To measure the effect, we take advantage of the fact that the intervention was staggered over time. Some banks went live as early as June 2010 while others only did two years later in 2012. The longitudinal nature of the data allows us to use the timing of the intervention across different rural banks to estimate causal pathways. In addition, our ability to compare rural banks before and after the computerization and connectivity, allows us to control for unobservable characteristics of the banks that could have effects on the indicators of interest.

The qualitative study looks at the perceptions of the bank managers regarding the activity and performance trends with the aim of better explaining the impact of the activity on the key performance indicators attributable to GBRCIP. The qualitative study was carried out in August 2017 in Ghana and it is based on individual bank returns data and interviews with the key management staff, discussions with the APEX Bank management, customer interviews, and interviews with staff from KPMG, the firm that oversaw project implementation

These two studies together offer an overview of the impact of the project, the lessons that can be learned from it for computerization and connectivity projects in general, and the issues that need to be considered when designing and implementing such projects in the future.

Findings

Did the activity improve the speed and reliability of transactions?

All rural banks report a reduction of the average transaction time from 15 minutes to less than 5 minutes and in some cases as low as 2 minutes. Waiting time only may exceed these times at the end of the month with many people collecting salaries or paying school fees. The rural banks agree that there has been a major improvement in customer experience due to reduced waiting time in the banking hall, and faster service. Bank clients who were interviewed concurred on this point. Electric generators, provided to the rural banks experiencing power outages, have helped them to continue operating even with electric power interruptions.

The majority of rural banks agree that the i-transfer system, which is the inter-rural-bank transfer of funds, has been a major improvement over the previous telephone system.

Consistently, our quantitative analysis indicates that the value of accounts and average balances per customer have increased due to GBRCIP -although the number of customers was not affected- indicating a possible improvement in the customers' satisfaction which could be linked to speed and reliability of bank services.

Did the activity improve accuracy and availability of accounts information?

The rural banks indicate that real time monitoring of branches through the connectivity system has greatly helped improving the real-time supervision and getting more accurate reports as compared to before the project.

In addition, the rural banks report that there has been a major improvement in customer experience due to more accurate statements and bank clients who were interviewed concurred on this point. Eleven of the 14 banks visited report that customers have overall gained greater confidence in dealing with them and their image has vastly improved as compared to the pre-project period.

As we mentioned, the quantitative analysis shows a positive effect of GBRCIP on the value of accounts and average balances per customer, which is consistent with improvements in the customer experience. We also find a positive effect on bank net income; however, bank expenses per customer have not changed due to GBRCIP.

Did the activity reduce transactions and check clearing times?

All the rural banks agree that by being connected to the national check clearing platform, Check Codeline Clearing (CCC), check clearing times are now reduced to one day as opposed to five days previously and even up to one month for out of station checks.

The generators provided helped to continue with the normal operation during electric power interruptions, reducing transaction times.

Additional Findings

Based on their experience with the GRBCIP, the rural banks are now asking for more sophisticated and diversified IT products such as ATMs, internet banking, integration with mobile money, which assure seamless and uninterrupted services. All the banks visited complained that the APEX has been slow to respond to these requests, especially in terms of reviewing and agreeing on new products and services such as introducing changes that would offer more services from internet banking and ATMs to rural bank customers.

The project has had a strategic impact in convincing the rural banks to embrace information technology and its implications, and has generated a growing appetite for learning and adopting modern technology for their operating needs. The enthusiasm and interest in new technology, and its immediate consequences could be considered the major strategic and, in many respects, positive impact of the project.

Among negative findings, the single most prevalent complaint of the rural banks is that VSAT communication costs are extremely high as compared to bank income. Communication costs have risen substantially because the contract between the APEX and the service provider is in US dollars and with over 100% devaluation of the Ghanaian currency between 2012 and 2016, the costs have doubled and all the rural banks are desperately looking for an alternative to the T24 software and its centralized management by the APEX Bank. VSAT and T24 were installed together although it is possible to use radio instead of VSAT for communication. Ten rural banks visited are considering an exit strategy with an alternative software called BankMill from India. This software, which runs on radio and not on VSAT, offers lower communication costs, unlimited users, and other added benefits such as integration with mobile money, ATM and internet banking and a fixed price for 9 years. This is only a software installation and does not require any hardware upgrade.

In addition, there is dissatisfaction among rural banks about the highly centralized nature of the current arrangement with APEX bank, which is both a supervisor and an IT service provider, a combination of tasks considered to be incompatible by all.

Conclusions

The Financial Services activity has enabled rural banks to embrace modern technology for their banking operations. These banks have now experienced faster and more accurate transactions, including check clearing, improved customer service, strengthened internal controls, and a much

better ability to monitor the operations of their branches. As a result, they are interested in further technological improvements. However, this has come at a substantial cost to them. First, their operating costs related to licensing and communication have increased several fold, to an unaffordable level. Second, they have lost a considerable amount of independence in terms of data ownership, product development, and, more generally, the ability to be in the driver's seat when it comes to new initiatives and new investments. The centralization of data at the APEX Bank has created an unequal relationship between the rural banks and the APEX Bank with the latter as the dominant partner. The APEX Bank has a double role; it is the regulation entity and also the IT service provider.

Based on lessons learned from this endeavor, there are three distinct areas of growth that must be considered in designing and implementing a project of this nature. They are, namely, anticipating growth in the volume of data, increase in operating costs, and growth in the appetite for new technology and product development, and technological obsolescence, which tends to occur faster than obsolescence of physical equipment.

1. INTRODUCTION

In 2011, the Millennium Challenge Corporation (MCC) contracted NORC at the University of Chicago to assess the impact of up to five activities under the Ghana Compact signed between MCC and the Government of Ghana in August 2006.

These activities included:
1. Agriculture Project, Post-Harvest Activity and Community Services Project, Electrification Sub-Activity
2. Agriculture Project, Irrigation Activity
3. Agriculture Project, Credit Activity
4. Rural Development Project, Community Services Activity, Education Sub-Activity
5. Rural Development Project, Financial Services

The main aim of the Ghana Compact was to reduce poverty by incentivizing economic growth through improvements in the agricultural sector.

Most activities took place in three geographic areas: 1) the Northern Agricultural Zone, 2) the Afram Basin Zone, and 3) the Southern Horticultural Belt.

This evaluation presented in this report covers exclusively the Financial Services Activity known as Ghana Rural Banks Computerization and Interconnectivity Project (GBRCIP) which was a $30,266,099 effort[2] and had nationwide coverage. The initiative was aimed at supporting the overall compact goal of reducing poverty through economic growth.

2. OVERVIEW OF GHANA COMPACT AND INTERVENTION EVALUATED

2.1 Financial Services Activity Logic

The ultimate objective of the GRBCIP was to strengthen and improve capacity of rural and community banks in Ghana to enable them to deliver sound financial services to rural communities in the country. The activity sought to establish a computerized networking system among all rural banks and the APEX Bank Server, thereby improving financial service delivery, operations, and access to information at rural banks with the objective of enhancing the depth and value of rural financial services and widening access to savings services and cash transfers.

The project financed the following inputs: (1) the establishment of Local Area Network (LAN) and Wide Area Network connectivity (WAN) through the VSAT system using satellite (as opposed to radio) technology; (2) one electricity generator per rural bank in most cases, (3) two computers per branch, (4) two printers per branch, (5) T24 software, (6) free of charge user licenses depending on the size of the bank, (7) a 1-day computer appreciation course, (8) a two-week computer training course per user, and (9) other sensitization seminars and workshops.

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[2] http://www.mida.gov.gh/pages/view/MCA_Completion_Report.pdf/3/news

As a direct result of the inputs above, it was expected that the rural banks would experience the following short-term outcomes:

- Higher transaction speed for depositing and withdrawing money;
- Shorter client queuing time at the branch
- Faster check clearing times
- Faster and more accurate statement printout
- Improved supervision of branches due to real-time connectivity with the branches
- Improved internal controls.

In the medium and long-term, it was expected this would lead to:

- Increased volume of transactions at rural banks
- Increased levels of client confidence in rural banks,
- Enhanced integration of the rural banks in the banking system, and
- Increased transparency of the rural banks

2.1.1 Link to ERR and Beneficiary Analysis

The financial service activity did not include ERR or beneficiary analysis.

2.1.2 Program Participants and Geographic Coverage

The intervention targeted all rural banks (134 by the end of the activity) in the country. Including their agencies and branches, the rural banks at the time of implementation were in five hundred and forty-seven locations, spread throughout the ten regions in Ghana.

2.1.3 Implementation Summary

The initiation phase of this activity included a kick-off meeting for all project stakeholders, during which they discussed and reached an understanding of the main project protocols. Three main project teams, the Technical Infrastructure Team, the Application Team and the Project Implementation Team, were formed and commissioned with clear roles and responsibilities. At the planning phase, a detailed project plan was developed and adopted by the Project Steering Committee. The execution phase commenced while planning of some remaining activities continued.

The GRBCIP was one of the largest computerization projects in Ghana, comprising of several information technology infrastructure supplies and installations, as well as deployment of a major banking software application to all the rural and community banks in Ghana.

2.1.3.1 Implementers

The implementing entities were ARB APEX Bank and Ghana Interbank Payments & Settlement Systems (GHIPSS), a subsidiary of the Bank of Ghana. These institutions worked with a number of partners, including:

- KPMG (Project Management Services)
- NCR (Implementation of Check Codeline Clearing Solution and Automated Clearing House)

- Sambus Company Limited (Data Centre Solution)
- SuperLock Technologies (Implementation of Wide Area Network Solution with Bandwidth Services)
- Inlaks (Implementation of the Temenos T24 Banking Application Common Platform)

SuperLock Technologies (STL) implemented the Wide Area Network (WAN) using a satellite technology known as VSAT (very small aperture terminal). The infrastructure interconnects all the rural banks and their branches to a Data Centre, located at the APEX Bank's offices. In total, the project succeeded in providing wide area network connectivity to five hundred and forty-seven (547) rural and community bank locations. A total of four hundred and sixty-five (465) generator sets with capacities ranging from 15KVA to 55KVA were procured and installed for the rural banks. Local Area Network (LAN) materials, computers, printers and uninterruptible power supply units or UPS were supplied to the rural banks under the project. A data center and disaster recovery facilities were built and commissioned by the GRBCIP for the banks. The primary data center is located at the APEX Bank's offices in Accra.

In addition to the computers and satellite dishes, banks received a full commercial banking software package, Temenos T24 eMerge Banking (T24), that enables them to access computerized front and back office applications for real time transactions with their customers, track cash flows, revenues, and expenses by profit/cost center, and update customer accounts with an easy end-of-the-day processing.

2.1.3.2 Projected and Actual Costs

The Financial Services Activity had an initial budget of US$ 23,970,000; the final budget increased to US$ 31, 336, 925 but the final actual disbursements were US$ 30,266,099.[3]

2.1.3.3 Targets

The first rural banks completed their transition to computerization in June 2010; the process continued during a 20-month period, with the final set of rural banks completing the process in February 2012. By the end of the MCC Compact, all rural banks targeted had received the full package of upgrades. In addition, all rural banks had received a scanner and software for the Check Code Clearing System.

Once fully automated, all financial data from the banks was supposed to be stored centrally at the APEX Bank. Rural banks use the software by connecting to the APEX Bank's Server. The accounting and banking data is, therefore, available in real time at the rural bank and at the APEX Bank. The rural banks are thereby enabled to provide accurate up to date real time statements to their customers. However, for the purpose of this evaluation, when NORC approached APEX to obtain post-computerization bank data, we learned that this data, even in its aggregate form, was not available centrally.

2.1.3.4 Selection of Participants

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[3] 3 http://www.mida.gov.gh/pages/view/MCA_Completion_Report.pdf/3/news

As mentioned before, the GRBCIP targeted all rural banks (134 by the end of the activity) with branches in 547 locations across the country.

According to information received from the Project Implementation Team in Ghana, the Financial Services Activity was supposed to use very strict prioritization criteria for the migration of the rural banks onto the T24 platform. The Project Implementation Team designed the guidelines for the prioritization. The guidelines were deliberated and amended, where necessary, by the Project Technical Infrastructure Team and the Project Steering Committee gave final approval. The key prioritization criteria were as follows:

- Availability of correct and balanced data (weighted highest)
- Infrastructure readiness
- Information security compliance, and
- Basic computer appreciation and training for staff.

The criteria, however, had to be changed several times as necessitated by the exigencies of the circumstances, including, the tight project schedule, limitation of the data center infrastructure, and location of the rural banks branches. The Project Management reported to NORC that the final computerization and connection ended up being done in a random order. Unfortunately, however, no registry of the bank priority selection and process was kept, and the randomization cannot be confirmed with documentation.

3. EVALUATION

This is a mix methods impact evaluation that includes quantitative and qualitative information. The quantitative impact study uses monthly returns from all banks for the period January 2009 – December 2013, while the qualitative study is based on more recent individual bank data, and interviews with the key management staff, discussions with the APEX Bank, which was the implementation agency for the project, customer interviews, and interviews with KPMG staff who oversaw project implementation.

The Quantitative Study examines the impact of computerization and connectivity on several key performance indicators. To identify the effect, we take advantage of the fact that the intervention was staggered over time. Some banks went live as early as June 2010 while other only did two years later in 2012. The longitudinal nature of our data allows us to use the timing of the intervention across different rural banks to estimate causal pathways. In addition, our ability to compare rural banks before and after the computerization and connectivity, allows us to control for unobservable characteristics of the banks that could have effects in the indicators of interest.

The Qualitative Study looks at the perceptions of the bank managers about the activity and performance trends with the aim of better explaining the impact of the activity on the key performance indicators attributable to GBRCIP. These two studies together offer an overview of the impact of the project, the lessons that can be learned from it for computerization and connectivity projects in general, and the issues that need to be considered when designing and implementing such projects in the future. More details about the data and methodology are presented below.

This evaluation does not include a review of the implementation process or costs associated with the activity.

3.1   Evaluation Hypotheses and Impact Indicators

This intervention intended to improve the efficiency of financial transactions at rural banks and make it more attractive for people to use the banking system through the computerization of operations and connectivity for the rural banks. The evaluation aims to answer the following questions:

- Did the activity improve the speed and reliability of transactions?
- Did the activity improve accuracy and availability of accounts information?
- Did the activity reduce transactions and check clearing times?

These expected improvements aim not only to make bank operations more efficient and potentially less costly per transaction, but also improve the customer experience and satisfaction with the services offered by the bank, while also reducing the incidence of fraud. This, in turn, is expected to increase the number of clients, the number of deposits and credits, and the number of bank operations, among others.

The following indicators measure intermediate outcomes such as the changes in deposits, changes in income, the ability of the bank to cover cost and make a profit, and return on invested capital.

i.   Number of all accounts combined (savings deposits, demand deposits, time deposits, Susu)
ii.   Number of all deposit accounts (savings deposits, demand deposits, time deposits)
iii.   Number of savings and fixed deposit accounts
iv.   Value of all accounts (savings deposits, demand deposits, time deposits, Susu)
v.   Value of all deposit accounts (savings deposits, demand deposits, time deposits)
vi.   Value of savings and fixed deposits
vii.   Average balance per account
viii.   Average balance of savings and fixed deposits
ix.   Fixed and savings deposits/total deposits
x.   Financial expenses (interest payments on deposits and other borrowings)
xi.   Operating expenses (excluding financial expenses)
xii.   Interest income
xiii.   Non-interest income (commissions and fees plus other income)
xiv.   Net financial income (interest income minus interest expenses)
xv.   Total income from all sources (non-interest and interest income)
xvi.   Net Income
xvii.   Non-interest income/total income
xviii.   Operating expense ratio
xix.   Operating costs per customer
xx.   Staff expenses
xxi.   Staff expenses/total expenses
xxii.   Operating expenses/net financial income
xxiii.   Total adjusted capital from all sources including reserves

xxiv. Operating expenses/ Net financial income

xxv. Total adjusted Assets

xxvi. Return on adjusted assets (ROA)

These are the principal measurable indicators that are expected to have been influenced positively with computerization and connectivity. The emphasis on the liability side of the balance sheet (sources of funds) is designed to assess to what extent the GRBCIP influenced the trust relationship between the bank and its clients and the public perception of the banks as the safe keepers of the depositors' funds. The emphasis on profitability and cost recovery is designed to assess the overall ability of the banks to operate as going concerns. The asset side is considered only in aggregate and in terms of total assets in order to measure the overall return on them. The lending activity in the asset side is not disaggregated since loans are subject to other variables such as the profitability of the enterprises being financed and the ability and willingness to pay of the borrowers which are outside the expected impact of the project. These indicators, therefore, cover the key areas of changes in the number of accounts and deposits, operating efficiency, profitability and returns on assets as compared to non-computerized rural banks.

Check Clearing: All rural banks received a scanner and software for the Check Codeline Clearing (CCC) System. However, there is no overall indicator about check clearing and check clearing times that can be measured through the banks' financial statements. The only available data were collected from banks' branches through qualitative interviews. Therefore, the evaluation provides a qualitative assessment and not a quantitative measurement of the impact of this activity on check clearing. (See Annex 5 for more information about the availability of these data)

3.2   Quantitative Approach – Impact Evaluation

3.2.1   Data Sources and Data Collection

NORC reviewed the existing data sources, and learned that bank data necessary to estimate the aforementioned indicators of interest were available at the APEX Bank in the form of monthly returns from individual rural banks (not by branch). The monthly returns for each bank were reported to be available in paper format for the period prior to full automation of a given bank, and electronically for the period following full automation of the bank.

In 2011 NORC initiated a request to access these data. Initial conversations with APEX staff were encouraging. MIDA sent a formal request for the data and obtained the agreement from APEX to support NORC's efforts to obtain data necessary for the evaluation. However, APEX never made the electronic (post-automation) data available, despite repeated NORC, MiDA, and MCC attempts to obtain it.

The process of obtaining paper records of monthly bank returns required several steps. First, the NORC team visited the ARB Apex Bank branch office in Kumasi, where monthly aggregate balance sheets for all rural banks were archived. The monthly returns for each bank were available in paper format for the period prior to full automation of a given bank, and for some periods following full automation of the bank. With the support and authorization of ARB APEX Bank, NORC and a subcontractor scanned all the available paper monthly returns from 134

banks for the period January 2009 – December 2013. This covers time before and after the rural banks transitioned to computerization, given that the first banks made the transition in June 2010, and the last rural banks completed the process in February 2012. After scanning all relevant rural bank monthly return documents housed in the APEX facility in Kumasi, the team extracted and entered into a database all monthly data pertaining to indicators of interest for each bank. However, a large amount of banks' monthly returns were not found in the Kumasi archives and therefore, the evaluation team decided to visit all 130 banks individually, to collect as much of the remaining missing data as possible. After pilot visits to 15 banks in the Greater Accra region to ensure that it would be possible to obtain the missing data directly from the banks, we coordinated with APEX to plan visits to the remaining 115 rural banks across five regions of Ghana (the map below shows the distribution of the 130 banks across Ghana). During each bank visit, the team scanned the available monthly prudential returns from each bank, taking care not to scan or record any personal identifying information.
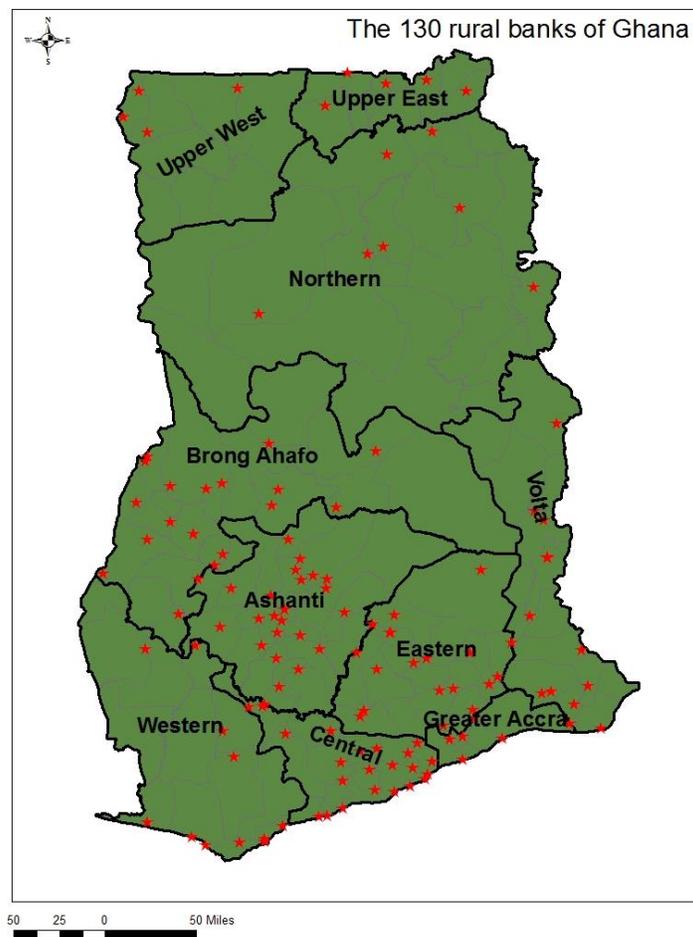
All PDF files were uploaded onto the NORC SFTP. Upon completing document retrieval at the archive and the banks, we created an Excel database recording the returns' data for each month. Data was entered into the Excel template using double-entry method, for all the available indicators from the five sub-reports in each monthly prudential return for 130[4] banks over the 60

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[4] Four of the original 134 banks closed.

months collected. This data was then transfigured and coded into Stata for further manipulation and analysis.

3.2.2 Data Description

Although most bank monthly returns were available from the APEX Kumasi archives and at the individual banks, a proportion of them were missing. Out of a total of 7,800 (130 banks during 5 years) monthly returns, 1,369 (17.5%) were not found at either source. Furthermore, the monthly returns do not contain all of the information that this evaluation would require for a complete accounting of GRBCIP's (expected) impacts. While the evaluation design proposed a set of indicators that are normally included in bank reports on its financial position, not all outcome indicators of interest (nor some of the indicators necessary to calculate these) were available in the bank returns. Differences between the target outcomes and the available data are described in Table 1. In some cases, we were able to create the indicator or provide an alternative (proxy) indicator, but in a few cases, the data was not available.

Table 1. Quantitative Indicators

	Target Outcome Indicator	Available Outcome Indicator
i	No. of accounts, total	No. of customers, total
ii	No. of all deposit accounts	No. of customers with deposit accounts
iii	No. of savings and fixed deposit accounts	No. of customers with savings and fixed deposit accounts
iv	Value of all accounts	Value of all accounts
v	Value of all deposit accounts	Value of all deposit accounts
vi	Value of savings and fixed deposits	Value of savings and fixed deposits
vii	Average balance per account	Average balance per customer
viii	Average balance, savings and fixed deposit accounts	Average balance, savings and fixed deposit customers
ix	Savings and fixed deposit/total deposits	Savings and fixed deposit/total deposits
x	Financial expenses	NA
xi	Operating expenses	NA
xii	Interest income	NA
xiii	Non-interest income	NA
xiv	Net financial income	NA
xv	Total income	Total income
xvi	Net Income	Net income
xvii	Non-interest income/Total Income	NA
xviii	Operating Expense Ratio	NA
xix	Operating costs per customer	Total expenses per customer
xx	Staff expenses	Staff number
xxi	Staff expenses/Total expenses	Total expenses/staff number
xxii	Total adjusted capital	Total adjusted capital
xxiii	Operating expenses to net financial income	NA
xxiv	Profitability ratio	Profit margin
xxv	Total adjusted assets	Total adjusted assets
xxvi	Return on adjusted assets	Return on adjusted assets

NA=not available

In addition, banks do not always report monthly returns indicators in a consistent way. For example, the number of accounts (or number of customers for different types of accounts) may

be reported for most months of a year but not all. In some cases, parts of the monthly report are missing. In Table 2, we show the proportion of missing values among the monthly reports available by indicator. We see that in many cases the proportion is not trivial. These shortcomings in the data should be borne in mind, throughout this quantitative analysis.

Table 2. Available Indicators Missing Values

Indicator	Missing	Total	% Missing
No. of customers with savings and fixed deposit accounts	1,175	6,431	18.3
No. of customers with deposit accounts	1,175	6,431	18.3
No. of customers, total	1,172	6,431	18.2
Value of savings and fixed deposits ('000)	1,171	6,431	18.2
Value of all deposit accounts ('000)	1,175	6,431	18.3
Value of all accounts ('000)	1,175	6,431	18.3
Average balance per customer	1,175	6,431	18.3
Average balance, savings and fixed deposit customers	1,175	6,431	18.3
Ratio savings and fixed deposit/total deposits	1,175	6,431	18.3
Net income ('000)	455	6,431	7.1
Total expenses/customer	1,434	6,431	22.3
Staff number	457	6,431	7.1
Total expenses/staff	774	6,431	12.0
Total adjusted capital ('000)	287	6,431	4.46
Profit margin	455	6,431	7.1
Total adjusted assets	314	6,431	4.9
Return on adjusted assets	712	6,431	11.1

In Annex 1, we show average year values for the indicators, as well as figures indicating the variance in rural bank sizes.

3.2.3 Impact Evaluation Methodology

We use the longitudinal bank data to examine the effect of computerization and connectivity on bank outcomes. The rollout of the intervention across banks was staggered over a 20-month period. The first rural banks made the transition to automation in June 2010, while the final set of rural banks completed the process in February 2012. We take advantage of this staggered rollout of the intervention – namely, the fact that different banks transitioned to computerization at different times over a 20-month timeframe - to identify and measure the effects of the GRBCIP on outcomes of interest. To this end, we use longitudinal bank data, gathered from monthly returns that cover a longer period than the 20-month implementation timeframe; specifically, our data spans the period from January 2009 (16 months prior to computerization of the first set of rural banks) to December 2013 (almost two years after the intervention ended).

These data allow us to examine outcome data for rural banks with and without computerization. This first approach takes the form of an OLS regression as follows:

$$y_{it} = \alpha\, D_{it} + \beta\, \mathbf{x}_{it} + \delta\, y_{it\text{-}12} + \lambda_t + \varepsilon_{it,} \tag{1}$$

where y_{it} is the outcome of interest and $y_{it\text{-}12}$ its one-year lag, x_{it} is the vector of the subset of control variables that vary both across units and time, λ_t is a time effect common to all banks in period t (month and year), and ε_{it} is a bank time-varying error distributed independently across banks and time and independently of λ_t. Finally, D_{it} is a dummy variable that is equal to 1 to indicate that the computerization (treatment) is present and 0 otherwise, and α is the parameter of interest that measures the effect of GRBCIP on each indicator y_{it}.

Rural banks were originally selected for computerization and interconnectivity according to a set of prioritization criteria (availability of correct and balanced data, infrastructure readiness, information security compliance, basic computer appreciation for staff, etc.); however, the original priority order is not available. NORC learned that the priority order was altered because of different circumstances and that the migration order was basically random in practice. Despite this information, we are concerned that the rural banks that went live earlier are also 'superior' in other unobservable dimensions that could introduce bias in our estimates. If this is the case, it is possible that the estimation of the activity effect will be biased upwards. Therefore, we also estimated the effect of the activity by comparing each bank with their own earlier performance. By applying this methodology, we take into account possible selection issues, as the identification of effects is based solely on changes within banks due to the computerization. As usual, when controlling for fixed effects, measurement error may imply a larger attenuation bias.

Using the monthly data for each individual bank, the general model can be specified as a fixed effects regression model for panels:

$$y_{it} = \alpha\, D_{it} + \beta\, \mathbf{x}_{it} + \lambda_t + \mu_i + \varepsilon_{it,} \tag{2}$$

where μ_i is a time-invariant effect unique to bank i. As before D_{it} is a dummy variable that indicates treatment and α is the parameter of interest that measures the effect of the intervention on the selected indicators.

3.2.4 *Quantitative Findings*

For each outcome of interest, we run regressions that include a dummy variable indicating treatment, a time trend and a square time trend, monthly indicators of temperature, precipitation, vegetation and light in each bank location lagged one year and the average of the dependent variable in 2009. The time trend variables aim to capture the growth that all banks display overtime in the context of a growing economy. The climate indicators capture changes in the agricultural circumstances in each area, which can affect the number and volume of bank transactions.

We present our estimations results in Table 3. In each row we focus on a different outcome indicator. In column (1), we show the findings from our first approach to the estimation of impact (equation (1)) where the identification of the effect is the result of variation in treatment across banks over time. In column (2) we show the estimation results using the bank fixed effect model (equation (2)), where the identification of the activity impacts comes from the change

within each rural bank due to the intervention. Each cell corresponds to a different regression and shows the parameter of interest, α, which is the effect of the treatment on each outcome indicator, and the corresponding robust standard error in parenthesis.

Table 3. Estimation Results

Outcome Indicators	Estimated Effects	
	Model (1)	Model (2) Fixed Effects
No. of customers with savings and fixed deposit accounts	1,064.64 (822.8)	1,182.42 (829.1)
No. of customers with deposit accounts	447.27 (1,106.7)	760.10 (1,125.9)
No. of customers, total	186.40 (1,168.6)	473.67 (1,187.8)
Value of savings and fixed deposits ('000)	265.57+ (148.2)	352.21* (294.2)
Value of all deposit accounts ('000)	593.52** (204.1)	723.63** (231.5)
Value of all accounts ('000)	708.35** (259.36)	884.63** (160.0)
Average balance per customer	22.44+ (13.5)	24.74+ (13.9)
Average balance, savings and fixed deposit customers	18.40 (34.9)	23.78 (37.8)
Ratio savings and fixed deposit/total deposits	-0.02*** (0.0)	-0.02*** (0.0)
Net income ('000)	7.40+ (4.2)	7.48+ (4.3)
Total expenses/customer	0.14 (0.3)	0.04 (0.2)
Staff number	0.63 (0.8)	0.83 (0.9)
Total expenses/staff	-6.92 (81.6)	4.82 (76.9)
Total adjusted capital ('000)	-48.86 (46.3)	-36.75 (46.9)
Profit margin	-0.21 (0.332)	-0.46 (0.6)
Total adjusted assets	828.74*** (157.1)	881.14*** (160.7)
Return on adjusted assets	0.0025*** (0.0)	0.0026*** (0.0)

Robust standard errors in parenthesis. *** $p<0.001$, ** $p<0.01$, * $p<0.05$, + $p<0.1$ All regressions include a time trend, a square time trend, and indicators of temperature, precipitation, vegetation and lights lagged one year. Regressions in column (2) include bank fixed effects.

The result of the two estimations are very similar. When looking at the effects of the intervention activity on bank clients, we see that the point estimates are positive, although not statistically significant at conventional levels. However, we estimate a positive and statistically significant effect on the value of bank accounts that customers hold at the banks, independently of their type –savings, demand deposits, etc. We also find a positive effect on the average bank account balance

per customer. The effect is statistically significant at conventional levels when all accounts are considered together and reaches around 23 to 25 additional GHc per customer. Although positive, the effect on the average balance per customer of savings and fixed accounts is not statistically significant at conventional levels. Finally, the intervention had a negative and significant effect on the ratio of fixed and savings deposits over total deposits of around 2 percent.

Computerization and connectivity of rural banks had a positive effect on bank net income that is statistically significant at 10 percent. No statistically significant effects were identified for total expenses per customer or per staff member and the number of bank employees does not seem affected by the intervention either. The estimated effects for total adjusted capital and bank profit margins are not different from zero.

Finally, the effects on total adjusted assets and the returns on total adjusted assets are positive and statistically significant. The estimates indicate an effect of around 830,000 to 880,000 GHc in adjusted assets and around 0.25 percent in their return.

In general, these estimates are consistent with a positive impact of the activity on the rural banks' number of customers, the number of deposits and bank operations, and net income as was expected. We also find a positive impact on assets and returns on assets.

3.2.5 Limitations

The first limitation that the quantitative evaluation faces is the number of observations. There are data for only 130 rural banks, and all of them were eventually treated within a relatively short time interval. With such a small sample, it is possible that effects cannot be detected with precision. Unfortunately, there is no alternative to the given sample.

A second limitation concerns missing values. As we mentioned before, almost 18 percent of the monthly returns are missing despite a significant effort to obtain them from different sources (APEX, banks, Central Bank of Ghana). In addition, a non-trivial percent of the observations in the bank returns that are available are missing as well. This limitation could be even more serious if the missing values were related to the characteristics of the banks, however the patterns of missing values for the different indicators seem random.

The final difficulty we face is that rural banks were selected for migration to the T24 platform according to a set of prioritization criteria (availability of correct and balanced data, infrastructure readiness, information security compliance, basic computer appreciation for staff, etc.). The original priority order is not available to us. Although we learned that the order was altered because of different circumstances and basically random, we are concerned that the rural banks that went live earlier are also 'superior' in other unobservable dimensions that could introduce bias in our estimates. If this is the case, it is possible that the estimation of the activity will be biased upwards. For this reason, we use a bank fixed effects approach that identifies the activity impact from the changes within each bank.

3.3 Qualitative Approach

3.3.1 Data Sources

The qualitative study was carried out in August 2017 in Ghana and it is based on individual bank returns data and interviews with the key management staff, discussions with the APEX Bank management, customer interviews, and interviews with staff from KPMG, the firm that oversaw project implementation.

For the qualitative study, we originally intended to visit 15 rural banks. The rural banks were selected based on geographical spread in four regions (Greater Accra, Eastern, Ashanti, and Central) and a mix of size, age and a strong agricultural focus. The team discovered while in the field, that one of the selected banks had closed and, hence, the final sample was 14 banks, which are listed in Table 4 below.

Table 4: Rural Banks Visited for the Qualitative Study, August 2017

Rural Bank	Location	Date of Creation	Date Visited
La Community Bank	Labadi	1987	7-Aug-17
Abokobi	Abokobi	1985	8-Aug-17
Citizen Rural Bank	Nsawam	2007	9-Aug-17
Asuogyaman	Akosombo	2007	10-Aug-17
Anum Rural Bank	Anum	1980	11-Aug-17
Kwahu	Pepease	1980	12-Aug-17
Asante Akyem	Juansa	1983	14-Aug-17
Sekyere	Jamasi	1983	15-Aug-17
Nsutaman Rural Bank	Nsuta	1984	15-Aug-17
Offinso Rural Bank	Offinso	2008	16-Aug-17
Bosomtwe Rural Bank	Kuntanse	1982	17-Aug-17
Akoti Rural Bank	Assin-Akropong	1984	18-Aug-17
Kakum Rural Bank	Elmina	1980	19-Aug-17
Ekumfiman Essueshyia	Essueshyia	1983	21-Aug-17

Data collection started with an initial visit to the ARB Apex Bank, where the NORC's qualitative researchers met key management staff and discussed the approach to visiting the RBs. The Managing Director of the ARB Apex Bank had already sent introduction letters on NORC's behalf to all the RBs selected. NORC also had copies of the same letters for each bank. Subsequently the NORC qualitative team started the visits and in all cases met the RB manager, always accompanied by the IT director, the finance director, and in some cases, the head of credit. In all cases, in spite of high staff turnover, there was someone with institutional memory going back to the project implementation period. In selected RBs, where possible, the team interviewed 3 customers (male and female). Altogether, each visit lasted on average about 4 hours. In all the banks, the answers were given in a group and there was general agreement on the answers amongst those present. Upon completion of our field visits, researchers had a 4-hour long meeting at ARB Apex Bank

with all the top management including the Managing Director, who particularly appreciated the findings, stating that NORC's qualitative team had done the work that should have been done by the ARB Apex Bank. Finally, the NORC team met KPMG and had a 2-hour meeting with one of its director, who had been directly involved in overviewing project implementation.

All instruments used in the collection of the qualitative data are included in Annex 2.

3.3.2   Qualitative Findings

The Ghana Rural Bank Computerization and Interconnectivity Project was a major milestone for the rural banks. Many concerns regarding modern banking practices involving work efficiency, record keeping, security, supervision, and customer experience were addressed. Generally, the effects of the GRBCIP are largely consistent with expected results in terms of lowering transaction times, increasing accuracy, improving internal controls, enhancing customer experience, reducing waiting time, and strengthening connectivity with branches, the APEX bank and the banking system, and they are consistent with the findings from the impact evaluation.

More specifically, the following qualitative results can be associated with the project:

Did the activity improve the speed and reliability of transactions?

- All rural banks report a reduction of the average transaction time from 15 minutes to less than 5 minutes and in some cases as low as 2 minutes, which is a vast improvement. Waiting time only may exceed these times at the end of the month with many people collecting salaries or paying school fees.

- The majority of RBs agree that the i-transfer system, which is the inter RB transfer of funds, has been a major improvement over the previous telephone system. This was agreed upon by 10 banks while the other 4 are mainly using mobile money and they don't use i-transfer for inter rural bank transfers.

- The rural banks agree that there has been a major improvement in customer experience due to reduced waiting time in the banking hall, and faster service. All rural banks visited, as well as bank clients who were interviewed concurred on this point.

- The generators, provided to the rural banks experiencing power outages, have helped them to continue operating even with electric power interruptions. All rural banks that received a generator agreed on this point. Two banks (Asuogyaman RB in Akosombo) did not receive a generator because they are next to a dam, where power outages are rare.

Did the activity improve accuracy and availability of accounts information?

- All rural banks agree that real time monitoring of the branches through the connectivity system has greatly helped in improving the real-time supervision of the branches and get more accurate reports as compared to before the project.

- The rural banks agree that there has been a major improvement in customer experience due to more accurate statements. All rural banks visited, as well as bank clients who were interviewed concurred on this point.

- Eleven of the 14 banks visited report that customers have overall gained greater confidence in dealing with them and their image has vastly improved as compared to the pre-project period. In three stressed banks[5] that have experienced mismanagement this did not concur.

- The rural banks are now more confident about the security of their data and in case of disaster they are assured that their data is kept safely. Twelve of the banks visited agreed with this conclusion. However, two banks namely, Sekyere Rural Bank and La Community Bank, were not sure if this was the case and they have opted to store their accounts locally and centrally at the APEX Bank. As long as the rural banks remain in the system APEX will be able to access their data in real time. If a bank decides to leave the system, access to the data in real time would not be possible but the bank would still be under the obligation to submit monthly returns to the APEX Bank.

Did the activity reduce transaction and check clearing times?

- All the rural banks agree that by being connected to the national check codeline clearing platform (CCC) check clearing times are now reduced to one day as opposed to five days previously and even up to one month for out of station checks.

- The generators provided helped to continue with the normal operation during electric power interruptions, reducing transaction times.

Based on their experience with the GRBCIP, the rural banks are now asking for more sophisticated and diversified IT products such as ATMs, internet banking, integration with mobile money, which assure more seamless and uninterrupted services. All the banks visited complained that the APEX has been slow to respond to these requests, especially in terms of reviewing and agreeing on new products and services such as introducing changes that would offer more services from internet banking and ATMs to rural bank customers.

The project has had a strategic impact in convincing the rural banks to embrace information technology and its implications, and has generated a growing appetite for learning and adopting modern technology for their operating needs. The enthusiasm and interest in new technology, and its immediate consequences could be considered the major strategic and, in many respects, positive impact of the project.

Identified unintended consequences and challenges

There are however significant unintended consequences of the software use and its current management by the APEX Bank. They include the following:

1. Frequent downtimes, especially towards the end of the month when the APEX Bank central data server runs the Close of Business (COB). Often the downtimes are sudden, causing negative customer experience and, in some cases, causing loss of customers. Sometimes the downtime can last several days without adequate notice or explanation. This was a com plaint heard from all the RBs visited without exception.

2. There are issues in terms of loan portfolio classification reporting, including aging analysis and the reporting of the overdue loans. This was expressed during the discussions in all but

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[5] Stressed banks are classified as such by the APEX for several reasons such as sudden reduction of deposits, eroded capital base, or high percentage of unpaid loans in the loan portfolio, inability to meet operating costs, etc.

one rural bank (Offinso Rural Bank) as a major issue. Moreover, these banks reported that, after the update to the 2014 release of T24 known as R14, overdue loans were reclassified by the software as current loans. This is said to have caused a loss of revenue although the actual value would be difficult to estimate. Some banks still do not have an accurate report of their loan classification and portfolio at risk. Except for Offinso Rural Bank, all banks had the same complaint. Offinso Rural Bank loan officer seemed to have learned the details of program better than his colleagues in other banks. This seems to show a weakness of the training offered by the APEX Bank.

3. In the earlier 2008 version of T24, known as R8, which was installed initially in all the banks, the software calculated receivable interest as income before the actual cash was received. This practice is not allowed by the Bank of Ghana (BoG) regulations, which only allow interest to be considered as income after the interest has been paid and not when it is only a receivable. In banks with a high Portfolio at Risk, this practice artificially inflated income, thereby distorting the net income reported in the Balance Sheet giving an incorrect impression of the health and profitability of the rural bank. According to the APEX Bank, however, this issue has been or is being addressed through programming modifications although according to the rural banks, the problem persists.

4. The printers provided under the project were incompatible with the T24 software and the investment in printers is considered a major waste by all banks visited. None of the banks visited could issue a computerized passbook or directly print statements from the software unless the balances are exported to Excel and then printed. The only other option was to print a snapshot of the screen showing the customer balances. All the banks have had to invest in their own printers. In all cases, the old printers are kept in storage. They cannot be sold as it goes against their agreement with the APEX. This was confirmed by all the rural banks visited.

5. The user licenses originally issued free of charge are, in all cases, insufficient for the rural banks' operations and the cost of purchasing a new license is quite high (US$1500 per user). The number of users depends on the size of the bank and the number of branches at the time of rollout. In view of the subsequent rapid growth, many of the banks reported that the number of user licenses were insufficient, causing inefficiencies and leaving some staff, such as loan officers, without a user license. Moreover, the cost of maintaining the software is 16% of the original license cost (or $240 per license) per year, which all the rural banks visited considered to be too high.

6. The single most prevalent complaint of the rural banks it that VSAT communication costs are extremely high as compared to bank income. The high cost of VSAT has forced the APEX Bank to revise the cost sharing arrangements; however, most rural banks still consider the cost as excessive. This has led the rural banks to look for alternatives to T24 and its centralized management by the APEX Bank. VSAT and T24 were installed together although it is possible to use radio instead of VSAT for communication. Ten (10) rural banks visited are considering an exit strategy with an alternative software called BankMill from India. This software, which runs on radio and not on VSAT, offers lower communication costs, unlimited users, and other added benefits such as integration with mobile money, ATM and internet banking and a fixed price for 9 years, as compared to T24. This is only a software installation and does not require any hardware upgrade.

Several banks have already exited the system, while keeping only one or two licenses to be able to link to the check clearing system. The satellite dishes received by these splinter banks (those that already exited the system) are used for the limited connectivity to maintain T24 for this limited use.

7. There is dissatisfaction of the highly centralized nature of the current arrangement with ARB Apex Bank, which is both a supervisor and an IT service provider, a combination of tasks considered to be incompatible by all.

8. Rural banks complained of their relationship with the APEX Bank, which is sometimes viewed as extracting resources while not providing value for money, and even an obstacle to their further development. The banks expressed dissatisfaction at being unable to introduce any new product unless it has been approved and adopted by the APEX Bank for all the rural banks. This conflict has increased with the growth of the banks and the need for more product development to meet customer expectations.

9. The MiDA Financial Services Activity did not leave behind a road map for aiding the medium-term sustainability of the system. There was limited planning for accommodating the expected growth in the volume of data. The data server became quickly obsolete soon after the end of the project and, therefore, the APEX had to invest an additional $4 million from its own funds to install a new data server. This investment was required to enable the rural banks to continue using VSAT and T24. The new server is again showing signs of strain because of growing volume of data.

10. The planned ATM introduction is taking a long time and mobile money is still not connected to the main software. Previous costs and poor responsiveness of the APEX Bank are making the banks doubtful about accepting ATMs through the APEX. The high operating costs of using the software, especially in terms of communication costs through VSAT, the insufficient number of licenses in most banks, the high cost of obtaining a new license per user, combined with a tense relationship between the APEX and the rural banks, are causing almost a third of the banks to look for an exit strategy.

11. Although deposits and assets have grown, in 12 of the 14 banks, expenditures have risen faster than incomes leading to falling or stagnant net income before tax, profit margins and returns on assets. The profits are under pressure in part because of the high communication costs brought about through the VSAT and T24 requirements installed by GRBCIP.

12. Many banks pay no dividends because of the pressure to reach GHC 1 million reserves (about $220,000) by the end of 2017 as required by the BoG. This policy decision is unrelated to GRBCIP although the banks see the high operating costs as an impediment in their ability to pay dividends or capitalize their net earnings in order and reach the required capital.

3.4   General Findings

The results from the quantitative and qualitative exercises indicate, in general, that the effects of financial services activity are consistent with expected results in terms of:

- Improvements in the speed and reliability of transactions
- Improvements in accuracy and availability of accounts information
- Reduction in transactions and check clearing times

In general, the rural banks we visited reported positive trends in the number of clients and accounts, and account balances. Banks indicated that these trends reflect the growth of the indicators that were impacted by the computerization and connectivity of the rural banks. The growth has occurred partly because of gains in internal efficiencies and partly because of an enhanced perception of the rural banks amongst their clients. The impact evaluation therefore reflects an accurate picture of the rural banks impacted by GRBCIP

The three important negative trends identified by the impact evaluation namely the rate of savings and fixed deposits in total deposits, profit margin and adjusted capital can be explained as follows:

The impact evaluation did not find a significant effect of the activity on profit margins, although the estimated point is negative. From that evidence, we cannot conclude on a particular effect. The case studies of the 14 rural banks visited indicate profit margins that have been declining because of faster rising costs as compared to revenues or incomes. This is not incompatible with the finding of rising net incomes which reflects absolute business volume whereas the profit margin is a ratio that looks at relative increase in costs as compared to revenue or income. Net incomes have also been under pressure in 9 out of 14 banks. What the qualitative study further shows is that although the rural banks in many cases have had a growing net income before tax, they are under a profitability stress and in almost all cases the profit margin and return on assets have declined significantly. The main explanation given by the rural banks is the faster rise of expenses over incomes caused principally but not solely by the rising communication costs caused by the adoption of the VSAT and T24 installed by GRBCIP.

Communication costs have risen substantially because the contract between the APEX Bank and the service provider is in US dollars and with over 100% devaluation of the Ghanaian currency between 2012 and 2016, the costs have doubled and all the rural banks are desperately looking for an alternative and some of them will move out in the next 3 to 6 months. The counterfactual scenario is said to have been lower costs. This was confirmed by banks that had already been computerized prior to GRBCIP and who have perceived a sharp rise in operating costs. The APEX has tried cost sharing and renegotiating the contract by lowering the standards (lowering data transfer speed) slightly but still the problem persists. This problem is likely to determine the future of the current arrangements between the APEX and the RBs.

The negative result concerning Adjusted Capital revealed by the qualitative study should not be linked to the computerization and connectivity project. Capital reflects more than anything else the regulatory regime and not the rural banks' own performance. Many decisions such as excessive dividend payments or changes in regulation by the Bank of Ghana could influence this indicator. In other words, there are many exogenous or external factors that could influence the outcome.

The overall conclusion of the qualitative study is that although the project achieved its immediate objectives of establishing an advanced IT system for the RBs which resulted in growth for many years, the design did not adequately consider the growth prospects that were likely to emerge from the computerization and interconnectivity or the growth in the economy, in terms of growth in the volume of data and the governance of the IT services.

Furthermore, project implementation had a uniform approach and did not consider the differences in the initial conditions of each bank. Implementation was done through a standard approach. The only difference considered was if the banks were already computerized in which case they may not have received the full hardware package. Five out of 14 rural banks visited were already computerized internally using the BSL banking software and LAN at the branch level. These banks revealed a somewhat negative assessment of the consequences of the project as compared to pre-project when they enjoyed lower operating costs and greater freedom and control over their data.

The APEX bank was briefed about the above findings and concurred to most, if not all, the conclusions of this report. The managing director was very much aware of the looming issues and agreed with the many concerns faced by the rural banking system. It should be added, however, that the IT department at the APEX Bank does not concur with the issues raised by the rural banks. They responded by generally blaming the banks for not knowing how to use the system. It is likely that the training received by the rural banks was not enough, in particular in the light of the staff turnover, given that no refresher trainings were provided.

4. CONCLUSIONS AND LESSONS LEARNED

The Financial Services activity has enabled rural banks to embrace modern technology for their banking operations. These banks have now experienced faster and more accurate transactions, including check clearing, improved customer service, strengthened internal controls, and a much better ability to monitor the operations of their branches. As a result, they are interested in further technological improvements. However, this has come at a substantial cost to them. First, their operating costs related to licensing and communication have increased several fold, to an unaffordable level. Second, they have lost a considerable amount of independence in terms of data ownership, product development, and, more generally, the ability to be in the driver's seat when it comes to new initiatives and new investments. The centralization of data at the APEX Bank has created an unequal relationship between the rural banks and the APEX Bank with the latter as the dominant partner. The APEX Bank has a double role; it is the regulation entity and also the IT service provider.

It is important to acknowledge that some anticipated outcomes of the GRBCIP did indeed come to pass because of the interventions. As the impact evaluation findings showed, the number of customers and the value of the deposits, for example, were positively affected as expected. At the same time, however, the GRBCIP also had some effects that were contrary to expectations, for example, no reduction in expenses or staff were identified. These effects, detected through the impact evaluation, are directly attributable to the GRBCIP intervention. The qualitative study confirmed in general the quantitative results uncovered by the impact evaluation. In addition, although not directly attributable to GRBCIP, the qualitative study uncovered positive trends in many more indicators, for example in the check clearing times, average transaction duration, customers waiting times, and in accuracy of supervision and information, among others.

Despite the positive effects of the GRBCIP and increasing demand for rural bank services, it seems apparent that the unintended consequences of the activity, which were not considered during project design and implementation, could potentially derail the trajectory of the

computerization and connectivity system established by MiDA and MCC as banks are looking to exit the existing systems to reduce costs and regain autonomy.

What remains after the project are not the "things" that are piled up but the "relationships" that are accumulated. What were the relationships that were created, how have they evolved, and how much value has been created because of these relationships? These questions need to be first and foremost in the minds of developers for future design of such projects. For example, there has never been a service level agreement between the APEX Bank and the Rural Banks for defining the roles and responsibilities of each party. The APEX Bank as a mini Central Bank does not have the mandate in its constitution for becoming an IT service provider. The APEX Bank as an IT service provider is currently using its unilateral power to bill and debit the accounts of the RBs for its services without having the consent of the RBs being billed. This reflects a major weakness of both design and implementation that was not considered neither during nor after the project.

A second important finding is that, although the project was well implemented and achieved some of its outcomes, there was little, if any, growth planning for the sustainability of the program.

Based on lessons learned from this endeavor, there are three distinct areas of growth that must be considered in designing and implementing a project of this nature. They are, namely, growth in the volume of data, increase in operating costs, and growth in the appetite for new technology and product development, and technological obsolescence, which tends to occur faster than obsolescence of physical equipment.

A. Data Volume – Future projects of this ilk should anticipate growth in the volume of data after implementation. The Data Center financed by GRBCIP became obsolete 2 years after the end of the project and had to be replaced by a new server to accommodate the growth of data. This server required a $4 million investment by the APEX Bank. Even the new server is now operating at peak capacity. In this case, the estimate of the growth of data was seemingly based on a very slow and limited growth of the rural banks, which did not turn out to be the case.

B. Operating Costs – Operating costs, particularly related to communication, rose substantially, primarily because of the major devaluations (over 100%) of the Ghanaian currency, which resulted in doubling of fees associated with a US dollar-based contract. High communication costs are driving a major push to exit from the VSAT communication towards a more independent radio-based system. The communication costs resulted in the APEX Bank having to pay 50% of the rural bank costs associated with VSAT. This payment in 2016 resulted in a major loss and a 30% decapitalization of the APEX Bank. Continuing with the current system is likely to result in a push by the rural banks to exit the system; on the other hand, a higher cost share by the APEX Bank can lead the Bank into insolvency. Future projects like the GRBCIP, need take into consideration all factors that could push up the costs of the component parts of an intervention, both at project inception and in the future.

C. Product Development – The total dependence of the rural banks on the APEX Bank for product development is a cause for concern for two reasons. First, each bank may have

different needs that require local solutions. Their initiative for introducing modern technology for addressing their local issues is currently blocked since no new product can be introduced in a single bank without it being accepted and generalized for all the rural banks through the T24 software. Second, product development can be a major source of growth for rural banks. As such, any structural arrangements or relationships that stymy product development serve as an impediment to the growth of the rural banks. Future projects of this nature should likely incorporate into plans and stakeholder discussion a degree of autonomy for individual financial institutions.

ANNEX 1: RURAL BANK QUANTITATIVE DATA DESCRIPTION

We present the available data in the next two tables. Data on bank customers and accounts balances overtime, is shown in Table A1. Customers could hold more than one account. Deposit customers (accounts) include demand, susu, savings and fixed deposits customers (account).

Table A1

Indicator	Annual Average				
	2009	**2010**	**2011**	**2012**	**2013**
No. of customers with savings and fixed deposit accounts	16,101	17,029	18,583	20,925	22,168
No. of customers with deposit accounts	24,057	26,809	29,274	31,812	34,026
No. of customers, total	27,479	30,532	33,304	36,728	39,386
Value of savings and fixed deposits	3,877,078	4,618,985	6,332,405	7,421,112	8,134,858
Value of all deposit accounts	5,408,943	6,406,387	8,778,388	10,546,269	11,412,260
Value of all accounts	8,658,225	9,758,252	13,349,000	16,330,394	17,765,387
Average balance per customer	230	258	325	356	358
Average balance, savings and fixed deposit customers	239	282	368	368	377
Ratio savings and fixed deposit/total deposits	72%	73%	73%	71%	73%
Observations	1,140	863	934	1,187	1,132

Note: account values in real Ghanaian Cedi of 20XX

Total customers include all deposit, savings, fixed deposit, loans and overdrafts customers. It can be observed that the number of customers and account balances increased over time. The average balance account per customer has also increased monotonically from 2009 until 2013. The ratio of savings and fixed deposits over total deposits has been more or less stable during the period.

In Table A2 we present the average evolution of income, expenses, staff, profits, capital, and assets in real values. For each indicator we report the number of available observations.

Table A2

Indicator	Annual Average				
	2009	**2010**	**2011**	**2012**	**2013**
Net income	28,813	27,483	35,272	56,625	65,136
Obs.	1,288	1,003	1,081	1,363	1,241
Total expenses/customer	4.7	6.3	5.8	6.8	7.4
Obs.	1,078	805	887	1,146	1,081
Staff number	50	52	57	62	66
Obs.	1,305	993	1,057	1,362	1,257
Total expenses/staff	2,142	2,284	2,682	3,235	3,666
Obs.	1,227	923	1,004	1,309	1,194
Total adjusted capital	945,084	1,080,615	1,286,196	1,564,334	1,978,766
Obs.	1,348	1,046	1,103	1,378	1,269
Profit/loss margin	-169%	-4%	6%	16%	13%
Obs.	1,288	1,003	1,081	1,363	1,241
Total adjusted assets	5,047,646	5,500,903	7,342,166	9,380,905	10,892,021
Obs.	1,330	1,034	1,101	1,378	1,274
Return on adjusted assets	0.57%	0.37%	0.41%	0.57%	0.54%
Obs.	1,233	952	1,024	1,310	1,200

Note: values in real Ghanaian Cedi of 20XX

The trends of the average of the indicators are positive. This is not to say that there are not RBs that present negative figures, for example some RBs show negative profits (loss) in some periods.

It is important to keep in mind that the high variance in the size of the rural banks, as shown in FigureA1 where we present box plots showing the distribution of bank customers and adjusted assets. The box plots show five values: minimum, first quartile, median, third quartile, and maximum values. In the case of customers, the range expands from just over 2,100 customer accounts to almost 150,000. The average bank averaged almost 34,000 customer accounts during the period 2009-13, while the median was approximately 22,000 accounts. In terms of the (risk-adjusted) asset base, the average bank averaged almost GHC 8 million in adjusted assets during the time period 2009-13, while the median, as shown in the box plot is close to GHC 5 million. In fact, banks ranged from under GHC 500,000 in assets, to more than GHC 30 million.

Figure A 1. Range of average bank size, according to adjusted assets and number of accounts
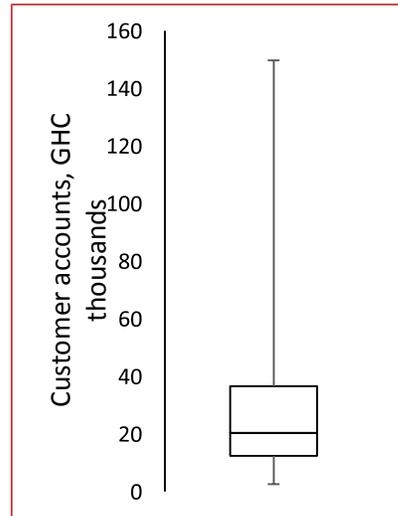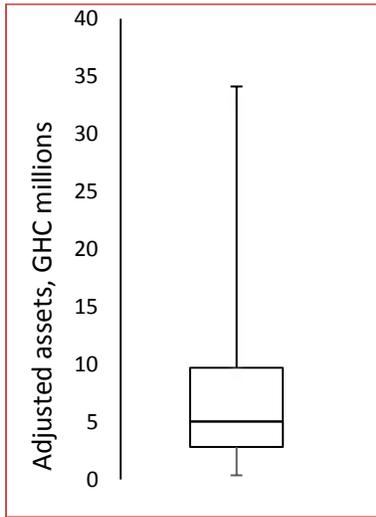
ANNEX 2: QUALITATIVE INSTRUMENTS

Millennium Challenge Corporation – Ghana Compact I
NORC at the University of Chicago
Impact Evaluation of GRBCIP (Ghana Rural Banks Computerization and Interconnectivity Project)

Interview Guide for APEX Key Informant Interviews

APEX OFFICIALS WITH KNOWLEDGE OF GRBCIP
(Length of Conversation: 1 hour)

1. When did the interconnectivity project start? Where and how?

2. What was the specific nature of the intervention, at different banks, and what did it look like from APEX's perspective?

3. How did it vary by bank?

4. Which bank(s) received the intervention first, and why?

5. What were the key issues affecting project implementation? Please provide a rough timeline of the main events during the history of implementation.

6. Did the nature of the intervention or its implementation change over time? What do you think would have been some differences between being one of the first banks to adopt the new technology, and being one of the later banks?

7. How would you describe the variety of banks' responses and experiences of the computerization and interconnectivity project (GRBCIP)?

8. How many banks are now interconnected? Did any drop out of the program or close down or reorganize?

9. How many banks have left the interconnectivity network since the project startup?

10. How many banks entered the interconnectivity after the end of the project? Was this entirely outside of GRBCIP support, but building on the project?

11. Are all banks able to pay for their membership fees to Apex? How might the project have contributed to benefits, difficulties or other changes in any banks' relationship to the Association?

12. How is the membership fee established?

13. How many banks are in arrears of payment of their membership fee?

14. Has the interconnectivity benefitted the RCBs in terms of the following indicators (below)—and if so, how so? If not, why not?
    a. Speed of transactions
    b. Ability to send and receive money faster
    c. Ability to clear checks faster
    d. Ability to issue more loans
    e. Ability to attract more savings
    f. Ability to submit monthly financial reports

15. In what way(s) have the rural banks benefited from interconnectivity? Have there been any downsides or difficulties for the banks?

16. In what way(s) has APEX benefited from interconnectivity? Have there been any downsides or difficulties for the APEX central banking institution?

17. Have any of the project outcomes extended to influence or concern the central Bank of Ghana, or any competitor private institutions?

18. Overall, was the project beneficial for RCBs? Please explain.

19. Overall, was the project beneficial for rural banking customers, both businesses and individuals? Please explain.

20. Did you see any differences in project *implementation*, according to any of the following characteristics (below)? Please explain.

   a. region of Ghana

   b. age of bank

   c. size of bank

   d. urban/suburban/rural characteristics

   e. bank performance prior to the intervention

   f. other characteristics (please specify)

21. Did you see any differences in project *outcomes*, according to any of the following characteristics (below)? Please explain.

   a. region of Ghana

   b. age of bank

   c. size of bank

   d. urban/suburban/rural characteristics

   e. bank performance prior to the intervention

   f. other characteristics (please specify)

22. If you had to start again, what changes would you make in the way project was implemented?

23. Would you like to add any final comments with regard to the history of GRBCIP project implementation, and its outcomes on computerization, interconnectivity, bank performance, and/or the needs of certain banks in particular?

Interview Guide for Rural Bank Managers and Staff Interviews

RURAL BANK MANAGERS AND STAFF
(Length of Conversation: 1 hour)

1. What support did you receive from MCA? (equipment, interconnectivity, software, capacity building) and when?

2. Did MCA procure 100% of the equipment? Was there a counterpart from your side?

3. How long did it take for you to receive the expected support?

4. Was the bank management or IT department consulted in terms of the types of equipment that you would receive?

5. Was the equipment appropriate or tailor made to your needs?

6. Did you receive any preparation or training prior to receiving the computers or the interconnectivity support?

7. Was there sufficient coordination amongst different departments and activities in the bank during and after implementation, both centrally and at every branch? Was the IT department solely responsible, or was there broad participation?

8. To what extent did computerization support the strategic vision of your bank?

9. Did you prepare a plan for your organization in terms of budgeting, staffing, and marketing, prior or after receiving the interconnectivity support? If not, why not?

10. Was your management ready or willing to implement the investments and provide the required additional support?

11. What was the involvement of top management, and how much planning was there for computerization and interconnectivity support?

12. Was there adequate budgeting for this activity?

13. Were staff trained on IT and computerization? If so, was the training adequate? What was as the quality and duration of training?

14. Has there been resistance against the computerization process, or negative consequences?

15. Are you still in the interconnectivity network? If not, why not?

16. Are you still interconnected? Since when and for how long have you been interconnected?

17. Can you comment on the operating costs of interconnectivity?

18. Is interconnectivity bringing additional revenue necessary to pay for any added operating expenses, or are other costs significantly reduced?

19. Please indicate the significance of interconnectivity and computerization on the following with (a) Significant, (b) Insignificant, (c) Don't know. Please explain why you believe it to be so

     i.   No of Clients

    ii.   No. of deposit accounts

   iii.   No. of savings and fixed deposit accounts

   iv.   Balances in deposit accounts

    v.   Balances in savings and fixed deposits

   vi.   Transaction time

  vii.   Expenses

 viii.   Income

   ix.   Profits

    x.   Client Satisfaction

   xi.   Bank's own capital

20. What were the other benefits from computerization and connectivity:

    a.   Reduced check clearing times?

    b.   Increased your ability to send and receive transfers

    c.   Improved your ability to provide up-to-date statement printouts for your clients?

    d.   Improved your ability to comply with Bank of Ghana compliance requirements and reporting?

    e.   Enhanced your ability to supervise the branches

21. In what ways has the investments improved your overall service delivery?

22. Did the project investments facilitate your access to commercial bank loans or other financing by other donors?

23. Did the support by MCC and MiDA (and, perhaps to some extent, APEX) help you to develop new products or improve existing ones? Please explain.

24. Would you like to add any final comments with regard to the history of GRBCIP project implementation, and its outcomes on computerization, interconnectivity, bank performance, and/or the needs of your bank in particular?

Interview Guide for Rural Banks Clients

RURAL BANK CLIENTS AND BENEFICIARIES WITH KNOWLEDGE OF GRBCIP, WHERE APPLICABLE
(Length of Conversation: 1 hour)

Note: This proposed interview is aimed primarily at clients who have been with the rural banks for at least 5 years, in order to understand and capture any change in client experience that could plausibly be related to the project. It could also take the form of a focus group discussion, if several compatible respondents are available at the same time.

1. How long have you held an account with your rural bank?

2. What kind of account(s) do you have?

3. How convenient is it to bank with your rural bank? Please explain

4. Have you noticed any improvements in rural bank services since their computerization and interconnectivity circa 2012?

5. What changes have you noticed in these recent years and since the availability of interconnectivity on the national network?

ANNEX 3: QUALITATIVE DATA DESCRIPTION FROM RURAL BANKS

LA Community Bank

The RB was established in 1987. It received project assistance in terms of computers and connectivity for the head office and its branches. The management stated that the computerization and connectivity have been beneficial in terms of lowering transaction times and the ability to monitor the branches in real time. The number of branches have not changed since computerization. They see the main advantage of the T24 for in lower check clearance time. They further stated that customers use the bank because of personalized customer care and their loyalty to the bank and not only because of the new technology.

Computerization overall is seemed as beneficial. The option of joining or not was not discussed in advance with the RBs. Everyone joined as a deadline was given with penalty implications. They said that the current centralized system under the APEX Bank is rigid and needs flexibility. Before the project, the bank was computerized through BSL which is a stand-alone software. The branches were networked and connected through the radio. They adopted the T24 software with many issues including loss of control as the process was done too quickly. Initially they faced many issues in terms of balancing and entries. They did not experience any change in the number of employees.

Their main comment is that before they had something affordable which met their needs. The perception of the bank's management overall was the project has not significantly impacted the bank as they were already computerized prior to the project. The high communication costs through VSAT has exerted negatively on the bank's overall profitability. The project came with little consultation and it didn't consider what was there and the different situation for each RB. Everybody was treated in the same way as though we are starting from a blank sheet which was not the case.

Now they are hesitating to follow the APEX for upgrading to ATM. They feel unable to introduce new products as all products must be uniform (although this point was disputed by the APEX thanks to the new R14 release of M24). Their current bill from APEX which is debited automatically (without asking them) is $11,500 for one quarter (over US$ 46,000 per year). This is a reduction from their previous bill which was GHC 79,000 or US$ 18,500.

As a result of the high communication costs and lack of independence, LA Community Banks is negotiating with Mindmill who is the supplier of Bankmill software for migrating out of T24 for most of their operations. They want the data to be kept at their head office with a cloud backup but not at the APEX. With the new software they can introduce new products. They will however keep a single license at their head office for continuing their CCC check clearance and i-transfer for sending money to other RBs. BankMill has no annual license for 9 years and provides unlimited users.

In 2016, they had invested GHC 11 million in government of Ghana treasury bills (TBs) but not this year since returns on TBs have declined.

LA Community Bank has been experiencing growth in its key performance indicators since 2013 although the rising cost of funds has increased pressure on its profitability. Comparing the overall quantitative results for 2009 to 2013 and the data from the LA Community Bank up to 31 December 2016 (Table 3 below), we find that in the key areas of value of fixed and savings deposits, net income, value of all deposit accounts, net income and adjusted assets there has been growth which is the same as the findings in the Quantitative Study. The bank's capital or net equity rose significantly and average account balances has declined both of which contrast with the Quantitative Study. Expenses rose faster than incomes and net income rose

substantially but profit margin declined both of which are in line with the Quantitative Study. Return to assets did not substantially changed which is in contract to the findings of the Quantitative Study. Overall, the implementation of T24 has been associated with rise in the number of accounts, account balances, and rising net income which are important achievements. The rise of expenses faster than incomes explains the falling profit margin.

Table A3.1 – LA Community Bank

LA COMMUNITY BANK LIMITED													
Year	Assets	Capital	# of Deposit Accounts	Total Deposits	% of savings and fixed deposits in total deposits	Annual Income	Annual Expenses	Net Income (before Tax)	# of staff	Average account balances	Profit margin	Return on Assets	Expenses/ account
2012	21,651,913	3,032,633	13,340	17,400,846	72%	3,762,030	2,825,481	936,549	68	1,304	25%	4%	212
2013	24,559,021	4,255,668	49,920	19,475,765	75%	5,046,926	3,916,520	1,130,406	62	390	22%	5%	78
2014	29,928,459	6,421,197	51,500	22,383,792	72%	6,275,175	4,418,927	1,856,248	70	435	30%	6%	86
2015	34,983,585	9,299,651	53,056	24,089,575	74%	7,616,901	5,832,681	1,784,220	71	454	23%	5%	110
2016	47,431,157	11,384,068	55,612	33,329,680	77%	8,556,644	6,464,001	2,092,643	73	599	24%	4%	116
Gowth 2012 - 2016	119%	275%	317%	92%	6%	127%	129%	123%	7%	-54%	-2%	0%	0%

Abokobi Rural Bank

The bank was established in 1985 and had 6 branches at the time of project roll out. It received WAN, LAN, 12 computers, 2 dot matrix printers for statements, 2 passbook printers, and 2 UPS. The printers have never worked due to what was described as "incompatibility" with the T24 software. Before computerization the bank was totally manual. The equipment and a 2-week training was provided free of charge on T24 but it was stated that there was poor after sales service with a long delay before the Help-Desk started.

Overall, it was stated that computerization has tremendously helped their operations with improved customer experience, faster transaction and more accurate reporting although reporting has been challenging especially for producing loan aging classification. Their ability to monitor and supervise their branches has improved greatly. Check clearing times has been reduced to 1 day and the i-transfer system has been effective for transferring money to other rural banks.

According to the manager and the key technical staff, they were not consulted regarding the type of equipment or the specifications. In their opinion, the specifications of the equipment were too basic. The training provided for the T24 software and for the use of the generators was adequate although the training was divided according to tasks and the manager training was insufficient. The bank was not adequately prepared for computerization and connectivity and they had to invent their way along the way. The biggest challenge was and remains the budgetary issue of allocating sufficient resources to meet communication costs. The operating costs of the system including communication costs is $25,000/year.

The software came with 17 user licenses which is insufficient for the 6 branches. Buying a new license costs $1500 which is expensive. The maintenance fee is 16% per year ($240). These costs plus communication costs are eating heavily into our profits. The bank is not making enough money to pay for these costs and maintain profitability.

The bank stated that they intend to migrate to an alternative software Bankmill which is local and independent of the APEX Bank. They intend to have only one branch connected for maintaining check

clearance and i-transfer. The new software also is directly connected to the Mobile Money Wallets of telecom providers such as MTN and customers can directly send or receive money with mobile money through their mobile phones – a feature which is unavailable in T24.

Another issue with the APEX based system and T24 is the frequent down time which severely affects their business and can even lead to the loss of clients. They don't want to experience frequent downtimes over which they have no control.

The newer R14 version transferred all the loans as current whereas some loans were overdue and this has distorted their earning results. Also, T24 was calculating interest due and not received as income which is contrary to the Bank of Ghana regulations but now this problem is being resolved.

Connectivity has increased the number of accounts. Most likely, the RB would not have existed by now had it not been due to the project and computerization. The management expressed that it is grateful to MIDA for their assistance in this regard. But now they are outgrowing the system and they need to explore more advanced lower cost options with newer technologies. They now fully embrace technology because of the computerization project.

Table 4 below shows the growth performance of Abokobi RB. The bank has had tremendous growth of deposits, assets, and capital over the 2013 – 2016 period but again with declining profitability due to rising expenses faster than income in part due to rising cost of connectivity. Value of all deposit accounts, value of fixed and saving deposit accounts, total adjusted assets, and profit margin are in line with the results of the Quantitative Study. However, the bank shows falling income, rising capital, and rising fixed and savings deposit as % of total deposits which is not the same as what was found in the Quantitative Study. In contrast to the results of the Quantitative Study, return to assets fell from 4% in 2013 to only 1.5% in 2016.

Table A3.2 – Abokobi Rural Bank

Abokobi Area Rural Bank									
year	Adjusted Assets	Value of all deposit accounts	Profit before Tax (Net income)	Annual Income	Annual Expenses	adjusted Capital	savings and fixed deposit balances	Ratio of fixed and savings	profit_margins
31/12/2013	9,106,372	9,724,572	444,879	2,573,444	1,873,227	1,696,954	5,375,440	0.55	0.27
31/12/2014	10,317,082	10,036,862	12,966	2,775,499	2,619,905	2,099,453	5,878,232	0.59	0.06
31/12/2015	12,642,952	10,078,133	705,127	3,632,921	2,927,794	2,012,058	8,108,343	0.80	0.19
31/12/2016	15,794,284	12,890,733	245,420	3,637,263	3,391,843	2,258,770	10,143,382	0.79	0.07
Growth	73%	33%	-45%	41%	81%	33%	89%	42%	-75%

Citizens Rural Bank

The bank received 2 computers, 2 passbook printers and 2 statement printers plus WAN and LAN equipment and a generator together with training for using the software and the generator. None of the printers could be used as they were incompatible with T24 software. Prior to the project the bank was entirely run using manual methods.

The computerization has made an important impact on the bank's ability to increase the speed of the operations especially onsite banking transactions, check clearance, customer balances, and transfers to other RBs. Average transaction time at the banking hall is now 5 minutes and check clearance only takes 1 day as compared to 15 to 20 minutes before computerization and up to 5 days for check clearance.

The software has had a host of problems including frequent downtime, not enough updates (going from R8 to R14 in 5 years), APEX response time to software issues is slow. During the upgrade from R8 to R14, some loans that were past due now showed as current. Loan classification report (aging, overdue analysis) cannot be produced. Moreover, as in other RBs, communication costs are extremely high for the bank's level of income amounting to US$ 5,359 per year.

In terms of impact, the bank has experienced very rapid growth with rising indicators all around. As shown in Table 5 below. Moreover, the number of staff has doubled from 14 to 28 over the 2013 to 2016 period. In comparison to the quantitative study results, the bank shows comparable results for rising average account balances from growth in deposit account balances from GHC 270 in 2013 to GHC 450 in 2016, rising value of fixed and saving deposits, rising net income, rising value of all deposit accounts, and rising adjusted assets.

In contrast to the quantitative study results, the bank shows rising number of accounts, rising percentage of fixed and savings deposit to total accounts, rising adjusted capital, and falling return on assets from 15% in 2013 to 7% in 2016. Overall, computerization has helped the bank to boost its growth although high communication costs has been a major factor in slowing down the growth of profits.

Table A3.4 - Citizens Rural Bank

Year	adjusted Capital	Adjusted Assets	Number of deposit accounts	Balance of all deposit accounts	Savings and fixed deposits	Ratio of savings and fixed deposits to all deposits	net income (before tax)
31/12/2013	335,598	1,687,923	8,915	2,408,603	1,975,166	0.82	256,470
31/12/2016	1,123,605	7,676,559	14,902	5,740,718	6,678,753	1.16	595,747
Growth	235%	355%	67%	138%	238%	42%	132%

Asuogyaman

This is a newer bank established in 2007 and it went live in October 2011. The bank received 4 personal computers, 3 printers, WAN and LAN. The bank which is located very near the Akosombo bridge experienced an early growth of deposits (over 100% increase between 2012 and 2013) soon after computerization. This sharp growth was reversed starting in 2014 with declines in all key performance indicators. This reversal was due to the closure of the Akosombo bridge for repairs and this sharply affected the indicators of the banks and customers were no longer paying back their loans. Since the opening of the bridge in 2017, RB is saying that business has picked up.

However, looking exclusively at the numbers in Table 6 below, this is a marginal or stressed bank which is losing its capital. In terms of capital they have only GHC 340,000 which is far away from the required GHC 1 million. The bank has three times its capital in loans at risk. Out of 12,000 accounts, almost 2/3 are dormant that need to be closed.

In terms of perceptions, the management is very positive about computerization and its impact on improving bank transaction efficiency, speed of operations, check clearance and overall customer experience. Data security has improved; They refer to the sharp growth between 2012 and 2013 as proof of the beneficial impact of computerization.

The reason for the decline in bank's performance are largely external and related to the economic environment and the closure of the Akosombo Bridge for repairs and not related to computerization which is considered a very excellent initiative by the management of the bank. Nevertheless, they consider the

cost of communication as excessive ($5000/year) and they think that the APEX bank is overcharging them and debiting their account without consulting them.

This case study is interesting as it shows external factors affecting the indicators of the bank.

Table A3.5 – Asuogyaman Rural Bank

Assuogyaman Rural Bank - Eastern Region					
Year	Assets	Deposits	Profits befrore tax	Income	Expenses
2012	1,775,113	1,365,503	69,461		
2013	3,660,656	1,795,971	92,133		
2014	3,554,557	2,514,411	55,879	1,196,945	1,141,066
2015	3,252,419	2,118,359	(144,219)	847,510	991,728
2016	2,902,050	1,590,126	(45,069)	761,694	806,763
Growth 2013 -2016	-21%	-11%	-149%		
Growth 2014 -2016				-36%	-29%

Anum Rural Bank

Anum Rural Bank was established in 1980. They received the full package of computers, printers, WAN, LAN, T24 software, and generators. software was incompatible with passbook printer; passbooks are still written manually. The bank was already computerized. The bank was already computerized before the project. The management considers that the project was an imposition by the APEX Bank and the benefits have come with considerable costs.

They recently were upgraded from the T24 version R8 (2008) to version R14 (2014) very suddenly. There is very significant improvement in speed of transactions and customer experience with R24. Customers can deposit money in one branch and take it from any other RB branch.

However, there are problem with down time costing us money.

The system rigid for the bank since all the rural banks must develop the same products due to centralization of product development at the APEX Bank.

The bank is now asking a lot of questions about proposed introduction by APEX of ATM in terms of costs and benefits; SMS alerts, internet banking, ATM, micro insurance, and mobile money are not integrated in the system. These operations are still connected to the accounts manually. APEX Bank is very slow in responding to new product development ideas.

Data security has improved. They are not confident about the data disaster recovery site. They complained that Close of Business (CoB) is running for too long which causes excessive downtime.

In terms of impact, the Table 7 below shows the key performance indicators corresponding to the Quantitative Study. In confirmation of the quantitative findings, total deposits and value of fixed and savings deposits, the ratio of fixed and savings deposits to total deposits, total assets rose, and net income fell. In contrast to the quantitative findings, however, capital rose, average account balances declined from GHC 580 in 2012 to GHC 335 or by 26%, while profit margins and return on assets both fell. The bank shows the symptoms of rapid growth without rising profitability. Rising expenses faster than incomes is again a major factor and one of the key contributory factors is communication costs brought about through the computerization program. As in several other banks, the project seems to have brought rapid nominal growth but without higher profitability.

Table A3.6 - Anum Rural Bank

Year	adjusted Capital	Adjusted Assets	Annual Income	Annual Expenses	Number of accounts	Balance of deposit accounts	Savings and fixed deposits	Balance of savings and fixed deposits	Ratio of savings and fixed deposits	net income (before tax)	Profit margin	Return on Assets
31/12/2012	2,950,343	20,172,753	4,645,661	3,542,308	26,663	15,457,550	21,309	8,933,418	58%	864,474	19%	4%
31/12/2014	3,547,417	19,413,019	4,790,718	4,177,335	-	12,826,762	-	-	-	613,383	13%	3%
31/12/2015	5,103,416	21,538,868	5,004,658	4,468,640	-	14,228,771	-	-	-	536,018	11%	2%
31/12/2016	5,401,413	23,548,101	5,758,255	5,138,960	48,042	16,088,181	41,071	12,807,869	80%	619,295	11%	3%
Growth 2012 -2016	83%	17%	24%	45%	80%	4%	93%	43%	38%	-28%	-42%	-39%

Kwahu Rural Bank

Kwahu Rural Bank was established in 1980. The Bank received the full package of assistance from MIDA. As in all other RBs the printers never worked.

The manager considers that computerization and T24 brought has brought many benefits to the bank such as increased transaction speed and decreased transaction time, increased the speed of check clearing and has enabled the members to send money to the other RBs.

However, they find the system too rigid since all RBs must develop same products due to centralization by the APEX. They are now asking a lot of questions about proposed introduction by APEX of ATM in terms of costs and benefits, internet banking, ATM, micro insurance, and mobile money which not integrated into T24. These operations are still connected to the accounts manually. The APEX Bank is very slow in responding to new product development ideas. The system has frequent downtime which is expensive for the bank.

In terms of performance as shown in Table 8 below, the bank has had its assets almost doubled, its accounts have increased by 50%, its deposits have increased by 78%, and capital has increased by 159%, but there has been a relatively small increase in Net Income. Profit margin has declined due to a faster increase in expenses as compared to income.

Table A3.7 - Kwahu Rural Bank

year	adjusted Capital	Adjusted Assets	Staff numbers	Annual Income	Annual Expenses	Number of deposit accounts	Balance of deposit accounts	Fixed and saving account as % of deposit accounts	net income (before tax)	profit_margins	average account balances
31/12/2012	1,989,196	14,392,274	76	2,397,431	1,893,970	30,833	11,758,666	2.44	503,461	21%	381
31/12/2013	2,793,200	16,103,456	89	3,813,179	2,827,198	35,061	4,081,238	0.17	985,981	26%	116
31/12/2014	3,315,638	18,732,951	92	4,491,300	3,562,182	39,273	14,339,514	0.75	929,118	21%	365
31/12/2015	4,027,445	21,346,885	84	5,165,100	4,147,368	40,930	16,013,607	0.70	1,017,732	20%	391
31/12/2016	4,635,159	25,780,594	87	6,061,919	5,069,985	44,394	19,530,229	0.79	991,934	16%	440
31/12/2017	5,154,193	27,675,097	86	3,003,296	2,434,601	46,290	20,887,658	0.82	568,695	19%	451
Growth	159%	92%	13%	25%	29%	50%	78%	-67%	13%	-10%	18%

Asante Akyem Rural Bank

The bank was established in 1982 and has 8 branches. Prior to the project, the bank was using an Excel-based method for keeping its customer transactions and did not use a banking software. The project provided 16 computers and 16 UPS, WAN and LAN and 16 printers in 8 branches.

The software was incompatible with printers which meant that the printers were never used. The project provided a computer appreciation courses and a 2-week T24 training course. Overall the time was short and more training should have been done. There was also training on the use of the generators. The training was task oriented and the managers did not get an overall training.

The software has greatly helped the bank in speeding up its transactions, check clearing, and transfers to other Rural Banks. The performance of the software in the reporting side is less than satisfactory because of problems with loan classification in terms of aging and overdue reports. The upgrade to R14 turned removed all the overdue loans and reported them as current which causes a lot of issues for loan monitoring. They monitor the loans manually through Excel.

Amongst the issue they mentioned is the very high communication costs which has gone up by 4 times over the past 5 years (Table below). The operating costs aspect of the software was not properly communicated to the RBs apart from a Workshop discussing cost share between APEX and the RBs. Most RBs had the impression that the computerization was basically free of charge.

Another issue is the centralization of the software and data storage at the APEX Bank. The banks cannot develop new products on their own and it all must accepted and introduced through the central system. Altogether the bank has 49 user licenses which is insufficient for its 8 branches and the cost of obtaining a new license is $1500 per license which is too high for the bank.

Customers are not fully satisfied because there were a lot of expectations. Technology has grown much faster than the T24 and the APEX Bank is slow to respond. They discussed mobile money application 6 years ago but still there is no connection between T24 and mobile money. The T24 does not offer internet banking and connection with the mobile banking wallet which is in demand for easy transfers of money to

anywhere. The statement printout remains a challenge and the bank's logo does not appear on the statement. The passbooks are still written manually.

In terms of impact on the indicators as shown in Table 9 below, the bank has had growth of its major indicators. Average account balances, value of fixed and savings accounts, net income, value of deposit accounts and assets all rose in line with findings of the quantitative study. Fixed and savings deposits as a % of all deposits also rose which is different from the quantitative study. Capital rose in contrast to the quantitative study. However, the bank has experienced negative profit margins and negative return on assets in spite of rising net incomes because of the faster increase in expenses as compared to income. This is also reflected in rising expenses per account. What the numbers show is a growing bank with rising deposits and assets but declining profitability. This overall result is consistent with key result of the Quantitative Study which is a growing RB system with declining profitability.

Table A3.8 - Asante Akyem Rural Bank

Year	adjusted Capital	Ajusted Assets	Annual Income	Annual Expenses	Communication costs	# of all deposit accounts	Balance of all deposit accounts	avearge account balances	value of fixed and savings accounts	% of fixed and savings accounts	net income (before tax)	profit margins	return on adjusted assets	Total expenses per account
31/12/2012	401,277	19,083,549	4,645,661	3,152,448	42,121	71,974	15,457,550	215	12,102,924	78%	1,103,353	24%	6%	43.8
31/12/2013	420,581	25,545,452	5,800,667	4,363,707	89,263	76,895	17,995,317	234	14,205,790	79%	1,252,607	22%	5%	56.7
31/12/2014	421,894	29,242,524	6,787,483	5,389,958	249,046	82,128	21,491,959	262	17,202,720	80%	1,139,571	17%	4%	65.6
31/12/2015	442,844	35,735,315	7,149,786	5,913,777	248,659	88,393	27,369,241	310	22,361,029	82%	1,036,281	14%	3%	66.9
31/12/2016		41,553,783	9,667,062	8,130,643	161,431	91,854	31,350,753	341	27,056,845	83%	1,536,419	16%	4%	88.5
Growth	10%	118%	108%	158%	283%	28%	103%	59%	124%	6%	39%	-33%	-36%	102%

Sekyere Rural Bank

As in some of the other Rural Banks, Sekyere Rural Bank was already computerized prior to the project by using the BSL banking software. However, before the project, the branches were stand alone and not connected. MIDA provided 2 computers per branch for a total of seven branches or 14 computers, 7 printers, and accessories. As in the other Rural Banks, the printers were not compatible with T24 and therefore never used. They also provided WAN for all the branches and LAN was already in place before the project.

Bank staff received a 2-day computer appreciation course and a 2 weeks training on T24 (50 people). Training was specialized for each position in the bank but the managers did not get an overall training. There was also training on the use of the generator.

It was six months after installation that the bank realized the financial challenges of the software. Originally, they had the impression of a gift without significant operating costs. After receiving the equipment, the RBs had a workshop where they were informed about the licensing There was insufficient budget to meet operating communication and additional licensing costs. The bank believes that the communication from MIDA was inadequate and the actual cost of the software was never revealed to them prior to the installation of the software. They have after the fact communication and billing from the APEX Bank that automatically debits their account without asking for their permission.

There has never been a service level agreement with the APEX for the supply and maintenance of the IT services.

The bank had expected that the computerization would make many functions automated. However, due to the challenges and certain inadequacies of the software, combined with an increase in the volume of business, their staff numbers has increased.

Several features such as loan classification, passbook updating, and mobile money do not yet exist in T24. These tasks are done by using five other software. According to the users at the bank including the IT manager, in comparison to the old BSL banking software, T24 is less user friendly and more rigid. They have experience frequent downtimes. During the whole of January 2016, the system was down frequently and in 2017 the system was down about 8 times and no explanation was given by the APEX Bank. Transaction are in real time but reporting has a two-day delay in the system.

The bank received 28 licenses under the project. The annual maintenance cost is 16% pf the cost of license with a total license maintenance payment of $6,720. The last payment for communication costs was GHC 54000 for one quarter or GHC 216,000 for 1 year (US$ 51,500). The APEX Bank has promised to bring down the annual price. However, the high communication costs is one of the reasons for the decision to migrate out of the system to Bank Mill and keep only 1 license and 1 connected branch for check clearance purposes. The bank emphasized that the resources needed to meet communication and license maintenance costs has eaten substantially into their profits.

The view of the bank's management is that the software itself is of high quality but it is poorly managed by the APEX and its quite costly compared to other alternatives.

The issue of the difficulties in printing loan classification report in terms of aging and overdue loans was mentioned. Another issue which is said to be being addressed by the APEX Bank is that interest was being calculated on interest and interest due was being considered as income whereas the BoG regulations require that only interest actually received may be considered as income. This has in several occasions resulted in inaccurate income and profits figures.

In general, the opinion of the management of the bank is that T24 has not produced the expected results. Their criticism is that the software and the project were rolled out regardless of the initial conditions of each Rural Bank and this disregard has created resentment in some instances. The management believes that the software was imposed on them by the previous MD of the APEX Bank.

In terms of impact Table 10 below shows that the bank has had growth in most indicators except the Profit Margin and Return on Assets. Average account balances, value of savings and fixed deposits, value of all deposit accounts, net income, and total assets rose consistent with the findings of the Quantitative Study. The results that are different from the Quantitative Study are the percentage Fixed and Savings Deposit accounts as a % of all account balances which rose by 66%, total capital which rose by 68%, total number of accounts which rose by 27%, number of staff which almost tripled, and expenses per account rose by 126%. Expenses rose by 37% more than income leading to a declining profit margin and declining return on assets. These last results seem to be quite generalized in most Rural Banks.

Table A3.9 - Sekyere Rural Bank

Year	Assets	Capital	Savings deposits	Number of savings accounts	Current Accounts	Number of current accounts	Fixed depoosits balances	number of fixed deposits	Total # of accounts	Total customer deposits	% of fixed and deposit account balances	average account balances	Income	Expenses	Profit before tax (net income)	Profit margin	return on assets	# of staff	expenses per account
2012	31,162,026	4,117,520	12,530,490	76,489	5,551,948	14,755	3,619,598	769	92,013	21,702,036	17%	236	6,371,965	5,059,138	1,312,827	21%	4%	76	55
2013	35,904,874	4,926,841	13,334,389	81,003	5,914,626	17,509	5,176,087	847	99,359	24,425,102	21%	246	8,148,264	6,850,353	1,297,912	16%	4%	89	69
2014	43,671,471	5,586,688	15,341,658	90,251	6,512,096	19,933	8,577,202	939	111,123	30,430,956	28%	274	9,930,404	8,707,322	1,223,081	12%	3%	92	78
2015	53,972,551	5,902,314	19,032,059	93,152	7,374,120	20,003	10,659,660	1,051	114,206	37,065,839	29%	325	12,554,803	11,352,941	1,201,863	10%	2%	84	99
2016	65,677,386	6,906,957	22,175,593	94,011	9,045,483	21,152	11,977,396	1,702	116,865	43,198,472	28%	370	15,922,475	14,538,283	1,384,191	9%	2%	211	124
Growth	111%	68%	77%	23%	63%	43%	231%	121%	27%	99%	66%	57%	150%	187%	5%	-58%	-50%	178%	126%

Nsutaman Rural Bank

The bank was established in 1984. T ran its operations manually before the project. They received 4 computers, 2 WAN and LAN connectivity, 2 Statement Printers, and 2 Passbook printers.

The manager considers that they have gained a lot for computerization and connectivity and especially from T24 despite the high communication costs which is a major problem in the bank.

The manager stated that for now they are fine with the current arrangements but they have considered the alternatives but they don't have the resources for migration to BankMill.

As in the other Rural Banks, the printers were never used because of incompatibility with T24. The supplier just connected the printers but never made them work.

The bank was not ready to meet the communication costs and because of devaluation since 2012, the costs have multiplied several folds. the payments to the APEX for communication and license maintenance costs are automatically debited from our account at the APEX bank without asking the bank. The bank was not informed about the operating costs which are extremely high. Initially it was GHC 60,000 (US$14,500) per year and now it has been reduced to GHC 50,000 (US$ 12,000) per year plus 16% of the original license cost for annual maintenance fee. The bank has had to find the resources to pay for communication costs but it has always been difficult and this has affected their net profits significantly. To cut down costs, the bank has changed one branch (Meduma) from VSAT to radio and our operating cost has gone down after connecting to the radio.

The bank has a positive impression of the project despite the high communication costs. Customers can withdraw from branches because of the connectivity. Number of all deposit accounts has gone up after computerization because of good customer experience. Savings and fixed deposit has gone up because of the high interest rates offered by the bank. Net income is growing. Every year (except for last year) we have been able to move GHC 200,000 from net surplus to capital. We now have GHC 440,000 as our capital.

At the beginning of each month, APEX runs cobs which causes downtime for the software.

Loan classification and loan aging analysis, analysis of overdue loans, are not done using T24 but manually in. Shares are not bought frequently and therefore retained earnings is the main method for capitalization. Due to nonpayment of dividends our shares are unattractive.

They can clear check by express on the same day. Before computerization, it took a minimum of 4 days. If the check was out of station, it could take one month. Mobile money operations are not connected to T24 and it is a separate manual system.

Computers not being used for passbook printing. software was incompatible with passbook printer; passbooks are still written manually.

T24 and connectivity has improved bank supervision of the branches and data security.

In terms of impact shown I Table 11 below, the all indicators show growth except the Profit Margin which is negative because of the faster growth of expenses relative to income. The main significant difference with results of the quantitative study is the sharply deteriorating return to assets which was found to be significantly and positively associated with computerization and banks going live earlier.

Table A3.10 - Nsutaman Rural Bank

Date	capital	Ajusted Assets	Total deposits	Annual Income	Annual Expenses	Profit before tax	profit margin	Return on Assets
31/12/2011	150,684	919,019	2,694,741	424,775	315,540	109,235	26%	12%
31/12/2012	NA	3,059,879	2,523,256	NA	NA	48,255	NA	NA
31/12/2013	NA	3,634,662	2,781,554	NA	NA	203,891	NA	NA
31/12/2014	NA	3,975,763	2,927,168	792,080	615,782	176,299	22%	4%
31/12/2015	220,000	5,157,613	3,810,567	938,389	785,250	153,140	16%	3%
31/12/2016	440,000	6,886,050	4,906,674	1,226,487	1,048,993	177,494	14%	3%
Growth rate 2012-201	192%	649%	82%	189%	232%	62%	-44%	-78%

Offinso Rural Bank

The bank was established in 2008. The Offinso Rural Bank had been already computerized before the project using the BSL banking software. It had 2 branches (3 branches now). The project provided the T24 software including installation with VSAT for both branches. LAN had already been done. As the banks was already computerized, it did not receive any computers or printers. They also received a computer appreciation course and a 2-week training on T24. They also received training on the use of the generator.

According to the manager, the APEX made it mandatory for them to adopt the software. The check clearing system and the interconnectivity of branches were new to the bank.

As in other banks, they were not informed about the costs of running the system. The bank was insufficiently prepared to meet the communication costs.   Management felt that since all the RBs were getting in, then we should go for it and get connected. The customer experience has been good especially with connectivity, faster transaction times, faster check clearing times, and more accuracy.

However, there is no internet banking, no connection with mobile money and no ATM so far. The T24 does not give details of the customer or the logo of the bank These are the sources of dissatisfaction. Downtime is frequent and system is sometimes very slow due to the high volumes of usage.

Moreover, the loan classification reports are not correct and statements cannot be printed in real time. The manager stated that the APEX organized a workshop to explain the cost share but not the actual costs.

There is no service level agreement between the bank and the APEX. The specific terms of agreement between APEX and the VSAT provider ASL are not known to the bank. The communication costs has skyrocketed especially, since the contract is in US dollars, after the over 100% devaluation of the Ghanaian

Cedis between 2012 and 2016. The Ashanti Association has formally complained and sent a delegation to the APEX but with no results.

The manager said however that they would move out if they could afford the cost. A neighboring bank has already moved out and its doing better than the Offinso Rural Bank.

No dividends has been paid to shareholders since the beginning of the bank. However, they feel that their data is secure and free of viruses and that the data disaster center is working.

In terms of impact shown in Table 12 below, value of fixed and saving deposits, value of all deposit accounts, total assets, and fixed and savings deposits as % of all deposits rose which is in line with the findings of the quantitative study. Total number of accounts rose while the Q study finds no effect. Profit margins and capital declined again in line with the quantitative study. Returns on adjusted assets and net income declined which as well is not what was concluded by the quantitative study. More generally, the bank confirms the general trend of declining profitability and return on assets that most rural banks are experiencing despite growth in assets and deposits. This shows that the bank, despite growth of accounts and deposits and assets, is not growing in its capital base. The computerization has led to an accelerated growth of deposits but the deposits are not creating the additional profits or value for the bank due to rising costs as compared to income. This is partly explained by the rising communication costs.

Table A3.11 - Offinso Rural Bank

Date	Capital	Assets	Savings Accounts	Current Accounts	Fixed deposit accounts	Annual Income	Annual Expenses	Balance of all Deposit Accounts	Bal of Savings and Fixed accounts as % of deposit accounts	Number of accounts	Average account balances	net income (before tax)	profit margins	Retrun on Assets
31/12/2011	624,979	5,800,583	2,226,897	1,331,926	151,364	1,774,815	1,433,457	3,710,186	64%	8,333	445	341,358	19%	6%
31/12/2015	504,012	7,464,134	4,377,144	1,348,716	402,820	1,137,529	1,063,444	6,128,680	78%	13,000	471	49,084	4%	1%
31/12/2016	508,112	8,609,477	5,478,069	1,294,535	797,680	1,273,200	1,178,054	7,570,285	83%	20,000	379	59,484	5%	1%
Growth 2011-2016	-19%	48%	146%	-3%	427%	-28%	-18%	104%	29%	140%	-15%	-83%	-76%	-88%

Bosomtwe Rural Bank

The bank was established in 1982 and has 10 branches. It was computerized before the project by using the BSL banking software. The project provided WAN for all 10 branches and interconnected the branches which was not the case before the project. They also received the T24 software and 1 generator per branch. They had a computer appreciation course and a 2-week training on T24 plus training on the use of the generator.

As a result of the T24 software, internal controls have been enhanced with lower possibility of fraud, loan classification has become easier, and there is more confidence in the bank. Moreover, banking hall queues are much less, and there are fewer complaints about statements. As compared to BSL, the software has more controls and is much less susceptible to manipulation.

The main issue, as in all other Rural Banks visited, was the inadequate preparation of the bank for meeting the communication and licensing costs. They stated that there was poor communication from the APEX regarding this matter. The Rural Banks were not informed about the costs prior to receiving the equipment and they had the impression of a gift without significant operating costs. After receiving the equipment, the RBs had a workshop where they were informed about the cost sharing for licensing maintenance and communication costs.

The bank considers that T24 is a very efficient banking software which is poorly managed by the APEX and moreover it is very expensive.

The bank stated that they are planning to move out of the system to BankMill and keep only one branch connected with a single license mainly for check clearance. The estimated cost of moving out of the system is about $90,000 and the balance is spread over 36 months.

The licensing maintenance cost in BankMill starts 1 year after start-up and is 15% of the license cost. The new software would have unlimited users. The bank currently has 28 user licenses which is not sufficient for its needs but the cost of getting more licenses is too high for them. Because of high costs of obtaining a new license, access is limited and for example the credit director cannot produce loan reports because of the lack of user access the credit.

The bank does not agree with APEX debiting their account automatically for communication costs without asking their permission to do so. The Rural Banks feel that the APEX does not respect them and is acting unilaterally without adequate consultation with the Rural Banks.

The APEX bank has the mandate of supervising the Rural banks on an annual basis but the bank stated that they have not seen the APEX representative for a long time. It is still the Bank of Ghana that does the annual supervision.

In terms of impact shown in Table 13 below, average account balances, value of fixed and savings deposits, net income, value of all deposit accounts has risen in line with the findings of the quantitative study. Fixed and Savings deposits, total adjusted capital, number of accounts, number of staff, and expenses per account has all risen in contract to the quantitative study. Profit Margin has declined in line with the results of the quantitative study but return to assets has also decline.

Table A3.12 – Bosomtwe Rural Bank

Date	Capital	Assets	Staff	Annual Income	Annual Expenses	Total number of accounts	Balances in deposit	average account balances	Balances in fixed and savings	% of fixed and	Net Income	Profit margin	Total expenses per account	Return to assets
31/12/2012	4,990,172	22,292,660	174	5,824,932	4,480,820	88,466	24,339,523	275	21,447,917	88%	1,344,112	23%	1,156,796	6%
31/12/2013	6,261,322	23,643,445	188	NA	NA	92,002	24,347,670	265	23,596,608	97%	NA	NA	NA	NA
31/12/2014	6,330,207	36,874,013	197	8,170,485	6,821,454	97,848	24,018,724	245	27,738,412	115%	1,349,031	17%	1,349,030	4%
31/12/2015	7,146,847	45,561,724	209	10,263,044	8,506,997	104,345	30,831,098	295	35,745,801	116%	1,756,047	17%	1,756,047	4%
31/12/2016	7,367,425	56,481,145	237	13,484,967	11,142,415	109,062	38,441,953	352	45,004,114	117%	2,342,552	17%	2,342,552	4%
Growth 2012 -2016	48%	153%	36%	132%	149%	23%	58%	28%	110%	33%	74%	-25%	103%	-31%

Akoti Rural Bank

The bank was established in 1984. The bank was run manually before the project. They received the full package for seven branches (14 computers, 1 4UPS, 7 WAN and LAN, and 7 generators). They also received the T24 software. They had a computer appreciation course and a 2-week training on T24 plus training on the use of the generator.

The manager stated that the T24 software is very efficient in many respects especially for improving internal controls, making our banking transactions more accurate, faster, and allowing a better customer experience. Ques are less, transaction time is shorter, check clearing is much faster and loan classification has become easier. loan classification has become easier, and there is more confidence in the bank.

The main issue, as in all other Rural Banks visited, was the inadequate preparation of the bank for meeting the communication and licensing costs. They stated that there was no communication on this matter. The Rural Banks were not informed about the costs and they thought they were receiving a free gift from the government without significant operating costs. After receiving the equipment, the RBs had a workshop where they were informed about the cost sharing for licensing maintenance and communication costs.

The bank stated that they would move out of the system if they could. The bank does not agree with APEX debiting their account automatically for communication costs without asking their permission to do so.

The APEX bank has the mandate of supervising the Rural banks on an annual basis but the bank stated that they have not seen the APEX representative for a long time. It is still the Bank of Ghana that does the annual supervision.

In terms of impact shown in table 14 below, value of fixed and savings deposits, net income, value of all deposit accounts has risen in line with the findings of the quantitative study. Fixed and savings deposits and total adjusted capital, number of accounts, number of staff, and expenses per account has all risen in contrast to the quantitative study. Net Income and Profit Margin, and return to assets has also declined.

Table A3.13 – Akoti Rural Bank

Date	Adjusted Capital Base	Adjusted Assets	Balances of savings	Balances of fixed deposit	Annual Income	Annual Expenses	Balances in all deposit accounts	Balances in fixed and savings	% of fixed and savings	Net Income	Profit margin	Return to assets
31/12/2012	354,212	5,562,793	3,317,953	474,992	171,478	179,725	4,955,998	3,792,945	77%	118,193	69%	2%
31/12/2013	164,473	5,906,716	3,769,365	586,592	151,790	155,199	5,356,247	4,355,956	81%	(3,409)	-2%	0%
31/12/2015	227,680	6,913,732	4,590,961	521,483	1,490,686	1,547,743	6,237,477	5,112,444	82%	(65,056)	-4%	-1%
31/12/2016	156,830	8,898,123	6,171,702	714,636	1,856,825	1,785,853	7,924,527	6,886,338	87%	(139,028)	-7%	-2%
Growth 2012 - 2016	-56%	60%	86%	50%	983%	894%	60%	82%	14%	-218%	-111%	-174%

Kakum Rural Bank

The bank was established in 1980. It received equipment for its 10 branches (20 computers, 20 UPS, 40 printers, 20 generators, LAN and WAN for each branch and the T24 software. It also received a computer appreciation training and a 2-week training on T24 plus training for generator maintenance.

According to the manager the software did serve the bank well. T24 is efficient and the number of clients initially rose but due to the embezzlement it has declined since 2014. Transaction time when the system is running normally and when we had sufficient cash was 2 minutes or less. When the system is slow, transactions take about 5 minutes especially at month end. T24 has however improved service delivery.

There are instances of downtime around end of month when the APEX Bank runs Close of Business.

They print from the note pad after copying the data from T24 because they printers have never worked. Mobile banking has not been integrated on the T24 yet. The bank has been disconnected from the i-transfer for sending money to the other rural banks because if its liquidity challenges due to the embezzlement. We have been disconnected from the I-trans because of liquidity challenges. The software is not connected to Mobile Money which is therefore not connected directly to customer accounts.

The manager complains of Inflexibility of developing own products as everything must be done through APEX Bank. The bank feels that their data is secure.

In terms of impact shown in Table 15 below, the numbers are largely a reflection of the major embezzlement that has almost destroyed the bank. Starting from 2013, the bank's indicators begin a sharp deterioration as the impact of the embezzlement begins to appear and customers start to withdraw and lose trust in the bank. The figures from this bank which is currently highly distressed are not representative of the average Rural banks and cannot be used for assessing the impact of the computerization.

Table A3.14 - Kakum Rural Bank

Date	Capital	Assets	Annual Income	Annual Expenses	Balances in deposit accounts	Net Income	Profit margin	Return to assets
31/12/2012	1,809,450	18,359,698	4,143,830	3,897,129	14,642,194	196,001	5%	1%
31/12/2013	1,668,335	17,918,878	3,921,909	4,049,834	14,169,276	(138,579)	-4%	-1%
31/12/2014	(2,482,637)	15,279,953	3,964,528	8,121,137	14,175,881	(4,156,609)	-105%	-27%
31/12/2015	(1,197,768)	14,063,318	2,842,084	2,136,830	12,706,527	(2,513,912)	-88%	-18%
31/12/2016	(7,809,597)	7,559,236	1,638,016	5,034,749	12,364,601	(6,614,176)	-404%	-87%
Growth 2012 - 2106	-532%	-59%	-60%	29%	-16%	-3475%	-8637%	-8296%

Ekumfiman

The bank was established in 1983. It was manual when the project arrived. The bank received computer and connectivity equipment for its 3 branches. The rural bank repeated most of the issues raised by the other banks especially in terms of the relationship with the APEX bank and the high communication costs.

They stated that the collapse of the Kakum bank nearby (90 minutes away) has spilled over to their area leading to a general distrust of rural banks and many clients have withdrawn their money. They are hopeful however that with improved economic climate the bank can recover.

In terms of performance shown in Table 16 below, despite the growth of deposits and average account balances, all other indicators are negative. This cannot be attributed to the computerization project which resulted in the growth of the bank until 2014. It was after the embezzlement in the neighboring Kakum Rural Bank and the generalized the distrust of the rural banks in the area that customers reduced their interaction with the bank.

Negative incomes show that the expenses associated with paying interest on fixed and savings deposits are larger than the incomes generated from loaning out or investing these funds.

This bank and other stressed banks with negative growth (declines) show the great dispersion that exists amongst the rural banks and therefore caution is needed when generalizing about aggregate performance.

Table A3.15 - Ekumfiman Rural Bank

Date	adjusted Capital	Ajusted Assets	Staff	Annual Income	Annual Expenses	Number of all deposit accounts	balance of all deposit accounts	average account balances	% of fixed and savings deposits	net income (before tax)	profit margins	Return on assets
12/31/2012	(202,193)	1,661,600	32	322,138	411,939	4,133	1,649,053	399	60%	(89,801)	-28%	-5%
12/31/2013	26,580	2,101,760	24	673,776	425,215	4,775	1,871,324	392	69%	248,561	37%	12%
12/31/2014	(118,268)	2,461,894	27	508,946	828,586	3,962	1,901,274	480	72%	(319,640)	-63%	-13%
12/31/2015	(995,941)	2,083,062	29	163,140	1,007,809	3,650	2,222,080	609	68%	(844,678)	-518%	-41%
12/31/2016	(658,460)	1,139,446	23	(162,212)	1,478,476	3,482	2,380,127	684	60%	(1,640,688)	1011%	-144%
Growth 2012-2016	-226%	-31%	-28%	-150%	259%	-16%	44%	71%	1%	-1727%	-3728%	-2564%

General Trends

Below, we summarize, based on the information received during the visits, the trends in rural banks' indicators post-2013. It should be noted that these are just general trends and should not be understood as impacts of the Financial Service activity.

1. Assets: 11 out of 14 rural banks had growing assets. The rural banks with no growth of assets were distressed banks with poor management and embezzlement. Prior to mismanagement issues surfacing, the project appeared to be positively associated with growth of assets for all banks including those that are now classified as distressed.

2. Total Deposits: 11 out of 14 rural banks had growing deposits. The rural banks that had no growth of deposits were the distressed banks influenced by poor management practices. The impact of computerization appears to have been positive prior to poor management taking effect.

3. Fixed and Savings Deposits Balances: 11 out of 14 rural banks had growing fixed and saving deposit balances. The rural banks showing no growth in fixed and savings deposits were distressed banks impeded by poor management practices. The computerization effect on fixed and savings balances seemed positive prior to poor management.

4. Ratio of Fixed and Savings Deposits/Total Deposits: In 10 out of 14 cases, this ratio rose, showing that the interest rates offered by the rural banks were competitive and attracted fixed and savings deposits that rose faster than current deposits that do not gain interest. This trend sharpened between 2013 and 2016 when interest rates offered by rural banks in Ghana almost doubled from 13% to 26% and then declined to 21% in 2017[6].

5. Number of Accounts – 11 out of 14 RBs had growing number of deposit accounts. Only distressed banks (Asuogyaman, Kakum, and Ekumfiman) had a declining number of deposit accounts because of customers closing accounts or the high rise of dormant accounts that have been closed by the bank.

6. Average Account Balances – 11 out of 14 banks had growing average account balances except for the distressed banks already mentioned. This shows the effects of the growth in the Ghanaian economy and that the clients are finding the rural banks to be an increasingly safe place for keeping their funds. It is also consistent with the positive effect of the intervention detected in the

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[6] Interest rates raised as the government maintained heavy borrowings to cover the fiscal deficit.

impact evaluation, but of course it cannot be concluded that this is due to the effect of computerization.

7. <u>Net Income</u> – Net Incomes are under pressure partially due to the rising communication costs but also due to the rate mismatch that is the rising costs of deposits (interest paid on fixed and savings account by the rural banks) as compared to interest received by the rural banks from their investments in Treasury Bills and other sources. BoG interest rates rose from 15% in 2013 to 27% in 2016 and came down to 21% by mid-2017[7]. The rising cost of funds did not always match adequately to the rising interest on loans and other incomes thereby creating cost pressures downward on rural banks. This is a factor independent of the Financial Services activity but has affected the indicator adversely.

8. <u>Profit Margin</u> – 13 out of 14 rural banks had declining profit margins. Profit margin shows the percentage of net income in total income. Declining profit margin indicate that the rural banks are increasingly losing their attractiveness as a place to invest in for stakeholders. The faster rise of costs as compared to income helps explain this trend.

9. <u>Return on Assets</u> - 13 out of 14 rural banks had declining return on assets in the last few years making them an unattractive investment.

10. <u>Capital</u> – 10 out of 14 rural banks had rising capital. It should be noted that this indicator is greatly influenced by regulatory factors since all rural banks must reach at a minimum the capital of GHC 1 million by the end of 2017 or they could lose their operating license from BoG. In other words, this indicator is not directly attributable to improved performance caused by the GRBCIP. Some rural banks have been seeking new shareholders for boosting their share capital. Moreover, most RBs are not paying dividends so that the net profit/income can be transferred to capital to reach the regulatory requirement.

11. <u>Number of Staff</u> – 10 out of 14 banks have had an increase in the number of staff. The expectation of the project was that computerization would lower the staff numbers as some of the tasks would be carried out automatically, thereby reducing the time required for performing them. None of the banks reported a decrease in staff numbers. Generally, the rural banks have stated that their staff requirements increased following the project for two reasons: the growth of transactions has required an increase in staff number and the aforementioned shortcomings of the T24 software such as the inability to print statements directly, instead requiring exporting to Excel prior to printing.

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[7] Bank of Ghana Website

[8] The government absorbs a large amount of savings against the promise of high interest rates. This has turned many Ghanaians to buy government bonds and get a return instead of investing in productive activities.

ANNEX 4: QUALITATIVE DATA DESCRIPTION ON CUSTOMER INTERVIEWS, APEX BANK, AND KPMG

I.   CUSTORMER INTERVIEWS

The Qualitative Study included several customer interviews in selected banks whenever it was possible to find customers who had banked with the Rural Bank for several years. The interviews were carried out at Sekyere, Akoti, Kakum and Ekumfiman Rural Banks.

According to the customers, transactions are processed much faster now than before the computerization and this has saved much time for them. They confirmed that the banking hall before the computerization was a much busier place than now especially at the end of the month when salaries are paid.

Customers explained that they receive a wide range of services including current, savings, and fixed deposit accounts.

Some of the customers used to have loans but they have paid them off.

The customers especially in some of the distressed banks complained of the fact that they cannot withdraw all their savings due to embezzlement and downturn of the banks but they confirmed that computerization had brought much business to the bank.

The customers also confirmed that check clearance is much faster and they can get a statement when they need it.

The customers in the stressed banks expressed optimism that the situation will improve. The bank is very considerate (unlike the commercial bank) and the customers are confident that things will improve.

II.   APEX BANK

The APEX Bank was established in 2001 as a mini Central Bank for the RBs in Ghana. The Bank is registered as a Public Limited Liability Company and its objectives are to provide central banking functions such providing liquidity, providing banking and investment services, and monitoring the rural banks. The non-banking function as stated in their charter is to provide training for the rural banks. It should be added that the current role of the APEX Bank as a service provider for T24 is nowhere mentioned in its original functions descried in the Legislative Instrument that created the Bank in 2002.

The APEX Bank was the implementation agency of the Computerization and Connectivity Project while KPMG was appointed to watch over all procurements. The APEX Bank benefitted from the project as it received a Data Centre for providing data management services and connectivity to the RBs. Through the Data Centre the bank manages the T24 software for real time banking transactions for all the RBs and represents the RBs at the Online Banker's Clearing House for Check Clearance, Check Codeline Clearing (CCC), and the Automated Clearing House (ACH).

The principal issue gripping the bank currently is how to manage the Data Centre communication costs. The cost sharing arrangement introduced in 2016 for the APEX Bank to absorb 50% of the Data Center communication resulted in the APEX Bank absorbing GHC 9 million (US\$ 2 million) of communication costs resulting in a major loss to the bank for the year 2016. In terms of profit and loss, the APEX went from a profit of GHC 1,056,566 (US\$ 250,000) in 2015 to a loss of GHC 13,365,251 (US\$ 3.2 million) leading to a 35% shrinkage of APEX Bank's capital.

To lower the communication costs for the RBs, the APEX has renegotiated the contract and has agreed to lower the bandwidth from 24 mbps to 16 mbps and a further reduction to 12 mbps by the end of 2017. This reduction is directly contributing to lower transaction speed and more frequent downtimes for the |RBs. The service quality offered by the APEX bank to the rural banks is therefore adversely affected. This explains a major part of the dissatisfaction of the RBs vis a vis the APEX Bank.

In terms of project implementation, the Bank did not consider the initial conditions, the preparedness of each bank, or the regional location of the RBs for differentiating its implementation approach. All the RBs were treated in the same way.

For example, some of the RBs were already computerized using the BSL banking software. These banks, which are currently amongst the most disgruntled, were discriminated against since they did not receive the full set of equipment as the totally manual banks. The previously computerized banks claim that they have benefitted in terms of connectivity but not so much in terms of data processing within the bank itself.

The fact that data is totally centralized is also an issue for many RBs. This demand for independence and the high VSAT communication costs is driving many rural banks to consider migrating to the BankMill software and keep only a minimal connection in one branch mainly for accessing the check clearing system.

In presenting the issues raised by the rural banks to the APEX Bank, the newly appointed MD was very sympathetic and stated that the evaluation team conducting the Qualitative Study has done a very valuable service to the APEX Bank by bringing to them the concerns of the RBs. He noted down each and every point and has requested a detailed answer from its technical heads. However, the IT Director who was present at the debriefing meeting appears to live in a state of denial by saying that all the issues have been or are being addressed without giving a clear acknowledgement or understanding of the solutions. For example, the plan to introduce ATMs in all the rural banks or E-banking is considerably behind schedule and many of the rural banks are skeptical in engaging further with the APEX Bank. He also dismissed the loan classification issue that has been raised by almost all the RBs.

KPMG

The discussion with KPMG management brought out the following points:

1. Computerization was a big milestone for the project. Many concerns regarding modern banking practices involving work efficiency, record keeping, security, supervision, and customer experience were addressed. RBs are now asking for more sophisticated products.

2. The mandate of KPMG was to support the APEX Bank in rolling out the computerization program although they did not participate in project design. KPMG was hired to watch over the vendors from a cost perspective and compliance with contract making sure that the vendors respect their contracts and provide quality assurance and risk management.

3. Many RBs were venturing into the technology space for the first time. MIDA had a limited budget and wanted the basics in place with priorities on infrastructure hardware, printers, back-up power supply, accessories, T24 software. The RBs were moving from a manual ledger to an electronic ledger.

4. No funds were foreseen for post-implementation. MIDA assumed that APEX would come up with a post-implementation growth plan which did not and has not happened. It was inevitable that the volume of transactions would grow. With many more customers and a major increase in the volume of data, issues of data storage and computerized application were always a challenge.

5. The Close-out Report prepared by KPMG explicitly expresses its views on post implementation regarding management, growth and sustainability of the IT infrastructure especially regarding WAN and the related VSAT communication costs. KPMG reviewed and brought some of these challenges to MIDA but there was no follow-up from MIDA's side. From the analysis of the communication costs alone, KPMG was aware of challenges ahead. WAN services through VSAT were very expensive, there were no fall back plans, and the APEX Bank could not absorb the rising costs without losing substantial sums of money which happened in 2016.

6. The relationship between the RBs and the APEX bank was never made clear through a written Service Level Agreement. It was clear at close-out that the operating costs escalation had to be handled very carefully. RBs were being tasked to support a project with cost escalation potential. This lead to conflict and misunderstanding which is now out of control.

7. The project sustainability issues were generally ignored by MIDA. Most of the trained staff have left the RBs and the remaining staff were inadequately prepared. When RBs went live, quickly it was realized that the data capacity is insufficient. The APEX has since then invested an additional US$ 4 million in data capacity from its own resources. The Steering Committee was dissolved at close-out despite the recommendation in the close-out report that the Steering Committee must continue for a while to supervise and assist in post-implementation.

ANNEX 5: MEMORANDUM: RECOMMENDATION FOR EVALUATION OF MCC GHANA RURAL DEVELOPMENT PROJECT: FINANCIAL SERVICES ACTIVITY

To:	Sarah Lane, MCC
From:	Alicia Menendez, NORC
Date:	March 2, 2018
Subject:	Recommendation for Evaluation of MCC Ghana Rural Development Project: Financial Services Activity

Background

Since the inception of the evaluation of the Financial Services Activity in Ghana 2011, NORC was informed during several meetings at the Bank of Ghana and at APEX that it was not possible to obtain monthly check clearing data by Rural Bank for the period 2009-2011. We informed MCC and MiDA about this data deficiency and its implication for the evaluation design. Specifically, NORC discussed the issue with MiDA during our design trip debrief meeting, the MCC project manager immediately after the trip, and included this in the Evaluation Design Report. The Evaluation Design Report was approved, without comment on the absence of check clearing data, and NORC proceeded with the evaluation under the assumption that the lack of a quantitative analysis around check clearing times and volumes was not an issue.

In January 2018, comments to the final evaluation report made by former MiDA staff, Mr. Yaw Brantuo, opened a discussion about the availability of check clearing data.

For the impact evaluation, NORC needs pre and post intervention (January 2009 to December 2013) monthly check clearing data (number of checks, volume, and/or clearing times) by Rural Bank. In the analysis we take advantage of the staggered rollout of the intervention – namely, the fact that different banks transitioned to computerization at different times over a 20-month timeframe - to econometrically identify and measure the effects of the GRBCIP on outcomes of interest. This can only be done with monthly data by bank.

This year, following on Mr. Brantuo's assertion that the check clearing data required for the impact analysis was available and accessible, Alicia Menendez, NORC evaluation PI, met with BoG representatives identified by Mr. Brantau as likely sources of the check clearing data.

Actions and new information

Mr. Brantuo facilitated a meeting with Clarissa Kudowor, Assistant Director at the Payments Systems Department of Bank of Ghana and one of her colleagues at the Department. Mr. Albert Nyarko from MIDA was also present in the meeting. Below, please find a summary of our conversation:

- The Payments Systems Department of the Bank of Ghana (BoG) does not produce any data by bank. They only have aggregate or industry data.

- BoG does not have the data by bank

- It is possible that Ghana Interbank Payment and Settlement Systems Limited (GhIPSS), a wholly owned subsidiary of the Bank of Ghana, has <u>post</u> intervention data, perhaps by bank

- The availability of the <u>pre</u>-intervention data is uncertain. When the system was manual or mechanical, there were different modalities to deal with clearance; for example, Rural Banks had agreements with commercial banks that did the clearance for the Rural Bank. It is not clear to Ms. Kudowor and her colleague whether separate information about check clearance for rural bank exists for pre-intervention period.

- The BoG oversees GhIPSS. They indicated that GhIPSS would not share any information unless MCC/MIDA obtains clearance from the BoG first.

- Ms. Kudowor's suggestion was that MCC/MiDA write to the BoG Governor requesting the required data. While it is not clear that the information is available, particularly for the pre-intervention period, when the system was manual or mechanical, we can only verify availability and accessibility by going to the BoG top authority. It is likely a complex process to produce the data, if it is available and we receive BoG authorization to obtain it.

Recommendation regarding data availability

The information obtained in our meeting with the BoG staff about pre-intervention check clearing data is consistent with what we learned in 2011. Taking into account the recent BoG staff opinion on the matter, prior information, and the experience NORC had collecting all the other financial indicators used in the report (see Evaluation Report, pages 10-11), we conclude that the likelihood of obtaining all the data necessary to assess impact on check clearing is very small. If at all feasible, the process will take substantial time and resources with intervention required on the part of MCC and MiDA.

Given the low probability of success and the associated costs in time and funds, it is NORC's recommendation that we discontinue the data search and, instead, use the qualitative data we have to address the evaluation questions around check clearing. However, please note that we are willing and available to continue efforts to obtain the pre- and post-intervention check clearing data, should MCC and MIDA desire it. We stand ready to do what is necessary to obtain the data, if it exists, from GhIPSS once MCC/MiDA obtains the necessary authorizations from the BoG Governor.

Can aggregate data inform the effect automation had on check clearing?

As, we have discussed during numerous phone calls and emails, our opinion is that aggregate data would not be informative in this case. There are multiple factors other than the Computerization and Interconnectivity interventions that could have affected trends. For example, a growing economy could increase the volume of checks cleared while alternative payment methods such as mobile money could reduce it. Using aggregate data does not help understand the effects of the intervention.

Before our meeting in Ghana, the BoG Payments Systems Department shared with us the post-intervention checks clearing data they have available:

Table 1: Cheques Cleared									
Indicators	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Volume/number	5,604,763	6,068,212	6,509,594	6,710,475	6,796,712	6,962,297	7,146,259	7,309,406	7,334,460
Value (GH¢'million)	28,607.00	38,501.18	53,160.92	69,222.07	81,144.33	113,698.39	131,189.70	152,390.42	179,555.47
APEX VOL					215,909	214,348	194,593	179,213	170,723
APEX (GH¢'million)					1,581.00	2,132.76	2,298.44	2,718.78	3,322.09

The data shows the total number and value of check cleared (rows 1 and 2) from 2009 and 2017. The BoG also has the same information for the Rural Banks starting in 2013 (rows 3 and 4). We discussed the trends of these indicators during the meeting with the BoG staff, who stated that aggregate check cleared data is non-informative in understanding the effects of the MiDA intervention on check clearing indicators. They mentioned, unprompted, that multiple exogenous factors, such as mobile money, affect trends and it would be misleading to use aggregates to understand the effect of the project on check clearing. This is consistent with NORC's opinion.

What do we know about the effect of intervention on check clearing?

Because we knew that check-clearing data was not available for the quantitative analysis, we included questions about it in our qualitative design. Our financial sector experts collected information about effect of the project on check clearing from key informants in Rural Banks and APEX. The findings are included in the final evaluation report. The qualitative approach rendered valuable information. All Rural Banks agree that connectivity to the national cheque clearing platform (CCC) has reduced clearing times from five days and even up to one month for out of station cheques prior to the intervention, to just one day after the intervention.

During our recent visit, Ms. Kudowor and her colleague at the BoG advised us to complement our quantitative work with qualitative research to understand the effects of the project on check clearing. This is what we have done and presented in the final evaluation report.

ANNEX 6: STAKEHOLDER COMMENTS AND NORC RESPONSES

MiDA

Page of Document	Line	Text	Comment	NORC Response
General	General	Rural Banks	Though minor issue, search and replace Rural Banks with 'Rural and Community Banks (RCBs)'. Community Banks, largely found in urban areas are more developed than Rural Banks. They are in the minority though.	We have used Rural Banks given that the activity name is GRBCIP
5	Paragraph 3	These activities included: 1. Agriculture Project, Post-Harvest Activity and Community Services Project, Electrification Sub-Activity 2. Agriculture Project, Irrigation Activity 3. Agriculture Project, Credit Activity 4. Rural Development Project, Community Services Activity, Education Sub-Activity 5. Rural Development Project, Financial Services	Not too sure what you are trying to depict here – all projects and activities under the Compact or projects and activities for which MCC contracted NORC to conduct Evaluation on? If the former is the case then please adopt below: 1. Agriculture Project – Commercial Training Activity, Land Tenure Facilitation Activity, Irrigation Activity, Post-Harvest Handling Activity, Agriculture Credit Activity, and Feeder Roads Activity 2. Transportation Project – N-1 Highway Activity, Trunk Roads Activity, and Ferry Activity 3. Rural Development Project – Procurement Activity, Community Services Activity, and Financial Services Activity	These are the five activities included in NORC's original SOW for the evaluation, not all projects under the compact. Did not change.

Page of Document	Line	Text	Comment	NORC Response
6	2.1.3.1 Implementers	The implementing entity was ARB APEX Bank	We need to feature the Bank of Ghana (BoG) somewhere because they signed the Implementing Entity Agreement. ARB Apex Bank came in because BoG has ceded it's regulatory oversight of Rural Banks to ARB Apex. Here the attempt to acknowledge various implementing partners without the use of the word "including" leaves two wrong impressions; (a) that the list is exhaustive and (b) that all of these companies operated under the GRBCIP for which the ARB Apex Bank Limited was the Implementing Entity. The first can be resolved by acknowledging that that there were other partners such as those who supplied the LAN and the end-user equipment such as the generators, PCs and accessories such as printers. The second impression can be resolved by highlighting that the Cheque Codeline Clearing (CCC) System and Automated Clearing House (ACH) projects had the Ghana Interbank Payments & Settlement Systems (GhIPSS), a subsidiary of the Bank of Ghana, as the Implementing Entity with NCR Ghana as the main contractors.	Modified to addressed the comment.
17	Paragraph 2	"For the qualitative study, we originally intended to visit 15 rural banks. The rural banks were selected based on geographical spread in four regions (Greater Accra, Eastern, Ashanti, and Central) and a mix of size, age and a strong agricultural focus. The team discovered while in the field, that one of the selected banks had	The sample selection for the qualitative study was rather biased to the south as ALL the 15 RBs selected are based in the southern part of the country with several distinctive characteristics which differ from those of the north. Some views may not be fair representation of RBs across the country. Infact, it may leave out the extent (for better or worse) of some of the challenges or benefits highlighted in the results of the study.	Yes, we tried to maximize the mix of geographical regions, size and age while keeping within a reasonable budget. Expanding further geographical would have required substantitally more resources and time.

Page of Document	Line	Text	Comment	NORC Response
		closed and, hence, the final sample was 14 banks……"		

GRBCIP PM@MiDA Compact1

Page of Document	Line	Text	Comment	NORC Response
			General Comments	
1 and 5	2nd and 5th paragraphs respectively	Financial Services Activity known as Ghana Rural Banks Computerization and Interconnectivity Project (GRBCIP) which was a $30,266,099 effort	This definition is problematic and inconsistent with the project documents, in particular, the Compact Completion Report (CCR). In Appendix 1 of the CCR: Summary of Financial Performance of Program (by Project & Funding Category), it is obvious that Financial Services Activity had 3 sub-activities: (1)330100 Development of WAN for Rural Banks with Compact Budget $20,827,900, Final Disbursement $26,428,060 percentage Disbursement 99.72% (2) 330200 Improvement in Payment Systems with Compact Budget $3,142,100, Final Disbursement $1,799,064 percentage Disbursement 81.76% (2) 330300 Apex Bank IEA with Compact Budget $0, Final Disbursement $2,111,765 percentage Disbursement 77.97%. Thus, the total final disbursement of the overall Financial Services Activity is what came to $30,266,099 or 96.58% of the final budget after all the reallocations. The Ghana Rural Bank Computerization and Interconnectivity Project (GRBCIP) can rightly be defined to comprise Sub-Activities 330100 and 330300, that is, the Development of the Wide Area Network for the Rural Banks and the complementary funds under the IEA. The Sub-Activity 330200 Improvement in Payments Systems supported the Payment Systems Department of Bank of Ghana and the Ghana	We are not quite sure as to the source of the problems and inconsistency cited in the comment. The reviewer confirms the dollar value of the GRBCIP and states that to join the cheque clearing system, the RBs had to computerize. We don't see an inconsistency and, as such, have not made any changes.

Page of Document	Line	Text	Comment	NORC Response
			Inter-Bank Payments & Settlement Systems (GhIPSS) in the development and deployment of the Cheque Codeline Clearing (CCC) System and Automated Clearing House (ACH) by NCR for the entire banking system in Ghana (including the Apex Bank acting on behalf of the rural banks) and the development of payment systems regulations for Bank of Ghana. I will revert to the importance of GRBCIP for the rollout of CCC+ACH on the operations/viability of RCBs. Simply put, (a) the RBs could not have joined the CCC+ACH platform (b) without being computerized and linked to the GhIPSS system directly (which enabled them to clear cheques as competitively as the High Street Banks). The impact of this is linked directly to their deposit turnover post-project.	
1 and 5	4th and last paragraphs respectively	The project financed the following inputs:……	The provision of of Local Area Network (LAN) at the Rural Bank branches is omitted in this list as in other references to the list of physical interventions. The LAN is, however, admitted in some pages of the text, eg Page 7 (para 2)under section 2.1.3.1.	Addressed by adding LAN to text
Several pages of report			The reference to ARB Apex Bank Limited is inconsistent and rather erratically used in the text, including the reference to its branch office in Kumasi. For the record, it has to be stated clearly that it is "ARB Apex Bank Limited" and perhaps a short form of "Apex Bank" may be used in the report. For the avoidance of doubt, I would recommend the use of the full formal name.	Addressed by using full name in first reference, with Apex Bank in parentheses; thereafter, we use ARB Apex Bank.
Several pages of report		GRBCIP acronym misspelt	Various pages numerous times - Ghana Rural Banks Computerization and Interconnectivity Project (GRBCIP)……..The acronym is misspelt on several pages, which a simple search and replace can resolve.	Corrected

Page of Document	Line	Text	Comment	NORC Response
			Specific Comments:	
6	Paragraph 8 under section 2.1.3.1	Implementers	Here the attempt to acknowledge various implementing partners without the use of the word "including" leaves two wrong impressions; (a) that the list is exhaustive and (b) that all of these companies operated under the GRBCIP for which the ARB Apex Bank Limited was the Implementing Entity. The first can be resolved by acknowledging that that there were other partners such as those who supplied the LAN and the end-user equipment such as the generators, PCs and accessories such as printers. The second impression can be resolved by highlighting that the Cheque Codeline Clearing (CCC) System and Automated Clearing House (ACH) projects had the Ghana Interbank Payments & Settlement Systems (GhIPSS), a subsidiary of the Bank of Ghana, as the Implementing Entity with NCR Ghana as the main contractors.	Addressed
7	Paragraph 4 Section 2.1.3.2	Projected and Actual Costs……	Please refer to comments under 1st General Comment above	Please refer to NORC response to 1st. General Comment above.
7	Paragraph 6	However, for the purpose of this evaluation, when NORC approached APEX to obtain post-computerization bank data, we learned that this data was not available centrally……	This speaks to one of the issues (Data Ownership) raised as a problem and refered to also in para 1 under Section 4 on Page 23. As page of the design, a clear requirement by MIDA/MCC for ARB Apex Bank Limited to comply with, and enshrined in the contract of the Software Providers and Data Centre Contractors, was for the non-existence of a Super User. The design was for each rural bank's data to be pigeon-holed or compartmentalized in such a way that internal data across banks cannot be spooled into one report. As a regulator, ARB Apex Bank Limited really wanted to have that capability but this is not backed by law in Ghana: The data and	The intent, per our understanding, is for ARB Apex to spool the data and produce aggregate reports, which would not compromise data of individuals. This aggregate data was not available at ARN Apex Bank.

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			information reported by companies including banks, are the direct responsibility of the Directors and no external person. It is important to retain the responsibility of reports submitted to RB directors otherwise their liability for errors, misleading data, plain illegal treatment of transactions would be contested. This, if it still exists, is meant to protect individual RBs and should be defended. In the particular case of the NORC request, the proper thing to do would have been for ARB Apex Bank to approach all the RBs in the same manner it sought clearance for the other data from its Kumasi office and individual RBs to fill identified gaps as highlighted in section 3.2.1.	
7	Paragraph 7 section 2.1..3.4	Selection of Participants…..	First line mischaracterizes the GRBCIP as the Financial Services Activity as indicated in the General Comments above.	Changed to GRBCIP
8	Paragraph 4, which is 1st paragraph under section 3 EVALUATION …	"… and interviews with KPMG staff who oversaw project procurement."	KPMG simply acted as project implementation managers, that is, they oversaw the implementation. At no point were they involved in the procurement process beyond sitting on some evaluation panels. The procurements were undertaken by MiDA under Government of Ghana and MCC guidelines.	Corrected

Page of Document	Line	Text	Comment	NORC Response
10	Paragraph 2	on "Check Clearing"….	The comments regarding the non-availability of data on cheque clearing is not acceptable. This should be available at ARB Apex Bank as they held the gateway license for the rural banks access to the GhIPSS platform and presented and received all cheques concerning RBs. That failing, as since the report acknowledges GhIPSS as a GRBCIP partner, that data could also have been collected from GhIPSS. Bank of Ghana/GhIPSS signed an Implementing Entity agreement with MiDA and so are equally obligated to provide data on the throughput of the CCC+ACH systems as ARB Apex Bank Limited and its members were for RB data.	Based on this comment, we reopened the process of trying to obtain the data from the bank of Ghana. However, as described in **Annex 5,** the data necessary for the evaluation is not available.
10	Last paragraph	..APEX Rural Bank Kumasi……	No such entity exists. The reference should be the ARB Apex Bank Limited branch office in Kumasi.	OK Addressed
18	Paragraph 1	Information from key informants has also been used to confirm that all the rural banks visited were amongst the compact beneficiaries. Interviews were carried out with managers and other…..	It is not clear if the "Key Informants " sampled were different from the managers and other key staff of the RBs. If they are, it will be useful to have a list with their designation and to give an indication of what qualified them as key informants. This is an important point given that key informants outside the RBs network work provide not only additional insight but, hopefully, more objective feedback. For instance, the point made about the data ownership and the overbearing nature of the ARB Apex Bank Limited Management towards the RBs fails to point out that the RBs are themselves complicit in the situation as the significant majority of the board of the ARB Apex Bank Limited are board members of RBs from all regions/zones of the country. Also, the issues of sustainability can really be	We included a paragraph with more details. Please note that we could not choose the participants in the meetings organized officially by the RBs. Usually the manager and the key directors were present and everyone agreed with the comments being made. In none of the meetings did the manager question comments made by any staff member. Even if the RBs elect the board members of the APEX Bank, the APEX bank interests are not identical with those of

Page of Document	Line	Text	Comment	NORC Response
			addressed, beyond the governance and management competence challenges of the RBs system, by also limiting the number of licences issued for RBs to operate: Some RBs are simply not viable. The reasons may include poor, incompetent or self-serving management as well as low patronage in catchment areas due to low levels of economic activities or too many competing RBs presence in some rural locations. The issues of technical incompetence being blame on the IT system is raised obliquely on Page 19 (para 8 bullet on issues with terms of loan portfolio classification reporting)	RBs. Managers of the ARB Apex Bank often have their own interests. We found that the IT director was particularly insensitive to comments made by the RBs regarding down time, and product development.
20	Last paragraph	"user licenses originally issued free of charge…"	Perhaps the term can be rephrased to read "user licenses originally issued under the Project without burdening the RBs…". That said, the policy was not to give all the licenses RBs wanted to them, but to encourage them to think through their needs and to begin carrying some of the costs to learn to make such choices with the cost implications in mind	The text directly reflects the perception of the RM managers and staff. We don't think changing it is appropriate.
21	Paragraph 3	"Several banks have already exited the system…."	This is not necessarily a bad thing. The ability for the RBs to make prudent choices to ensure their sustainability and retain the access to the CCC+ACH as it gives them a clear competitive advantage should be applauded. Clearly, with the wide range of RB sizes, markets, levels of management competences, etc, it should not be surprising that some would not fare well with a modern operation with relatively high initial and recurrent costs. The banks should be free to operate models which make them operationally and financially sustainable provided they can continue to ensure a positive customer experience.	That is certainly one perception. However, the text in the report represents the perception of the RB respondents. According to RBs, they are exiting because of the dissatisfaction with the current ATP Apex management. ARB Apex Bank also stated they are worried about the possible consequences of a mass exit. The rural banks did not see this as a positive

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				force for modernizing. It was perceived as poor planning and management.
21	Paragraph 4	"The MiDA Financial Services Activity did not leave behind a road map for aiding the medium-term sustainability……."	This is an interesting point. Perhaps if the evaluation had spoken to industry experts as key informants they would have received some feedback regarding the posture of ARB Apex Bank Limited Management towards further donor support and guidance to support the system and migrate more smoothly towards greater sustainability. Also, the less than prudent and unduly costly investments made by the RB system in the system which needlessly burdens the bottom-lines of the RBs. Remember these additional investments are approved by the board of ARB Apex Bank Limited, the majority of which are board members of the RBs themselves.	The text in the report represents the perception of the RB managers. We are not contesting that these investments were justified. We are positing that the project didn't have a medium-term growth plan.

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3 & 19	4th, 9th paragraphs respectively	APEX has been slow to respond to these requests, especially in terms of reviewing and agreeing on new products and services such as introducing changes that would offer more services from internet banking and ATMs to rural bank customers	**Absence of New Products on T24:** T24 has U-Connect, which was launched on December 14, 2017 with a range of unique products including mobile money, APEX wallet, transfer within and across RCBs and other Banks using the ACH.	In our opinion, these are still theoretical possibilities. Most RBs don't have these facilities and that was the point made during the qualitative inquiry. RBs have lost confidence in the ability of the APEX Bank and T24 to provide new services for them.
3, 4, 21, 23 & 24	7th, 1st, 4th, last, 3rd paragraphs respectively	In addition, there is dissatisfaction among rural banks about the highly centralized nature of the current arrangement with APEX bank, which is both a supervisor and an IT service provider , a combination of tasks considered to be incompatible by all.	**APEX as IT Service Provider:** APEX is Supervisory Institution and facilitates IT needs of the RCBs. A Legislative Instrument, "ARB Apex Bank Limited Regulations, 2006 (L.I. 1825) ", mandates APEX Bank under objects of the APEX Bank, Regulation 4 (a) (ii) as follows - "provision of related non-banking services. This could conveniently cover the IT services provided to the RCBs.	Non-banking services referenced in the legislature refer to capacity building and training rather than Apex Bank becoming an IT service provider, which is a business. The role as an IT provider presents a conflict of interest for Apex Bank. When we discussed this findings with Apex Bank, during our qualitative inquiry, they found it to be a fair critique.
22	Second to last paragraph	The main explanation given by the rural banks is the faster rise of expenses over incomes caused principally but not solely by the rising communication costs caused by the adoption of the VSAT and T24 installed by GRBCIP	**MindMill and Communication Cost:** Difference must made between Software Cost and Communication Cost. Indeed T24 cost is lower than introducing MindMill over a 9-year period. Now VSAT cost is coming down to comparable levels as radio. Also a mix of Radios and VSAT are being considered to further reduce Communication Cost.	We are informing the situation as stated by the RBs visited. This was not an isolated opinion.

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40, 48 & 49	1st, 5th, and 4th paragraphs respectively	APEX bank is overcharging them and debiting their account without consulting them	**Unilateral Debiting of RCBs:** APEX bank actually allocates bills to RCBs based on a criteria known to them. Initially based on bandwidth consumption as computed by Solarwinds was used. The basis for sharing has been communicated to the RCBs.	Noted. We are informing the response obtained from the RBs visited. Again, the comment was made in several opportunities.