

## **Relationship between Savings and Credit in Rural Banks with Specific Reference to Ghana**

**Jacob Donkor**

Lecturer

Department of Finance

Sikkim Manipal University- Kumasi Campus

**Frank Agyemang Duah**

Lecturer

Department of Marketing

School of Business

Takoradi Polytechnic

### **Abstract**

*During the last years the banking business has come under considerable competitive pressure and bank managers often express concern regarding its savings and credits vis-à-vis other activities. This paper examined the relationship between savings and credits at Atwima Kwanwoma rural bank from 2004 to 2011 financial years. The researchers employed both financial and non-financial analysis. The bank charges different rate of interest for various customers on the basis of risk and nature of loan. Empirical results from estimating the model on 2004 to 2011 data from the bank's financial statement indicates that total deposits has been increased from GH¢8.692 million to GH¢152.65 million respectively. Also the analysis in the study period indicates that credits has increased from GH¢1.559 million in 2004 to GH¢110.42 million in 2011. Regression analysis of the findings established that there is a positive relationship between total deposits and credits. This shows that as total deposits increased the amount to lend also increased.*

**Key Words:** Savings, Credit

### **1. Introduction**

The governments of countries in Sub-Saharan Africa, and aid agencies including the World Bank, have long recognized the importance of financial sector reforms and rural financial markets development in realizing the goals of real sector growth, food security and poverty alleviation. To meet such an ambitious target, Sub-Saharan Africa - countries will have to dramatically raise domestic savings and investments (Thillairajah, 1994). A sound financial sector, supported by appropriate macroeconomic policies and institutional infrastructure are prerequisites in creating such an environment. A strong and vibrant rural financial market should be an integral part of this effort. Great emphasis is therefore being placed on developing rural financial markets, particularly on the mobilization of rural savings and the efficient allocation of resources to the most productive investments and activities in the rural areas.

The World Bank Development Report 1989, recognizing the non-viability of the financial sector in most of the developing countries, and having reviewed the lessons of past experience, stressed the need for efficient financial systems. The Report emphasized the importance of governments having to lay the foundations of well-functioning financial systems, through financial liberalization, increasing competition, restructuring institutions, improving a locative efficiency, prudential oversight functions of central bank, and increasing resource mobilization to ensure sustainability. While recognizing that properly designed administrative interventions might be desirable in special circumstances, the report cautions against; their possible adverse impact on the financial viability of the lending institutions; inefficient resource use; compounding distortions in the financial market and finally, the retarding of the development of the financial sector itself.

Rural credit markets in SSA countries, as in other developing countries, have been subject to policy interventions during the last two decades and more. Until recent times, the main focus of African governments and aid agencies alike was on providing agricultural credit, largely with funds external to the rural financial systems (Adams, 1985).

The targeting/directing and subsidization of credit, often delivered through state-owned specialized financial institutions, neglected the overall development of the rural financial market. Experiences of such heavy-handed approaches abound in SSA countries where the infusion of soft external funds to meet perceived credit gaps have at best produced only mixed results.

Improvement in agricultural performance - whether in the form of investments, productivity increase, production, food security, poverty alleviation or social equity - has not been as spectacular as hoped for. There are instances of the economic environment, the financial systems, and the rural community as a whole having suffered from such a misdirected approach. Such financial system distress is, however, not unique to Africa. The results of many of the World Bank's traditional agricultural credit operations, and the special credit schemes supported by other donors and governments too have been disappointing. Causes and consequences in a number of cases have also been researched and recorded. It is evident, as reported in these various studies, that subsidized and directed credit does not always reach the beneficiaries, while at the same time jeopardizing the financial viability of the lending institutions and discouraging domestic savings.

It is against this background therefore that, the Bank of Ghana in line with the Banking Act 1970 undertook a study into rural credit needs of the country, which culminated in the introduction of rural banks in 1976. The establishment of the rural banking system was justified from the viewpoint that in spite of the fact that Ghana is an agrarian country with farmers dwelling in the rural areas, credit facilities to them are grossly inadequate (Quaicoo, 2001). Again, the need to set-up rural banks is evident from the failure of the commercial banks to provide adequate financial institutions responsible for mobilizing and channeling rural communities in which they are located.

The first rural bank was established in 1976 at Agona Nyarkrom in Central Region of Ghana. At present there are 126 rural banks distributed among the regions as follows; Greater Accra (6), Ashanti (23), Eastern (22), Volta (14), Central (22), Brong Ahafo (18), Western(14), Upper East (2), Northern (3) and Upper West (2). One basic objective of establishing rural bank is to provide financial intermediation services to the nation's rural majority. Thus, the influx of rural banks is necessary for savings mobilization especially in the countryside. This, notwithstanding, many rural banks have find their way to the urban areas to operate branches and agencies. Whether this is in compliance with regulatory authorities or not, the issue of concern should be how far these rural banks have contributed to banking the non-banked populace. A recent publication in the business and financial times reported that Ghana has close to about 2.3 million bank accounts as at the end 2010 out of a population of over 24 million (Ghana Statistical Service, 2000). Also, the Bank of Ghana in the conduct of its redenomination exercise in 2007 revealed that less than 30% of the total money supply in the economy can be found at the banks. Thus, the financial sector still has a long way to go in respect of savings mobilization. It is based on the above uncertainties that the researchers are accessing the savings mobilization of Atwima Kwanwoma Rural Bank, the leading rural bank in the country and how it influenced credits (determining the relationship between total deposits and credits for the period 2004 to 2011). To contribute to the debate surrounding the relationship this research poses two hypothetical problems;

***The null hypothesis:*** Credits has no relationship with total deposits.

***The alternate hypothesis:*** Credits has relationship with total deposits.

## **2.0. Literature Review**

### **2.1. Theories of Saving**

Savings fundamentally is about choosing between present and future consumption. Savings theories usually forecast that present consumption is connected not to present income, but to a longer-term estimate of income. The life-cycle hypothesis (Modigliani, 1966) forecasts that individuals hold their spending steady over their lifetime; they save during their working years and draw down their savings in retirement. The permanent income hypothesis (Friedman, 1957) indicates that spending is proportional to a consumer's estimate of lasting income. These theories of savings were created with developed countries in mind. Deaton (1989) indicates four reasons why these two theories might be of incomplete use in developing economies. First, families in developing nations are larger than in developed nations and are more possible to have several generations. As a result there is less need to save for intergenerational transfers or for retirement.

Second, wages in many of these nations are unsure and cyclical, making view of longer-term income flows hard. Third, individuals are probable to be credit constrained, so that borrowing in early years will not be easy. Finally, these collective factors imply that savings in developing nations often plays a significant role in buffering between income and spending. Individuals often save small amounts at regular intervals to smooth income, rather than build up or save for retirement.

Economic theories of inter-temporal choice usually believe exponential discounting that entails a steady marginal rate of substitution between future periods. In other words, choosing among consumption in one month versus two months from now should be no unusual than choosing among consumption in 20 months versus 21 months, all else equal. Though, a long literature indicates that several individuals suffer from a time discrepancy difficulty and do not discount the future exponentially (O'Donahue and Rabin, 1999)

Experimental evidence suggests that many individuals have favorites that reverse as the date of making decision nears. Psychological experiments indicate that favorites are roughly hyperbolic in shape, involving a high discount rate in the immediate future and a comparatively lower rate over times that are further away. Commitment mechanisms that bind an individual to future actions or restrict individual choice in the future can overcome these inconsistencies (Ainslie, 1992). How widespread is the setback of commitment? There is proof that clients are willing to pay to have their alternatives limited, even in nations like the United States with advanced financial markets and low business costs. Individuals regularly decide to save in ways that limit or delay their capacity to contact funds, what Laibson (1997) refers to as the “golden eggs”.

Between poor and unbanked families in the United States a number of savings commitment plans have been documented including selecting savings accounts that charge per withdrawal, giving money to a trusted person to hold, deferring the cashing of paychecks, opening an account at a branch that is inconveniently located, and selecting not to have an ATM card (Beverly et al., 2001). Benartzi and Thaler (2002) demonstrate that individuals who contribute in a worker savings program that commits them (in a nonbinding way) to commit higher proportions of potential earnings to retirement strategies do in fact save more.

Behavioral economics also indicates that persons do not treat the components of their riches as fungible, as implied by the life-cycle theory. Instead, individuals divide their wealth into broad mental accounts such as  $x$  current assets, postponing the cashing of paychecks and future assets with contrary marginal propensities of consumption for each account (Shefrin and Thaler, 1988). For example, data from Japan illustrate that the marginal propensity to consume out of income from expected semi-annual bonuses is largely lower than for usual income (Ishikawa and Ueda, 1984). The use of savings commitment technologies or mental accounting heuristics is not limited to developed nations; however there is little methodical, practical proof on these effects in developing nations. Gugerty (2001) offers evidence that rotating savings and credit association (ROSCA) participants in Kenya clearly design their ROSCAs to offer self-control. Shipton (1992) documents the use of lock boxes in the Gambia. Rutherford (1999) cites some commitment devices that rural folks in East Africa use to attach to savings plans, including the use of “money guards” in which individuals hand over their savings to someone else so that they cannot use it and buying a lock box and throwing away the key. There is evidence that in Africa and Latin America, families use tubers and tree crops as a comparatively illiquid store of savings (Godoy, Frank et al, 1996).

Anderson and Baland (2002) argued that ROSCAs are popular in developing countries because they offer “spouse control” devices, allowing persons to hide money from their spouse, or otherwise remove it from the family economy. Vonderlack and Schreiner (2001) suggest that particularly women are in need of savings commitment devices. Families in developing nations are also part of a net of casual contracts that include debt, credit and insurance (Townsend, 1995). If savings are not simply accessed, then a person is more empowered to turn down needs for withdrawals or loans from peers or family. This limited access, though, might also have the harmful effect of falling informal insurance mechanisms within households or villages.

## **2.2. Importance of Savings**

Savings is described as the fraction of incomes not instantly consumed, but kept for future investment, consumption or for unforeseen contingencies is considered as a crucial weapon for economic development and growth.

Its role is revealed in capital formation through increased capital stock and the impact it makes on the ability for an economy to produce more and higher incomes. Rose (1986) sees the significance of savings further than capital formation. To her, savings are a means for capital formation but equally, a main determinant of the cost of credits based on the law of scarcity, which holds that 'when the former is scarce, it becomes more expensive to obtain'. The classics as well as modern growth models hold that savings make up the principal and determinant and parameter of economic growth. This plan is upheld by (World Bank, 1989) which demonstrated that on the standard, third world nations with higher growth rates by the way are those with superior saving rates.

Capital organized from domestic sources is very basic for a nation's growth not only because it is less expensive, but also due to the reason that it is permanent and durable. Adam (1985) considers that most of this domestic savings will come from the rural areas especially in countries with a dominant rural because there is a greater saving capacity and growth potentials. Thillairajah (1994) and Padmanabhan (1988) sharing the same opinion, explain the high marginal propensity to save by the unstable economic conditions that generally prevails in these areas (unstable incomes, fluctuations in harvest etc).

But unfortunately, in spite of these advantages, most of the saving potentials of rural communities in developing economies remain not mobilized especially in respect to the formal financial system on which an economy depends for growth (Nwankwo, 1994). To permit an efficient and sustainable mobilization of savings in general and rural savings in particular, a number of issues must be satisfied. Hussein and Thirlwall (1999) classified these into the willingness to save and ability to save. Whereas the ability to save is influenced by the level of growth of these incomes, per capita income, income distribution and population age structure; the willingness to save to them depend more on the nation's financial structure through variables such as the level of inflation and financial deepening. They however ended that the number, nearness and variety of financial institutions serving a range of needs of depositors play a central influence over the primeval factor of the ability to save. However, there emerge to be a strong relation between the rates of growth of financial circuits and how extend and resourceful a nation's financial structure can sustainable assemble domestic savings.

Bomda (1998) stressed on the influence of certain factors on the supply of savings and empirically showed the existence of a negative correlation between the rate of savings and the costs/risks incurred by customers. These include transportation cost and risk involve in moving with large sums of money through long distances. Whatever motive an individual may have for savings, the rate of savings in any given community according to (Toluhi, 1968; Schmidt & Kropp, 1988; Padmanabhan, 1988) depends on the available savings institutions which themselves must fulfill conditions like an efficient number, diversity, accessibility, attractive terms of operations, perfect knowledge on their existence and the usefulness and trust people have on them. Thus, an efficient and sustainable savings mobilisation will certainly depend on the availability and or number of financial variables, their accessibility and nature of and the way such services are rendered to customers. Unfortunately, Cameroon's formal financial system seems poorly developed, poorly diversified and inefficient. It is also fragmented and records a low financial deepening ratio (M2/GDP), which witnessed a decline from 22 percent in 1989 down to 17 percent in 1995 according to (Heidhues & Weinschenck, 1989; Kammogne, 1988). Due to this low financial deepening ratio, Cameroon was ranked behind countries like Gambia, Ghana, Nigeria, Senegal and South Africa whose respective per capita incomes were far lower than hers during the same period. But to ensure that the banking industry is efficiently spread equally requires financial soundness of these institutions.

### **2.3. Problems of Savings**

A lack of savings facilities creates problems at three levels: (i) the level of the individual; (ii) the level of the financial institution; and (iii) the level of the national economy. At the level of the individual, the lack of appropriate institutional savings facilities forces the individual to rely upon in-kind savings such as savings in the form of gold, animals or raw materials, or upon informal financial intermediaries, such as Rotating Savings and Credit Associations (ROSCAs) or money-keepers. These informal savings options, however, do not offer a combination of security of funds, ready access or liquidity, positive real return and convenience in order to meet the various needs of the particular saver.

At the institutional level, microfinance institutions (MFIs) have microproduct service windows on both sides of the balance sheet, serving micro and small savers and borrowers with an average savings balance or loan amount below the average per capita annual income in the respective countries.

Yet the number of MFIs that exclusively offer credit is much larger than MFIs with both savings and credit facilities. Empirical studies have demonstrated that the performance records of credit-only MFIs in outreach and sustainability have not been widely successful (see, for example, Schmidt/Zeitinger, 1996; Christen et al. 1995, Yaron 1992). Those MFIs lacking effective savings mobilization strategies are unable to increase their outreach to a significant number of clients on a regional or national scale. In addition, few MFIs that do not mobilize savings have attained full financial self-sufficiency, independently covering their expenses for operations, loan loss, cost of funds and inflation with their revenues.

Throughout the world, MFIs have often experienced that exclusively offering credit services can lead to undue dependency on external sources of financing. This dependency can cause the MFIs to concentrate on the demands of the donors rather than on the demands of potential clients, especially potential savings clients. At the level of the national economy, high levels of savings increase the amount of national resources and decrease the need to resort to foreign indebtedness in order to cover domestic investment and consumption demand. Numerous countries with low internal savings rates must borrow from abroad, which results in a debt service burden. This clearly underlines the importance of savings mobilization to sustain economic growth with national financial resources.

Furthermore, there is a distinct interaction effect of mean age of consumption/ earnings and real growth rate that suggests that middle income countries reduce savings when dependency ratios increase. These same countries increase aggregate savings when per capita income increases, while decreasing savings when the growth rate of per capita income increases. If poor households everywhere have the same motivations to save, why do African households save less than others? This issue is currently unresolved, but we can glean some partial explanations from the existing literature.

Deaton (1992) suggests that when agents do not have access to credit markets, they can still smooth their consumption over time by accumulating and selling off assets. He suggests that saving behavior may be guided by rules of thumb, and that short-term falls/increases in income are the primary causes of savings/dissavings. These rules of thumb are of a remarkably simple form, and in some instances correspond quite closely to the optimal nonlinear saving rule. If we define the sum of current income and the value of assets as cash on hand, the rules take the form "consume all of your cash on hand if cash on hand is less than a number  $x$ , and save a constant fraction of the excess of your cash on hand over  $x$  otherwise". The number  $x$  will be something like the mean over time of the household's income, and the fraction will be something like 20 to 40 percent. He tests these general hypotheses on two West African countries, Ghana and Cote d'Ivoire and also on Thailand. Informal arrangements dominate the credit market, and despite the large numbers of both creditors and debtors in the sample, loan sizes are not large enough to conclude that they play a role in consumption smoothing. When observing the pattern of loans in the seasonal data, he finds a more definitive correlation between loans and consumption smoothing. Deaton (1992) cautiously suggests that a case could be made for credit markets playing a modest role in smoothing consumption, a view consistent with Udry's findings in Northern Nigeria (1990). The role of credit markets is implied to be moderate at best.

Deaton's (1992) analysis, however, is unlikely to provide a route for understanding the generally low level of household saving in Africa. Variations over time in saving by an agent are determined largely by variations in income, so that looking over time at an individual's saving you will find high saving in periods of high income, and low saving in periods of low income. This does not, however, translate into aggregate differences in saving rates. The buffer stock model of savings does not imply any strong relationship between average levels of income and average saving rates. Aside from preferences, the primary determinants of saving rates in this model are not average incomes, but: (1) the variance of income; and (2) the availability of credit markets. Agents facing a more uncertain income path will be willing to sacrifice a larger amount of current consumption in order to protect themselves against large drops in consumption in the future. And agents without access to credit markets are forced to rely more heavily on buffer stocks of saving to protect their future consumption.

On both counts, we might expect households in Africa to have higher rates of savings than households in other parts of the world. Institutional impediments to saving may be particularly important in Africa. One important clue is that a substantial part of that saving in Africa is done informally, which may be attributed to the nature of the savings institutions in rural Africa.

Discussion of the structural and institutional constraints to savings mobilization has seen a contribution from Ikhide (1996) who argues mainly that rural savings mobilisation is weak because of the low presence of formal institutions. He studied the extension of commercial bank offices to rural areas in five African countries to assess their impact on private savings, conducting empirical tests of the determinants of gross domestic savings rates using population per bank branch as one of his explanatory variables<sup>7</sup>. It turned out to have the strongest effect on savings. The individual country regressions show the weakest effect of the population per bank branch variable in Ghana (7%) and the strongest effect in Kenya (21%).

Nissanke and Aryeetey (1998) have discussed a number of structural and institutional constraints to the mobilization of savings, particularly from poor households.

They suggest that financial markets in Africa are highly fragmented and that the high transaction costs for economic agents of trying to move across different segments act as a disincentive in savings mobilization. They relate these structural features to various institutional constraints of the formal sector, noting, for example, that savings mobilization from rural areas is very costly and that banks in Africa have not been designed to counter this through innovative approaches in savings mobilization.

The answer does not simply lie in having more rural outlets for commercial banks, as they indicate that rural savings mobilization is not necessarily positively correlated with the number of bank outlets turn out to be unsustainable, hence the tendency to close many of them with financial sector reforms. Nissanke and Aryeetey (1998) suggest that there have been few innovative savings instruments developed with a view to reaching untapped segments of the financial market. While informal sector agents are acknowledged to play a major role in savings mobilization, their operations are confined to specific groups of people, which effectively preclude the participation of others not belonging to those groups. The fact that only a few such informal savings mobilises also lend creates a problem for financial intermediation. The outcome is that even though the informal sector provides a haven for many savers, its full potential has not yet been reached. Together with all the reasons provided about the uncertainty of the rural environment, this would explain why saving in rural areas is intended to meet specific expenditure targets.

#### **2.4. Interest Rates**

Interest rates can be defined as the premium received by the lender after a stated period of time. From the borrower's point of view, it is the cost of capital at the time of obtaining a loan. There are several schools of thought regarding the interest rates. According to the Classical school, the rate of interest is the main determinant of savings and investment. This school asserted that aggregate investment is inversely related to the rate of interest. This relationship has been observed to be a weak one; that is, investment tends to be fairly interest inelastic because it is influenced by businessmen's expectations, and yields are normally estimated within a particular range, for example 10% to 15%, that is if a small increase in the interest rate occurs, it will not disturb the long run expansion of the enterprises.

The Neo-Classical school maintains that the interest rate is determined by supply (savings) and demand (marginal efficiency of capital). Autonomous increase in savings reduces the interest rate and the additional cost of capital. Because additional investment contributes to diminishing returns, this will cause a 'switch' from less capital intensive to more capital-intensive methods of production. The phenomenon of re-switching has led to the two Cambridge's controversy of capital theory (Hardwick, Khan and Langmead, 1990). Keynes believed that the quantity of money played a key role in determining the rate of interest. He viewed the equilibrium interest rate as that rate which equates the supply of money with the demand for money. In a more fundamental sense, the equilibrium rate of interest is determined by factors affecting the supply of money and the money demand. The modern view of interest rates is based on the imperfect information paradigm as explained by (Hoff and Stiglitz, 1990).

#### **2.5. Demands for Credit**

The role of credit is to bridge the gap between enterprise owner's financial assets and the required financial assets of the enterprise. Due to persistence of this imbalance, enterprises are forced to demand credit. Demand for credit, according to Aryeetey et al (1994) can be categorized into perceived, potential and revealed demand.

Perceived demand is represented by a situation where enterprises that assume to be in need of cash, mention finance as a constraint. Potential demand is characterized by a desire for credit which is not actualized due to market imperfections and institutional barriers. Revealed demand is characterized as written application for financial support at a given rate of interest. The researcher agrees with the above classification of demand for credit. But, in the case of revealed demand definition which is of basic importance to both lenders and borrowers, a further division needs to be underscored because the application for credit, even if backed by a bankable project, may not necessarily be translated into effective demand. Gale (1991) defined effective demand as the amount of loans that lending institutions are prepared to release to borrowers.

### **3. Methodology**

The research methodology involves the method used in collecting data for the study, sample size determination, sampling technique. It also includes the presentation and analysis of data. Data for the study was gathered from both primary and secondary sources.

The primary source dealt with information gathered from selected members of executive management of the bank under study. Data collection was achieved by the use of interview guide to interview executive management and also from financial statements of the bank. The sample frame of this study was all financial statements of Atwima Kwanwoma Rural Bank since 1983. The sample size of this study was made up of financial statements of Atwima Kwanwoma Rural Bank for the past eight years that is from 2004 to 2011. This period was chosen for the study because it was the period where banking industry in Ghana faced a lot of competition from foreign banks. It was within this same period that Atwima Kwanwoma Rural Bank did so well and was considered the best performer among rural banks in the country; a position still held by the bank. (ARB, APEX BANK).

Two sets of respondents were involved in this study. First, the financial statement of the banks was collected. Second, the credit manager was interviewed to explain why there were differences in credits given to clients for various years. The data collected were analyzed by the use of frequency tables, percentages, bar charts and also regression analysis to determine the relationship between the total deposits and credit. Information gathered from various respondents were first edited and tallied in frequency table. The values corresponding to frequencies were later converted in percentages to facilitate comparison between the responses. Microsoft Excel (spread sheet) was employed for the analysis.

### **4. Results/ Discussion**

#### **4.1. The Trend in Total Deposits in AKRB**

It is observed that total deposits continuously increase over the period shown in Figure 1. The deposit was slow from GH¢ 8.692 million to GH¢ 16.888 million in 2004 and 2005 respectively. However, there was a sharp increase in the deposits from GH¢ 31.931 million in 2006 to GH¢ 78.046 million in 2007. This increase may be attributed to establishment of branches in Santasi, Old Tafo, New Tafo and Ayigyi and Atonsu. From 2008 to 2011 also experienced increase in the total deposits. The micro-finance product of the bank takes the staff to the doorsteps of their customers and also the establishment of Business and Development Department which always come out with new savings products. As a result the amount of deposits increased from GH¢8.692 million in 2004 to GH¢152.65 million in 2011.

#### **4.2. The Trend in Credit in AKRB**

It is also observed that credits increased over the first four years from GH¢1.559 million in 2004 to GH¢ 34.650 million in 2008 as shown in table 2. This increment was due to the fact that the bank did not undertake any massive investment in infrastructure and also less social responsibility took place. However, there was a decrease in credits to GH¢31.649 million in 2009 even though there was an increase in total deposits that year. This fall in credit was due to increase in the bank's social responsibilities like assistance went to hospital support, orphanage, infirmary and the handicapped and infrastructural development like police station renovation, drainage and boreholes. Also the bank increased credit activities from GH¢79.874 million to GH¢110.42 million in 2010 and 2011 respectively. This increase in credits was due to effective savings mobilization by the bank as a result of establishment of new department (business and development) which always come out with new products.

### 4.3. Relationship between Total Deposits and Credits

This section tests the hypothesis that the amount of loans made is positively related to the amount of deposit a bank has.

Let Y be the amount of loan giving (in GH¢)

Let X be the amount of deposits (in GH¢)

We start by assuming that the variables are related with the simplest possible mathematical form that is the relationship between loans and deposits is of linear form:

$$Y = b_0 + b_1X + U;$$

Where U is the error term and  $b_0$  and  $b_1$  are the parameters of the loan function. And our aim is to obtain estimates of their numerical values.

Therefore, the estimated regression model is  $Y = b_0 + b_1X$

From the simple regression model

$$b_1 = \frac{SS_{xy}}{SS_x}$$

$$\implies SS_{xy} = \frac{\sum xy - (\sum x)(\sum y)}{n}$$

$$\begin{aligned} \implies SS_{xy} &= \frac{32788.79 - (542.978)(283.359)}{8} \\ &= \frac{32788.79 - 19232.129}{8} \\ &= 13556.577 \end{aligned}$$

$$\begin{aligned} \implies SS_x &= \frac{\sum x^2 - (\sum x)^2}{n} \\ &= \frac{54645.32 - (542.978)^2}{8} \\ &= \frac{54645.32 - 36853.14}{8} \\ &= 17.792.18 \end{aligned}$$

$$\text{Therefore } b_1 = \frac{13556.572}{17,792.18}$$

$$\text{Therefore } b_1 = 0.76194$$

$$b_0 = \bar{Y} - b_1\bar{X}$$

$$\bar{Y} = \frac{\sum Y}{n}$$

$$\begin{aligned}
 &= \frac{283.359}{8} \\
 \bar{X} &= \frac{\sum X}{n} \\
 &= \frac{542.978}{8} \\
 &= 67.8723
 \end{aligned}$$

By substitution

$$\begin{aligned}
 b_0 &= 35.4198 - 0.76194(67.8723) \\
 &= 35.4198 - 51.7146 \\
 b_0 &= -16.2948 \\
 \bar{Y} &= -16.2948 + 0.76194X
 \end{aligned}$$

The above result confirms that there is a positive relationship between the amount of loan given (Y) and the amount of deposits the bank has.

The coefficient of 0.76194 means that for every GH¢1 million increase in the deposits, the amount of loan given is expected to increase GH¢ 761,940.00

Therefore, for the bank to give more loans and for that matter more profits, it must intensify its saving mobilization program.

Furthermore to find the extent to which loans depend on saving, we employ the technique of coefficient of determination,  $r^2$ .

The coefficient of determination reveals what percentage of the change in Y explained by a change in X. it is;

$$r^2 = \frac{(SS_{xy})^2}{(SS_x)(SS_y)}$$

But

$$SS_{xy} = 13,556.577$$

$$SS_x = 17,792.18$$

$$SS_y = \frac{\sum y^2 - (\sum y)^2}{n}$$

$$SS_{xy} = \frac{21,051.093 - (283.359)^2}{8}$$

$$= 21,051.093 - 10,036.54$$

$$SS_y = 11,014.553$$

$$\text{Hence } r^2 = \frac{(SS_{xy})^2}{(SS_x)(SS_y)}$$

$$\begin{aligned}
 r^2 &= \frac{(13556.577)^2}{(17,792.82)(11,014.553)} \\
 &= \frac{183,780,780}{195,972,909.6} \\
 &= 0.93869 \text{ or} \\
 &= 93.87\%
 \end{aligned}$$

This result implies that 93.87% of the changes in loans given are explained by changes in deposits. The remaining 6.13% can be explained by factors like interest rate, business expectations and other credit worthiness of borrowers.

### 5.0. Conclusion

The key motives to use deposit facilities are the safety and security of the savings, easy and immediate access, and a positive real return. It is commonly agreed that poor people have a significant capacity to save, proven by the existence of various informal savings mechanisms found throughout the world and by a few recent empirical studies. It is further understood that many people, particularly in rural households, are obliged to save during certain times of the year, such as harvest, in order to compensate for periods when their income is drastically reduced, such as the dry season. It is widely accepted that though only a certain number of people will need credit at any given time, virtually all people will need to save at any given time. We can therefore conclude that poor people will deposit their savings in a financial institution if an appropriate institutional structure and appropriate savings products exist to the depositor's mix of savings needs.

In accessing the impact of savings on credits of the Atwima Kwanwoma Rural Bank Ltd, it is an undeniable fact that it has improved upon its mode of savings mobilization and credit allocation tremendously since the year 2004 to 2011. The study also indicated that there was a positive relationship between savings and credits. What is left is for the bank to extend their outreach as well as the size of credits to make their impact on the rural banking concept more meaningful in reducing poverty and for national development.

*The Trend in Total Deposits in AKRB (Table 1)*

Years	Deposits (Gh¢ In Millions)	Percentage (%)	Percentage Change
2004	8.692	1.60%	
2005	16.888	3.11%	1.51%
2006	31.931	5.88%	2.77%
2007	53.014	9.76%	3.88%
2008	78.046	14.37%	4.61%
2009	82.059	15.11%	0.74%
2010	119.698	22.04%	6.93%
2011	152.65	28.11%	6.07%
TOTAL	542.978	100.00%	

*Source: Atwima Kwanwoma Rural Bank Credit Department*

**4.2. The Trend in Credit in AKRB (Table 2)**

Years	Credits(Gh¢ In Millions)	Percentage (%)	Percentage Change
2004	1.559	1%	
2005	3.429	1%	0.66%
2006	7.35	3%	1.38%
2007	14.428	5%	2.50%
2008	34.65	12%	7.14%
2009	31.649	11%	-1.06%
2010	79.874	28%	17.02%
2011	110.42	39%	10.78%
<b>TOTAL</b>	<b>283.359</b>	<b>100.00%</b>	

*Source: Atwima Kwanwoma Rural Bank Credit Department*

**The Relation between the Total Deposit and Loans (Table 3)**

Years	Amount of deposits X(GH¢in Millions)	Amount of loans Y (GH¢in millions)	X <sup>2</sup>	Y <sup>2</sup>	XY
2004	8.692	1.559	75.551	2.431	13.551
2005	16.888	3.429	285.205	11.758	57.909
2006	31.931	7.35	1019.589	54.023	234.693
2007	53.014	14.428	2810.484	208.167	764.886
2008	78.046	34.65	6091.178	1200.623	2,704.294
2009	82.059	31.649	6733.680	1001.659	6,55.381
2010	119.698	79.874	14,327.611	6379.856	2597.085
2011	152.65	110.42	23302.023	12,192.576	16,855.613
Total	542.978	283.359	54,645.32	21,051.093	32788.79

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