I. AKAAH, K. DADZIE, B. DUNSON

FORMAL FINANCIAL INSTITUTIONS AS SAVINGS MOBILIZING CONDUITS IN RURAL LDCs: AN EMPIRICAL ASSESSMENT BASED ON THE BANK SAVINGS BEHAVIOR OF GHANAIAN FARM HOUSEHOLDS

Excerpt from

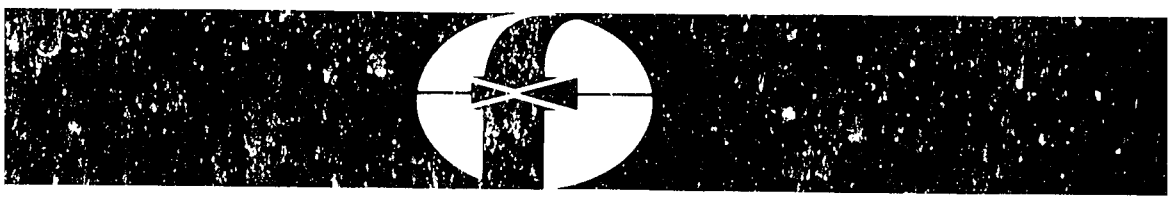
Savings and Development

Finafrica

Centre for Financial Assistance to African Countries

Foundation established by

CARIPLO



FORMAL FINANCIAL INSTITUTIONS AS SAVINGS MOBILIZING CONDUITS IN RURAL LDCs: AN EMPIRICAL ASSESSMENT BASED ON THE BANK SAVINGS BEHAVIOR OF GHANAIAN FARM HOUSEHOLDS

Ishmael P. Akaah - Wayne State University
Kofi Q. Dadzie - North Carolina Central University and
Bruce Dunson - Prairie View A&M University

1. Introduction

The importance of savings as a catalyst in the economic development of less developed countries (LDCs) is widely recognized by development economists (e.g., McKinnon 1973; Shaw 1973). While other ingredients might be equally important (e.g., education, economic attitudes, resource management), sustained economic development is generally believed to be difficult to maintain without savings. Considerable literature attention has therefore focused on how savings could be mobilized in LDCs to aid economic development (e.g., Adams 1978; Gurley and Shaw 1967; Mauri 1977).

Although there is no consensus as to the best strategy for savings mobilization, a network of formal financial institutions (i.e., banking institutions such as commercial banks, agricultural banks, rural banks, savings banks, cooperative banks) that spans rural areas of LDCs is generally offered as an essential component of any such strategy (Adams 1978; Mauri 1977). In support of this viewpoint are three basic arguments. First, although the direction of causation is unclear, a positive relationship appears to exist between the diffusion of banking institutions and savings (Porter 1966). Second, banking institutions enhance economic growth by channeling funds from low-yielding investments to high-yielding investments (Galbis 1977; Porter 1966)[1]. Third, the diffusion of banking institutions enhances monetary controls and, thereby, ensures greater economic stability (Porter 1966).

As beneficial as formal financial institutions appear to be as savings mobilizers, the great bulk of the rural population of LDCs make little or no use of these institutions (Miracle, Miracle and Cohen 1980). Moreover, relatively few empirical studies have focused on their efficacy as savings mobilizing channels in LDCs. Additionally, the few studies on the subject reflect largely Asian data (Adams 1978; Hyun, Adams and Hushak 1979; Lee, Kim and Adams 1977; Ong, Adams and Singh 1976). However, the diverse nature of the socio-economic environment of LDCs, coupled with the costs associated with bank expansion (e.g., the cost of erecting bank offices and training personnel to man them), suggests the need for more empirical research. Such research is needed to help development planners and policy makers of LDCs evolve strategies and policies for using formal financial institutions to mobilize savings.

1 While this might be perceived as beneficial, it has the negative effect of starving rural households of credit if the mobilized savings are channeled to urban areas of LDC's (Aggrey-Mensah 1983).

In this regard, the recent bank expansion program in Ghana, West Africa, provides a unique framework and opportunity for assessing the efficacy of formal financial institutions as savings mobilizing conduits in rural LDCs. As discussed below, the program embraced, as subjects, cocoa farmers in Ghana. It also reflected a number of voluntary savings-inducing features desired of banks as savings mobilizers (Adams 1978). The objective of this paper is to assess, in the context of the bank expansion program in Ghana, the extent to which formal financial institutions could serve as savings mobilizing conduits in rural LDCs. More specifically, the paper examines the willingness of Ghanaian cocoa farmers to save with formal banking institutions and the factors that influence their bank savings behavior.

Formal financial institutions as savings mobilizers in rural LDCs

As noted above, despite the appeal of formal financial institutions as channels for savings mobilization in LDCs, the great bulk of the population of LDCs, particularly the rural ones, make little or no use of these institutions. Instead, they rely on informal savings and loan associations (e.g., fixed fund associations, and rotating credit associations) as the main channels for savings and credit. Underlying this are a number of factors (Miracle, Miracle and Cohen 1980). First, even though over 70% of the rural population of most LDCs is rural, formal banking institutions are located almost exclusively in the larger urban centers. Thus, the lack of convenience of banking institutions (i.e., in terms of location), coupled with the poor nature of the transportation system of most LDCs, makes these institutions «foreign» to the rural population of LDCs.

Second, the low nature of the nominal rate of interest on bank deposits, relative to the rate of inflation in LDCs, serves to lessen the attractiveness of formal financial institutions as savings conduits, even if conveniently located, While this low interest rate regime is rationalized in terms of the desire of LDC governments to make credit affordable by the masses of small (rural) borrowers, Miracle, Miracle and Cohen (1980) have observed that it yields the opposite effect of attracting the economically and politically powerful while repelling small borrowers. Moreover, even if small savers have access to credit from banking institutions, the complex nature of the paperwork and collateral requirements serve to discourage them from using formal financial institutions for credit. In addition, the communal nature of property ownership (e.g., of land and homes) in rural LDCs impedes the ability of small borrowers to meet collateral requirements for bank credit.

Finally, the formal nature of banking procedures, particularly the keeping of detailed

records, detracts from the attractiveness of banks as savings institutions (Miracle, Miracle and Cohen 1980). For instance, the web of extended family obligations that characterizes many LDCs demands that prosperous family members share their wealth with kinsmen. However, since bank records are in the hands of clerks who are potentially open to bribes, it makes it difficult for LDC bank customers to fend off repacious relatives. There is also the fear of bank savings records being used by government revenue officials to scrutinize savers' financial dealings and activities. Furthermore, the fact that most rural households of LDCs lack formal education (i.e., the ability to read and write) detracts from their ability to understand formal banking procedures.

Given the popularity of informal savings and loan associations as savings channels in rural LDCs, it appears that for formal financial institutions to succeed as savings mobilizers, they should embody the features that make informal savings and loan associations attractive. Miracle, Miracle and Cohen (1980) suggest these features as including prompt servicing of members' credit needs, convenience of location, flexibility of operating procedures, and return on savings (if loans are made to members at interest)[2]. Furthermore, informal savings and loan associations instill savings discipline among their members, provide security of savings (i.e., compared to members saving on their own), and offer several economic benefits (e.g., the organization of beneficial joint projects, exchange of economic intelligence, and the provision of technical and managerial assistance to members). In essence, for formal financial institutions to succeed as savings mobilization conduits, they should reflect the banking needs and preferences of the rural population to be served.

Unfortunately, the dearth of micro data from LDCs has not permitted empirical research on the banking needs and preferences of rural LDC households. Instead, LDC savings research has tended to involve aggregate level modeling of savings behavior, with the current and/or permanent income hypothesis as the modeling framework (Mikesell and Zinser 1973; Snyder 1974). While income might be important as a bank savings correlate, the earlier discussion suggests the importance of other factors besides income. Accordingly, the present paper explores, in addition to income, the influence of bank-related and demographic factors as correlates of rural households' bank savings behavior. The methodology section below discusses the specific variables considered in the analysis.

2 Empirical data are sparse on the average return to savings of funds saved through informal savings and loan associations. Figures reported in the literature range from 0% to 300% (Miracle, Miracle and Cohen 1980).

2. The check system as a savings mobilization mechanism

As noted earlier, the framework for the present research is the expansion of formal banking services to cocoa farmers in Ghana. Like most LDCs, Ghana is an agricultural country with a population of 12.2 million. Cocoa farming is the leading industry, with earnings from cocoa accounting for approximately 37.0% of the country's gross domestic product (GDP). The cocoa industry employs about 400,000 farmers. To most cocoa farmers, earnings from cocoa represent their main or only source of household income (Dadzie, Menyah and Akaah 1985). The Ghana Cocoa Marketing Board (GCMB), a government-created monopoly, controls the purchasing of cocoa from farmers. Prior to each cocoa purchasing season, GCMB, in consultation with the government, sets the producer price of cocoa. This price becomes the basis for cocoa purchases across the country.

Given the lack of banking facilities in the rural areas of Ghana, GCMB, since its inception, paid cocoa farmers in cash for their cocoa sales. However, as the magnitude of cash needed to finance cocoa purchases increased, the cash payment mode became inadequate and plagued with problems. First, the sheer size of the magnitude of cash needed to meet cocoa payments (i.e., 25% of the country's total money supply annually) made it increasingly difficult for GCMB to marshall the needed cash via the banking system (Ahwoi 1986). Exacerbating the difficulty of raising cash was the fact that the lack of banking facilities in the rural area of Ghana compelled rural dwellers to operate outside the banking system. As such, cash holdings outside the banking system remained relatively high compared to bank-held cash, with the former outstripping the latter as of 1978 (Ghana Central Bureau of Statistics 1984). This starved the banking system of cash — thus compounding the difficulty of raising enough cash to meet cocoa payments.

Second, the cash payment mode entailed the logistics problem of moving large quantities of cash safely and promptly from urban areas to rural cocoa buying centers. The poor nature of the transportation network, to and from rural areas, implied undue delays in movings needed cash. Coupled with this was the security risk of moving the large sums of cash involved in cocoa puchases. As Ahwoi (1986) points out, cash was sometimes lost in transit. Even if cash for cocoa purchases reached its destination, it was sometimes diverted to non-cocoa purchasing activities by purchasing clerks (e.g., the loaning of cash to the very farmers for whom it was intended).

The problems associated with the cash payment mode translated into undue delays in farmers receiving payments for their cocoa sales. In lieu of cash payments, farmers

were issued IOU's (i.e., signed receipts acknowledging debt owed by GCMB). The IOU's were redeemable when cash became available. The extent of the payment delays is reflected by the fact that it took some farmers as long as four years to have their IOU's redeemed. The delays, coupled with other industry problems, led cocoa farmers to shift to other crops with lucrative prices and assured payments, particularly that of food crop farming[3]. This led to a steady decline in cocoa output — from a peak level of 566,000 metric tons in 1964/65 to a low level of 225 metric tons in 1981/82 (Ghana Central Bureau of Statistics 1984). However, because of increases in the producer price of cocoa (i.e., measures needed given inflation), the volume of cash needed for cocoa purchases increased despite the decline in cocoa output — leaving unchanged the problems associated with the cash payment mode.

It was in the context of these problems (i.e., the payment delay and decline in cocoa output) that GCMB, in November, 1982, introduced a new system of paying for cocoa purchases. Under the new system, cocoa farmers were paid in checks for their sales to GCMB. The checks were then taken to «designated» banks where they could be cashed in full or parts of the face-value deposited in savings accounts opened with designated banks. To ensure the smooth operation of the new payment system (referred to hereafter as the check system), the designated banks were so assigned that no farmer had to travel more than 25 miles to cash checks or conduct banking business. To meet the 25-mile bank assignment criterion, the government asked all urban-based commercial and specialized banks to open branches in the rural regions of the country. Also, efforts at the establishment of rural banks (i.e., non-branch banks operated with share capital from residents of respective rural areas) were intensified. This brought the total of the network of banking outlets authorized to handle farmers' checks to over 250 as of the end of the first year of the check system's operation (Dadzie, Menyah and Akaah 1985)[4].

3 Besides payment delays, the industry faced several problems, including low producer price of cocoa, as compared with inflation and/or the yield from crop farming (e.g., cassava, plantain, maize, etc.), the aging of cocoa trees and farmers' lack of desire to create new cocoa farms or replant aging farms, lack of farm inputs (e.g., insecticides and farm implements), and lack of means of transportation for moving cocoa beans from rural areas to the ports for export (Dadzie, Menyah and Akaah 1985).

4 Until the 1960's, Ghana's formal banking system comprised two expatriate (foreign-owned) banks (i.e., Barclays Bank and Standard Bank) and two domestic banks (i.e., Ghana Commercial Bank and Post Office Savings Bank). By the mid 1970's, the banking system had been expanded to include special-purpose banks (e.g., Agricultural Development Bank, Social Security Bank, Merchant Bank, and Bank for Housing and Construction), and Sav-

The objectives of the check system were two-fold, i.e., (1) to enhance the prompt payment of farmers for their cocoa sales, and (2) to introduce farmers to formal financial institutions and, thereby, get them to use these institutions for savings. As noted earlier, the focus of the present paper is on the second objective of the check system (i.e., its ability to stimulate bank savings among cocoa farmers). (The reader interested in the check system's performance in terms of the first objective is referred to Dadzie, Menyah and Akaah (1985)).

As a savings mobilization mechanism, the check system embodied several features desired of formal financial institutions as savings mobilizers (Adams 1978; Mauri 1977; von Pischke, Adams and Donald 1983). First, the network of banking outlets involved in the check system spanned all of the cocoa growing regions of the country. It comprised all of the main categories of banks in the country, including commercial banks (both foreign-owned and domestic), specialized banks (e.g., Agricultural Development Bank, Bank for Housing and Construction), savings and loan societies, and rural banks. Second, the check system was so designed as to reflect the banking needs of cocoa farmers who are mostly illiterates. This included a simplified method of bank identification, check cashing, and savings account operation. Third, even though savings decisions (i.e., whether or not to leave part of one's cocoa income with designated banks) were purely voluntary, the system compelled farmers to initiate interaction with their designated banks.

Fourth, the check system possessed a number of savings-inducing features — i.e., convenience of bank location, liquidity of savings, and security of deposits. As previously noted, distance of banks from farmers' homes was specifically taken into consideration in assigning banks. Also, farmers were free to withdraw savings deposits as and when needed. Furthermore, to ensure the safety of bank deposits, the operations of the banks involved in the check system were closely monitored by the central bank. Finally, the check system embodied two features Adams (1978) considers essential for the success of bank-based savings mobilization programs. The first of these is the

---

ings and Loan Societies. With the exception of Ghana Commercial Bank and Post Office Savings Bank, most banks had minimal banking role in the rural areas. To help improve the situation, the central bank, in the late 1970's, initiated the establishment of commercially-oriented rural banks across the rural areas of the country. The rural banks were operated with share capital provided by citizens of the respective rural communities and redeemable preferred stocks held by the central bank. Sixty such rural banks participated in the check system's operation.

fact that the check system involved a sector of the economy with growth and income potential. The second is that the check system was strongly supported and promoted by government actions — including farm rallies and mass media promotions.

The only real drawback of the check system as a savings-inducing mechanism was the low nature of the nominal interest on savings deposits, relative to inflation. As Table 1 indicates, the average rate of interest on savings deposits for 1982/83 (i.e., the first year of the check system's introduction) was 11.5%. However, the corresponding average rate of inflation was 72.6%. This implied a negative real return on savings of 66.1% for 1982/83. Thus, to the extent that real return on savings was an important consideration in farmers' decision as to whether or not to save with their designated banks, its negative nature must have dampened their interest in doing so[5].

Table 1

SELECTED ECONOMIC INDICES OF GHANA (1978-1984)[a]

Year	Consumer Price Index (1980 = 100)	Rate of Inflation (Percent)	Interest on Savings Deposits (Percent)
1978	43.15	42.25	11.5
1979	66.63	54.41	11.5
1980	100.00	50.08	11.5
1981	216.49	116.49	11.5
1982	264.76	22.30	11.5
1983	590.08	122.87	11.5
1984	824.13	39.66	15.0

a Source: IMF (1986)

5 While one would ordinarily expect the volume of bank savings to be positively related to the real interest on bank deposits, empirical research regarding this is far from conclusive. Giovannini (1985), for instance, found negligible responses of aggregate savings to the real rate of interest. Whether a more appreciable (significant) relationship exists at the micro-level remains to be established.

3. Research methodology

3.1 Sample and Data Collection

To help evaluate the success of the check system, a national survey involving 2,106 cocoa farmers was undertaken. The survey involved personal interviews with farmers who represented heads of their respective households. Since most cocoa farmers lacked formal education, the survey instrument was administered in one of three Ghanaian dialects with which farmers were familiar. To minimize possible interviewer bias, interviewers were provided standard translations of the English version of the questionnaire in all three dialects. The survey was conducted at the end of the main 1982/83 cocoa season, approximately nine months after the check system's introduction. Specially trained field officers of GCMB administered the survey instrument. All interviews were conducted in farmers' homes on one-to-one basis. The research results reported here represent part of the data from the survey[6]. Table 2 represents a summary of the profile of the respondents reflected in the study.

3.2 *Study Variables*

To help assess the effectiveness of the check system as a savings mobilizing mechanism, the respondents provided information regarding their household income from cocoa for the 1982/1983 cocoa season (COINCOME), and the amount of cocoa income they maintained as savings deposits with designated banks (BASAVE). In addition, respondents provided bank-related and demographic data. The latter were used, along with COINCOME, to model respondents' bank savings behavior. The bank-related data comprised the following:

1. INTERESTS: i.e., the extent to which interest on savings deposits was a consideration in the decision to save with designated bank;
2. SECURITY: i.e., the extent to which security of bank savings was a consideration in the decision to save with designated bank;
3. DISTANCE: i.e., distance (in miles) of designated bank from a respondent's home;
4. ATTITUDES: i.e., the nature of the attitudes of bank personnel (e.g., bank clerks) toward respondent; and

6 For a detailed discussion of the survey instrument and sampling procedure, the reader is referred to Dadzie, Menyah and Akaah (1985).

Table 2

PROFILE OF RESPONDENTS REFLECTED IN THE STUDY[a]

I.	Sex	
	1. Male	88.3%
	2. Female	11.7%
II.	Age (In Years)	
	1. 29 or Younger	3.0%
	2. 30-39	11.0%
	3. 40-49	21.1%
	4. 50-59	28.6%
	5. 60 and Over	36.3%
III.	Marital status	
	1. Single	2.5%
	2. Married	90.1%
	3. Divorced/Widowed	7.4%
IV.	Education (Formal)	
	1. None	66.2%
	2. Elementary	12.4%
	3. Secondary	17.8%
	4. College	3.6%
V.	Number of Dependents	
	1. 1-5	20.9%
	2. 6-10	42.8%
	3. Over 10	36.3%
VI.	Banking Experience Prior to Check System	
	1. Prior Experience	34.0%
	2. No Experience	66.0%
VII.	Representation in Terms of Cocoa Growing Regions[b]	
	1. Ashanti	26.7%
	2. Brong Ahafo	19.8%
	3. Central	11.4%
	4. Volta	6.0%
	5. Western	24.1%
	6. Eastern	12.0%

a Percentage are based on sample size of n = 2106
b The distribution of respondents corresponded to that of cocoa purchases for the main cocoa season that preceded the survey.

5. FEAR: i.e., the extent to which fear of savings account records being used to investigate financial activities was a consideration in the decision to save with designated bank.

As noted earlier, INTERESTS, SECURITY, and DISTANCE are posited as factors that would influence LDC households' use of banks for savings. In addition to these, it was

reasoned that farmers would be more willing to interact, on a continuing basis, with their designated banks (as bank savings demand), provided the attitudes of bank personnel were positive. The inclusion of FEAR stemmed from the fact that the check system's introduction coincided with a highly publicized anti-corruption campaign by the government. This campaign permitted the use of bank-acquired information to investigate the financial activities of persons suspected of corrupt financial practices. It was therefore reasoned that the fear of savings records being used to investigate respondents' financial activities could have inhibited their saving with designated banks.

The demographic data considered in the analysis comprised respondents' level of education (EDUCA), number of household dependents (DEPEND), and banking experience prior to the introduction of the check system (EXPER)[7]. Since some level of education (i.e., ability to read and write) is needed for an uninhibited interaction with formal financial institutions, EDUCA was intended to capture the influence of this factor on respondents' saving with designated banks. Underlying the inclusion of DEPEND was the rationale that the larger the number of dependents, the greater is the extent of household obligations and, thus, the need to save to meet these obligations during lean income periods. Finally, given the «foreign» nature of banking institutions, it was posited that respondents with banking experience prior to the introduction of the check payment system would be less intimidated by formal banking operations and, thus, more likely to save with designated banks. EXPER was therefore intended to capture the effect of formal banking experience, if any. Table 3 is a summary of the variables considered in the analysis, including a brief description of how each variable was scaled.

4. Analysis and results

4.1 *Bank Savings Propensity*

The extent of respondents' willingness to save with formal financial institutions was explored by computing the proportion of cocoa income (COINCOME) saved, on the average, with designated banks. The latter was interpreted as reflecting respondents' average propensity to save (APS) with banks. To help assess respondents' willingness

7 These reflected demographic variables that were considered *a priori* to be pertinent. Age and farm size were considered in the initial analysis. Age was dropped because of its multicollinearity with DEPEND. Also, farm size was dropped because it was found to be multicollinear with COINCOME.

Table 3

SUMMARY OF VARIABLES CONSIDERED IN THE ANALYSIS

	Variable	Variable Coding		Scale Type
A.	Dependent Variable			
	S : BASAVE	Cedis[a]		Ratio
B.	Independent Variables			
	I. Income Variable			
	Y : COINCOME	Cedis		Ratio
	II. Bank-Related Variables			
	X_1 : INTERESTS	5-point scale:	"1" = not at all important "5" = extremely important	Interval
	X_2 : SECURITY	5-point scale:	"1" = not at all important "5" = extremely important	Interval
	X_3 : DISTANCE	Miles		Ratio
	X_4 : ATTITUDES	5-point scale:	"1" = very negative "5" = very positive	Interval
	X_5 : FEAR	5-point scale:	"1" = not at all important "5" = extremely important	Interval
	III. Demographic Variables			
	Z_1 : EDUCA	Years (of formal schooling)		Ratio
	Z_2 : DEPEND	Number in family		Ratio
	Z_3 : EXPER	"1" = prior experience "2" = no prior experience		Dichotomous

a Cedis is the local currency

to continue with or adopt the bank saving habit, analysis was also made of data provided by respondents regarding their intention to save with their designated banks during the next cocoa season, given their experiences with the check system.

The results of the analysis indicated that respondents, on the average, saved 15% of their cocoa income with designated banks. This implied an APS with banks of 0.15. The distribution of BASAVE indicated that only 23.6% of the respondents did not maintain any bank savings. The remainder maintained bank savings deposits that ranged in value from \$1.00 to \$30,000.00. This translated into an average per capita household bank savings of \$137.31. Although lack of comparable literature data precludes comparisons, the present results indicated a high level of bank savings responsiveness on the part of respondents. Not only did relatively few respondents maintain no bank savings but also the average per capita household bank savings of \$137.31 was fairly high, compared with the per capita GNP of Ghana of \$360.00 (World Development Report 1984). Analysis of the intention-to-save-with-bank data further indicated that respondents were willing to continue with or adopt the bank saving habit. Compared with the 23.6% who maintained no banks savings for the period covered by the study, only 7.0% of

the respondents indicated no intention to save with their designated banks during the next cocoa season. The remaining 93.0% expressed the intention to maintain, on the average, 24.6% of their next cocoa season's income as bank savings[8].

Indeed, the fact that respondents exhibited bank savings at all is to be viewed as highly encouraging given the adverse nature of the real return on bank savings noted earlier. The conjecture is that the observed APS with banks of 0.15 could have been higher if one takes into account the level of inflation, relative to the nominal rate of interest on savings deposits. Moreover, the APS with banks of 0.15 does not reflect bank savings lost to cocoa smuggling to neighboring countries. Although reliable data on cocoa smuggling are lacking, Franco (1981) estimates this to be an average of 11.3% of Ghana's cocoa output for each of the years between 1970 and 1979[9]. Since income from smuggled cocoa remained outside the check system, its inclusion could have increased the observed APS with banks[10].

4.2 *Correlates of Bank Savings*

To help explore the factors that influenced respondents' bank savings behavior, the three sets of variables — COINCOME, bank-related, and demographic — were utilized in regression analysis. The following four models were fitted to the data:

(1) $S_i = \alpha + \beta\gamma_i + \mu$ (INCOME-ONLY model)

(2) $S_i = \alpha + \beta\gamma_i + \sum_{j=1}^{5} \gamma_j X_{ij} + \mu$ (INCOME-PLUS-BANK-RELATED model)

(3) $S_i = \alpha + \beta\gamma_i + \sum_{k=1}^{3} \delta_k Z_{ik} + \mu$ (INCOME-PLUS-DEMOGRAPHIC model)

8 The results reported here are fairly consistent with the actual savings rate reported by the banks involved in the check system for the total cocoa farming population. The banks reported a 13.0% savings rate for cocoa farmers, compared with zero and negative savings rates for salaried white and blue collar workers (Ahwoi 1986). Also, bank statements from 48 of the 60 rural banks involved in the system indicated that $151.89 million (using the exchange rate of 2.75 cedis to 1 U.S. dollar) was mobilized as rural savings deposits.

9 Cocoa smuggling stemmed from the low nature of the producer price of cocoa in relation to what farmers could obtain in neighboring countries of Ghana (e.g., Ivory Coast and Togo) and also the payment delays that characterized cocoa purchases (see text).

10 It could alternatively be argued that income from cocoa smuggling enabled respondents to maintain the observed savings propensity since this augmented the income needed to meet consumption expenses.

$$(4) \qquad S_i = \alpha + \beta\gamma_i + \sum_{j=1}^{5} \gamma_j X_{ij} + \sum_{k=1}^{3} \delta_k Z_{ik} + \mu \text{ (FULL model)}$$

where i = the ith respondent (i = 1,2...,2106), j = the jth bank-related variable (j = 1,2,...,5), k = the kth demographic variable (k = 1,2,3), and α, β, γ and δ are model parameters. μ is the error term and S_i, Y_i, X_{ij} and Z_{ik} are as defined in Table 3[11]. Of the four models, only the INCOME-ONLY model (equation 1), has received ample literature attention in LDC savings research (Mikesell and Zinser 1973); Snyder 1974). However, the earlier discussion (see above) suggests the need to explore, in addition to COINCOME, the influence of bank-related and demographic factors as correlates of bank savings behavior. The INCOME-PLUS-BANK-RELATED model (equation 2) was intended to capture the combined effect of COINCOME and the bank-related variables (i.e., INTERESTS, SECURITY, DISTANCE, ATTITUDES, and FEAR). The INCOME-PLUS-DEMOGRAPHIC model (equation 3) tested for the combined effect of COINCOME and the demographic variables (i.e., EDUCA, DEPEND, and EXPER). Finally, the FULL model (equation 4) tested for the combined effect of all three categories of factors, COINCOME, bank-related, and demographic.

The models comparison approach (Green 1978) was used to determine the incremental explanatory power, over and above that of COINCOME, of the bank-related and demographic category of factors[12]. This involved first establishing the statistical significance of COINCOME alone (i.e., the INCOME-ONLY model) as a correlate of respondents' bank savings behavior. Second, the INCOME-ONLY model was compared with the INCOME-PLUS-BANK-RELATED model (equation 2). Third, the INCOME-ONLY

11 Although not reported here, three other models were initially fitted to the data using equation 1 (the INCOME ONLY model). These were the double-log, semi-log and quadratic models. The double-log model yielded about identical results as the linear model reported below for equation 1. Like Kelley and Williamson (1968), and Ong, Adams and Singh (1976), the semi-log, and quadratic models yielded nonsensical parameter estimates and relatively low R^2's.

12 As discussed by Green (1978), the models comparison test involves the following F-statistic:

$$F = \frac{SSE_r - SSE_f}{SSE_f} \cdot \frac{d_f}{d_r - d_f}$$

where SSE_r = the error sum of squares of the «reduced model» (i.e., the INCOME-ONLY model), SSE_f = the error sum of squares for either model 2, 3, or 4, and d_r and d_f are the number of degrees of freedom associated with the «reduced model» and model 2, 3, or 4, respectively.

model was compared with the FULL model (equation 4). Finally, with the statistical significance of each of the models established, the FULL model was fitted and used as the basis for discussing the correlates of respondents' bank savings behavior.

Table 4 is a summary of the regression results involving equations 1,2,3, and 4. All three models comparison tests (i.e., equation 1 versus equations 2,3, and 4, respectively) yielded highly significant F-values, with $p < 0.001$ for each test[13]. Hence, the models comparison tests suggested that both the bank-related and demographic category of factors exhibited significant explanatory power, over and above that of COINCOME. This meant that both categories of factors merited consideration as correlates of respondents' bank savings behavior. Even though the FULL model is the most pertinent from a discussion standpoint, Table 4 shows that the results were fairly consistent across the four models (equations 1,2,3, and 4). With the exception of DEPEND, variables were consistently significant or otherwise (at $p < 0.05$) across the four models.

Examination of the results of Table 4 confirms the importance of COINCOME as a bank savings correlate. Not only was COINCOME highly significant across all four models ($p < 0.001$) but also the coefficient in each model was positive, implying a positive marginal propensity to save (MPS) with banks. This meant that respondents displayed the willingness to save more with their designated banks as their income from cocoa increased (i.e., net savers). The adverse nature of the economic environment (i.e., the negative nature of real return on bank savings and cocoa smuggling) leads one to conjecture that the observed MPS with banks of 0.012 (equation 1 of Table 4) could have been higher if these factors are taken into consideration.

Besides COINCOME, the results of Table 4 (i.e., for the FULL model) show that three of the five bank-related variables, INTERESTS, ATTITUDES, AND FEAR, yielded statistically significant effects (i.e., at $p < 0.05$ or better). The direction of the coefficient of INTERESTS implies that the more important interest on savings deposits was perceived to be, the more willing respondents were to save with their designated banks.

13 The INCOME-ONLY model versus the INCOME-PLUS-BANK-RELATED model yielded $F = 14.84$ (d.f. = 5, 2096; $p < 0.001$), the INCOME-ONLY model versus the INCOME-PLUS-DEMOGRAPHIC model, $F = 8.70$ (d.f. = 3, 2101; $p < 0.001$), and the INCOME-ONLY model versus the FULL model, $F = 11.56$ (d.f. = 8, 2096; $p < 0.001$).

Table 4

REGRESSION OF BANK SAVINGS (AS DEPENDENT VARIABLE) ON INCOME, BANK-RELATED, AND DEMOGRAPHIC VARIABLES

Variable	Estimated Model Parameters			
	INCOME-ONLY MODEL (Equation 1)	INCOME-PLUS-BANK-RELATED MODEL (Equation 2)	INCOME-PLUS-DEMOGRAPHIC MODEL (Equation 3)	FULL MODEL (Equation 4)
α : Intercept	20.543[a]	- 25.544[a]	7.053[b]	- 35.136[a]
	(1.432)	(10.049)	(2.720)	(10.405)
Income Variable				
β : COINCOME	0.012[a]	0.014[a]	0.011[a]	0.014[a]
	(0.001)	(0.001)	(0.001)	(0.001)
Bank-Related Variables				
γ_1 : INTERESTS	—	2.738[b]	—	2.539[b]
		(0.891)	—	(0.899)
γ_2 : SECURITY	—	1.348	—	1.421
		(1.047)		(1.044)
γ_3 : DISTANCE	—	- 0.070	—	- 0.147
		(0.138)		(0.138)
γ_4 : ATTITUDES	—	3.994[c]	—	4.272[c]
		(2.028)		(2.019)
γ_5 : FEAR	—	- 4.138[a]	—	- 3.956[a]
		(1.126)		(1.122)
Demographic Variables				
δ_1 : EDUCA	—		- 0.104	- 0.112
			(0.191)	(0.191)
δ_2 : DEPEND	—		0.622[a]	0.324
			(0.175)	(0.172)
δ_3 : EXPER[d]	—		14.971[a]	11.461[a]
			(2.695)	(2.697)
Summary Statistics				
Overall F-Ratio	503.93[a]	175.42[a]	141.05[a]	153.56[a]
R^2	0.193	0.222	0.212	0.234

[a] $p < .001$
[b] $p < .01$
[c] $p < .05$
[d] Reflect level (1) — i.e., prior banking experience, other level is set to zero.

Of course, the negative nature of the real return on bank savings makes this finding seemingly contradictory. It, nonetheless, appears fairly consistent if one assumes that the seasonal nature of cocoa income, led respondents to save with banks in order to tie them over lean income periods, as opposed to utilizing bank savings as long-term investments. If this assumption were valid, then bank savings represented the best short-run savings option. For example, while cash holdings at home offered similar liquidity

as bank savings, they lacked security (i.e., given the possibility of loss through thefts) and interest income (however small interest on bank savings was).

Unlike INTERESTS, the directions of the coefficients of ATTITUDES and FEAR were as expected. The coefficient of ATTITUDES was positive, implying that the more positive the attitudes of bank employees, the more willing respondents were to save with their designated banks. The negative coefficient of FEAR meant that the greater the fear of bank savings records being used to investigate savers' financial activities, the less inclined respondents were to save with their designated banks. The lack of statistical significance of SECURITY and DISTANCE (equation 4, Table 4) must have stemmed from the nature of the check system. As discussed above, the network of banks involved in the system enjoyed the full public support of both the government and the central bank. This must have therefore bolstered respondents' confidence in the system, thereby neutralizing the importance of SECURITY as a decision criterion. Also, since the distance of banks from farmers' homes was specifically taken into consideration in assigning respondents to their designated banks, this must have lessened the salience of DISTANCE as a bank savings decision factor.

Finally, Table 4 (equation 4) shows that one of the three demographic factors, EXPER, yielded statistically significant effect ($p < 0.001$). The direction of the coefficient was also consistent with expectation. That is, respondents with banking experience prior to the introduction of the check system exhibited greater propensity to save with their designated banks than those who lacked such an experience. Although DEPEND was statistically significant in equation 3, it was not so in equation 4 (the FULL model), implying that this variable had, at best, only a marginal influence on bank savings behavior. Also, contrary to expectation, EDUCA did not yield statistically significant effect. This implied that respondents exhibited fairly similar disposition to save with their designated banks, regardless of their level of formal education. While there is no clear reason for the observed results, the conjecture is that because the check payment system was specifically designed to meet the banking needs of respondents (e.g., in terms of simplified check cashing, deposit, and withdrawal procedures), this must have neutralized the possible effect of EDUCA.

5. Conclusions and implications

Although formal financial institutions are offered as savings mobilizing conduits in rural

LDC, empirical research is sparse as to their efficacy as savings mobilizers. Such research is however needed to help development planners and policy makers of LDCs evolve strategies and policies for utilizing formal financial institutions to mobilize savings. The present paper contributes to this research effort by examining, in the context of the recent extension of banking services to cocoa farmers in Ghana, the efficacy of formal financial institutions as savings mobilizers. In this regard, the paper addresses two issues central to the use of formal financial institutions as savings mobilizing conduits in rural LDCs, i.e., (1) the willingness of rural LDC households to save with banking institutions, and (2) the factors that underlie their bank savings behavior.

With respect to the first issue, the research results indicate that cocoa farmers in Ghana are willing to save with formal financial institutions, especially if banking operations and procedures are designed to reflect their needs and preferences. The cocoa farmers utilized in the analysis exhibit a reasonable level of bank savings propensity (i.e., an APS with banks of 0.15) and also the desire to increase their bank savings as their income from cocoa increases (i.e., a positive MPS with banks of 0.012). The fact that these positive savings propensities occurred despite the negative nature of the real return on bank savings leads to the conjecture that cocoa farmers would have probably saved more if the real return on bank savings had been positive. Also, the savings propensities excluded savings which must have accured if there had been no cocoa smuggling.

With respect to the second issue, the research results suggest that three categories of factors, income, bank-related, and demographic, underlie farmers' bank savings behavior. Consistent with the literature, income strongly influences cocoa farmers' bank savings propensities. As just noted, cocoa farmers' bank savings appear to increase directly with increases in cocoa income. Additionally, the results suggest that bank-related factors also influence farmers' bank savings behavior. Pertinent, in this regard, are variables such as interest on savings deposits, attitudes of bank employees, and fear of bank records being used to investigate savers' financial activities. That is, farmers who consider interest on savings deposits as important appear to save more with banks than vice-versa. Also, the more positive the attitudes of bank employees, the more willing farmers are to save with banks. On the other hand, the fear of bank records being used to investigate savers' financial activities serves to discourage farmers from savings with banks. Finally, the results suggest that farmers with formal banking experience exhibit greater inclination to save with banks than those lacking such an experience.

In sum, the research results imply that a network of formal financial institutions that

spans rural LDCs could be used successfully as the nucleus of a savings mobilization program. However, the success of such a program would depend on several factors. First, the program's design and implementation should reflect the needs and preferences of the rural population to be served. Second, while voluntary savings inducements (e.g., interest on savings deposits, convenience, liquidity, and security) are vital to the program's success, it could also benefit from a built-in structure that induces rural households to initiate the bank interaction process. As observed in the present study, rural households are willing to maintain the bank saving habit once initiated. Third, the program should utilize bank personnel who are conversant with the clientele to be served and are positively predisposed to serving them. However, the one-shot nature of the present study implies that more research of the kind reported here is needed. Such research would shed more light on the efficacy of formal financial institutions as savings mobilizers and, thereby, enhance the generalizability of research findings. To meet this goal, such research should reflect different sectors of rural economies. Particularly useful in this regard are longitudinally-based studies that track changes in rural households' bank savings behavior over time.

References

Adams, Dale W. (1978), «Mobilizing Household Savings Through Rural Financial Markets», *Economic Development and Cultural Change*, 26, 3 (April) 546-60.

Aggrey-Mensah, W. (1983), «Savings Mobilization for Rural Development», paper presented at 2nd Annual Seminar on Rural Banks, GIMPA, Greenhill, Ghana.

Ahwoi, Kwesi (1986), «Rural Savings Mobilization: Myth and Practicality», Seminar Paper, Hubert H. Humphrey North-South Fellowship Program, Washington, D.C.

Dadzie, Kofi A., Kojo Menyah, and Ishmael P. Akaah (1985), «The Akuafo Cheque System: A Baseline Study of Farmers' Response to the Introduction of a Bank-Based System of Cocoa Purchasing», A Research Report Submitted to the Ghana Cocoa Marketing Board, Accra, Ghana.

Franco, G. Robert (1981), «The Optimal Producer Price of Cocoa in Ghana», *Journal of Development Economics*, 8, 77-92.

Galbis, Vicente (1977), «Financial Intermediation and Economic Growth in Less-Developed Countries: A Theoretical Approach», *Journal of Development Studies*, 13, (January), 58-72.

Ghana Central Bureau of Statistics (1984), *Quarterly Digest*, Bureau of Statistics, (September).

Giovannini, Alberto (1985), «Saving and the Real Interest Rate in LDCs», *Journal of Development Economics*, 18, 197-217.

Green, Paul E. (1978), *Analyzing Multivariate Data*, The Dryden Press, Hinsdale: Illinois.

Gurley, John G. and E.S. Shaw (1967), «Financial Structure and Economic Development», *Economic Development and Cultural Change*, 15 (April), 257-268.

Hyun, K.H., D.W. Adams, and J.L. Hushak (1979), «Rural Household Savings Behavior in South Korea, 1962-1976», *American Journal of Agricultural Economics*, (August), 448-54.

IMF (1986), «*International Financial Statistics*, Bureau of the International Monetary Fund, Washington D.C.

Kelley, A. and J. Williamson (1968), «Household Savings Behavior in the Developing Economies: The Indonesian Case», *Economic Development and Cultural Change*, 16, 3, 385-403.

Lee, Tae Young, Dong Hi Kim, and Dale W. Adams (1977), «Savings Deposits and Credit Activities in South Korean Agricultural Cooperatives 1961-1975», *Asian Survey*, 1182-94.

Mauri, Arnaldo (1977), «A Policy to Mobilize Rural Savings in Developing Countries», *Savings and Development*, 1, 14-25.

McKinnon, Ronald I (1973), *Money and Capital in Economic Development*, Washington, D.C., Brookings Institution.

Miracle, Marvin P., Diane S. Miracle, and Laurie Cohen (1980), «Informal Savings Mobilization in Africa», *Economic Development and Cultural Change*, 28, 701-724.

Mikesell, R. and J. Zinser (1973), «The Nature of the Savings Function in Developing Countries: A Survey of the Theoretical and Empirical Literature», *Journal of Economic Literature*, 11, 1-26.

Ong, M.M.L., D.W. Adams, and L.L. Singh (1976), «Voluntary Rural Savings Capacities in Taiwan, 1960-1970», *American Journal of Agricultural Economics*, 58, 578-82.

Porter, Richard C. (1966), «The Promotion of the 'Banking Habit' and Economic Development», *Journal of Development Studies*, 2 (July), 346-366.

Shaw, Edward S. (1973), *Financial Deepening in Economic Development*, Oxford University Press, New York: New York.

Snyder, D.W. (1974), «Econometric Studies of Household Saving Behavior in Developing Countries: A Survey», *Journal of Development Studies*, 10, 139-53.

von Pischke, J.D., Dale W. Adams, and G. Donald (1983), *Rural Financial Markets in Developing Countries*, Baltimore, MD: Johns Hopkins University Press.

World Development Report (1984), World Bank, Washington, D.C.

LES INSTITUTIONS FINANCIÈRES DE NATURE FORMELLE COMME ORGANISMES DE MOBILISATION DE L'ÉPARGNE DANS LES ZONES RURALES DES PAYS EN VOIE DE DÉVELOPPEMENT: UNE ÉVALUATION QUANTITATIVE BASÉE SUR LE COMPORTEMENT DE L'ÉPARGNE BANCAIRE DES MÉNAGES AU GHANA.

RESUME

On sait depuis longue date que l'épargne est d'une importance fondamentale dans les processus de croissance et de transformation économique des pays en voie de développement. Ce que l'on sait moins c'est comment choisir la stratégie plus adaptée en vue de la mobilisation de l'épargne. Toutefois, un des éléments essentiels de n'importe quel programme bien conçue de mobilisation de l'épargne réside dans la présence d'un système d'institutions financières de nature formelle dans les zones rurales des pays en voie de développement. Malgré que cette conclusion soit largement acceptée, on doit constater que la grande majorité des ménages des pays en voie de développement n'utilise pas (ou utilise seulement de façon limitée) les institutions financières ci-dessus mentionnées. A ce sujet, il convient de souligner l'insuffisance de recherches empiriques quant'à l'efficacité de ces institutions en ce qui concerne la mobilisation de l'épargne dans les pays en voie de développement.

Cet article examine, dans le cadre de l'expérience de l'expansion bancaire au Ghana, deux prolèmes qui sont d'importance fondamentale pour l'utilisation des institutions financières dans la mobilisation de l'épargne dans les pays en voie de développement. Ces deux problèmes sont: 1°) la propension des ménages ruraux des pays en voie de développement à utiliser les institutions bancaires dans la mobilisation de l'épargne et 2°) les facteurs qui déterminent le comportement des épargnants vis-à-vis du système bancaire.

En ce qui concerne le premier problème, les résultats montrent que les ménages des pays en voie de développement désirent confier leur épargne aux institutions financières dans la mesure où les opérations et le procèdures bancaires tiennent compte des besoins et des préférences des épargnants.

En ce qui concerne le deuxième problème, les résultats de la recherche montrent encore

une fois l'importance du niveau du revenu dans la formation de l'épargne. L'utilisation des banques dans le processus de mobilisation de l'épargne des ménages ruraux des pays en voie de développement est favorisée par de multiples facteurs. Parmi ces derniers, il faut rappeler la présence d'un taux d'intérêt sur les dépôts (savings deposits), le comportement accueillant du personnel bancaire, la confiance des clients dans l'institution bancaire surtout en ce qui concerne le secret bancaire et enfin l'utilisation précédente des services bancaires par les usagers.

Savings and Development,
a quarterly review published since 1977 by Finafrica Foundation

EDITORIAL OFFICE: FINAFRICA, via S. Vigilio 10, 20142 MILANO (Italy)
Tel. 8135341 - Telex 313223 FINAFR I

FINAFRICA is a non-profit institution established by CARIPLO - Cassa di Risparmio delle Provincie Lombarde - Milan (Italy), its goal being the promotion of social and economic development of less developed countries, especially in Africa, through research and documentation on savings mobilization and financial development, technical assistance for the creation and reorganization of financial institutions, training of bank staff.

RASSEGNA TRIMESTRALE
REGISTRATA PRESSO IL TRIBUNALE DI MILANO AL N. 102 DEL 27.3.1974
DIREZIONE, REDAZIONE, AMMINISTRAZIONE
FINAFRICA CARIPLO - VIA S. VIGILIO, 10 - 20142 MILANO

Direttore Responsabile
GIUSEPPE VILLA

Arti Grafiche FRIMA s.r.l. - Milano