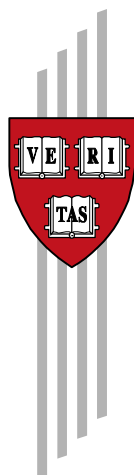


# Saving in Sub-Saharan Africa

Ernest Aryeetey and Christopher Udry

CID Working Paper No. 38  
January 2000

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## Working Papers

Center for International Development  
at Harvard University

## **Saving in Sub-Saharan Africa**

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### **Abstract**

Gross domestic savings in Africa averaged only 8 percent of GDP in the 1980s, compared to 23 percent for Southeast Asia and 35 percent in the Newly Industrialized Economies. Aside from being generally low, saving rates in most of Africa have shown consistent decline over the last thirty years. These savings figures must be considered tentative, because they are derived as a residual in the national accounts from expenditure and production data that are themselves quite unreliable. Notwithstanding the problems of measurement, it is clear that savings are dominated by household savings. Survey evidence in turn shows that household savings are primarily in the form of non-financial assets. Financial savings are predominantly directed to informal markets and institutions. The paper documents these trends and provides a simple model of portfolio allocation to guide future research. It is suggested that an array of transaction costs associated with formal financial markets, coupled with the risk management strategies and production activities of households in Africa account for the patterns of saving and portfolio allocation observed in the data.

**Keywords:** saving, Africa, household savings, transactions costs, risk management

**JEL Classification:**O16, O55, O17, D12

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An earlier version of this paper was presented at the Workshop on "Explaining African Economic Growth Performance," held at Harvard University, March 26-27, 1999. The workshop was sponsored by the African Economic Research Consortium and the Weatherhead Center for International Affairs.

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## SAVING IN SUB-SAHARAN AFRICA<sup>1</sup>

Ernest Aryeetey and Christopher Udry

### 1. INTRODUCTION

In much of the recent development literature that attributes Sub-Saharan Africa's relatively slow growth in the last three decades to slowness in capital accumulation, a great deal of attention is paid to the apparently low saving rate in the region (World Bank 1994). For the entire region, gross domestic savings averaged only 8 percent of GDP in the 1980s, compared to 23 percent for Southeast Asia and 35 percent in the Newly Industrialized Economies of Korea, Hong Kong China, Singapore and Taipei China. Aside from being generally low, saving rates have shown consistent decline over the last thirty years in most countries, seldom exceeding 15 percent of GDP. Where rises have been seen, these have been very modest.

Having noted that saving rates in Africa are generally estimated to be low and stagnant, we must also point out that it is also not entirely clear what the data actually capture. Most data concerning saving in Africa are based on estimates of national or domestic savings that are compiled by the UN relying on national accounts statistics. These are generally problematic, as has been noted by several researchers<sup>2</sup>. The main problem is that consumption estimates are seldom actually measured but derived as residuals from production and expenditure data that are themselves severely understated (Srinivasan 1994). Heston (1994) suggests that the inability to reconcile the outcomes of the production and expenditure approaches that are used for different components of national income makes it difficult to uncover major discrepancies in income estimates and hence obscures the lack of credibility of the data. "Where production side estimates are the basis.... it is still common for a number of countries with weak survey sources to derive consumption as a residual. Because of this, estimates of saving and particularly investment, may appear to be more precise in such countries than in fact they are" (Heston 1994, pp.35). This is indeed the situation in many SSA countries where the production approach is generally used.

These difficult national accounts data issues notwithstanding, it is apparent that domestic and national savings are dominated by private savings, and that household savings form the more substantial part of these in most countries (Deaton 1989). Household savings may be measured in a number of ways. One approach is provided by the flow-of-funds perspective (Wilson, et.al. 1989), in which the capital expenditures of households are added to their acquisition of financial assets in the first instance. Any changes in their liabilities are subtracted from this to yield their gross personal saving. An allowance for capital consumption yields the net personal saving in the flow-of-funds account. Making further deductions for spending on consumer durables and income adjustments yields

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<sup>1</sup> This paper is essentially about sub-Saharan Africa. Any further reference to Africa is related to sub-Saharan Africa.

<sup>2</sup> Deaton (1990) discusses in great detail the shortcomings of these measurements.

personal saving by the flow-of-funds approach on the same conceptual basis as measured by the national income and product accounts approach. Data limitations, however, make it difficult to measure the household saving rate by the flow-of-funds approach in almost all African countries. The National Income and Product Approach in which expenditure is subtracted from income is therefore widely used.

Given the known problems of national accounts data, it is necessary to try to improve our understanding of saving data and saving behavior with household survey material. But while it appears that microeconomic data from household surveys may contribute to a better understanding of patterns of aggregate saving, they are themselves problematic. Surveys in many developing countries seem to significantly understate both consumption and income, with income subject to the more serious downward bias. This means household saving is often underestimated, sometimes quite dramatically. Indeed, most developing country household surveys imply that households are dissaving, contradicting national accounts statistics. Deaton (1997) suggests that the appearance of dissaving can be explained by the underestimation of household incomes. Large numbers of households that are involved in small family businesses and farming are likely to be confused about “personal and business incomings and outgoings”. When such people are interviewed for surveys, they are not likely to know what is required if asked about profits from farms or own enterprises. “The only way to obtain such measures is by imposing an accounting framework on the data, and painstakingly constructing estimates from myriad responses to questions about the specific components that contribute to the total” (Deaton 1997, p.29). Most household surveys in SSA do not attempt such a careful accounting of business activities.

Moreover, there are very few countries that have completed comprehensive income and expenditure surveys in recent years, thus making generalizations based on them very difficult. There are, however, a few household surveys, completed in the last decade, that provide promising ground for study, particularly if the data are considered alongside the aggregated data for trends across the region.

Cross-sectional data on asset holdings is less subject to the definitional problems which afflict the income and consumption (and hence saving) data. Households generally hold a significant amount of assets. This stock of wealth plays a crucial role in peoples' management of predictable changes in their resources over their life-cycles, and also in strategies to cope with unpredictable shocks. In situations where consumers are relatively impatient and risk averse and when labor income is subject to random variation, assets act as a buffer stock to protect consumers against uncertain future incomes. When the precautionary demand for saving interacts with borrowing constraints, they provide a motive for holding assets.

A buffer stock of assets is critical to enable risk-averse households facing liquidity constraints to cope with unexpected shocks. An assetless household that is constrained in its access to credit may not be able to survive a negative shock. In practice, many such households do survive, but at the cost of adopting an extremely risk averse production strategy. In many rural areas, for example, this strategy might be reflected in the sacrifice of expected return as farmers choose safer, lower yield crops, thus perpetuating the cycle of poverty and hampering economic growth as credit constraints force farmers to choose sub-optimal production patterns<sup>3</sup>.

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<sup>3</sup> See Morduch (1993) for an exposition and test of this argument.

There are many assets that households hold and control, particularly in the informal sector that may not be reflected in the aggregated national data. Households in Africa appear to hold quite diverse portfolios of non-financial assets. Many have observed the accumulation of livestock, stocks of goods for trading, and grain and farm inputs by rural households. In southern Ghana, Aryeetey and Gockel (1991) reported the holding of construction material and unprepared farm land. A wide variety of consumer durables (for example, jewelry or cloth) are also held. Indeed, depending on other socio-cultural conditions, holdings of assets that can easily be sold to smooth consumption may be very extensive. Obviously, these savings are not recorded in the accounts of financial institutions, and indeed they may often be mistakenly attributed to consumption in the national accounts.

The composition of household asset holdings reflects the return on different assets, the covariance structure of risks associated with the different assets, liquidity constraints, transaction costs, and production interactions between the different assets. In effect, the composition of household portfolios is affected by liquidity preference, which is derived from perceptions of liquidity constraints and the ease of asset-switching. Hence it is possible to draw conclusions about the financial environment within which households operate by examining the equilibrium composition of their portfolios. On the environment, we may note that the economic turmoil that has characterized many SSA countries in the last two decades has established the role of macroeconomic phenomena, as well as unstable politics, on asset choice (Nissanke and Aryeetey 1998). High and very uncertain inflation rates have had major influences on the asset holdings of private agents. They have to choose between non-financial assets and financial assets, and within the latter, between assets denominated in domestic currencies and those held in foreign currencies. Much of this paper is concerned with documenting the patterns of household portfolios in Africa and understanding what these patterns imply about the financial environment facing these households.

A crucial fact of portfolios in Africa is the predominance of non-financial assets in household wealth. The domination of non-financial assets in household portfolios is related to the degree of complexity of economic activity. In economies that generate greater opportunities for more complex and intermediated economic undertakings, financial assets are more likely to dominate. In contrast, where financial markets are fragmented and small-scale production activities predominate, then household portfolios will tend to include a higher proportion of non-financial assets. In sum, we note that the composition of household assets is affected by the economic and institutional environment in which private agents find themselves as well as by the cultural, demographic and other socio-economic characteristics of their communities.

While many African economies may exhibit a greater potential for voluntary savings than hitherto known, the largely non-financial assets households hold tend to be highly liquid. The agricultural production cycle and the risky environment within which they live create an urgent need for liquidity. The need for liquidity puts a premium on relatively liquid assets, often dictated by the seasonality of agricultural activity and the associated rural household income. As Deaton (1989) notes, many of the informal savings arrangements which dominate household savings in Africa are small in transaction size and of a high-frequency nature. This is hardly surprising given the essential role of savings as a buffer between uncertain and unpredictable income and a low level of consumption.

This has significant implications for the savings-investment nexus. The small scale and high frequency of saving imply high transaction costs for institutions that want to intermediate such

resources. Weak financial intermediation makes long term investment difficult and costly and helps to depress such investments.

We believe that there are two key research questions that need to be asked about saving in Africa. First, how can national accounts and household survey data best be used to determine the level and composition of savings in Africa? Second, how can we explain why households do not financialize their assets? Sections 2 and 3 of this paper provide an overview of what is known about the level and composition of savings in Africa, as a first step towards addressing the first question. Much more research is required, however, before a coherent strategy for improving knowledge about savings patterns in Africa can be proposed. Section 4 provides an overview of knowledge about the composition of household assets in Africa and describes a theoretical framework and an econometric methodology for using data on the composition of portfolios to address questions about the financial environment faced by households. We intend this section to serve as a guide to researchers who have access to relatively standard data (similar to that available from Living Standards Measurement Surveys) and who wish to test simple hypotheses about financial markets. Finally, in section 5 we discuss some of the most important institutional barriers to financialization of assets in Africa.

## 2. SAVINGS TRENDS IN AFRICA

There are no hard and fast rules on the determination of how well national and domestic savings should perform in any given year. Thus, in discussions of how well savings are doing in any economy, the standard is usually to compare that economy to other economies of similar size and structure, or to compare the same countries' savings performance over time, or even to compare actual performance to planned performance. In this section, we shall focus our discussion on these three indicators with respect to the observed changes in the levels or magnitude of savings in the last three decades and look at factors that have been identified to be influencing these.

### *Some Trends in Savings Rates*

As noted in the introduction, SSA's savings performance is far below that of other developing regions, notably Southeast Asia. The general picture is depicted in Figure 1, as a region, SSA appears to have low and stagnant saving. Some of the best saving rates in Africa may be found in Angola where the domestic saving rate has averaged 28 percent in 1980-96, and Gabon with an average saving rate of 38 percent for the same period. These are by all accounts outliers in a region where a majority have domestic saving rates of under 15 percent of GDP and sometimes negative savings. Their high saving rates can be attributed to their being relatively small economies with large oil exports. The public sector dominates saving in these two countries.

Despite the economic reforms that many African countries attempted in the last decade, there is little evidence of these having a major impact on savings and investments in countries (World Bank 1994). Figure 2 provides examples of trends in aggregate saving over the period 1988-96. Only a couple of serious reformers saw some modest improvements in their savings performers. One of the more comprehensive reformers, Ghana, has had a very low average domestic saving rate of about 5 percent of GDP for the same period. Indeed, Ghana's saving rate only rose from 4 percent to 7 percent after a decade of reforms. By 1990, the only SSA economies (besides Angola and Gabon) with domestic

saving rates above 20 percent were Kenya and Zimbabwe. One of the characteristics of all the data on domestic saving rates is that they declined for most countries in the period 1980-96 and have not seen a revival yet. (See Elbadawi and Mwegu 1998).

The region indeed boasts of some contrasts in country performance with savings. In Tanzania, aggregate savings ratios remained strikingly low throughout the period of adjustment. During reforms, saving rates turned negative and the gap between national and domestic savings ratios widened, as net factor payments abroad rose significantly. The government continued to dissave on a large scale in the early part of this decade, even though the rate of dissaving has slowed down since. Huge losses made by public enterprises have been a substantial drain on the economy's financial resources. The high domestic investment rate of almost 40 percent in 1990 (it was similar in other years) was made possible only by large inflows of external finance.

Nigerian trends with aggregate savings have been interesting and different from the situation in many other countries. It first experienced a general decline during 1979-86, but this was reversed after that. While this was happening, however, increasing debt service payments widened the gap between national and domestic savings after 1986. The domestic savings ratio rose to more than 30% in 1990, an increase that was largely accounted for by private savings as government savings fell.

In terms of a comparison on the basis of planned savings growth and actuals, we note that most countries that prepared development plans in the 1960s and 1970s usually had a planned saving rate of 20-25 percent, derived on the basis of Harrod-Domar type models (Todaro 1997). By the 1980s, most of such development planning had been abandoned due to difficulty in meeting targets. But working with planned saving rates was not that easily abandoned. The achieved average saving rate of 8 percent up to 1994 was substantially lower than the targeted regional saving rates of 16.6 percent for 1995 and 20 percent for 2000 that Calgagovski et al. (1991) estimated was necessary to achieve overall macro-economic growth targets. Using the standard two-gap model, they calculated the minimum saving rate required to achieve economic growth of 5 percent p.a. for the region by year 2000. This growth target was, in turn, a minimum acceptable rate if the region was to attain a modest increase of 1.3 percent in real per capita consumption by the turn of the century (World Bank 1989). In Ghana, for example, under a program for accelerated growth in the midst of Bank-supported reforms that would transform the economy into a middle-income economy by the year 2020, it was programmed to achieve an annual growth rate of 8% for the rest of the century which would require an investment/GDP ratio of 25 percent, assuming the ICOR remained at 3 percent. This would push the required domestic savings/GDP ratio to 20 percent, assuming foreign savings remained at 5 percent (World Bank 1993). Obviously, the challenges posed by those demands on the domestic economy were enormous, and it is not surprising that not much progress has been made in that direction. Indeed very few countries have ever achieved their savings targets.

In contrast, we note that the fast growing East Asian economies recorded average saving rates of about 33 percent in 1980-95. Singapore maintained a saving rate in excess of 45 percent for the period while Korea exceeded 35 percent. In southeast Asia, Malaysia has seen impressive growth of its savings which also went beyond 36 percent, indeed reaching 40 percent in 1995. India's performance in South Asia was far higher than the African average at 20 percent.

An interesting point about the performance of savings in Africa in contrast with savings performance in the fast growing Asian economies during the reform period is that any changes in the saving rates in Africa were driven by public savings (World Bank 1994), while in Asia they were usually driven by private savings. Srinivasan (1993) observed about largely East Asian savings that "public sector savings, if anything, do not appear to have increased significantly in the last four decades. .... One has to look for an explanation in the behaviour of the private sector for the measured rise in aggregate savings rates". The importance of private savings in Asia is again underscored by Collins (1991) who suggests from Korean data that while urban households have increased savings dramatically since 1965, rural households on average save a lot more. This savings, however, is primarily in inventory increases, and excluding this component shows average rural savings to be 6.5 percent as opposed to 18.6 percent of disposable income for urban households.

In contrast private saving in Africa dropped from 11.4 percent of disposable income in the 1970s to 7.5 percent in the 1980s. By the mid-1990s it was still less than 9 percent. Public saving performed even worse, staying at under 3 percent of disposable income by the mid-1990s after falling from 4.5 percent in the 1980s. In many of the African countries where saving rates declined, they did so because public savings declined. This was certainly the case in Kenya and Niger. In countries like Tanzania and Malawi the decline in the saving rate came following large increases in external transfers. Indeed, the issue of foreign savings substituting for domestic savings has been noted (World Bank 1994). The important issue for Africa is why private savings, including household savings, do not rise fast enough to offset the negative trends in public savings.

There are very few estimates of saving rates in Africa based on microeconomic data. Those which do exist are often imply patterns of saving which are dramatically different from those in the national accounts. In 1990 South Africa, gross private savings according to the national accounts was 25% of GDP. Household survey evidence indicates that in the same year, households saved an average of 2.6% of their income (Makgetla, 1995). In Ghana in 1996, gross domestic savings were 8% of GDP, but the following year in a household survey of southern Ghanaian farmers, Goldstein and Udry (1999) found that the median household saved over 30% of its income.

### *Explaining the Trends*

Mwega (1997) has conducted a comparative analysis of average private saving rate in 15 African countries and finds evidence that saving rates are unambiguously lower than in other developing countries. Relying primarily on life-cycle and permanent income intertemporal models of household saving, he estimates a private savings function for a number of developing countries<sup>4</sup>. The estimation for the entire sample shows (among other things) a positive and highly significant coefficient on per capita income (that decreases as income increases), a positive and highly significant coefficient on growth of per capita income (1% increase in economic growth raises private saving rate by 1.6%), a negative and highly significant coefficient on public saving (1% increase in the public savings rate reduces the private rate by at least 0.9%), a positive and highly significant coefficient on the degree of financial depth (M2/GDP), and an insignificant coefficient on financial constraints (suggesting that these constraints are either unimportant, captured by other variables or that the variable is a poor proxy). The estimation for the African countries shows that the unambiguously important variables determining private savings behavior are the dependency ratio, level of per capita income (negative

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<sup>4</sup> His sample of 33 developing countries included 15 African, 9 Asian and 9 Latin American countries with comparable data for the period 1970-1993



effect), economic growth (larger effects compared to other developing countries), terms of trade (negative effect) and public savings rates (less negative effect compared to other countries). Mwega (1997) concludes that the low savings rate in Africa reflects both the private savings function and the initial economic conditions not explained by his study.

Given the low saving rates from the private sector, we need to understand saving behaviour in rural or poor communities. Deaton (1997) has discussed methodologies for testing the various hypotheses for saving using household data. For example for the life-cycle hypothesis, he has considered a range of methodologies including such simple ones as plotting the age profiles of household heads against income and consumption using Ivorian LSS and Thai household data. He looked at consumption and saving by cohorts. In all these there is very little evidence of life-cycle rationalizations for saving. Of particular interest was the Ivorian case where no divergence in incomes and consumption was observed across all age groups. In the 1986 Cote d'Ivoire survey, income and consumption were lower for 40 year-olds than they were for 45 year-olds. The only thing that is clear from a lot of the empirical work is the fact that over the long term consumption and income are closely correlated. Consumption is observed to track income. There is no evidence, therefore, of life-cycle saving in preparation for old age in Cote d'Ivoire.

The weakness of the life-cycle hypothesis for poor economies is corroborated by the work of Collins (1991). She discusses saving behaviour in ten developing countries (nine in Asia and Turkey). Aside from highlighting savings trends in these countries since the early 1960s, she answers questions about the major determinants of savings empirically, using primarily a life-cycle model<sup>5</sup>. She finds that the population share of children, per capita income and growth of per capita income are all significant. Household saving also seems to be less sensitive to the age distribution as well as to changes in income for poorer countries in the sample. 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 increase.

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<sup>6</sup>. Informal

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<sup>5</sup> The life-cycle model of savings used highlights level and growth effects, as well as including mean ages of income earnings and consumption. The author uses this model to construct a specification with per capita income and percentage of population below age 15 as the explanatory variables.

<sup>6</sup> Deaton uses the WorldBank's LSMS household surveys, summaries of debts and credits as well as distribution of

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 Ikhida (1996) who argues mainly that rural savings mobilization 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. Indeed, many of the rural outlets

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loans by season of contract and termination in Ghana and Cote d'Ivoire.

<sup>7</sup> The study countries were Nigeria, Ghana, Ethiopia, Kenya and Tanzania. Other explanatory variables are real exchange rate and rate of growth of per capita income. All three independent variables are shown to be significant and together explain over 80% of the change in domestic savings ratios.

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 precludes the participation of others not belonging to those groups. The fact that only a few such informal savings mobilizers 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.

### 3. COMPOSITION OF HOUSEHOLD SAVINGS

In looking for a pattern in the composition of household savings and the associated saving behavior we need to keep in mind that “one way of classifying saving behavior is by the length of time period over which households can detach consumption from income” (Deaton 1997, p.335). While the term structure of deposits matters, it is equally important to distinguish among various savings instruments by the returns on them and the flexibility of the contracts associated with them. In general, when this has been done, two types of saving are often identified, namely formal and informal. Formal saving may have a less flexible structure and be less liquid and of a longer maturity than informal saving<sup>8</sup>. We must point out, though, that recent studies of financial systems suggest that this distinction is no longer that straightforward between formal and informal savings.

In addition to the changing characterization of formal and informal savings, the very low number of published household surveys makes it extremely difficult to discern clear patterns in the composition of household savings across the region. There are very few surveys that report on the asset holdings of households on a large enough scale. An example of this is the study of rural finance in northern Ghana by IPC (1988) that showed that only 20 percent of household assets were held in financial assets, and that this was divided as follows: 12 percent informal savings and 8 percent formal savings. In a recent survey in southern Ghana, Udry (1999) found that only 19 percent of farming households had any financial assets with formal institutions and these were valued at only 4 percent of the total value of assets exclusive of the value of land.

While it is relatively easy to measure the magnitude of formal savings, assuming that the monetary authorities reports provide ample disaggregation of the ownership of various bank liabilities, it is not that easy to do the same for the informal sector. Most of what we know today about the magnitude of informal savings is from small sample surveys in a few countries<sup>9</sup>. We will discuss briefly here some characteristics of formal savings and how they have performed in recent years and contrast this with informal savings.

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<sup>8</sup> Other forms of saving, including social security contributions and other pension funds are negligible in most countries as these cover only parts of the modern sectors of the economy.

<sup>9</sup> See Aryeetey, E. (1992), *Informal Finance in Africa*, AERC, Nairobi.

### *Formal Savings*

It has been usual to gauge the performance of formal savings with the measure of financial deepening,  $M_2$ /GDP ratio. While this may not provide an accurate picture of how people wish to save, it nevertheless provides a good picture of how well a financial system is performing in terms of its ability to attract surplus funds<sup>10</sup>. The financial deepening indicator for most African economies provides very few indications of sustained improvements in the financial systems, with ratios that averaged 24 percent in the early 1990s declining in many countries. In other words, the capacity of formal financial institutions to attract deposits has not seen much improvement in the last decade.

Most suggestions that private saving, including household saving in Africa is not growing rapidly enough are supported by trends in bank liabilities and data on deposit mobilization. Some of the most recent data on household holdings with banks is from the work by Nissanke and Aryeetey (1998). On magnitude, they indicate from reviews of central bank annual reports and flow of funds analysis that private deposits are larger than government deposits, and the private deposits are largely held by households. What their work also shows is the relatively high liquidity of savings instruments in many countries. They show from bank-branch data that in the study period (1989-93) which also saw considerable reform of financial sectors in their study countries, the numbers of depositors and the amounts being deposited did not vary significantly. In the cases where some increase in the deposit sizes were observed, as in Ghana, this was attributed to an income effect following economy-wide reforms.

In terms of the liquidity of formal savings, Nissanke and Aryeetey (1998) note that a feature of commercial bank deposits is that they are overwhelmingly short-term, and attract little or no return to the depositors. Very few depositors use the few long-term deposit instruments that are available. One of the most important changes that occurred in their study countries was a reduction in the proportion of deposits in liquid instruments. The proportion of demand deposits to the total dropped from 70 percent to 57 percent in Ghana between 1985 and 1991. Added to savings deposits, this left about two-thirds of all bank liabilities in liquid instruments. Tanzania, Malawi and Nigeria also showed similar variation, even though demand deposits continued to dominate total deposits.

Using survey data on the numbers of depositors and average deposit sizes from sample branches, Nissanke and Aryeetey (1998) also show inconsistent growth in the numbers of depositors and deposit sizes over the period 1989-1991. They observed that where deposit mobilization grew fastest, it was usually the outcome of some exogenous intervention in the process. For instance, in Tanzania, they observed that commercial bank branches in Dar es Salaam saw their depositors grow 11 times as fast as in regional towns in the period 1990-92. In small rural towns, the number of depositors grew even faster than in Dar es Salaam. This rapid growth was largely the result of a government decision to pay salaries and farmers' payments through rural bank outlets. Many bankers that they interviewed believed that the most significant factor behind the rapid rise in the number of rural depositors was this new payment mode adopted by government for agricultural export purchases. Indeed, as in many other African countries, many people holding deposits at banks do so under compulsion, as their salaries and other payments are channelled through banks. They are usually kept in the most liquid

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<sup>10</sup>  $M_2$  clearly reflects the use of deposits for transactions rather than the demand for long-term savings. The argument that it is not a good reflection of how people wish to save is supported by fact the monetary base in many African countries with growing  $M_2$ /GDP ratios has remained high, and has been not much less than the ratio.

deposit instruments, and withdrawn within days of placement, thus supporting the argument that they are more a reflection of transactions balances than a demand for savings.

### *Informal Savings*

The widespread use of informal agents for saving is quite well documented (Chandarvarkar 1989; Aryeetey 1995). The several different types of informal deposit mobilizers in different regions include savings collectors, savings and credit associations, cooperatives and credit unions (Seibel 1989). As indicated earlier, while this may be a well-known avenue for saving throughout Africa, the structures are such that only people with specific characteristics can save with particular kinds of agents (Aryeetey 1995). These are generally persons or households about whom the operator of a savings facility has enough information to enter into repeated transactions. Thus, for example, one will have to be a member of a cooperative to be able to save with it, and membership is not open to all. Similarly, membership requirements for a number of other informal groups may be based on ethnicity, religion, age or other social characteristics that may effectively bar open participation.

Despite the above limitations, saving informally remains popular in many parts of Africa. Deaton (1989) suggests that this form of saving is intended to smooth consumption over relatively short periods. While there may be a lack of exactitude about the relative magnitudes of formal and informal savings in African economies, there are a number of other country reports that support the view that informal saving is larger than formal saving (Aryeetey 1995). Field surveys for the Nissanke and Aryeetey (1998) study suggested that informal saving grew in popularity in a number of African countries even as they underwent financial sector reforms. The growth was attributed to a low level of confidence in the formal sector as well as the relatively high transaction costs associated with formal saving.

While the suggestion that saving informally is largely intended to smooth consumption over short periods is certainly credible, there is also evidence of considerable variation in the manner in which informal savings can be utilized. And this is related to the period over which the depositors can afford to give up control of the asset. There are very short periods, as in the case of the one-month deposits held with savings collectors in West Africa. In contrast, some institutions are designed for longer periods of saving, as with some of the rotating savings and credit associations, which can tie up savings for a period of between six months and a year. Most studies of fund utilisation by such associations suggest that funds are usually spent on consumer durables and for providing working capital (Miracle et.al., 1980). For traders and other market women in ROSCAs the fund is normally regarded as working capital, utilized in replenishing stocks (Aryeetey and Gockel, 1991). Chipeta and Mkandawire (1991) reported that in 1988/89, 72 percent of takings from savings and credit associations in Malawi were "invested", which was made up of expenditures on fertilizer (64.9 percent), farm labour (4.9 percent); and school fees/uniforms (2.9 percent). Consumer goods and services took the remaining 27.3 percent. In Ghana, some market women explain that they use the fund to "expand" their businesses, which often means increasing the stock of whatever items they sell at the market (Aryeetey and Gockel 1991). There are hardly any exclusive uses of such funds. The findings of Miracle et.al (1980) on the uses of savings funds portrayed a broad scope of use patterns in West Africa.

On net financial returns, while there is considerable variation by type of agent and by region/country, there is reason to believe that these are generally lower than returns on formal sector savings

(Aryeetey 1995). It may be noted that savings and credit associations seldom pay direct interest on deposits, while savings collectors in West Africa actually charge a fee to take in deposits. In the absence of direct financial returns, why do people chose to save via these informal agents? In many cases, the primary motivation seems to be to gain access to loans from the informal agent or to accumulate a target amount for consumption or other purposes without incurring the large transaction costs associated with accumulating that amount in formal savings (Aryeetey 1995). Indeed, where borrowing possibilities exist, as with some savings collectors in Nigeria and Ghana, deposits have been known to grow fastest. The predominance of informal savings in financial savings, therefore, appears to be a consequence of imperfections in formal financial markets.

#### 4. ASSET HOLDINGS OF HOUSEHOLDS

The available sketchy evidence indicates that the value of formal sector financial assets is less than half the value of financial assets held by households in Africa, and financial assets overall are a relatively small component of the portfolio of assets held by households. For example, the Ghana Living Standards Survey reports that in urban areas, only 5 percent of the value of household portfolios is held in the form of financial assets, while almost half of the value of portfolios consists of assets used in non-farm enterprises (see Table 1). In rural areas financial assets are even less important, and wealth in the form of farm land and livestock dominates the portfolio. To provide a contrast, Wolff (1993) reports that over 40 percent of the assets held by American households are in the form of financial savings.

Table 1: Asset Types by Household Location in Ghana

Asset types	Shares in total portfolio	
	Urban	Rural
Livestock	0.11	0.30
House	0.13	0.20
Farm	0.09	0.31
Land	0.15	0.07
Non-farm Enterprise Assets	0.47	0.16
Net Savings	0.05	-0.04
Of which: Net loans	0.25	0.10
Of which: Savings	0.30	0.06
Net remittances	-0.01	-0.01

Source: Computed from GLSS3, Ghana Statistical Service, 1993

A simple and direct approach to understanding the environment within which households make their decisions regarding saving, borrowing, and investment is to examine financial institutions themselves. This is the method used by many authors, including Nisanke and Aryeetey (1998) and Udry (1994). The data requirements of this method, however, are quite severe. At a minimum, rich descriptions of the relevant institutions are required, and these will have to be linked to data on financial transactions and household allocation decisions if progress is to be made on quantifying the effects of the institutions on behavior. In this section, we describe a simple method for comparing more readily available data on household portfolios with the implications of successively more rich models of the financial environment. As we noted in the introduction, this will enable the analyst to draw some tentative conclusions about the financial environment without detailed information on transactions. In order to interpret the results, however, it will be vital that information concerning the institutional structure of financial markets be brought to bear.

Consider a standard model of intertemporal choice with more than one asset (to keep it simple, we will consider the case of two assets, though nothing we say is special to that case). Let household utility be of the very simple form

$$U_t = E_t \sum_{\tau=t}^T v_{\tau}(c_{\tau}). \quad (1)$$

Suppose households can hold two assets: a financial asset  $w_f$  and an asset that is used directly in production  $w_p$ . The financial asset earns a return that is independent of the amount that is owned (for example, a bank account, or a physical asset for which there are good rental markets). The productive asset is combined with household labor and used directly in household production.

In period  $t$  the household allocates its available resources (the value of current assets  $A_t$  plus some exogenously specified income  $y_t$ ) between consumption  $c_t$  and holdings of the available assets  $w_{it}$  ( $i \in \{f,p\}$ ):

$$c_t + w_{ft} + w_{pt} = A_t + y_t \quad (2)$$

The current value of assets is determined by last period's investment and production choices

$$A_t = (1 + r_f(e_t))w_{f,t-1} + (1 + r_p(w_p, z_t))w_{p,t-1}. \quad (3)$$

For preliminary analysis, it is useful to consider  $y_t$  to be exogenous labor income. This assumption is incorrect in most African contexts for a number of reasons. Most importantly, for almost all households, the bulk of their portfolios are held in assets used directly in household production. Where labor markets are imperfect, the magnitude of  $y_t$  will be determined simultaneously with the allocation of wealth among the various assets because the demand for labor in household enterprises will be affected by the quantity of the physical asset owned by the household. Even if labor markets operate perfectly,  $y_t$  will be jointly determined with  $w_t$  unless labor is supplied inelastically. To the extent that labor markets are imperfect or labor is supplied elastically, the assumption of an exogenous  $y_t$  is incorrect. So while this assumption simplifies the problem, it will be important to consider the consequences of relaxing it.

The distinction between this and conventional models of saving and portfolio choice lies in our explicit acknowledgment that at least some assets are used in household production, that rental markets for these assets are imperfect, and that at least some other factor markets are imperfect. For these assets, the return depends upon the outcome of the household production process. In addition, the return to an asset used directly in household production depends on a vector of (exogenous) household characteristics ( $d_t$ ) such as family size, levels of education, and holdings of assets which cannot be transacted through markets. The vector  $d_t$  might also include household-specific random shocks to asset returns. Finally, the return depends on a vector of random shocks ( $e_t$ ) which are not specific to the household. Let  $z_t \equiv [e_t' d_t']'$  summarize these latter two sets of variables. Some assets, of course, are not used in household production. For these *financial* assets, the return is a market return which depends only on the vector of random shocks  $e_t$  which is not specific to the household. For such assets, the interest rate can be written  $r_p(e_t)$ .

It might also be the case that there are constraints on the levels and growth of individual assets:

$$w_{it} \geq 0 \quad \forall i \in S \subseteq I \quad (4)$$

$$w_{jt} \geq w_{j,t-1} \quad \forall j \in J \subseteq I \quad (5)$$

$S$  is the set of assets subject to short-sale constraints, while  $J$  is the set of assets for which investment is irreversible. We begin, however, by assuming that there are neither irreversibilities nor short-sale constraints, so that  $S=J=\{\emptyset\}$ .

Households maximize (1) subject to (2) and (3). The value function of this problem is



$$V_t(A_t) = \max_{w_{pt}} v_t(y_t + A_t - w_{ft} - w_{pt}) + E_t V_{t+1}((1 + r_f(e_{t+1}))w_{ft} + (1 + r_p(w_{pt}, z_{t+1}))w_{pt}) \quad (6)$$

The first order condition relating to asset the asset used in production is

$$\begin{aligned} v_t'(c_t) &= E_t \left( 1 + r_p(w_{pt}, z_{t+1}) + \frac{\partial r_p(w_{pt}, z_{t+1})}{\partial w_{pt}} w_{pt} \right) V_{t+1}'(A_{t+1}) \\ &= E_t \left( 1 + r_p(w_{pt}, z_{t+1}) + \frac{\partial r_p(w_{pt}, z_{t+1})}{\partial w_{pt}} w_{pt} \right) v_{t+1}'(c_{t+1}) \end{aligned} \quad (7)$$

where the second equality follows from an envelope argument applied to (6). The second term in equation (7) is a consequence of the use of asset holdings in production. Increments to holdings of asset p result in diminishing returns as fixed household factors are spread more thinly across the productive asset.

One striking implication of the direct connection between asset holdings and household production is apparent if we abstract for a moment from risk aversion. So assume that either (a) households are risk neutral; or (b) households have access to complete insurance markets. For simplicity (though this is not essential to the argument), we will also assume that the intertemporal variation in  $v_t(c_t)$  can be captured through a simple discount factor  $\beta$ . Assume, therefore, that

$$v_t'(c_t) = \beta v_{t+1}'(c_{t+1}) \quad (8)$$

for any  $c_t$  and  $c_{t+1}$ . (7) now becomes

$$\beta - 1 = E_t \left( r_p(w_{pt}, z_{t+1}) + \frac{\partial r_p(w_{pt}, z_{t+1})}{\partial w_{pt}} w_{pt} \right) \quad (9)$$

The distribution of the return to the financial asset does not vary across households. Let  $E_t r_{ft+1} \equiv \bar{r}_f$  (we have here made an inconsequential assumption that the mean of  $r_{ft}$  does not change over time). Financial market equilibrium requires that  $1 + \bar{r}_f = \beta$ . In this case,

$$\bar{r}_f = E_t \left( r_p(w_{pt}, z_{t+1}) + \frac{\partial r_p(w_{pt}, z_{t+1})}{\partial w_{pt}} w_{pt} \right) \quad (10)$$

and all of the assets held by households in the economy earn an expected (marginal) return equal to that of the generally available financial asset. Look more carefully at the determinants of the return to the asset used in a household enterprise. Output of the enterprise depends on a vector of purchased inputs  $x$  (available at the price  $w$ ) as well as on the asset  $w_{pt}$ . In this case, define

$$G(w_{pt}) \equiv E_t r_p(w_{pt}, z_{t+1}) w_{pt} = \max_{x_{t+1}} E_t F(x_{t+1}; w_{pt}, z_{t+1}) - \omega_{t+1} x_{t+1} \quad (11)$$

where  $F(x, w, z)$  is increasing and strictly concave in  $(x, w)$  for all  $z$ . From (10),  $w_{pt}$  will be chosen so that

$$\bar{r}_f = E(r_p(w_{pt}, z_{t+1})) + \frac{\partial r_p(w_{pt}, z_{t+1})}{\partial w_{pt}} w_{pt} = G'(w_{pt}) \quad (12)$$

The RHS of (12) is strictly decreasing in  $w_{pt}$  as a consequence of the strict concavity of  $F(\cdot)$ . Hence there exists (at most) a unique value  $w_{pt}^*$  which solves (12). Moreover,  $\frac{d w_{pt}^*}{d \bar{r}_f} < 0$  and  $\frac{d w_{pt}^*}{d A_t} = 0$ .

The final equality is particularly interesting. Household ownership of the physical asset is independent of household wealth. Demand for that asset is determined entirely by (a) the return on alternative assets; and (b) the marginal productivity of that asset in the household enterprise. Household wealth affects neither (a) nor (b). Any change in wealth  $A_t$  is reflected in changes in holdings of the financial asset  $w_{ft}$ , and leaves holdings of  $w_{pt}$  unchanged. Obviously, household characteristics  $d_t$  affect  $w_{pt}^*$ , but two households with the same  $d_t$  will have the same  $w_{pt}^*$  even if their wealth levels differ.

If it was possible to observe the entire vector  $d_t$  for a sample of households, then given a particular functional form for  $F(x_{t+1}, w_{pt}, z_{t+1})$  it would be possible to test the implication that  $w_{pt}^*$  does not depend on  $A_t$ . The test would be implemented by regression of holdings of the physical asset  $w_{pt}$  on  $d_t$ , and on  $A_t$ . The coefficient of  $A_t$  should be zero.

Were one to run such a regression, it is likely that one would observe a positive correlation between  $w_{pt}^*$  and  $A_t$  even if the restrictions of this model are correct for two reasons. First, asset ownership is measured with error, and any error in the measurement of  $w_{pt}^*$  would induce a spurious positive correlation between  $w_{pt}^*$  and  $A_t$  because  $A_t$  includes  $w_{pt}^*$ . Second, not all of the components of  $d_t$  are observable.  $A_t$  is likely to be correlated with the unobserved elements of  $d_t$ , because household characteristics which increase (decrease) the productivity of the physical asset will increase (decrease) wealth over time. One potential solution to this problem would be an instrumental variable approach, purging  $A_t$  of its likely correlation with omitted elements of  $d_t$ . Ideas for potential instruments include inherited wealth, or perhaps the wealth of an individual's parents. A solution that addresses the first problem, but not the second, would be to examine the correlation between  $w_{pt}$  and  $w_{ft}$ , which should also be zero.

Aryeetey and Udry (1999) implement this approach in a study of the saving behavior of Ghanaian households using GLSS data. In that paper, it is found (subject to standard econometric caveats) that (1) holdings of productive assets are not the same across households with similar values of  $d_t$ ; (2) variations in these holdings are systematically and positively related to financial wealth; and (3) holdings of financial assets are positively correlated with the share of non-farm assets in the total value of directly-productive assets.

These results are not surprising. It is unlikely that the assumptions required to derive these results are correct anywhere in Africa (or the world, for that matter). To reiterate, here are the most important of the many questionable assumptions made so far:

- (A) no liquidity constraints

- (B) no risk aversion or complete insurance markets
- (C) perfectly integrated markets for the financial assets
- (D) no irreversibilities in investment
- (E) everybody has the same production function

Assumption (E) is a rather trivial objection, but it has some power given the very frugal specifications that researchers might need to use given data as limited as LSMS surveys. It is important that the vector  $d_t$  which is included in the regressions described above be very rich in order to account for as much as possible of the variability in production conditions across the sample of households.

It is likely that assumption (D) is false - quite clearly it is difficult to reverse a decision to plant a cocoa tree. However, there are often (imperfect) markets for the sale of capital goods, and these provide a measure of reversibility. Consequently, we will not focus on this objection.

It would be quite a surprise were it to turn out that assumption (C) is true. Retaining assumptions (A), (B), (D) and (E) but dropping (C) is a trivial theoretical exercise, but has dramatic consequences for the cross-sectional properties of the portfolio. Households facing a lower interest rate will have larger holdings of non-farm and farm assets. If total wealth is held constant, then these households will have lower levels of financial wealth, and thus we should see an *inverse* relationship between financial wealth and holdings of productive assets. Ghanaian data indicates precisely the opposite relation. However, it may be the case that richer households are able to borrow at lower interest rates. The correlation between financial wealth and holdings of productive assets might then be positive. If detailed information on financial markets is available it would be possible to examine this hypothesis directly. If information on interest rates is lacking but the data has a panel structure it might be possible to examine the evolution of consumption over time, and from this to deduce the cross-sectional variation in interest rates. However, to us it seems unlikely that this type of market imperfection is at the heart of the strong positive relationship between holdings of financial assets and holdings of directly productive assets.

Assumptions (A) and (B) seem to be the most plausible candidates for an explanation of patterns of portfolio allocation in Africa. Without dropping (A), it is impossible to understand the presence of so many households with zero holdings of either farm or non-farm assets. Without dropping (B), it is impossible to understand the positive correlation between holdings of financial and directly productive assets throughout the distribution of wealth.

Consider first the issue of liquidity constraints and the form that they must take in order to be a potential explanation for the patterns we see in data from Ghana. In particular, it cannot be the case that they take the standard form of a limit on the overall value of wealth. The conventional assumption would be that  $w_{ft} + w_{pt} \geq 0$ . If this were our assumption, even households with zero net wealth could set  $w_{pt}$  at its optimal value and borrow to fund this investment.  $w_{pt}$  would remain invariant to total wealth. Our assumption must be stronger - *financial* wealth must be constrained to be non-negative.

So maintain assumptions (B)-(E) while dropping (A). Suppose that no asset can have a negative value. In particular, financial borrowing is not permitted. Equation (6) becomes

$$V_t(A_t) = \max_{w_{it}} v_t(y_t + A_t - w_{ft} - w_{pt}) + E_t V_{t+1}((1 + r_f(e_{t+1})) w_{ft} + (1 + r_p(w_{pt}, z_{t+1})) w_{pt}) + \sum_i \lambda_{it} w_{it} \quad (13)$$

where  $\lambda_{it}$  is the Lagrange multiplier corresponding to constraint (4) for asset  $i$  in period  $t$ . We retain the risk neutrality assumption (8). The first order condition for the productive asset is now

$$\bar{r}_f = E_t(r_p(w_{pt}, z_{t+1}) + \frac{\partial r_p(w_{pt}, z_{t+1})}{\partial w_{pt}} w_{pt}) + \frac{\lambda_{pt} - \lambda_{ft}}{\beta v'(c_t)} \quad (14)$$

where complementary slackness holds between  $\lambda_{it}$  and  $w_{it}$ . Consider the case where the return to the directly productive asset is high - high enough so that for a household with total wealth  $A_t$ ,

$$\bar{r}_f < E_t(r_p(A_t, z_{t+1}) + \frac{\partial r_p(A_t, z_{t+1})}{\partial w_{pt}} A_t). \quad (15)$$

This equation simply states that if the household devotes all its wealth to the productive asset, the return from that asset is still larger than the return to the financial asset. Without liquidity constraints, this household would simply borrow financial assets (at expected interest rate  $\bar{r}_f$ ) to accumulate more of the directly productive asset until it accumulated enough  $w_{pt}$  to drive down the expected return from that productive asset to  $\bar{r}_f$ . If such borrowing is prohibited, then equation (14) comes into play. For this household,  $\lambda_{pt}=0$  because the liquidity constraint on the productive asset is not binding. However,  $\lambda_{ft}>0$  because  $w_{ft}=0$ . The household's portfolio will be in equilibrium with

$$\bar{r}_f < E_t G'(A_t). \quad (16)$$

For households with small enough wealth, holdings of directly productive assets will be increasing in total wealth, and financial asset holdings will be zero. Only for households with sufficient overall wealth will holdings of directly productive assets be fixed by considerations of production efficiency. To be precise, define  $A^*$  as the value at which

$$\bar{r}_f = E_t G'(A^*). \quad (17)$$

For those households with wealth less than  $A^*$ , financial wealth will be zero and holdings of directly productive assets will increase with wealth. Only households with wealth greater than  $A^*$  will behave as described in the section above.  $A^*$ , of course, will depend upon the household characteristics  $d_t$ . Figure 3 shows the correspondence between holdings of financial wealth and directly productive wealth as overall wealth increases for a household if this model is correct.

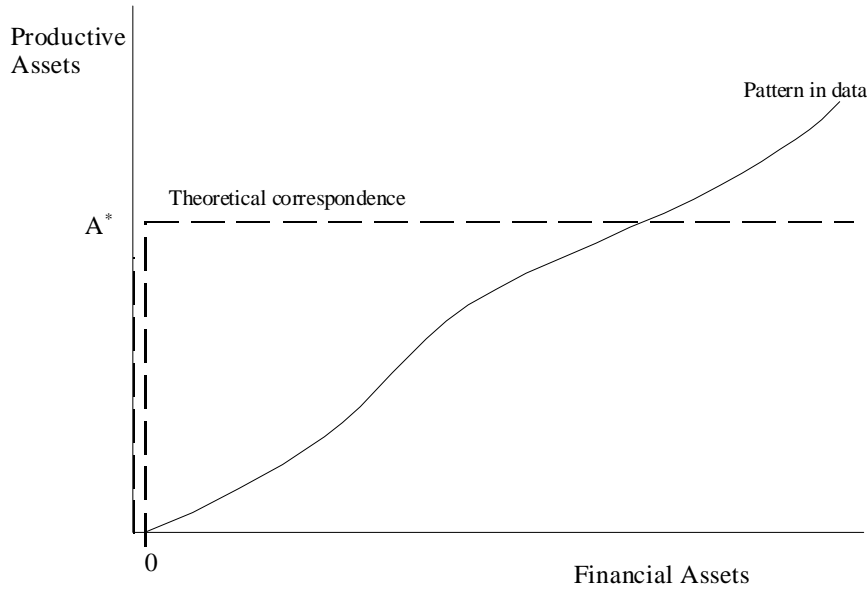


Figure 3 - Correspondence Between Productive Assets and Financial Assets with Liquidity

If this model is correct, and given the fact that  $A^*$  is a function of  $d_t$ , it would not be surprising for a simple bivariate nonlinear regression of productive assets on financial assets to show a general upward slope, as Aryeetey and Udry (1999) document in Ghana. Let  $I(\text{cond})$  be the indicator function (equal to one when the condition is true, and zero otherwise). The correct specification of the model is now:

$$w_{pt}^* = \alpha I(w_{lt} = 0) + \beta I(w_{lt} > 0) + \gamma w_{lt} + X_t' \delta + \varepsilon_t \quad (18)$$

$$w_{pt} = I(w_{et}^* > 0) w_{pt}^*$$

where  $w_{et}^*$  is a latent variable. The non-linearity of the theoretical relationship portrayed in figure 3 is captured by the indicator functions in the first equation of (18). When we estimate (18) we should find  $a < b$  and  $g = 0$ .

Aryeetey and Udry (1999) find that in Ghana  $g > 0$  - holdings of productive assets are positively correlated with financial wealth even when looking only at households with positive financial wealth. In fact, the relationship in Ghana looks like that described as 'data' in Figure 3 - holdings of directly productive assets increase smoothly with holdings of financial assets throughout the distribution of wealth.

In order to reconcile that evidence with individual optimization, a model with *both* liquidity constraints and risk aversion is required. We have just seen that liquidity constraints alone are not consistent with the observed pattern of portfolio allocations. Similarly, risk aversion alone is not consistent with the data, because relatively poor risk averse households would borrow to finance the acquisition of directly productive assets (though not to the profit-maximizing level of  $A^*$ ). The intuition behind this argument is that at zero wealth, the first order effect of increasing expected profit by borrowing to finance the acquisition of  $w_{pt}$  outweighs the second order effect of the increased risk associated with that transaction.

We conclude, therefore, that the allocation of household wealth that we observe in the Ghana GLSS data is consistent with household optimization in an environment characterized by (A) significant asset-specific liquidity constraints, and (B) risk averse households without access complete insurance markets. As a consequence of (A), we do not find significant levels of borrowing to finance the acquisition of directly productive assets in household production. As a consequence of (B), we find households holding diversified portfolios in which they acquire financial assets even when their holdings of directly productive assets are below profit maximizing levels.

## 5. CONSTRAINTS TO FINANCIALIZATION OF HOUSEHOLD ASSETS

Broad patterns that are evident in cross-sectional data on equilibrium portfolios show that liquidity constraints and imperfect insurance markets are salient features of the financial markets in Sub-Saharan Africa. To gain further insight into the nature of these imperfections, it is necessary to examine the markets themselves. In this section we discuss specific characteristics of financial markets in Africa that have limited the role of formal financial assets in household saving strategies.

There is a large literature on the economic theory of saving decisions and credit transactions in economies that are characterised by incomplete markets and imperfect information. Much of this work explores the implications of such imperfection for contractual forms in credit markets in low-income environments.<sup>11</sup> For understanding saving behaviour, three themes from this literature are particularly important. The first is the role of risk and liquidity preference (Fafchamps et.al 1998; Udry 1994). The second is the responsiveness of saving to changes in nominal rates of return (Townsend 1987), while the third is transaction costs (Stiglitz 1989).

### *Risk and Liquidity Preference*

The liquidity preferences of households are closely tied to the kinds of economic activities they are engaged in and their income situation as a consequence of that activity. Depending on the nature and the environment of the activity, households become exposed to various risks, including idiosyncratic ones that affect individual or specific households (e.g. the loss of land due to poorly defined “tenancy agreement”) and systemic or covariate risks (e.g. inflation, drought) that affect wider areas. Risks are pervasive throughout African economies. Indeed in most poorly managed African economies, where agricultural activity tends to be the main source of income for large numbers of rural people, both idiosyncratic and systemic risks tend to be quite significant. The high risk environment and the frequent incidence of large income shocks heighten demand for mechanisms and institutions for risk management, even if only for sheer survival. Households whose low incomes depend on rain-fed agriculture are likely to have erratic income streams and therefore require frequent consumption-smoothing measures. Households with more regular income streams have a lesser need for such measures and hence have a higher preference for less liquid assets.

We have seen that portfolio choices are strongly influenced by risk, when insurance markets are missing and insurance possibilities are limited. In many communities, there are a variety of

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<sup>11</sup> Alderman and Paxson (1992) provide a useful bibliography of such studies.

financial institutions that serve as an imperfect substitute for insurance (Besley 1995). For example, in Northern Nigeria, households can use small scale credit transactions to effect a degree of *ex-post* consumption smoothing (Udry 1990). While poor households may sometimes be able to “insure” against idiosyncratic risks under mutual/informal insurance arrangements, such insurance tends to be highly costly, not always effective and tends to limit the freedom of economic agents in making choices about savings and investment (Besley 1994).

As noted in section 4, households in this environment hold assets as a buffer between uncertain and unpredictable low income and low consumption. Udry (1995) found in Northern Nigeria that “households dissave when they suffer an adverse shock and save more when they are favored with a positive shock” (p.1298). The model of section 4 implied that the assets used to buffer consumption would be 'financial' assets not directly used in household production. At the same time, in order to be able to dissave rapidly in the event of such an adverse shock, the assets must be very liquid. If formal sector financial assets are not very liquid, then households might use informal substitutes for them. Hence in Northern Nigeria, the primary asset used as a buffer stock is harvested grain, which is quite liquid and which earns a linear return (depending upon the seasonal rise in the price of grain).

While money as a store of wealth could theoretically play the role of providing liquidity and flexibility, there are a number of reasons why it has not played that role effectively in many African economies. The historical dimension of this phenomenon is drawn from the fact that monetization of African economies has been very slow. The slow monetization is both a cause and effect of the dualism that characterizes these economies generally. In many such economies, the modern sector was drawn from the colonial trading relationships that were established. Thus, households that were involved with export crops were more likely to have a certain portion of their assets denominated in cash terms in order to facilitate transactions. Similarly, labor that was engaged in modern activities received cash payment in exchange. But these economic agents had to conduct further economic transactions with other people that were not engaged in modern sector activities, for example in the acquisition of land, where property rights were often based on custom and had little to do with market conditions. In these conditions, households and other economic agents make asset choices that will assure their continued ability to produce (Hill 1970).

There is evidence from the work of Polly Hill that asset choices in rural West Africa are strongly influenced by the desire to guarantee income and consumption across generations as well as over shorter periods of time. She discussed in her pioneering work how “the forms of capital, represented by cocoa trees, cattle, fishing nets, manure, lorries, and so forth, play a crucial role in indigenous economies” (Hymer 1970). She also shows how the accumulation of these assets have been influenced by prevailing social structures and individuals’ and families’ attempts to break out of the established modes of production, often through migration and the accumulation of new forms of capital. She shows that, in order to preserve or add to the value of assets that ‘rural capitalists’ may have, they are influenced by various social practices and norms to hold both productive and financial assets. The institutions had not been developed at the time of her study to facilitate the financialization of assets with ease. “The major problem of capital accumulation in underdeveloped economies is not so much a shortage of savings but a lack of institutions to channel the existing or latent surplus into productive investment” (Hymer 1970).

In more recent times, there has been a great deal of uncertainty associated with the macroeconomic conditions of countries, making it preferable to hold non-financial assets. A lot of the economic difficulties that began in the latter part of the 1970s for most African economies continued right through the 1980s, and have not eased much in this last decade (Easterly and Levine 1994). Thus, despite reforms, most African economies are characterized by inflationary tendencies even if the rate of inflation has come down considerably in some countries. Average annual change in the CPI for the period 1980-90 was 16.1% and 30.7% since 1991 for the region. There are a number of countries where annual inflation rates have averaged over 25% for more than a decade, including Ghana, one of the most comprehensive reformers. Quite a bit of the inflation in Africa is related to rapid exchange rate depreciation (Younger 1992). The combination of high inflation and rapid exchange rate depreciation has been shown to have the effect of making people withdraw from the monetized economy in a number of African countries as shown by Nissanke and Aryeetey (1998). They write that “in a number of African countries demonetization has taken place as more rural households have retreated into subsistence during the crisis periods. A clear example of this is Zambia, which once registered the highest coefficient of monetization in sub-Saharan Africa, at 93 per cent in 1975. A similar process of demonetization is reported to have occurred in Tanzania, Uganda and Ghana” (p.38). Nissanke and Aryeetey (1998) also suggest that the real demand for money relative to income and output declined in all those countries and the domestic currency almost ceased to function as a store of value.

Even though a measure of stability returned to a number of African economies earlier in this decade, other structural and institutional constraints still restrain households from making a switch to money-based assets. There are relatively few financial institutions that have been designed and structured to take care of the high frequency and liquid nature of agricultural savings. This would explain the domination of the relatively small amount of financial saving by informal arrangements, including various types of savings and credit associations and cooperatives. Even where formal financial institutions have grown rapidly in rural areas, which is often not the case in Africa, there has been little growth in savings mobilization by those institutions (Nissanke and Aryeetey 1998). But there is a limit to how far informal agents can go to mobilize financial savings. The growth of the savings mobilization function of those agents is constrained by the characteristics of informal finance, i.e. the need to restrict their operations to specific groups of people with distinct socio-economic characteristics in order to limit informational problems (Steel et.al. 1997).

### *Returns on Different Assets*

The most basic reason why households prefer to hold assets is that they expect to receive some return on those assets. Is the predominance of non-financial assets in household portfolios a simple consequence of extremely low expected returns to holding financial assets? This brings into focus the role of interest rates and how they are perceived in small African economies in relation to the return on other assets. We must caution that the role that the returns on assets play is one whose importance has been the subject of debate for decades and remains unresolved.

The relationship between the interest rate and saving is ambiguous in theory and weak in the data. Higher interest rates increase the opportunity cost of consumption and therefore encourage households to save through their substitution effect. But they also increase the wealth of savers and thereby create a positive income effect on consumption. Various studies of saving in sub-Saharan Africa have come



up with inconclusive evidence of how interest rates influence saving (Mwega et.al. 1990, Oshikoya 1992, Azam 1996). The generally weak link between interest rates and saving have often led to debate about the strength of the financial liberalization propositions from McKinnon (1973) and Shaw (1973) with respect to Africa. [See, for example, Nissanke and Aryeetey 1998).

Why should the substitution effect of interest rates for relatively poor rural households be particularly weak in Africa? Real interest rates are often generally low in most of SSA for a number of reasons, including relatively high inflation and other indicators of macro-economic instability, as seen earlier, as well as institutional factors that have often repressed interest rates. It is interesting that despite the financial sector reforms undertaken in a number of African countries throughout the last decade, real deposit rates have not risen appreciably in many of those countries (Nissanke and Aryeetey 1998). Indeed, the real deposit rates have risen far slower than lending rates in many countries, leading to a continually widening spread in rates for close to a decade in some countries, including Ghana, Malawi, Tanzania, Uganda and Kenya. There are indications, however, that when there is some stability in macro-economic conditions and deposit rates rise, depositors react positively to such rises as happened in Ghana at the end of the 1980s and in Nigeria earlier (Nissanke and Aryeetey 1998).

In a study by Aryeetey and Gockel (1991) market women in Ghana were asked about their responsiveness to bank deposit rate changes and over 70 percent indicated indifference to them. The survey had been conducted after a relatively long period of high inflation, several years of financial repression and rather arbitrary regulations on banking that had left many people with very little confidence in the banking system. It took another decade of unusually high treasury bill rates to get Ghanaians to once again purchase financial instruments to any appreciable degree.

The above illustration suggests that pervasive market failure in Africa makes the deposit rate an inappropriate tool for gauging the expected direction of people's preferences. Market failure forces the return on other assets to assume a greater role in asset allocation. But data on the return to non-financial assets is scarce. It is, for example, difficult to measure the return on land when it cannot easily be traded (Binswanger and McIntire 1987). It is, however, less difficult to determine the return on many other productive assets, such as those used in rural non-farm enterprises, or livestock (Bigsten et.al. 1998). The scarcity of good measures of rates of return makes this a fertile area for further research. We compare below rates of return on physical capital engaged in manufacturing from five countries estimated by Bigsten et.al. (1998) with real interest rates in 1996 for those countries. While Kenya and Zambia show no or little difference in the returns on physical and financial assets, the differences are large for Ghana and Zimbabwe in favor of physical assets.

Table 2: Rates of Return on Physical Capital and Financial Assets

Country	Rate of Return on Physical Capital % p.a.	Real Interest Rate % p.a. 1996
Cameroon	19	n.a.
Ghana	32	-10*
Kenya	22	22
Zambia	10	13
Zimbabwe	35	10

Source: Bigsten et.al (1998) for column 2 and World Development Indicators 1998.

\* Calculated directly from Bank of Ghana Data.

### *Transaction Costs*

As households weigh the decision to put wealth into particular assets, the alternatives that they confront come with costs that are intrinsic to the transaction. One important source of such costs is incomplete information. Most of the work relating to information asymmetry in developing economies has been applied to credit market transactions (Stiglitz and Weiss 1981), but they hold equally well for savings transactions. This is because saving like lending is an intertemporal transaction as households trade present consumption for future consumption in which the agents expect to gain. The important issue becomes the conditions under which that gain will occur. These will be influenced by (a) the nature of information (probably asymmetric) possessed by depositors and deposit-takers on intertemporal conditions, and (b) contract enforcement possibilities on the financial markets.

In these situations where potential savers are concerned about a future gain, two types of costs concern them most. The first is the cost of ‘administering’ their savings; the second is the cost of the deposit-taker defaulting on the contract. In the case where somewhat functional financial markets can be found, depositors are concerned about the likelihood of their deposits being returned to them with the expected return agreed upon with the deposit-taker. Studies in a number of countries have shown that both the administrative cost and default risk cost components of transaction costs can be quite high for financial assets (Nissanke and Aryeetey 1998).

A major source of administrative costs for saving in rural Africa is transport cost. Due to long distances that depositors would have to travel in order to find formal financial institutions, transport costs tend to be high. Aryeetey and Gockel (1991) have indicated an average travel time of over an hour is required to reach a bank in rural northern Ghana and the cost of such travel is about the equivalent of the prevailing minimum wage. Many potential savers cannot afford the expense involved in making a deposit at a bank in that kind of environment. It is interesting to note that innovative financial arrangements are not necessarily immune from significant transport costs. In many schemes where the innovation requires that the deposit-taker travels to the depositor, there is evidence of this affecting significantly the operational costs of the schemes, which are then passed on to their clients. They have to limit their operations to district towns mainly, as a consequence. Webster and Fidler (1995) attribute the relatively low scale of a number of micro-finance arrangements in West Africa in part to the sparse population in many of the rural areas they serve in the Sahel.

Because the few formal financial institutions are usually centralised in regional or district centers, there is often seasonal congestion and long waiting periods for customers. Aryeetey and Gockel (1991) showed that in a number of banks located in regional and district towns in Ghana, service time at the end of each month for people making deposits could go beyond an hour. For many depositors, the opportunity cost of that time is immense, particularly if they have travelled to the district town from their villages to transact other business.

But holding non-financial assets does not have zero administrative/opportunity cost, even though we suggested earlier that these are often thought to be negligible. Livestock owners have to spend time away from ploughing fields, planting, caring for and harvesting crops in order to take care of their livestock. There are no known actual estimates of the opportunity cost involved for any

African countries, but Fafchamps et. al (1998) suggest that it would be significant. In many Sahelian communities, taking care of livestock on a more regular basis is the responsibility of boys of school-going age, who are subsequently deprived of formal education. The associated private and social costs are bound to be very high. Other costs in relation to holding livestock, stored crops, etc. will come from their value possibly diminishing with time as a result of death or spoilage. Finally, there are significant transaction costs associated with the sale of virtually any non-financial asset, ranging from conventional transportation and marketing costs to the costs associated with imperfectly observed quality variation in the asset. All of these must be weighed by the asset holders against the expected return on the asset. The savings decision of households, and their equilibrium portfolio allocation depends on all of these asset-specific transaction costs, as well as on the more general considerations, discussed in section 4, of risk, liquidity constraints and the intertemporal allocation of lifetime resources.

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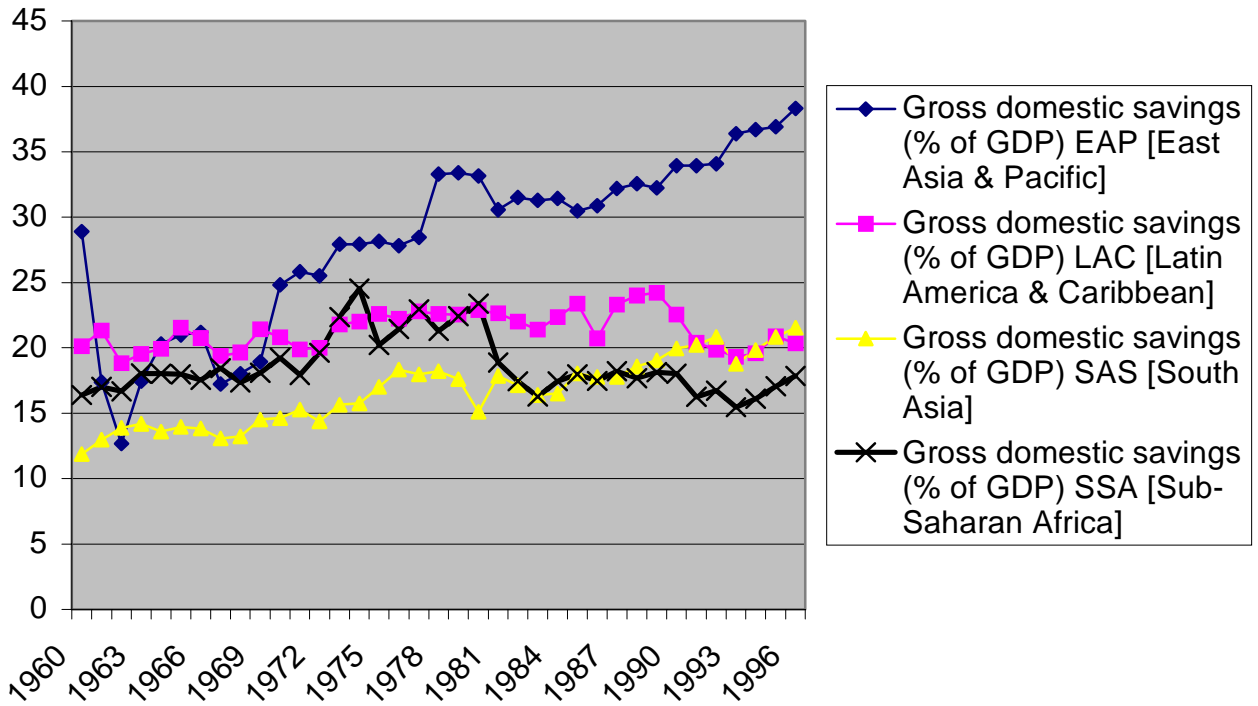
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**Figure 1: Saving Trends in Africa Relative to other Regions**





**Figure 2: Gross domestic savings  
(% of GDP)**

