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Real interest rates and the mobilization of private savings in Africa

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A case study of Kenya

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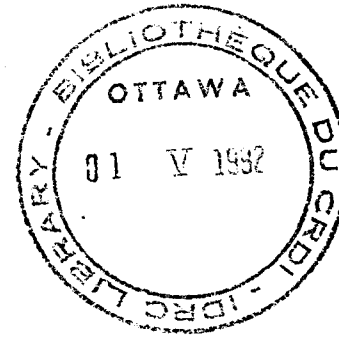

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I. Introduction

Since independence in the early 1960s, Kenya has been able to invest a substantial portion of its national income. According to official estimates, the country invested an average 23.7 percent of GNP in 1965–1985 (Kenya 1986). This investment was largely financed from domestic savings which comprised an average 16.7 percent of GNP in that period, leaving an average resource gap of 7 percent of the GNP to be financed from external sources. However, this resource gap has been expanding over time from 3.2 percent of the GNP in 1965–1969 to 7.5 percent in 1970–1974 to 7.8 percent in 1975–1979 and to 9.5 percent in 1980–1985. As a consequence, the country has increasingly relied on external resources to finance its capital formation.

Such an expanding reliance on foreign capital flows in not acceptable in the long run. This is because of the general decline in net concessionary capital inflow from industrialized countries and the domestic concern over the growth of external indebtedness and the external dependence of the economy. There has, therefore, been a felt need to institute measures to increase saving in order for the country to sustain and even augment past levels of capital formation and development without incurring unsustainable external indebtedness and external dependence. An increase in savings also facilitates macroeconomic stabilization and improves the social welfare (Leff and Sato 1987).

In Kenya, the bulk of the national savings is mobilized by the private sector. While the public sector is potentially an important source of savings, it has played a relatively minor role, contributing very little to investment finance. In the 1970s, saving by the public sector constituted less than 3% of the GNP. It was a net dissaver in the 1960s and in the first half of the 1980s (Kenya 1986). This paper, therefore, studies the determinants of private saving in the country.

One of the policy measures adopted by the Kenya Government to increase private saving was a liberalization of the financial system, mainly by raising interest rates. For example, in the first half of the 1980s, nominal deposit rates were increased by about 100 percent and lending rates by about 50 percent, from relatively low levels. The objective was to make and maintain them positive in real terms as the upsurge in inflation in the 1970s following the first oil shock of 1973 had rendered them negative. Before this period, the Government followed a low-interest-rate policy whose main objective was to promote investment.[1] From the time the Central Bank was established in 1966 until 1980 interest rates were only adjusted upwards once in 1974 by 1–2% points (see Tables 1 and 2).

In the development economics literature, the theory of high interest rate policy

Table 1 Selected nominal deposit rates in Kenya (%)

End of year	Commercial banks: Time deposits 3–6 months	Commercial banks: Time deposits 6–9 months	Commercial banks: Time deposits 9–12 months	Commercial banks: Savings	Hire purchase and merchant banks	Building societies (various deposits)	Post Office Savings Bank
1967	3.500	3.750	4.000	3.00	–	–	–
1968	3.500	3.750	4.000	3.00	3.00–6.00	4.00–6.50	3.0
1969	3.500	3.750	4.000	3.00	3.00–6.00	4.00–6.50	3.0
1970	3.500	3.750	4.000	3.00	3.00–6.00	4.00–6.50	3.0
1971	3.500	3.750	4.000	3.00	3.00–6.00	4.00–6.50	3.0
1972	3.500	3.750	4.000	3.00	3.00–6.00	4.50–7.00	3.0
1973	3.500	3.750	4.000	3.00	3.00–6.00	4.50–7.00	3.0
1974	5.125	5.370	5.625	5.00	3.00–7.50	5.50–6.50	3.0
1975	5.125	5.370	5.625	5.00	5.00–7.50	5.50–6.50	5.0
1976	5.125	5.370	5.635	5.00	5.00–8.00	6.00–8.50	5.0
1977	5.125	5.375	5.625	5.00	5.00–8.75	6.00–8.50	5.0
1978	5.125	5.375	5.625	5.00	5.00–8.75	6.00–8.50	5.0
1979	5.125	5.375	5.625	5.00	5.00–8.75	6.00–8.50	5.0
1980	7.000	6.750	6.350	6.00	8.00–11.00	6.00–9.50	6.0
1981	10.000–11.750	10.750–12.000	11.000–12.250	10.00	12.00–14.50	11.00–12.00	11.00
1982	12.750–13.042	13.208–13.625	13.375–13.792	12.50	13.25–16.25	15.25	10.00
1983	12.000–12.500	12.250–12.750	12.500–13.000	12.50	14.00–16.50	15.00–15.50	11.00
1984	11.000–11.250	11.500–11.750	11.750–12.000	11.00	13.00–14.50	13.00–14.25	11.00
1985	11.000–11.250	11.500–11.750	11.750–12.000	11.00	13.00–14.50	13.00–14.25	11.00
1986	11.000–11.250	11.500–11.750	11.750–12.000	11.00	13.00–14.50	13.00–14.25	11.00
1987	9.500–10.000	9.500–10.000	9.500–10.000	11.00–11.50	10.00–13.50	10.75–12.50	11.00

Source: Central Bank of Kenya, *Quarterly Economic Review*, January–March 1988.

Table 2 Selected money lending rates in Kenya (%)

	Commercial banks		Non-bank financial institutions (NBFIs)	
	Loans and advances			
	Minimum	Maximum	Hire purchase companies and merchant banks	Building society loans
967	7.00	–	–	–
1968	7.00	–	10.00–12.00	7.50–10.00
1969	7.00	–	10.00–12.00	7.50–10.00
1970	7.00	–	10.00–12.00	7.50–10.00
1971	7.00	9.00	10.00–12.00	7.50–10.00
1972	7.00	9.00	10.00–12.00	7.50–10.00
1973	7.00	9.00	7.00–12.00	7.50–10.00
1974	7.00	10.00	7.00–12.00	7.50–10.00
1975	8.00	10.00	8.00–12.00	7.50–11.00
1976	8.00	10.00	10.00–12.00	8.00–12.00
1977	–	10.00	10.00–12.00	8.00–12.00
1978	–	10.00	10.00–12.00	8.00–12.00
1979	–	10.00	10.00–12.00	8.00–12.00
1980	–	11.00	10.00–14.00	11.00–13.00
1981	–	14.00	14.00	14.00
1982	–	16.00	16.00	16.00
1983	–	15.00	20.00	16.00
1984	–	14.00	19.00	16.00
1985	–	14.00	19.00	16.00
1986	–	14.00	19.00	16.00
1987	–	14.00	18.00	14.50

Source: As for Table 1.

was popularized by McKinnon (1973) and Shaw (1973) who argued that, in countries characterized by "financial repression", raising nominal interest rates relative to inflation would increase saving and the supply of investable resources in an economy. The productivity of investment also rises as these resources are channelled to projects that have higher rates of return than hitherto. According to the McKinnon and Shaw doctrine, financial repression arises mostly when a country imposes ceilings on nominal deposit and lending interest rates at a low level relative to inflation. The resulting low or negative real interest rates discourage savings mobilization and the channelling of the mobilized savings through the financial system. This has a negative impact on the quantity and quality of investment and hence on economic growth.

The hypothesis that private saving has a significant positive real interest elasticity is not a theoretical truism. In economic theory, high real interest rates have two effects on private saving that work in opposite directions. They have a substitution effect, in which saving increases as consumption is postponed to the future, and a wealth effect, in which savers increase current consumption at the expense of saving. The impact of real interest rates on private saving is therefore ambiguous and can only be established empirically. The McKinnon and Shaw doctrine therefore postulates that under conditions of financial repression the substitution effect dominates the wealth effect. The doctrine also postulates that there is a portfolio effect in which an increase in real interest rates induces a shift in the composition of the wealth portfolio from non-financial to financial assets, thereby enhancing financial intermediation.

The objective of this paper is, therefore, to test the hypothesis that real interest rates have a significant positive impact on financial and non-financial saving in Kenya, which in turn support a higher level of investment. This is done by examining the propositions that private aggregate and financial savings in Kenya increase significantly with real deposit rates, and that the increase in financial savings is reflected in increased credit flow to the private sector.

There is no consensus in the literature on the impact of real interest rates on aggregate saving. Examples of this are the studies by Fry (1978, 1980) which found aggregate saving significantly interest elastic in seven Asian countries using 1960s pooled time series data, while Giovannini (1983, 1985) could not reproduce the results for these countries using the same model and 1970s pooled time series data. Giovannini explained Fry's results by the fact that his sample period included Korea's financial reform of the mid-1960s when interest rates were drastically increased. And because of institutional factors that were peculiar to Korea at the time, there is almost unanimous agreement (Thorne 1986) that this was followed by a substantial increase in financial and non-financial savings. Accordingly, removing Korea from the sample of Asian countries, and/or carrying out the analysis for a different sample period, the significant interest elasticity of saving cannot be found. Similarly, the argument that high real deposit rates increase financial savings which are then channelled to investors cannot be established *a priori*. For instance, Wijbergen (1983) and Buffie (1984) indicate that financial savings need not be interest elastic, and if they are they may not be translated into increased credit to the private sector. For example, they may be used to raise the cash and foreign-asset reserves held by these institutions, or to finance fiscal deficits.

The rest of the paper is organized as follows. Section II analyses the impact of real deposit rates on aggregate private saving in Kenya. Section III analyses the impact of real deposit interest rates on financial saving, and Section IV the impact of real lending rates on the demand for credit in Kenya. The paper is concluded in Section V.

II. Real deposit rates and aggregate private saving

To test the responsiveness of the private saving rate in Kenya to real deposit rates, we apply the following traditional model used by Fry, Giovannini and others to 1966–1985 annual data derived from the IMF *International Financial Statistics (IFS).*

$$\left(\frac{S}{Y}\right)_t = a_0 + a_1 \log\left(\frac{y}{PoP}\right)_t + a_2\left(\frac{\Delta y}{y}\right)_t + a_3 (d - \pi^e)_t + a_4\, D80 + a_5\left(\frac{FS}{Y}\right)_t + a_6\left(\frac{S}{Y}\right)_{t-1} + u_1$$

where S/Y is the private saving rate with private savings measured as gross investment minus foreign and government savings.[2] Foreign savings are measured by the external current-account deficit, while government savings are estimated by tax revenue[3] minus government consumption expenditures, the latter as reported in the national accounts. The variable y/POP is per capita real income; $(d-\pi^e)$ is a representative real deposit rate of interest as given by the difference between the IFS reported nominal deposit rate and the expected rate of inflation; and D80 is a dummy variable to capture the influence of the other structural-adjustment reforms introduced by the government in the first half of the 1980s, such as the crawling peg exchange rate, prices decontrol, trade liberalization, and the control of the fiscal deficit. Lastly FS/Y is the net foreign savings inflow as given by the ratio of the deficit in the current account of the balance of payments to GNP and u_1 is a random error term.

Per capita income is included among the determinants, based on Keynes (1936) absolute income hypothesis in which the average prospensity to save rises with per capita income, at least in the short run. The other variables incorporate relevant non-Keynesian theories of saving behaviour. For instance, Friedman (1957) and Ando and Modigliani (1963) postulate that saving is a function of permanent income or wealth rather than measured income, so that it varies with deviations from permanent income or wealth which can be proxied by growth of income.[4] In addition, the growth of income generates buoyant conditions that are conducive to business saving.

At the same time, Duesenberry (1949) and others such as Brown (1952) postulate that there are adjustment lags in saving behaviour as the full reaction of savers to changes in their environment is not instantaneous but occurs over time. For instance, only a fraction of desired change in the saving rate may be adjusted

for in any period because of inertia, habit persistence or customs that make savers react only slowly to changes in exogenous stimuli. The saving rate therefore becomes a function of the previous rate(s).

Lastly, while the inflow of foreign savings has traditionally been regarded as having a positive impact or as being complementary to domestic savings, researchers such as Weisskoff (1972) have questioned this postulating that the availability of foreign savings may "psychologically' induce savers to increase consumption and to relax their income generation efforts. The flow of foreign savings then competes with and is a partial substitute for domestic saving.

While a macroeconomic model would need to be estimated to fully capture all the relationships between these variables, we used 2SLS to capture the likely strong feedback effects from the private saving rate to the growth in income and inflation. While McKinnon and Shaw argue that LDCs can determine the real rate of interest by manipulating the nominal deposit rate and the nominal money supply, it is doubtful whether these countries in practice have sufficient control over the latter. The equation was then controlled for first-order autocorrelation by the Cochrane-Orcutt (1949) method which requires the inclusion of the lagged Independent variables among the instruments (Pindyck and Rubinfeld 1981).

To make the estimates we had, in addition, to determine how inflationary expectations are formulated. In Kenya, the rate of inflation has generally been low, averaging only 9.8% in the period of analysis, so that expectations can be assumed to be static and estimated by π. And as Giovannini (1983) points out, the expected real rate of interest can be regarded as the actual rate with an error and therefore estimated by an instrumental variable.

The regression results are reported in Table 3. In the Table, equation (2) gives the results when only the growth in real income is treated as the endogenous independent variable, while equation (3) gives the estimates when only the real deposit rate is treated as endogenous. Equation (4) gives the estimates when both variables are endogenous.

The real deposit rate has an insignificant impact on the real saving rate in Kenya. This is consistent with studies by Giovannini (1983, 1985), Leite and Makonnen (1986), and Melo and Tybout (1986) on other countries which have rejected the McKinnon and Shaw hypothesis that private saving is significantly and positively interest-elastic in LDCs.

While per capita income has a significant coefficient at the 5 percent level in equations (1) and (2), it is not significant in the other estimates, perhaps supporting the general observation that per capita income does not have an independent influence on the private saving rate when the growth of income is included in the analysis (Leff and Sato 1987). This may also reflect the sluggish change in per capita income in Kenya since the first oil crisis of 1973 with for example the 1985 per capita income (at 1980 prices) 27 percent below the 1973 level.

In contrast, the growth of real income is consistently significant at the 5 percent level in influencing private saving with a 1 percent point rise in real growth raising the private saving rate by 0.3–0.6 percent. It would seem that the high

Table 3 Estimates of the private saving rate function in Kenya, 1966–1985

Technique of estimation	Dependent variable	Constant	Log $\left(\frac{y}{POP}\right)_t$	$\left(\frac{\Delta y}{y}\right)_t$	d-π^e_t	D80	$\left(\frac{FS}{Y}\right)_t$	$\left(\frac{S}{Y}\right)_{t-1}$	R^2	DW
1. OLS	$\left(\frac{S}{Y}\right)_t$	-1.553[b]	0.203[b]	0.356[b]	-0.295	0.051[b]	-0.536[a]	0.520[a]	0.81	2.07
		(2.107)	(2.188)	(1.938)	(0.235)	(2.439)	(3.572)	(2.744)		
2. 2SLS[f]	$\left(\frac{S}{Y}\right)_t$	-1.426[b]	0.187[b]	0.410[b]	-0.044	0.050[a]	-0.495[a]	0.514[a]	0.81	2.62
		(2.188)	(2.269)	(2.350)	(0.387)	(2.843)	3.514)	(3.135)		
3. 2SLS[g]	$\left(\frac{S}{Y}\right)_t$	-1.110	0.145	0.484[b]	-0.136	0.053[b]	-0.460[b]	0.567a[a]	0.79	2.70
		(1.227)	(1.256)	(2.050)	(0.761)	(2.686)	(2.559)	(2.993)		
4. 2SLS[h]	$\left(\frac{S}{Y}\right)_t$	-0.904	0.118	0.553[b]	-0.175	0.053[b]	-0.406[b]	0.576[a]	0.79	2.56
		(0.935)	(0.962)	(2.191)	(0.947)	(2.620)	(2.060)	(3.079)		

Key: *t*-statistics in brackets

[a] = Significant at the 1% level

[b] = Significant at the 5% level

[c] = Significant at the 10% level

[f] = Only $\frac{\Delta y}{y}$ treated as endogenous

[g] = Only (d-π^e) treated as endogenous

[h] = Both $\frac{\Delta y}{y}$ and (d-π^e) treated as endogenous

rates of growth that the country experienced before 1973 and during the coffee–tea boom of 1976–1977 explain a large proportion of the high rate of private saving obtained in these periods. On the other hand, the low rates of private saving in 1975, 1979 and 1985 may be attributed to a large extent to the negative or very low growth rates experienced in these years.

The 1980s dummy variable has a consistently significant positive coefficient so that the non-interest-rate structural adjustment reforms undertaken in the first half of the decade had a positive impact on private saving. At the same time the foreign saving rate has a significant negative impact on the private saving rate. gross investment minus the public and foreign saving. Therefore, holding gross investment and public saving constant, there is a one-for-one negative relationship between private and foreign saving which may be reflected in the result even if other things do not remain constant.

Lastly, the lagged dependent variable has a highly significant coefficient suggesting the existence of adjustment lags in private saving behaviour. The coefficients also suggest a high speed of adjustment from the actual to the desired private saving rate of about 40–50 percent per year.

In conclusion, then, these results do not support the hypothesis that the real deposit rate is an important tool for mobilizing private saving in Kenya.

III. Real deposit interest rates and financial saving

In their analysis, McKinnon and Shaw argue that a large proportion of investors in LDCs mainly rely on self-finance. And because investment tends to be indivisible or lumpy, these investors have to accumulate financial and non-financial savings before they invest. In most LDCs the capital markets are fairly thin so that money is the main financial asset in the portfolio of wealth holders. Accordingly, investors have to accumulate money balances before they invest. In this argument, money and capital accumulation are complementary so that policies that increase the demand for real money balances promote self-financed investment in addition to enhancing financial intermediation and hence outside financed investment. One such policy is the upward adjustment in the real deposit rates. Such a policy boosts the demand for money, and therefore self-financed investment, as the real balances that individuals and firms have at their disposal are boosted. The policy also enhances financial deepening and promotes competition which reduces the profit margins and also the risks that firms face in the financial sector, thereby increasing their potential ability to provide credit. By reducing the firms dependence on self-finance, liberalization stimulates investment by permitting outside finance to rise *pari passu* with the needs of the economy.

To test whether the real demand for money in Kenya changes significantly with the real deposit rates we apply the following money demand model suggested by McKinnon and Shaw to Kenyan data.

$$\text{Log}\left(\frac{M}{P}\right)_t = b_o + b_1 \log y_{t} + b_2(d - \pi^e)_t + b_3\left(\frac{S}{P}\right)_t + b_4 \log\left(\frac{M}{P}\right)_{t-1} + u_z$$

where $\frac{M}{P}$ is real money balances held either as currency or as deposits in banks and non-bank ("bank-like"—IMF) financial institutions (NBFIs). The equation was fitted for the real M2 (currency in circulation plus deposits in commercial banks) and M3 (M2 plus deposits in NBFIs).

Besides the real deposit rate ($d-\pi^e$) which measures the return to holding money, the money demand function includes a scale variable—real GDP—and the private sector's average propensity to save (S/Y). When investors rely on self-finance, then investment is equal to saving and (S/Y) captures the McKinnon and Shaw money–investment complementarity effect.

In a partial adjustment analysis, the speed of adjustment or the fraction of the desired change in real money balances that is attained in any period is measured from the coefficient of the lagged dependent variable and is equal to $(1-b_4)$.

The model was estimated by OLS and controlled for first-order serial correlation of the residuals by the Cochrane-Orcutt method. The results are given in Table 4.

According to the results, the real deposit rate does not significantly influence the real demand for money in Kenya.[5,6] Similarly, the results do not support the McKinnon and Shaw complementarity effect that (S/Y) rises significantly with real money balances even though the estimates indicate strong multicollinearity between S/Y, log y and the lagged dependent variables, as seen in drastic change in the parameters when the first variable is removed, while R^2 remain constant or change marginally. However, real income has a significant positive impact on the demand for real M2 and M3, while the lagged dependent variable only has a significant impact on the demand for real M3 in equation (4).

Table 4 OLS estimates of the broad money demand functions in Kenya

Dependent variable	Constant	Log y	$(d-\pi)$	$\frac{S}{Y}$	Lagged dependent variable	R2	DW	Period of analysis
1. $\text{Log}\left(\frac{M2}{P}\right)_t$	-2.335	0.762[b]	-0.128	0.791	0.377	0.94	2.26	1967–85
	(1.136)	(1.791)	(0.354)	(1.177)	(1.289)			
2. $\text{Log}\left(\frac{M2}{P}\right)_t$	-3.252[c]	1.144[a]	-0.250		0.057	0.93	2.18	1967–85
	(1.469)	(3.148)	(0.683)		(0.264)			
3. $\text{Log}\left(\frac{M3}{P}\right)_t$	-7.139	1.275[b]	-0.017	-0.107	0.336	0.91	2.39	1973–85
	(1.374)	(1.963)	(0.043)	(-0.139)	(0.358)			
4. $\text{Log}\left(\frac{M3}{P}\right)_t$	-6.862[b]	1.205[a]	0.021		0.356[b]	0.91	3.34	1973–85
	(2.023)	(3.286)	(0.60)		(2.214)			

Key: t-statistics in brackets
[a]=Significant at 1% level
[b]=Significant at 5% level
[c]=Significant at 10% level

It comes as no surprise that financial savings in Kenya are not significantly responsive to the real deposit rates as their behaviour generally reflected other developments in the economy. The period before the oil crisis of 1973 was one

of sustained real financial growth with real M2 doubling. There was a downturn between 1973 and 1975 and a general improvement between 1976 and 1979 as a result of a large increase in beverage export prices. The 1980–1983 period was one of decline, as seen in a reduction in the real M2 and M3, and came about as the government was implementing the interest rate reform by raising nominal interest rates. This decline occurred despite a very rapid growth in NBFIs with their deposits as a proportion of M2 rising from 31.9 percent in 1980 to 40.6 percent in 1983, and rising further to 54.2 percent in 1985 when their growth peaked due to a shift of deposits to the more established commercial banks because of solvency problems in some of the NBFIs.

The financial sector picked up in 1984 and declined in 1985, but by 1983 the government was apparently having second thoughts about the wisdom of the high interest rate policy and has since then adjusted the rates downwards several times in order to rationalize their structure and to "promote investment".[7] In 1986 the government also imposed a 20 percent tax on interest income. The overall effect of these changes is that the real deposit rates remain negative or not much above zero in contrast to "success cases" of interest reform when real deposit interest rates were generally in excess of 10 percent (McKinnon 1973). As a consequence the impact of the high deposit rate policy was overshadowed by other stabilization policies adopted by the government.

IV. Real lending rates and the demand for credit by the private sector

The evidence so far is consistent with the doubts placed on the effectiveness of a high deposit rate policy in promoting private saving and in enhancing the potential ability of financial intermediaries to give credit. In the McKinnon and Shaw hypothesis, the increase in the cost of borrowing does not influence the *ex post* demand for credit as borrowers are constrained more by the availability of credit than its cost. Indeed, the economic growth of a financially repressed economy is enhanced as credit is now channelled to more productive activities.

However, indications, such as the decline in the ratio of commercial banks' private advances to private deposits in the 1980s suggest that the demand for formal-sector credit by the private sector is negatively correlated with an increase in real lending rates.[8]

To test the extent to which this was the case we explain the demand for the credit by the private sector ($\Delta CR/Y$) by real income (log y), growth in the real income ($\Delta y/y$), the real cost of borrowing ($L-\pi$) where L is the nominal lending rate reported in IFS and by the previous period credit ratio.

The equation was fitted for the commercial banks' credit to the private sector ($\Delta CR1/Y$) and for the combined commercial banks' and NBFIs' credit to the private sector ($\Delta CR2/Y$) and controlled for serial correlation by the Cochrane-Orcutt method. The regression results are given in Table 5.

According to the results, the real cost of borrowing has a significant negative influence on the demand for credit to the private sector, with a 1 percent increase in the real lending rates reducing the demand for credit by 0.13–0.22 percent, while none of the other variables is significant.

It is difficult to tell *a priori* the extent to which the increase in the cost of borrowing has reduced investment in the private sector, with investment measured from capital formation in traditional and modern dwellings, non-residential buildings and construction works, land improvement, breeding stock and dairy cattle, transport, machinery, other equipment and stocks. But casual empiricism suggests that this may have been substantial. For example, in one sector where information is relatively reliable (UNIDO 1988, p. 21):

It is estimated that total capital stock within the manufacturing sector declined from Kshs.1428.3 million in 1976 to Kshs.1245.9 million in 1985. When measured at constant . . . prices the manufacturing investment has declined very significantly during the 1976–85 period . . . Manufacturing investment as a percentage of gross fixed capital formation has also tended to decline—from 13.4% in 1980 to 10.6% in 1985. It is thus clear that the annual rate of fixed capital formation in the manufacturing sector is significantly lower than the real rate of depreciation . . . . An important cause of decline in investment within the manufacturing sector has been a significant increase in the cost of borrowing. The real interest rate which was negative for most of the 1970s is currently estimated at 10%.

Table 5 OLS estimates of the private sector credit demand functions

Dependent variable	Constant	Log y	$\frac{\Delta y}{y}$	L-π	Lagged dependent variable	R^2	DW	Period of analysis
$\frac{\Delta CRI}{Y}$	-0.012	-0.001	0.054	-0.126[a]	-0.021	0.28	2.15	1966–1985
	(0.035)	(0.047)	(0.718)	(1.502)	(0.081)			
$\frac{\Delta CR2}{Y}$	-0.203	0.024	-0.023	-0.224[a]	-0.270	0.54	2.03	1974–1985
	(0.060)	(0.074)	(0.135)	(1.729)	(0.823)			

Key: t-statistics in brackets

[a]=Significant at the 10% level

Kenya's high interest rate policy can therefore be subjected to the structuralist critique (Taylor 1983) that it may turn out to be stagflationary.

V. Conclusion

The objective of this paper was to test, within Kenya's institutional framework, the McKinnon-Shaw hypothesis that an upward adjustment in real deposit rates significantly increases the private sector's financial and non-financial savings which are then utilized to support a high level of credit supply and investment in the economy.

The results fail to support the McKinnon-Shaw hypothesis, and instead find that the private saving rate and the real demand for money are non-significantly responsive to a representative deposit rate of interest. On the other hand, the study suggests that the major impact of the high interest rate policy is in reducing the private sector's demand for credit and hence its aggregate spending. While this facilitates the government's deflationary (stabilization) objectives, it might have a negative effect on the economy's capacity to produce to the extent that it reduces capital formation. This may lead to a situation where the higher real interest rates reduce aggregate supply more than they reduce aggregate demand or are cost-pushed to accelerate inflation.

These conclusions, however, ought to be qualified in two important ways. First, the analyses of the interest elasticity of savings and investment were done on the relatively modest changes in the real interest rates that have occurred in Kenya since independence. A large increase in real rates that would probably result, for example, from a fuller liberalization of the financial system so that the rates are more market-determined, may give different results. Second, higher real lending rates cause an improvement in quality of the investment that is undertaken so that the net impact on national output cannot be predicted *a priori*. It is the latter channel of influence that some studies emphasize when they find a positive significant correlation between real interest rates and real economic growth across countries.

Addendum

This paper was written and presented to an AERC workshop way back in 1988. The paper therefore does not cite the more recent literature on the elasticity of savings and investment to real interest rates. The data used in the analyses will also seem dated as they cover the period to 1985. A suggestion for further research is to update the analyses to see how this affects the results.

Appendix

Table A-1 OLS estimates of the money demand (component) functions in Kenya

	Dependent variable	Constant	Log y	d-π^e	$\frac{S}{Y}$	Lagged dependent variable	R^2	DW
1. (i)	Log CU	-8.551[a]	1.835[a]	-0.293	-0.244	-0.415[a]	0.52	0.13
	P	(2.951)	(6.977)	(1.059)	(0.629)	(5.497)		
(ii)	Log CU	-8.172[a]	1.799[a]	-0.303		0.419[a]	0.52	0.30
	P	(2.953)	(7.173)	(1.123)		(5.727)		
2. (i)	Log DD	3.899	0.141	-0.308	1.660[c]	0.338	0.65	2.86
	P	(1.229)	(0.366)	(0.383)	(1.716)	(1.491)		
(ii)	Log DD	5.857[c]	0.218	-0.478		0.047	0.60	2.41
	P	(1.456)	(0.470)	(0.575)		(0.213)		
3. (i)	Log QM	-8.838[b]	1.424[a]	0.267	-0.221	0.269	0.97	2.21
	P	(2.323)	(2.690)	(0.785)	0.291)	(1.213)		
(ii)	Log QM	-8.491[a]	1.354[a]	0.290		0.311[b]	0.96	2.24
	P	(2.663)	(3.278)	(0.904)		(2.042)		
4. (i)	Log NBFID	-3.301	0.392	0.301	-0.339	0.876[a]	0.97	2.03
	P	(0.697)	(0.915)	(0.337)	(0.495)	(7.192)		
(ii)	Log NBFID	-2.463	0.314	0.230		0.904a	0.96	2.03
	P	(0.628	(0.839)	(0.276)		(8.908)		

Key: *t*-statistics in brackets

a = Significant at the 1% level

b = Significant at the 5% level

c = significant at the 10% level

Table A-2 Data used in estimating the private saving rate function.

	Private saving rate (%)	Per capita real GNP (Shs)	Real growth in GNP (%)	Deposit rate of interest (%)	Rate of inflation (%)	Real deposit rate of interest (%)	Ratio of current account deficit to GNP
1966	19.6	2,670	11.1	3.50	4.01	-0.53	0.1
1967	20.3	2,661	3.1	3.50	1.58	1.92	0.9
1968	20.1	2,808	9.3	3.50	0.51	2.99	0.7
1969	22.4	2,973	9.9	3.50	-0.16	3.66	-0.7
1970	20.6	3,112	8.0	3.50	2.06	1.44	1.8
1971	18.6	3,243	8.3	3.50	3.72	-0.22	6.6
1972	20.5	3,272	4.4	3.50	6.07	-2.57	2.3
1973	18.4	3,281	3.7	3.50	9.33	-5.83	1.4
1974	19.9	3,307	4.3	4.32	17.74	-13.42	7.9
1975	12.7	3,096	-2.8	5.13	19.07	-13.94	5.0
1976	20.6	3,303	10.2	5.13	11.40	-6.27	-0.7
1977	26.0	3,566	11.9	5.13	14.91	-9.78	-3.5
1978	16.3	3,250	-5.5	5.13	16.88	-11.75	10.2
1979	11.7	3,249	3.0	5.13	8.00	-2.87	6.2
1980	14.3	3,058	2.4	5.75	13.80	-8.05	11.8
1981	15.0	3,018	2.7	14.74	11.84	2.90	9.3
1982	14.8	2,686	-7.4	12.20	20.40	-8.20	4.9
1983	18.1	2,626	1.7	13.27	11.52	1.75	1.1
1984	15.0	2,536	0.6	11.77	10.18	1.59	2.5
1985	12.6	2,400	-1.6	11.25	13.05	-1.80	2.5
Mean					9.80		

Source: IMF, *International Financial Statistics*, 1987.

Table A-3 Some of the data used in estimating the money demand functions (Sh million)

Year	Real currency	Real M1	Real Quasi money	Real M2	Deposits in NBFIs	Real M3	Share of (5) in (4) %	Real GNP
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1967	1,435	4,478	2,147	6,624	+	+	+	26,929
1968	3,160	5,141	2,180	7,321	+	+	+	29,425
1969	1,842	5,699	2,997	8,696	+	+	+	32,342
1970	2,211	6,902	3,966	10,868	+	+	+	34,943
1971	2,239	7,088	4,179	11,268	+	+	+	37,842
1972	2,520	7,903	4,205	12,108	+	+	+	39,495
1973	2,532	8,892	4,916	13,808	2,073	15,880	15.0	40,944
1974	2,378	8,222	4,519	12,741	2,091	14,832	16.4	42,689
1975	2,271	7,619	4,914	12,542	2,575	15,107	20.5	41,513
1976	2,682	8,452	5,505	13,957	2,593	16,550	18.6	45,741
1977	3,135	10,534	7,460	17,995	3,285	21,280	18.3	51,175
1978	2,833	9,684	7,715	17,399	3,617	21,016	20.8	48,367
1979	3,042	10,445	7,776	18,221	4,466	22,687	24.5	49,800
1980	3,032	8,434	7,702	16,136	5,141	21,277	31.9	50,960
1981	3,191	8,413	7,933	16,346	5,427	21,772	33.2	52,330
1982	2,766	7,898	7,973	15,871	5,647	21,518	35.6	48,446
1983	2,716	7,641	7,294	14,935	6,068	21,002	40.6	49,288
1984	2,641	7,915	7,373	15,288	7,636	22,924	49.9	49,559
1985	2,688	6,910	7,473	14,382	7,789	22,171	54.2	48,784

Key: + = Not available

Source: Same as Table A-1.

Table A-4 Some of the data used in estimating the private sector credit demand functions

Year	Commercial banks credit to the private sector as a proportion of GNP	NBFIs credit to the private sector as a a proportion of GNP	Total	Real lending rate
1966	0.84	+	+	4.97
1967	2.77	+	+	7.42
1968	-0.41	+	+	8.49
1969	0.78	+	+	9.16
1970	3.60	+	+	6.94
1971	3.81	+	+	5.28
1972	1.91	+	+	2.93
1973	4.17	+	+	-0.33
1974	3.44	0.67	4.11	-8.24
1975	1.48	0.96	2.44	-9.07
1976	2.68	1.26	3.94	-1.40
1977	4.55	1.02	5.57	-4.91
1978	6.07	1.61	7.68	-6.88
1979	2.00	1.21	3.21	2.00
1980	3.89	2.36	6.25	-3.22
1981	2.16	1.83	3.99	0.64
1982	2.04	2.30	4.34	-5.90
1983	1.38	1.71	3.19	4.31
1984	1.91	2.86	4.77	4.24
1985	2.79	2.15	4.94	0.95

Key: + = Not available

Source: Same as Table A-1.

Notes

1. In the early 1970s, the Central Bank of Kenya (CBK) maintained that it had "not hitherto felt that official changes in interest rates would be a useful instrument to influence economic activity and the flow of credit in the economy." See CBK, *Money and Banking in Kenya*, Nairobi, 1972, p. 10.
2. Private savings will, therefore, vary with the way depreciation and inventory investment have been measured, the inclusion of indirect business taxes, the degree of protection given domestic goods, the overvaluation of the exchange rate, etc. This implies that the *ex post* estimates of savings may not provide a true picture of the saving effort, with year-to-year changes containing much error. See Mikesell and Zincer, 1973.
3. Tax revenue is given in financial years so that it had to be adjusted to relate to calendar years by averaging for consecutive years. For example, the 1974 tax revenue data were derived from the average of the 1973/74 and 1974/75 data.
4. This is, for example, established in rigorous theoretical terms by Leff and Sato (1988) from a model of savers wealth maximization behaviour.
5. Indeed, the real deposit rate does not significantly influence any of the money demand components: currency in circulation (CU), demand deposits (DD), quasi-money (QM) and NBFI deposits (NBFID), as shown in Table A-1, in the Appendix.

   In addition, the results show that the demand for currency and quasi money significantly and positively change with real income while the demand for demand deposits and NBFI deposits do not. At the same time the lagged dependent variable has consistently a very significant negative impact on the demand for currency while it has a highly significant positive impact on the real demand for NBFI deposits. It would then seem that the growth of NBFI deposits in the economy was at the expense of currency holdings.
6. In a study by one of the authors (Mwega 1988), the demand for real M2 was found to be statistically stable.
7. See Kenya, *Economic Survey*, various issues.
8. Ratio of commercial banks' private advances to private deposits (%) are shown below:

1971	*1972*	*1973*	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*
84.1	75.4	78.3	97.1	90.7	86.4	79.6	90.0	92.8
1980	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*		
99.5	97.3	90.2	88.4	87.0	88.2	82.1		

Source: CBK, *Quarterly Economic Review*, January-March 1988.

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