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Taxation, Risk and Real Interest Rates

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1. Introduction: the impact of taxation and risk on the case for positive real interest rates

It is an established orthodoxy that negative real interest rates constrain development, by causing financial repression.¹ The World Bank and the International Monetary Fund (IMF) frequently make the raising of nominal interest rates above the rate of inflation a condition of their lending;² and some countries without IMF or World Bank programmes have announced that positive real interest rates are a policy objective.

This paper does not challenge the argument that negative real interest rates should be made positive. Rather it raises two frequently neglected points:

- the effect of tax rules on whether a positive real rate of interest is actually achieved and how it should be measured³
- the risk attached to borrowing at high nominal rates of interest, even though inflation may also be as high or higher.

Firstly (Section 2), if the interest paid by borrowers is treated as a tax deductible expense, then it is not sufficient to raise the nominal rate of interest above the rate of inflation in order to have a positive real cost of borrowing. Similarly, if interest received on bank deposits and other financial instruments is taxable, the real return is not necessarily positive even if the nominal rate of interest is above the rate of inflation. Moreover, allowing for tax drives a gap between the nominal interest rates required to make real rates positive for taxpayers on the one hand and non-taxpayers on the other hand. This gap increases with the level of inflation.

The nominal interest rates required, to make real after-tax rates positive, are higher the higher is inflation and the higher is the marginal tax rate. As a result, in order to have

¹ The arguments for positive real rates of interest, deriving from the work of Shaw [1973] and McKinnon [1973] are usefully summarised in Kitchen [1986: 79-95] and Fry [1988]. More recent reviews include McKinnon [1991] and Page [1993].

² See for example Kitchen [1986: 87] and Michalopoulos [1987]. Killick [1984: 191] notes "... there was an average of about two preconditions per programme ... these were likely to include either or both exchange rate and interest rate policy changes".

³ This issue has been raised in the theoretical literature [see Darby (1975); Diamond (1970); Feldstein (1976); Tanzi (1980)]. It has rarely been applied, and one of the purposes of this paper is to demonstrate its importance.

positive real interest rates after allowing for tax, nominal rates have to be at levels that are likely to be unacceptably high. Only if inflation is low, are tax-adjusted real interest rates likely to be positive.

The effect of taxation on the actual cost of borrowing is demonstrated in Section 2 for Sub-Saharan Africa, where a majority of governments have a positive real interest rate policy, some as part of IMF conditionality, some independently. The point also applies in developed countries, but the effect of taxation is smaller where inflation is low, as is shown in Section 2 for the United States.

Secondly (Section 3), the higher the rate of inflation and therefore the nominal rate of interest required to achieve a positive real interest rate, the greater is the risk to the borrower. In other words, paying 55 per cent to borrow money when inflation is 50 per cent is much riskier than borrowing at 5 per cent when there is no inflation. The difference between interest rates and inflation may increase; and output prices may not rise in line with inflation, while input prices almost certainly will.

This may explain why in countries with high rates of inflation, nominal rates of interest so often remain below inflation, even when the government has announced a policy of moving to positive real interest rates. This point is demonstrated statistically for the countries of anglophone Africa.

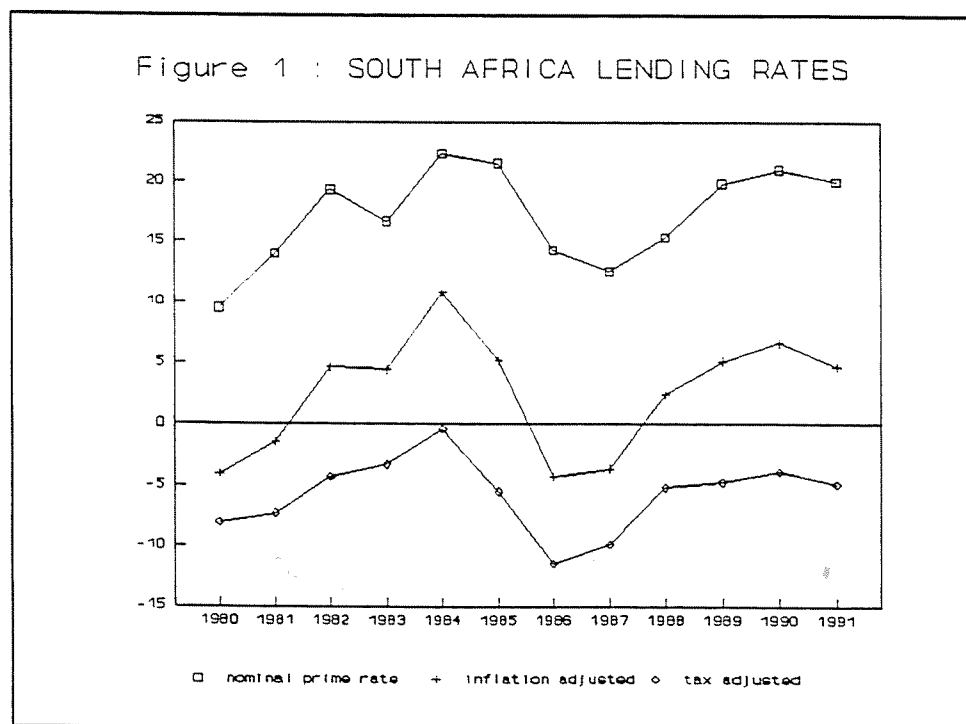
The conclusion (Section 4) must be that reducing the rate of inflation is preferable to raising nominal rates of interest as a way of achieving positive real rates of interest. The risks and distortions which arise from having a nominal rate of interest higher than inflation can only be minimised by reducing inflation, or by changing the tax laws so that interest is not tax deductible. Where inflation does remain high, it is not possible to say whether the cost of high nominal interest rates is greater or less than the cost of negative real rates.

There is nothing new or unorthodox about arguing that it is better to achieve positive real rates of interest by lowering inflation than by raising the nominal interest rate [Killick and Martin, 1990]. This paper points out the difficulty created by tax rules in achieving positive real interest rates, and the risks attached to high nominal interest rates as a way of making real interest rates positive.

2. Taxation and the real rate of interest

In most countries, the interest on money borrowed by businesses may be subtracted from profits before calculating the corporate tax payable. This tax effect sharply reduces the real after-tax cost of borrowing. As a result, real interest rates remain negative in many countries despite nominal rates being raised above the rate of inflation.

In South Africa, for example, influenced by the strongly monetarist recommendations of the De Kock Commission of Inquiry into Monetary Policy [RSA, 1980; 1985], the authorities attempted to introduce and maintain positive real interest rates throughout the 1980s. The prime lending rate rose from the range of 8.0 to 12.5 per cent in the 1970s to between 15 and 22.5 per cent for most of the 1980s (except during the severe recession of 1986 and 1987). Allowing only for inflation, lending rates appeared to be positive from 1982 onwards, except in 1986-7. However, Figure 1 shows that if the effect of tax rules is taken into account, the real cost of borrowing remained negative.



The top line in Figure 1 shows the commercial banks' prime lending rate. The middle

line is the prime rate less the annual rate of inflation. It appears to show that the real cost of borrowing was positive and close to 5 per cent in six of nine years from 1982 to 1990.

However, the post-tax cost of corporate borrowing was substantially less, as shown by the bottom line. For example, in 1985, the nominal cost of borrowing at the prime rate averaged 21.5 per cent, while inflation averaged 16.3 per cent. The real cost of borrowing appeared to be +5.2 per cent. Firms paying taxes at the then 50 per cent corporate tax rate paid effectively only 10.75 per cent on credit after allowing for taxation, so that their real after-tax cost of borrowing was negative at -5.5 per cent. The tax-adjusted cost of borrowing at the prime rate came closest to being positive in 1984. Firms paying above the prime rate for credit would then have had a positive real cost of borrowing.

Similar points can be made about every country in Sub-Saharan Africa which has experienced moderate to high inflation during the 1980s. Table 1 shows the number of occasions from 1980-91 when positive inflation-adjusted lending rates have been achieved before and after the effects of tax rules are taken into account, using annual data. All countries in Sub-Saharan Africa, including South Africa, are listed. Of the 32 for which comparable data are available, only Ethiopia excludes interest costs from those costs which firms may deduct from revenue before calculating tax liability [International Bureau of Fiscal Documentation, 1992].

Over the 12 year period, 60 per cent of all possible instances of lending rates are higher than inflation. After tax rules are taken into account, this percentage falls to 29. In fact, over half of all positive inflation-adjusted rates change sign when a further adjustment for tax is made.

The higher the rate of inflation, the more the nominal interest rate has to be above the rate of inflation, to make after-tax costs of borrowing positive. This point can be illustrated in several ways.

For example, the low inflation countries of the CFA franc zone have a fixed exchange rate with the French franc. They cannot devalue, so that if their inflation rates are higher than in France they have to deflate their economies to bring their price levels back into line. Consequently, high inflation in the 1970s and early 1980s was followed by falling prices in the later 1980s. The CFA franc zone countries in Table 1 have a much smaller percentage of sign reversals after tax effects are taken into account (37 per cent) than the rest of Sub-Saharan Africa (63 per cent).

Table 1 : OCCURRENCES OF POSITIVE LENDING RATES 1980-91

COUNTRY	- INFL			AFTER TAX			COUNTRY NOTES
	+	-/0	N.A.	+	-/0	N.A.	
Angola							no data available
Benin*							no price data available
Botswana	6	6	0	0	12	0	
Burkina*	11	0	1	8	3	1	
Burundi	10	2	0	5	7	0	
Cameroon*	8	2	2	4	6	2	
Cape Verde							old CPI series in IFS used
CAR*	6	4	2	0	10	2	no data pre-1985 (IFS)
Chad*	4	2	6	4	2	6	high income CPI used
Comores*							tax: manuf (45%) used; comm 50%
Congo*	8	3	1	5	6	1	insufficient data available
Cote d'Iv.*	11	1	0	9	3	0	
Djibouti							no data pre-1985 (IFS)
Equ Guinea*							no data pre-1985 (IFS)
Ethiopia	2	5	5	n.a.			interest costs NOT tax deductible
Gabon*	10	1	1	3	8	1	
Gambia	9	3	0	6	6	0	
Ghana	2	9	1	0	11	1	
Guinea							lending rts estimated 1989-90
G-Bissau							no data available
Kenya	10	2	0	2	10	0	no data available
Lesotho	8	4	0	1	11	0	
Liberia	10	0	2	7	3	2	
Madagascar							highest marg. corp tax rt
Malawi	8	4	0	0	12	0	only discount rates in IFS
Mali*							
Mauritania	5	4	3	2	7	3	no price data before 1988
Mauritius	10	1	1	6	5	1	break in CPI series 1985
Mozambique							
Namibia							no data available
Niger*	11	1	0	8	4	0	independence gained 1990
Nigeria	6	6	0	1	11	0	
Rwanda	11	1	0	8	4	0	
Senegal*	11	1	0	8	4	0	highest marg. corp tax rt
Seychelles	11	0	1	10	1	1	
S Leone	0	12	0	0	12	0	
Somalia	0	9	3	0	9	3	
S Africa	8	4	0	0	12	0	
Sudan							Islamic banking; Elhiraika (1991)
Swaziland	8	4	0	2	10	0	
Tanzania	2	9	1	0	11	1	
Togo*	11	1	0	8	4	0	
Uganda	2	8	2	0	10	2	
Zaire							only discount rates in IFS
Zambia	0	12	0	0	12	0	
Zimbabwe	8	4	0	0	12	0	
(Ethiopia	-2	-5	-5)				
Sum	225	120	27	107	238	27	118 occurrences changed sign
Per cent	60	32	7	29	64	7	55 % of those that were +ve

Sources : price and interest rate data : mainly IFS; corporate tax rates : IBFD
supplemented by central bank and EIU quarterly reports

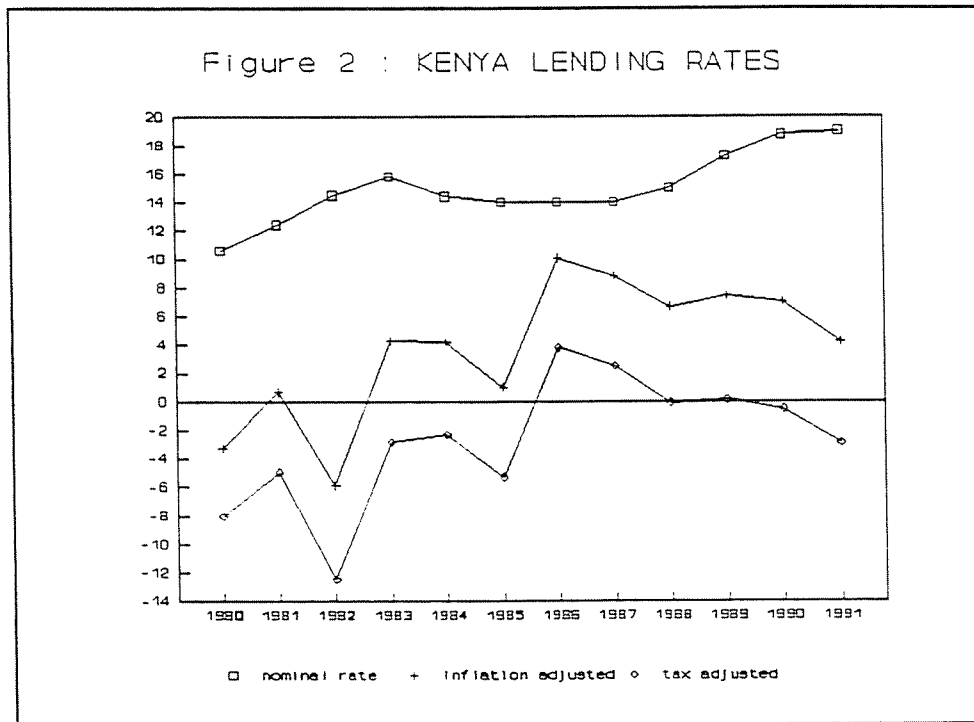
Notes : 1. Because many borrowers pay above the prime rate for bank credit, actual borrowing costs may be higher than shown. Even though the average rate of tax paid by firms may be less than the nominal rate, decisions to finance investment by borrowing are based on the full marginal (not average) rate of tax.

2. The CPI is used instead of the GDP deflator, because it is (i) available, and (ii) less subject to distortions caused by changes in the terms of trade.

* CFA franc zone countries

This point is further illustrated by the experience of individual countries: Kenya, with moderate but variable inflation; Zambia with high and escalating inflation; and Senegal which is in the CFA franc zone and had falling prices in the late 1980s. All three countries were attempting financial liberalisation.

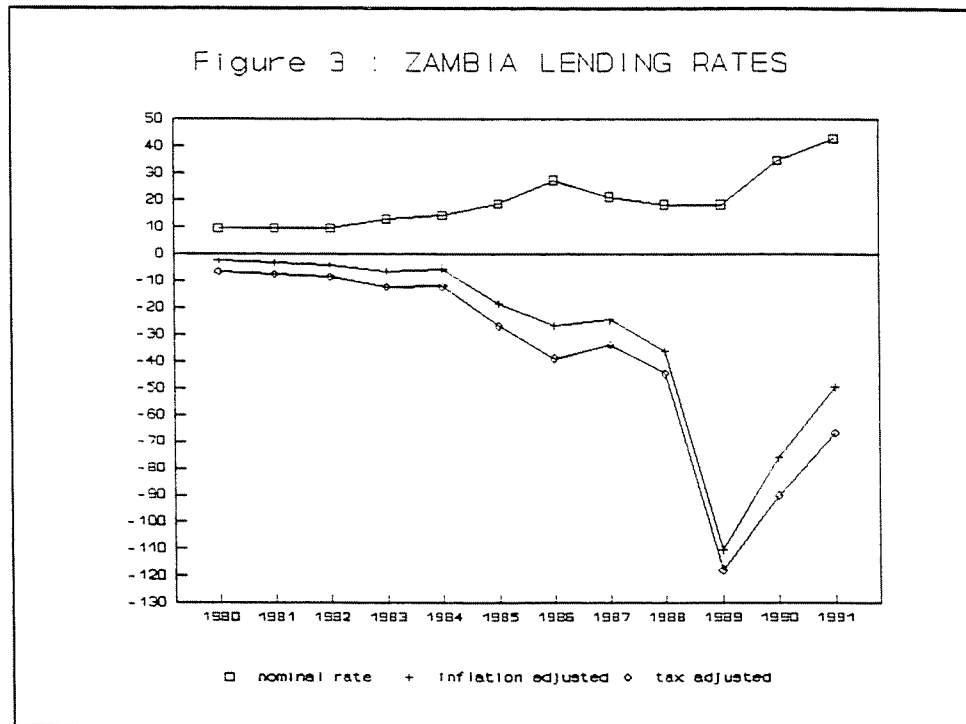
In Kenya, falling inflation and rising nominal interest rates in the mid-1980s yielded two years of positive after-tax real rates and three more where the rate was approximately zero. This is illustrated in Figure 2. This graph also shows how variable inflation produced sharp fluctuations in real rates when nominal interest rates were relatively stable. It would have taken frequent (and correct) changes in nominal rates to provide stable real rates to borrowers.⁴



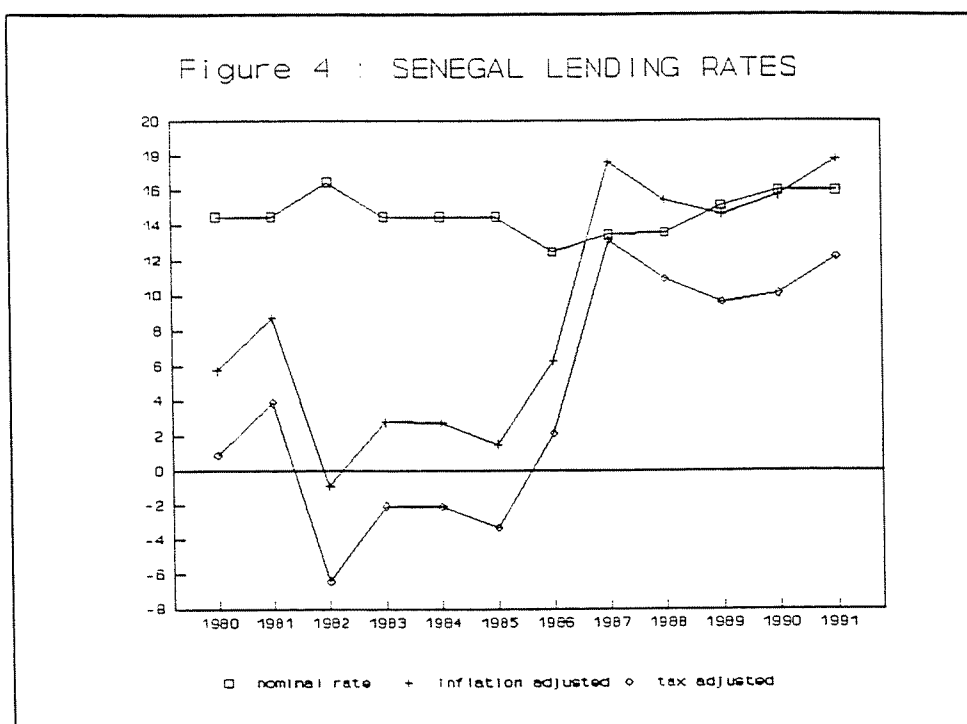
In Zambia, the authorities were never able to raise the nominal rate above inflation, still less to make the real rate positive after allowing for taxation, even when the nominal rate reached 43 per cent in 1991 (see Figure 3). By then a nominal rate of 163 per cent would

⁴ This point would be strengthened if account were taken of short term changes. The graphs show only annual changes in interest rates and inflation.

have been needed to make the real after tax cost of borrowing equal to +5 per cent. This demonstrates the extreme difficulty of achieving positive real rates when inflation is high.



In Senegal, prices fell during the later 1980s, so that the cost of borrowing after adjusting for inflation was higher than the nominal lending rate (Figure 4). Firms liable to tax were provided some relief from punitively high borrowing costs, but were still paying between 9 and 14 per cent in real terms after 1987.



The following table provides yet another, striking, illustration of the tax effect. The last column of Table 2 shows the nominal rate of interest necessary to give a real cost of borrowing of +5 per cent, if interests costs are tax deductible at a corporate rate of 40 per cent. The nominal rates required, as inflation moves higher, would be unacceptable politically in most countries, and therefore unlikely to be implemented.

Table 2
*The difference between the cost of borrowing
with and without taxation
(corporate tax assumed at 40%)*

Nom. rt of int.	Rt of inflatn adj. rt.	Inflatn	Real rt post tax	Nom. rt required
5	0	+5	+3	8.3
10	5	+5	+1	16.7
15	10	+5	-1	25.0
20	15	+5	-3	33.3
25	20	+5	-5	41.7
100	95	+5	-35	166.7
200	195	+5	-75	333.3

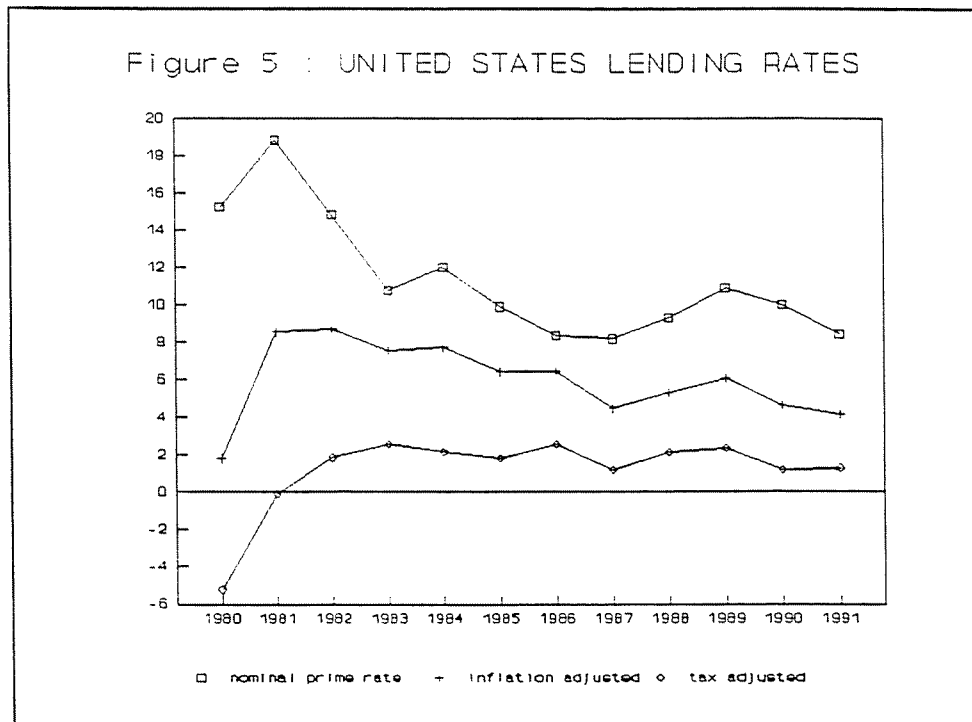
Several implications arise from taking account of the effect of tax on the real cost of borrowing. Firstly, only profitable firms can reduce the real cost of borrowing by deducting interest costs from profits before paying tax. Firms not paying tax, for whatever reason, are not able to do this. The real after-tax cost of borrowing varies, therefore, as between taxpaying and non-taxpaying firms. The variation increases with inflation. This can be seen clearly in Figures 1 to 4 as the difference between the middle and bottom lines. The real cost of borrowing, at high rates of inflation, would be impossibly high for unprofitable firms if it was made positive after tax for profitable firms (Table 2). This would apply to the large number of firms in Africa which do not pay corporate tax, for example in Ghana. However, in Ghana such firms borrow little from banks, financing themselves mainly by retained earnings or loans from family members [Baah-Nuakoh and Teal (eds), 1993:39-43; 149]. The importance of taking account of taxation in calculating the real cost of borrowing applies to those formal sector firms who are liable for taxation and have access to bank credit.

Secondly, the very high real cost of borrowing applicable to non-taxpayers would apply to personal borrowing where interest costs are not deductible against personal tax liability. If the government wishes to reduce lending for consumption while not reducing the incentive to invest, this result might be desirable.

Thirdly, the cost of paying dividends is not tax deductible in most countries. This creates a bias against the use of equity finance and in favour of the use of loans, which is inappropriate to the relatively uncertain conditions in developing countries.

Fourthly, allowing for tax also reduces the real return on bank deposits and other financial instruments. Attempts to increase domestic savings by offering a rate of return above inflation will be undermined by taxation of the returns generated.

The points made in this section also apply in developed countries. The USA in the 1980s, for example, had positive real borrowing costs after allowing for tax, because of low rates of inflation. This was a major shift from negative interest rates in the 1970s. Even in the USA, though, real after-tax borrowing costs were only just positive (see Figure 5).



In practice, most attempts to impose positive real rates of interest fail where inflation is high and interest is tax deductible. It seems unlikely that if governments did take account of the effect of taxation on real rates, they would be prepared to raise nominal rates of interest to the levels required. A neglected reason for this, it is argued in the next section, is that high nominal rates create big risks for borrowers, even where inflation appears to make the cost of borrowing acceptably low.

3. Risk and High Nominal Interest Rates

It is apparently costless to borrow if the nominal rate of interest is below the rate of inflation. The real cost of borrowing is even lower if the borrower is liable to tax and interest is tax deductible. However, this neglects two points: the possibility of adverse fluctuations in inflation and interest rates, and the fact that costs are more certain to rise with inflation than output prices.

3.1 Variability of inflation and interest rates

What matters to borrowers is not the difference between current interest rates and current inflation, but what the difference will be in the future. The current difference between the two rates is used as a proxy for the actual difference while the credit is outstanding. The borrower risks, therefore, an adverse change in the difference. This risk is larger the longer the loan is outstanding, because the current difference between interest rates and inflation is a weaker proxy for the difference further in the future. With fixed interest rate loans, the risk is limited to a fall in the rate of inflation. In practice, most institutional credit in Africa is from commercial banks. Almost all commercial bank lending is short term and subject to changes in nominal interest rates, so that borrowers are at risk (unless they are able to repay their bank borrowing) to adverse changes in both inflation and interest rates.

In general, high rates of inflation are less stable than low rates.⁵ The higher is the absolute level of inflation, the weaker is current inflation as a proxy for future inflation, and the greater is the risk that what appears in advance to be a negative real cost of borrowing will turn out to be positive.

Borrowers also face the risk that interest rates will increase. This is more likely at times of macroeconomic instability, one of the symptoms of which is high inflation. In fact, all the African countries covered in Table 3 below with annual inflation above 20% for at least one year had an apparently active interest rate policy during the 1980s, except for Ghana before 1984. Borrowers cannot therefore count on constant nominal interest rates when inflation increases.

Nevertheless, there is evidence that governments refuse to impose exceptionally high nominal rates of interest. As a result, the higher is inflation, the greater is the probability that nominal interest rates will not be raised as high as required to make real interest rates positive.

⁵ Calculating the mean and standard deviation of the consumer price index over successive time periods, for each of the 32 countries in Africa for which comparable data are available, showed that on average the higher was the rate of inflation the higher was its variability.

To test this point, annual data for the years 1980-91 from seventeen anglophone African countries were used to compare the nominal rate of inflation with nominal lending rates in years for which there appeared to be an active interest rate policy, as shown by annual changes.⁶ Periods of years with unchanged nominal rates were omitted.

In the years in which inflation was less than 20 per cent, nominal lending rates were greater than inflation in 92 out of 121 years. In sharp contrast, when annual inflation was more than 20 per cent, nominal lending rates were almost all lower than inflation (Table 3).

Table 3
*Nominal lending rates and inflation in
anglophone Africa (1980-91)*

	Infl. above 20%	Infl. below 20%
Lending rate < inflation	67	29
Lending rate > inflation	6	92

Source: IFS
central bank annual reports and quarterly bulletins

The problem of trying to achieve positive real rates of interest has become worse in recent years in those parts of the developing world with the most IMF agreements. Forty-two developing countries in Africa, Latin America and Europe had IMF agreements at end-1992. Inflation there was higher than in the 1970s, and higher than in Asia, the Middle East and North Africa where only seven countries had IMF agreements and inflation declined [IMF Survey, 8 Feb 1993; World Bank 1992]. As a result, attempting to make real rates of interest positive, as part of a stabilisation or structural adjustment programme, required exceptionally high nominal rates of interest, with the attendant risks. Alternatively, real borrowing costs remained negative, with the attendant distortions.

⁶ CFA franc zone countries were omitted because their governments are more constrained in interest rate policy.

3.2 The greater certainty of cost inflation

A second reason why high nominal interest rates are risky is that borrowers are much more certain that inflation will affect their costs than that it will affect the prices at which they sell. Most businesses sell one product or a narrow range of products. Their costs are more diversified. This creates a serious risk that the borrower's product price, or prices, will rise, whether for market reasons or because of government controls by less than costs. Product prices must eventually rise in line with costs, as shortages occur; but in the meantime, some producers may be unable to repay their loans, and go out of business.

It seems likely therefore that if inflation is high, and nominal interest rates are raised above inflation, many businesses will regard the risk of borrowing as too high. Only larger, monopolistic businesses that can expect to pass on high borrowing costs (or to be bailed out by the government) will be willing to borrow. Smaller businesses may choose not to borrow, because it is too risky, and banks may choose not to lend to them, for the same reason.

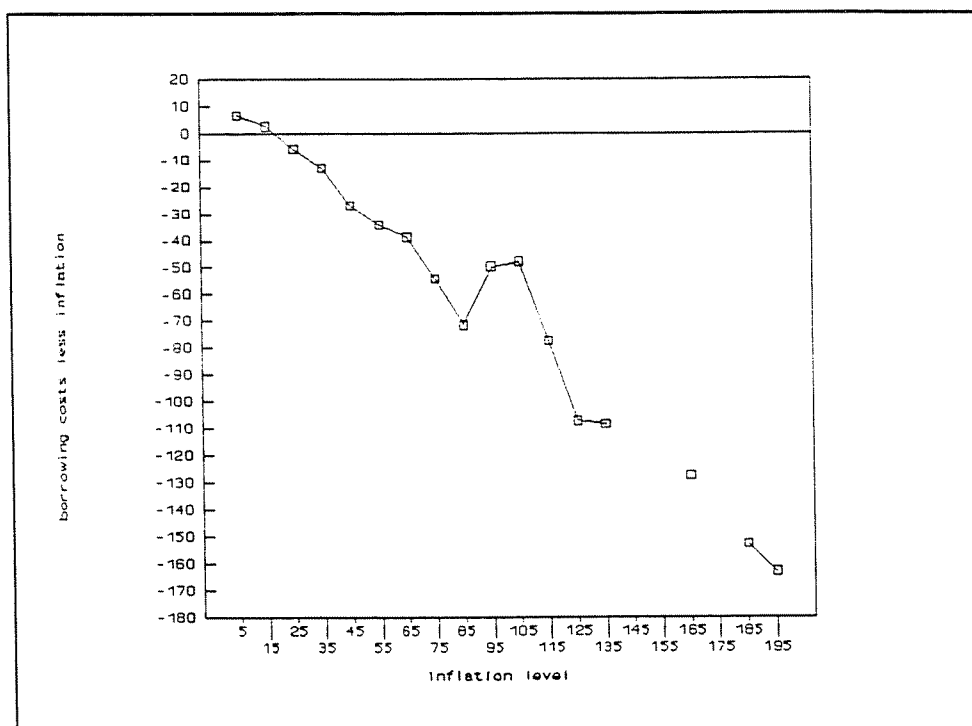
Existing debt holders may strongly oppose government initiatives to raise interest rates. Borrowers not in a position to reduce their outstanding debt are exposed to a potential interest rate shock if the difference between the rates of interest and inflation suddenly becomes positive.

Governments are also unwilling to increase nominal interest rates because it increases the cost of servicing government debt. However, governments resist raising interest rates even where this is not a factor. In the extreme case of Botswana, where there is no domestic government debt at all, proposals to raise nominal interest rates are also strongly resisted.

The unwillingness of governments to increase nominal interest rates by enough to make real interest rates positive increases the higher is inflation. Data for the same group of African countries covered in Table 3 are shown in Figure 6; they strongly support this point. Using annual data, all instances of inflation within ten percentage point ranges, on the one hand, were compared with the average difference between lending rates and

inflation, on the other hand. The graph shows that the higher was inflation, the more did inflation exceed interest rates.⁷

Figure 6
*Borrowing costs less inflation at different inflation levels
in 17 anglophone African countries (1980-91)*



Source: as Table 3

One implication of the greater risk which attaches to high nominal interest rates is that it may not be necessary to raise tax-adjusted rates above the rate of inflation in order to achieve policy objectives. In many standby agreements, the main aim of interest rate policy is to restrain the demand for domestic credit. If an absolutely high nominal rate

⁷ Figure 6 plots, for example, the 19 occurrences (6 in Tanzania, 4 in Ghana, 3 in Somalia and one in the Gambia, Malawi, Nigeria, Sierra Leone, Uganda and Zambia) of years in which annual rates of inflation were between 30 per cent and 40 per cent (shown as 35 on the horizontal axis) against the average of inflation-adjusted interest rates in those years (minus 14.5 per cent) on the vertical axis. The graph only takes account of inflation. Allowing for interest costs being tax-deductible would have made the graph slope downwards more steeply.

renders borrowing unattractive by making it more risky, this objective may be attained without raising the interest rate above inflation.⁸

3.3 Real deposit rates

Some of the arguments above also apply to the real rate of interest on deposits, especially long term deposits. It is not reasonable to expect depositors to agree to place their money for long periods in banks, or in government bonds, when the rate of inflation is high and variable. The apparent attraction of a positive real rate of interest can quickly be wiped out by a rise in the rate of inflation, or by a fall in the nominal rate of interest where the rate is not fixed. This would explain capital flight, and failures to induce flight capital to return, even when nominal deposit rates are positive. Nominal, and therefore real, rates of interest on deposits are lower than the cost of borrowing, so that it is not surprising that there has been large scale capital flight, from countries with negative real rates of interest, and from countries with high rates of inflation where the risk of negative real rates of interest is very great.

In most countries there are some forms of savings for which interest receipts are tax free. The intention is to encourage savings, especially where they are lent to the government, and to simplify tax administration by not taxing at source interest payable to those with low incomes who are not liable to tax. The result however, is to attract savings from those with high marginal tax rates, so that the effective cost of government borrowing is sharply raised by the loss of tax revenue.

4. Conclusions

It is argued in this paper that positive real interest rates (tax adjusted) are rarely achieved in countries with middle and high levels of inflation, and therefore in most countries with IMF and World Bank structural adjustment programmes. This point is almost always

⁸ This implication for policy was pointed out by Adrian Wood.

ignored: monetary authorities and economic analysts present real interest rates as being positive if nominal rates are above the rate of inflation, without reference to taxation.⁹

Firstly, nominal interest rates higher than inflation do not necessarily generate a positive real cost of borrowing or return to lending, because of tax rules. At high rates of inflation, nominal interest rates would need to be unacceptably high to generate positive real interest rates adjusted for tax, certainly much higher than was the case in Africa in the 1980s.

Secondly, even though tax rules reduce their impact, high nominal interest rates are very risky for borrowers. Adverse changes in inflation and nominal interest rates can impose a real interest rate shock. High inflation is associated with greater fluctuations in both inflation and interest rates, so that the risk of an interest shock is increased. This may explain in part why nominal interest rates higher than inflation are often recommended, but not fully implemented.

These arguments strengthen the case for reducing inflation rather than raising nominal interest rates as a way of achieving positive real interest rates. Lower inflation would also reduce the distortion by which non-taxpaying borrowers pay higher real borrowing costs than tax-payers. Unfortunately, it is simpler, and much quicker, to raise interest rates than to reduce inflation.

Governments often raise interest rates in order to reduce inflation. The problem is not only that positive rates, adjusted for tax, are only achieved in practice if inflation is already low, as is shown in this paper, but also that high nominal rates of interest impose high risks on borrowers. Moreover, it takes time to curb inflationary expectations. Consequently, high nominal rates must be persisted with for a long period, with their attendant costs.

An additional policy option is to change the tax rules so that interest costs are not tax deductible. This would greatly increase the incidence of positive real borrowing costs,

⁹ For example, a recent IMF paper about real interest rates under financial liberalisation makes no reference to the effect of tax on real interest rates [Galbis, 1993]. Innumerable central bank reports also omit this point. An exception is Dailami and Walton [1989]; mention is also made in Leite and Sundararajan [1991], but the point is not developed in the discussion.

and make them the same for borrowers paying the same nominal interest rate. It would have the additional advantage of treating loan and equity finance equally.¹⁰

Unfortunately, the arguments presented here do not make it possible to say whether the harm done by high nominal interest rates is greater or less than the harm done by negative real rates. They merely establish that high nominal rates have real costs, making it uncertain whether nominal interest rates should be raised while inflation is high, and urgent to reduce inflation as soon as possible.

Meanwhile, either real borrowing costs remain negative, or nominal costs are damagingly high, or, in some cases, both.

¹⁰ If interest were not tax-deductible, firms would pay more tax. Such a change should be phased in gradually, or offset by a lower corporate tax rate. The revenue gain would be reduced if the return to financial savings were to be made tax exempt. The net budget impact would vary by country.

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