

Factors Affecting Pricing of Loanable Funds by Commercial Banks in Kenya

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Abstract

Pricing of loanable funds without a proper rationale or framework leads to uncertainty and unpredictability on the incidence of the next or expected interest rate. The uncertainty and unpredictability lead to high interest rates to cover for any eventual loss. High interest rates may lead to high cost of capital, low investment, reduction in aggregate supply of goods and services and a vicious circle that reduces economic growth. It also reduces credit availability and increase the risk of speculation and adverse selection. These problems result in lower standard of living due to reduced disposable income. The specific objectives of the study were: to examine how changes in wealth influence pricing of loanable funds by commercial banks in Kenya. Secondly, to examine how expected return on bonds relative to alternative assets influence pricing of loanable funds by commercial banks in Kenya. Third, to examine how liquidity of bonds relative to alternative assets influence pricing of loanable funds by commercial banks in Kenya. Fourth, was to examine how risk of bonds relative to alternative assets influence pricing of loanable funds by commercial banks in Kenya. Fifth was to examine how government short-term borrowings influence pricing of loanable funds by commercial banks in Kenya. And lastly, was to examine how changes in expected inflation influence pricing of loanable funds by commercial banks in Kenya. A descriptive cross sectional survey research design was used to collect qualitative and quantitative data. A census of forty three commercial banks in Kenya that were in operation by 2006, was carried out to gather information on the issues in the sector pertaining to setting lending rates on loanable funds. Primary data was collected using a questionnaire, administered through interview schedules to commercial banks and to the central bank. Data collected was analysed by use of multiple regression. Applying the loanable funds model, changes in wealth, expected inflation and government borrowing were found to be significant predictors of lending rates. Liquidity of bonds relative to alternative assets (treasury bills), risk of bonds to alternative assets and expected return of bonds to alternative assets were not significant predictors of lending rates. The study recommends; that to improve changes in wealth (demand and supply for bonds market); the government should review laws and regulations applicable to collective investment vehicles for people to increase participation in bonds as viable investment assets. The government should develop automated trading systems to encourage access by onshore and offshore investors. And the government should promote a common infrastructure (settlement system, central securities depository, trading systems). For government short-term borrowing, the Central Bank of Kenya should ensure there is a proper debt restructuring strategy together with ample liquidity in the system. The government through the Central Bank of Kenya should ensure wider dissemination of the information on inflation to the public through various channels of communication available.

Background to the Study

1.1. Pricing Practices of Loanable Funds

According to Ngugi (2004), banks and other financial intermediaries facilitate the mobilization of savings, diversification and pooling of risks, and allocation of resources (loaning to the public). The loans are issued at a price to the public. The price of a loan can be equated to the cost of current consumption and investment above and beyond current income. It can also be said to be the nominal interest rate, which should be jointly determined by both the desirability and availability of loan-able funds (Mishkin, 2004). Banks may price loan-able funds based on three approaches: a collection of other pricing practices (Avlonitis and Indounas, 2001); loan-able funds model; and liquidity preference model (Mishkin, 2004). Under a collection of pricing practices approach of the three above, banks might use pricing strategies, collusion, price competition, non-price competition and price games. With the uncertainty, firms prefer pricing strategies and collusion to the riskier and uncertain option of price wars or be exposed to the harsh reality of price competition. Also firms resort to price games and price competition only when they are not in a position to fully utilize pricing strategies and collusion as weapons of choice (Avlonitis and Indounas, 2001).

In an industry with several interdependent players, a lot of uncertainty existed in product pricing especially during the era of financial liberalization in the early nineties. Market players were to come up with prices without a clear basis or policy direction. The case for financial liberalization, from McKinnon (1973), Shaw (1973) and Fry (1997) studies, enjoyed enormous policy support from the Bretton woods institutions. The rapid financial liberalization was taunted as a promise for enhanced levels of financial savings and investments, improvement in resource allocation through the market mechanism and overall benefits of productive investments. Later financial liberalization was to be associated with several issues that emerged. First was the substitution of financial taxation with rising public debt especially domestic. Secondly, coupled with financial flows and the exchange rate, was the onset of government as a major player in debt-financed budgets in what was dubbed Domestic Debt Strategy (DDS), despite un-accompanying strengthening of supervision and regulation of Commercial Banks (CBs) that held 60 percent of the total stock of treasury bills (TB's) (CBK, 2000). Third, inefficiency and uncompetitiveness of the banking system, high operating costs, CBs not equipped for credit and risk analysis coupled with a poor asset structure from farming to real estate resulted in a sharp increase in Non-Performing Loans (NPLs) as shown in table 20 appendix VII. The fourth issue was a resultant distress in the banking sector after financial liberalization due to nonperforming assets (NPAs). This was further undermined by a logjam in judicial system versus the financial system. Lastly, high implicit tax on bank deposits due to high cash-ratio requirements of the Central Bank of Kenya (CBK), without compensation, in what was termed as monetary instruments to mop up excess liquidity and increased inflation rates saw the government issue Kshs 80 billion of TBs and other securities in 1993, alone compared with the average Kshs 20 billion over the previous five year period 1988-1992 (CBK, 2007). The role this played in precipitating the 1993/4 banking difficulties pointed to the direction that CBK did not have the foresight and/or the authority to regulate the financial sector alongside government spending during liberalization (Wagacha, 2001).

Furthermore, a lax fiscal policy after liberalization, led to a rapid build-up of short-term government debt which, coupled with declining saving rate led to lending rates in excess of twenty percent in real terms (Wagacha, 2001). The continuous fall in current savings and investment, illustrated a preference for current consumption as the interest rate unpredictably fluctuated each year, as observed by Wagacha (2001). The fluctuations, in cases of an expected rise in interest rates will make saving more attractive and reduce borrowing. This will tend to reduce current spending by both consumers and firms on investment. Conversely, an expected fall in interest rates will tend to increase borrowing and spending by consumers and firms.

Fluctuations in interest rates affect the value of certain assets, such as houses and share prices. Expected higher interest rates increase the expected return on savings in banks and building societies. This might encourage savers to invest less of their money in alternatives, such as property and company shares. Any fall in demand for these assets is likely to reduce their prices. This reduces the wealth of individuals holding these assets, which, in turn, might influence their willingness to spend. Lower expected interest rates will tend to increase asset prices (Arestis and Demetriades, 1999).

Additionally the effects of rapid fluctuations in interest rates also cause uncertainty in the user cost of capital, which reduces investment leading to reduced employment, inventories and output.

Aggregate demand might also decrease due to low factor incomes as a result of expected rise in interest rates. The effect of volatile fluctuations in interest rates destroys economic prospects and impacts negatively on growth. In the long run, loss of investor confidence in the financial system, uncertainty in debtors' net worth towards future commitments creates a gambling-like environment, in turn increasing chances of adverse selection in loan allocations (Wagacha, 2001). It may also provoke portfolio reallocation, bankruptcies and increase the amounts of nonperforming loans.

The major components of pricing strategy are pricing objectives and pricing methods. Empirical studies conducted on pricing objectives in the services sector show that quantitative objectives tend to be regarded as more important to organizations than qualitative ones with a particular emphasis placed on profit considerations (Avlonitis and Indounas, 2001). Quantitative objectives include the firm's profits, sales, market share and cost coverage. On the other hand, the qualitative ones include the relationship with customers, competitors, distributors, and the long-term survival of the firm and the achievement of social goals.

Interdependence between firms may further lead to implicit and explicit collusion between firms in the market. Although direct agreements among oligopolists are obvious examples of collusion, organizations like Kenya Institute of Bankers (KIB), and the Banks Clearance Houses, which despite performing many activities achieve the goals of direct collusive agreements. The means of achieving such agreement range from informal agreement, tacit agreement, pooling of information, to formal arrangements with cartel organizations where sanctions are imposed on defectors (Koutsoyannis, 1991). When oligopolists collude, their main aim is to maximize joint profits (Fellner, 1947). Collusion may be achieved through several joint patterns, which include: price, output, transactions terms of agreement, coordinating policies regarding the products, purchasing of the factors of production and agreement not to compete at all and share market. In an oligopoly, collusion and pricing strategies act as strategic behaviour for a firm. In the absence of collusion and pricing strategies, oligopolies will resort to the last option of price wars as strategic behaviour due to the difficulty of modeling price decisions (Avlonitis and Indounas, 2001).

The second approach is the use of loanable funds model/framework. This framework uses the bond market to determine and explain the behaviour of interest rates. The third approach is the use of liquidity preference model/framework. Keynes (1936) constructed a demand theory of money based on an understanding of the behaviour of economic agents. This was a theory of allocation of money indicating how agents perceive the demand for money.

1.2. The Banking Sector in Kenya

The history of banking in Kenya dates back to 1896 when the National Bank of India opened a branch in Kenya. The Banking Sector is composed of the CBK, as the regulatory authority and the regulated; CBs, Non-Bank Financial Institutions and Forex Bureaus. CBs and mortgage finance companies are licensed and regulated under the Banking Act, Cap 488 and Prudential Regulations issued there under. Foreign Exchange Bureaus are licensed and regulated under the Central Bank of Kenya Act, Cap 491 and Foreign Exchange Bureaus Guidelines issued there under. In 1992, there were 15 CBs operating in Kenya. This number increased to 43 by 2006, the last year the study covered. However, only five banks were controlling 57.11 percent of the loans market, leaving 38 CB to control the rest by 2006 (See appendix IV). Earlier in 1998, several CBs collapsed, including Trust Bank, Reliance Bank, Prudential Bank, Bullion Bank; and the National Bank of Kenya almost folded due banking sector fragility, poor management and worsening economic conditions (Wagacha 2001). The Kenyan commercial banking sector was also composed of, five banks registered abroad, eight foreign owned but locally incorporated banks, seven CBs with Government participation and thirty six banks locally owned by the end of 2001 (CBK, 2007).

CBs offer several services to the public including, opening saving and current account, allowing deposits from customers, foreign exchange transactions and giving loans to the public. They in-turn charge a fee for allowing deposits and opening accounts and charge interest in the case of loans. Also, banks are of major importance for the financing of firms and households. The extent to which banks adjust their lending and the pricing of loans in response to monetary policy actions can be an influential channel through which monetary policy shapes the economy. The role of banks in the monetary policy transmission process can work through various channels.

First, banks behaviour affects the degree and speed with which policy rates can be passed on to households and firms. Berger and Udell, (1992) argued that banks tend to adjust only sluggishly, their lending rates in response to changes in monetary policy rates. Mojon, (2001) added that the stickiness of bank rates had been found to rely on financial structures and competition within the banking sector as well as on competition from market-based sources.

Among second principal objective of the CBK is to foster the liquidity, solvency and proper functioning of a stable market-based financial system as spelt out in Section 4 (2) of the CBK Act. Bank Supervision Department (BSD) is mandated to promote and maintain the safety, soundness and integrity of the banking system. In addition, section 33B of the Act specifies the legal basis for licensing of foreign exchange bureaus. The Banking Act, which provides the legislative framework for regulating banking business, empowers the CBK to issue guidelines to be followed by institutions in order to maintain a stable and efficient financial system (CBK, 2005).

1.3. Statement of the Problem

Before financial liberalization, Commercial Banks adopted interest rates issued by the regulator (Central Bank of Kenya). Many of the economies relied on the government as a source of discipline for economic agents (Bandiera *et al*, 1999). With the advent of financial liberalization in the early 1990's, CBs were faced with the challenge of setting the rates. As Bandiera *et al* (1999) noted, the wave of liberalization in many developing countries in the 1980s was characterized by more attention given to market forces in allocating credit through freely determined interest rates.

In Kenya, the wave of financial liberalization led to a problem of unpredictability and uncertainty on the incidence of the future rate of interest to be charged on loans by players in the sector. Volatile fluctuations in interest rates and unpredictability on the incidence of the next rate of interest, lead to unpredictability in various macro-economic variables like investment, savings, output, employment, aggregate demand and consumption in the economy. Uncertainty surrounding future incidence of the interest rate and profitability following the rapid financial liberalization initiatives led to volatile fluctuations in interest rates, high (to protect against losses), irregular, inconsistent and un-predictive rates for interest on loanable funds. It also became difficult to predict the rate of interest that will be charged, when making borrowing decisions. Volatility in interest rates can affect the economic variables in several ways as stated in the background of the study. The problem was further complicated by lack of a market standard or benchmark like treasury bill rates on which to peg the lending rates and non-existence of the regulators guidelines or controls on setting the lending interest rates, yet interest was the leading source of income for CBs. Additionally, government emergence as a borrower at 21 percent risk default free rate complicated the whole problem (Kimura, 1997). The problem of unpredictability was further aggravated by a policy of substitution of financial taxation with public debt (Wagacha, 2001). Inefficiency of banking institutions in terms of weak regulations, supervision and enforcement of contracts was also apparent with five banks being placed under statutory management by the CBK by the year 1998 (Ndung'u and Ngugi, 2000). Ndung'u, (1997) also observed the possibility of existence of uncompetitive market structure composed of 57 percent market share controlled by the five players behaving in an oligopolistic structure.

While the remaining 43 percent market share was controlled by 38 banks exhibiting atomistic market features. Hence, overall there was no competition since these two segments were independent. Finally, there was a distress in the banking sector and accompanying high implicit taxes resulting from high cash ratio requirements of the CBK without compensation (Wagacha, 200). Moreover, owing to information asymmetries and principal-agent problems between banks and their borrowers, a poor monetary policy or lack of it, may impact on the supply of loans. For example, if following a monetary policy tightening, certain banks face balance sheet constraints, such as lower liquidity or capital holdings, and then CBs may choose to restrain lending. CBs credit has also been shown to be related to the boom and bust of economic cycles, for example as evidenced by the correlation between credit cycles and assets cycles (Borio and Lowe, 2004). Despite studies of unsuccessful implementation of a policy of market determined interest rates in most emerging economies without supporting policy framework (Arestis and Demetriades, 1999), the government adopted rapid financial liberalization, without creating a rational and objective target and proper policy tools to back-up the financial liberalization process as seen from the resultant associated problems (Wagacha, 2001).

Few studies have been done in Kenya on interest rates, like Ndung'u and Ngugi (2000) on interest rate spread, and none has been done on pricing of loanable funds, especially factors that determine pricing or setting of lending rates. Therefore, this study comes in handy to provide knowledge on pricing of loanable funds, by unearthing the determinants of pricing of loanable funds. Furthermore, the distinctive characteristics of loan services (intangibility, heterogeneity, perishability and inseparability) necessitate a closer look at the way at which the loan services are priced (Schlüssel and Chasin, 1991 and Kurtz and Clow, 1998).

1.4. Objectives of the Study

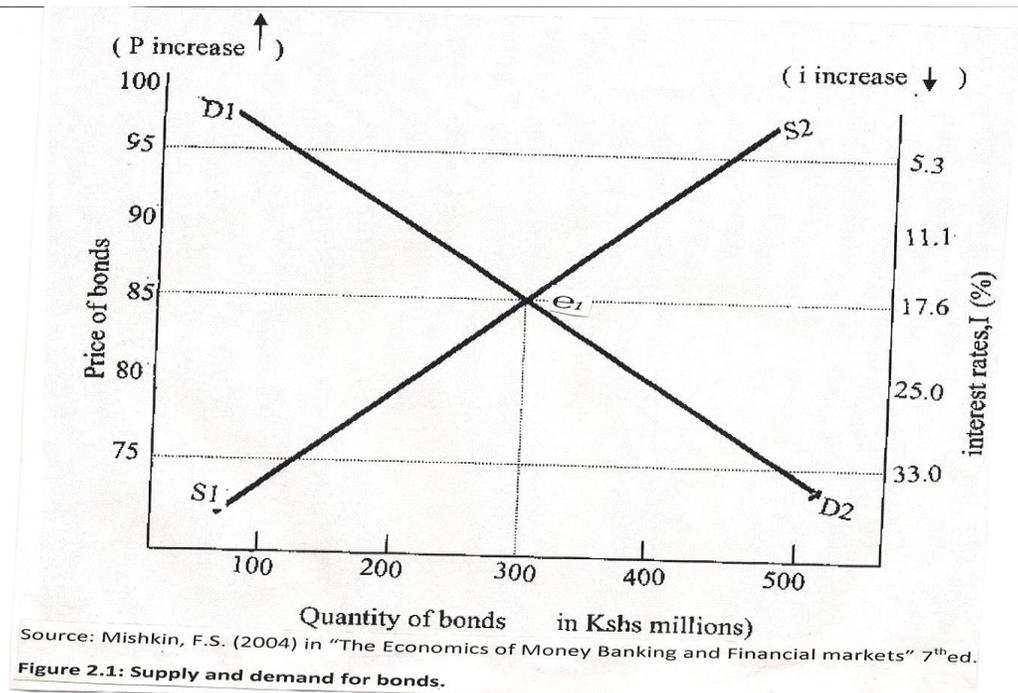
The general objective of the study was to find out the factors that affect pricing of loanable funds by commercial banks in Kenya. Specifically the study sought to:

- i. Determine how changes in wealth influence pricing of loanable funds by commercial banks in Kenya.
- ii. Establish how expected return on bonds relative to alternative assets influence pricing of loanable funds by commercial banks in Kenya.

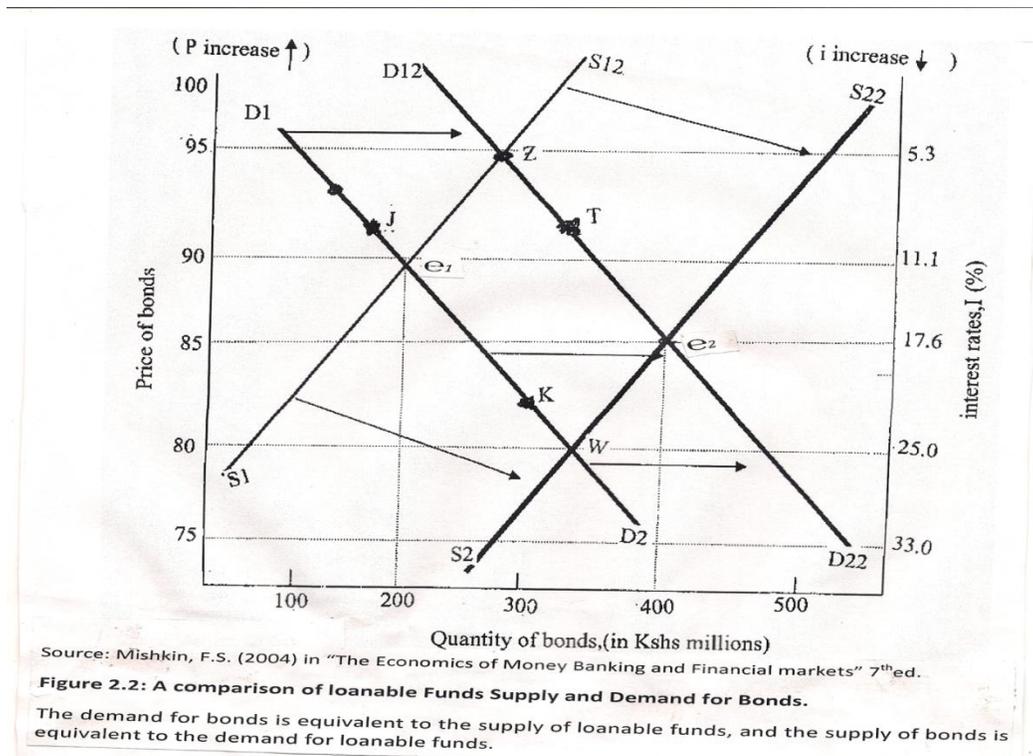
Literature Review

2.1. Loanable Funds Model

The market demand curve for bonds represents the willingness to borrow, and the market supply curve for bonds represents the willingness to lend or save. CB's are the suppliers of credit since they are the ultimate source of loanable funds. The demanders of credit are households, firms and governments. The quantity borrowed is inversely related to the interest rate, and the quantity lent is directly related to the interest rate. Hence, a negatively sloped market demand curve and a positively sloped market supply curve (Mishkin, 2004). The loanable funds model determines interest rates based on the supply and demand in the bonds market. According to Mishkin (2004), initial interest rates are determined at the market equilibrium, a point of intersection of the supply (S1S2) and demand curve (D1D2) for bonds, represented by point *e1* in figure 2.1.



The market equilibrium is a unique point of interest rate that clears the market, where quantity lent equals quantity borrowed. The market outcome in supply and demand intersection, assumes that interest rates are free to adjust with no government interference (Mishkin, 2004). Subsequent interest rates are then based on the next point of intersection, after a shift in either the demand curve or supply curve as opposed to a movement along the curves, in the bonds market. A movement along the demand curve and supply curve is caused by changes in price for bonds, shown by points *J* to *e1*, to *K* in figure 2.2 on the same demand curve (D1D2).



A shift in the demand and supply curve is caused by several factors, other than price of the bond. The factors include, changes in wealth, expected return on bonds relative to alternative assets like shares and TBs, liquidity of bonds relative to alternative assets, risk of bonds relative to alternative assets, tax rules on capital gains, dividend and interest income, future expected taxes on households and expected inflation (Mishkin, 2004).

In a business cycle expansion with growing wealth, increased liquidity for bonds relative to alternative assets and future expected taxes on households' current consumption, lead to an increase in demand for bonds, hence a shift of the demand curve to the right, from demand curve D1D2 to D12D22, as shown in figure 2.2. This shift is shown by a change from points J and T respectively. On the other hand, an expected increase in returns for bonds relative to alternative assets -shares, expected increased risk of bonds relative to alternative assets, an increase in current tax rules on capital gains, dividend and interest income and expected increase in inflation causes the demand for bonds to fall, and shift of the demand curve to the left, a change from T to J.

Several factors affect a shift in the supply curve; hence affect interest rates determination (Mishkin, 2004). They include, returns on alternative assets to bonds, expected profitability of the investment opportunities, government tax policy for home owners and businesses, government borrowing, expected inflation, time preference for current consumption as opposed to saving and/or investment and expected future income from bonds. From figure 2.2 with the initial demand curve (D1D2) and supply curve (S1S12), an increase in demand for wealth due to confidence in an expanding economy, increased liquidity for bonds relative to alternative assets; and reduction in future expected taxes on households' current consumption, will lead to an increase in demand for bonds, hence a shift in the demand curve only, from D1D2 to D12 D22 with the supply curve , S1S12, unchanged, *ceteris paribus*-price, leading to a change in equilibrium from point e1 to Z. The shift will lead to reduction in interest rates from 11.1 to 5.3 percent.

Similarly from figure 2.2 with the initial supply curve (S1S12) and demand curve (D1D2), an increase in supply for bonds due to expected reduced returns on alternative assets to bonds, expected reduced profitability of investment opportunities, expected increase in government taxes for home owners and business, increased government borrowing, expected increase in inflation, increased time preference for current consumption as opposed to saving and/or investment and reduced expected future income from bonds; leads to an increase in supply for bonds. This will lead to a shift in the supply curve only, from S1S12 to S2S22 with the demand curve, D1D2, remaining unchanged. With other factors held constant, the shift will lead to a change in the equilibrium from point e1 to W. Hence, an increase in interest rates from 11.1 to 25.0 percent.

In a case where there is a shift in both demand and supply for bonds, as shown in figure 2.2 the demand curve will shift from D1D2 to D1D22. Then the supply curve will shift from S1S12 to S2S22. This will move equilibrium rates from point e1 to e2. This leads to an increase in interest rates from 11.1 to 17.6. The results from any shifts in supply and/or demand curve in figure 2.2 prove that monetary authorities can influence the market outcome by either influencing a shift in either demand curve, supply curve or both depending on the desired policy target.

2.2. Liquidity Preference Model

Keynes (1936) believed there were three motives to holding money; transactions motive, precautionary motive, and speculative motive. Under the speculative motive, money demand was negatively related to the interest rate. Holding money was one way of guarding against uncertainty. Hence Liquidity preference framework determines the equilibrium interest rate in terms of supply and demand for money. The model was developed by Keynes (1936) based on several assumptions. First, money pays no interest. Second, that there were only two kinds of assets for storing wealth: money and bonds. This means that, total wealth in the economy is equal to the total quantity of bonds plus money in the economy, which is equivalent to the quantity of bonds supplied plus the quantity of money supplied. The quantity of bonds and money that people demand, is also equal to the total amount of wealth, equivalent to what the available resources can allow.

So

$$\left\{ \begin{array}{l} \text{Bond supply (SB)} \\ + \\ \text{Money supply (SM)} \end{array} \right\} = \left\{ \begin{array}{l} \text{Bond demand (DB)} \\ + \\ \text{Money demand (DM)} \end{array} \right\} \dots\dots\dots(1)$$

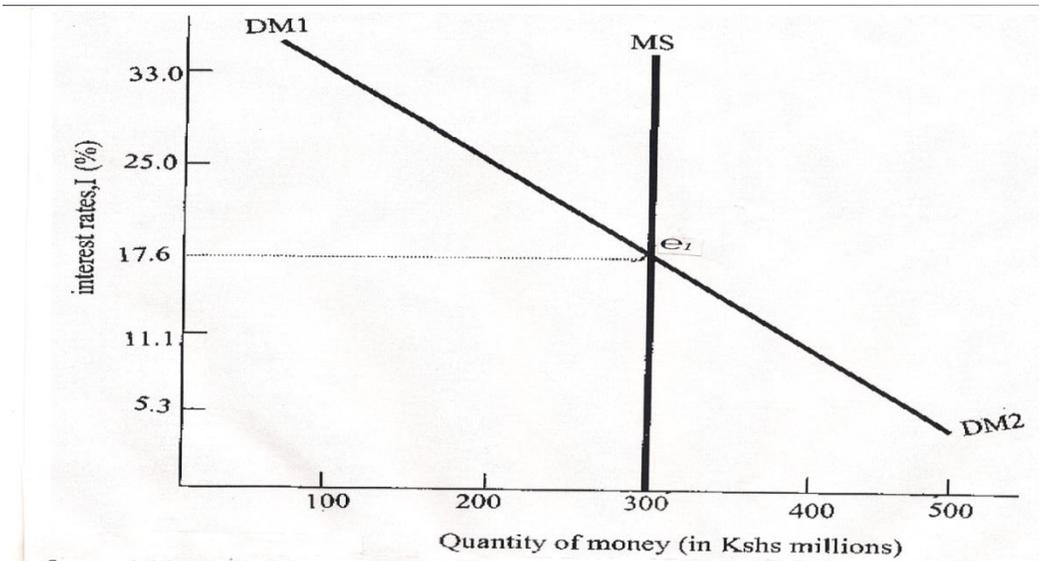
Summing up equation 1, leads to;

$$SB + SM = DB + DM \dots\dots\dots(2)$$

Collecting like terms together will lead to;

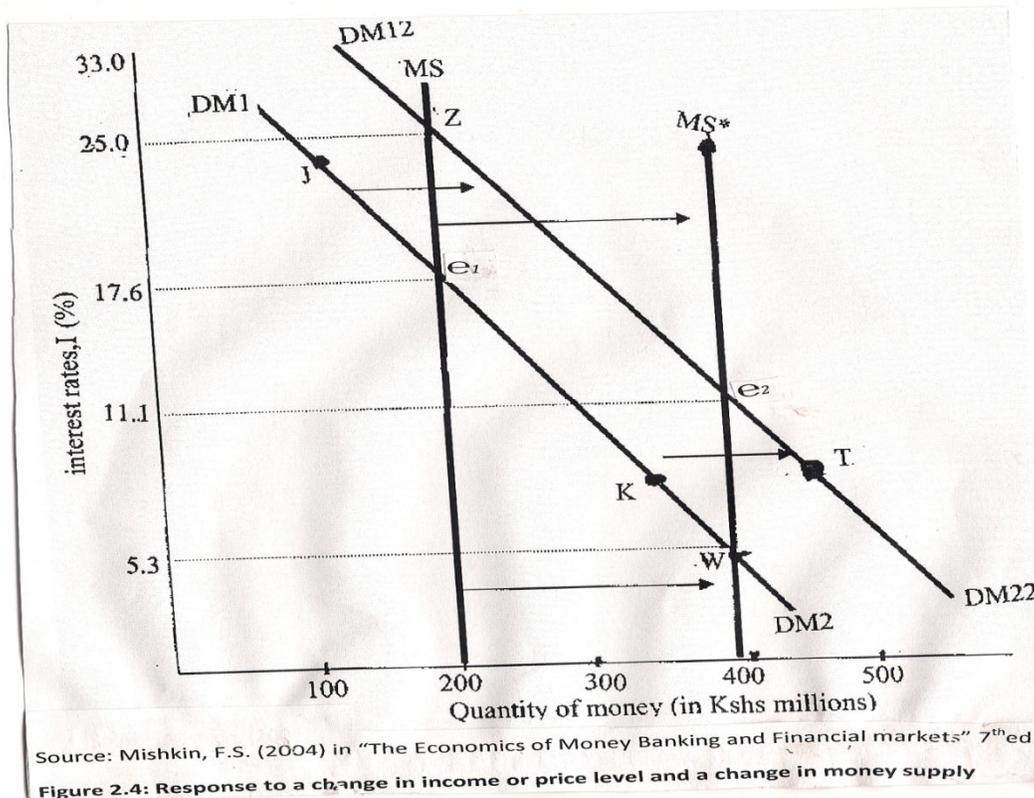
$$SB - DB = DM - SM \dots\dots\dots(3)$$

Rewriting equation 3 and equating to zero implies that, when money market is in equilibrium (SM =DM) then the bond market (SB= DB) will also be in equilibrium. According to this model, interest rates are determined at the market equilibrium (Mishkin, 2004), a point of intersection between the demand and supply for money, as shown in figure 2.3 at point e1. Using figure 2.3, the intersection of the demand curve, DM1DM2, and supply curve, MS, is at point e1, resulting in an equilibrium interest rate of 17.6 percent.



Source: Mishkin, F.S. (2004) in "The Economics of Money Banking and Financial markets" 7thed.
Figure 2.3: Equilibrium in the market for money.

For instance, from figure 2.4 a movement along demand curve caused by a change in income and price level will lead to a change from point J to K along demand curve, DM1DM2, while a shift will lead to a change from point K to T on a different demand curve, DM12DM22.



A shift in the demand curve DM1DM2 to DM12DM22 while leaving money supply, MS, unchanged moves the equilibrium point from e_1 to Z, thus an increase in interest rates from 17.6 to 25 percent. A shift in the demand curve can be caused by the income effect, price level effect and the fisher effect (Mishkin, 2004). A change in the money supply by the central bank, shifts the supply curve from MS to MS* without a corresponding shift in the demand curve, DM1DM2, leading to a change in equilibrium from point e_1 to W. This translates into a fall of interest rates from 17.6 to 5.3 percent.

Study Methodology

3.1. Empirical Model

The relationship between pricing of loanable funds or lending interest rates and its determinants can be represented as follows

$$r = f(W_0, R_{te}, L_b, R_{rb}, G_{t0}, e)$$

- Where
- r Price of loanable funds or lending interest rate
 - W_0 Changes in wealth
 - R_{te} Expected return on bonds relative to alternative assets (TBs)
 - L_b Liquidity of bonds relative to alternative assets
 - R_{rb} Risk of bonds relative to alternative assets
 - G_{t0} Government short term borrowing
 - e Changes in expected inflation

3.2. Working Hypotheses

- i. Demand for bonds is inversely related to the rate of lending interest rates, while supply of bonds has a direct relationship with the rate of lending interest rates.
- ii. Liquidity of bonds has an inverse relationship with the rate of lending interest rates.

- iii. Rate of expected return on bonds relative to alternative assets has an inverse relationship with the rate of lending interest rates.
- iv. The amount of government short-term borrowing has a direct relationship with the rate of lending interest rates.
- v. Rate of expected inflation has a direct relationship with the rate of lending interest rates.
- vi. Rate of expected risk of bonds relative to alternative assets has a direct relationship with the rate of lending interest rates.

3.3. Definition and Measurement of Variables

Lending interest rate (**r**): Price of loanable funds measured in percent rate.

Changes in Wealth (**W₀**): The amount of bonds demanded or supplied and measured in billions.

Expected return on bonds relative to alternative assets (**R_{te}**); Net yield of treasury bonds (less 10percent withholding tax for bonds whose maturity had more than 10 years) divided by net yield of treasury bills (less 15 percent withholding tax) . CBK only deals with withholding tax at primary issue, which is 15% for bonds with less than 10 years and 10% for bonds of more than \10 years maturity.

Table 4.1; Pearson Correlations and Sig. (2-tailed)

		W ₀	R _{te}	R _{rb}	G _{to}	L _b	e	r
Changes in wealth	Pearson Correlation	1						
	Sig. (2-tailed)							
	N (Population)	124						
Expected return on bonds relative to alternative assets	Pearson Correlation	-.016	1					
	Sig. (2-tailed)	.862						
	N (Population)	124	124					
Risk of bonds relative to alternative assets	Pearson Correlation	.311**	.256**	1				
	Sig. (2-tailed)	.000	.004					
	N (Population)	124	124	124				
Government short-term borrowing	Pearson Correlation	-.326**	-.001	-.191*	1			
	Sig. (2-tailed)	.000	.990	.034				
	N (Population)	124	124	124	124			
Liquidity of bonds relative to alternative assets	Pearson Correlation	.181*	.352**	.761**	-.036	1		
	Sig. (2-tailed)	.044	.000	.000	.691			
	N (Population)	124	124	124	124	124		
Expected inflation	Pearson Correlation	.163	.130	.265**	-.249**	.287**	1	
	Sig. (2-tailed)	.070	.151	.003	.005	.001		
	N (Population)	124	124	124	124	124	124	
Pricing of loanable funds	Pearson Correlation	-.458**	-.059	-.137	.799**	-.045	.010	1
	Sig. (2-tailed)	.000	.513	.129	.000	.617	.913	
	N (Population)	124	124	124	124	124	124	124

Liquidity of bonds relative to alternative assets (**L_b**); Number of days to maturity of treasury bonds divided by number of days to maturity of treasury bills. All bonds whose maturity was in years were converted using 365 days as the average due to the presence of 364 day bills (although not used in the study).Risk of bonds relative to alternative assets (**R_{rb}**): Risk of bonds can be calculated by convexity, Modified duration and Macaulay (1938) duration.

The study will compute risk of bonds using modified duration formulae. Government Short-term borrowing (G_{to}); short term borrowing in terms of; 91 and 182 days treasury bills the two tenures were offered jointly on weekly basis. Prior to 2001, Treasury bills market was mainly for 91 days.

High rates then discouraged many investors investing in long term maturity, hence no performance in 182 days. Expected inflation (e); Expected inflation and changes thereof are normally published by CBK every year.

3.4. Population Profile

These banks were drawn into leaders and followers based on total net assets and market share as unit of analysis. The leaders were designated to be Barclays Bank of Kenya (BBK), Kenya Commercial Bank (KCB), Standard Chartered Bank (SCB); Co-operative bank and NBK; since they had total assets valued well over 32.5 billion and had over 5.3 percent control of the market share.

4.1 Data Analysis (Correlation analysis)

The probability associated with the correlation coefficient between "pricing of loanable funds " and "changes in wealth, expected return on bonds relative to alternative assets, liquidity of bonds relative to alternative assets, risk of bonds relative to alternative assets, government short-term borrowing and expected inflation" (<0.001) is less than or equal to the level of significance. The assumption of linearity is supported as shown in table 4.1.

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Second assumption is normality. That the errors should be normally distributed - technically normality is necessary only for the t-tests to be valid, estimation of the coefficients only requires that the errors be identically and independently distributed. Normality means that the distribution of the test is normally distributed with 0 mean, with 1 standard deviation and a symmetric bell shaped curve.

4.2. Regression Results and Hypotheses Testing

The relationship between pricing of loanable funds or lending interest rate and its determinants after multiple regression can be represented as shown in the model summary in table 4.5.

Table 4.5: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.868 ^a	.754	.741	1.29132	.754	59.740	6	117	.000	.371

a. Predictors: (Constant), Liquidity of bonds relative to alternative assets, Government short-term borrowing, Expected return on bonds relative to alternative assets, Expected inflation, Changes in wealth, Risk of bonds relative to alternative assets

b. Dependent Variable: Lending interest rate

The regression results above in table 4.5, shows adjusted R^2 , F-change and the corresponding significance level, and the Durbin-Watson statistic; reporting the strength of the relationship between the model and the dependent variable. A significant overall model emerged ($F_{6,117}=59.740, p < 0.0000$. Adjusted R squared = .741). As per the results above in Table 4.5. with an Adjusted R squared statistic of .741 this indicates 74.10 percent chance of a strong linear relationship between Lending interest rate (r) with changes in wealth (W_o), Expected return on bonds relative to alternative assets (R_{te}), Liquidity of bonds relative to alternative assets (L_b), Risk of bonds relative to alternative assets (R_{tb}), government borrowing (G_{to}) and expected inflation (e). For meaningful comparison between two models use of adjusted R Squared or an F-test can be performed on the residual sum of squares. In this particular case according to Everitt (2002), the adjusted R Squared will not be more useful as it takes account of phenomenal shrinkage in a sample as opposed to an entire population.

Therefore the study makes use of the F-statistic. In this study the F-static is significant according to the model in table 4.5 above .When testing hypothesis, comparison of two values of F's; that is F calculated value ,denoted as $F(cal/rat)$ and F -critical value denoted as $F\alpha$ is done.

With F-static of 59.74 which means $F(\text{cal})$ is greater than F_{α} ; the rule is to reject the null hypothesis (hypothesis of no difference) and accept the alternative hypothesis (hypothesis of difference). Also, using table 4.5 to determine or test at 5% significance level, if the model was useful for predicting the response.

With $H_0 : \beta_1 = \beta_2 = 0$ and $H_a : \text{at least one } \beta_i \neq 0$ and ($F = 59.740$), $p\text{-value} < 0.001$ the rule is to reject the null hypothesis (since $p\text{-value} < 0.001 \leq 0.05$). At the $\alpha = 0.05$ level of significance, there exists enough evidence to conclude that at least one of the predictors is useful for predicting lending rate; therefore the model is useful. As the model is considered significantly better than would be expected by chance and therefore the null hypothesis is rejected.

4.3. Factors Affecting Pricing of Loanable Funds

The linear relationship between lending interest rate with changes in wealth, expected return on bonds to relative to alternative assets, liquidity of bonds relative to alternative assets, risk of bonds relative to alternative assets, government borrowing and expected inflation can be represented with the resultant coefficients as shown in table 4.6 and 4.7 below.

Table 4.6: Coefficients

Model	Standardized Coefficients		t	Sig.	Correlations			Collinearity Statistics	
	Beta				Zero-order	Partial	Part	Tolerance	VIF
1 (Constant)	6.857		8.374	.000					
Changes in wealth	-0.263		-5.197	.000	-.458	-0.433	-0.238	0.820	1.219
Government borrowing	0.801		15.833	.000	0.799	0.826	0.726	0.822	1.216
Expected inflation	0.261		5.263	.000	0.010	0.438	0.241	0.858	1.165
Expected return on bonds relative to alternative assets	-0.090		-1.837	.069	-0.059	-0.167	-0.084	0.868	1.152
Risk of bonds relative to alternative assets	0.144		1.925	.057	-0.137	0.175	0.088	0.377	2.655
Liquidity of bonds relative to alternative assets	-0.121		-1.612	.110	-0.045	-0.147	-0.074	0.372	2.685

The results from table 4.6 above, indicate changes in wealth, government borrowing and expected inflation were statistically significant predictors of lending rate. Expected return on bonds relative to alternative assets, risk of bonds relative to alternative assets and liquidity of bonds relative to alternative assets were not statistically significant predictors of lending rate. Additionally at the 5% significance level, does it appear that any of the predictor variables can be removed from the full model as unnecessary? Significant variables from table 4.7 are shown below:

Table 4.7: Coefficients and P-values

Variable	coefficient	P-value
Changes in wealth	-0.263*	$p = 0.00047$
Government borrowing	+0.801*	$p = 0.00032$
Expected inflation	+0.261*	$p = 0.00043$
Expected return on bonds relative to alternative assets	-0.090	$p = 0.069$
Risk of bonds relative to alternative assets	+0.144	$p = 0.057$
Liquidity of bonds relative to alternative assets	-0.121	$p = 0.110$

*- means coefficient is significant at 5%.

4.4.1 Wealth

$H_0 : \beta_1 = 0$ (changes in wealth was not useful for predicting lending rate) and the alternative hypothesis is $H_a : \beta_1 \neq 0$ (changes in wealth was useful for predicting lending rate).

Assuming that expected return on bonds relative to alternative assets, liquidity of bonds relative to alternative assets, risk of bonds relative to alternative assets, government borrowing and expected inflation, included in the model and based on table 4.6 and 4.7 with $p\text{-value} < 0.001 \leq 0.05$, reject the null hypothesis. Therefore at the $\alpha = 0.05$ level of significance, there exists enough evidence to conclude that the slope of the changes in wealth variable is not zero and, hence, that changes in wealth was useful as a predictor of lending rate.

If interest rates are higher than the equilibrium where supply equals demand, there will be excess supply in the market. With high interest rates, a lot of people will be encouraged to save rather than to spend, causing the quantity of loanable funds supplied to be larger. The high interest rates also mean that borrowers pay a high cost to borrow causing borrowing and the quantity demanded to be smaller. The interest rate will fall as lenders compete by offering funds at a lower rate. Excess demand exists when interest rates are too low. A very low interest rate discourages savings (smaller quantity supplied) due to the low return that is earned. At the same time, a low interest rate tends to attract a lot of borrowing (larger quantity demanded) The interest rate will rise to equilibrium as borrowers compete for the loanable funds.

Explicit consideration of the effects of changes in the stock of wealth has proven to be significant for macroeconomic analysis. Models which fail to consider the roles of stocks of various types of wealth are suspected of being a biased basis for addressing the loanable funds model issue (Laubach 2009). Simple Keynesian models contain at most only an unsophisticated treatment of wealth. In such models changes in taxes affect disposable income. In the Keynesian framework, the effects of wealth on macroeconomic variables such as consumption, and the demand for money, have been given increasing attention with consideration given to wealth in the form of government bonds, privately issued bonds, real physical capital, and the money supply. Important sources for the treatment of wealth in Keynesian style models include Leijonhufvud (1968), Metzler (1951), Patinkin (1965), and Tobin (1961 and 1969).

From the discussion based on the most basic Keynesian framework, an increase in the government borrowing brought about by a more expansionary fiscal policy without an increase in the money supply tends to raise interest rates. The basic Keynesian framework can be elaborated by introducing government bonds into the analysis in at least two ways. In both cases the bonds are regarded as wealth and the bond effect reinforces the tendency of the higher government borrowing to raise interest rates. First, the bonds are assumed to be a form of wealth which substitutes for the wealth embodied in real capital. Under this assumption, additional government bonds issued to finance an additional deficit thus are perceived to increase wealth. The new bonds have the effect of increasing aggregate private consumption spending (reducing saving). This increase in consumption is another addition to final demand, and following the same logic as before, the increase in aggregate demand raises the demand for money and causes an increase in interest rates. This bond effect reinforces the increase in government spending or the reduction in taxes to raise demand and thereby raise interest rates.

A second way in which the increase in bonds can raise interest rates is that the bonds can affect money demand directly. The presence of additional bonds in the economy increases the ratio of bonds to money in investors' portfolios. In response, people attempt to increase their money holdings relative to their bonds by selling bonds. This drives up interest rates, and interest rates continue to rise until the bonds have become so attractive that people are willing to hold them.

The foregoing analysis shows that the typical Keynesian result of an increase in the government borrowing is a rise in interest rates. However, a special case in which the fiscal expansion does not raise rates is the case of the liquidity trap. The liquidity trap is a situation in which people believe that interest rates are so low that they cannot fall further. Indeed, in this situation, interest rates are expected to rise and the prices of assets (such as bonds) are expected to fall so low that an asset purchaser can expect to sustain a capital loss which counterbalances the interest earned on the asset. Fearing capital loss, people hold money and other very liquid assets rather than long-term assets. Thus, an increase in the demand for money for transactions purposes can be met simply by drawing down enlarged holdings of money without any rise in interest rates. Hence in this case an increase in government borrowing does not raise interest rates. The practical significance of the liquidity trap, which is believed to occur mostly in depressions, is a subject of dispute.

Another effect upon the demand for money is the effect of the business cycle. An increase in demand for output stimulated by fiscal policy may induce a cyclical expansion.

In an expansion people have more confidence in their immediate future; hence they are more willing to invest in long-term capital and they have less need to hold money or other short-term liquid assets to protect themselves against risk. In such a situation the demand for money to be held as an asset falls, and this tends to reduce interest rates.

Incentive effects of tax rate cuts can operate not only in the long run, but over shorter periods such as a business cycle as well. The influence of supply-side effects on real interest rates is ambiguous. For instance, a marginal tax rate cut which raises the deficit can stimulate the supply of real output and induces a cyclical expansion in which the demand for money falls and consequently interest rates fall too. This supply-side effect complements the demand-side effect outlined in the previous paragraph in which a tax cut or other fiscal measure was perceived to stimulate a cyclical expansion by raising demand.

4.4.3. Expected Inflation

$H_0 : \beta_3 = 0$ (expected inflation was not useful for predicting lending rate) and the alternative hypothesis is $H_a : \beta_3 \neq 0$ (expected inflation was useful for predicting lending rate). Assuming that changes in wealth, expected return on bonds relative to alternative assets, liquidity of bonds relative to alternative assets, risk of bonds relative to alternative assets and government borrowing were included in the model. As shown in table 4.6 and 4.7 above, since $p\text{-value} < 0.001 \leq 0.05$, the rule is to reject the null hypothesis. At the $\alpha = 0.05$ level of significance, there exists enough evidence to conclude that the slope of expected inflation variable is not zero and, hence, that expected inflation was useful as a predictor of lending rate.

Consider using the bond market model to explain changes in interest rates with the Fisher effect, thus the assertion by Irving Fisher that the nominal interest rises or falls point-for-point with changes in the expected inflation rate. The discussion of the Fisher effect leads to two important facts about the bond market, higher inflation rates result in higher nominal interest rates, and lower inflation rates result in lower nominal interest rates. Secondly changes in expected inflation can lead to changes in nominal interest rates before a change in actual inflation has occurred. When expected inflation increases, investors reduce their demand for bonds because, for every nominal interest rate, the higher the inflation rate, the lower the real interest rate investors will receive. Therefore increases in expected inflation lead to higher nominal interest rates and capital losses for investors who hold bonds in their portfolios.

An increase in the expected rate of inflation reduces investors' demand for bonds by reducing the expected real interest rate that investors receive for any given nominal interest rate. From the point of view of a firm issuing a bond, a lower expected real interest rate is attractive because it means the firm pays less in real terms to borrow funds. Can the deficit affect inflation? The answer is that although deficits can be observed to rise while the inflation rate falls, it is possible that an increase in the deficit can put some temporary upward pressure on the price level even if the deficit is not monetized. In other words, although monetary policy is the dominant influence on inflation, the deficit (as well as changes in inflationary expectations, and exogenous supply shocks) has the potential for affecting the price level. When taxes are cut and government borrowing increased by an equal amount, some of the tax cut will be spent on the new government bonds. The total amount of the tax cut will be used to purchase the new bonds if the taxpayers/bond buyers assume that the bond interest received will be used to pay the future tax required to service the government debt, and that the return of the principal of the bond will be used to pay the future tax required to retire the bond.

In any other case unless the debt is monetized, and assuming that the tax cut does not take a form which changes savings incentives and causes a change in the percentage of income saved, it would appear that some of the tax reduction will be saved and some will be spent on private consumption. Relative price (incentive) effects aside, because not all of the tax cut is saved, the demand for bonds rises by less than does the supply. With the growth of money unchanged, the shift in the demand and supply of bonds puts upward pressure on real interest rates. Thus, real interest rates rise and discourage investment demand unless a tax cut is of a type which raises the after-tax rate of return to capital or lowers the user cost of capital. But higher interest rates also encourage asset holders to shift some money balances into bonds (financial assets). Therefore, the real interest rate increase does not reduce investment demand by as much as the increase in consumption, so total demand rises.

To the extent that total demand increases relative to the total supply of goods and services, (still assumed, for analytical simplicity, to be unresponsive to the tax cut), upward pressure is exerted on prices. The pressure will stop once prices have risen by enough to restrain total demand from exceeding total supply.

The price pressure will be self-terminating if monetary policy remains unchanged. Because the higher prices reduce the real value of money balances, asset holders shift some of their wealth out of bonds (financial assets) and into money. As a result, there is a secondary rise in real interest rates which discourages investment demand by enough to offset the initial increase in consumption demand. Thus, in this analysis with no supply-side effects considered, a tax reduction accompanied by an equal increase in the deficit causes a temporary increase in inflation, a permanent rise in the price level and in real interest rates, and a permanent decline in investment.

4.4.4. Expected Return on Bonds Relative To Alternative Assets

With $H_0 : \beta_4 = 0$ (expected return on bonds to alternative assets was not useful for predicting lending rate) and $H_a : \beta_4 \neq 0$ (expected return on bonds to alternative assets was useful for predicting lending rate) while assuming that changes in wealth, liquidity of bonds relative to alternative assets, risk of bonds relative to alternative assets, government borrowing and expected inflation were included in the model. As shown in table 4.6 and 4.7 above with the resultant p-value = 0.069, the rule is to accept the null hypothesis. At the $\alpha = 0.05$ level of significance, there exists enough evidence to conclude that the slope of the expected return on bonds to alternative assets variable is zero and, hence, that expected return on bonds to alternative assets was not useful as a predictor of lending rate.

The loanable funds framework postulates that a decrease in the expected return on bonds relative to alternative assets leads to a shift of the demand curve to the left, leading to a rise in interest rates. An increase in the expected return on bonds relative to alternative assets shifts the demand curve to the right further leading to a fall in interest rates. Hence, the loanable funds framework implies that bonds with higher expected returns will have higher interest rates. Interest rates, serve as incentive to savers, making them defer present consumption to a future date. The relevant interest rates in this case are the deposit rates corrected for price inflation (or more precisely expected inflation rate). In this connection, interest rates affect the availability of savings, and to the extent that deposit rates vary depending on the maturity of the financial assets, they also influence the allocation of current saving among the assets. Bond yields, for example, influence business decisions pertaining to expenditures on plant, equipment and R&D.

Another possibility is the marginal tax rate cut that could lower real before-tax interest rates by raising the after-tax real rate of return. The rise in the after-tax return can be expected to induce increased investment, which increases the intensity of capital and lowers its marginal productivity, thus tending to reduce real before-tax interest rates. In contrast, a marginal tax rate cut can raise the profitability of capital investment and the after-tax return to capital, and have the effect of stimulating innovation. Additional innovation raises the marginal productivity of capital, and since the real before-tax interest rate is ultimately determined by the productivity of capital, a tax cut which raises capital productivity leads to a higher real interest rate, both before and after tax.

Incentive effects that is, the increase in the supply of productive factors caused by improved incentives resulting from cuts in marginal tax rates are most important when the tax cuts are permanent rather than temporary. Permanent tax cuts provide permanent incentives to alter the supply of labour and capital. A temporary tax cut provides only the incentive to alter the timing of that supply; if more is offered now, less will be offered later when the temporary tax cut is removed. A tax cut financed by government borrowing may be viewed as temporary to the extent that the borrower expects that tax rates will be raised in order to retire the debt issued to finance the tax cut in the first place. This is the reason why a tax cut accompanied by a reduction in government spending is more likely to be viewed as permanent than a tax cut not matched by a reduction in government outlays. The results presented by this variable should be interpreted with caution. As argued by Eugen and Hubbard (2004) and Laubach (2009), the change of the bond yield today may be confounded by the current business cycle conditions, which are not captured completely by the output growth or the interest rates.

Conclusions and Policy Implications

5.1. Conclusions

The loanable funds theory is a long run theory of interest rate determination, that is, the interest rate adjusts to achieve equilibrium in the loanable funds market.

The price of money, the interest rate, should be market determined by a market supply and demand mechanism, as are prices of other commodities or services in the economy. An important feature of the loanable funds analysis used is that supply and demand are always in terms of stocks (amounts at a given point in time) of assets, not in terms of flows.

This approach is somewhat different from certain loanable funds analyses, which are conducted in terms of flows (loans per year). The results show that changes in wealth, government borrowing and expected inflation affect lending interest rates. Liquidity of bonds relative to alternative assets, risk of bonds relative to alternative assets and expected return of bonds relative to alternative assets did not determine lending rates during the period of the study.

The results suggest that the multiplier effect of increased government deficit spending would not change much due to crowding-out. In the loanable funds model, the world interest rate and the exchange rate need to be considered as international investors search for better returns in determining the supply of loanable funds.

5.2. Policy Implications

In order to improve changes in wealth (demand and supply for bonds market); the government should review laws and regulations applicable to collective investment vehicles for people to increase participation in bonds as viable investment assets. The government should relate and align insurance and pension fund reforms to building government securities markets. The government should examine capital account restrictions and consider liberalization, depending on overall macroeconomic and financial sector conditions. The government should develop automated trading systems to encourage access by onshore and offshore investors. The government should adopt tax policies that encourage tax earnings on government securities at comparable rates as other taxable income sources. The government should establish sunset clauses for tax incentives for government and private sector securities, and periodically review the efficacy of such incentives.

The monetary policy pursued should ensure that inflationary pressures are contained while monetary expansion is facilitated through availability of credit. The monetary policy should be complemented by a process of fiscal consolidation as the government strengthens its fiscal position by efficiently utilizing the existing resources and enhancing revenue collection. Moreover, public policy should continue to be pursued with the objective of allocating increased resources to private sector activity and restating the private sector as the engine of economic growth. As interest rates are determined by the market, continued implementation of prudent monetary policy is thus expected to foster interest rate stability.

For changes in inflation, the government should establish an adequate forecasting facility in the Treasury to produce reports on surveillance of receipts, expenditures, expected inflation and overall economic timely forecasts. The government through the CBK should ensure wider dissemination of the information on inflation to the public through various channels of communication available.

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