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Department of Economics

The Demand for Bank Credit in Malawi: A Cross-Sector Panel Approach

By

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DECLARATION

I declare that this is my original work and that it has not been presented for a degree at this or any other university. Work of others used in this study has been duly acknowledged. Any errors contained here in are entirely mine.

Candidate _____

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Date _____

CERTIFICATE OF APPROVAL

We declare that this thesis is from the student's own work and effort and where he has used other sources of information, it has been acknowledged. This thesis is submitted with our approval.

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DEDICATION

To Ignancia Kassam, the only grandmother I ever knew and now sleeping a sleep all mankind shall sleep.

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ABSTRACT

Bank credit constitutes a single vital source of financing for private sector firms in an economy. Its availability makes it relatively easy for entrepreneurs to obtain financing to start a new business and for established businesses to purchase new equipment and technologies to expand their operations. Private sector credit is also one of the main counterparts to the monetary liabilities in the consolidated balance sheet of institutions in the banking sector. Thus, bank credit may contain useful information for analysing and forecasting both a country's fiscal and monetary developments.

Most of the work on bank credit to the private sector has largely focused on aggregate time-series evidence from developed economies and of the few that have attempted to study the same in under developed countries; none has been conducted on Malawi so far. Deviating from the usual time-series modelling, this study adopts panel data analysis techniques for a more refined modelling of the behaviour of credit demand. The study, therefore, carried out a cross-sector panel analysis of the determinants of bank credit demand by the private sector in Malawi using data for the period 1980 to 2004. Its main objective was to analyse the determinants of bank credit demand by the private sector firms and its implications on the country's level of employment and hence economic growth.

Empirical results from the study indicate that real cost of bank credit, level of economic activity, level of firms internal financing and liberalisation policies have a significant impact on bank credit demand by the private sector in Malawi. However, the results also show that the real cost of alternative external sources of credit has an insignificant impact on bank credit demand by the private sector in Malawi.

The overall policy implication from the findings is that, on its own, a monetary policy focusing on real lending rates alone will not be the most effective way of stimulating bank credit demand by the private sector in Malawi.

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LIST OF ACRONYMS

EP and D:	Ministry of Economic Planning and Development
FEM:	Fixed Effects Model
FGLS:	Feasible Generalised Least Squares
GDP:	Gross Domestic Product
GLS:	Generalized Least Squares
GNP:	Gross National Product
IMF:	International Monetary Fund
LR:	Likelihood Ratio
LSDV:	Least Squares Dummy Variable
OLS:	Ordinary Least Squares
RBM:	Reserve Bank of Malawi
REM:	Random Effects Model
SMEs:	Small and Medium Scale Enterprises
SSA:	Sub-Saharan African countries
VECM:	Vector Error Correction Method
2 SLS:	Two-Stage Least Squares

CHAPTER ONE

Introduction

1.1 Background

The role and significance of the private sector[1] in economic development has, for sometime now, attracted considerable attention from both academics and policy makers. The consensus of opinion is that the private sector has a significant role to play in terms of its contribution to the level of investment, employment and economic growth in any economy. However, economic agents in the private sector are oftentimes faced with the problem of insufficient funds to finance all of their positive net present value investment and working capital opportunities. When this happens, the economic agents must either abandon some of their profitable projects or else turn to credit[2] markets for external financing of the same (Thomas, 1992).

In Malawi, just like in most developing countries where the financial sector is underdeveloped and relatively small, external finance for private sector firms (businesses) mainly come from the banking sector. Indeed, bank credit is the lifeblood for much of the productive economic activity emanating from the private sector in Malawi since its availability makes it relatively easy for entrepreneurs to obtain financing to start a new business and for established businesses to purchase new equipment and technologies to expand their operations. Fry (1995) explains that the degree of bank lending to the private sector in developing countries is emphasised largely because private sector firms have been observed to be more productive in their use of domestic savings than their public sector counterparts.

[1] In this study, Private sector refers to businesses and or other such income generating activities in the following sectors as categorized by the Reserve Bank of Malawi: agriculture, mining and quarrying, manufacturing, construction and civil engineering, wholesale and retail trade, finance, insurance, real estate and business services, community, social and personal services and personal accounts

[2] Bank credit, as defined by The Reserve Bank of Malawi in its Directive on Large Exposures (2006), implies any asset or off-balance sheet item that contains credit risk, including loans and participations, overdrafts and advances. It also includes all of the following 'credit facilities' as enshrined in the Banking Act (1989), section 2: financing by means of factoring, leasing, hire purchase, acceptance of trade and other bills, discounting of such bills and notes, the opening or confirming of documentary credit, the issue of other letters of standby, credit guarantee or surety, the undertaking to pay on account of another person, and other similar undertakings. In this study however, the terms bank credit, credit, or advances to the private sector are used interchangeably to refer to anyone or all of the assets listed above.

Nevertheless, authorities in Malawi have, for a long time now, firmly believed that inadequate access to bank credit (especially one with long repayment periods) is one of the major factors constraining growth of the various sectors of the economy. It is generally felt that this constraint makes it very difficult for entrepreneurs to launch new businesses and for existing businesses to grow and expand, especially small businesses which comprise the main source of employment in the country. Other constraints faced by entrepreneurs include stringent bank lending policies and government regulatory and control measures. In a bid to encourage banks to prudently boost the level of credit to the private sector and hence significantly enhance growth and poverty reduction in Malawi, authorities in the country have had to review and modify bank lending policies on several occasions. Prior to 1990, the monetary authorities and hence the Government of Malawi, followed a more restrictive Directed Bank Lending Policy which entailed compulsory credit allocation to seemingly key sectors of the economy or even the government itself (as a way of financing its deficits). After the abolition of credit ceilings, allocation of bank credit was based on market forces. However, as is being revealed by data in section 2.4 below, banks in Malawi remain highly liquid and generally provide only modest or minimal levels of credit to the private sector despite significant reforms in the country's financial sector.

It is obvious that the ability to lend by banks is subject to availability of effective credit demand which in turn depends on the willingness to borrow of economic agents from various sectors of the economy. In spite of this, according to Goldfeld and Chandler (1981), demand for credit may exist yet banks may be constrained to lend due to some factors. *Inter alia*, this is the reason why the study was interested in the process of credit extension to private sector in Malawi. The study examined the determinants of private sector demand for credit in Malawi, using evidence from different sectors of the economy, with an implicit aim of gauging the likely flow of investment related funds from banks to private sector.

In literature, there exist two competing schools of thought amongst the Post-Keynesian economists regarding demand for bank credit. At the heart of the debate is the assumption of whether demand for bank credit is faced with an infinite interest rate elasticity of bank credit supply (i.e. an exogenous rate of interest) as argued by horizontalists or whether this rate is less than perfectly elastic and hence determined by market forces as argued by structuralists. The implication of structuralists is that not all demand for bank credit is accommodated at the going market rate of

interest. On the other hand, horizontalists assume full accommodation of demand for bank credit. Lately, it is increasingly being agreed by Post-Keynesian economists that the theoretical differences between the two schools of thought are largely related to the choice of the analytical time frame, and hence on the scope of the analysis at hand. It would seem the structuralists' argument better explains a liberalised market economy whereas views of horizontalists' are seen as being more relevant in repressed economies. Again, it will be interesting to see which one of these theories best supports data from Malawi in this study.

1.2 Problem Statement and Justification of the study

A common concern of authorities in Malawi is that our banking system is not providing enough support to new economic initiatives and, in particular, to the expansion of small and medium scale enterprises (SMEs). This is reflected in a report done by Sacerdoti (2005) on behalf of the IMF which revealed low ratios of private sector bank credit to GDP, currently ranging between 10% and 20%, in most countries of the Sub-Saharan African countries (SSA).

In Malawi, the ratio of bank credit to GDP currently stands at 7.1%[3]. Surprisingly, the meagre size of bank credit provided to the private sector in Malawi is perhaps not due to a lack of funds in the banking sector. Available data shows that Malawian banks choose to channel only a modest portion of their funds to private sector borrowers, while keeping a sizeable percentage of their deposits in liquid assets, such as cash and/ or deposits with the central bank. As shown in Section 2.4 below, banks in Malawi have over the study period registered dwindling shares of private sector credit in their asset portfolios from a staggering 61.8% in 1980 to a mere 29.4% in 2004. According to Caprio and Honohan (1991) this is evidence enough of the prevalent 'excess liquidity' (or rather free reserves) in Malawian banks. Similarly, a study by Chirwa (2001) found evidence of declining share of domestic credit to the private sector in the periods following suspension of donor aid and/or external loans which culminated into heavy government borrowing from the banking sector. All this evidence is against a background of increased efforts by the authorities to reform the country's financial sector.

[3] See section 2.4 below

High bank liquidity is a problem because it entails less lending to support potentially high-yielding non-government investment and hence it limits national employment and economic growth. Usually, Banks attribute the problem of excess liquidity to insufficient supply of "good bankable" projects from the private sector (i.e. a weak demand for credit that meets their criteria). On the other hand, according to Caprio and Honohan (ibid.), private sector businesses allege that the key hindrance to their competitiveness and expansion is the availability and cost of bank finance.

It was against this problem of excess bank liquidity and its alleged causes and consequences that this study embarked upon an econometric investigation to empirically establish the determinants of private sector demand for bank credit (and their implications on productive investment) in Malawi. It was believed that sector analysis on the same will allow for a more refined modelling of the behaviour of credit demand in Malawi. Further to this, it should be noted that previous studies on commercial bank-related issues in Malawi (e.g. Kamanga, 1999; Chirwa 2001; Gondwe, 2001) ignored the analysis on determinants of bank credit demand in the country. Instead, these studies concentrated on the empirical evidence of the impact of financial liberalisation either on private investment or commercial bank performance. Hence, this study will address this knowledge gap.

1.3 Research Objectives

Broadly, the study intended to analyse demand for bank credit by different firms from the private sector in Malawi.

Specifically, the objectives of the study were to:

i. Analyse the effect of cost of bank credit on private sector demand for the same in Malawi.

ii. Examine the impact of the cost of alternative sources of credit on demand for bank credit in Malawi.

iii. Assess the implication of internal financing by the private sector on its demand for bank credit.

iv. Investigate the effect of economic activity on demand for bank credit in Malawi.

v. Explore the effect of financial sector reforms on private sector demand for bank credit in Malawi.

1.4 Hypotheses to be tested

The study tested the following hypotheses:

1. Private sector demand for bank credit is not explained by changes in the cost of bank credit.

2. Private sector demand for bank credit is not affected by changes in the cost of alternative sources of credit.

3. Private sector demand for bank credit is not influenced by the level of firms' internal financing.

4. Private sector demand for bank credit is not related to changes in economic activity.

5. Private sector demand for bank credit is not explained by reforms in the financial sector.

1.5 Significance of the study

Output from the study is expected to:

i. Theoretically and empirically contribute towards knowledge of factors that influence private sector demand for bank credit in Malawi. This is vital in designing effective monetary policies and hence better macroeconomic management that can best address the problem of inadequate investment and employment levels in Malawi.

ii. Serve as a reference point by future researchers and public policy makers.

1.6 Organisation of the Study

The rest of the study is organised as follows: Chapter Two gives a brief overview of the financial and banking sector in Malawi. Chapter Three reviews theoretical and empirical literature on private sector demand for bank credit while Chapter Four presents the methodology of the study. Here, we develop an econometric model, provide its estimation technique and identify the nature of the data required for the empirical analysis of the study. Chapter Five discusses empirical results and, lastly, Chapter Six concludes and gives policy implications.

CHAPTER TWO

Overview of the Malawian Financial and Banking Systems

2.0 Introduction

This chapter gives a brief overview of Malawi's financial environment within which the banking system operates. It reviews the extent to which government policies have helped shape the banking terrain in Malawi since independence in 1964. An attempt is made to explore whether or not repressive policies in form of direct government intervention in the financial sector had any impact on the development of the banking system and its subsequent extension of credit to the private sector. Secondly, the chapter also examines trends in bank credit to the private sector and the nature of its relationship with other major macro economic variables widely believed to influence the same.

2.1 Evolution and Structure of the Financial and Banking System in Malawi

2.1.1 Pre-liberalisation era (1964-1986)

The Malawi Government Economic Reports (1989) insinuate that prior to independence in 1964, banks in Malawi primarily served the needs of the then expatriate communities and only had a flippant interest in direct lending to local entrepreneurs. Further, banks were observed to have a tendency of imposing high charges for routine services during this period.

At independence in 1964, authorities in Malawi felt that the prevailing banking system then was not pro-active enough to support the type of development tempo envisaged. Consequently, the government of Malawi instituted numerous direct controls as a way of achieving its goals. During this period, the authorities desired to increase the level of investment, improve the allocation of investment among the various sectors of the economy, including the micro and small scale enterprises, and keep financial costs down so as to avoid the perceived inflationary effects of liberalised market rates of interest (Malawi Government Economic Report, 1989). In addition, the

government also realised that it could use the banking system to access cheap finance for covering its budget deficits. Gondwe (2001) summarised post-independence financial reforms in Malawi as concentrating on both institution building and review of policies that would make credit available to various designated sectors of the economy considered as key to development and yet economically deprived. Firstly, the post-independence reforms encompassed government determined interest rates. Typically, these rates were low and different for deposits and loans of different maturity and to different sectors. Other reforms included credit ceilings and sectoral allocations, institution building of development banks and lastly, nationalisation of foreign owned banks or participation in such banks with majority share. Practically, low interest rates and sectoral credit ceilings were designed to reinforce each other in ensuring that bank credit flowed to the designated priority sectors of the economy namely agriculture and manufacturing at a cheaper cost. These priority sectors were principally suspected of having large unsatisfied credit demands. The implication is that credit constraints had predominantly been the inhibiting factor in economic development in general and, in particular, a retarding factor in the productive potential and growth of the private entrepreneur at the micro level.

However, directed lending policy was found to restrict the ability of borrowers to switch between banks. Since banks were forced into credit rationing, would-be borrowers had to win the goodwill of potential lenders by, among others, leaving larger balances than would otherwise have been desirable. Due to this, the shadow price of credit was in excess of the quoted price and included the opportunity cost of the surplus deposits. For this reason, ability to switch banks was greatly impaired and resultantly slowed down financial and other portfolio adjustments. Nevertheless, banks were not under any duress to make their liabilities competitive and, as concluded by the World Bank (1991) report, credit ceilings and related controls such as low interest rates caused banks to hold excess cash as lending under such prescribed conditions was not exactly profitable.

Furthermore, though credit ceilings and sectoral allocations were relatively easy to administer, their combination with low interest rates discouraged banks to extend credit to their customers once prescribed ceilings were attained. Effectively, this disincentive led to the reduction in the total amount of funds being earmarked for credit in the economy[4]. In addition to this, banks' remaining

[4] See Fry (1995) for a related discussion on directed lending and other forms of financial repression in third-world economies.

resources over and above their prescribed ceilings was considered 'excess' liquidity. This, coupled with relatively high reserve requirement which was at 25% just before liberalisation in 1989[5], had two implications on the banking system. Firstly, a substantial amount of available commercial bank funds was directed away from potential borrowers who in turn had to look elsewhere for their financial needs. Consequently, as argued by Chipeta and Mkandawire (1992), there was a growing informal financial sector to cater for the rationed out borrowers in the formal sector. Secondly, as banks were forced by the monetary authorities to hold large amounts as reserve requirements in form of low (or even zero) yielding assets, interest rates were distorted in an attempt by banks to cover up lost revenue through increased margin between deposit and lending rates (Chirwa; 2001).

In summary, therefore, financial management through directed policies served to reinforce one another in perpetuating distortions in financial intermediation, credit extension inclusive, and hence limiting potential investment and economic growth in the country.

2.1.2 Structural Adjustment Programmes and the financial sector reforms (1987-2004)

Financial sector reforms were one of the cornerstones of the World Bank-initiated adjustment programmes that aimed at enhancing efficiency through greater reliance on market forces, promoting economic growth and improving the effectiveness of monetary policy in developing economies since the early 1980's. In Malawi, the financial sector reform programme commenced in 1987 with the partial liberalisation of commercial banks' lending rates shortly before the deregulation of deposit rates in 1988 (Chirwa; 2001). In the same year the authorities also abandoned credit ceilings and credit rationing though preferential lending to the agricultural sector was maintained. The second phase of financial sector reform program involved the complete overhaul of the legal and regulatory framework of the banking system in order to introduce indirect monetary policy instruments and to give more power to the monetary authorities to monitor and supervise the banking system more effectively (Gondwe; 2001). Consequently, in 1989 changes were made to the Reserve Bank Act of 1965 and the Banking Act of 1965 leading to the enactment of the Reserve Bank Act of 1989 and the Banking Act of 1989. The new Acts broadened the powers and mandates of the central bank to, *inter alia*, promote the money and capital markets in Malawi besides supervision of financial institutions

[5] See Chirwa (2001) for further details.

while pursuing monetary policy through use of market based instruments. Chirwa (2001) concluded that the Banking Act of 1989 was aimed at creating an environment that enhanced competition in financial intermediation through opening up of the sector to new entrants with moderate entry requirements. These changes immediately led to entry of three financial institutions; Leasing and Financing Company, Finance Corporation of Malawi (presently Nedbank Malawi), and INDEBank to commercial banking activities. In 1990 the government abandoned the preferential treatment to agricultural sector. *Table 1* below illustrates the sequence of events on the liberalisation of the choice variables in the study.

On its part, the Reserve Bank of Malawi (RBM) has on several occasions issued directives aimed at complementing and reinforcing these reforms. In 1993, RBM issued a Credit Concentration Directive for Banks which was later superseded by the Bank Directive on Large Exposures in March 2006. Both directives aimed at ensuring that banks follow sound practice of credit diversification and that credit is not concentrated on a small number of borrowers resulting in denial of credit to smaller entities with viable credit needs.

Table 1: Liberalisation of the Choice Variables

Effective Date	**Liberalisation of choice variables**
July, 1987	Partial liberalisation of lending rates
August, 1989	Discontinuation of preferential lending rates to agricultural sector
1989	Enacting of the new Reserve Bank Act 1989 and the new Banking Act 1989
May, 1990	Final liberalisation of all interest rates
January, 1990	Elimination of quantitative credit ceilings

Source: Compiled by author from various Economic Reports of the Government of Malawi.

2.2 Structural characteristics of the financial and banking sector in Malawi

Despite significant reforms, the financial and banking system in Malawi remains relatively small, underdeveloped and dominated by a limited variety of institutions and services. Currently, the formal banking industry in Malawi has two supervisory authorities; Ministry of Finance and the Reserve Bank of Malawi. For a long period, the banking sector in Malawi was predominantly monopolised by the two major commercial banks; National Bank of Malawi (incorporated in 1971) and Standard Bank Limited (first incorporated in 1970). However, the advent of financial liberalization and hence removal of entry barriers has led to the entry of other players namely; First Merchant Bank (1994), Malawi Savings Bank (1995), Loita Investment Bank (1998) INDEBank Limited (2001), NEDBank Malawi (2001), NBS Bank (2004) and Opportunity International Bank of Malawi (2002). Other players in the financial institutions include two discount houses, three development institutions, one lease finance company, a stock exchange institution and lastly, one semi-formal saving institution.

The Banking Act of 1989 distinguishes banking business from financial institutions. Banking business involves receiving funds from the public by accepting demand, time and saving deposits or borrowing from the public or other banks, and using such funds in whole or in part for granting loans, advances and credit facilities and for investing by other means. On the other hand, financial institutions' regular business consists of granting loans, advances and credit facilities, and investing funds by other means, and whose business is financed by own or borrowed funds or with funds not acquired by accepting or soliciting deposits from the public.

The above are the major participants in the Malawi financial industry playing an important role in the mobilization and allocation of resources for the development of the economy. However, the scope of this study is only limited to credit from the banking sector as analysis of credit resources from the other finacial institutions is constrained by inadequate and incomplete published data**.**

2.3 Case of excess liquidity in Malawian banks

Sacerdoti (2005) contends that the stock of bank credit to the private sector in most Sub-Saharan Africa, Malawi inclusive, remains very low in the range of 10 to 20% of their respective GDP. Conversely, commercial banks in this region are characterized by excess liquidity. In Malawi, the ratio of real private sector credit from banks to real GDP has registered a declining trend over the period of the study from 17.1% in 1980 to 7.1% in 2004. From *Table 2* below one can also easily notice that, on average, the ratio of real private sector credit to real GDP in Malawi declined by 43.9% from the 12.6% in the pre-reform period (i.e. before 1989) to 7.1% in the post-liberalisation period. In addition, *Table 2* shows that, in real terms, the total asset share of commercial bank credit to the private sector has declined from 62% in 1980 to 29% in 2004 with the pre-reform period in the study recording an average of 47.5% as opposed to 30.3% after reforms.

The meagre size of domestic credit provided by commercial banks to the private sector in Malawi is perhaps not due to a lack of funds in the banking sector but rather because they (banks) choose to channel only a modest portion of their funds to private sector borrowers, while keeping a sizeable percentage of their deposits in liquid assets, such as cash, deposits with other banks (central bank inclusive) and short-term government securities. Despite a declining ratio of private sector credit from banks to GDP over the period of the study as shown in *Table 2* below, commercial bank deposists (as a ratio of total assets) with the Reserve Bank of Malawi showed an overall upward trend from 5% in 1980 to 13.3% in 2004. This implies that on the overall, commercial banks prefer to keep their assets in other forms apart from lending to the private sector.

In line with the observations made in *Table 2*, Chirwa (2001) concluded that on average, although commercial bank assets (deposits with the central bank in particular) have increased since liberalisation, the proportion of assets that financial institutions lend out to the private sector has not followed a similar pattern. This, in itself, is evidence enough of excess liquidity in the country's banking system.

Table 2: Case of excess liquidity in Malawi

Year	Deposits (K' mn)	Total Assets (K'mn)	Pvt.Cr (K 'mn)	GDP (K 'mn)	Deposits/ Assets (%)	Pvt.Cr/Total Assets (%)	Pvt.Cr/GDP (%)
1980	8.2	163.9	101.3	591.2	5.0	61.8	17.1
1981	13.8	150.9	94.9	554.0	9.1	62.9	17.1
1982	13.9	161.5	101.0	566.4	8.6	62.5	17.8
1983	12.2	165.9	110.0	598.8	7.4	66.3	18.4
1984	31.4	181.0	75.7	632.2	17.4	41.8	12.0
1985	31.8	173.8	62.5	670.7	18.3	36.0	9.3
1986	55.8	190.7	70.4	667.6	29.3	36.9	10.5
1987	76.5	188.0	52.2	670.0	40.7	27.7	7.8
1988	54.9	152.2	53.0	692.9	36.1	34.8	7.6
1989	34.1	135.4	59.7	696.5	25.2	44.1	8.6
1990	29.8	152.8	74.3	743.8	19.5	48.7	10.0
1991	25.6	159.7	85.3	802.2	16.0	53.4	10.6
1992	21.4	177.0	101.5	745.3	12.1	57.3	13.6
1993	31.9	177.2	70.9	821.4	18.0	40.0	8.6
1994	38.6	225.4	78.9	732.3	17.1	35.0	10.8
1995	48.1	198.1	49.4	857.8	24.3	25.0	5.8
1996	43.2	180.9	37.5	918.9	23.9	20.7	4.1
1997	35.3	152.7	37.4	954.1	23.1	24.5	3.9
1998	35.4	212.6	60.5	992.6	16.7	28.4	6.1
1999	28.0	190.9	55.2	1022.2	14.7	28.9	5.4
2000	13.3	106.0	66.1	1038.2	12.6	32.0	6.4
2001	25.8	216.1	52.1	986.7	11.9	24.1	5.3
2002	25.6	228.1	27.2	1014.7	11.2	11.9	2.7
2003	24.4	258.8	63.7	1076.5	9.4	24.6	5.9
2004	28.8	278.8	82.1	1153.1	10.3	29.4	7.1

Source: Computed by author from various issues of the RBM's Financial and Economic Reviews

Key: Variables not expressed in percentage form are in real terms.

2.4 Commercial bank credit to the private sector

In Malawi, a significant proportion of commercial bank resources is extended as credit to the various sectors of the domestic economy. As of end 2004, the total credit extended by commercial banks to the private sector was at K14, 749.7 million[6]. *Table 3* below shows annualised proportions of commercial bank credit allocation to the main sectors of the Malawi Economy between 1980 and 2004.

[6] See appendix 2 for details.

Table 3: Commercial banks Loans and Advances by main sectors (percentage)

Year	Agric	Dsbn	Manuf	Fin/Prof	Const	Tpt/com	Mining	Utilities	Other	Total
1980	53.833	9.582	3.891	20.616	0.871	2.323	0.224	0.005	8.656	100
1981	49.684	10.748	3.214	20.917	0.685	3.583	0.174	0.002	10.994	100
1982	51.824	8.870	3.512	20.621	0.585	1.531	0.081	0.060	12.915	100
1983	52.442	11.624	4.089	20.901	0.341	3.218	0.131	0.024	7.229	100
1984	55.556	14.586	9.741	9.006	0.196	0.538	-	0.256	10.121	100
1985	65.066	15.894	5.408	1.269	0.497	0.938	0.168	0.007	10.752	100
1986	57.444	17.857	6.583	2.797	0.602	0.301	0.004	0.002	14.409	100
1987	53.589	17.060	12.144	1.131	0.836	0.295	0.002	0.019	14.925	100
1988	34.147	26.526	17.980	7.510	0.518	0.333	0.222	0.083	12.681	100
1989	33.422	28.051	22.175	6.621	0.665	1.808	0.213	0.003	7.043	100
1990	26.550	33.840	23.236	8.460	0.897	2.573	0.136	0.092	4.216	100
1991	21.705	34.429	26.149	9.802	1.142	2.938	0.003	0.000	3.832	100
1992	24.912	39.255	15.215	10.660	0.759	2.651	0.057	0.020	6.472	100
1993	27.747	24.597	27.227	9.135	1.804	2.897	0.152	0.005	6.437	100
1994	27.367	21.460	31.781	8.334	2.302	3.183	0.090	0.020	5.465	100
1995	28.617	19.438	25.684	10.202	4.386	2.071	0.032	0.006	9.563	100
1996	25.666	18.626	23.319	6.394	2.452	3.049	0.063	1.096	19.335	100
1997	25.601	28.679	18.779	5.224	3.195	3.609	0.490	0.064	14.360	100
1998	16.659	21.711	17.314	10.038	4.095	1.901	0.169	0.097	28.016	100
1999	14.599	29.792	21.620	16.273	3.580	2.204	0.147	0.095	11.691	100
2000	7.546	16.940	18.590	7.668	5.718	18.038	0.138	2.954	22.408	100
2001	8.635	14.341	33.697	4.150	7.480	4.103	0.559	6.961	20.074	100
2002	3.229	21.609	28.737	2.796	3.546	3.748	0.224	12.369	23.743	100
2003	10.403	16.237	20.292	6.698	7.958	7.323	0.013	1.293	29.783	100
2004	12.113	18.013	15.779	3.949	6.672	5.253	0.578	0.831	36.812	100
2005	9.898	14.912	13.343	18.285	4.998	3.358	0.195	1.288	33.723	100
Total	13.159	18.481	19.234	9.460	5.374	5.327	0.261	2.113	26.592	100

Source: RBM Economic and Financial Reviews; various issues

Key:Agric = Agricultural; Dsbn = Distribution; Manuf = Manufacturing; Fin/Prof = Financial and Professional Services; Const = Construction and Building; Tpt/com = Transport and Communications

Table 3 above shows that during the pre-liberalisation period and in line with government policy, most bank resources were being channelled towards the agricultural sector (especially the large scale agriculutural estates). Agricultural sector alone accounted for 48.9% of the total bank credit directed to the private sector in the pre-reform period. The other two most favoured sectors in this era were the distribution (trade) and manufacturing sectors which accounted for 17.2% and 10.1% of the total private sector credit respectively. However, the discontinuance of the directed lending policy by the government from 1990 saw the gradual emergence of the other sectors notably distribution and manufacturing sectors as the most beneficiaries of bank credit. The latter accounted for 21.4% of

total bank credit in the post-reform period as opposed to agriculutural sector's 12.8%. *Appendix 1* illustrates the trend of bank credit towards the different sectors in Malawi. The shift in sectoral credit allocation from agriculture was mainly on account of the seemingly higher risk resulting from the effects of adverse and unpredictable weather conditions which raised chances of default in the large scale agricultural estates.

2.5 Commercial bank credit and Sectoral Income

Fig.1 below shows the trend of total private sector credit to different sectors in relation to movements in total income (as a measure of economic activity) from those sectors. Though *Fig.1* below suggests an overall positive relationship in the trends of these two variables, this need not be the case always. Movements in bank credit have not been matched by corresponding movements in income in certain years. This implies that some factors other than economic activity also come into play to determine levels of bank credit extended to different sectors of the economy. *Table 4* below shows that over the study period, the distribution and manufacturing sectors registered the highest annual average shares of sectoral income at 43.35% and 25.09% respectively.

Fig.1: Real Private Sector Bank Credit vs. Real Private Sector Income

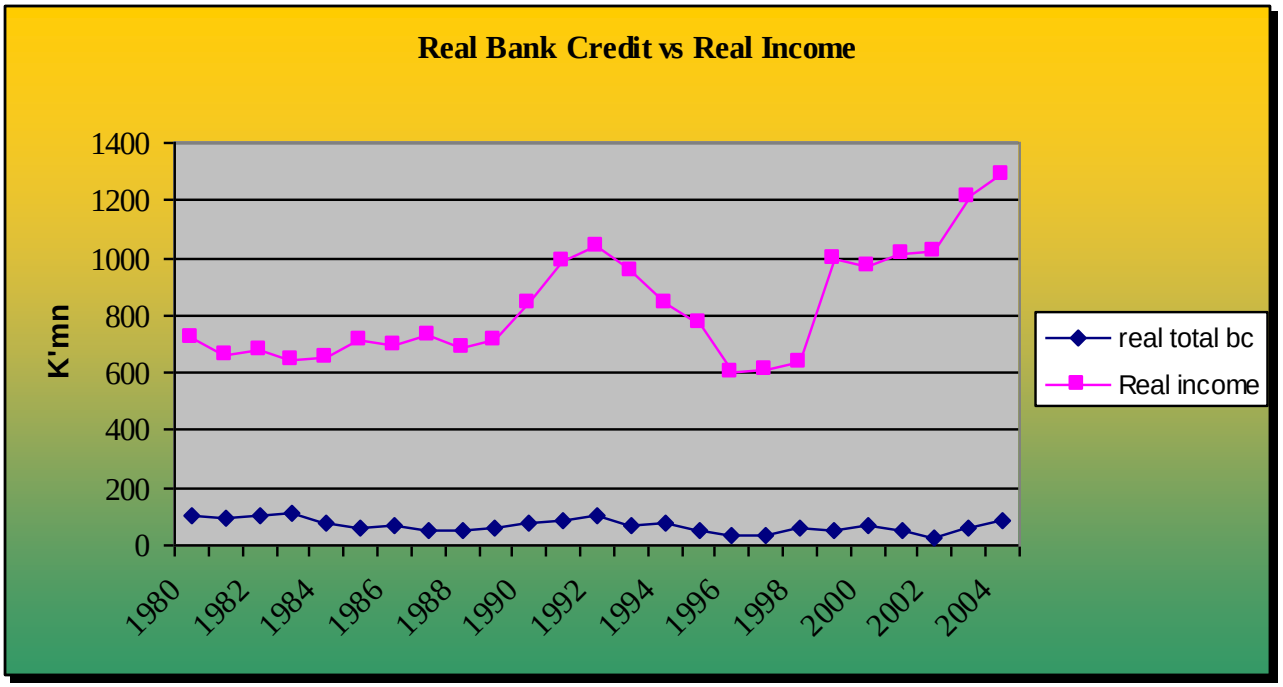


Table 4: Annual Percentage Sectoral Income

Year	Agric	Dsbn	Manuf	Fin/Prof	Const	Tpt/comms	Utilities	Other	Total
1980	8.15	47.09	23.53	7.49	5.57	6.05	1.75	0.37	100.00
1981	9.10	43.83	25.19	8.23	6.43	4.93	1.88	0.40	100.00
1982	8.10	47.46	23.85	7.94	5.92	4.62	1.84	0.27	100.00
1983	8.50	47.56	23.69	7.57	6.31	3.86	2.08	0.43	100.00
1984	7.26	44.72	29.58	7.10	6.97	2.00	2.04	0.33	100.00
1985	6.66	45.59	29.87	7.01	5.73	2.67	2.09	0.38	100.00
1986	6.71	46.86	28.57	7.10	5.76	2.61	2.04	0.35	100.00
1987	5.63	48.03	26.99	7.11	6.87	3.00	1.91	0.47	100.00
1988	5.58	47.13	26.50	6.85	7.99	3.54	1.88	0.53	100.00
1989	6.22	43.77	29.65	6.94	7.63	3.34	1.88	0.58	100.00
1990	5.52	43.90	29.23	6.72	8.61	3.46	2.25	0.32	100.00
1991	6.51	42.22	29.56	6.10	8.54	3.52	2.50	1.04	100.00
1992	6.45	40.79	32.14	5.89	8.44	3.38	2.25	0.66	100.00
1993	5.68	44.54	30.83	5.58	7.57	2.96	2.34	0.50	100.00
1994	6.34	43.51	29.35	5.70	8.18	3.35	2.50	1.06	100.00
1995	5.54	43.17	29.84	6.89	6.62	3.67	3.42	0.86	100.00
1996	6.07	41.57	30.06	7.54	6.50	3.75	3.55	0.96	100.00
1997	5.77	41.12	31.09	7.82	5.84	3.49	3.86	1.02	100.00
1998	5.33	39.25	3.31	5.80	7.04	3.71	4.16	31.38	100.00
1999	6.05	41.91	21.72	5.79	11.32	1.87	3.82	7.52	100.00
2000	6.56	42.40	21.10	7.40	14.17	1.91	4.39	2.08	100.00
2001	5.86	43.67	20.29	7.09	16.00	1.65	4.64	0.81	100.00
2002	5.88	39.64	21.32	7.53	14.49	3.85	3.65	3.64	100.00
2003	5.36	35.78	24.99	8.79	14.09	3.76	3.35	3.89	100.00
2004	6.14	36.29	26.32	8.77	12.24	2.43	3.61	4.19	100.00
Avg %	6.44	43.27	25.94	7.07	8.59	3.34	2.79	2.56	100.00

Source: National Statistical Office publications (various issues)

2.6 Commercial bank credit and real lending rates

Real lending rates (i.e. differential between nominal lending rate and inflation rate of a particular year) were generally positive, recording an average annual rate of 9.17% between 1980 and 2004. In the pre-reform era, real lending rates averaged 2.03% per annum but rose to an annual average of 13.93% in the post-liberalisation period mostly due to the determination of the nominal lending rates by market forces. Deregulation of the financial sector ensured that lending rates were no longer deliberately repressed by authorities hence financial sector institutions started to charge profitable rates based on market demand and supply forces. *Fig.2* and *Fig.3* below provide evidence of the relationship between bank credit developments and real interest rates over the period of study.

Fig. 2: Real Cost of Bank Credit

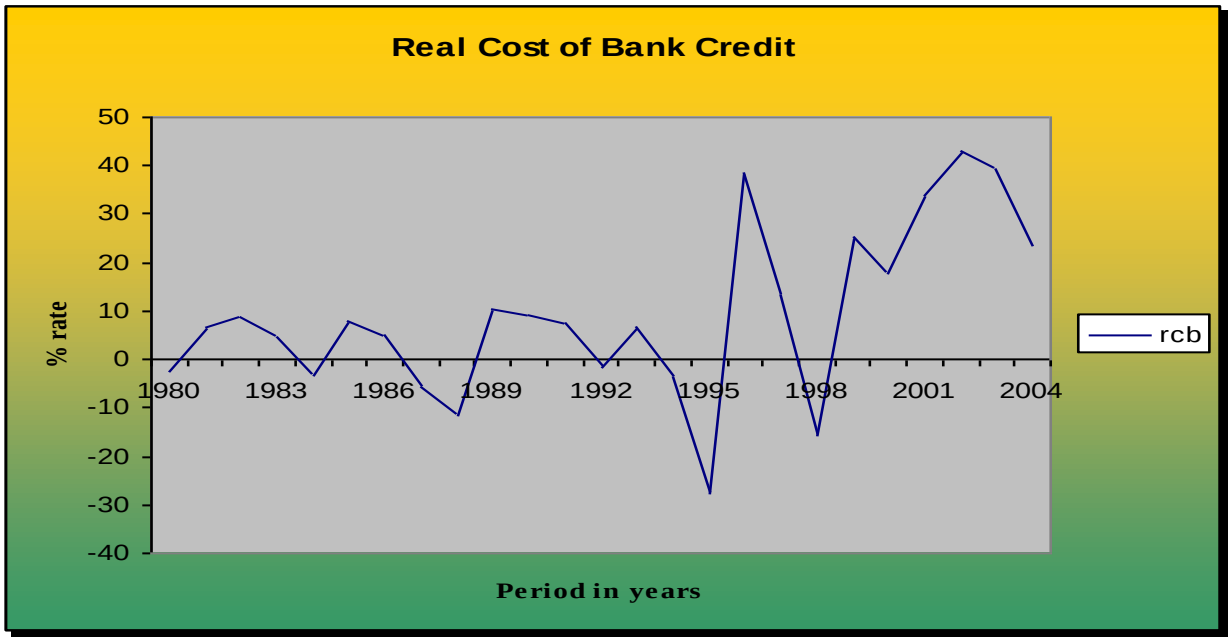
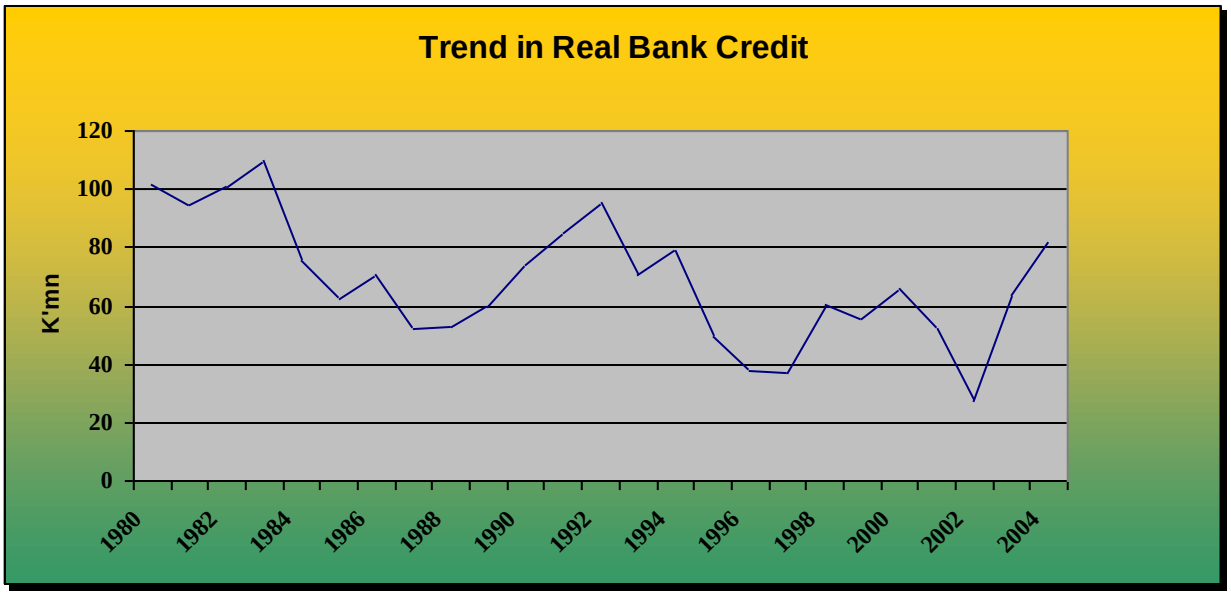


Fig.3: Bank Credit to the Private Sector



Both *Fig. 2* and *Fig.3* above suggest that over the years an inverse relationship between real bank credit and real lending rates has existed. This has been particularly significant in the post-reform period when increases in the real lending rates corresponded to declining levels in real bank credit

being extended to private sector in general. Almost a similar trend has been observed on sectoral analysis of the two variables as is being reflected in *Appendix 1*.

2.7 Summary

In conclusion, it has been noted in the preceding discussion that the financial and banking sector in Malawi is quite small, underdeveloped and the insitutional structure highly oligopolistic with limited scope of diversification in the type of financial institutions and instruments operating therein. To overcome these problems, the Government of Malawi embarked on a campaign to reform the same resulting in increased number of participants and scope of services being offered to the commercial banks' private sector clientele. The result of these reforms is the increased flow of bank credit in real terms to other sectors apart from agriculture.

CHAPTER THREE

Literature Review

3.1 Theoretical Literature Review

For better analysis, demand for bank credit is analysed in the same way as would be the case with demand for any good. Consumer theory postulates that besides its own price, the quantity demanded for any good depends on a consumer's income, prices of other goods and consumers tastes and preferences (Laidler, 1975).

According to Cochran (1983), the own price of bank credit is the prime rate, which is administratively set and tends to be related to the money market interest rate. Cochran (ibid.) further argues that in terms of prices for other goods, bank credit competes with other sources of financing instruments such as bonds, equities etc. As the yield and thus cost of borrowing from these instruments increase, demand for bank credit also increases and the reverse is equally true. Thus, demand for bank credit (CR^D) is specified as:

$$CR^D = F(Y, PR, PAS, \mu) \quad \ldots\ldots (1)$$

Where: Y = income; PR=administratively set prime rate; PAS= cost of alternative sources of credit/finance; μ = other tastes and preferences of the investor.

Consumer taste may be represented by the notion that demand for credit by the private sector is necessarily a demand for a stock of investment from which to derive profits. The essential features of investment are that it provides a flow of income to owners and households, goods and services, employment and ultimately growth for the entire economy.

However, Keynes (1936) suggested that rather than depending on income, demand for bank credit is affected by other factors including the level of production, which is further influenced by the expectations of effective demand in the form of short-term expectations of proceeds. This point is

further elaborated by Post-Keynesians who emphasise the importance of effective demand as a driving force in economic activity and/or lack thereof in explaining levels of unemployment. Coglan (1981) argues that effective demand impacts on the theory of money in that when firms make their production/investment decisions for which they need credit, they must consider the expectations of the level of effective demand in the near future. Thus, effective demand and its expectations play an important role in determining the amount of credit needed to carry out present production and investment. In outlining the importance of demand for credit in the creation of money, Post-Keynesians argue that money is created via a circuit of five stages, viz: demand for bank credit, its supply to firms from banks, production, receipt of profit from sale of production and thus its ultimate destruction when banks are repaid.

Post-Keynesian theory on bank credit demand is divided into two schools of thought, viz: Horizontalism and Structuralism.

3.1.1 Horizontalists / Accommodationists Approach

This school of thought is associated with the works of Kaldor (1970, 1982), Moore (1988), Lavoire (1992), Smithin (1994) and others. They came up with an alternative view to the theory of endogenous money, emphasizing the relationship between commercial banks and entrepreneurs as well as between commercial banks and the central bank.

Horizontalists see money arising as the counterpart of bank credit. However on the view of whether or not demand for bank credit is completely or partially determines supply of bank credit, horizontalists assume an infinite interest elasticity of the bank credit supply schedule in response to demand for the same. In a Cartesian diagram, this would be a horizontal line at the going rate of interest to represent the credit-money supply function (see *Fig. 4* below)**.** Kaldor (1982) argues that at this rate of interest, banks will stand ready to supply credit to all borrowers who meet their criteria for loans (i.e. full accommodation). The implication is that at any point in time, the volume of bank credit or its rate of expansion is limited by the availability of credit-worthy borrowers which is a non price criterion and thus there is no need to increase the loan rate as demand for credit increases. However, Rochon (1999) argues that even though the credit supply schedule is infinitely elastic, it is the responsibility of Central banks to assess the quality and direction of loans granted and for banks

to judge the ability of firms to repay loans. Giuseppe (2003) argues that the exogeneity of the going rate of interest on credit implies that central banks have substantial discretion over its variations and therefore full employment can not always be guaranteed. He further contends that it is this availability of non-price criterion that prevents the increase in credit price as demand for credit rises. This view is compatible with Keynes (1936) insight that there is always a fringe of unsatisfied borrowers.

Furthermore, horizontalists argue that the relationship between banks and entrepreneurs is a result of time discrepancy between costs and revenue of firms. They argue that demand for finance by firms is due to the non-synchronisation between costs incurred at production time and receipt of revenue after sales. This creates the need for firms to access external finance to enable them finance production costs (e.g. wages and purchase of raw materials) that are normally incurred and paid for before sale receipts are earned. Drawing on the works of Keynes (1936) and Kaldor (1970, 1982), Moore (1988) recognises that production takes time and that time should be taken seriously in any economic analysis and hence justifying the fact that firms' demand for bank credit should be explained by the sequential analysis of the production process. In particular, Moore (ibid) argues that in the process of credit-demand-credit supply, the following causal sequence of events occurs:

a) Firms require credit money to keep a production process going or to set up new businesses. At time t_0 firms face an exogenous increase in production costs. Firms raise the price of new goods but, as long as sales revenues of past productions are based on old production cost ($t_1 - t_0$ period), there is a need for additional funds to finance higher expenses.

b) Banks are institutions in the business of selling credit. They fully accommodate, at a given interest rate, the demand for additional funds. The interest rate is determined by banks as a mark-up on the short-term interest rate set by the central bank, taking into account the possibility of alternative sources of finance provided by liability management practices. Thus, banks are price-makers and quantity-takers.

c) The liquidity of banks as a whole, as opposed to the case of a single bank depends exclusively on the supply of reserves by the central bank.

d) As lender of last resort, the central bank is able to choose the short term interest rate at which reserves are made.

In short, to accomodationists, firms demand for credit arises from their need to cover for working capital. The quantity of credit demanded varies with production and investment plans and that the exogenous variable for the entire process of credit money creation is the price which is, through the intermediation of banks, under the control of the central bank.

3.1.2 Structuralists Approach

Structuralists approach is associated with the early contributions by Davidson (1972), Minsky (1975) and Chick (1983) who used the money-demand-money-supply framework to show that credit is in fact equivalent to money the only difference being that money is a medium of exchange and credit a medium of production. The most well known current exponents of this approach are Wray (1992), Howells (1995), Dow (1996) and Sawyer (2001). Davidson (1972) argued that according to Keynes, credit is viewed as a fourth motive of holding money rather than as part of a transaction motive. The difference being that the transactions motive was a result of time lags between receipts and disposal of income by the public and also receipts of proceeds and payment of wages by firms whilst the finance motive was a result of the time lag between the inception and execution of the entrepreneur's decisions. Although the interpretations may be different, the fact remains the same that finance is a component of the demand for money.

According to Davidson (ibid.), both Structuralists and Horizontalists develop their demand for bank finance, L_t^* in the same manner as follows:

$$L_t^* = \alpha C + \beta I \quad \text{...} (2)$$

Where α and β are constants ($0 \leq \alpha \leq 1; 0 \leq \beta \leq 1$) and their magnitudes depend primarily on the frequency of payments and the overlapping of payments and receipts in the system, and C and I are the real consumption and investment functions respectively.

Assuming linearity (for algebraic simplicity), then consumption function becomes;

$$C = a_1 + b_1 Y \qquad (3)$$

Where b_1 = marginal propensity to consume and the investment function becomes:

$$I = a_2 - b_2 i \qquad (4)$$

Where a_2 and b_2 are constants, and *i is* the rate of interest. Combining (3) and (4) into (2) we obtain:

$$L^*_t = \alpha a_1 + \beta a_2 + \alpha b_1 Y - \beta b_2 i \qquad (5)$$

Equation (5) depicts demand for finance by economic agents and is associated with planned or expected spending propensities i.e. it is a function of aggregate demand which in turn is a function of the level of output. The implication is that demand for finance will apart from changes in output also depend on the relationship of the change in the level of aggregate demand with a change in output (e.g. given the level of investment, demand for finance will also depend on the marginal propensity to consume). It is the shift in the L_t^* function induced by a change in spending propensities that Keynes alluded to when discussing demand for finance schedule. Every upward shift of the aggregate demand function implies prevalence of a 'finance motive' and thus this motive has evolved as one of the dynamic elements in the static Keynesian model. Bibow (1995) and Vernego (2001) stressed the fact that finance motive only comes into picture once there is a change in planned activity. It primarily emanates from a changed expansion of the economy leading to abnormal increases in planned investment. Otherwise, in the long run finance motive would not be a significant component of the total demand for money since the economy automatically generates sufficient purchasing power to sustain its current equilibrium level of spending. To the extent that it did exist, demand for finance would be temporary due to disappear in time as the needed savings materialised. In the long run, savings appear to be determining investment thus the finance motive would then be analogous to a disequilibrium situation.

Dow (1996) has argued persuasively that one of the main aims of the Structuralists approach is to "qualify and enrich" the accomodationists analysis of the credit money demand-supply process. Structuralists object to the accomodationists' depiction of an infinitely elastic credit-money supply

function interacting with a negatively sloping credit demand function in the credit market. Structuralists argue that the accommodationist approach is built on a simple assumption that the state of expectations of agents involved in the credit –demand-supply process is given and constant.

In terms of assumptions, Minsky (1975) argues that at the core of Structuralists school of thought is the assumption of a negatively sloping bank credit demand schedule interacting with a less –than – perfectly elastic bank credit supply schedule. This implies an upward sloping bank credit supply curve**.** The implication is that shifts in credit demand are not fully accommodated due to resultant increases in interest rates that leave only the most 'credit-worthy' borrowers on the market. Structuralists, according to Sawyer (2001), hold that when borrowers increase their demand for credit, the assessed risk may increase and banks will in turn increase the supply price of credit. The price of credit is now a function of the lending risk as perceived by the banks as it depends on the expected default risk attached to the banks' loans. Further to this, Giuseppe (2003) argues that perceived borrowers (or lending) risk rises with increased borrowing and hence the greater the demand for credit the greater the risk and hence the higher the price. However, once banks arrange credit lines, borrower-firms can draw on them up to the negotiated limits at a constant interest rate. This argument, together with the accommodationist view of a horizontal credit-money supply, suggest that the supply of credit-money may now be drawn as an upward-sloping curve made by a set of horizontal lines, where each line represents a different interest rate policy (see *Fig.4* below). This is where Structuralists reconcile with horizontalists. According to strucuturalists, increased credit price has another source. The shift in credit demand also lead to increased demand for reserves at the central bank by the commercial banks. At this juncture, Structuralists make another assumption that the central bank has other equally important aims to realise hence the raising base lending rates to defuse some of the demand for reserves by the banks. The implication is that a fully accommodative policy of demand for reserves by banks, and on extension by firms (as advanced by horizontalists), is not feasible.

Some structural economists such as Howells (1995), Dow (1996) and Sawyer (2001) have argued to say that at a more theoretical level, the differences in the assumptions between the horizontalists and structuralists is defined by the particular timeframe used to capture the behaviour of the economic agents in the credit-demand-supply process. Hence, accommodationists are said to have proposed a single period analysis of credit-money within which the expectations of credit demand and supply for later periods remain unchanged. In a similar way, structuralists are said to have adopted a

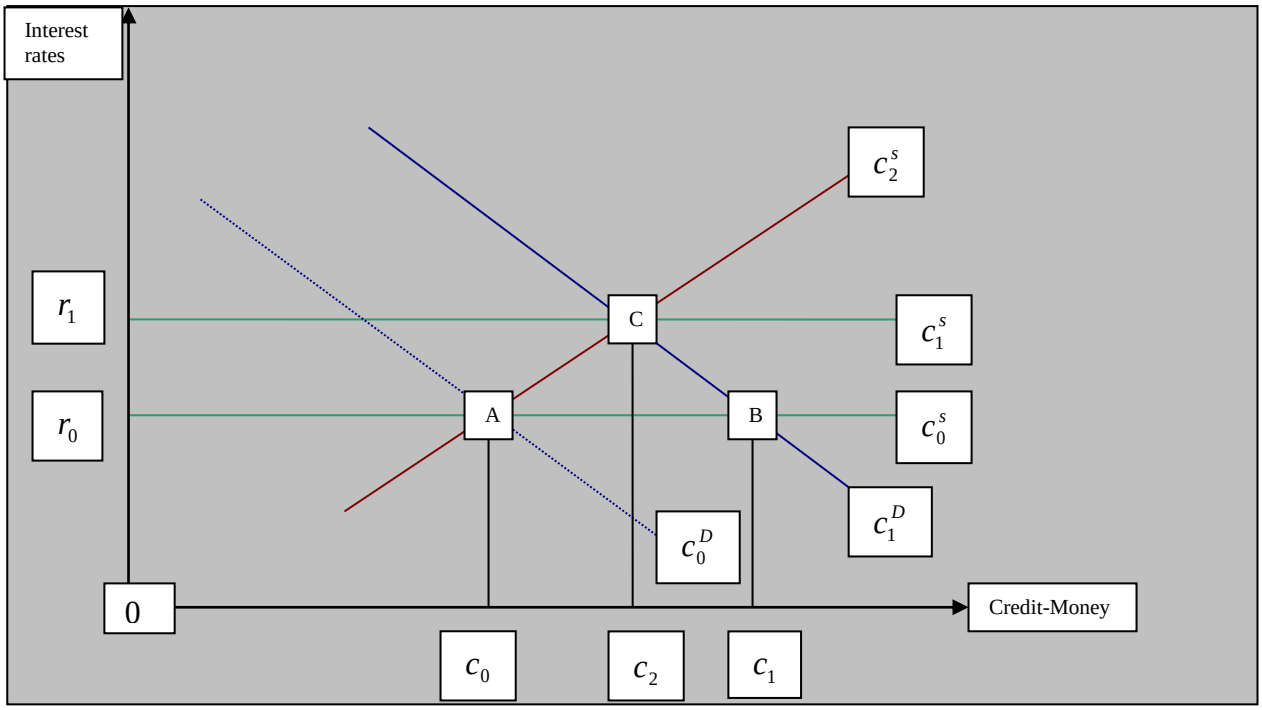
continuation analysis of credit. Their models attempt to capture the changing nature of the underlying conditions of credit-demand-supply process. Sawyer (2001) argues that structuralist models are built on the assumption that the expectations of agents are liable to disappointment. Therefore, their analysis allows for the effects of changing expectations on the actual and future level of the short-term interest rate and/or the loan rate.

Another dimension of Post-Keynesian Structuralism is that adopted by economists such as Stiglitz and Weiss (1981) who build on horizontalists and structuralists to emphasise the role of information asymmetries in limiting bank credit extension and hence investment. This brand of structuralism argues that banks typically face an excess demand for credit at a given short run rate of interest and thus they must ration the supply of credit at that rate of interest. Credit rationing occurs when some borrowers receive loans and others do not and also when loan applicants are denied credit even if they offer to pay higher interest rates. These economists further argue that faced with excess demand for loans, the loan rate is not only determined by demand and supply conditions but also by the profit maximization conditions of banks, subject to the availability of loanable funds.

3.1.3 The Controversial Issues: A graphical analysis

The bank credit market being depicted in *Fig. 4* below simplifies the controversial issue between accommodationists and structuralists of whether or not the price of credit changes in response to demand conditions. According to accommodationists, when firms demand for bank credit increases from c_0^D to c_1^D in *Fig. 4* below, the level of lending rate will remain unchanged at r_0 since it is exogenously set by monetary authorities after assessing the quality and direction of bank credit to be granted. Further, banks expectations of firm behaviour is assumed given and constant such that *ceteris paribus* they (banks) will offer credit to all borrowers that meet their criteria at price r_0. This implies that the increased bank credit demand, AB, is expected and fully accommodated at the going rate of interest. Consequently, line $r_0\, c_0^s$ defines the accommodationists' credit supply schedule.

Fig. 4: Bank Credit Market – Accomodationists vs. Structuralists



On the contrary, structuralists defend a less-than-perfectly elastic supply schedule of bank credit. They insist that banks face an uncertain business environment such that as the supply of bank credit increases in response to increased demand, the supply price is continuously revised upwards to reflect the resultant increase in default risk attached to such loans. The rise in credit price from r_0 to r_1 in response to increased demand from c_0^D to c_1^D ensures that only credit-worthy borrowers remain in the market and hence full accommodation (in the sense of horizontalists) is not attainable. The volume of bank credit only increases up to $0\,c_2$ instead of $0\,c_1$. Structuralists further argue at the new level of lending rates, r_1, banks arrange credit lines which borrower-firms can draw up to the negotiated limits at a constant interest rate. This implies that the structuralists credit supply schedule passing through points A and C, c_2^s, also incorporates the views of the horizontalists since it is made up of a series of horizontal lines each representing a different monetary stance.

3.2 Empirical Literature review

3.2.1 Developing economies

A study by Mwega et al (1990) on *'Real interest rates and the mobilisation of private savings in Africa: the case of Kenya'* tested the correlation between demand for formal sector credit by the private sector and real lending rates in Kenya. In the study, bank credit to the private sector was hypothesized to depend on real income, growth in real income and the real cost of borrowing. The specified model was:

$$\Delta CR / Y = F(\log Y, \Delta Y / Y, LCRY, L - \Pi) \quad \text{......} \quad (7)$$

Where: log Y = real income

ΔCR/Y = change in outstanding total private sector credit

ΔY/Y = growth in real income

L – л = real cost of borrowing where L is the nominal lending rate and л is the rate of inflation

LCRY = lagged dependent variable

Results of the study were in support of Structural Post- Keynesians who argue for the significance of cost of credit in determining the overall demand for credit. In addition, the results showed that the cost of borrowing had a significant negative influence on the demand for credit to the private sector with a 1% increase in real lending rates reducing the demand for credit by 0.22 % buttressing the notion of less than full accommodation of credit as advanced by the Structuralists. The results further showed that none of the other variables used in the study were significant. This finding could be due to the use of national income variable (GNP) rather than domestic income (GDP) which excludes net factor income from abroad to which resident businesses have no claim. The study concluded that Kenya's high interest rates, if left unchecked, might turn out to be stagflationary.

However, disparate results were obtained by Kim (1999) who carried out a study to investigate whether the credit channel was a key monetary transmission mechanism in the Republic of Korea following the country's recent financial crisis. The study utilised time series monthly data from

January 1993 through May 1998 to assess a disequilibrium loan market model following Stiglitz and Weiss (1981). Consequently, demand for loans was specified as:

$$L_t^D = \alpha_0 + \alpha_1 L_{t-1} + \alpha_2 (RL - RCB)_t + \alpha_3 IP_{t-1} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (6)$$

Where L_t^D denotes real bank loans i.e. total bank loans (for twenty-six banks) deflated by the consumer price index (*CP*I), and *RL* is the weighted average of loan rates applied by those banks. RCB denotes the yield of corporate bonds with a three year maturity; IP_{t-1} is the index of industrial production used to capture the firms' expectations about future economic activity. L_{t-1} is the lagged dependent variable incorporated to avoid a potential problem of endogeneity between dependent and explanatory variables, and in part to take into account the issue of stationarity of the variables being considered. The real cost of loans was proxied by the differential between the nominal loan rate and the yield of corporate bonds, *(RL-RCB)*. This variable was also used to avoid the problem of high colinearity between the nominal loan rate and rate of returns on corporate bonds. The model was estimated using maximum likelihood approach and results show that all coefficients had expected signs and also that the model was well specified (basing on significant residual variance). However, despite being in support of Strucuturalists, the size of the coefficient on real cost of loans (RL-RCB) is rather small at –0.017 when compared to -0.22 obtained in Kenya. On the contrary, industrial production does appear to have a significant explanatory power in the loan demand equation with a 1 % increase in the production index leading to a 0.21% increase in loans being demanded.

The differences in impact of changes in the cost of credit on its demand by the private sector in Korea and Kenya can firstly be attributed to differences in the measurement of real cost between the two studies and, again, on the degree of financial sector development in the two economies at the material time of the study. Financial liberalisation in Korea took place in the 1960s hence we expect a greater level of financial depth than Kenya which only liberalised its financial sector in the early 1990s. Again, unlike in Kenya, the study by Kim used domestic variable (industrial production) to proxy income hence the difference in its impact on loan demand.

Mixed results were obtained in a study by Dlamini (2000) who carried out a time series investigation on the *"Private Sector Demand for Bank Credit in Swaziland"* for the period 1974-2000. Private

sector demand for bank credit was hypothesized to depend on real bank lending rates, real output and change in private fixed capital investment and the level of previous year's bank credit to the private sector. OLS results showed that the coefficient on real cost of credit was statistically insignificant though it had the expected sign. This implied that the private sector in Swaziland heavily relies on bank credit to implement production plans such that its price ceases to be a constraint. This observation also implies that demand for bank credit in Swaziland is in support of horizontalists who argue for the insignificance of own price in determining overall demand for credit. The other variables used in the study had the expected signs and were also statistically significant with a 1% growth in real output leading to a 0.20% rise in the demand for bank credit

In Malawi, a study to ascertain the relationship between private sector investment and bank credit was carried out by Kamanga (1999). The study *"Impact of Financial Liberalisation on Private Investment in Malawi,'* utilised annual time series data covering the period from 1965-1997 and the model was specified as follows:

$$PI = B_0 + B_1 r + B_2(r)D + B_3 PDC + B_4 RERV + B_5 \Delta GDP_{t-1} + B_6 \Delta CPI + \mu \ldots\ldots\ldots\ldots\ldots (8)$$

Where: PI= ratio of private investment to GDP; r = interest rate; D= switching point dummy variable; PDC= bank credit to the private sector; ΔGDP_{t-1} = lagged change in GDP as a measure of the accelerator effect on investment; ΔCPI = percentage change in the consumer price index. Estimation of the model was done using an Error Correction and Three-Stage Least Square estimation technique. Results of the estimation showed that the rate of domestic credit to the private sector is positive and statistically significant from zero hence implying that the availability of domestic private sector credit increases investment in Malawi.

As observed most of the studies done in developing countries used time series data analysis techniques mainly because they focused on aggregated private sector data. The current study will be an improvement in the sense that it will use a breakdown of sector data. It is hoped that the use of panel data analysis will allow for a more refined modelling of the behaviour of loan demand by incorporating the specificities of individual sectors in our economy.

3.2.2 Developed economies

By using OLS and 2SLS to estimate a monthly model of the demand for small business loans in Canada between December 1981 and January 1984, Saunders (1984) estimated the following equation:

$$D_t = \beta_1 RL_t + \beta_2 (RL_t - RA_t) + \beta_3 INV_t + \beta_4 CAPI_t + \beta_5 TC_t + \beta_6 NPI_t + \beta_7 GNP_t + \mu_t \ldots \ldots\ldots\ldots\ldots \quad (9)$$

Where: D_t = total private loans demanded; RL_t = absolute lending rate; $RL_t - RA_t$ = interest rate differential (i.e. absolute lending rate less rate on alternative sources of finance); INV_t = inventories; $CAPI_t$ = capital investment; TC_t = trade credit; NPI_t = net proprietor investment (as an alternative type of finance) and GNP_t = gross national product. Results from the study were in support of Horizontalists Post-Keynesians and showed that all the variables had the expected signs and were also statistically significant except for the rate on loans. The income elasticity of demand was found to be 0.21%. A conclusion from the results was made that small businesses might be relatively insensitive to the level of cost of funds but sensitive to differentials between alternative sources of finance (whose proxy had an elasticity of 0.42%). Though the 2SLS regression seemed to fit better than OLS, both the sign pattern and coefficient significance were broadly consistent with the model.

Contrary results were obtained by King (1986) who conducted a study to evaluate the relevance of the equilibrium credit rationing approach by examining whether U.S banks act, in the aggregate, as though they ration credit and also by examining whether bank credit aggregates had any predictive content for the aggregate economic activity. Amongst the models estimated were loan demand and supply functions. The study used quarterly data from 1955-1 to 1979-3 and estimation was done using a log likelihood function in which the log of real loan demand was allowed to depend on the loan rate, the rate on commercial paper, expected inflation rate, log of GNP and the lagged quantity of loans. Results of the study showed all the variables used had the expected signs and were also statistically significant with the long run loan rate elasticity of demand at -0.54 while that of income was at 0.26. The significance of the loan rate is in support of Structural Post-Keynesians who argue for less than full accommodation of the demand for bank loans. The results further showed that loan demand was more susceptible to income shocks than it was to interest rate changes.

Calza, *et al* (2001) found similar results to those found by King (1986). They used quarterly data from 1980 Q1 to 1992 Q2 to model the demand for loans to the private sector in the euro area by means of co-integration and VECM analysis. They tested both steady state and disequilibrium hypotheses by regressing total bank loans to the private sector on output and short run and long run interest rates (all variables in real terms). The model was specified as:

$$LOANS = a + b_1 GDP + b_2 ST + b_3 LT + \varepsilon \quad \text{……...……...…} \quad (10)$$

Where: LOANS and GDP stand for logarithms of loans to the private sector and GDP both in real terms; while ST and LT denote the real short-term and long-term interest rates respectively.

The results were in support of Structuralist Post-Keynesians and suggested that the behaviour of real loans is mainly related to developments in domestic factors such a real GDP and short and long term real interest rates as the signs of their coefficients did not only conform to a priori expectations but also had sizes that were statistically different from zero. As regards the estimated coefficients, the long-run elasticity of real loans and real GDP was above unity at 1.339% where as those of short term and long term real interest rates were -1.008% and -1.788% respectively. A possible explanation for the result on GDP could be the fact that apart from capturing income effects, GDP could also have been capturing effects of omitted variables such as wealth which are also relevant in explaining credit demand in developed countries. Results on real interest rates led to the conclusion that loans seemed to be more affected by changes in long term real interest rates than by changes in short-term real interest rates. In addition, the coefficients of real short-term interest rate and long term interest rates show negative signs, suggesting that the model employed indeed describe a demand phenomenon. However the study focussed on aggregate loans to the private sector which is less informative as would be the case if they had used sector data. Thus it would be interesting to observe the outcome of the same using sector-specific data as is being proposed in the current study.

Comparing the results of studies done in developed countries to those from developing countries, one can conclude that the effect of lending rate on demand for bank loans is ambiguous although output is found to be positively related to bank credit demand. Again, results from these studies show support for both Structuralists and Horizontalists hence one can not predetermine which school of thought between the two will be supported in any empirical study. However, as is the case with

studies in developing countries, there is still need to refine the modelling of loans behaviour through use of sector data. The current study intends to contribute towards bridging this knowledge gap.

3.3 Summary from literature review

The theoretical literature review has given an insight into the factors influencing demand for credit by the private sector by emphasizing on bank credit as a medium of production without which firms can not produce and that it is positive only when an economy is growing and zero in steady state.

At the heart of debate between Post-Keynesians is the assumption of whether or not demand for bank credit is faced with an infinite interest elasticity of bank credit supply. Indeed, the controversy surrounding the response of interest rates to changes in the demand for credit has exposed major theoretical differences that separate accommodationists and structuralists. It is important to note that the differences are related to the choice of the analytical time frame, and hence to the scope of the analysis at hand. Accommodationists have limited their task to providing provisional but important conclusions about the modern credit money demand-supply process by isolating a few simple factors. Thus, they need to allow plenty of space for qualifications, adjustments and developments of their analysis. Structuralists, on the other hand, took over from where the accommodationists had stopped by incorporating the complications of the changing expectations of economic agents involved in the credit money-demand-supply process.

Empirically, results from studies conducted in both developed as well as developing economies show ambiguous results in terms of which school of thought is being supported in these two economies. In developing countries, for example, studies by Mwega *et al* (1990) and Kim (1999) were in support of Structuralists. This is in contrast to the study by Dlamini (2000) who found evidence in support of Horizontalists. In developed countries, studies by King (1986) and Calza *et al* (2001) were in support of Structuralists whereas the study by Saunders (1984) supported the Horizontalists. Thus, it would be interesting to test the outcome in the current study. In addition to this, it has been noted that dependent variables used in various empirical studies were either in stock or flow values of demand for credit. The most commonly used independent variables were the cost of borrowing, alternative sources of finance and economic activity. In addition, it has been noted that most of the studies were using time series data analysis techniques mainly because they focused on

aggregated private sector data. The current study will be different in the sense that it will use sectoral data and hence cross sector panel data analysis which is hoped to allow for a more refined modelling of the behaviour of loan demand.

CHAPTER FOUR

Methodology and Data Analysis

4.0 Introduction

This chapter discusses an assortment of analytical tools employed in the study. It briefly reviews the analytical framework for estimation before presenting the specific form of the econometric model used in the study. To ascertain reliability of empirical results, mention is also made of the various diagnostic tests that the preferred model has been subjected to. Lastly, the chapter briefly discusses the econometric package used for data analysis as well the sources of data used.

4.1 Framework of analysis and methods of estimation

Greene (2000) asserts that panel data sets are usually the most preferred framework for conducting econometric cross-sectoral studies in which heterogeneity (individual effect) is often the central focus of such analyses. In addition, Gujarati (2003) argues that panel data analyses create more variability by combining variations across economic units as well as time space. Again, the biases that result from data aggregation procedures (such as averaging cross section observations over time) are greatly minimised in panel data models. Baltagi (2003) specified a basic panel data model as:

$$y_{it} = \alpha + X_{it}^{'}\delta + \varepsilon_{it} \qquad i = 1,...,N; t = 1,...,T \quad \text{.. (11)}$$

Where: i= cross-section units; t = time series dimension; $X_{it}^{'}$ = vector of regressors; $\alpha =$intercept coefficient; and $\varepsilon_{it} =$disturbance term.

Most panel data applications utilise a one-way error component model* for the disturbances where:

$$\varepsilon_{it} = \varepsilon_i + v_{it} \quad \text{.. (12)}$$

* where parameters are assumed to be constant over time but can vary across individuals.

Where ε_i is the time invariant unobserved individual specific effects omitted in the regression equation and v_{it} is the idiosyncratic disturbance term varying with individual units as well as time.

In practice, there are a number of approaches used in estimating panel data models. The first one pools all the time series and cross sectional data and then estimate the underlying model by ordinary least squares (OLS) assuming constant intercept and slope coefficients. However, this method makes too simplistic assumptions by ignoring the heterogeneity aspect of individual cross sectional units.

Two basic methods have been identified to address the problem of heterogeneity in cross-sectional units, the fixed-effects model (FEM) and random-effects model (REM). The former assumes the individual effects in the disturbance term ε_i are correlated with the regressors and hence makes use of cross section dummies to account for the uniqueness in each cross section unit. Because of this, the approach is sometimes referred to as the least square dummy variable (LSDV). In addition, the intercept in FEM is assumed to vary across individuals though the slope coefficient may either remain constant or change over time and individuals. On this account, the FEM approach has been faulted for potential loss of degrees of freedom especially where many individual effects lead to excessive use of dummy variables. On the other hand, REM formulation rules out the possibility of any correlation between the unobserved individual specific effects with any of the regressors in the model. It further improves on the efficiency of FEM by accounting for both the cross section as well as time effects. This is a variation of the generalized least square (GLS) estimation procedure. Formally, specification tests such as the Hausman Specification Test are used to determine the appropriate model to adopt between FEM and REM (see section 4.4.1 below).

4.2 Model Specification

Owing to the discussion in the preceding section on analytical framework for cross-sectoral-time-series (panel data) models, the current study has modified models employed by Calza *et al* (2001) and Mwega *et al* (1990). Rather than focussing on aggregated bank credit for the private sector, the current study conducts an analysis of sector breakdown of bank loans to the private sector. In addition, the study includes a measure of the cost of obtaining loans from other external sources of funds specifically from the micro finance institutions. The study also includes net trading profits

retained from the previous year to proxy the level and degree of internal financing (own sources of funds) on demand for bank credit by firms in the private sector. This may also represent taste preference of the private sector. The study uses total annual income generated by each sector in the study to approximate economic activity in the same. Finally, a measure of financial sector reform has also been added owing to the nature of the time series element of our data (i.e. since it covers both the financial repression and liberalisation periods).

The model to be estimated is therefore of the form:

$$BC_{it} = f(ARCB, RCB_{it}, RETPROF_{it}, Y_{it}, LIB_t) \quad \text{..... (13a)}$$

Where:

BC_{it} = observed total credit (loans and advances) outstanding to a chosen sector *i at* any period *t* expressed in real terms. In essence, this variable is a measure of effective credit demand (i.e. total credit demanded and accessed by the private sector firms.

$ARCB_{it}$ = the differential between average lending rates of selected microfinance institutions and the rate of inflation to depict real cost of credit from competing external sources of credit other than banks.

RCB_{it} = the differential between prime lending rate and the rate of inflation to depict real cost of credit from banks.

$RETPROF_{it}$ = net trading profit retained from the previous year proxying a measure of internal financing private sector firms deflated by the GDP deflator.

Y_{it} = total annual income for a given sector representing overall economic activity for that particular sector and deflated by the corresponding GDP deflator

LIB_t = binary variable equal to 1 for t = 1990 to 2004 representing the liberalization period, otherwise zero.

Transforming all the variables in equation (13a) above except for real cost, cost of alternative sources of credit and the dummy variable into natural logs, the model becomes:

$$bc_{it} = \alpha_0 + \alpha_1 arcb_t + \alpha_2 rcb_t + \alpha_3 retprof_{it} + \alpha_4 y_{it} + \alpha_5 lib_t + \mu_{it} \quad \text{..... (13b)}$$

(+) (-) (+,-) (+,-) (+,-)

Where: $bc_{it} = \ln BC_{it}$; $arcb_t = ARCB_t$; $rcb_t = RCB_t$; $retprof_{it} = \ln RETPROF_{it}$; $y_{it} = \ln Y_{it}$; $lib_t = LIB_{it}$ and ln = *natural log.*

Furthermore, the error term in equation (13b) above is formulated as follows:

$$\mu_{it} = \mu_i + v_{it} \quad \text{..... (13c)}$$

Where μ_i captures time-invariant unobserved individual sector effects while v_{it} is the idiosyncratic disturbance term varying with individual sectors as well as time. In addition, μ_{it} above is independently and identically distributed (IID) with mean zero and constant variance.

4.2.1 Justification, measurement and expected signs of regression variables

4.2.1.1 Dependent variable

bc_{it}: Observed credit outstanding proxies effective demand for credit accessed by sector *i* at period *t*. The variable is measured in real terms (i.e. nominal credit outstanding scaled down by the GDP deflator for that particular year) and is expressed in its natural logarithmic form. According to Post-Keynesian, demand for credit exists as a means of production that varies with changes in economic activity and thus justified as a flow variable. Empirically, the choice of this dependent variable is based on the equation of demand for bank credit used by Mwega *et al* (1990).

4.2.1.2 Explanatory Variables

i. rcb_t **:** Real cost of bank credit being depicted by the differential between the nominal lending rate and the rate of inflation. The nominal lending rate depicts the cost of bank credit and the rate of inflation represents changes in the general price level in the economy. To maximise profit, businesses seek to minimise costs and thus consider the absolute price particularly the real price of credit. The expected sign for the coefficient is negative because the higher the real cost of bank credit, the less attractive it becomes hence a decline in its demand.

ii. $arcb_t$ **:** The real cost of credit from competing/alternative external sources of credit other than banks and is being captured by the differential between average nominal lending rates of selected microfinance institutions and the rate of inflation for a given year. For a normal good, its demand is expected to rise with an increase in the cost of alternative goods. Hence, we expect a positive relationship between bc_{it} and $arcb_t$. Use of this variable was also recommended by Calza *et al* (2001) though it was not included in their study.

iii. y_{it} **:** Natural log of total annual real income per sector scaled down by the corresponding GDP deflator and was employed to measure the overall sectoral economic activity. The choice of the variable has been borrowed from Calza *et al* (2001) though its coverage has been modified in this study to reflect sectoral economic activity. As pointed out by Calza *et al* (2001), there seems to be no clear consensus in the literature about how economic activity affects credit demand. One school of thought (see Kayshap *et al*, 1993) argue for a positive relationship between the two based on the theoretical grounds that increased economic activity would have a positive effect on expected income and profits and, thus, on the overall conditions of corporations. Furthermore, they argue that robust economic growth enables private agents to support higher levels of indebtedness and, consequently, to finance higher investment through credit. In addition, expectations of higher activity and productivity can lead to a larger number of projects becoming profitable in terms of expected net present value and, hence, to a higher demand for credit to finance them.

By contrast, others (see Bernanke and Gertler, 1995 and Friedman and Kuttner, 1993) argue that if any such relationship between credit and economic activity ever existed, then it might actually turn out to be negative. They argue that an increase in contemporary productivity (as opposed to expected productivity) leads to a rise in output and, ultimately, profits. Hence, during expansionary phases, companies might prefer to rely more on internal sources of finance and reduce the relative proportion of external finance (bank credit inclusive). Conversely, in recessions, profitability of firms is likely to decline and hence corporations may increase their demand for bank credit in order to smooth out the impact of lower income and profits.

Therefore, a priori, the expected sign of the coefficient of economic activity variable is ambiguous.

iv. $retprof_{it}$: Calza (2001) recommended use of this variable to measure the impact of internal financing on demand for bank credit by the private sector. Internal financing serves as one of the alternatives to firm financing and just like income above, the a priori expectation of its coefficient is ambiguous. The higher the level of retained profits, the more the private agents are able to support higher levels of indebtedness and, consequently, to finance higher investment through credit. On the contrary, the lower the level of internal financing the more the firms resort to external sources of funding.

v. lib_t: This dummy variable was included to capture the effects of financial sector reforms on private sector demand for bank credit. It also captures the unobservable effects of reforms, such as the democratic political environment and uncertainty in the policy environment (Mwamba, 2006). The dummy variable tests the significance of policy reforms that had a bearing on bank credit demand (as highlighted in *Table 1* above) in their totality as opposed to effects of individual policy reforms[7]. This is because of the possible interplay, overtime, of effects between two or more policy reforms affecting bank credit demand. According to Fry (1995), the theoretical basis of financial reforms or liberalization is deeply entrenched in the McKinnon-Shaw hypothesis of 1973. This hypothesis argues that financial deregulation in

[7] However further studies, as highlighted in section 6.2, may investigate the individual effects of such policy reforms.

developing countries result in raised interest rates hence promoting the degree of financial intermediation in an economy. Fry (ibid.) further contends that increased financial intermediation will imply increased savings, increased private sector borrowing (from banks), increased investment and finally, economic growth. By extension, increased economic growth implies more productivity and hence revenues and/or profits for private sector firms. Therefore, as discussed in (iii) and (iv) above, the a priori expectation of the sign on this variable's coefficient is ambiguous.

4.3 Data Type, Sources and Method of Estimation

The study utilised secondary annual data from 1980 to 2004 owing to the availability of data for the required variables. Data was primarily sourced from the Reserve Bank of Malawi and the National Statistical Office of Malawi. Other sources included the Ministry of Economic Planning and Development (EP and D), International Financial Statistics (IFS) various issues, World Bank Africa Database 2006 CD-ROM, World Development Indicators 2006 CD-ROM and finally, the Global Development Finance 2006 CD-ROM.

Figures for bank credit extended to the private sector reflected the total from all registered commercial banks which operated in Malawi at any time within the period 1980 to 2004. All variables except for lending rates were transformed into their natural logarithm forms for efficient interpretation of results. The choice of sectors was largely determined by the availability of data and the need to base our analysis, as much as possible, on consistent and uniform sample database. The following are the seven sectors from which data used in the study was obtained: Agriculture, Distribution, Manufacturing, Finance and Professional Services, Building and Construction, Transport and Communication and, lastly, Utilities sector. Alternative lending rates were calculated using end period lending averages from the following microfinance institutions; INDEFund Ltd, Malawi Rural Finance Ltd, SEDOM and Leasing and Finance Company of Malawi. Finally, data analysis was carried out using STATA 9.2 statistical package.

4.4 Specification and Diagnostic Tests

4.4.1 Hausman Specification Test

Hausman (1978) specification test is designed to distinguish and hence adopt the most appropriate model between the REM (GLS) and the FEM (LSDV). According to Wooldridge (2002), the LSDV model is, in practice, costly in terms of degrees of freedom lost. On the other hand, the FEM has a considerable virtue in portraying that there is little justification for treating the individual effects as uncorrelated with other regressors as is assumed in the REM. The basic idea in conducting the Hausman's specification test is to compare two estimators; one consistent under both the null hypothesis of no misspecification and under the alternative (with misspecification), whereas the other estimator is consistent only under the null hypothesis. The procedure is to test the orthogonality of the random effects and the regressors included in the model. Both the LSDV and the GLS are consistent though the former is inefficient under the null hypothesis. Therefore, under the null hypothesis, the two estimates should not differ systematically, and a test can be based on the difference. Conversely, if the two estimates are significantly different, we reject the null. Asymptotically, the test has a χ^2 distribution computed in the following manner:

Let $q = (\hat{\alpha}_{GLS} - \hat{\alpha}_{LSDV})$ and $V(q) = V(\hat{\alpha}_{GLS}) - V(\hat{\alpha}_{LSDV})$ ..... (14)

The Hausman statistic is then given as:

$$H = \hat{q}'[\hat{V}(\hat{q})]^{-1}\hat{q}$$

While the test hypothesis is formulated as:

$H_{0:}$: $\hat{\alpha}_{LSDV}$ consistent, inefficient		$\hat{\alpha}_{GLS}$ consistent, efficient
H_1 :	consistent	inconsistent

If the null hypothesis is rejected, the REM is not an appropriate specification and hence we accept the FEM formulation. The reverse is true if we are to accept the REM formulation.

4.4.2 Heteroskedasticity in Panel Data Models

Usually, the basic panel data model presented in equations (11) and (12) above is assumed to have homoskedastic regression disturbances (i.e. with same variance across time and individuals). However, this assumption may be restrictive for panels where cross section units may be of varying sizes and as a result may exhibit different variation. Baltagi (2003) argues that by assuming homoskedastic disturbances when Heteroskedasticity is present will still result in consistent estimates of regression coefficients, though these estimates will not be efficient. In addition, standard errors of these estimates will be biased unless one computes robust standard errors correcting for the possible presence of Heteroskedasticity.

4.4.3 Testing for Heteroskedasticity in Panel Data Models

Green (2003) recommended the likelihood ratio test for testing for heteroskedasticity across panels. This is a rather nested test in which the testing statistic (LR) is computed after running both a non-restricted model (assuming heteroskedastic) as well as a restricted model (assuming homoskedasticity). The latter regression is assumed to be nested in the former. Asymptotically, the LR statistic has a χ^2 distribution and is given by:

$$LR = -2(\ln L_{restricted} - \ln L_{unrestricted}) \quad \text{..... (15)}$$

In line with this, the test hypotheses are stated in the following manner:

H_0 : Homoskedasticity across panels

H_1 : Heteroskedasticity across panels

A significant LR statistic implies acceptance of Heteroskedasticity across panels. Where severe heteroskedasticity occurs, Green (2000) suggests use of an estimator such as the feasible generalised least square (FGLS) for cure.

4.4.4 Autocorrelation in Panel Data

According to Baltagi (2003), the classical error components model disturbances given by equation (12) above assumes that the only correlation overtime is due to the presence of the same individuals across the panel. This equicorrelation coefficient is shown as:

$$corr(\varepsilon_{it}, \varepsilon_{is}) = \delta_{\varepsilon}^{2} / (\delta_{\varepsilon}^{2} + \delta_{v}^{2}), \text{ for } t \neq s \text{ ..... (16)}$$

The implication of the relationship in equation (16) above is that the correlation structure is the same no matter how far *t* is from *s*. This assumption may be restrictive for most economic relationships where an unobserved shock in the current period will affect the behavioural relationship for at least the next few periods. Ignoring serial correlation when it is present will result in consistent but inefficient estimates of regression coefficients and biased standard errors.

4.4.5 Testing for Serial Correlation in Panel Data Models

Wooldridge (2002) developed a procedure for testing for serial correlation in the idiosyncratic errors of linear panel data models. Later on, Drukker (2003) provided simulation results that showed that the test has good size and power properties in reasonably sized samples. Pooled OLS residuals from an estimated regression are used to estimate a residual regression of the following form:

$$\hat{\varepsilon}_{it} = \hat{\rho}_1 \hat{\varepsilon}_{i,t-1} + error_{it} \quad \dots\ i=1, 2,3,\dots\ N;\ t = 3, 4,5,\dots,\ T \text{ .....} \quad (17)$$

Where $\hat{\varepsilon}_{it}$ are the estimated residuals for sector *i* at time *t*, $\hat{\varepsilon}_{i,t-1}$ are the estimated residuals for sector *i* in the previous time period, and $\hat{\rho}_1$ is the correlation coefficient. The test follows an F-distribution with N-1 degrees of freedom under the null hypothesis. The alternative hypotheses are formulated as:

H_0 : No first order serial correlation

H_1 : First order serial correlation

A significant F statistic indicates the presence of serial correlation and hence the need to correct for the same. To correct for serial correlation in panel data models, Greene (2000) recommends use of an estimator that explicitly takes autocorrelation into account such as the Feasible Generalised Least square approach (FGLS).

CHAPTER FIVE

Empirical Results and Discussions

5.0 Introduction

This section presents the results of the empirical analysis. *Table 5* reports a summary of descriptive statistics of the variables used in the study. The variables are drawn from a panel of 7 sectors whose composition remained more or less unchanged and have been consistently reported over the period 1980 to 2004. *Table 6* gives a summary of descriptive statistics per sector whereas *Table 7* gives results of the specification and diagnostic tests on the data. Results of the estimated regression equation (13b) are given in *Table 8* and their interpretation is given in section 5.3.2.

5.1 Analysis of Descriptive Statistics

Table 5 below gives a summarised report of descriptive statistics of variables used in the regression analysis.

Table 5: Descriptive Statistics of Variables in the Study

Variable name	Unit of Measurement	Obs	Mean	Std dev	Min	Max
bc_{it}	MK	175	6.38	1.02	2.59	7.76
$arcb_t$	Percent	175	12.75	15.94	-28.79	42.96
rcb_t	Percent	175	9.23	17.12	-27.62	42.95
$retprof_{it}$	MK	175	6.92	0.59	4.48	8.26
y_{it}	MK	175	7.83	0.45	7.09	8.67
lib_t	Binary	175	0.60	0.49	0	1

Note: The variables are as explained in section 4.2.1 above

The table shows that the real cost of bank credit (real bank lending rate) had the highest variability followed by the cost of alternative sources of funds with 17.12% and 15.94% standard deviations respectively. This suggests instability in these variables over the period of study. Further analysis of the table reveal some losses in the banking industry as reflected by negative real lending rates in

those periods when the inflation rate exceeded the nominal lending rates. Apart from lending rates, the other variables showed little variability suggesting some degree of stability in these variables across the panel. The mean of the liberalization dummy shows that about 60% of the period was post liberalization. In terms of individual sectors, *Table 6* below shows that the distribution sector recorded both the highest mean annual income as well as returned profits with the former displaying the lowest variation (standard deviation of about 6%). On the other hand, the largest amount of bank credit was extended to firms in the agricultural sector followed by those in the distribution sector. The two sector s recorded mean annual credit averages of K7.2 million and K7.1 million respectively (in real terms). Performance of the other sectors is as shown in *Table 6* below.

Table 6: Summary of descriptive statistics per individual sector

Variable name∗	**Sector name**	**Mean**	**Std. dev**	**Min**	**Max**
bc_{it}	Agriculture	7.212	0.423	5.943	7.761
$retprof_{it}$	Agriculture	6.871	0.384	5.672	7.300
y_{it}	Agriculture	7.698	0.092	7.532	7.890
bc_{it}	Distribution	7.101	0.192	6.769	7.600
$retprof_{it}$	Distribution	7.486	0.422	6.191	8.256
y_{it}	Distribution	8.554	0.058	8.460	8.669
bc_{it}	Manufacturing	6.996	0.269	6.484	7.399
$retprof_{it}$	Manufacturing	7.414	0.166	6.863	7.612
y_{it}	Manufacturing	8.281	0.214	7.326	8.529
bc_{it}	Fin & Prof. Services	6.147	0.453	5.187	7.076
$retprof_{it}$	Fin & Prof. Services	6.732	0.168	6.363	7.025
y_{it}	Fin & Prof. Services	7.745	0.111	7.569	8.052
bc_{it}	Bdng & const	6.674	0.440	5.771	7.362
$retprof_{it}$	Bdng & const	7.132	0.581	5.371	7.979
y_{it}	Bdng & const	7.794	0.226	7.553	8.231
bc_{it}	Tpt and Comm	5.992	0.4170	5.171	6.758
$retprof_{it}$	Tpt and Comm	6.171	0.6290	4.481	7.336
y_{it}	Tpt and Comm	7.398	0.1280	7.119	7.657
bc_{it}	Utilities	4.551	1.114	2.591	6.560
$retprof_{it}$	Utilities	6.611	0.297	5.639	7.290
y_{it}	Utilities	7.310	0.206	7.092	7.673

∗ *The variable names are as explained in section 4.2.1 above*

5.2 Results of Model Specification and Diagnostic Tests

This section discusses results of model specification and diagnostic tests conducted based on both the model specified in equation 13(b) as well as the preceding discussion in section 4.5 above. The tests were conducted with an aim of ensuring correct model specification and hence reliability of the estimated regression coefficients.

5.2.1 Hausman Specification Test

This test was conducted to assist in deciding on the appropriate model to adopt between the FEM and REM formulations. Results of the Hausman Specification test are presented in *Table 7* below. Under the null hypothesis of no systematic difference in the estimates from FEM and REM, the GLS estimator is appropriate as opposed to the LSDV formulation. From the test, we obtain a *p-value* of 0.9949 implying that we may not reject the null hypothesis that the GLS is an appropriate estimator as opposed to the LSDV estimator even at 10% level of significance.

5.2.2 Likelihood-Ratio Test for Heteroskedasticity

The test was conducted in order to assess whether the estimated regression equation 13(b) in chapter four above violates the assumption of homoskedastic regression disturbances across time and individual sectors. Under the null hypothesis of homoskedasticity across panels (against an alternative hypothesis of heteroskedasticity across panels), we obtain a *p-value* of 0.0000. This implies that we may reject the null hypothesis of homoskedasticity across panels even at 1% level of significance and hence, conclude that there is evidence of heteroskedastic variances across panels. In this regard, there is need to correct our data so as to obtain both consistent as well as efficient estimates of our regression coefficients. Results of this test are summarized in *Table 7* below.

5.2.3 Wooldridge Test for Serial Correlation in Panel Data

As explained in section 4.5.5 above, the Wooldridge test is conducted to investigate the possibility of any serial correlation in the idiosyncratic error term in our estimated regression equation. This is necessary to ensure that we obtain consistent and efficient estimates as well as unbiased standard errors. Under the null hypothesis of no first order serial correlation we obtain a p-value of 0.7546 implying that we may not reject the null hypothesis. Hence, we accept the argument in favour of a non-serially correlated idiosyncratic disturbance term in our estimated model.

Table 7 below summarises results of the Hausman's Specification, Likelihood-Ratio as well as the Wooldridge's tests.

Table 7: Summarized Hausman's Specification, Likelihood-Ratio and Wooldridge's Tests.

Test	H_0	Test Statistic	P-Value	Conclusion
Hausman's Specification	no systematic difference in the estimates from FEM and REM, (GLS formulation appropriate)	$\chi_5^2 = 0.41$	0.9949	Accept H_0
Likelihood-Ratio	Homoskedasticity across panels	LR $\chi_6^2 = 172.32$	0.0000	Reject H_0
Wooldridge	No first serial correlation in the idiosyncratic error term	$F_{1,6} = 0.107$	0.7546	Accept H_0

5.3 Econometric estimation of the preferred model

Having established the correct specification of our model on the basis of the Hausman's specification test and also after diagnosing our data as having heteroskedastic problem across panels, we proceed to estimate our model in equation 13(b) above by FGLS. As indicated earlier on, an FGLS transformation of our GLS model reliably purges our estimated results of any heteroskedasticity and or serial correlation effects across our panel.

5.3.1 Empirical results of the Cross-sectional time-series FGLS regression

Table 8 below presents the results of the Cross-sectional time-series FGLS regression. The estimated results are a reflective of the demand for bank credit emanating from the perspective of the entire private sector as opposed to individual.

Table 8: Estimation Results of the Cross-sectional time-series FGLS regression

Cross-sectional time-series FGLS regression

Coefficients: generalized least squares

Panels: heteroskedastic

Correlation: no autocorrelation

Estimated covariances	= 7	Number of obs.	=175
Estimated autocorrelations	= 0	Number of groups	= 7
Estimated coefficients	= 6	Time periods	= 25
		Wald chi 2(5)	= 299.63
Log likelihood	= -120.2398	Prob > chi 2	= 0. 0000

bc	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
arcb	.0163285	.0108018	1.51	0.131	-.0048427	.0374997
rcb	-.020747	.0102511	-2.02	0.043*	-.0408388	-.0006553
retprof	.2318974	.0667872	3.47	0.001**	.1009969	.362798
y	.6623108	.0885292	7.48	0.000**	.4887968	.8358248
lib	.2888277	.0581621	4.97	0.000**	.1748321	.4028233
_cons	-.4680973	.4821546	-0.97	0.332	-1.413103	.4769084

**significant at 1%

*significant at 5%

5.3.2 Interpretation of Regression Results

The estimation results shown in *Table 8* above show a Wald statistic of 299.63 with a *p-value* of 0.0000 implying that the regressors included in the estimated regression are jointly significant in explaining variability in the level of total bank credit demanded by the private sector at 1% level of significance.

The results also show that the proxy for real cost of alternative sources of credit has the expected *a priori* positive sign albeit being statistically insignificant even at 10% significance level. This is reflective of the relative underdevelopment of the microfinance institutions in Malawi in as far lending to private sector firms is concerned. Such being the case any changes in their lending rate does not significantly influence any meaningful changes in the levels of credit that is obtained from the formal banks.

On the other hand, the results also show a statistically significant negative relationship between the demand for bank credit and its own price (i.e. real cost) at 5% level of significance. The sign of the coefficient seems to further confirm that the estimated equation is indeed describing a demand behavioural relationship. Specifically, findings from the study are in support of Post-Keynesian Structural economists who argue in favour of a less-than-perfect interest rate elasticity. However, the variable representing real cost of bank credit variable has been found to have very low explanatory power. From the results, the semi-elasticity of bank credit demand with respect to its own price (i.e. real cost of bank credit) is .02 percent. This suggests that a percentage change in the real cost of bank credit will, on average, induce a 0.2 percentage change in the demand for bank credit. The fairly inelasticity of bank credit demand to its own price can be attributed to the fact that the private sector in Malawi is heavily reliant on bank credit such that its price almost ceases to be a constraint. A study by Mwega *et al* (1990) found similar results though in their case the semi-elasticity of bank credit demand with respect to its own price was a bit high at .22 percent. Similarly, Calza *et al* (2001) found a positive significant relationship between these two variables but in their case, the semi-elasticity was more than unity. Contrary results were obtained by Dlamini (2000) who found a negatively insignificant relationship between the real cost and demand for bank credit in Swaziland. The differences in the semi-elasticity values from these studies may be attributed to variations in the degree of financial sector development in the respective economies being studied.

The level of internal financing, as proxied by retained profits, showed a statistically significant positive relationship with the demand for bank credit at 1% level of significance. The elasticity of bank credit demand with respect to internal financing is fairly elastic at 0.23 percent. This implies that, *Ceteris paribus*, a 1% increase in private sector retained profits will, on average, stimulate the demand for bank credit by 0.23 percent. This is the case because the more the profits are retained, the more the private sector has alternative source of funds (from their current revenues) and hence

able to service higher levels of indebtedness to finance new investment ventures as well as meeting the current working capital needs. Economically, the more the private sector firms seek finance from banks the more they increase their investment, employment and hence production levels. In the long run, this is beneficial to the entire economy.

As per a priori expectation, the coefficient of real income is positive and is also statistically significant at 1% level of significance. The elasticity of real bank credit and real income is 0.66 percent suggesting that a 1% increase in economic activity (as measured by real income) will, on average, lead to a 0.66 percent increase in the demand for bank credit by the private sector. The result is consistent with the Post Keynesian Theory that recognizes credit as a medium of production without which firms cannot produce. Increased economic activity implies increased output and hence income which is an incentive to firms to produce more through increased investment as they demand even higher levels of credit from banks. Similar results were obtained by Calza et al (2001) though the elasticity was more than unity at 1.339 percent. Dlamini (2000) also found similar results with an elasticity of .20 percent. On the contrary, Mwega et al (1990) found output to be statistically insignificant in explaining the private sector demand for bank credit in Kenya. As pointed out earlier on, these differences in results are due to the nature of economies being studied.

Lastly, the coefficient on the dummy variable for reform is positive and statistically significant at 1% though its elasticity gives no plausible economic sense. Still, it is evident that the financial sector reforms that Malawi embarked upon starting from the late 1980's had a significant influence on the demand for bank credit by the private sector.

CHAPTER SIX

Conclusion and Policy Implications

6.1 Conclusion

The study has attempted to empirically establish the determinants of private sector demand for bank credit in Malawi for the period 1980 to 2004 using data from a total of seven sectors chosen on the basis of data availability as well as consistency in their composition. The study is justified by the observed excess liquidity in Malawian banks and the apparent reluctance of the same to extend credit to the private sector. Banks attribute this problem to an insufficient supply of "good bankable" projects by the private sector which, in turn, argues that the key hindrance to their competitiveness and expansion is the availability and cost of finance.

The model of demand for bank credit by the private sector, equation 13(b), was specified so as to capture the influence of real cost (lending rates) of bank credit, real cost of alternative sources of credit, level of internal financing by firms, economic activity and, finally, financial sector reforms on the level of private sector demand for bank credit in Malawi. The model was estimated in the framework of panel data modelling using the feasible generalised least squares (FGLS) estimators. Several specifications as well as diagnostic tests were carried out prior to estimation of the preferred model to ascertain reliability of our empirical results.

Results of the estimated equation suggest that the behaviour of real bank credit demand is related to the developments in domestic factors such as real lending rates, economic activity, level of internal financing by firms and finally, financial sector policy reforms. In addition, the results show the coefficient of real cost of bank credit as being negative hence confirming that the model employed indeed describe a demand phenomenon. Specifically, overall results are in support of Structural Post-Keynesian economists who argue in favour of less-than-perfect interest rate elasticity of bank credit demand. Furthermore, analysis of the results provides a basis for the following conclusions and policy implications:

- The real cost of bank credit has a statistically significant negative impact on the private sector demand for bank credit, albeit low elasticity, in Malawi. This statistical significance

suggests that policies aimed at reducing or even arresting increases in the real cost of bank credit (for example policies geared towards limiting increases in the inflation rate) will indeed lead to increased effective demand for bank credit by the private sector. The converse of this implication is that banks do lose out with increased inflation since, *ceteris paribus*, a rise in inflation rates can potentially result in negative real cost of credit hence decreasing both their profits as well as credit volume being extended to the private sector. This can be detrimental to the economic development of the country.

- The low elasticity of the real cost of bank credit has three policy implications. Firstly, it signifies that the private sector in Malawi is heavily reliant on bank credit such that its price almost ceases to be a constraint. This fact is buttressed by the observation that the cost of alternative sources of credit does not significantly influence demand for bank credit in Malawi. Secondly, it suggests that, on its own, a monetary policy focusing on real lending rates alone will not be the most effective way of stimulating demand for bank credit by the private sector. This further point to the fact that policies designed to stimulate bank credit demand ought to synchronise developments in real lending rates with developments in the other variables included in the regression equation (13b). Thirdly, the low elasticity of bank credit demand with respect to its real cost implies that banks can afford to increase the own price of credit (and hence realize more profits) without risking major reductions in total amount of credit extended to the private sector. This conclusion is buttressed by the observation that banks need not fear competition from alternative external sources of credit as the latter's price has been found to be insignificant.

- Both the levels of economic activity (as measured by firms' total income) as well as internal financing of firms exert a positive and significant influence on the demand for bank credit by the private sector in Malawi. The implication is that any increase in economic activity and/ or firms' own sources of funds is complementary to bank credit demand by the private sector firms. Consequently, as private sector firms take advantage of increased economic activity to raise their production levels and hence income, banks need not be concerned with possible reductions in credit being demanded as is sometimes suggested in literature. In fact, as evidenced by findings in this study, banks stand to gain from increased demand for credit as firms become more capable to support higher levels of indebtedness given their increased

productivity and own sources of funds. Another implication of this finding is that fiscal policies (such as taxation) that positively influence the level of corporate profits and hence level of firms internal finance strongly complement demand for bank credit by the private sector. This has a positive impact on overall investment and employment levels and economic development of our country.

- Finally, the financial sector reforms that Malawi embarked upon from the late 1980's have a significant positive impact on the demand for bank credit by the private sector in Malawi. However, in spite of this finding, the observed insignificance of the price of firms' alternative external sources of funds suggests the need for continued reforms to deepen the country's financial sector and hence stimulate activity in the money and capital markets. The implication is that such efforts will widen the sources of external credit available to the private sector and possibly avail the most affordable cost of finance.

6.2 Limitations of the study and areas for further research

The current study has been limited in its choice of explanatory variables due to data availability on other possible explanatory variables. However, it is hoped that inclusion of other factors such as loan purpose, maturity and collateral requirements will give more improved results in the estimations as these data become available with time. In addition, the study investigated the significance of policy reforms in their totality. Therefore, further studies may wish to investigate the significance of such reforms on individual basis.

Secondly, the current study has been limited to the determinants and/or constraints of bank credit as is being faced by the private sector in Malawi. Nonetheless, for a complete understanding of bank credit developments in the country, it will be fruitful for further studies to also investigate the behavioural characteristics of banks as issuers of credit.

REFERENCES

Baltagi, B.H. (2001). **Econometric Analysis of Panel Data**, New York: John Wiley and Sons.

Bernanke, B. and Gertler, M. (1995**). Inside the black box: the credit channel of monetary policy transmission**, NBER working paper No. 5146.

Beck, T., Demirgüc-Kunt, A., Laeven, L. and Levine, R. (2005). **Finance, Firm Size and Growth,** Policy Research Working Paper 3485. Washington, DC: World Bank.

Bibow, J. (1995). 'Some reflections on Keynes's Finance Motive for the Demand for Money,' **Cambridge Journal of Economics, 19,** 647-666.

Calza, A., Gartner, C. and Sousa, J. (2001). 'Modelling the Demand for Loans to the Private Sector in the Euro Area,' **European Central Bank Working Paper Series No 55,** Frankfurt am Main: European Central Bank.

Caprio, G. and Honohan, P. (1991). 'Excess Liquidity and Monetary Overhangs,' **Policy Research Working Paper 796**, Washington, DC: World Bank.

Chick, V. (1983). **Macroeconomics after Keynes: a reconsideration of the General Theory,** Oxford: Philip Allan.

Chipeta, C. and Mkandawire, M.L.C. (1992). **Links between the Informal and Formal Semi-Formal Financial Sectors in Malawi,** AERC Research Paper No.4, Nairobi: Initiative Publishers.

Chipeta, C. and Mkandawire, M.L.C. (1996). **Financial integration and development in sub-Saharan Africa: The formal and semi-formal financial sectors in Malawi**, Working Paper 89, London: Overseas Development Institute.

Chirwa, W., (2001). **Market Structure, Liberalisation and Performance in the Malawian Banking Industry**, AERC Research Paper No. 108, Nairobi: AERC.

Cochran, J.A. (1983). **Money, Banking and the Economy**, New York: Macmillan.

Coghlan, R. (1981). **Money, Credit and the Economy,** London: George Allen & UNWIN Ltd.

Davidson. P., and Weintraub, S. (1972), 'Money as Course and Effect,' **Economic Journal, 83,** 111-132.

Demirgüc-Kunt, A. and Maksimovic, V. (1998). 'Law, Finance and Firm Growth', **Journal of Finance, 53**, 2107-37.

Freedman, P and Reid, W. (2006). 'Banks that Don't Lend? Unlocking Credit to Spur Growth in Developing Countries,' **2006 Overseas Development Institute Policy Review, 24 (3),** Oxford: Blackwell.

Dlamini, R., (2000). **Private Sector Demand for Bank Credit: The Case of Swaziland**, unpublished, University of Botswana.

Dow, S. C. (1996). 'Horizontalism: a critique,' **Cambridge Journal of Economics, 20**, 497–508.

Drukker, D. M. (2003). 'Testing for serial correlation in linear panel-data models,' **Stata Journal, 3,** 168–177.

Friedman, B. and Kuttner, K. (1993). 'Economic activity and the short-term credit markets: an analysis of prices and quantities,' **Brookings Papers on Economic Activity, 2,** 193-283.

Fry, M. (1995), **Money Interest, and Banking in Economic Development**, London: The Johns Hopkins University Press.

Giuseppe, F. (2003). 'Post Keynesian Approaches to Endogenous Money: A Time Framework Explanation,' **Review of Political Economy, 15 (3),** 291-309.

Goldfeld, S., and Chandler, L.V. (1981). **The Economics of Money and Banking**, New York: Harper and Row.

Gondwe, S. (2001). **The Impact of Liberalisation Policies on Commercial Bank Behaviour and Financial Savings Mobilisation in Malawi**, unpublished, Economics Department, University of Malawi.

Greene, W. (2000). **Econometric Analysis,** 4th Ed., New Jersey: Prentice Hall.

Gujarati, D. (2003). '**Basic Econometrics'**, New York: McGraw Hill.

Howells, P. (1995). 'Endogenous money,' **International Papers in Political Economy, 2 (2).**

Kaldor, N. (1970). 'The New Monetarism,' **Lloyds Bank Review, 97,** 1-17.

Kaldor, N. (1982). **The Scourge of Monetarism**, Oxford: Oxford University Press.

Kamanga, J. (1999). **The Impact of Financial Liberalization on Private Investment in Malawi**, unpublished, Economics Department, University of Malawi.

Kayshap, A., Stein, J. and Wilcox, D. (1993). 'Monetary policy and credit conditions: evidence from the composition of external finance,' **American Economic Review**, **83**, 8-98.

Keynes, J., (1936). **The General Theory of Employment, Interest and Money**, London.

Kim, H., (1999). **Was Credit Channel a Key Monetary Transmission Mechanism Following the Recent Financial Crisis in the Republic of Korea?** Policy Research Working Paper 3003, Washington D.C: World Bank.

King, S., (1986). 'Monetary Transmission: Through Bank Loans or Bank Liabilities?' **Journal of Money, Credit and Banking, 18,** 290-303.

Laidler, D.E.W. (1975). **The demand for Money: Theories, Evidence and Problems,** New York: Harper and Row.

Lavoire, M. (1992). 'The Endogenous Supply of Credit Money, Liquidity Preference and the Principle of Increasing Risk,' **Scottish Journal of Political Economy, 43 (3),** 275-300.

Love, I. (2003). 'Financial Development and Financing Constraint: International Evidence from the Structural Investment Model', **Review of Financial Studies, 16**, 765-91.

Malawi Government (1989). **Malawi Government Annual Economic Report**, Zomba: Government Press.

Minsky, H. (1975). **John Maynard Keynes,** London: Macmillan.

.

Moore, B. J. (1988). **Horizontalists and Verticalists: the macroeconomics of credit money,** Cambridge: Cambridge University Press.

Mwamba, S. (2006). **Impact of Financial Sector Liberalisation on Commercial Bank Profitability in Zambia**, Unpublished, Economics Department, University of Malawi.

Mwega, F., Ngola, S., and Mwagi, N. (1990). **'Real Interest Rates and the Mobilization of Private Savings in Africa: the Case of Kenya,**' AERC Research Paper No. 2, Nairobi: AERC.

Ray, D. (1998). **Development Economics**, New Jersey: Princeton University Press.

Rochon, L. (1999). **Credit, Money and Production: An alternative Post Keynesian Approach,** London: Edward Elga Publishung Inc.

Roussakis, E. (1984). **Commercial Banking in an Era of Deregulation**, New York: Praeger Publishers.

Sacerdoti, E. (2005). 'Access to Bank Credit in Sub-Saharan Africa: Key Issues and Reform Strategies,' **IMF Working Paper WP/05/166**, Washington, DC: IMF.

Saunders, A. (1984). 'Demand for Small Business Loans,' in Horvitz, P., and Pettit, R., (eds), **Contemporary Studies in Economics and Financial Analysis (Part A), 42,** London: Jai Press Inc.

Sawyer, M.C. (2001). Kalecki on imperfect competition, inflation and money, **Cambridge Journal of Economics, 25**, 245–261.

Smithin, J. (1994). **Controversies in Monetary Economics: ideas, issues and policy,** Aldershot: Edward Elgar.

Stiglitz, J., and Weiss, A. (1981). 'Credit Rationing in Markets with Imperfect Information,' **American Economic Review, 71 (3),** 393-410.

Thomas, J. (1992). 'Whatever happened to the urban informal sector? The regressive effect of double dualism on the financial analysis of developing countries,' **Bulletin of Latin American Research, 11 (3),** 279-294.

Vernergo, M. (2001). **Credit, Interest Rates and the Open Economy: Essays on Horizontalism**, London: Edward Elga Publishing Inc.

Wooldridge, J. M. (2002). **Econometric Analysis of Cross Section and Panel Data**, Cambridge: MIT Press.

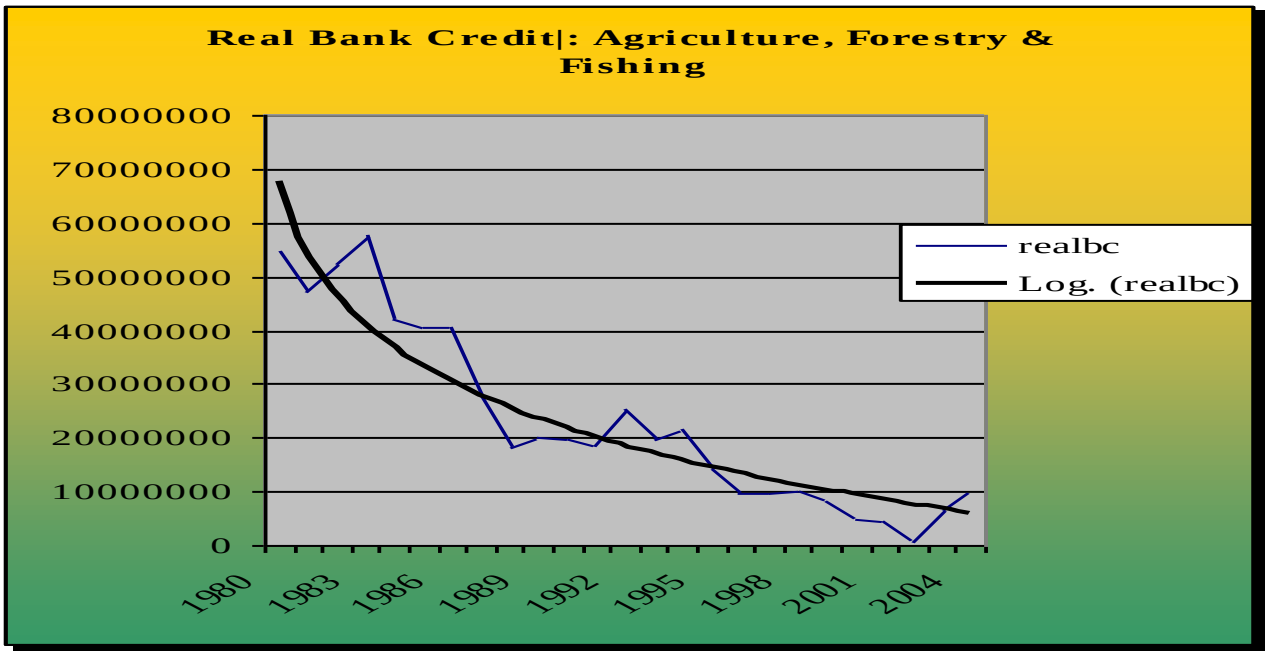
World Bank (1991). **Malawi: Financial Sector and Enterprise Development Project.** Report 9096-MAI, Washington, DC: World Bank.

Wray, L. R. (1992). Commercial banks, the central bank, and endogenous money, **Journal of Post**

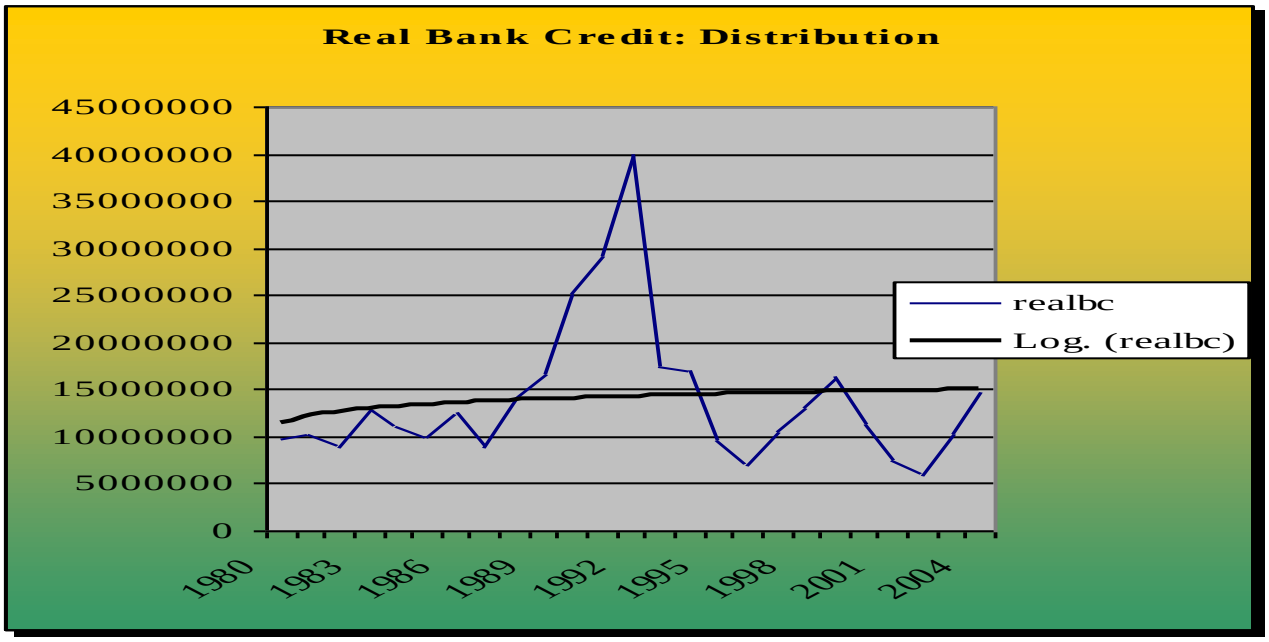
Keynesian Economics, 14, 297–282.

Appendix 1: Real Bank Credit to the Private Sector

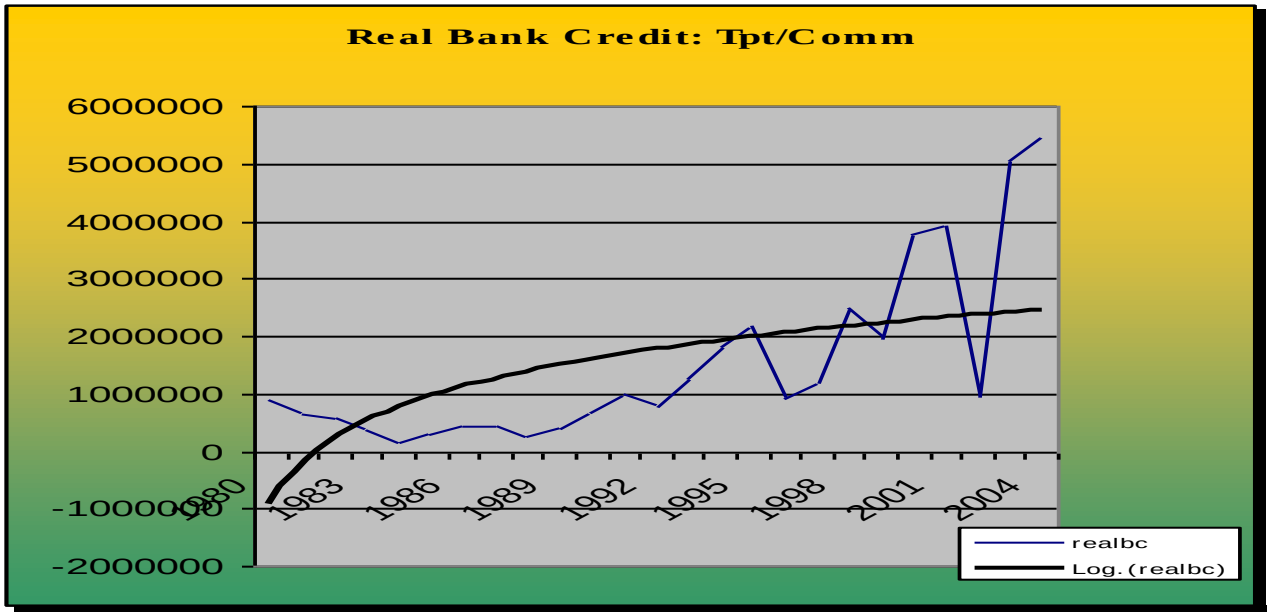
Appendix 1.1: Real Bank Credit to the Agricultural Sector



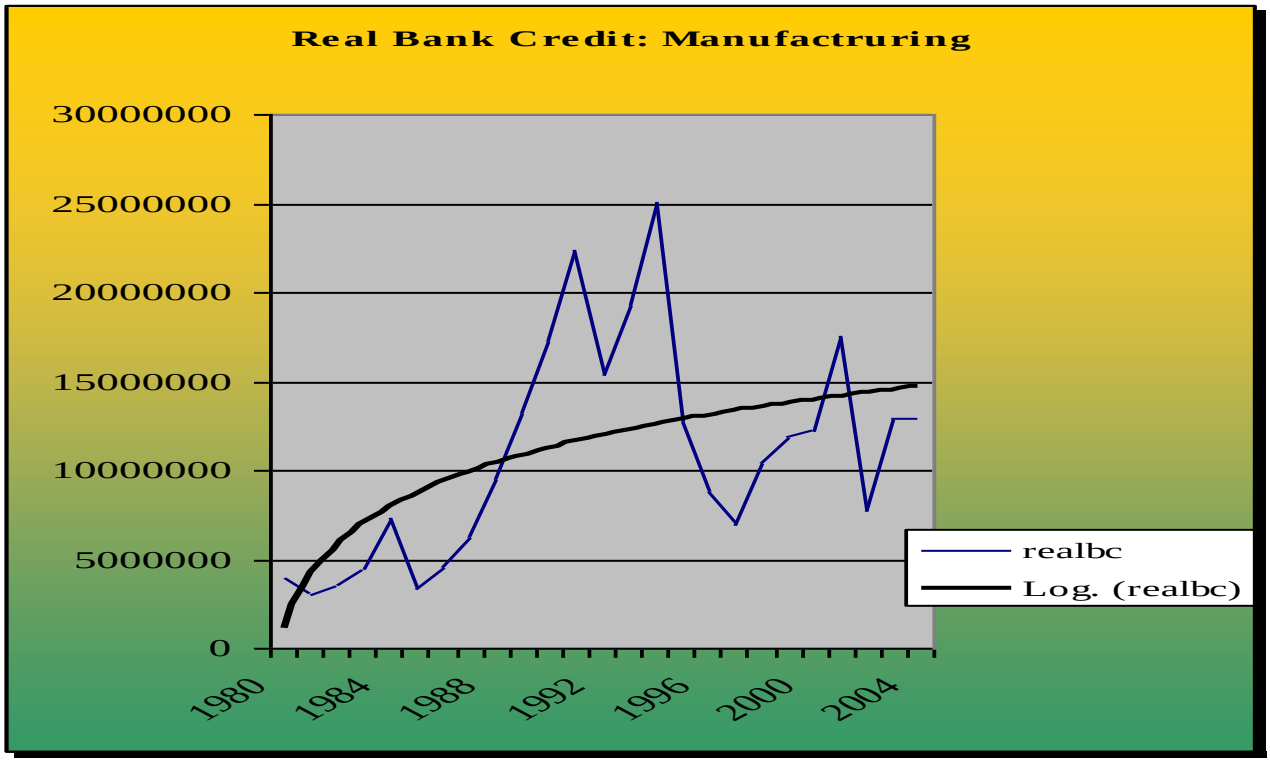
Appendix 1.2: Real Bank Credit to the Distribution Sector



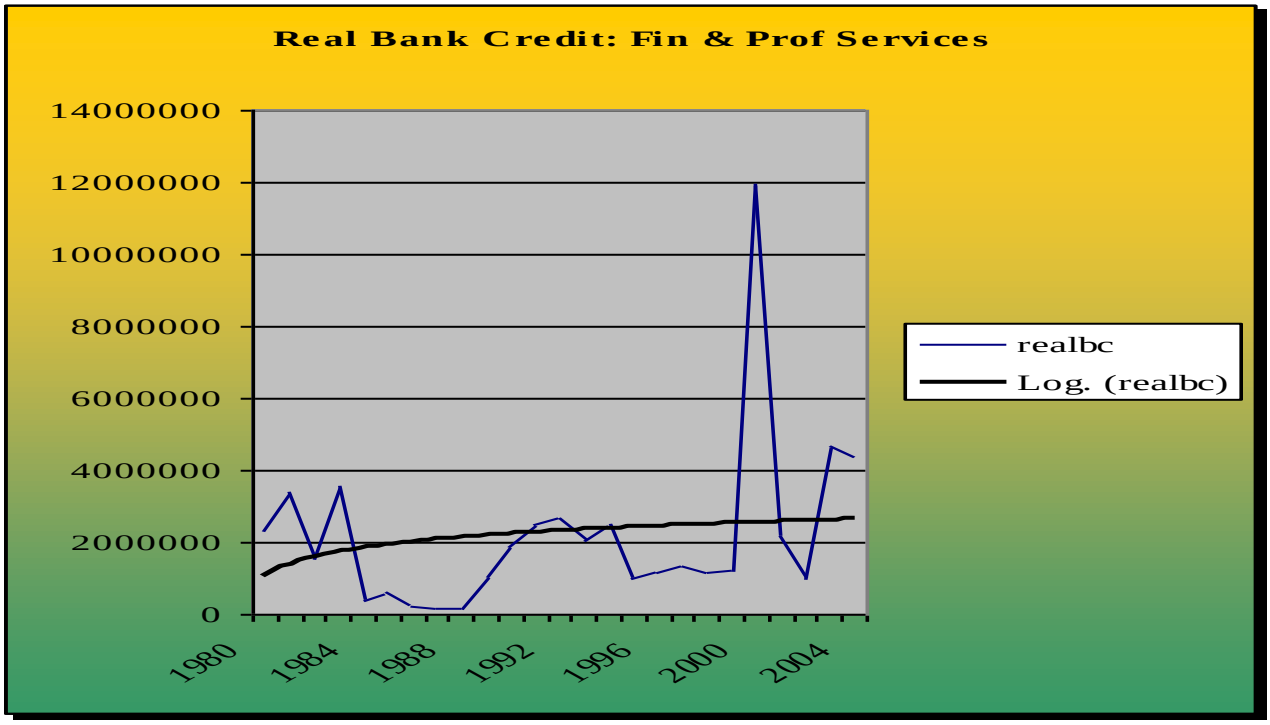
Appendix 1.3: Real Bank Credit to the Transport and Communication Sector



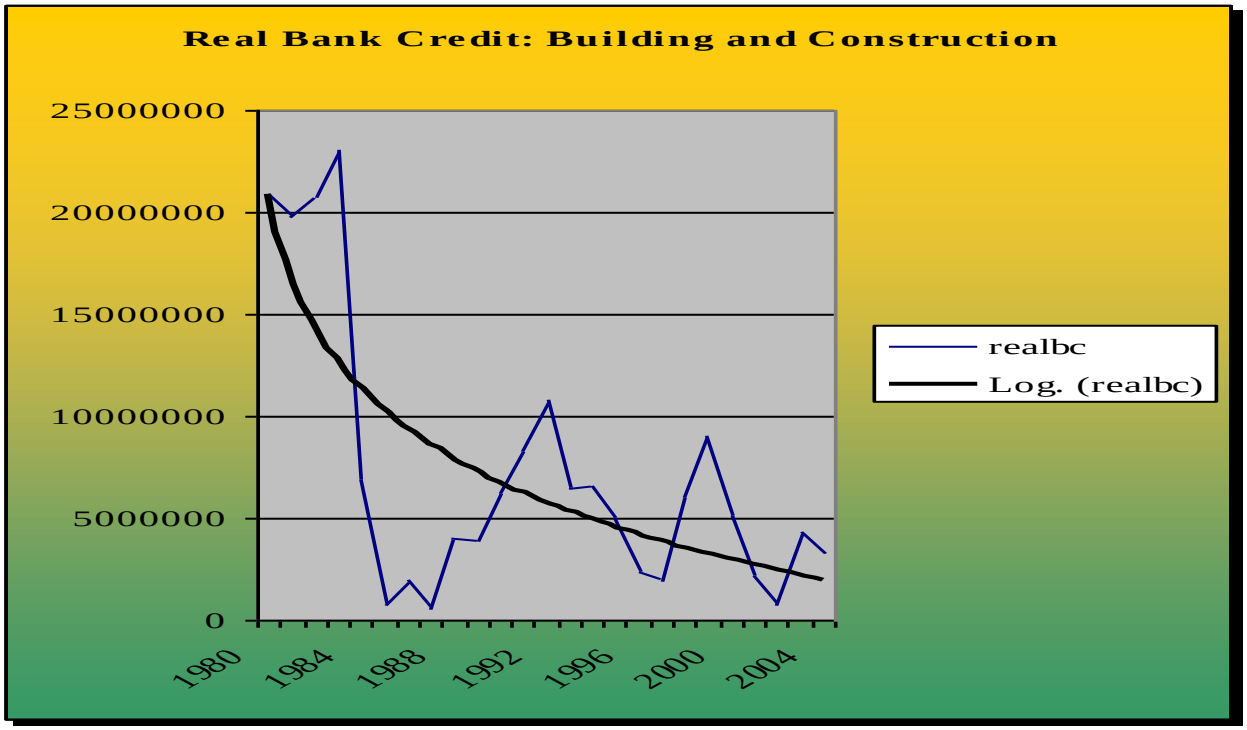
Appendix 1.4: Real Bank to the Manufacturing Sector



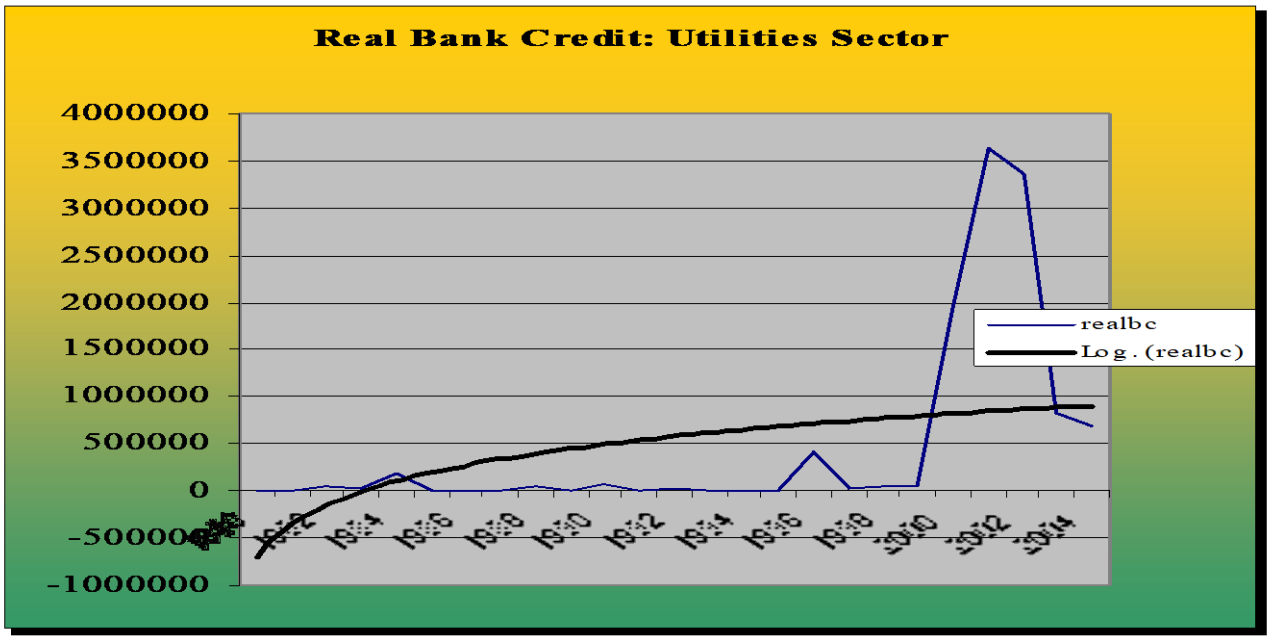
Appendix 1.5: Real Bank Credit to the Financial and Professional Services Sector



Appendix 1.6: Real Bank Credit to the Building and Construction Sector



Appendix 1.7: Real Bank Credit to the Utilities Sector



Appendix 2: Data used in the study

Datum	Year	bc	cost	alt. cost	inflation	income	retprof	gdp deflator	lib	sector ID	Sector Name
1	1980	92.7	16.7	21.7	17.7	1231.7	154.0	1.7	0	1	Agric
2	1981	94.3	18.5	23.5	11.8	1316.3	127.9	2.0	0	1	Agric
3	1982	115.1	18.5	23.5	9.7	1485.8	127.1	2.2	0	1	Agric
4	1983	138.5	18.3	23.3	13.6	1544.5	91.9	2.4	0	1	Agric
5	1984	113.5	16.5	21.5	19.9	1772.1	211.8	2.7	0	1	Agric
6	1985	117.9	18.4	23.4	10.6	2075.5	243.9	2.9	0	1	Agric
7	1986	133.5	19.0	24.0	14.1	2290.2	272.1	3.3	0	1	Agric
8	1987	109.0	19.5	24.5	25.1	2849.7	469.0	3.9	0	1	Agric
9	1988	92.3	22.3	27.3	33.9	3512.6	649.6	5.1	0	1	Agric
10	1989	125.7	23.0	28.0	12.5	4516.0	841.9	6.3	0	1	Agric
11	1990	136.2	21.0	26.0	11.8	6362.5	1052.9	6.9	1	1	Agric
12	1991	142.6	20.0	25.0	12.6	8209.0	1264.0	7.7	1	1	Agric
13	1992	219.9	22.0	27.0	23.8	9510.0	1475.0	8.7	1	1	Agric
14	1993	218.4	29.5	34.5	22.8	11356.5	1575.0	11.1	1	1	Agric
15	1994	304.4	31.0	36.0	34.5	11902.0	1686.0	14.1	1	1	Agric
16	1995	352.3	47.3	46.2	75.0	19181.0	3644.0	24.9	1	1	Agric
17	1996	365.3	45.3	49.7	6.7	22784.0	3414.0	38.0	1	1	Agric
18	1997	439.1	28.3	33.6	15.2	28116.0	3923.0	45.9	1	1	Agric
19	1998	552.0	37.7	45.6	53.2	35009.0	5413.0	54.8	1	1	Agric
20	1999	617.4	53.6	52.9	28.2	76206.8	22345.2	76.6	1	1	Agric
21	2000	498.8	53.1	52.0	35.4	96734.2	31088.6	100.0	1	1	Agric
22	2001	565.5	56.2	53.4	22.1	127419.2	48714.0	125.6	1	1	Agric
23	2002	128.2	50.5	49.9	7.6	149006.2	50648.3	146.2	1	1	Agric
24	2003	1059.1	48.9	49.3	9.8	192774.7	22046.4	159.7	1	1	Agric
25	2004	1786.7	36.8	38.3	13.7	231094.4	38510.3	179.7	1	1	Agric
1	1980	16.5	16.7	21.7	17.7	1231.7	154.0	1.7	0	2	Dsbn
2	1981	20.4	18.5	23.5	11.8	1316.3	127.9	2.0	0	2	Dsbn
3	1982	19.7	18.5	23.5	9.7	1485.8	127.1	2.2	0	2	Dsbn
4	1983	30.9	18.3	23.3	13.6	1544.5	91.9	2.4	0	2	Dsbn
5	1984	29.8	16.5	21.5	19.9	1772.1	211.8	2.7	0	2	Dsbn
6	1985	28.8	18.4	23.4	10.6	2075.5	243.9	2.9	0	2	Dsbn
7	1986	41.5	19.0	24.0	14.1	2290.2	272.1	3.3	0	2	Dsbn
8	1987	34.7	19.5	24.5	25.1	2849.7	469.0	3.9	0	2	Dsbn
9	1988	71.7	22.3	27.3	33.9	3512.6	649.6	5.1	0	2	Dsbn
10	1989	105.5	23.0	28.0	12.5	4516.0	841.9	6.3	0	2	Dsbn
11	1990	173.6	21.0	26.0	11.8	6016.0	950.2	6.9	1	2	Dsbn
12	1991	226.2	20.0	25.0	12.6	7516.0	1100.7	7.7	1	2	Dsbn
13	1992	346.5	22.0	27.0	23.8	9516.0	1357.6	8.7	1	2	Dsbn

14	1993	193.6	29.5	34.5	22.8	10990.0	1495.6	11.1	1	2	Dsbn
15	1994	238.7	31.0	36.0	34.5	11902.0	1686.0	14.1	1	2	Dsbn
16	1995	239.3	47.3	46.2	75.0	19181.0	3644.0	24.9	1	2	Dsbn
17	1996	265.1	45.3	49.7	6.7	22784.0	3414.0	38.0	1	2	Dsbn
18	1997	491.9	28.3	33.6	15.2	28116.0	3923.0	45.9	1	2	Dsbn
19	1998	719.4	37.7	45.6	53.2	35009.0	5413.0	54.8	1	2	Dsbn
20	1999	1259.9	53.6	52.9	28.2	76206.8	22345.2	76.6	1	2	Dsbn
21	2000	1119.8	53.1	52.0	35.4	96734.2	31088.6	100.0	1	2	Dsbn
22	2001	939.2	56.2	53.4	22.1	127419.2	48714.0	125.6	1	2	Dsbn
23	2002	858.0	50.5	49.9	7.6	149006.2	50648.3	146.2	1	2	Dsbn
24	2003	1653.0	48.9	49.3	9.8	192774.7	22046.4	159.7	1	2	Dsbn
25	2004	2656.9	36.8	38.3	13.7	231094.4	38510.3	179.7	1	2	Dsbn
1	1980	6.7	16.7	21.7	17.7	1231.7	154.0	1.7	0	3	Manuf
2	1981	6.1	18.5	23.5	11.8	1316.3	127.9	2.0	0	3	Manuf
3	1982	7.8	18.5	23.5	9.7	1485.8	127.1	2.2	0	3	Manuf
4	1983	10.8	18.3	23.3	13.6	1544.5	91.9	2.4	0	3	Manuf
5	1984	19.8	16.5	21.5	19.9	1772.1	211.8	2.7	0	3	Manuf
6	1985	9.8	18.4	23.4	10.6	2075.5	243.9	2.9	0	3	Manuf
7	1986	15.3	19.0	24.0	14.1	2290.2	272.1	3.3	0	3	Manuf
8	1987	24.7	19.5	24.5	25.1	2849.7	469.0	3.9	0	3	Manuf
9	1988	48.6	22.3	27.3	33.9	3512.6	649.6	5.1	0	3	Manuf
10	1989	83.4	23.0	28.0	12.5	4516.0	841.9	6.3	0	3	Manuf
11	1990	119.2	21.0	26.0	11.8	6517.2	955.8	6.9	1	3	Manuf
12	1991	171.8	20.0	25.0	12.6	8790.8	1123.8	7.7	1	3	Manuf
13	1992	134.3	22.0	27.0	23.8	9950.4	1357.9	8.7	1	3	Manuf
14	1993	214.3	29.5	34.5	22.8	10178.8	1502.7	11.1	1	3	Manuf
15	1994	353.5	31.0	36.0	34.5	11902.0	1686.0	14.1	1	3	Manuf
16	1995	316.2	47.3	46.2	75.0	19181.0	3644.0	24.9	1	3	Manuf
17	1996	331.9	45.3	49.7	6.7	22784.0	3414.0	38.0	1	3	Manuf
18	1997	322.1	28.3	33.6	15.2	28116.0	3923.0	45.9	1	3	Manuf
19	1998	573.7	37.7	45.6	53.2	35009.0	5413.0	54.8	1	3	Manuf
20	1999	914.3	53.6	52.9	28.2	76206.8	22345.2	76.6	1	3	Manuf
21	2000	1228.9	53.1	52.0	35.4	96734.2	31088.6	100.0	1	3	Manuf
22	2001	2206.9	56.2	53.4	22.1	127419.2	48714.0	125.6	1	3	Manuf
23	2002	1141.0	50.5	49.9	7.6	149006.2	50648.3	146.2	1	3	Manuf
24	2003	2065.8	48.9	49.3	9.8	192774.7	22046.4	159.7	1	3	Manuf
25	2004	2327.4	36.8	38.3	13.7	231094.4	38510.3	179.7	1	3	Manuf
1	1980	4.0	16.7	21.7	17.7	1231.7	154.0	1.7	0	4	Fin / Prof
2	1981	6.8	18.5	23.5	11.8	1316.3	127.9	2.0	0	4	Fin / Prof
3	1982	3.4	18.5	23.5	9.7	1485.8	127.1	2.2	0	4	Fin / Prof

4	1983	8.5	18.3	23.3	13.6	1544.5	91.9	2.4	0	4	Fin / Prof
5	1984	1.1	16.5	21.5	19.9	1772.1	211.8	2.7	0	4	Fin / Prof
6	1985	1.7	18.4	23.4	10.6	2075.5	243.9	2.9	0	4	Fin / Prof
7	1986	0.7	19.0	24.0	14.1	2290.2	272.1	3.3	0	4	Fin / Prof
8	1987	0.6	19.5	24.5	25.1	2849.7	469.0	3.9	0	4	Fin / Prof
9	1988	0.9	22.3	27.3	33.9	3512.6	649.6	5.1	0	4	Fin / Prof
10	1989	6.8	23.0	28.0	12.5	4516.0	841.9	6.3	0	4	Fin / Prof
11	1990	13.2	21.0	26.0	11.8	5580.7	995.8	6.9	1	4	Fin / Prof
12	1991	19.3	20.0	25.0	12.6	7356.9	1098.2	7.7	1	4	Fin / Prof
13	1992	23.4	22.0	27.0	23.8	9026.8	1208.3	8.7	1	4	Fin / Prof
14	1993	22.8	29.5	34.5	22.8	10078.8	1889.8	11.1	1	4	Fin / Prof
15	1994	35.4	31.0	36.0	34.5	11902.0	2590.2	14.1	1	4	Fin / Prof
16	1995	25.5	47.3	46.2	75.0	19181.0	3644.0	24.9	1	4	Fin / Prof
17	1996	43.4	45.3	49.7	6.7	22784.0	3414.0	38.0	1	4	Fin / Prof
18	1997	61.9	28.3	33.6	15.2	28116.0	3923.0	45.9	1	4	Fin / Prof
19	1998	63.0	37.7	45.6	53.2	35009.0	5413.0	54.8	1	4	Fin / Prof
20	1999	93.2	53.6	52.9	28.2	76206.8	22345.2	76.6	1	4	Fin / Prof
21	2000	1192.4	53.1	52.0	35.4	96734.2	31088.6	100.0	1	4	Fin / Prof
22	2001	268.7	56.2	53.4	22.1	127419.2	48714.0	125.6	1	4	Fin / Prof
23	2002	148.8	50.5	49.9	7.6	149006.2	50648.3	146.2	1	4	Fin / Prof
24	2003	745.5	48.9	49.3	9.8	192774.7	22046.4	159.7	1	4	Fin / Prof
25	2004	774.8	36.8	38.3	13.7	231094.4	38510.3	179.7	1	4	Fin / Prof
1	1980	35.5	16.7	21.7	17.7	1231.7	154.0	1.7	0	5	Const
2	1981	39.7	18.5	23.5	11.8	1316.3	127.9	2.0	0	5	Const
3	1982	45.8	18.5	23.5	9.7	1485.8	127.1	2.2	0	5	Const
4	1983	55.2	18.3	23.3	13.6	1544.5	91.9	2.4	0	5	Const
5	1984	18.4	16.5	21.5	19.9	1772.1	211.8	2.7	0	5	Const
6	1985	2.3	18.4	23.4	10.6	2075.5	243.9	2.9	0	5	Const
7	1986	6.5	19.0	24.0	14.1	2290.2	272.1	3.3	0	5	Const
8	1987	2.3	19.5	24.5	25.1	2849.7	469.0	3.9	0	5	Const
9	1988	20.3	22.3	27.3	33.9	3512.6	649.6	5.1	0	5	Const
10	1989	24.9	23.0	28.0	12.5	4516.0	841.9	6.3	0	5	Const
11	1990	43.4	21.0	26.0	11.8	6067.9	980.3	6.9	1	5	Const

12	1991	64.4	20.0	25.0	12.6	7940.4	1127.4	7.7	1	5	Const
13	1992	94.1	22.0	27.0	23.8	9045.8	1467.3	8.7	1	5	Const
14	1993	71.9	29.5	34.5	22.8	10467.6	1563.2	11.1	1	5	Const
15	1994	92.7	31.0	36.0	34.5	11902.0	1686.0	14.1	1	5	Const
16	1995	125.6	47.3	46.2	75.0	19181.0	3644.0	24.9	1	5	Const
17	1996	91.0	45.3	49.7	6.7	22784.0	3414.0	38.0	1	5	Const
18	1997	89.6	28.3	33.6	15.2	28116.0	3923.0	45.9	1	5	Const
19	1998	332.6	37.7	45.6	53.2	35009.0	5413.0	54.8	1	5	Const
20	1999	688.2	53.6	52.9	28.2	76206.8	22345.2	76.6	1	5	Const
21	2000	506.9	53.1	52.0	35.4	96734.2	31088.6	100.0	1	5	Const
22	2001	271.8	56.2	53.4	22.1	127419.2	48714.0	125.6	1	5	Const
23	2002	111.0	50.5	49.9	7.6	149006.2	50648.3	146.2	1	5	Const
24	2003	681.9	48.9	49.3	9.8	192774.7	22046.4	159.7	1	5	Const
25	2004	582.4	36.8	38.3	13.7	231094.4	38510.3	179.7	1	5	Const
1	1980	1.5	16.7	21.7	17.7	1231.7	154.0	1.7	0	6	Tpt & Comm
2	1981	1.3	18.5	23.5	11.8	1316.3	127.9	2.0	0	6	Tpt & Comm
3	1982	1.3	18.5	23.5	9.7	1485.8	127.1	2.2	0	6	Tpt & Comm
4	1983	0.9	18.3	23.3	13.6	1544.5	91.9	2.4	0	6	Tpt & Comm
5	1984	0.4	16.5	21.5	19.9	1772.1	211.8	2.7	0	6	Tpt & Comm
6	1985	0.9	18.4	23.4	10.6	2075.5	243.9	2.9	0	6	Tpt & Comm
7	1986	1.4	19.0	24.0	14.1	2290.2	272.1	3.3	0	6	Tpt & Comm
8	1987	1.7	19.5	24.5	25.1	2849.7	469.0	3.9	0	6	Tpt & Comm
9	1988	1.4	22.3	27.3	33.9	3512.6	649.6	5.1	0	6	Tpt & Comm
10	1989	2.5	23.0	28.0	12.5	4516.0	841.9	6.3	0	6	Tpt & Comm
11	1990	4.6	21.0	26.0	11.8	6520.8	908.4	6.9	1	6	Tpt & Comm
12	1991	7.5	20.0	25.0	12.6	7745.9	1086.3	7.7	1	6	Tpt & Comm
13	1992	6.7	22.0	27.0	23.8	9045.8	1256.9	8.7	1	6	Tpt & Comm
14	1993	14.2	29.5	34.5	22.8	10048.9	2468.2	11.1	1	6	Tpt & Comm
15	1994	25.6	31.0	36.0	34.5	11902.0	3025.9	14.1	1	6	Tpt & Comm
16	1995	54.0	47.3	46.2	75.0	19181.0	3644.0	24.9	1	6	Tpt & Comm

17	1996	34.9	45.3	49.7	6.7	22784.0	3414.0	38.0	1	6	Tpt & Comm
18	1997	54.8	28.3	33.6	15.2	28116.0	3923.0	45.9	1	6	Tpt & Comm
19	1998	135.7	37.7	45.6	53.2	35009.0	5413.0	54.8	1	6	Tpt & Comm
20	1999	151.4	53.6	52.9	28.2	76206.8	22345.2	76.6	1	6	Tpt & Comm
21	2000	378.0	53.1	52.0	35.4	96734.2	31088.6	100.0	1	6	Tpt & Comm
22	2001	489.9	56.2	53.4	22.1	127419.2	48714.0	125.6	1	6	Tpt & Comm
23	2002	140.8	50.5	49.9	7.6	149006.2	50648.3	146.2	1	6	Tpt & Comm
24	2003	810.1	48.9	49.3	9.8	192774.7	22046.4	159.7	1	6	Tpt & Comm
25	2004	984.1	36.8	38.3	13.7	231094.4	38510.3	179.7	1	6	Tpt & Comm
1	1980	0.0	16.7	21.7	17.7	1231.7	154.0	1.7	0	7	Utilities
2	1981	0.0	18.5	23.5	11.8	1316.3	127.9	2.0	0	7	Utilities
3	1982	0.1	18.5	23.5	9.7	1485.8	127.1	2.2	0	7	Utilities
4	1983	0.1	18.3	23.3	13.6	1544.5	91.9	2.4	0	7	Utilities
5	1984	0.5	16.5	21.5	19.9	1772.1	211.8	2.7	0	7	Utilities
6	1985	0.0	18.4	23.4	10.6	2075.5	243.9	2.9	0	7	Utilities
7	1986	0.0	19.0	24.0	14.1	2290.2	272.1	3.3	0	7	Utilities
8	1987	0.0	19.5	24.5	25.1	2849.7	469.0	3.9	0	7	Utilities
9	1988	0.2	22.3	27.3	33.9	3512.6	649.6	5.1	0	7	Utilities
10	1989	0.0	23.0	28.0	12.5	4516.0	841.9	6.3	0	7	Utilities
11	1990	0.5	21.0	26.0	11.8	6587.4	1004.3	6.9	1	7	Utilities
12	1991	0.0	20.0	25.0	12.6	7986.6	1243.9	7.7	1	7	Utilities
13	1992	0.2	22.0	27.0	23.8	9009.7	1398.9	8.7	1	7	Utilities
14	1993	0.0	29.5	34.5	22.8	1087.6	15699.3	11.1	1	7	Utilities
15	1994	0.2	31.0	36.0	34.5	11902.0	1686.0	14.1	1	7	Utilities
16	1995	0.1	47.3	46.2	75.0	19181.0	3644.0	24.9	1	7	Utilities
17	1996	15.6	45.3	49.7	6.7	22784.0	3414.0	38.0	1	7	Utilities
18	1997	1.1	28.3	33.6	15.2	28116.0	3923.0	45.9	1	7	Utilities
19	1998	3.2	37.7	45.6	53.2	35009.0	5413.0	54.8	1	7	Utilities
20	1999	4.0	53.6	52.9	28.2	76206.8	22345.2	76.6	1	7	Utilities
21	2000	195.3	53.1	52.0	35.4	96734.2	31088.6	100.0	1	7	Utilities
22	2001	455.9	56.2	53.4	22.1	127419.2	48714.0	125.6	1	7	Utilities
23	2002	491.1	50.5	49.9	7.6	149006.2	50648.3	146.2	1	7	Utilities
24	2003	131.6	48.9	49.3	9.8	192774.7	22046.4	159.7	1	7	Utilities
25	2004	122.5	36.8	38.3	13.7	231094.4	38510.3	179.7	1	7	Utilities