

Market structure, liberalization and performance in the Malawian banking industry

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AERC Research Paper 108
African Economic Research Consortium, Nairobi
July 2001

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Published by: The African Economic Research Consortium
P.O. Box 62882
Nairobi, Kenya

Printed by: The Regal Press Kenya, Ltd.
P.O. Box 46116
Nairobi, Kenya

ISBN 9966-944-41-9

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Abstract

Financial sector reforms in Malawi began in the late 1980s as a continuation of structural adjustment programmes sponsored by the International Monetary Fund and the World Bank. Prior to liberalization, the financial system was highly repressed, with heavy government intervention in the banking sector through credit and interest rate controls. Furthermore, the banking sector was highly oligopolistic: two banks dominated commercial banking activities. Financial sector reforms led to the removal of credit ceilings and interest rate controls and opened the banking system to new competition. This study examines the effect of financial sector reforms on market structure, financial intermediation, savings mobilization and commercial bank profitability in the Malawian banking industry. The evidence in this study shows that some signs of financial repression still exist, although some positive developments have taken place. The results show that financial liberalization has significantly increased financial depth and savings mobilization, increased credit to the manufacturing sector, and reduced the monopoly power in the Malawian banking system. However, real interest rates have fallen, intermediation margins have increased, credit to the public sector has increased and that to the private sector has fallen. Using the market structure–performance hypothesis, the study finds a significant relationship between monopoly power and commercial bank profitability, but rejects the efficient market hypothesis. Thus, although interest rates were under control for most of the study period, other bank services that generate income for commercial banks were subject to monopoly power abuse.

Acknowledgements

I would like to thank the African Economic Research Consortium (AERC) for funding this research project. I am also grateful to a number of people who provided comments and guidance at the various AERC Biannual Research Workshops, particularly resource persons and fellow researchers. Specifically, I thank professors Ibrahim Elbadawi, Paul Collier, Machiko Nissanke, Chris Adam and Ernest Aryeetey, and anonymous AERC referees for their tireless efforts in shaping the study. Nonetheless, I am solely responsible for any errors and omissions in this study.

1. Introduction

Background to the study

Traditionally banks have been heavily regulated by the monetary authorities. On the one hand, such regulation led financial markets in most developing countries, especially in the 1970s and early 1980s, to be characterized by financial repression. In Malawi, as in most less developed countries (LDCs), the financial system was highly repressed, characterized by heavy regulation through credit and interest rate controls until the late 1980s. This had negated the vital role the banking sector plays in economic development and growth. Government interventions in the financial system have been the basis of the McKinnon–Shaw hypothesis of financial repression in developing countries (McKinnon, 1973; Shaw, 1973). It is argued that for sustainable growth, the banking sector has to be effective and efficient to respond favourably to the needs of the productive sectors of the economy. With the adoption of structural adjustment programmes in 1981, the Malawi Government embarked on financial liberalization that among other things led to the removal of restrictions on credit and interest rates charged by commercial banks.

On the other hand, government intervention and regulation in the financial sector also created highly concentrated market structures in the banking industry, leading to monopolistic or oligopolistic market structures. Economic theory predicts different welfare outcomes for different market structures through firms' price and non-price behaviours. The market structure–conduct–performance (SCP) hypothesis has been a basis for analysing firm behaviour or performance given the structure of the market. According to the SCP hypothesis market structure influences conduct (behaviour) of firms through for instance pricing and investment policies, and this in turn translates into performance. The definitive theoretical implication of the SCP hypothesis is that in concentrated markets prices will be less favourable to consumers because of the noncompetitive behaviour that arises in such markets. This hypothesis is a tool of analysis in industrial business behaviour, and is also applied in the banking sector especially in the developed countries.¹

Until recently, the Malawian banking industry has been oligopolistic. At independence in 1964, two foreign commercial banks dominated the banking industry (Standard Bank and Barclays Bank), with the New Building Society (NBS), National Finance Company (NFC) and the Post Office Savings Bank (POSB) providing fringe competition. In 1971, the activities of Standard Bank and Barclays Bank were transferred to National Bank of Malawi (NBM), effectively creating a monopoly situation for NBM. In 1969 the

Commercial Bank of Malawi (CBM) was incorporated; it started operations in 1970 providing fringe competition to National Bank of Malawi and offering similar commercial banking facilities. The late 1980s and 1990s witnessed moderate entry into commercial banking services by non-bank financial institutions. In 1987, Leasing and Finance Company of Malawi (LFC) was incorporated offering financial leases. In the 1990s the financial system opened up to entry. New banking institutions were incorporated such as INDEFinance, Finance Company of Malawi (FINCOM), First Merchant Bank (FMB) and Malawi Finance Bank (MFB). The POSB was incorporated into Malawi Savings Bank. Despite the changes, however, the two established commercial banks still dominate the banking industry.

Justification and objectives of the study

There are numerous studies in developing countries on the structure of the financial system (both formal and informal), and its role in savings mobilization and intermediation (Soyibo and Adekanye, 1992a, 1992b; Mrak, 1989; Fischer, 1989; Civelek and Al-Alami, 1991; Seck and El Nil, 1993; Agu, 1992). In Malawi, there have been other studies undertaken that have also focused on savings mobilization and monetary policy including those by Chipeta and Mkandawire (1991, 1992) and Silumbu (1990). Chipeta and Mkandawire focused on the role of the informal sector and the link that exists between the informal and formal/semi-formal sectors. Because of the lack of effective competition, however, the banking industry in Malawi has been characterized by limited financial facilities, interlocking directorship and oligopolistic interdependence (MCCI, 1990; MDC and ERL, 1989). The latter problem has not been adequately investigated. This study notes the absence of empirical inquiry into the effects of market structure on the performance of the banking industry in Malawi, and attempts to provide such missing empirical evidence. The concentration of bank deposits in a few commercial banks is likely to have policy implications for the direction of reform in the financial sector. If there is evidence of a positive relationship between market structure and profitability in the Malawian banking market, this would imply that regulatory policies should aim at changing market structure to increase competition or quality of bank services.

The specific research problem being investigated by the study is the relevance of market structure and behavioural elements to bank profitability, and the effect of financial reforms on savings mobilization and financial intermediation in the Malawian banking industry. The study in particular assesses whether competitive banking matters for the vibrancy of the financial system. The study has four specific objectives. First, to assess the impact of financial sector reform on structural and policy variables in the Malawian banking system. Second, to analyse the effects of liberalization measures on savings and intermediation. Third, to examine the effect of bank concentration on the profitability performance. Finally, to make recommendations based on the study, focusing on areas of reform in the banking industry, that the authorities have to target in future.

Testable hypotheses

Proponents of financial liberalization argue that financial sector reforms that eliminate direct government intervention in the financial system are expected to lead to financial deepening (therefore increased savings mobilization); improved efficiency of the financial system resulting in lower intermediation margins; and increases in the flow of funds between various segments of the financial system. Reforms are also expected to yield greater access to finance for hitherto marginalized borrowers, and a diminishing role of the informal financial sector (Aryeetey et al., 1997). Thus, with liberalization several policy variables are expected to change, such as the interest rate structure, the structure of assets and liabilities, investment decisions by banks, and the cost structure. However, some of these policy variables can be influenced by the degree of competition in the financial sector. Proponents of competition policy have used the SCP framework to test whether structural and behavioural characteristics of banks have some influence on bank profitability. The SCP hypothesis predicts that market concentration lowers the cost of collusion between firms and results in higher than normal profits for all market participants (Evanoff and Fortier, 1988; Smirlock, 1985; Gilbert, 1984). However, following Demsetz (1973) and Peltzman (1977) there is a competing efficient market hypothesis that argues that an industry's structure may exist as a result of superior efficiency in production by particular firms, therefore obtaining larger market shares. Smirlock (1985) argued that firms possessing a comparative advantage in production become large and obtain a high market share and, as a result, the market becomes more concentrated. The efficient market hypothesis involves testing the relationship that exists between market share and firm's profitability.

The study intends to test the following hypotheses:

- a) Savings mobilization and intermediation have increased as a result of financial sector reforms.
- b) Financial sector reforms have led to declining intermediation margins in the banking industry.
- c) The composition of performing assets has changed in favour of the previously neglected sectors of the economy.
- d) Deregulation of the banking industry, through changes in entry conditions and related financial reforms, has led to a decrease in monopoly power of banks.
- e) Bank concentration has led to higher profitability of dominant firms in the banking sector.

2. Overview of the banking system in Malawi

Structural characteristics

The banking system in Malawi is segmented into the formal, semi-formal and informal sectors. This segmentation is large, but direct and indirect deposit links exist (Chipeta and Mkandawire, 1992). In the formal sector there are a few players with branch networks confined mostly to urban and semi-urban areas. As a result, the bulk of the 89% of the population that is rural makes very little use of the formal banking sector. This location problem has led to the development of the semi-formal sector in the form of cooperative savings associations and savings and credit associations. In addition, the informal banking sector has proved vital for the rural population.² Surveys by MCCI (1992) and World Bank (1989, 1991) indicated that the financial sector in Malawi specializes in short-term credit as opposed to the long-term loans that are necessary for industrial development. As Chipeta and Mkandawire (1996) argue, the commercial banking subsector has for too long focused on short-term lending that historically has largely targeted the foreign trade sector and large enterprises, leaving a persistent unsatisfied demand for medium-term and long-term capital finance for both large- and small-scale enterprises. Because of structural adjustment programmes that incorporated financial sector reforms in 1988, however, many structural changes have since taken place in the financial sector.

Structure of the banking system

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 funds by other means. Financial institutions are institutions whose 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 financial institutions in Malawi include formal development finance institutions—Malawi Development Corporation (MDC) and Investment Development Bank (INDEBank)—and semi-formal development finance institutions—Investment and Development Fund (INDEFund), Small Enterprise Development Organization of Malawi (SEDOM), Malawi Union of Savings and Credit Cooperatives (MUSCO) and Malawi Rural Finance Company (MRFC) (see Chipeta and

Mkandawire, 1996). This study concentrates on the banking industry, including savings banks, and we can divide the formal banking system in Malawi into five markets: commercial banks, corporate banks, leasing finance, savings banks and building societies. These form the core of the financial system in Malawi. We will call noncommercial bank institutions non-bank financial institutions (NBFIs). Table 1 shows the distribution of deposits by type of bank in selected years. The data reveal that the commercial banks account for most of the deposits in the banking system; the dominance is quite apparent in the 1970s but falls in the 1980s and 1990s.

Table 1: Structure of deposits in Malawi's banking system, 1970–1994, in millions of kwacha

Category	1970–79		1980–89		1990–94	
	Value	Share (%)	Value	Share (%)	Value	Share (%)
Commercial banks	85.8	84.1	377.0	79.1	1347.9	73.8
Corporate banks	-	-	-	-	75.2	4.1
Lease finance	0.4	0.4	9.0	1.9	124.8	6.8
Savings banks	10.9	10.7	66.7	14.0	123.0	6.7
Building societies	4.9	4.8	24.2	5.1	156.3	8.6

Source: RBM (various) *Financial and Economic Review* and Bank's *Annual Reports and Accounts* (various)

Commercial banks. There are four commercial banks in Malawi. These banks accept deposits including checking accounts and offer credit services to both individuals and companies. Before 1995 two commercial banks operated in Malawi, the National Bank of Malawi, incorporated in 1971, and Commercial Bank of Malawi, founded in 1969. These banks offer traditional banking services including checking accounts, which distinguishes them from any other bank in Malawi. The two banks dominated commercial banking and current account services until the First Merchant Bank in 1994 and the Finance Bank joined them in 1996. The new Banking Act of 1989 makes provision for licensing additional commercial banks to foster competition in the financial sector.

Corporate banks. Corporate banks accept deposits only from corporate investors and institutions, with emphasis on time deposits. These banks have emerged as a result of changes in the Banking Act in 1989. The corporate banking sector comprises Finance Company of Malawi and INDEFinance, founded in 1991 and 1992, respectively. These banks are registered under the Banking Act of 1989 and have provided additional competition in the banking system.

Lease finance companies. Lease finance companies accept corporate deposits and provide financial leases to companies. Currently, there are three leasing companies in Malawi: National Finance Company, Leasing and Finance Company, and CBM Financial Services Limited. National Finance Company (formerly National Mercantile Credit) is the oldest; it was established in 1958 and was the sole lease finance company operating in Malawi

until the establishment of Leasing and Finance Company of Malawi in 1986 and CBM Financial Services in 1992 as part of CBM diversification. The lending portfolio of lease finance companies is concentrated in financial leases to the transport sector. The activities of lease finance companies provided competition to commercial banks, especially in corporate financial facilities.

Savings banks. Savings banks mostly accept time and savings deposits from individuals and companies. The only savings bank is the Post Office Savings Bank (POSB), established in 1911 to provide facilities for small savers in both rural and urban areas. The POSB operated as a government department. The POSB has been vital in mobilizing savings in the rural areas through its 300 outlets. POSB did not have a lending mandate and as a result most of its funds were invested in local registered stocks. However, in 1990 the POSB was incorporated into a government company as Malawi Savings Bank and preparations are under way for offering normal banking activities including extension of credit to the private sector.

Building societies. The New Building Society (NBS), established in 1964, is Malawi's only building society. Its main activity is to provide loans for commercial buildings and residential housing. The NBS also accepts savings and time deposits and offers short-term private loans in addition to its lending activities to finance private dwellings and commercial buildings. With innovativeness and improved quality in delivery of services, the NBS has attracted many more savers and has actively competed for savings with the two dominant commercial banks. Recently, commercial banks raised the minimum balance on savings accounts to K500 but the NBS kept its minimum savings balance at K100. The NBS has capitalized on this development as most small investors closed their accounts with commercial banks. In addition, the computerization of deposit and withdrawal transactions, tax-free accounts, and the ease in getting a line of credit against deposits have attracted many savers to NBS.

Ownership structure

Ownership structure in the banking industry in Malawi is also highly concentrated, with most banks being controlled by a small number of international, domestic agricultural and industrial conglomerates with interlocking ownership across the economy. Table 2 presents the distribution of ownership in selected financial institutions in Malawi. ADMARC and Press Corporation own 87.43% of shares in National Bank of Malawi, while Press and MDC own 70% of Commercial Bank of Malawi. Such interlocking ownership is likely to facilitate collusive pricing arrangements in the financial sector and create credit bias towards subsidiaries of shareholders. In Malawi, it has resulted in identical prices of major services for the two commercial banks, even since liberalization, suggesting scope for elements of collusion or interdependent behaviour. Furthermore, the government and parastatals are also dominant shareholders in the banking system. It is, as well, interesting to note that there is a considerable degree of ownership in the

banking system by major banks. For instance, National Bank of Malawi is a majority shareholder of National Finance Company and INDEBank is the sole owner of INDEFinance and a majority shareholder in LFC. Despite this high degree of interlocking ownership in the banking sector, holding companies appoint different directors to different banks.

Table 2: Current share holding position in the banking system by 1994

Name of bank	Voting strength (%)	Name of shareholders
National Bank of Malawi	48.27 -	Press Corporation Limited
	39.16 -	ADMARC Investment Holding Limited
	12.57 -	South Africa Mutual Life Assurance Society
Commercial Bank of Malawi	40.00 -	Press Corporation Limited
	30.00 -	Malawi Development Corporation
	30.00 -	Malawi Government
Malawi Savings Bank	100.00 -	Malawi Government
New Building Society	51.00 -	Malawi Government
	15.90 -	Press Corporation Limited
	33.10 -	Lonrho and Protea Assurance (SA)
INDEFinance	100.00 -	Investment and Development Bank of Malawi
National Finance Company	51.21 -	National Bank of Malawi
Leasing and Finance Company	36.00 -	Investment and Development Bank
	15.00 -	Finance Corporation of Malawi
	10.00 -	Old Mutual
	10.00 -	International Finance Corporation
	10.00 -	German Development Bank (DEG)
	10.00 -	UDC (Zimbabwe)
9.00 -	Economic Development for Equatorial and Southern Africa (EDESA)	
Finance Company of Malawi	100.00 -	ADMARC Investment Holding

Source: Reports and accounts (various banks).

Legal framework and monetary policies

The legal framework for the formal banking sector was stipulated in the Banking Act of 1965. The act was very restrictive in entry conditions, which contributed to the concentration of banking services in a few banks. Entry into the banking system was subject to ministerial approval and banks were required to get permission from the Minister to extend their branch network. Moreover, financial institutions³ were not allowed to

have liabilities of more than ten times their paid-up capital. The Banking Act of 1965 also stipulated that as a financial requirement for entry, commercial banks were supposed to have a minimum paid-up capital of K500,000, discount houses a minimum paid-up capital of K200,000 and financial institutions a minimum paid-up capital of K100,000.

There were government interventions in the financial sector prior to liberalization. Monetary policy was characterized by control of interest rates and imposition of credit ceilings on the commercial banks, which in turn led to credit rationing. The system of intervention was such that the Reserve Bank of Malawi administered the interest rate structure that set deposit rates while financial institutions set lending rates within a prescribed range. In addition, the Reserve Bank also prescribed preferential rates for lending to the agricultural sector at 2% less than the base lending rate.

Financial sector reforms in Malawi

The financial reform programme was initiated in 1987 as part of structural adjustment. Liberalization of the financial sector started with the liberalization of lending rates in 1987. This was followed by deregulation of deposit rates in 1988 (Mamba, 1996). However, the Reserve Bank of Malawi actively uses the discount rate to influence the direction of changes in the interest rate structure. The government maintained preferential lending to the agricultural sector. In 1988, the monetary authorities abandoned credit ceilings and credit rationing. The liquidity reserve requirement (LRR) was enforced at 10% of commercial bank liabilities as a market instrument by the Reserve Bank to moderate credit and money supply. The Reserve Bank paid interest on commercial bank reserves held as reserve requirements. Several adjustments have occurred and the Reserve Bank adjusted the reserve requirement five times in 1990 as shown in Table 3. Due to financial liberalization, financial institutions are free to set their own prices guided by the central bank discount rate (but they require no consultation with Reserve Bank) and grant credit based on their risk management techniques.⁴

Table 3: Changes in the liquidity reserve requirement in percentages

Effective Date	Liquidity reserve requirement
1 June 1989	10
2 January 1990	25
15 May 1990	15
1 June 1990	10
1 September 1990	20
1 December 1990 ¹	20
1 August 1991	15
23 December 1992	20
7 June 1993	20
29 October 1993	30
December 1994	35

Note: 1. The liquidity reserve requirement ceased to earn interest.

Source: Ganiza (1995); Reserve Bank *Financial and Economic Review* (various issues); commercial banks' annual reports and accounts (various issues).

In 1989, the government made changes to the Reserve Bank Act of 1965 and the Banking Act of 1965 and enacted the Reserve Bank Act of 1989 and Banking Act of 1989. The Reserve Bank Act of 1989 broadened the powers and mandates of the central bank. It gave due recognition to the market mechanism and empowered the central bank to supervise financial institutions while pursuing monetary policy by using market-based instruments (Malawi Government, 1989). In addition, the Reserve Bank of Malawi was given the task of promoting the money and capital market in Malawi.

The Banking Act of 1989 aimed at creating an environment that would enhance competition in savings mobilization and intermediation. It opened the financial system to new entries, specifying moderate entry requirements. The powers to regulate entry were given to the Reserve Bank of Malawi, with the Minister endorsing recommendations from the Reserve Bank and reasons for denial of entry clearly stipulated in the new act. The government changed the financial requirement of entry to K2 million for commercial banks and K250,000 for financial institutions,⁵ with a provision for exceptions. These changes immediately led to entry of three existing financial institutions, Leasing and Finance Company, Finance Corporation of Malawi and INDEBank, to commercial banking activities and these were granted commercial banking licences. By the end of 1995 another four new entrants had been granted commercial banking licences: CBM Financial Services in the form of Commercial Bank of Malawi diversification in 1991, INDEFinance in 1991, First Merchant Bank of Malawi in 1994 and Finance Bank (Malawi) Limited in 1995. The entry of new firms is expected to bring efficiency gains in the financial sector by reducing the monopoly power of the dominant commercial banks.

The government abandoned the preferential treatment to agricultural sector lending in 1990. In the same year, reserve requirements of commercial banks at Reserve Bank ceased to earn interest (Ganiza, 1995; Mamba, 1996). In 1990 the Reserve Bank of Malawi also introduced the marketing of its own bills to mop up excess liquidity from the public. Since then the Reserve Bank has actively used open market operations. Although the major players have been the commercial banks and other financial institutions, the financial institutions dominate the market for treasury bills and local registered stock. The banking system in Malawi holds 77.99% and 58.7% of treasury bills and local registered stocks, respectively.

In order to force commercial banks to comply with the liquidity reserve requirement, an 18% penalty fee on shortfalls was introduced in 1992. The Reserve Bank adjusts the penalty fee in line with the discount rate. For instance, in 1995 they adjusted the penalty for noncompliance with liquidity reserve requirement from 45% to 55% in April and to 60% in June.

It is also important to note that the government implemented these financial reforms within a very unstable macroeconomic environment characterized by high rates of inflation largely due to structural rigidities of the economy and devaluation of currency, large budget deficits and increased government borrowing from the banking sector, and balance of payments instability. Table 4 shows the trend in some of the macroeconomic and policy variables since 1970. We can observe that inflation remained high and unstable even after liberalization. Fiscal deficits as a share of gross domestic product averaged

6.9% between 1970 and 1994. Before financial reforms were introduced in 1987, the share of fiscal deficits to gross domestic product was 8.3%, the highest level being in 1980 when it reached 15.9%. There has been a declining trend, though not systematic, in the share of the fiscal deficit since liberalization. The fiscal deficit has averaged 4.1% in the period after liberalization. The growth of real gross domestic product has also been erratic, with large declines in the period after liberalization. The share of public sector credit in the banking system followed a declining trend from 1987, but there was a reversal in 1993. This was a result of the suspension of donor aid to Malawi, and most of the budgetary requirements during this period (1993/94) were financed using domestic resources.

Table 4: Indicators of macroeconomic stability, 1970–1994 in percentages

Year	Inflation	Fiscal surplus (Deficit)/GDP	Public sector share of credit	Growth in real GDP
1970	7.94	-9.5	7.91	-
1971	8.09	-7.4	8.52	25.07
1972	3.63	-5.6	21.51	7.50
1973	5.25	-5.0	25.63	12.35
1974	15.38	-6.4	29.52	7.44
1975	15.50	-9.2	46.41	5.53
1976	4.37	-6.1	45.90	6.22
1977	4.19	-6.3	33.52	4.34
1978	8.61	-9.3	33.26	8.23
1979	10.96	-9.1	34.16	3.54
1980	19.05	-15.9	41.30	-1.13
1981	10.40	-12.4	51.82	-4.70
1982	8.70	-7.6	53.53	2.83
1983	13.50	-7.1	52.12	3.53
1984	11.01	-5.2	58.11	4.45
1985	14.95	-8.4	65.62	4.46
1986	14.90	-9.9	68.63	1.09
1987	26.64	-8.6	72.48	2.25
1988	31.36	-6.0	54.86	3.29
1989	15.74	-4.2	46.45	4.06
1990	11.39	-3.1	19.65	4.77
1991	8.12	-5.0	19.11	7.79
1992	23.29	-3.8	43.74	-7.92
1993	22.79	-1.0	56.58	10.70
1994	34.62	-1.3	54.17	-11.52

Note: Financial reforms began in 1987

Source: IMF (various), *International Financial Statistics*; RBM (various), *Financial and Economic Review*.

3. Literature review

Financial repression and financial liberalization

The financial sector is vital in facilitating economic growth and development. According to the exponents of financial repression (McKinnon, 1973; Shaw, 1973), financial liberalization can foster economic growth. They argue that the financial sector of the economy matters in economic development as it assists in the breakaway from repetition of repressed economic performance to accelerated growth of the economy (Shaw, 1973). The McKinnon–Shaw hypothesis postulates that government interventions in various forms in less developed countries lead to financial repression. The economies in these countries have been characterized by control of interest rates, imposition of credit ceilings, use of credit rationing, high levels of inflation and high public sector deficits. These policies have meant that finance in these countries has been shallow compared with national income or financial wealth. The interest rates on deposits have been low and negative and savings have been confined to a narrow range of financial instruments. Government control of interest rates on loans and deposits tends to raise the demand for and curtail the supply of funds. According to Aryeetey et al. (1997) unsatisfied demand for investible funds forces financial intermediaries to ration credit by means other than the interest rate while the informal market develops at uncontrolled rates.

Financial repression has also led to large differentials between deposit and lending rates of interest (Shaw, 1973). There is also a tendency for the monetary authorities to set high reserve requirements in less developed countries. As Seck and El Nil (1993) argue, the high spread between lending and deposit rates can be viewed as an implicit tax through high reserve requirements on the banking sector by the monetary authorities. Arguably, the legal liquidity reserves form a sizeable loanable fund that the financial institutions could use to expand the size of their loan portfolio. It is likely that such high liquidity reserve requirements encourage crowding out of the private sector, and provide the government with a buffer of resources to finance deficits (Gibson and Tsakalotos, 1994). In a study of nine African countries, Seck and El Nil (1993) observed that financial repression was prevalent. Real interest rates were virtually negative and high inflation rates and large fiscal deficits characterized the economies. The intermediation margins were twice those of the high income developing countries and industrial countries. Liquidity reserve requirements were in the order of 20–25%, about five times the average for industrial countries. Aryeetey et al. (1997) observe similar characteristics of financial repression and fragmentation of the financial markets in Ghana, Malawi, Nigeria and Tanzania.

The role of an efficient banking system in economic growth and development lies in savings mobilization and intermediation. Banks, as financial intermediaries, channel funds from surplus economic units to deficit units to facilitate trade and capital formation (Soyibo and Adekanye, 1992a). As Ncube and Senbet (1994) argued, an efficient financial system is critical not only for domestic capital mobilization but also as a vehicle for gaining competitive advantage in the global markets for capital. For the financial system to be efficient, it must pay depositors favourable rates of interest and should charge borrowers favourable rates of interest on loans. The financial intermediation activity in banking involves screening borrowers and monitoring their activities, and these enhance efficiency of resource use (Ncube and Senbet, 1994). The authors argue that small investors (depositors) who face costly contracting and asymmetric and imperfect information appoint large financial institutions as delegated monitors in the intermediation process. These financial institutions receive large amounts of information from borrowers on which they base the decision to extend a line of credit to industry. It is within the efficient financial system argument that the McKinnon–Shaw hypothesis of financial liberalization has been popularized. In essence, there have been many studies on the role of the real interest rates in savings mobilization that have supported the positive relationship between real interest rates and domestic savings. However, as Seck and El Nil (1993), Gibson and Tsakalotos (1994), and Gonzales Arrieta (1988) note, most studies have mixed the empirical evidence, and the empirical tests have failed to lend support to the financial repression hypothesis.

Given the financial characterization of developing economies, financial liberalization is expected to generate positive gains to the economies if implemented properly. Seck and El Nil (1993) concluded that African countries stand to gain from financial liberalization because real deposit rates were found to have a positive impact on financial savings, which in turn affects the level of investment positively. However, the design of financial sector reforms is also important. As Nissanke (1994) argues, liberalization programmes need to be realistic about the speed and sequencing of financial reforms. Furthermore, for financial liberalization to be successful there should be macroeconomic stability and adequate prudential supervision and regulation of banks. Gibson and Tsakalotos (1994) note that the difficulties faced by many countries in liberalizing their financial markets go beyond simply problems of macroeconomic stability. Financial markets are characterized by severe market failures that can lead to a case for government intervention. Diaz-Alejando (1985) argues that liberalization can lead to instability and questions the ability of financial markets to allocate credit efficiently. Gibson and Tsakalotos (1994) note that the experience with financial instability in many developing countries suggests that liberalization promotes instability. They also argue that the concept of financial repression used in the literature appears too broad, encompassing both positive and negative aspects of government interventions in the financial markets that may mask the need for institutional development.

In any case, financial liberalization is expected to generate several benefits that build the impetus for economic growth and development in developing countries.⁶ First, financial sector reforms are expected to lead to financial deepening, hence the stock of financial assets relative to income is expected to increase with liberalization. Second,

the intermediation margins of the banking sector are expected to diminish with liberalization. Gibson and Tsakalotos (1994) note that competitive pressures that result from conditions of free entry and competitive pricing will raise the functional efficiency of intermediation by decreasing the spread between deposit and lending rates.⁷ Seck and El Nil (1993) assert that financial liberalization may not help reduce interest spreads in African countries if the reduction in reserve requirements and deregulation of the banking sector are not coupled with the increase in competition in the sector. Third, liberalization opens the way to superior allocation of savings by widening and diversifying the financial markets on which investment opportunities compete for savings flow. The market for savings is extended in terms of scale, maturity and risk, and information for comparisons of alternative facilities becomes available more cheaply (Shaw, 1973). Fourth, local capital markets can be integrated into a common market, and new opportunities for pooling savings and specialization in investment are created in the economy. Aryeetey et al. (1997) note that in this context, financial liberalization is expected to lead to the diminishing role of the informal financial sector.

Studies in Africa have shown that liberalization of the financial sector has proceeded with limited success. Seck and El Nil (1993) concluded that financial repression in African countries is likely to persist because governments have the incentive to perpetuate it given the incidence of high inflation, large budget deficits and limited access to foreign capital. Thus, African countries are likely to face problems in getting their economies out of the financial repression web because of high inflation rates that justify banks' high intermediation margins, implicit tax that the government extracts from the banking system through enforcement of below market rates, and high liquidity reserve requirements to help them finance often large deficits. Aryeetey et al. (1997) concluded that fragmentation of financial markets in Ghana, Malawi, Nigeria and Tanzania persisted several years after initiation of financial sector reforms. The reasons attributed to this limited success include the fact that reform measures have mostly been incomplete and have not been accompanied by complementary measures to address underlying institutional and structural constraints.

Market power and bank performance

The banking firm and structure–performance hypothesis

We can view a financial institution as a microeconomic firm that attempts to maximize an objective function in terminal wealth, where the bank firm uses quantity and/or price variables such as asset quantities or prices as control variables (Santomore, 1984). However, according to Clark (1986) there are numerous models of the banking firm that deal with specific aspects of bank behaviour, but no single model is acceptable as descriptive of all bank behaviour although the portfolio theory approach has played an important role.⁸ In the portfolio choice models, banks seek to maximize profits defined by a feasible set of assets and liabilities with interest rates set by the bank and per unit

costs incurred by the bank of producing each component of assets and liabilities. These bank models have incorporated various aspects of the competitive process and scale economies.⁹ The basic portfolio model following Clark (1986) is presented in Appendix A.

The relationship between profitability and market structure has generated two competing hypotheses. On the one hand, the traditional market structure–conduct–performance (SCP) or collusion hypothesis (following Bain, 1951) postulates that market structure influences conduct (behaviour) of firms through, for instance, pricing and investment policies, and this in turn translates into performance. The definitive theoretical implication of the SCP hypothesis is that in concentrated markets prices will be less favourable to consumers because of noncompetitive behaviour that arises in such markets. On the other hand, the efficient market hypothesis following Demsetz (1973) and Peltzman (1977) postulates that market concentration is a result of firms' superior efficiency, which leads to larger market share and profitability. Several authors have tested these two hypotheses in various studies of the banking industry, but results are generally mixed (see Gilbert, 1984; Smirlock, 1985; Evanoff and Fortier, 1988; Clark, 1986; Molyneux and Forbes, 1995; Maudos, 1998).

The traditional paradigm of assessing the effect of market power and performance has been the structure–conduct–performance (SCP) model. This model assumes that certain market structures are conducive to monopolistic conduct, and this conduct enables firms to raise prices above costs thereby making abnormal profits. Therefore, the link between market structure and profitability is through firms' pricing behaviour. In perfectly competitive markets where firms face a perfectly elastic demand, theoretically the model predicts that there will be lower profitability compared with all other markets where the demand is less elastic (George and Joll, 1971). The model is widely applied in the analysis of industrial behaviour. Many researchers in the field of industrial economics have empirically tested this hypothesis using the following specification:

$$\pi = f(C, B, D) \quad (1)$$

where π is the index of performance (profitability), C is a vector of variables denoting ease of collusion, B is the vector of variables representing barriers to entry and D is the vector of demand variables. In his landmark study Bain (1951) found evidence in favour of a positive and significant relationship between concentration and profitability using US manufacturing data. Although the SCP hypothesis is widely applied in the manufacturing sector,¹⁰ more recently the model has been used in the banking industry.¹¹ Civelek and Al-Alami (1991) rightly note that the banking industry is very important to the economy and empirical evidence on the SCP relationship can help in government regulatory policies and in modifying the environment in which banks operate. Increased bank concentration, by increasing the cost of credit, has the effect of reducing firms' demand for credit and consequently affects the level of intermediation and retards the growth of the economy.

The specification of the SCP model in banking has been based on the various theories of the banking firm (Mullineaux, 1978; Gilbert, 1984; Clark, 1986). The structure–

performance model is the profit–concentration relationship and postulated as:

$$\pi_i = f(CR, X_i) \quad (2)$$

where π is a measure of the profitability of i th bank as measured by the rate of return on equity (or capital) or rate of return on assets, CR is the banks' index of concentration, and X_i denotes a vector of control variables that are exogenous to the bank and may affect prices through market or cost considerations. The empirical evidence in the profit–concentration hypothesis has generated mixed results (see Gilbert, 1984).

The mixed empirical results on the traditional profit–concentration hypothesis have led to the questioning of the relevance of the structure–performance hypothesis as an explanation of industrial or banking behaviour. Following Demsetz (1973) and Baumol (1982), alternative hypotheses have been tested as a direct challenge to the SCP hypothesis. Proponents of the efficient market hypothesis (Demsetz, 1973) have argued that market concentration is not a random event, but rather the result of firms with superior efficiency obtaining a large market share. Thus, differences in firm-specific efficiencies within markets create unequal market shares and high levels of concentration. As Molyneux and Forbes (1995) and Smirlock (1985) note, the hypothesis is the market share–profitability relationship that we specify in the following form:

$$\pi = f(CR, MS, X) \quad (3)$$

where π is a profit measure, CR is a measure of market structure (a concentration measure), MS is a measure of market share, and X is a vector of control variables that account for firm-specific and market-specific characteristics. The significance of market share (MS) in Equation 3 would imply support for the efficient structure hypothesis, while the significance of concentration ratio would support the traditional hypothesis.¹² Maudos (1998) notes that the market share variable can capture the effects that are unrelated to efficiency, and directly includes a measure of overall efficiency in Equation 3.

Baumol (1982), in the contestable market theory, raised serious questions about the validity of the structure–performance hypothesis. The market is contestable when barriers to entry and exit are not preclusive, such that no outside potential competitors can enter by undercutting the price and still make profits. In this case, there is no basis for assessing a significant value to the market concentration variable in determining profitability. Given the contestability of the market, it is possible to have outcomes approximating those of perfect competition although the number of actual competitors is quite small.

The empirical tests of the competing hypotheses of market structure and efficient market have mainly used a single-equation, multiple-regression analysis approach. However, Clark (1986) argues that bank profits might be jointly determined with other variables, especially where the firms being considered are multi-product in nature. This necessitates the use of a simultaneous equation approach. Some researchers have argued for a Quiet Life hypothesis in the banking industry (Nyong, 1990). The Quiet Life hypothesis states that uncertainty avoidance by large firms varies directly with the degree

of market power that these firms possess. In such cases, banks with substantial market power may choose to trade some of their potential monopoly profits for a reduction in risk by choosing safer portfolios.

Determinants of bank profitability

Several variables are used as determinants of bank profitability in SCP studies in the banking industry. We can essentially divide bank studies into two groups based on the variables used to measure bank performance as a dependent variable. On the one hand and in most studies, bank performance is measured by the level of bank profitability. The profitability measures include the rate of return on equity (ROE), rate of return on capital (ROC) and rate of return on assets (ROA). In most bank studies, emphasis is placed on measuring profitability in terms of ROC and ROA. Smirlock (1985) notes that the use of ROA has provided strongest evidence on the concentration–profitability relationship in banking. Keeton and Matsunaga (1985) assert that ROA is especially useful in measuring changes in bank performance over time since banks' income and expense components are more closely related to assets. Several studies of the structure–performance hypothesis in the banking system have used both ROA and ROE (Civelek and Al-Alami, 1991; Agu, 1992) and Smirlock (1985) used all the three measures.¹³ However, Civelek and Al-Alami (1991) found results based on ROA to be statistically very inferior and justified the relative performance of ROE on the basis that it reflects the efforts of managers interested in maximizing shareholders' wealth. Nonetheless, other studies have used ROA as a measure of profitability in testing the SCP hypothesis in banking (see Molyneux and Forbes, 1995; Evanoff and Fortier, 1988). The basic argument in favour of profitability measures in banking is that banks are essentially multi-product firms and the use of profitability measures eliminates problems associated with cross-subsidization between products and services.

On the other hand, other researchers assess performance in terms of bank prices (Berger and Hannan, 1989; Rose and Fraser, 1976). The justification for use of bank prices (interest rates) has been that the use of the price–concentration relationship instead of the profit–concentration relationship tests the structure performance hypothesis in a way that excludes the efficient structure hypothesis (Berger and Hannan, 1989). The main argument in the price–concentration relationship is that high levels of concentration allow for noncompetitive behaviour that results in lower interest rates offered to depositors and/or higher lending rates to borrowers. However, Molyneux and Forbes (1995) argued that price measures of performance create problems of cross-subsidization for a multi-product firm. In addition, the use of prices does not take into account the effects of costs (Morris, 1984). In any case, whatever the measure of performance, empirical results on the structure–performance hypothesis are also mixed and the performance of the model in the banking system is weaker than in manufacturing.¹⁴

At the centre of the traditional SCP hypothesis is the argument that market concentration is a determinant of profitability. Concentration, defined as the extent to which most of the market's output is produced by a few firms in the industry, forms the basis for the explicit link between market structure and performance through firms'

conduct (Bain, 1951; Scherer and Ross, 1990). The definition of concentration in terms of output poses empirical problems in the banking industry because of its multi-product nature, although the main products are loan-making and deposit-taking services (Morris, 1985). However, since deposit data are readily available, bank output is usually measured by total deposits. Competition theorists argue that firms in highly concentrated industries refrain from competing among themselves and might also refrain from raising deposit rates or lowering lending rates (Morris, 1984). This would result in higher than average profitability. The traditional expectation is that higher concentration leads to higher and monopolistic performance.¹⁵

There are several measures of market concentration,¹⁶ but the most common measures in both industrial and banking studies have been the concentration ratio (CR) and the Herfindahl–Hirschmann index (HHI) (Scherer and Ross, 1990; Morris, 1984; Civelek and Al-Alami, 1991; Agu, 1992). As Berger and Hannan (1989) point out, theory provides little guidance on the measure of monopoly power when the type of noncompetitive behaviour is unknown.¹⁷ Results from empirical studies on the performance of concentration in banking are mixed.¹⁸ Civelek and Al-Alami (1991) find a statistically significant relationship between concentration and performance in most years with perverse signs in some years in the Jordanian banking system, while Molyneux and Forbes (1995) find overwhelming evidence of a significant positive relationship between concentration and profitability. On the other hand, Agu (1992) finds no significant statistical relationship between concentration and profitability. Where the market share variable is included in the model, the concentration ratio fares poorly and the results tend to support the efficient market hypothesis (Evanoff and Fortier, 1988; Smirlock, 1985).

The main variable in the efficient market hypothesis is the efficiency of firms that can be proxied by market share (MS). We use the market share of industry deposit for the two dominant commercial banks to test the alternative hypothesis of efficient market. We expect a positive relationship between market share and profitability. Larger market shares are a result of efficiency that in turn leads to higher profitability.

Several control variables that take into account firm-specific and market-specific characteristics are theoretically justified and included in empirical studies of the banking industry. One of the variables is bank size. Bank size is measured as banks total deposits or assets or as an average measure based on total assets (ASSET) (Civelek and Al-Alami, 1991; Molyneux and Forbes, 1995; Smirlock, 1985; Evanoff and Fortier, 1988). The bank size variable takes into account differences brought about by size such as economies of scale. We expect that larger banks compared with smaller banks' can reap economies of scale and have greater diversification opportunities. However, according to Evanoff and Fortier (1988) and Smirlock (1985) any positive influence on profits from economies of scale may be partially offset by greater ability to diversify assets resulting in a lower risk and a lower required return. Therefore, the impact of bank size, *a priori*, is indeterminant. The empirical results on the performance of the bank size variable are mixed, with conclusions of no economies of scale (Civelek and Al-Alami 1991; Molyneux and Forbes, 1995) and others having significant positive (Evanoff and Fortier, 1988) and negative (Smirlock, 1985) relationships.

Since profit measures are usually not risk adjusted, the capital–asset ratio (CAPAST)

is included to account for differences in levels of risk between firms. Lower CAPAST is associated with high risk. We hypothesize a negative relationship between capital asset ratio and profitability performance.¹⁹ However, as a measure of risk, the capital asset ratio also produces a perverse sign although it is statistically significant (Molyneux and Forbes, 1995). Evanoff and Fortier (1988) found a significant negative relationship between return on assets and capital–asset ratio.

Another measure of risk included is the loan–asset ratio (LTOAST).²⁰ The loan–asset ratio is traditionally included in the model to capture bank-specific risk. Portfolio theory postulates that risky investments are usually associated with higher returns than primary assets. The loan–asset ratio is expected to be positively correlated with bank profitability. Empirically, this measure of bank risk has produced perverse results, suggesting that there is risk reduction behaviour among bank managers (Civelek and Al-Alami 1991; Molyneux and Forbes, 1995; Evanoff and Fortier, 1988). Agu (1992) also found a negative and weak statistical association between the loan–deposit ratio and profitability performance in the Nigerian banking system.

The bank's relative cost of funds is captured by the ratio of demand deposits to total deposits (DDTDEP).²¹ Demand deposits are a relatively inexpensive source of funds. We expect that the higher the ratio of demand deposits to total deposits, the higher the level of profitability. Evanoff and Fortier (1988) and Smirlock (1985) found a significant and positive relationship between the ratio of demand deposits to total deposits and bank profitability.

Other variables are included to account for market demand characteristics. These include market size and market growth rate. Market size is measured by total market deposits (MKDEP). Large markets should be easy to enter and bank customers in such markets tend to be sophisticated, hence a negative relationship between market size and profitability. However, as noted by Evanoff and Fortier (1988) and Smirlock (1985), this negative relationship may be partially offset if banks in these markets take on riskier portfolios requiring higher returns. The relationship between market size and bank profitability may be either positive or negative. The growth of the market (MKGRO) is included because rapid market growth expands profit opportunities for existing banks, but if growth encourages entry then a negative relationship may be observed. Civelek and Al-Alami (1991) have argued that larger market size or an expanding market enables banks to differentiate their products and consequently generate higher profits.

In summary, the SCP hypothesis has now been widely used in the analysis of bank markets and there exists evidence in support of the structure–performance hypothesis, although the competing efficient market hypothesis is also gaining empirical support. The specification of the model, though following the traditional form, has been enriched by inclusion of control variables. The overall evidence suggests that high market concentration may be an institutional feature that limits savings mobilization and intermediation. Alternatively, the efficient market hypothesis asserts that market concentration results from firms' ability to secure larger market shares because of their efficiency.

4. Methodology and data

Methods and model specification

Financial sector reforms in Malawi were first introduced in 1987. In testing the financial liberalization hypothesis we divide the data into two sub-samples: the period before liberalization (1970–1986) and the period after liberalization (1987–1994). We compute the averages of the two sub-samples and use the test of the difference between two means to establish the statistical significance of the changes in performance of impact variables. In some cases, we compute the simple correlation coefficient to find the statistical association between policy variables and bank profitability.

We test the collusion and efficient market hypotheses on commercial banks using banking industry data from 1970 to 1994. Interest rates and credit limits between 1970 and 1986 were heavily regulated, thus banks' decisions over prices during the period before liberalization were restricted. However, the monetary authorities did not regulate other sources of income such as fees and commissions on various services. The market structure–profitability model specified in this study tests the traditional SCP and the efficient market hypotheses for commercial banks based on equations 2 and 3. This study examines the behaviour of the two commercial banks (the dominant firms) in the banking industry, which may be pursuing joint profit maximization through their common ownership structure. We estimate the following lin-log equation based on other studies (Evanoff and Fortier, 1988; Smirlock, 1985):

$$\begin{aligned}\pi_{Dt} = & \beta_0 + \beta_1 \ln(CR_t) + \beta_2 \ln(MS_{Dt}) + \beta_3 \ln(ASSET_{Dt}) + \beta_4 \ln(CAPAST_{Dt}) \\ & + \beta_5 \ln(LTOAST_{Dt}) + \beta_6 \ln(DDTDEP_{Dt}) + \beta_7 \ln(MKDEP_t) \\ & + \beta_8 \ln(MKGRO_t) + \beta_9 REFORM + \varepsilon_t\end{aligned}\tag{4}$$

where for time t and dominant commercial banks D ,

π = commercial bank profits measured by return on assets (ROA), return on equity (ROE) and return on capital (ROC).

- CR* = three-firm concentration ratio (the share of bank deposits accounted for by the three largest banks). The more concentrated the industry the higher the level of profitability ($\beta_1 > 0$).
- MS* = market share of the two commercial banks. Larger market shares are a result of efficiency, which in turn leads to higher profitability ($\beta_2 > 0$).
- ASSET* = commercial bank assets (thousands of kwacha). The relationship may be positive, reflecting economies of scale, or negative, reflecting greater ability to diversify assets, which results in lower risk and lower required return ($\beta_3 > 0$ or $\beta_3 < 0$).
- CAPAST* = capital to asset ratio of commercial banks. Lower ratios show risky positions, hence a negative relationship ($\beta_4 < 0$).
- LTOAST* = loan to asset ratio of commercial banks. This provides a measure of risk, since loans are riskier assets, and hence the higher the ratio the higher the profitability ($\beta_5 > 0$).
- DDTDEP* = demand deposits to total deposits ratio of commercial banks. This variable represents the relative cost of funds. Demand deposits are a cheaper source of funds and the higher the ratio, the higher the level of profitability ($\beta_6 > 0$).
- MKDEP* = market deposits (thousands of kwacha) of the banking industry. This is a proxy for market potential. Higher profits are expected when a larger market provides new opportunities, while lower profits may be expected if the large market makes entry relatively easy ($\beta_7 > 0$ or $\beta_7 < 0$).
- MKGRO* = annual growth rate of market deposits for the banking industry. Higher profits are expected when a market grows, while lower profits may be expected if the growing market makes entry relatively easy ($\beta_8 > 0$ or $\beta_8 < 0$).
- REFORM* = binary variable equal to 1 for $t = 1987$ to 1994 representing the liberalization period, otherwise zero. In cases where liberalization makes entry easy, we expect lower profitability as a result of actual and potential competition, otherwise liberalization can strengthen the monopoly power of existing banks ($\beta_9 < 0$ or $\beta_9 > 0$).
- ℓn = natural logarithm.

Data

The data cover the period from 1970 to 1994. The main data sources are the annual reports and accounts for the financial institutions. These financial institutions are National Bank of Malawi, Commercial Bank of Malawi, New Building Society, Malawi Savings Bank, INDEFinance, Leasing and Finance Company, and National Finance Company. Other sources are *Financial and Economic Review* and *Annual Report* of the Reserve Bank of Malawi, and *International Financial Statistics* of the International Monetary Fund. We exclude the National Finance Company in the regression analysis because data on profits are not available.

5. Empirical results

Financial liberalization hypotheses

Savings mobilization and intermediation

Malawi's banking system is a successful mobilizer of funds. Both the commercial banking system and an array of deposit-taking and credit-making institutions have managed to attract substantial resources into the financial system. Appendix B, Table B1, shows the relative importance of commercial banks and other banking institutions in savings mobilization. Total deposits increased by an average rate of 20.3% per annum between 1970 and 1994. The deposits of commercial banks have grown but the share of deposits has fallen especially since 1988. There has been tremendous growth of deposits in non-bank financial institutions since 1987. The financial interrelations ratio, defined as the ratio of deposits of non-bank financial institutions to deposits of commercial banks, shows the importance of the NBFIs. The financial interrelations ratio averaged 21.5% in the 1970s, increasing to 24% in the 1980s and to 35.4% in the 1990s.

The effect of liberalization on financial deepening, savings mobilization and intermediation is presented in Table 5. Financial deepening is reflected by the changes in the ratio of money supply (M1 and M2) to gross domestic product (GDP). The ratio of M1 to GDP fell from 11.3% before liberalization to 11.2% after liberalization. The ratio of broader money supply (M2) to gross domestic product increased significantly, at the 5% level, from 24.3% before liberalization to 27.8% after liberalization. The financial interrelations ratio computed as the ratio of deposits of non-bank financial institutions to commercial bank deposits increased significantly, at the 1% level, from 21.3% before liberalization to 33.8% after liberalization. This underscores the importance of entry of other banks in deposit mobilization.

There is a significant decline in the share of demand deposits in total domestic deposits, from 36.3% in the period before liberalization to 29% in the period after liberalization. This decline is significant at the 5% level. With liberalization there has been an increase in long-term liabilities in the banking system.²² Savings and time deposits in the banking industry increased from 63.8% in the period before liberalization to 71.2% in the period after liberalization. This study shows that there has been a significant change in savings behaviour from short-term to medium- and long-term savings, at the 5% level. The developments in financial deepening and savings mobilization in Malawi are encouraging, suggesting that liberalization of the financial sector has reduced financial repression.

Table 5: Changes in financial deepening and savings mobilization in percentages

Variable	Before	After	t-value	Change
Financial deepening				
M1/GDP	11.30	11.20	-0.22	Negative
M2/GDP	24.30	27.80	2.69 ^b	Positive
Structure of deposits				
Demand deposits	36.30	29.00	-2.18 ^b	Negative
Savings and time deposits	63.80	71.20	2.22 ^b	Positive
NBFIs/CBs deposit ratio	21.26	33.79	5.99 ^a	Positive

Notes: a = significant at 1%, b = significant at 5%, c = significant at 10%.

Interest rates and intermediation margins

Interest rates on deposits and lending were controlled by the monetary authorities before liberalization. Table 6 presents interest rates and intermediation margins. Interest rates on savings ranged from 5.5% in 1970 to 13.6% in 1986. However, in the period after liberalization, the average interest rate on deposits temporarily increased to 16.6% in 1987 but declined to 12% in 1990. By 1994 interest rates on deposits averaged 25% but further increased to 44% by mid-1994. The interest rate offered to depositors improved after liberalization of the banking system, especially in 1995. Similarly, lending interest rates were low before liberalization, but the banking system did not react by substantial adjustments in the interest rates after liberalization. Lending rates in the period before liberalization ranged from 8.5% in 1970 to 16% in 1986. Loan interest rates increased from 20% in 1987 to 31% in 1994 and 56% by mid-1995. In 1995, there were substantial increases in lending interest rates.

The intermediation margin was rather constant and traditional between 1970 and 1994, averaging 5.45% and varying between 2 and 10%. Overall, the intermediation margin increased from 4.6% in the period before liberalization to 7.26% in the period after liberalization. Although a simple correlation analysis revealed a positive relationship between profitability measures (ROA and ROE), the relationship was not statistically significant. We obtained correlation coefficients of 6% and 2% for ROA and ROE, respectively. Actually, interest rate controls dominate most of the period of analysis and this low correlation is not surprising. However, the correlation coefficient between intermediation margins and profit measures in the post-liberalization period was 44% and 38% for ROA and ROE, respectively.²³ The changes in interest rate structure in the 1990s were due to the active auctioning of treasury bills and the flexibility of financial institutions in determining prices for their products. This pushed up the Reserve Bank discount rate to the extent that the lending and deposit rates reached 46% and 57%, respectively, by mid-1995.

Table 6: Interest rates and intermediation margins, 1970–1994, in percentages

Year	Nominal interest rates		Inflation	Real interest rates		Intermediation Margin
	Deposit	Lending		Deposit	Lending	
1970	5.50	8.50	7.94	-2.26	0.52	3.00
1971	5.50	8.50	8.09	-2.39	0.38	3.00
1972	5.50	8.50	3.63	1.81	4.70	3.00
1973	5.50	8.50	5.25	0.24	3.09	3.00
1974	5.50	8.50	15.38	-8.57	-5.97	3.00
1975	5.50	8.50	15.50	-8.65	-6.06	3.00
1976	6.63	10.00	4.37	2.17	5.40	3.37
1977	7.17	10.00	4.19	2.86	5.58	2.83
1978	7.17	10.00	8.61	-1.32	1.28	2.83
1979	8.10	11.50	10.96	-2.58	0.48	3.40
1980	7.92	16.67	19.05	-9.35	-2.00	8.75
1981	9.75	18.50	10.40	-0.59	7.34	8.75
1982	9.75	18.50	8.70	0.97	9.02	8.75
1983	9.92	18.33	13.50	-3.15	4.26	8.41
1984	11.75	16.50	11.01	0.66	4.94	4.75
1985	12.50	18.38	14.95	-2.13	2.99	5.88
1986	13.58	16.00	14.90	-1.15	0.96	2.42
1987	16.58	20.00	26.64	-7.94	-5.24	3.42
1988	13.50	22.25	31.36	-13.59	-6.93	8.75
1989	12.75	23.00	15.74	-2.59	6.27	10.25
1990	12.10	21.00	11.39	0.64	8.63	8.90
1991	12.50	20.00	8.12	4.05	10.98	7.50
1992	16.50	22.00	23.29	-5.51	-1.05	5.50
1993	21.75	29.50	22.79	-0.85	5.47	7.75
1994	25.00	31.00	34.62	-7.14	-2.69	6.00

Source: IMF (various) *International Financial Statistics*; RBM (various), *Financial and Economic Review*.

In real terms, deposit rates were mostly negative, averaging -2.66% per annum over the period of analysis. Due to high rates of inflation during the period after liberalization, real interest rate on deposits fell to -4.21% compared with -1.97% in the period before liberalization. In contrast, real lending rates were generally positive, and recorded an average annual rate of 2.09% between 1970 and 1994. Real lending rates averaged 2.17% per annum in the period before liberalization but declined to 1.93% in the period after liberalization.

Significant changes in interest rates only occurred in nominal rates at the 1% level (Table 7). This was a result of rising inflation in the period after liberalization. The average rate of inflation doubled between the two periods, and nominal interest rates also doubled. Real interest rates show that there was a decline (though not significant) before and after liberalization. The behaviour of the intermediation margin is different, almost doubling in nominal rates and increasing significantly, at the 5% level, in real terms. Real lending rates were much higher than real savings rates.

Table 7: Changes in interest rates and intermediation margins in percentages

Variable	Before	After	t-value	Change
Nominal rates				
Deposit rate	8.07	16.34	5.88 ^a	Positive
Lending rate	12.67	23.69	6.15 ^a	Positive
Intermediation margin	4.60	7.26 ^b	2.71 ^b	Positive
Real rates				
Deposit rate	-1.97	-4.12	-1.20	Negative
Lending rate	2.17	1.93	-0.12	Negative
Intermediation margin	4.14	6.05	2.19 ^b	Positive
Inflation rate	10.40	21.70	4.34 ^b	Positive

Notes: a = significant at 1%, b = significant at 5%, c = significant at 10.

Shift in sectoral allocation of domestic credit

The banking system also plays a role in delivery of credit to various sectors of the economy. However, financial institutions extend most credit to large and well-established enterprises and limited credit facilities are advanced to micro, small and medium-scale enterprises perceived as high risk borrowers.²⁴ Loans and advances to the private sector have grown substantially, at an average annual rate of 18.3% between 1970 and 1994. Figure 1 shows the trend in the distribution of credit between the private and public sectors. In the 1970s, the share of domestic credit to the private sector was 71.4%, compared with 28.6% for the share of credit to the public sector. However, credit to the private sector fell and that to the public sector rose between 1981 and 1988. As a result, the share of domestic credit to the private sector fell to 43.5% and that of the public sector increased to 56.5% in the 1980s. In 1990 and 1991, the private sector accounted for most of domestic credit. Due to suspension of donor aid and external loans pending democratic elections in 1992, government borrowing from the banking system increased substantially, leading to a reversal in allocation of credit between 1992 and 1994.

Most credit has been directed to the trading and agricultural sectors (see Table B2 in Appendix B) through commercial bank loans and advances. Figure 2 shows commercial bank loans and advances by sector. During the period 1970–1994, agriculture, manufacturing, trading and other sectors accounted for 35.9%, 13.2%, 27.2% and 23.7%, respectively. During the period before liberalization, the agricultural sector accounted for 37.9% and the trading sector accounted for about 26.7%, while the manufacturing sector accounted for only 9.5% of total advances. In the period after liberalization, however, the dominance of the agriculture sector fell to 31.8%, while the proportion of advances to trading and manufacturing sectors increased to 28.2% and 21%, respectively. Credit to the agricultural sector dominated in domestic credit in the period before liberalization as a result of deliberate government policy to direct credit to the mainstay of the economy, the agricultural sector. This policy was abandoned in 1990. The removal

Figure 1. Distribution of domestic credit between private and public sector, 1970–1994

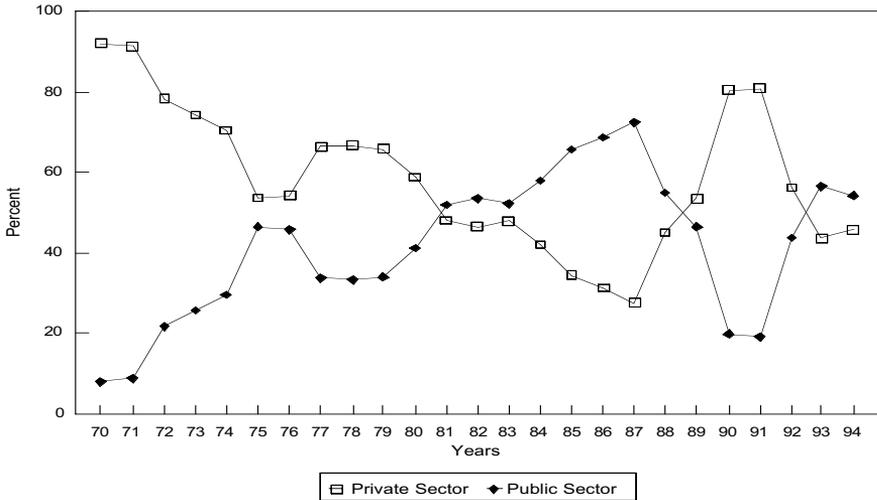
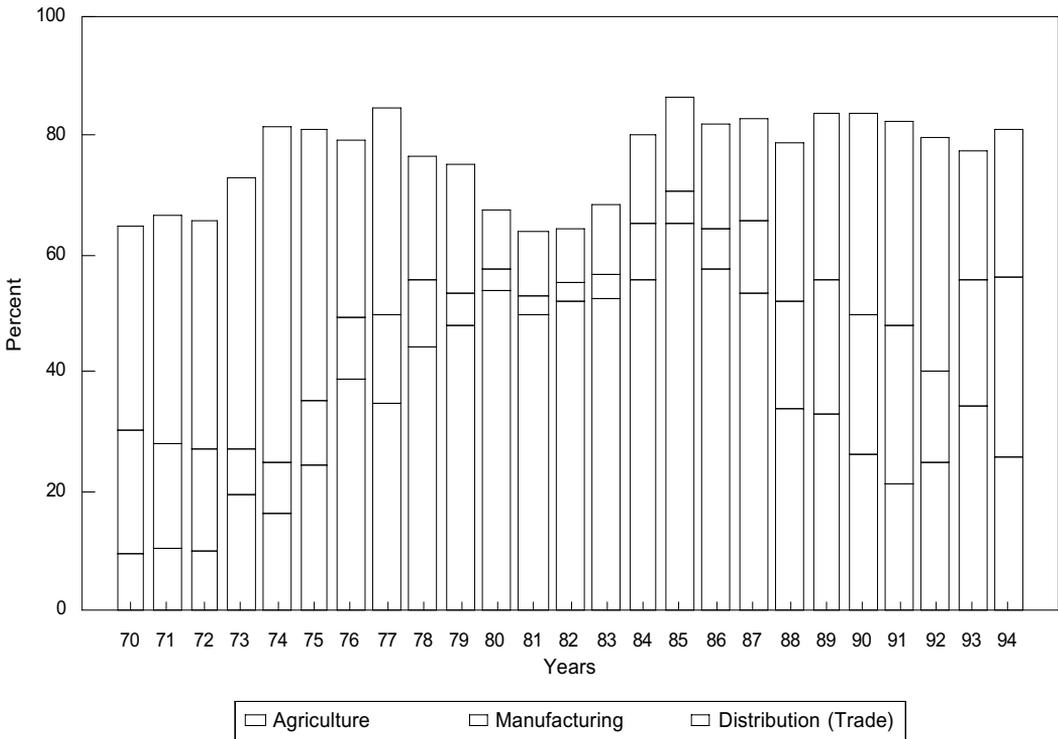


Figure 2: Commercial banks' loans and advances by economic activity, 1970–1994



of preferential treatment of the agricultural sector enabled the share of commercial banks' advances to the manufacturing sector to increase. These changes are significant and liberalization has enabled banks to freely allocate loans to various economic activities.

The impact of financial sector reforms on intermediation is presented in Table 8. In terms of structure of assets, there has been a decline in loans and advances as a share of total assets from 54.96% in the period before liberalization to 45.65% in the period after liberalization. However, this decline is not statistically significant. The share of treasury bills and local registered stocks in total assets also declined from 23.15% in the period before liberalization to 19.34% in the period after liberalization. Although savings mobilization has increased since liberalization, this has not been accompanied by an increase in the proportion of assets that financial institutions lend out to the private sector. There is excess liquidity in the formal banking sector in Malawi. This may not be surprising because in the period after liberalization the required reserve ratio increased from 10% in 1989 to 35% in 1994. The result is an increase in liquidity. For instance, commercial banks' deposits with Reserve Bank, currency in cash and balances with other banks were only 21.89% of total assets before liberalization, but increased to 35.01% in the period after liberalization. Aryeetey et al. (1997) note that the intermediation role of the informal sector increased with liberalization, in contrast to the formal sector.

Table 8: Intermediation: changes in asset structure and sectoral allocation of credit in percentages

Variable	Before	After	t-value	Change
Asset structure (banking industry)				
Loans and advances	54.96	45.65	-2.33 ^b	Negative
Treasury bills	23.15	19.34	-2.11 ^b	Negative
Cash and Reserve Bank balances	21.89	35.01	4.24 ^a	Positive
Fixed assets	4.97	4.36	-1.25	Negative
Sectoral allocation of credit				
Private sector	60.10	54.10	-0.81	Negative
Public sector	39.90	45.90	0.81	Positive
(Commercial banks only)				
Agriculture sector	37.90	31.80	-0.87	Negative
Manufacturing sector	9.50	21.00	5.08 ^a	Positive
Distribution (trade) sector	26.70	28.20	0.28	Positive

Notes: a = significant at 1%; b = significant at 5%; c = significant at 10%.

In terms of sectoral allocation of credit, there has been an insignificant decline in the banking system's credit to the private sector, from 60.1% in the period before liberalization to 54.1% in the period after liberalization. Consequently, the public sector has insignificantly gained the share in domestic credit from the banking system. The distribution of credit from commercial banks by economic activity shows that the agricultural sector still accounts for most credit. However, there has been an insignificant

fall in commercial bank lending to the agriculture sector. The share of commercial bank credit in the manufacturing sector was less than 10% in the period before liberalization, but more than doubled in the period after liberalization. This significant increase in credit to the manufacturing sector resulted in a decrease in credit to other sectors, besides the decrease in the agriculture and distribution sectors. Most of this credit is geared towards the large-scale enterprises. Aryeetey et al. (1997) observe that in 1992, the small-scale enterprise sector received only 15% of the total volume of loans, while large enterprises received 63%.

The direction of credit from the banking industry had implications for banks' profitability performance. Table 9 presents correlation coefficient results between sectoral shifts in credit and the performance indicators. The return on assets and return on equity are negatively associated with credit to the agriculture sector by 35% (10% level of significance) and 24%, respectively. Channelling credit to the manufacturing and distribution (trading) sectors is positively associated with the ROA by 58% at 1% level of significance and 49% at 5% level of significance, respectively.

Table 9: Correlation analysis: Sectoral shift in commercial bank credit (loans and advances) and profitability

Variable	Agriculture sector	Manufacturing sector	Distribution sector
Return on assets (ROA)	-0.3481 (-1.7808) ^c	0.5783 (3.4000) ^a	0.4923 (2.7125) ^b
Return on equity (ROE)	-0.2370 (-1.1699)	0.2302 (1.1345)	0.5433 (3.1036) ^a

Notes: a = significant at 1%; b = significant at 5%; c = significant at 10%.
t-statistics in parentheses.

There is a significant positive correlation between lending to the distribution (trade) sector and ROE, but the correlation between credit to the manufacturing sector and ROE is statistically insignificant. These interrelationships imply that government policy on preferential interest rates for agricultural activities directed credit to a sector where the banking system could not get the highest return, hence a shift of credit to more profitable investments in the post-liberalization period. The simple correlation analysis between the direction of credit to the public and private sectors and the measures of profitability (ROE and ROA) suggests that there was no significant relationship.

Capitalization of the banking system

The Banking Act of 1989 adjusted the minimum capital requirement for commercial banks and other financial institutions. The government increased the minimum paid-up capital requirement for commercial banks by 300% to K2 million, while for financial institutions they adjusted it from K0.1 million to K0.5 million. This was done to cover

depositors from risks of bank failure or bankruptcy, justifiable in the absence of deposit insurance facilities in the banking system. However, the existing banks were already well capitalized and this rule only applied to new entrants. In any case, the banking system has accumulated substantial reserves, and on average has about 100 times the minimum capital requirement. In the period before liberalization, for example, the average capitalization (equity and reserves) of the banking system was 905% of the minimum capital requirement, and increased to 5,580% of the minimum capital requirement in the period after liberalization. The banking system capitalization in terms of equity only was K7.3 million in the period before liberalization, and increased substantially to K64.6 million in the period after liberalization.

Deposits and market structure

Deposits in the banking system are dominated by a few banks. This implies that the banking system in Malawi is highly concentrated. Figure 3 shows the trend in market structure using various indexes of market concentration. The one-firm concentration ratio (CR1) shows that one bank dominates the share of deposits in the banking system and accounts for not less than 40% of bank deposits. However, it is also clear from the figure that the monopoly power of the largest banks has been falling, especially since liberalization. The trend of the two-firm concentration ratio (CR2) is more or less stable, although a decline is witnessed since 1987.

The three-firm concentration ratio (CR3) reflects increasing monopolistic or oligopolistic positions in the 1970s and early 1980s, but monopoly power declined during the post-liberalization period. Using the Herfindahl–Hirschmann index (HHI), the declining trend of monopoly power and the role of new competition is apparent. The HHI also shows that there has been instability in the market power since 1970, but a real downward trend started in 1987. Comparatively, the average HHI was 42.59% in the period before liberalization, but fell to 33.29% in the period after liberalization. The extent of changes in the monopoly power in the banking system is presented in Table 10. All measures of concentration show that after liberalization, the level of monopoly power in the banking industry declined. We also observe significant increases in the level of profitability as reflected by the return on assets during the same period. This seems to be a perverse result for the market structure hypothesis. However, the comparison of the changes in the means for market structure and profitability masks the relationship between the two variables over time, as monopoly power is just one of the many factors that explain bank profitability. The increase in profitability in the liberalization period varies with many factors that may suggest any or a combination of reduction in costs, increases in productivity and efficiency, the quality of the portfolio, market expansion, and effectiveness of competition.

There are several explanations for the trend in monopoly power in the banking system. The relative stability of the monopoly power, especially as reflected by the concentration ratios, arises because new entrants have mainly concentrated on corporate deposits and have therefore not diverted the clientele for commercial banks. The period after

liberalization also witnessed tremendous growth in the market: The market for deposits grew on average at 20.3% per year, with growth rates of 16.88% and 27.04% in the periods before and after liberalization, respectively. Such high growth rates have enabled the market to accommodate new entrants without substantial loss of market shares by the incumbents.

Figure 3: Trend in market structure: Indexes of market concentration, 1970–1994

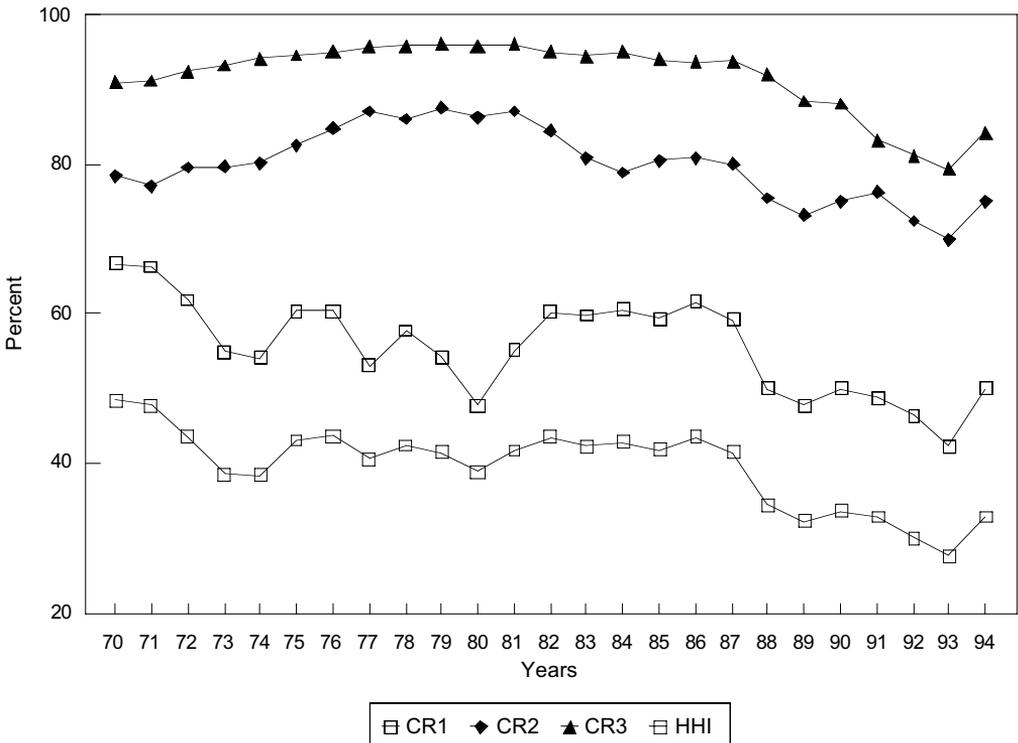


Table 10: Changes in market structure and profitability in percentages

Variables	Before	After	t-value	Change
Indexes of market concentration				
CR1	58.58	49.39	-4.70 ^a	Negative
CR2	82.60	74.84	-5.70 ^a	Negative
CR3	94.41	86.44	-6.36 ^a	Negative
HHI	42.59	33.29	-7.20 ^a	Negative
Profitability				
ROE	34.25	46.66	1.47	Positive
ROA	2.25	4.52	3.65 ^a	Positive
ROC	16.82	23.74	1.33	Positive

Notes: a = significant at 1%; b = significant at 5%; c = significant at 10%.

The declining trend in monopoly power in the late 1980s is a direct result of liberalization measures. Financial liberalization meant that entry in the financial system is relatively free. With the new Banking Act of 1989, the number of banks in the financial system also increased from five banks to eight banks by 1994, and to ten banks by the first quarter of 1996. This has increased the level of actual and potential competition in the banking sector. The new entrants have mainly used price competition and product innovation as an entry strategy. For example, Leasing and Finance entered the market with interest rates on deposits 4% higher than those offered by commercial banks. First Merchant Bank and Finance Bank entered the market with higher interest rates on deposits and a new innovation of offering interest on high value current accounts.

As Gibson and Tsakalotos (1994) note, a number of consequences follow from increased competition. First is a deterioration in the risk–return relationship and loosening of credit limits as banks compete with one another to maintain, if not increase, their market share. Second, increasing competition may lead to falling profits as some banks may be willing to accept short-run losses in the hope of future monopoly profits as competition stifles. However, in the short and medium term, this competition in Malawi has had limited effect on the market power of National Bank and Commercial Bank, since the two new entrants that have full commercial banking services only entered the market in 1995 and 1996.

Determinants of bank profitability

Market power in the banking industry is tested using a single-equation multiple regression analysis. Table 11 presents summary statistics of the variables used in the regression analysis of the structure–performance relationship (see Appendix C). Return on equity (ROE) and return on capital (ROC) show a mean profitability of 43.45% and 23.78%, respectively. The standard deviation and maximum rates are also high. The average profitability measured by return on assets (ROA) is 3.24% with a standard deviation of about half the mean rate. The trends in the profitability of commercial banks

are presented in figures 4 and 5. All profitability measures show that in the early 1970s bank profitability increased, but then deteriorated from 1979 through to 1984 when it picked up to match the mid-1970s levels. During the period of poor performance, the economy in general was in a crisis, which affected banks' major customers such as state enterprises and large private enterprises. Commercial bank profitability also shows a declining trend since 1990, reflecting the potential effect of competition as more financial institutions were granted commercial banking licenses. The standard deviation, the maximum and minimum values of the three-firm concentration ratio (CR), shows that there has been little variability of monopoly power. The variability as indicated by the standard deviation is also low for CAPAST, LTOAST and DDTDEP, suggesting that these ratios were relatively stable over the study period.

Figure 4: Return on assets for dominant commercial banks (percent)

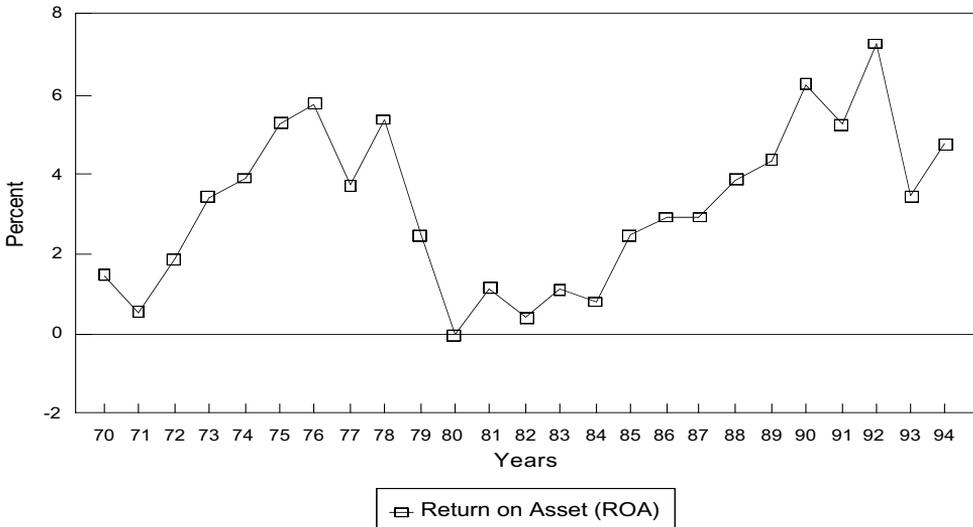
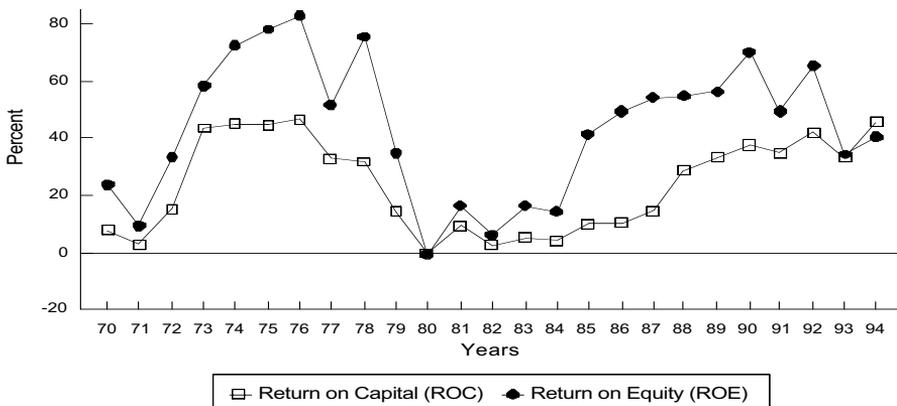


Figure 5: Return on capital and equity for dominant commercial banks (percent)



In order to avoid spurious regression, we use the Dickey–Fuller unit root tests to establish stationarity and order of integration as reported in Table 11. We cannot reject the presence of a unit root in levels, but it is rejected in the first difference for all the series. Thus, all the series are integrated of order 1. We only estimate the long-run relationship that exists between market structure and profitability.

Table 11: Summary statistics of variables in regression analysis

Variable	Unit of measure	Mean	SD	Max.	Min.	Augmented Dickey–Fuller Tests ^a		
						Levels ^b	First Order difference ^c	
ROA	Percent	3.24	2.00	7.27	-0.03	-2.1827	-6.3698 (0)	I(1)
ROE	Percent	43.45	24.11	82.59	-0.49	-2.4195	-5.5968 (0)	I(1)
ROC	Percent	23.78	16.48	46.82	-0.15	-1.8350	-4.0107 (0)	I(1)
CR	Percent	91.84	4.87	96.15	79.51	-2.7805	-3.4279 (4)	I(1)
MS	Percent	80.11	4.93	87.57	70.18	-1.7687	-4.1233 (1)	I(1)
ASSET	MK ^d	535232	622828	2647076	45000	-1.8535	-2.8448 (0)	I(1)
CAPAST	Percent	15.82	4.90	27.52	7.91	-1.6895	-3.8825 (2)	I(1)
LTOAST	Percent	56.75	12.10	77.90	35.35	-2.1688	-3.2948 (1)	I(1)
DDTDEP	Percent	42.31	10.75	65.68	29.38	-0.8693	-3.3975 (1)	I(1)
MKTDEP	MK ^d	597095	753921	3150177	41877	-0.5153	-3.8620 (0)	I(1)
MKTGRO	Percent	20.23	11.51	44.91	1.94	-1.8260	-4.1600 (2)	I(1)
REFORM	Binary	0.32	0.48	1.00	0.00	-	-	-

- Notes:
- Unit root tests for all independent variables are applied on variables in natural logarithms.
 - Two lags are used and the MacKinnon critical values for the ADF are: 1% = -4.4415, 5% = -3.6330, 10% = -3.2535.
 - Number of lags used and the MacKinnon critical values for the DF are: 1% = -3.7497, 5% = -2.9969, 10% = -2.6381; for ADF: 1% = -3.8304, 5% = -3.0294, 10% = -2.6552.
 - Thousands of Malawi kwacha.

Market power in the banking industry is tested using a single-equation multiple ordinary least squares (OLS) regression analysis. Table 12 reports regression results from estimating Equation 4 above. For each performance measure we estimate the collusion model and efficient market model. The first equation tests the collusion hypothesis. In the second equation we introduce market share and test the efficient market hypothesis. We also test the equations for serial correlation, normality and misspecification using the LM serial correlation test, Jarque-Bera normality test and the RESET specification test, respectively. The null hypotheses of serial correlation, misspecification and that residuals are not white noise were rejected at the 1% level. The explanatory power of the model ranges from 61% to 81%. Thus, the model explains most of the variation in commercial banks' profitability. Table 13 provides computed elasticities of variables that are significant at least at the 10% level.

Table 12: Regression results: Determinants of commercial bank profitability

π	Eqn	Constant	CR	MS	ASSET	CAPAST	LTOAST	DDTDEP	MKDEP	MKGRO	REFORM	R ²	DW	F
ROA	3.1	-296.223 (-2.566)	41.629 (2.230)	-	1.094 (0.088)	0.326 (0.126)	4.328 (2.118)	13.188 (4.344)	2.372 (0.183)	0.009 (0.021)	1.163 (0.759)	0.735 [0.60]	1.93	5.559
	3.2	-244.244 (-1.579)	45.329 (2.224)	-14.897 (-0.521)	13.240 (0.499)	-1.820 (-0.371)	5.052 (2.012)	13.147 (4.229)	-9.770 (-0.364)	0.053 (0.114)	1.456 (0.874)	0.740 [0.58]	1.98	4.747
ROE	3.3	-3683.33 (-2.192)	578.596 (2.130)	-	65.653 (0.363)	-11.484 (-0.304)	25.230 (0.848)	159.990 (3.621)	-30.186 (0.160)	-1.123 (-0.174)	20.503 (0.920)	0.613 [0.42]	1.79	3.163
	3.4	-1938.10 (-0.897)	702.819 (2.468)	-500.195 (-1.251)	473.443 (1.276)	-83.543 (-1.220)	49.533 (1.412)	158.616 (3.652)	-437.988 (1.168)	0.337 (0.052)	30.365 (1.305)	0.649 [0.44]	1.94	3.085
ROC	3.5	-1598.90 (-2.092)	230.830 (1.868)	-	31.701 (0.386)	-28.131 (-1.638)	18.890 (1.396)	83.276 (4.143)	-9.927 (-0.115)	-1.345 (-0.458)	4.140 (0.408)	0.828 [0.74]	1.77	9.655
	3.6	-911.296 (-0.915)	279.773 (2.132)	-197.071 (-1.070)	192.366 (1.125)	-56.521 (-1.791)	28.465 (1.760)	82.735 (4.133)	-170.553 (-0.987)	-0.770 (-0.259)	8.025 (0.748)	0.841 [0.74]	1.78	8.787

Notes:

- All independent variables, except REFORM, are in natural logarithm. Therefore, the absolute change in the dependent variable for a percentage change in the independent variable is obtained by multiplying the coefficient by 0.01.
- Figures in parentheses are t-statistics. The following significance levels and t values apply for 25 observations: 1% = 2.787, 5% = 2.060, 10% = 1.708.
- Figures in brackets are adjusted R².
- All the equations passed the LM serial correlation test, Jarque-Bera normality test and RESET specification test.

The results show support for the traditional concentration–conduct–performance or collusion hypothesis. The coefficient of the three-firm concentration ratio is statistically significant at 5% irrespective of measure of performance. The elasticity of commercial bank profitability with respect to market concentration ranges from 9.71% in Equation 3.5 to 16.18% in Equation 3.4, as Table 13 shows. These results support the collusion hypothesis in the banking industry in Malawi. Molyneux et al. (1994) also accept the structure–conduct–performance paradigm in the Spanish banking industry. The inclusion of market share does not significantly improve the explanatory power of the model, and does not change the significance and sign of the market concentration variables. Most empirical studies show that inclusion of market share makes concentration insignificant or negatively associated with profitability (Smirlock, 1985; Maudos, 1998). The relationship between market share and profitability is negative and insignificant irrespective of the measure of profitability. This relationship is weak in the Malawian banking industry because of the high correlation between concentration and market share, since two commercial banks dominate the banking industry.

Table 13: Computed elasticities from significant variables*

Variables	ROA		ROE		ROC	
	3.1	3.2	3.3	3.4	3.5	3.6
CR	12.87	14.02	13.32	16.18	9.71	11.76
CAPAST	-	-	-	-	-	-2.38
LTOAST	1.34	1.56	-	-	-	1.20
DDTDEP	4.08	4.07	3.68	3.65	3.50	3.48

Note: *Evaluated at the mean of the dependent variables.

Of the control variables only DDTDEP, LTOAST and CAPAST are at least statistically significant. The coefficient of DDTDEP has the expected positive sign in all equations whatever the profitability measure and specification. In all the equations, the coefficient of DDTDEP is significant at the 1% level. The elasticity of profitability with respect to DDTDEP ranges from 3.48% to 4.08%. We also note that ROA is more sensitive to DDTDEP than ROE and ROC. The significance and consistency of this variable confirm the notion that demand deposits are a cheaper source of funds for the banking industry. The performance of this variable is similar to that found in other studies (Smirlock, 1985; Evanoff and Fortier, 1988).

The ratio of loans to assets, LTOAST, is only significant in three specifications, particularly when we use ROA and ROC as measures of profitability. The coefficient of LTOAST is consistently positive, as expected, in all specifications. LTOAST is positively associated with ROA and its coefficient is statistically significant at 5% in both cases. With respect to ROC, the coefficient of LTOAST is statistically significant at the 10% level only when we include the market share variable. The elasticity of profitability with respect to the loan–asset ratio ranges from 1.56% to 1.20%. The performance of the LTOAST variable has mostly produced perverse results, with negative coefficients (Molyneux and Forbes, 1995; Evanoff and Fortier, 1988; Maudos, 1998).

The capital–asset ratio, CAPAST, is statistically significant at the 10% level only in the case where we use ROC as a profitability measure with the inclusion of market share. The coefficient of CAPAST is generally negative, although we also obtain a positive coefficient in one specification. The other control variables including ASSET, MKDEP, MKGRO and REFORM are not statistically significant. The coefficient of ASSET is consistently positive, supporting the scale economy argument, but is not significant in all specifications. The coefficients of market demand variables are inconsistent and highly insignificant. Financial sector reforms provide an environment conducive to high bank profitability as reflected by the consistency of the dummy variable REFORM. However, the effect of financial sector liberalization is not statistically significant.

Overall, the study supports the traditional structure–conduct–performance hypothesis, suggesting the role of monopoly power in determining commercial banks' profitability in the Malawian banking industry. Commercial banks may exercise monopoly power on interest rate margins, which increased significantly after liberalization, and other income earning services such as fees and commissions. The data do not support the efficient market hypothesis, and the coefficient of market share is negative in all specifications. However, we must exercise caution in this judgement because others (Maudos, 1998) note that market share is a poor proxy for efficiency and propose inclusion of a direct measure of efficiency. Maudos (1998) introduces a measure of overall efficiency with market concentration and market share and finds the coefficients of both efficiency and market share to be highly significant while the coefficient of concentration is either negative or insignificant.

6. Concluding remarks

This study attempts to provide empirical evidence on the effect of financial sector reforms on financial intermediation, savings mobilization and market structure, and to investigate the relationship among market structure, bank behaviour and profitability performance in the Malawian banking industry. This study tested two hypotheses. First, we examined the financial liberalization hypothesis based on the McKinnon–Shaw thesis, which focuses on the impact of financial sector reforms on savings mobilization and intermediation, behaviour of real interest rates, and the structure of assets. Second, the structure–conduct–performance hypothesis in the Bainian tradition investigates the effect of financial sector reforms on monopoly power and the relationship that exists between market structure and performance. We also test the alternative efficient market hypothesis.

With respect to the financial liberalization hypothesis, the study provides some evidence that financial sector reforms have reduced financial repression in the formal banking system in Malawi. The results compare favourably with those by Aryeetey et al. (1997), although there are stronger differences in this study between the periods before and after liberalization with the use of a longer time horizon. Nonetheless, some signs of financial repression are still evident several years after financial liberalization. The evidence in favour of financial liberalization is remarkable as for financial deepening and shift in credit to non-preferential sectors. The ratio of M2 to GDP has increased and non-bank financial institutions are playing a greater role in the financial sector. The share of demand deposits in total deposits has significantly fallen in favour of a significant increase in the share of time and savings deposits. The share of credit to the agricultural sector has fallen in favour of a significant increase in the share of credit to the manufacturing sector. We also find a high correlation between bank profitability and the direction of credit. Credit to the agricultural sector was associated with low bank profitability while that to the manufacturing and distribution sectors was associated with high profitability. This provides justification for the banks to diversify their income-earning assets away from the agricultural sector in the period after liberalization.

On the perverse side, the share of loans and advances in total assets has fallen, indicating the impact of the high liquidity reserve requirement and increases in cash holdings by banks and other non-performing assets. The share of credit to the public sector increased, while that to the private sector declined, suggesting a crowding out effect. The indicators of the behaviour of interest rates and intermediation margins show that real interest rates declined after liberalization, contrary to the predictions of the financial liberalization thesis. The improvements in real interest rates have been adversely affected by macroeconomic instability due to high levels of inflation, upward adjustments in liquidity reserve

requirement and fiscal indiscipline. Inflation and fiscal indiscipline partly resulted from the economic liberalization programme initiated in 1981. The financial liberalization hypothesis also predicts that the spread between lending and savings interest rates will diminish with liberalization, but the evidence in this study shows a significant increase in intermediation margins. Average monopoly power as measured by the concentration indexes has fallen significantly.

The relationship between market structure and performance was investigated using a regression analysis of commercial banks' profitability. We have examined two competing hypotheses—whether collusion or efficiency is the more important determinants of commercial banks' profitability. The results of the study provide evidence in favour of the traditional structure–conduct–performance (collusion) hypothesis in the Malawian banking industry. Intermediation margins are high and increased significantly following the introduction of financial sector reforms. The simple correlation coefficient between intermediation margin and profitability, though positive, is not statistically significant, possibly masked by the long period of interest rate controls during the period before financial sector reforms and the fact that other sources of revenue may play a significant role. The overall performance in terms of interest income compared with other sources of income, such as fees and commissions on specialized services, shows that monopoly power is one of the determinants of commercial banks' profitability.

These results point to the fact that fees and commissions, which form part of the income for commercial banks that the authorities do not regulate, may be high because of lack of competition. Other sources of revenue for commercial banks are transaction costs that savers and borrowers pay, including commission charges on foreign exchange transactions, bank charges, penalties on returned cheques, mail transfer charges, loan or overdraft application fees, and cable charges. The results show that if there is concern about monopoly powers in multi-service (multi-product) firms such as banks, it is not only the structure of interest rates (intermediation margins) that matters. Transaction costs that savers and depositors incur are also potential avenues for the exercise of monopoly power by banks, and may affect the ability of the banks to mobilize savings and to extend credit to productive sectors of the economy.

Data from the Malawian banking industry do not support the relationship between market share and profitability. Thus, it is not the efficiency of commercial banks that explains variations in profitability over time in the Malawian banking industry. Other scholars also note that market share is a poor proxy of efficiency, so that we need a direct measure of efficiency to test the efficient market hypothesis.

We also find the ratio of demand deposits to total deposits and the loan–asset ratio to be other important and significant determinants of commercial bank profitability. However, commercial banks' profitability is more sensitive to monopoly power than to the ratio of demand deposits to total deposits. We also note that commercial bank profitability increased after financial sector reforms, although the relationship is not statistically significant.

Financial reforms in the Malawian formal banking industry are almost complete. However, one aspect that requires further reform is the high liquidity reserve requirement. If the concern is risk in the banking system, the monetary authorities should encourage

the development of deposit insurance institutions, rather than resorting to direct control that results in financing government deficits and hence contributes to macroeconomic instability. The policy implications that emerge from the market structure–performance hypotheses are twofold. First, the monetary authorities should determine the relative importance of fees and commissions vis-a-vis interest income in the revenue function of banks, to examine the extent to which each component is subject to abuse of monopoly power. Thus, if the concern is monopoly power, interest margins are not the only sources of revenue that exist in multi-service firms such as banks. Second, the current ownership structure in the banking industry, in which the state has a dominant ownership position, facilitates collusion. The government should therefore encourage new entry in commercial banking activities, for instance by divesting its ownership to the private sector in the financial sector. The current state of competition in the banking system is fringe, with two banks accounting for 75% of the market and the other nine banks only 25%.

Nonetheless, we require further research to understand the institutional framework and operations of financial institutions in Malawi. First, there is need to determine the specific components of income-earning services that may be subject to abuse of monopoly power. Second, there is need to further test the SCP hypothesis after a long period of competitive banking activities. The dominant commercial banks in this study started facing competition in similar services only in 1995, and it would be interesting to study the trend in monopoly power in the post-1995 period. Finally, the issue of the effectiveness of bank supervision during and after the liberalization period has not been investigated and requires further research in the Malawian banking industry.

Notes

1. See surveys by Clark (1986), Evanoff and Fortier (1988), and Gilbert (1984).
2. Chipeta and Mkandawire (1991) estimated that in terms of credit extended to the private sector, the informal sector is larger than the formal and semi-formal sectors.
3. Financial institutions were defined in the Banking Act of 1965 as those institutions carrying out banking business that were not commercial banks, discount houses or an accepting house.
4. However, the new Reserve Bank of Malawi Act of 1989 gives powers to the central bank to prescribe credit ceilings for banks and financial institutions aimed at limiting the availability of credit in the economy (under section 33 of the act).
5. The Banking Act of 1989 defines financial institutions as those whose regular business consists of granting loans, advances and credit facilities and whose business is not financed by soliciting deposits from the public. These include pension funds, insurance companies, investment funds and investment companies.
6. See Shaw (1973), Aryeetey et al. (1997), and Seck and El Nil (1993). Gibson and Tsakalotos (1994) provide a good review of the benefits of financial liberalization and its limitations.
7. However, excessive competition may bring about unproductive and potentially destabilizing speculative activity such as foreign exchange speculation, which may create instability in the banking system.
8. See Klein (1971) and Santomoro (1984) for an extensive survey of models of the banking firm.
9. See Klein (1971), Santomoro (1984) and Mullineaux (1978).
10. See Scherer and Ross (1990), Lee (1992), and George and Joll (1971) for a review of studies in manufacturing industries.
11. See surveys by Gilbert (1984), Smirlock (1985), Evanoff and Fortier (1988), and Clark (1986).
12. Maudos (1998) and Smirlock (1985) give alternative explanations of the traditional and efficient market hypotheses when both variables are significant.
13. See Gilbert (1984) for alternative measures of bank performance that have been used in empirical work.
14. See Gilbert (1984), Morris (1984), Civelek and Al-Alami (1991), Berger and Hannan (1989), and Molyneux and Forbes (1995) for some of the studies.
15. However, see Demsetz (1973) and Baumol (1982) for alternative hypotheses of efficient structure and contestable markets, respectively.

16. See Davies (1979), Rose and Fraser (1976), and Vanlommel et al. (1977) for a discussion of alternative concentration measures used in empirical studies.
17. See Sleuwaegen and Dehandschutter (1986) and Dansby and Willig (1979).
18. See Morris (1984) and Gilbert (1984) for a review of some of the studies. Other studies include Smirlock (1985) and Evanoff and Fortier (1988).
19. See Mitchell (1984) and Evanoff and Fortier (1988).
20. Civelek and Al-Alami (1991), Molyneux and Forbes (1995), and Agu (1992) use the loan–deposit ratio.
21. See Evanoff and Fortier (1988) and Smirlock (1985).
22. This positive trend is also noted by Aryeetey et al. (1997) using 1980 and 1992 figures.
23. These simple correlation coefficients were not statistically significant using the t-test.
24. See Aryeetey et al. (1997) and Chipeta and Mkandawire (1996).
25. The efficient market hypothesis is still rejected if we exclude the market concentration variable. The coefficient of market share is negative and/or statistically insignificant.

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Appendix A: Portfolio theory approach of the banking firm

Assume that the bank manager (owner) has an exponential utility function that is concave in the uncertain end of period profit. Maximization of expected utility is equivalent to maximization of the certainty equivalent of profit:

$$CE(\pi) = E(\pi) - (b/2)\sigma_{\pi}^2 \quad (\text{A1})$$

subject to a balanced sheet constraint, where E_0 is the expectations operator and b is a measure of the bank's absolute risk aversion. Profit, variance and the balance sheet constraint are expressed, respectively, as:

$$\pi = \sum_{i=1}^m (r_i - c_i)A_i - \sum_{k=1}^n (r_k - c_k)D_k \quad (\text{A2})$$

$$\sigma_{\pi}^2 = E[(\pi - E(\pi))^2] \quad (\text{A3})$$

$$\sum_{i=1}^m A_i = \sum_{k=1}^n D_k \quad (\text{A4})$$

where A_i and D_k are a feasible set of assets and liabilities, r_i and r_k are interesting rates on the i th assets and k th liability, and c_i and c_k are per unit cost of producing each of the i asset and k liabilities.

Under the assumption of quantity uncertainty, the variance can be written as:

$$\sigma_{\pi}^2 = \sum_{i=1}^m (r_i - c_i)^2 \sigma_{Ai}^2 + \sum_{k=1}^n (r_k + c_k)^2 \sigma_{Dk}^2 + 2 \sum_{i=1}^m \sum_{(j=1 \ i \neq j)}^m (r_i - c_i)(r_j - c_j) \sigma_{Aij}$$

$$+2 \sum_{k=1}^n \sum_{(l=1, k \neq l)}^n (r_k + c_k)(r_l + c_l) \sigma_{Dkl} + 2 \sum_{i=1}^m \sum_{k=1}^n (r_i - c_i)(r_k + c_k) \sigma_{AiDk} \quad (\text{A1.5})$$

Differentiating the Lagrangian function Φ with respect to interest rates, r_i and r_k , assuming that all variances and covariances are insensitive to changes in interest rates, obtains the following first-order conditions:

$$\begin{aligned} \delta \Phi / \delta r_i &= (r_i - c_i)(\delta A_i / \delta r_i) + A_i \\ &- (b/2) \left[2(r_i - c_i) \sigma_{Ai}^2 + 2 \sum_{i \neq j} (r_j - c_j) \sigma_{Aij} + 2 \sum_k (r_k + c_k) \sigma_{AiDk} \right] \\ &- \lambda (\delta A_i / \delta r_i) = 0 \end{aligned} \quad (\text{A6})$$

$$\begin{aligned} \delta \Phi / \delta r_k &= - (r_k + c_k)(\delta D_k / \delta r_k) + D_k \\ &- (b/2) \left[2(r_k + c_k) \sigma_{Dk}^2 + 2 \sum_{k \neq l} (r_l + c_l) \sigma_{Dkl} + 2 \sum_i (r_i - c_i) \sigma_{AiDk} \right] \\ &- \lambda (\delta D_k / \delta r_k) = 0 \end{aligned} \quad (\text{A7})$$

Assuming uncertainty in asset demand and deposit supply given the selection of r_i and r_k , the bank's optimality condition from maximizing (A1) subject to (A4) with respect to r_i and r_k , for all i and k is:

$$\begin{aligned} &r_i \left[I + \left(\frac{I}{e_{Ai}} \right) \right] - c_i - \left[\frac{b}{(\delta A_i / \delta r_i)} \right] \\ &x \left[(r_i - c_i) \sigma_{Ai}^2 + \sum_{j=1, i \neq j}^m (r_j - c_j) \sigma_{Aij} + \sum_{k=1}^n (r_k + c_k) \sigma_{AiDk} \right] \\ &= r_k \left[I - \left(\frac{I}{e_{Dk}} \right) \right] + c_k + \left[\frac{b}{(\delta D_k / \delta r_k)} \right] \end{aligned}$$

$$x \left[(r_k + c_k) \sigma_{Dk}^2 + \sum_{l=1}^n (r_l + c_l) \sigma_{Dkl} + \sum_{i=1}^m (r_i - c_i) \sigma_{Aidk} \right] \quad (A8)$$

where e represents respective elasticities.

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Appendix B: Bank deposits and advances

Table B1: Structure of deposits by type of bank in thousand kwacha

Year	Commercial bank (CB) deposits	Non-bank financial institution (NBFI) deposits	Ratio of NBFI deposits to CB deposits
1970	32943	8934	27.12
1971	34943	10279	29.42
1972	44347	11319	25.52
1973	55522	14032	25.27
1974	73326	17994	24.54
1975	83314	17296	20.76
1976	94961	16760	17.65
1977	121906	17829	14.63
1978	141944	22659	15.96
1979	174667	24790	14.19
1980	188011	29522	15.70
1981	236869	34756	14.67
1982	242471	43920	18.11
1983	244406	57729	23.62
1984	317649	84427	26.58
1985	330454	79421	24.03
1986	389524	92352	23.71
1987	519748	128537	24.73
1988	635101	205235	32.32
1989	665393	243028	36.52
1990	791156	261285	33.03
1991	936343	287609	30.72
1992	1115531	420447	37.69
1993	1525529	648304	42.50
1994	2371088	779089	32.86

Sources: RBM (various), *Economic and Financial Review*, annual reports and accounts for individual banks.

Table B2: Commercial banks' advances by economic activity, 1970–1994

Year	Thousands of Malawi kwacha					Proportion of the total (percent)			
	Agriculture	Manufacturing	Distribution (Trade)	Other	Total	Agriculture	Manufacturing	Distribution (Trade)	Other
1970	2086	4526	7406	7620	21638	9.64	20.92	34.23	35.22
1971	3015	4834	10537	9170	27556	10.94	17.54	38.24	33.28
1972	3306	5617	12633	11399	32955	10.03	17.04	38.33	34.59
1973	5705	2308	13284	7886	29183	19.55	7.91	45.52	27.02
1974	7763	3976	26229	8730	46698	16.62	8.51	56.17	18.69
1975	13606	6059	25013	10549	55227	24.64	10.97	45.29	19.10
1976	27872	7652	21328	14890	71742	38.85	10.67	29.73	20.75
1977	30190	12675	29980	13501	86346	34.96	14.68	34.72	15.64
1978	53763	13552	25193	28344	120852	44.49	11.21	20.85	23.45
1979	81853	9667	36752	42333	170605	47.98	5.67	21.54	24.81
1980	92671	6689	16548	56337	172245	53.80	3.88	9.61	32.71
1981	94272	6053	20387	69077	189789	49.67	3.19	10.74	36.40
1982	115128	7819	19723	79444	222114	51.83	3.52	8.88	35.77
1983	138520	10838	30684	84041	264083	52.45	4.10	11.62	31.82
1984	113463	19780	29791	41262	204296	55.54	9.68	14.58	20.20
1985	117866	9849	28810	24668	181193	65.05	5.44	15.90	13.61
1986	133464	15261	41534	42113	232372	57.44	6.57	17.87	18.12
1987	109037	24690	34699	34936	203362	53.62	12.14	17.06	17.18
1988	92323	48611	71749	57611	270294	34.16	17.98	26.54	21.31
1989	125707	83403	105466	61521	376097	33.42	22.18	28.04	16.36
1990	136201	119222	173636	83953	513012	26.55	23.24	33.85	16.36
1991	142592	171811	226202	116414	657019	21.70	26.15	34.43	17.72
1992	219917	134251	346548	181955	882671	24.91	15.21	39.26	20.61
1993	84308	52409	53053	56071	245841	34.29	21.32	21.58	22.81
1994	283001	326885	268754	209221	1087861	26.01	30.05	24.70	19.23

Sources: RBM (various) *Economic and Financial Review*, annual reports and accounts for individual banks.

Appendix C: Variables used in the regression model

YEAR	ROA	ROE	ROC	CR	MS	ASSET	CAPAST	LTOAST	DDTDEP	MKDEP	MKGRO
1970	1.457	23.600	7.807	91.109	78.666	45000	18.659	58.025	60.416	41877	19.42
1971	0.539	9.160	3.039	91.433	77.269	42479	17.741	62.862	65.678	45222	7.99
1972	1.885	33.556	15.128	92.699	79.666	50660	12.462	65.235	54.766	55666	23.09
1973	3.434	58.097	43.424	93.453	79.826	60289	7.907	63.773	58.723	69554	24.95
1974	3.920	71.934	44.821	94.681	80.296	80354	8.746	56.269	52.865	91320	31.29
1975	5.267	78.050	44.462	95.002	82.809	94510	11.846	52.478	60.536	100610	10.17
1976	5.782	82.595	46.823	95.387	84.998	108339	12.348	67.125	47.850	111721	11.04
1977	3.743	51.493	32.587	96.036	87.241	137725	11.486	70.809	42.988	139735	25.07
1978	5.347	75.187	31.638	96.316	86.234	170811	16.900	69.794	44.804	164603	17.80
1979	2.493	35.099	13.970	96.620	87.571	212612	17.847	75.216	35.733	199457	21.17
1980	-0.031	-0.490	-0.490	96.496	86.429	237263	20.758	77.903	29.993	217533	9.06
1981	1.165	16.529	16.529	96.733	87.204	271040	12.607	60.679	31.673	271625	24.87
1982	0.400	6.019	6.019	95.763	84.664	292329	17.055	64.091	33.850	286391	5.44
1983	1.103	16.459	16.459	95.181	80.893	309509	21.034	58.504	31.020	302135	5.55
1984	0.792	14.221	14.222	95.725	79.002	391268	18.816	42.308	29.377	402076	33.08
1985	2.467	41.192	41.193	94.595	80.623	441339	25.125	45.106	32.064	409875	1.94
1986	2.919	49.122	49.122	94.286	80.835	537444	27.523	43.199	36.668	481876	17.57
1987	2.951	53.792	53.792	93.964	79.843	650101	20.051	35.349	32.460	650965	35.09
1988	3.858	54.504	54.504	92.459	75.577	734690	13.555	35.886	38.843	840336	29.09
1989	4.368	56.402	56.402	88.908	73.247	766524	13.194	48.200	36.127	908421	8.10
1990	6.263	70.105	70.106	88.622	75.173	948795	16.615	54.336	38.370	1052441	15.85
1991	5.247	49.271	49.271	86.263	76.502	1102020	15.034	62.888	40.655	1223952	16.30
1992	7.270	65.306	65.306	82.395	72.627	1351150	17.438	62.745	42.579	1535978	25.49

Notes: ROA, ROE, ROC, CR3, CAPAST, LTOAST, DDTDEP and MKTGRO are measured in percentages, while ASSET and MKTDEP are in thousands of Malawi kwacha.

Source: Author's calculations.

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