

Banking and Economic Growth: Case of the Gambia

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Abstract

This research advances four theoretical approaches in an attempt to relate the banking activities to the real economic activities. It starts with the Schumpeter's circular flow of creditary production that argues that the banks start the production cycle for offering the credits that enable the entrepreneurs to purchase labor and capital. The banks increase the savings mobilization and allocate the scarce savings to the productive investments. Second, we develop a benchmark from the Broadus' competitive model to analyze the competitiveness and efficiency in the banking industry. The third theoretical approach incorporates a credit market in IS/LM analysis and discusses the credit constraint as an analogy to a quantity constraint of the neo-Keynesian theory. This approach also analyzes the impacts of the interaction between the monetary policy and the fiscal policy on the endogenous macroeconomic variables. We finally modify Tsurus' model to show that banks' mobilized savings could be spent on the maintenance of the banks rather than being channeled to the productive investments, and as a result a bank-based economy could perform worse than a nonbank-based economy. We then estimate and test the hypothetical relationships between the banking and the real economic activities, and estimate and analyze the banks' credit market functions and the credit constraint hypothesis. We use Johansen Vector Error Correction Methods, VECM, for all the estimations, and hence the analysis is focused on the long run relationships and the adjustments towards the equilibrium. We also conduct an explorative survey into the public's relationships with the banks. The research finds that the banks' credit to the private sector is vital for the real economic activities of output and capital accumulation, it is found to be Granger causal for these activities, and it is a weakly exogenous variable in the equilibrium systems that do not include private sector investments; while, the bank liabilities are found to be an endogenous variable. The interest rate is found to slightly influence the decision of the public to save in the banks; the public see the credit facilities biased towards the consumption financing than investment financing. The lending interest rate has a small effect on the credit supply. The banks' credit supply is inelastic with respect to the lending interest rate, and there is weak credit constraint in the credit market. The banking industry is found to be uncompetitive and inefficient; and the increased transaction costs of the bank credit market are associated with increased prices in the economy. These increased transaction costs are also found to cause the public to hold increased real money balances. The banks' credit and lending capacity are found to depend on the private sector investments, increases in the private sector feed back onto both the banks' credit and lending capacity. The banks lag behind the developments in the private sector; thus they are not promoters or engines of growth for the private sector.

Dedicated to my father, may his soul rest in peace.

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1 Introduction

Paul Romer (1993) says “A nation that lacks physical objects like factories and roads suffers from object gap. A nation that lacks the knowledge used to create value in a modern economy suffers from idea gap.” To complete, a nation that lacks finance to erect physical objects and produce knowledge suffers from all gaps. A well-functioning banking sector is sufficient to create economic modernization. Alexandra Hamilton (1781)¹ argued that “banks were the happiest engines that ever were invented for spurring economic growth”. That is, there is a causation that runs from banking sector development to economic growth. The recent experience in Eastern Europe and Asia has shown that countries that moved quickly to fix their banking industry were able to achieve a sustainable rate of growth and new job opportunities than those that did not. But why this hypothesis did not hold for the case of the Gambia, with some banks existing in the country for over a hundred year. Are these banks really financing the domestic economic growth? Or what went wrong with the banks including the central bank in the country? These are some of the questions this research intends to tackle. The research will span from the public perspectives about banking to banking activities and the impact of those activities on the economic growth. The research advances four models that attempt to link the banking activities to the real economic activities. It starts with Schumpeterian circular flow of creditary production that argues that banks enable the entrepreneurs to carry out new economic activities, and that any new development that has no previous products must be incubated by a bank credit. The second model gives an economic representation that investigates the efficiency and competitiveness of the banking industry. The third model incorporates a bank credit market in an IS/LM analysis and discusses the credit constraint, and the fourth model investigates the banking role in the savings mobilization and allocation. The research attempts to analyze three problems, which are defined in the next section.

¹ A quote from Levine, Ross; Loayza, Norman; and Beck, Thorsten (2000), *Journal of Monetary Economics* 46, pp. 31 – 77.

1.1 Research Problems

- 1.1.1 To inquire historically in the Gambian economy with emphasis on the banking industry and financial system. This is to attempt to identify some major parameters of the economy and how those parameters have been changing over time.
- 1.1.2 To investigate the public view about the banking industry in the country and attempt to formulate the reasons for which the public hold bank accounts and the reasons for which the public get the bank facilities, and to improve the understanding about the types of projects the banks tend to finance. This is done by conducting an explorative survey, the survey questionnaire sample is in Appendix C, and the survey outcomes are discussed in section 5.2.
- 1.1.3 Banking and the economy: I attempt to formulate models in which the role of the banks can be identified in the economy and the ways in which the banks can contribute to the economic growth. Hypothetical models are developed in which the banks can start the circular flow of the economic growth and development, and how the efficient performance of the banks can be channelled to promote the economic activities. I develop a bank credit market that can interact with the other markets to determine the national output, transaction costs, interest rate, prices and the credit quantity of the banks. I also attempt to formulate models in which the bank credit can affect the private sector investments and help determine some other endogenous variables. I then analyze statistically and econometrically the hypothetical models over the period 1964 to 2002 in order to spot the linkages between banking and economic activities.

1.2 Objectives and Contribution

The Gambia has no abundant natural resources; but this is no excuse for underdevelopment. In fact, it has been observed that countries with abundant natural resources have tended to grow less rapidly than natural scarce economies. Sachs and Warner (1997)² found a negative relationship between natural resource abundance and economic growth, confirming the old notion of Dutch Disease that natural resource booms crowd out other sectors that have positive externalities in the form of learning by doing (Boschini, Pettersson and Roine, 2003). Recent findings by Welsch (2004) and Esanov et. al(2004) have also point to the validity of resource curse. The other views suggest that whether the resource is a curse or not depends on the interaction between the institutional setting and the type of natural resources (Boschini, Pettersson and Roine, 2003, and Hausmann and Rigobon, 2002). Hausmann and Rigobon found that financial market imperfection worsens resource curse. This is the point we like to develop in this research; we are not here to write on the natural resource-growth relation, but finance-growth interaction. It is finance, bank credit, that matters to the economic activity; if there is a finance gap, then there will be gaps everywhere in the economy. With sound banking system, we should be sure of economic modernization. The resolutions to the research problems will contribute towards the long debates and on-going researches that the Gambia should be a financial centre and a trade gateway of Africa, particularly West Africa. It is argued that because the country is small and has no natural resource, it should specialize in banking, finance and inter-port trade. The debates have been going on without any scientific research on how current banking activities are affecting the economy. I believe, before any strategic policy to make a country a financial centre, the current banking sector should be thoroughly appraised against the long term economic goals of the country.

This research will be first of such kind that will explore what is going inside the banking sector, how that activities affect the economic growth and modernization and what could be recommended for policymakers to make the country a financial centre. The research is organized as follows, Chapter 2 reviews the Gambian economy with an emphasis on the financial sector; Chapter 3 presents a brief survey of the theory and evidence for the role of

² A quote from Manzano and Rigobon, Resource Curse or Debt Overhang?, Working Paper 8390, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138, July 2001.

the banks in the economy. Chapter 4 discusses the theoretical framework, where four approaches are presented to analyze the banking contributions to the economic growth and development. It also defines the behavioural relationships to be estimated and the variables in each relationship. Chapter 5 presents and analyzes the empirical findings, and chapter 6 concludes the research and derives the recommendations. There are three appendices after the list of references, Appendix A gives the results of order selection, co-integration rank tests and some Granger causality tests. Appendix B tabulates the research data and Appendix C gives a sample of the survey questionnaire. The lists of figures and tables are given in the table of contents.

2 Background to the Gambian Economy

2.1 Introduction

Pre-colonial Gambia witnessed a variety of currencies for trade purposes. Gold, Cowries, Strips of Cloth, Copper and Iron rods, were widely circulated for facilitating liquidity and effecting exchanges of goods and services through the free market forces. The simultaneous existence of these different currencies produced a complex currency system in the country. However, each currency served some specific purposes. For example, Copper rods were used for controlling liquidity because they were available in small denominations. Similarly, cloth money or currency for its widespread availability, easy valuations, was used for small trade transactions up to the colonial times. Gold and Cowries, for their durability and high valuations, were used for savings, high valued transactions, rituals and jewellery. With the advent of imperial missions of France and Britain, the monetization and the integration of the local economies into the capitalist world were introduced. The introduction of the British currency was on the basis that local currencies were not convertible into international currencies, and that some currencies like cloth money had prohibitive transportation costs, and that all the local currencies encouraged barter trade. Nevertheless, due to the miscalculations and the pursuit of self interests by the colonial powers, the introduction caused some economic miseries for the local population. The local currencies continued to exist along side the colonial monies of British silver coins and French Five Francs until 1891. In as early as 1891 with the prohibition of the use of all local currencies, the colonial monies became legal tenders. The colonial power then created and used a banking system to help supply and distribute the British currency. Thus, the British Bank of West Africa (later know as Bank of West Africa) was established in the same year 1891 to serve as both central and commercial bank for the British colonies in the West Africa. The Bathurst (now Banjul) branch was opened on September 8th 1902. "All the banking businesses are transacted by this bank without charge, except in certain specified cases such as remittances, overdrafts if desired, and a defining of the current account below £400, in the last two cases the interest permissible being at the lowest rate the bank would

charge its most favourable customers”³. This was an agreement entered into by the bank and the Government of the Gambia in 1902; it was aimed at monetizing the economy and making available cheap financial services. Hut and yard taxes introduced by the colonial government also helped institute the colonial monies in the Gambia. The introduction of British currency and the prohibition of local currencies had severe impact on the local economy and retarded the growth. The local merchants were rendered poor because they could not redeem their local currencies at the British Bank of West Africa; similarly, all ordinary people who were having cloth pieces, iron or copper rods just had to consume them, or kept them until they got spoilt or lost, but never to be redeemed for British currency. Worse still, the local merchants and population had to pay all series of taxes in the new currency which was not widely available in their hands. So, they were forced to be farmers not of their own any more but of the colonial governments who wanted them to grow groundnuts, which the colonial monopolists offered to buy. The economic balance was then changed; people were forced to migrate and settle around the British administrative head quarters and branches to get colonial jobs and got paid in the new currency. The breed of merchants and administrators of Indians, Lebanese and Hakus emerged. These people were brought by the colonial masters because they had the European taste and education and could be trusted to run the protectorate. The Lebanese and Indians engaged in import trade; they promoted the European goods and taste on the local markets; and the colonial masters accorded them favours and opportunities, because they were seen as opening new markets for European products and taste. Thus, no efforts were made to manufacture export products or build import substitution products. This further impoverished the local people, who had to rely almost entirely on the import goods even for some basic subsistence needs. While, the demand for local products continued to fall in the face of the European goods and with the fact that those who had the colonial currency were in the metropolis and around the administrative areas and these people were already undergoing cultural transformation and assimilation into their masters’ culture, so, they would prefer to buy the European taste. The other negative

³ The Gambia Colony and Protectorate: An Official Handbook, Francis Bisset Archer, Frank Cass & Co. Ltd 1967, p. 272

impact brought about by the introduction of the British currency was that, during the times of the local currencies, local merchants and ordinary people were their own banks, they hoard the number of cloth pieces, gold, iron and copper rods they got; they subsequently applied the same mentality on the new currency, by hoarding as much as they could, kept under pillows, praying mats and some people resorted to burying them for safekeeping. As a result more currency was kept as cash holdings in the individual hands instead of as deposits to be channelled back to economy as investments. Many people ended up as debtors to the money lenders who were charging 100 percent interest rate. This drove out local investors from the market. Even the Gambia Co-Operative and Central Banking and Marketing Union Ltd were having a daunting challenge to conduct operations due to lack of local savings. This was highlighted in the Second Report of International Labour Office, Geneva 1965, on the Co-operative Banking in the Gambia:

“ ... The Apex Bank depends largely on the provision of short term credits by the Bank of West Africa, B.W.A, to carry out its operations. The overdrafts with the Bank of West Africa are guaranteed by the Government. The expansion of the Apex bank's activities leads to a growing dependence on such government-guaranteed overdrafts from the B.W.A., should B.W.A. for some reason be unable to grant further credits to Apex Bank, the latter would almost immediately be unable to continue its operations. It is again recommended that the co-operative movement should make every effort to build up capital by attracting savings and other deposits in order to avoid borrowing from B.W.A.”

Unfortunately, the recommendation was not heeded of quickly; more currency continued to be held in individual hands, spent on European taste, and ultimately withdrawn from the economy. Apex bank continued to borrow at increasing interest rates, which could not last indefinitely; then, it resorted to buying the produce on credit forcing the farmers to borrow from money lenders to pay taxes, meet subsistence needs and prepare for the next farm season. This pyramid could not later be sustained, but it had to collapse with the farmers buried under its debris. This caused further migration of the rural population to the metropolis, which was seen as a solution for obtaining the colonial currency; with those left behind in the up-country totally dependent on those lucky ones who could make it to the metropolis. This created economic insecurity and instability in the entire country.

2.2 Currency Board Episodes

The arrival of British introduced the British coins such as copper coins and silver coins, which were exclusively imported by British Bank of West Africa. By 1900 the monetization of West African economies was on a high gear and the demand for British silver coins in West Africa exceeded that within the British economy itself. By 1912, according to Schuler (1992), “the seigniorage of British silver coins was 165 percent of the value of their silver content, and this situation agitated the West African Colonies and they demanded the British Treasury to share the seigniorage with them or allow them to introduce a separate West African currency”. Their demand was not heeded until 1913 when the West African Currency Board was established and allowed to issue its silver coins and notes. Currency board, unlike a central bank, holds at least 100% foreign reserves against all the notes and coins it issues. . The currency board has no monetary policies; its job is to respond to the supply and demand forces of the foreign exchange market. The West African Currency Board was the first typical currency board system. It enjoyed impressive stability and generally good macroeconomic performance. It started to crumble down as the colonies gained their independence. Ghana was the first to throw it away as it got its independence in 1957 and established a central bank in 1958 by converting a government commercial bank to a central bank. Then Sierra Leone and Nigeria followed Ghana, as they too got their independences. Meanwhile, Gambia maintained it, and it became The Gambia Currency Board even after the independence until 1971. It will however be difficult to judge the performance of currency boards over the period 1913 to 1971 as an effort to compare that with the performance of the central bank afterwards. The era of currency board is a complex one due to the colonial administration that linked the domestic economy completely to the British economy. It though connected the domestic monetary system to that of colonial masters; there is a merit to shed some light on its episodes. The first episode ran from 1913 to 1963; that is the period when the board is a British West African Currency Board. The second period ran from 1964 to 1971; that is when it became a Gambian Currency Board. The data on the first episode is difficult to extract or evaluate its marginal effects on the health of the Gambian economy.

In the first episode, the reserve ratio and assets was 110% of British Pound Sterling assets, it reduced to 100% in the second episode. The exchange rates in both periods were one

West African Pound or Gambian Pound to one British Pound plus 0.5 %. Immediately after the currency systems, the Gambian currency depreciated 67% against the Sterling Pound; and until today, any currency issued by the central bank is worth less than the Sterling. Contrary to other currencies of former British colonies, such as Hong Kong, Brunei, Bermuda, that still maintained currency boards,” no currency still issued by them is worth fewer Sterling today than in 1950”⁴. The domestic economy enjoyed low levels of inflation during the whole episodes of the currency board; the inflation averaged 1.5% per annum; while the GDP grew on average 4.5% per annum. The aftermath of currency board has witnessed increasing levels of inflations coupled with declining or constant real per capita growth rates. From 1972 to 1989, the inflation averaged 15% per annum, and the GDP averaged 1.1% per annum⁵.

The traditional functions of the British West African Currency Board were purchases and sales of sterling, and the management of overseas investments. The West African pound was issued as the Board purchased sterling and withdrawn as the Board sole sterling. This activity was purely determined by the demand and supply forces of the market. The volume of trading determined the volume of West African currency in the circulation. The Bank of British West Africa acted as an agent in issuing and redeeming the currency. The other traditional function was the management of its overseas investments, which were mostly held in UK assets. The money demands in the member countries (Nigeria, Southern Cameroon, Ghana, Sierra Leone and the Gambia) were not of course perfectly positively correlated; thus, at any given time, the board had sufficient redeemed currency to be invested in high-yielding UK assets that could earn it income to cover operating costs of the Board and credit the profits to the Government accounts of the respective members. Nevertheless, a high portion of the overseas investments were in the UK government treasury bills, which were highly liquid and could be easily liquidated to meet the seasonal money demands arising from the harvest and marketing of crops in the agric-economies of the member countries.

When the Gambia Currency Board was established in 1964, after the other members abandoned the board, it found itself as a financial arm for the one-crop economy of the

⁴ Schuler, Kurt A., (1992), Currency Boards

⁵ Ibid

Gambia. The ordinary revenues of the Government could hardly meet the recurrent expenditures, and that grants and loans were always required to build new capital work or expand the amenities and services. The Co-operative Central Banking Union, the sole financier of the business of Gambia Oilseeds Marketing Board, which was the sole purchaser of the economy's sole industry's output, groundnut, had to borrow from the Bank of British West Africa at high interest rates or via Government guarantees. With collapsing sole industry and strained Government budget, the currency board was mistaken for the currency printing machine, and the acts of the Currency were quickly amended to incorporate the following:

1. Discounting and rediscounting of inland bills of exchange and promissory notes payable in lawful money of the Gambia arising out of the marketing of agricultural produce.
2. Discounting and rediscounting treasury bills of the Gambia Government payable in Gambian pounds.
3. Granting advances against the security of promissory notes issued by the Government and payable on demand⁶.

The Board could also undertake fiduciary lending in respect to financial assistance in the marketing of the staple crop, groundnut, and the extension of credit to the Government.

The amendments in practice disabled the Gambian Currency Board and transformed it into more than a central bank. Even countries then that opted for central banks did not have such functions like direct lending to the Government. In addition, to purchases of sterling, the Board now had to issue currency against the acquisitions of local credit instruments issued by the government, commercial banks, local merchants and Co-operative Central Banking Union. Consequently, the sight liabilities of the Board increased tremendously forcing it to reduce its external cover from 110% to 100%; and within two years of its existence, the minimum external cover was just around 70%.

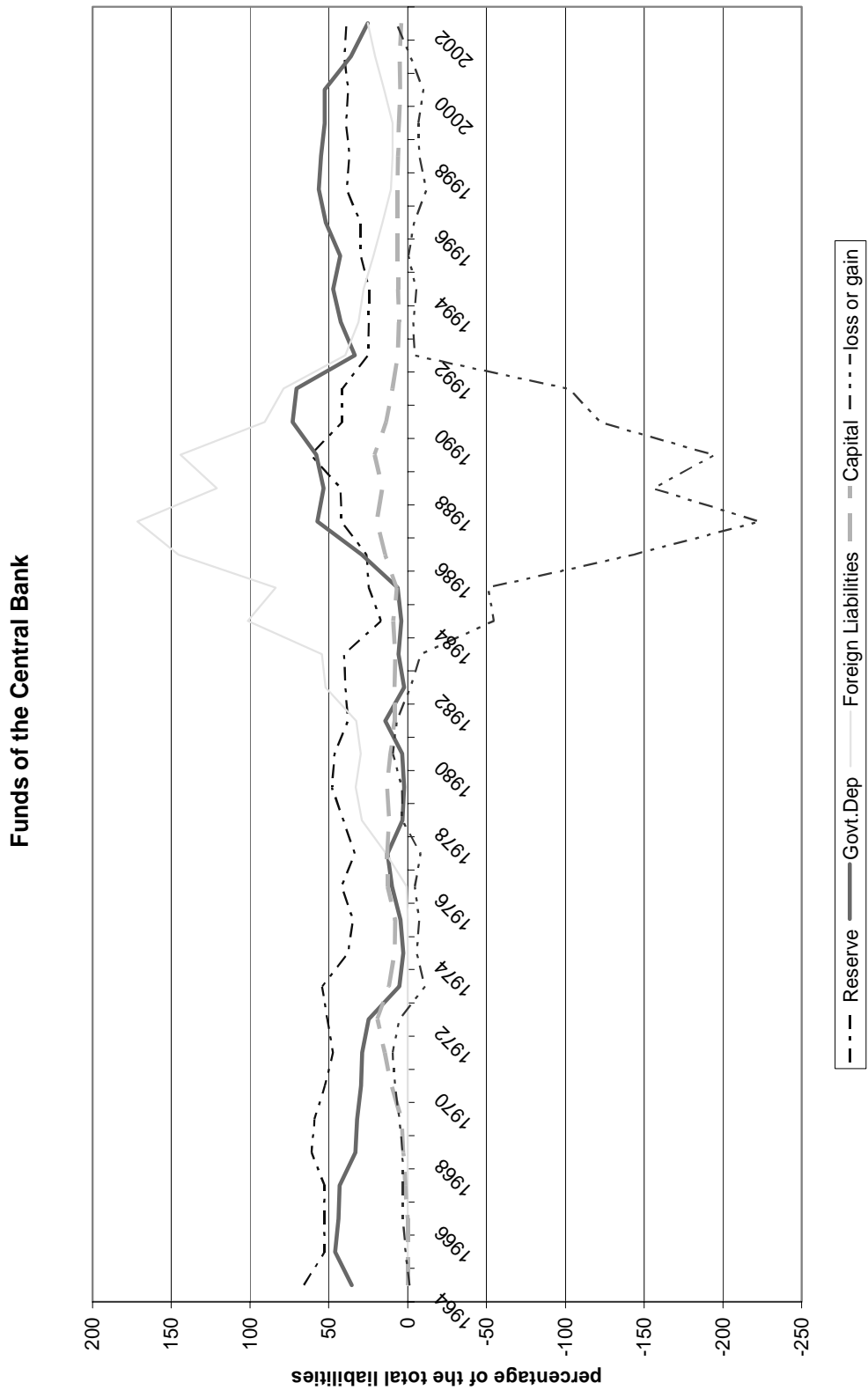
⁶ Annual Reports of The Gambia Currency Board, 1964 – 1968, Banjul.

2.3 Central Banking System

It was argued, as Schuler (1992) has narrated, that currency boards did not allow the policymakers a room to influence the national employment and undertake development projects and did not satisfy the Government need for money; that currency boards did transmit external shocks directly into the domestic economy due to the nature of its foreign reserves and the exchange rate regime it had to adopt, which is a fixed or managed system. Thus, the Central Bank was established to pursue price stability, high employment and growth. It would also act as an economic adviser to the government and function as a national bank that would conduct monetary policies to help channel government development and stabilization objectives into the economy.

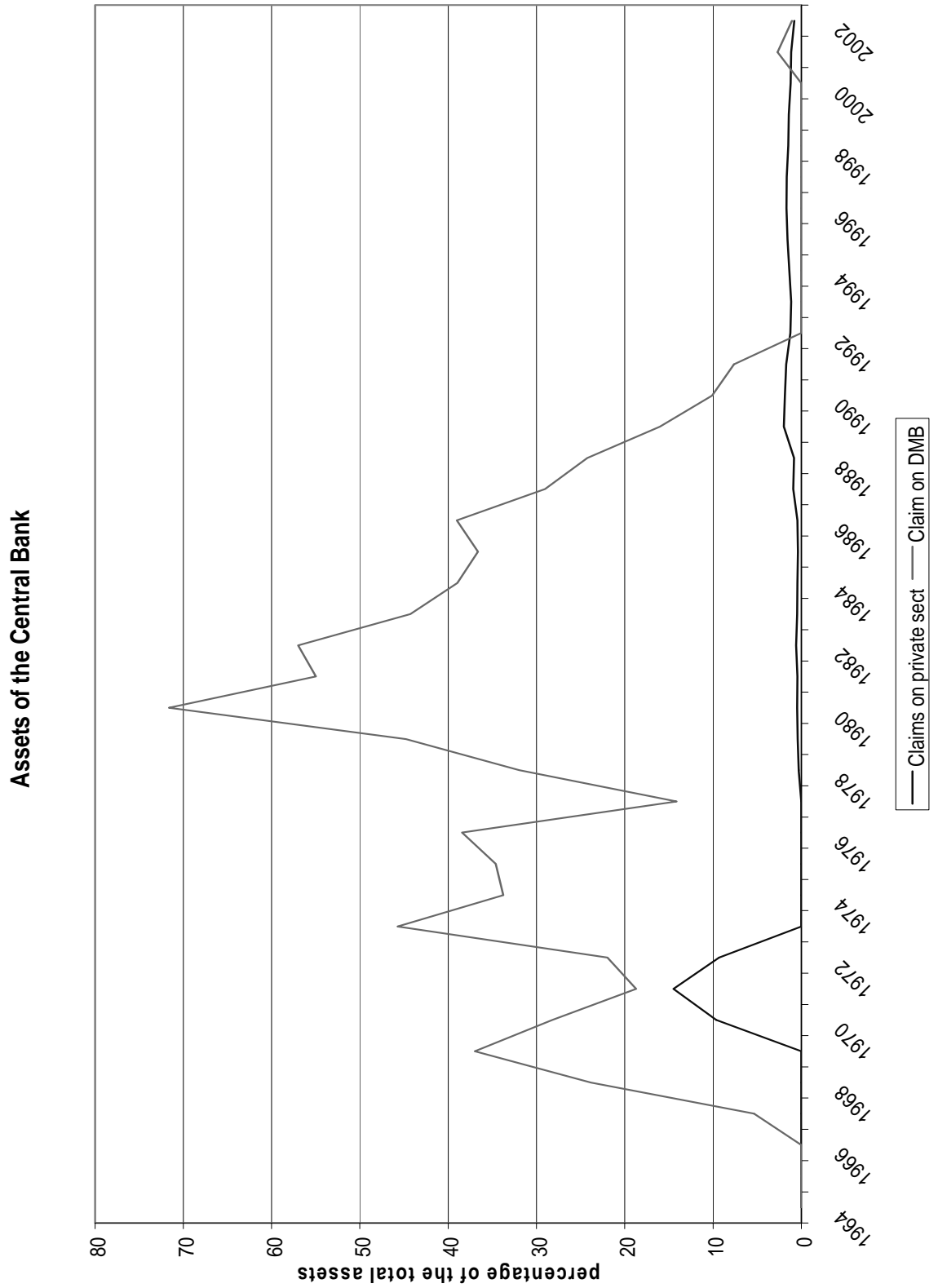
In this section, we analyze the balance sheets of the Central Bank of the Gambia in the light of the above stated objectives, and evaluate its performance over the period from 1971 to 2002. The funds of the central bank consists of reserves, Government deposits, foreign liabilities, capital and other items, which include the valuation adjustments. The conditions of the funds was stable, each of these components closely maintained its share in the total funds from 1964 to 1981/1982.

figure 2.1



The Government deposits slightly declined from 28.9 per cent in the year the central bank was inaugurated to 3.4 per cent in 1980, it later rose somewhat. The central bank did not hold foreign liabilities until 1976. The reserve was also stable before 1981/1982; in that period, it accounted for 50 per cent of the total funds of the central bank. The stability of the funds was disturbed by two major events that rocked the Gambian economy with a lag effects spanning from 1981 to 1992. In 1981, an attempted coup d'etat foiled by Senegalese intervention triggered the ready-to-explode problem of the central bank. The central bank replaced the Gambia Currency Board at the time the asset holding of the board has dropped from the required 100% to an unsustainable level of 67% of the total assets; and the rest of the assets were claims on the Government and the deposit money banks. Thus, the central bank did not come into being because of some genuine economic reasons as was claimed; it came because the Currency Board has lost its meaning and was crippled by asking it to fine tune the economy by giving credits to the Government, the deposit money banks and the groundnut merchants. This behavior was completely contrary to the meaning of the Currency Board; even the then central banks were hardly found involved in such cases. The problem became amplified with the advent of the central bank. The bank pegged the Gambian currency to the British pound, while the fiscal authorities introduced the measures of price controls. These measures were taken to combat the 1970's inflation blamed on the energy crisis. But that inflation could be also blamed in part on the unstable money supply of the country. The money supply was highly variable, while the government budget deficit was growing widely. Thus, pegged currency rate could not last long in the face of high variable money supply and increasing budget deficit. This was combined with repressed and low deposit rates and fixed lending rates. These pressures have created implicit inflation rates higher than that of the United Kingdom, to whose currency the Dalasi was pegged; thus the Dalasi had to depreciate against the sterling pound. Repressed interest rates, managed exchange rate, increasing budget deficits and variable money supply created high uncertainty in the economy, it did not explode because the country risk was almost zero. The 1981 attempted coup ignited the explosion as the country risk was added to the already unbearable economic and financial uncertainty. In 1985/1986, the peg was abandoned, and the banking market was somewhat liberalized, and the fiscal authorities

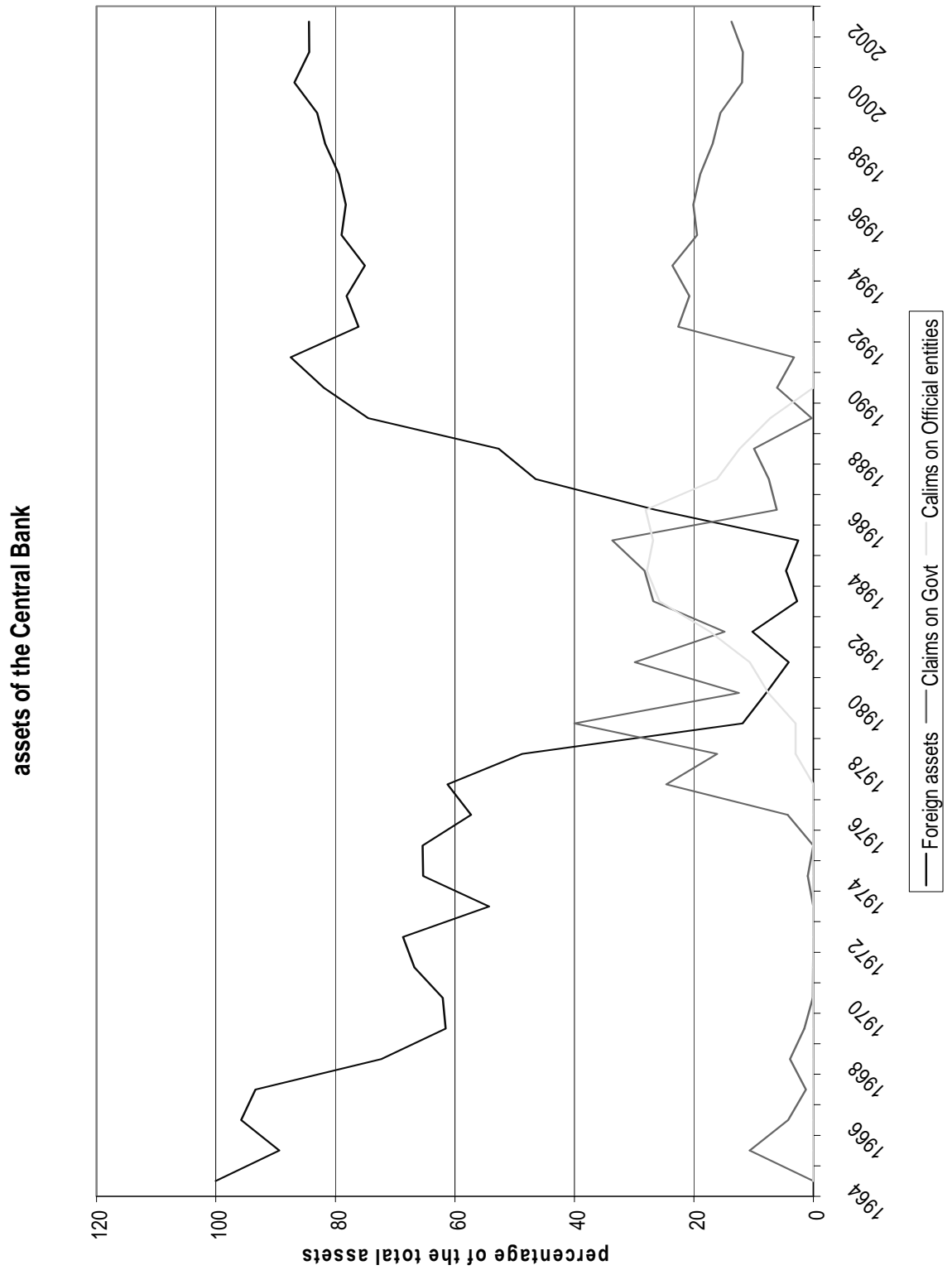
Figure 2.2



also abandoned the price controls. The central bank changed its policy from boosting lending base of banking sector via credits to reducing the paper money in the economy via reserve increases and sale of Government and central bank discount bills. The chart above illustrates. The Government also reduced its role in the economy; the Government enterprises such as port authorities, national water and electricity company and the telecommunications company were let away to run semi-privately, known as parastatals. It was painful adjustment; the Government laid off some civil servants, and attempts were made to balance the budget, and the intermittent surplus balances were deposited in the central bank to finance its fund base that has been wiped out by foreign exchange losses and valuations. The valuation losses stood at 224 per cent of the total liabilities of the central bank in 1987. The gain from the adjustment was immediately reflected in the banking sector. It has become able to raise funds higher than before from both local and foreign sources. The increase of the nominal interest rates attracted the inflow of the capital that helped offset greatly the current account deficit. The private sector was activated as the government reduced its role in the economy; the trade and re-export trade flourished. However, the impact of the gains on the general welfare was not felt. The parastatals focused on growth not development; so, they grew pyramids. The private sector in response to the shortage of goods created by the previous policies of price controls, State department stores and exchange rate pegs, they focused on quick refilling via imports. Thus, this sector built its nests along the administrative and merchandise ports. It paid no attention to the majority of the people, who depend on the groundnut industry. The purchasing power of this people kept dwindling at every trade season as synthesized import goods displace their produce. Some decide to migrate to the urban areas but only to add to already unemployed secondary and high school graduates there.

Where was the central bank in the midst of these economic tumults and imbalances? The central bank was busy going back to the era of its predecessor, the Currency Board. The central bank lost almost all its foreign assets during the crisis; the foreign assets stood at around 2.5 per cent of the total assets from 1983 to 1985.

Figure 2.2 (continued)



But suddenly after 1985, it increased foreign asset holdings to 46 per cent in 1987, and 87 per cent in 1991 which is higher than that of the Currency Board in 1968. Throughout 1990's and until 2002, the foreign asset holdings remain very high accounting on average for 86 per cent of total assets of the central bank. It cannot be a currency board and central bank at the same time; so, what does the Central Bank of the Gambia pursue? Does it pursue price stability, or exchange rate stability, or maximum employment, or banking supervision and stability, or conflict avoidance with the fiscal authorities. Pursuing multiple goals causes a central bank to lose its independence and to more exacerbate the economic shock than to achieve the goals. The central bank of the Gambia tends to pursue multiple goals and to accommodate the Government needs. This has rendered it ineffective in achieving many of its goals. Prices have never been stable; they are either controlled as was the situation in 1970's to mid 1980's, or they are left to spiral up very rapidly as has been witnessed from 1990's to date. The inflation is almost uncontrollable, but the measure of inflation does not seem to say so. According to the Gambia CPI, the domestic inflation from 1994 to date is either equal to or less than the UK inflation. This theoretically implies that the Gambia currency must stay unchanged or appreciate against the UK currency. But that was not the case; in fact, the Gambia currency depreciated more than 50% against the UK currency. Thus, this can cause a researcher to suspect that the Gambia CPI does not correctly and technically capture the general price changes in this period. In late 1960's and early 1970's when the UK inflation was higher than Gambia inflation the Gambia currency was revalued against the pound sterling from GD5/1£ to GD4/1£. Furthermore, it is a forgone conclusion in the economic literature that inflation is a monetary phenomenon in the long run. This does not seem to hold in the Gambia. The contemporaneous correlation between money supply growth and the inflation is 0.033, one lag is 0.372, second lag is 0.167, third lag is 0.141 and fourth lag is 0.092. The money supply growth is highly variable and has an increasing trend and the exchange rate index has been depreciating; while the inflation rate measured by the CPI looks steady and somewhat falling. The central bank might have been hitting a wrong target of inflation. Figure 2.3 graphs the Gambia inflation and the UK inflation, and figure 2.4 presents the money supply growth rate, the inflation and the nominal exchange rate index of the Gambia.

Figure 2.3

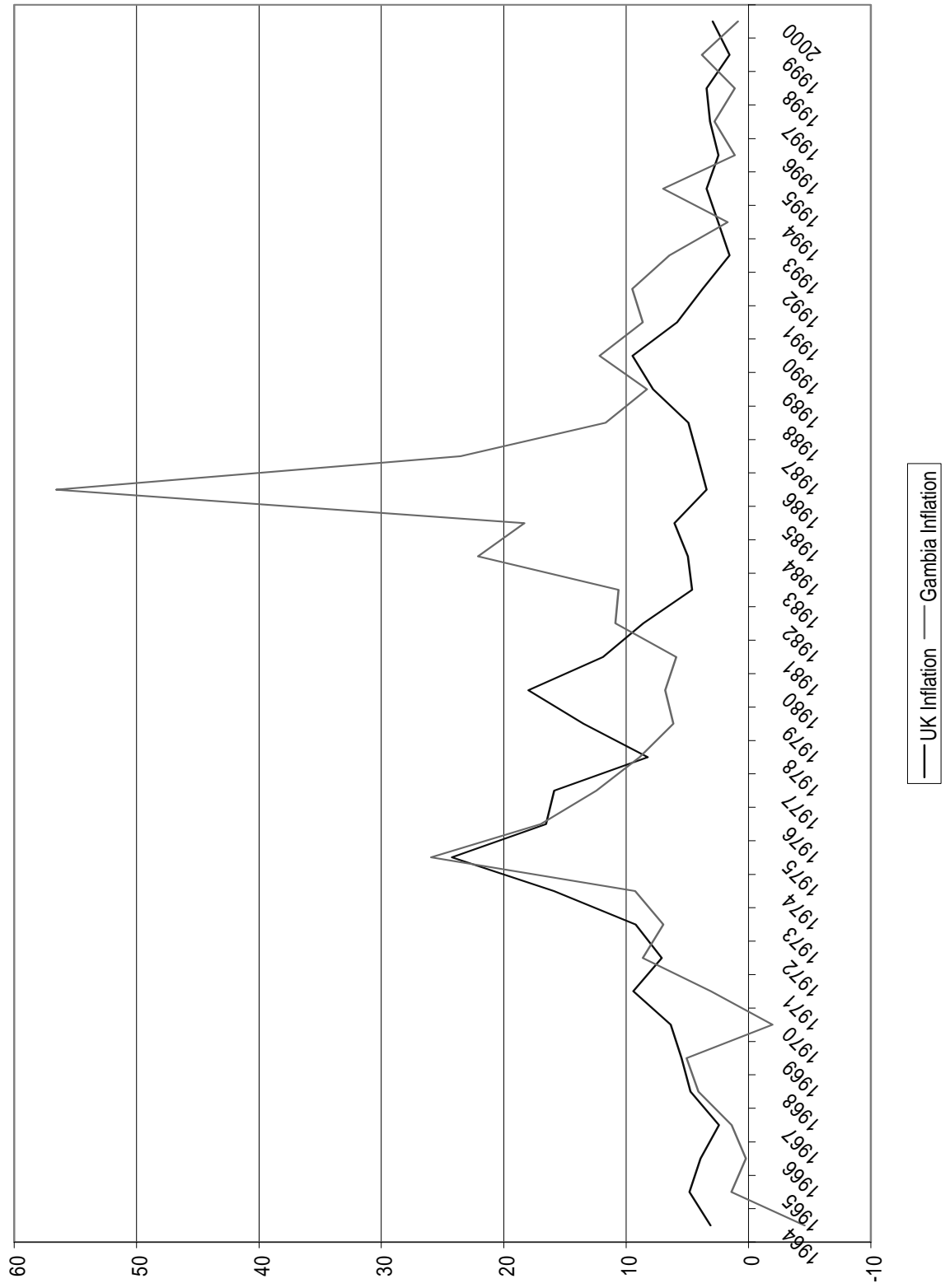
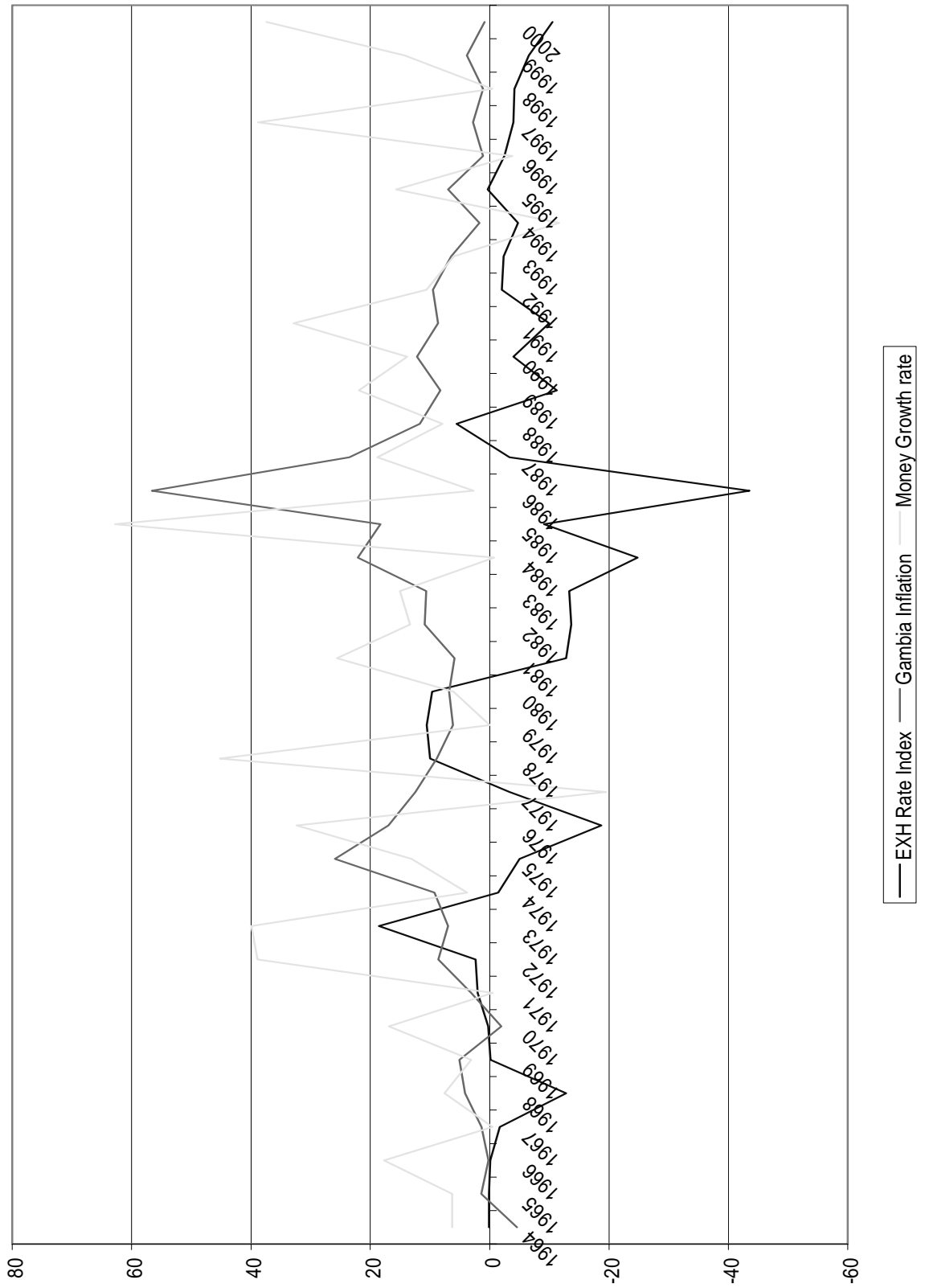
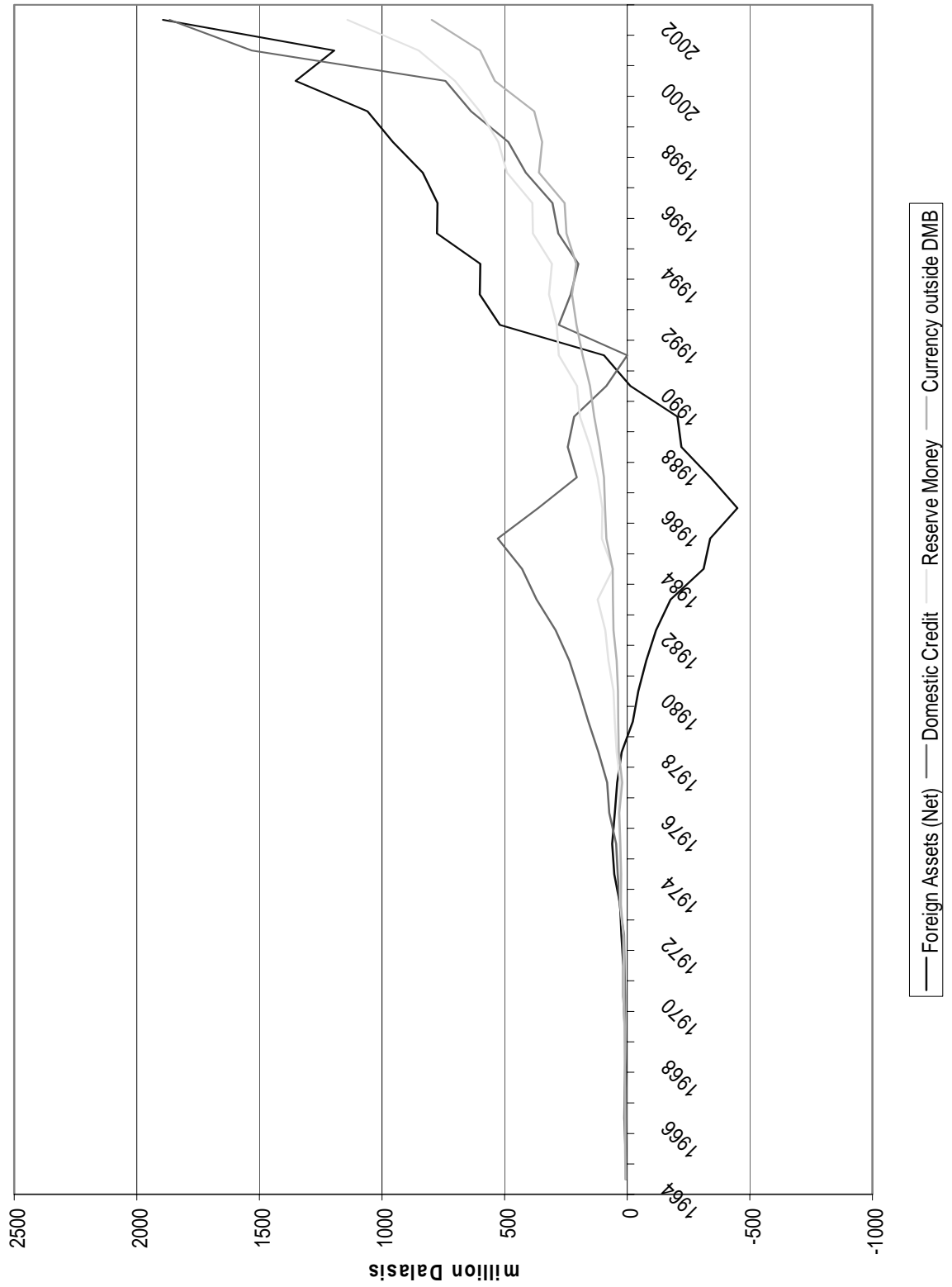


Figure 2.4



It is also the responsibility of the central bank to supervise the banking sector and maintain its stability. The central bank conducts open market operations using its own discount bills and the Government treasury bills with largely the banking sector. The bank's own fund can be used for monetary management but the Government funds are directed by the fiscal authorities, and the objectives of the latter funds normally overrun that of the former, and when conflict is imminent, the central bank pursues the goal of conflict avoidance. The bank acts also as a lender of last resort. Similarly, this operation can conflict with price stability objective. Releasing funds to insolvent banks will derail the bank from its money supply target. If it pursues maximum employment objective together with price stability and other objectives mentioned in the beginning, a conflict will arise. In a supply shock situation, for example, which is common in the domestic economy, that causes the actual output to fall below the potential output, any action by the central bank to stimulate the aggregate demand will result in inflation; thus, the price stability target will be missed. Likewise, accommodating the Government needs either by letting the fiscal authorities to use the sterilized funds or maintaining repressed interest rates for the Government borrowing will cause the central bank to miss its other targets such as price stability and exchange rate stability. Looking at figure 2.5 below, we get a glimpse into what objectives the central bank has been pursuing. From 1980 to 1990, foreign funds started flowing into the domestic economy, and the central bank responded by sterilizing the inflows in the form of increased domestic credit; this resulted in a negative relationship between the foreign reserve and the domestic credit. This, according to Roubini (1988) happens when "a central bank cares more about interest rate smoothing objective relative to foreign exchange reserve stabilization". This period witnessed some lifting of financial restrictions on interest rates and banking operations in general; the soaring interest rates after the lift attracted foreign funds, but the central bank was cautious about high interest rates lest they harm the economy; and thus it was more concerned about interest rate smoothing relative to other objectives.

Figure 2.5



The pattern has changed from 1990; both domestic credit and the foreign assets have been increasing, implying a positive relationship, which means the central bank has become more concerned with foreign exchange reserve stabilization relative to interest rates (Roubini, 1988). Both the central bank and the commercial banks have been accumulating foreign assets. Smoothed or flat interest rates coupled with falling export funds of the groundnut industry have made the domestic economy unattractive to the foreign funds; while increasing Government debts and debt services and increased demand for imported food stuffs, building materials and high rates of migration from the country have put pressure on both the central bank and the commercial banks to hold increasing foreign assets in order to meet the demands for foreign exchanges stemming from imports, debt services and migration. This combined selling of the domestic currency resulted in its depreciation. The central bank responded by backing the currency in the form of increased interest rates, and increased domestic credit, and recently by asking the banks to increase their minimum capital requirements; the long term objectives of price stability and full employment have already gone off track. The depreciated currency from its 1990's level combined with high interest rates have already been translated into high prices and low private investments signaling a long term difficulty, especially if the earnings of the accumulated foreign assets fall short of meeting the high domestic interest obligations. That is, if the increased domestic credits are not in profitable and tradable economic activities that can more pay the interest obligations, then theoretically the domestic economy must be asked to liquidate, the currency will further depreciate, prices will go up and employment will fall, the economic authorities must examine carefully the situation of the country's debts and cut down the interest rates. The current discount rates may even satisfy the banking industry in meeting their deposit and operational obligations; thus rationally telling the bankers to just put their funds in the treasury bills and central bank bills and then wait for the maturity. This will deny funds to the productive sectors of the economy; the discount rates must not be higher than the expected returns of the least risky economic activity in the country.

In chapter six, we will see empirically how the Central Bank monetary policy has performed over the study period.

2.4 Commercial Banks

Until 1973, banking and financial institutions were rudimentary, and the general public knew nothing about them. From 1973, when the Financial Institutions Act was passed into law, to 1986, the banking performance was precarious, it is only very recently that banks have been able to somehow position themselves in the market, but still their impact on the welfare of the general public is questionable.

The first bank established in the Gambia was the Government Savings Bank on 1st January 1886. It operated under the treasury department of the Government, and accepted limited deposits from the public. It did not engage in business transactions; so, it had a limited role in executing financial facilities for the entrepreneurs. In fact, its liabilities were under the Government balance sheets. Unfortunately, these liabilities were in many years until 1964 invested in foreign assets, mainly British assets. The incomes generated from these assets were used to pay the deposit interests, and the balances were credited to the Government accounts.

Later on, when the Central Bank of the Gambia was inaugurated, the importance of the Gambia Savings Bank declined, because the central bank could act as a better bank for the treasury department than the savings bank; thus the Gambia Savings Bank was phased out.

The Bank of British West Africa (Bank of West Africa changed to Standard and Chartered Bank, and then today is known as Standard Chartered Bank) opened its branch in the Gambia on 8th September 1902. All the banking business was exclusively transacted by this bank for many years as we earlier explained in the introduction to the chapter. The bank operated well as a pure trading bank, not as a universal, finance or investment bank, though no other banks existed beside it for many years and the opportunities for other than distributive trading existed.

This behavior of not venturing beyond trading business was both developed and imported into the Gambia by the bank. It developed the trading behavior along side the groundnut marketing, which was the mainstay of the economy. The groundnut marketing overwhelmed the bank; and with its banking monopoly, it was alone to provide all the financial services, such as discounting and rediscounting of bills of exchanges, importation and exportation of currency species, and provision of loans guaranteed by the Government

for the purposes of groundnut marketing. The bank also helped export the profits of the colonial merchants. Given wide spread network of the bank in other British colonies, the merchants always found it convenient to deal with the bank for import and export financial services. The public and the policymakers were all focused on groundnut marketing, and the distributive trade was profitable; the bank then developed and shaped its behavior accordingly. Thus, industrial finance, which was a major feature of the banks in the early stages of industrialization of today's developed countries never occurred in the Gambia. It was easy for the bank to concentrate on distributive trade, because that was what it had mastered in other British colonies before coming to the Gambia. Thus, in part it has imported the trading behavior into the Gambia.

The Colonial Bank joined the Gambia banking industry in 1917; and it closed down after the Second World War. It was most probably for war financing. The two banks, both of them were international, experienced the first financial crisis of the Gambia in 1922. The French silver coin five Franc, then locally known as Dollars (Dallasey) was very popular with the natives, and most payments were made in it. This forced the Government to make it a legal tender in 1843. the circulation of the five Franc soared, and in 1880 it formed 85% of the total money circulation. In 1916, nearly 70% of payments in trade with the natives were made in French five Franc. The exchange rate was fixed at 3 Gambian Shillings to one Franc, but for trade purpose it realized 4 Shillings. The two banks in collusion refused to accept five Franc specie for transfers abroad except at the exchange rate of 4 Shillings; the currency has become increasingly overvalued. Worse still, in 1917, French Government prohibited the exportation of the currency from its soil, and in March 1921, the silver coin was declared non-legal tender. As a result, the Gambia Government banned its importation into the country. To its embarrassment, the circulation of the currency increased rapidly forcing the Government to hold over £70000 in French five Franc earning no interest and of no use for transfer. In 1922, the colonial agents declared the five Franc non-legal tender, and demonetized it with a cost of £200000 with 4% annual interest rate. This was the first time the Gambia Government went into a debt. The banks also shouldered some cost in the nature of Franc currency holdings. In fact, one could assume that the closure of the Colonial Bank was partly contributed by this currency crisis. It was established in the same year the French Government banned the exportation of its silver coin; thus, the bank could

have held huge Franc specie as reserves, which then suddenly proved of no use. The other theory for the collapse of the Colonial Bank could be that knowing the French five Franc was overvalued, and knowing that its exportation from France would be banned, the colonial agents established the bank to start collecting the overvalued currency from the circulation. Thus, they were embarrassed when the circulation in fact increased, forcing them to just declare it non-legal tender and asked the public to turn in the currency; and after the process was complete the bank became of no use.

After the collapse of the Colonial Bank, the Bank of British West Africa continued to operate lonely in the Gambia. However, its trading behavior gave no help to the Government's ambitious development works in agriculture and infrastructure. Financing of agricultural and infrastructural works was always a trouble. Hoping to give some financial impetus to the agricultural sector, the groundnut marketing societies called "co-operatives" established a Central Co-operative banking and Marketing Union that handled the banking and marketing business of the societies. However, it depended heavily on loans and government-guaranteed loans from the Bank of British West Africa. It remained for many years as one block of loan pyramid with the Bank of British West Africa on the top of the pyramid. The bank was then phased out, and in early 1980's it was enjoying only conditional license. The development financing did not then take off. Wishing it to take off, the Government and its extensions in the entities of the Gambia Co-operative Union and the Gambia Produce Marketing Board came together and established in 1972 the Gambia Commercial and Development Bank. It existed approximately for twenty years. This period was also one of the booming groundnut seasons, the production averaged 99530 tons from 1972 to 1987, the average highest of all the preceding periods. In this period, the Gambia Produce Marketing Board, one of the founders of the bank, was making the highest exploitative profits of all the periods. Its selling price (export price) was two to four times the producer price the farmers were receiving. This gave the bank an opportunity to amass huge deposits for the groundnut co-operative societies, the Gambia Produce Marketing Board and the Government. However, it built its assets around the marketing of the groundnut and ignored the production, which was the origin of more than 70% of the money circulation. Thus, when the groundnut production collapsed, the bank had difficulty recovering its assets from the groundnut marketing agents. It was the largest bank with 44%

of total bank liabilities before going finally out of business in 1992, its assets were hardly found in development works but marketing businesses. The Meridian International Bank took it over, but itself could not survive long. Then came the International Bank for West Africa. It opened in 1983 in the Gambia, and exited the market before 1992.

It is difficult for the banks to venture outside the traditions of distributive trading to other areas such as industrial and infrastructural developments. It seems that banks in the Gambia are followers to the economic activities; they hardly seek out entrepreneurs much more develop them. Entrepreneurs cannot expect the banks to lead; in fact, they have to wait long before they can see any bank following; that is, banks are lazy lagers. There could be reasons for this; one is the low rate of savings in the Gambia and the other is the inefficiency of the banking industry.

The Gambia has constantly experienced adverse current account balances, from 1935 until today, the current account has in most cases been deficit. Though the deficit was in some cases sustained by the re-export trade, its implication for the savings activity in the country is not encouraging. It always puts pressure on the economy to draw on its wealth and accumulated savings to sustain the deficit. Because the capital market is not developed, wealth and accumulated savings are often drawn to finance excess of imported goods and services. Thus banks are constantly under-funded. The figure 2.6 illustrates the behavior of the banks' sources of funds over time.

Figure 2.6

Sources of Funds

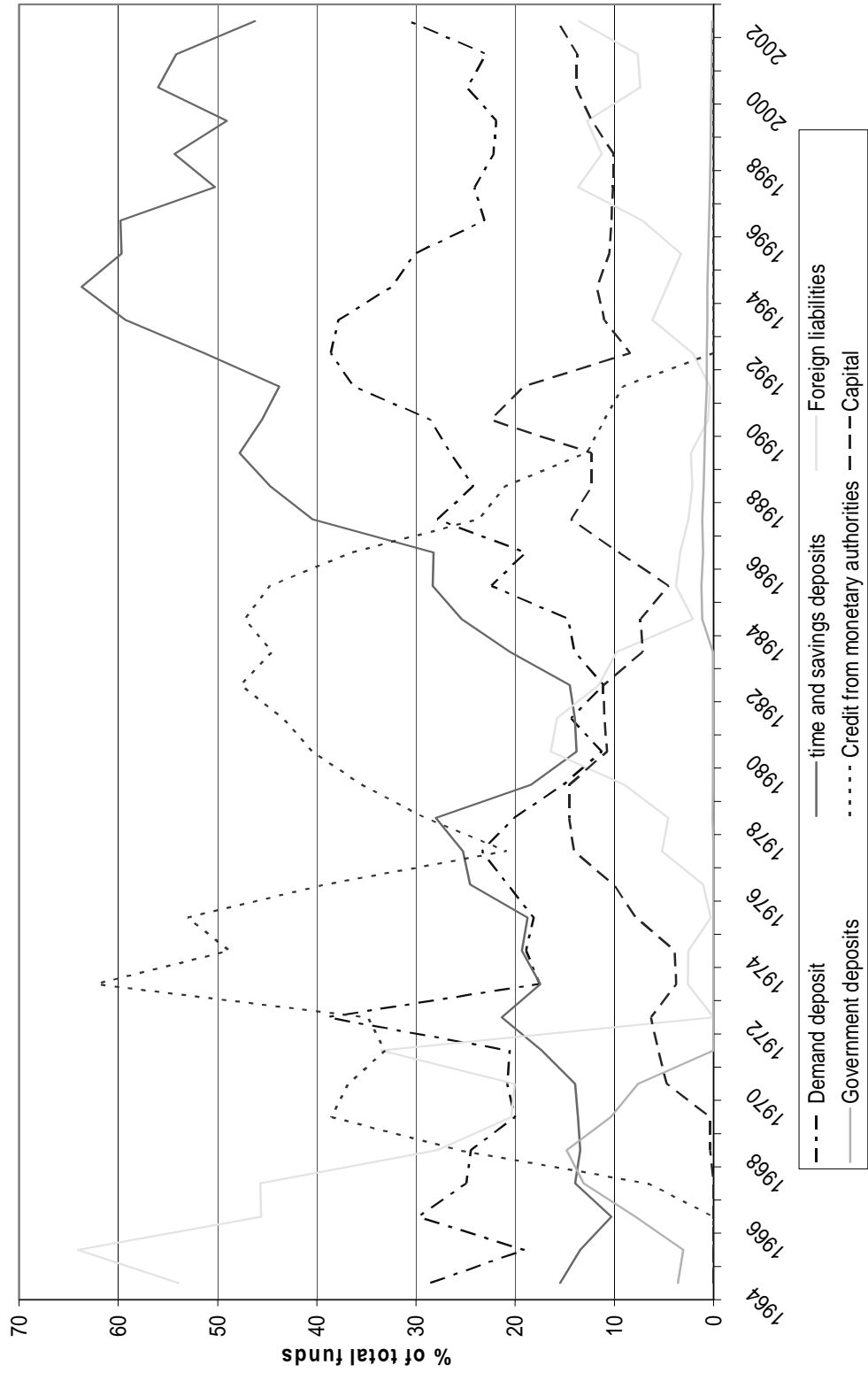


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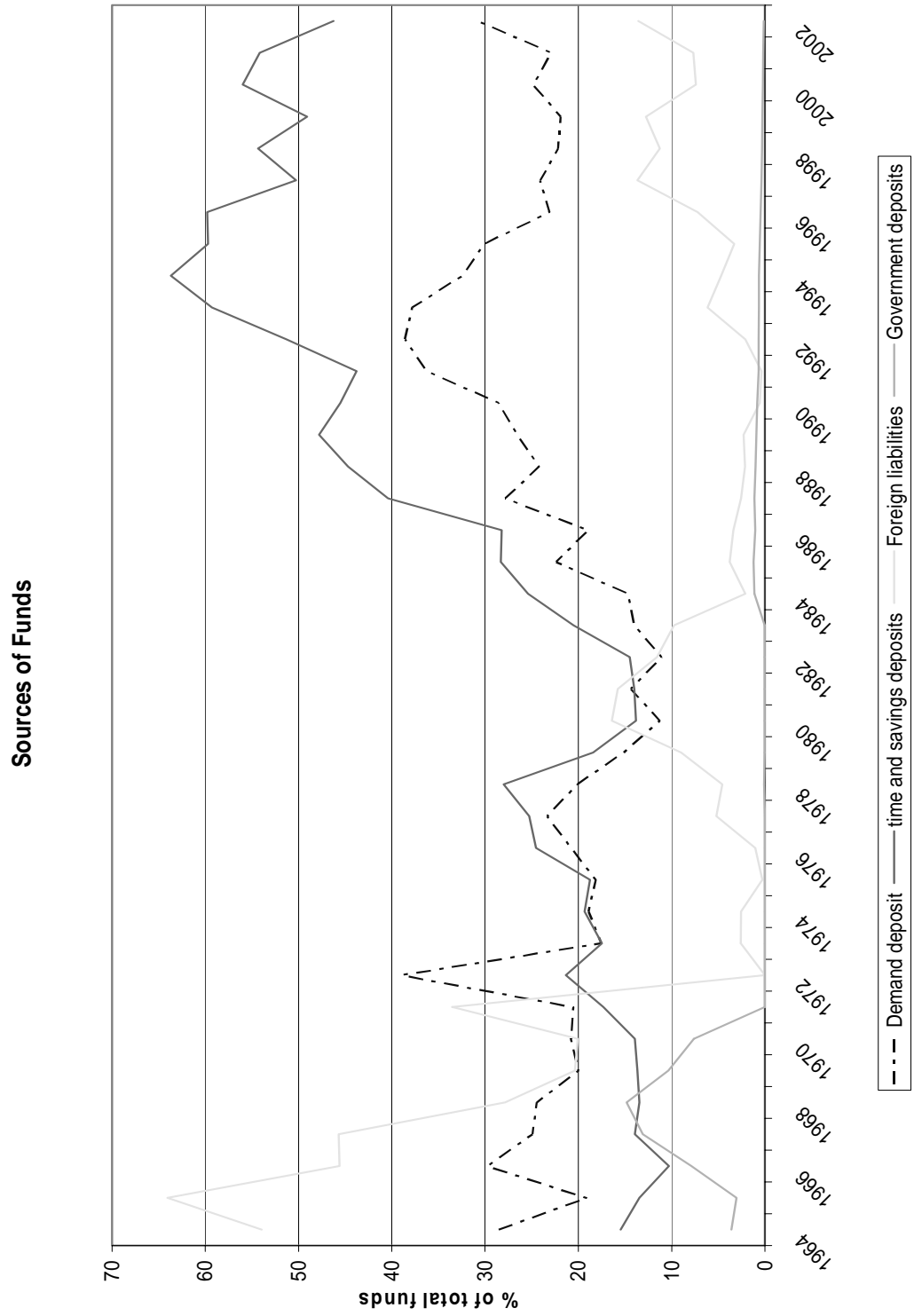
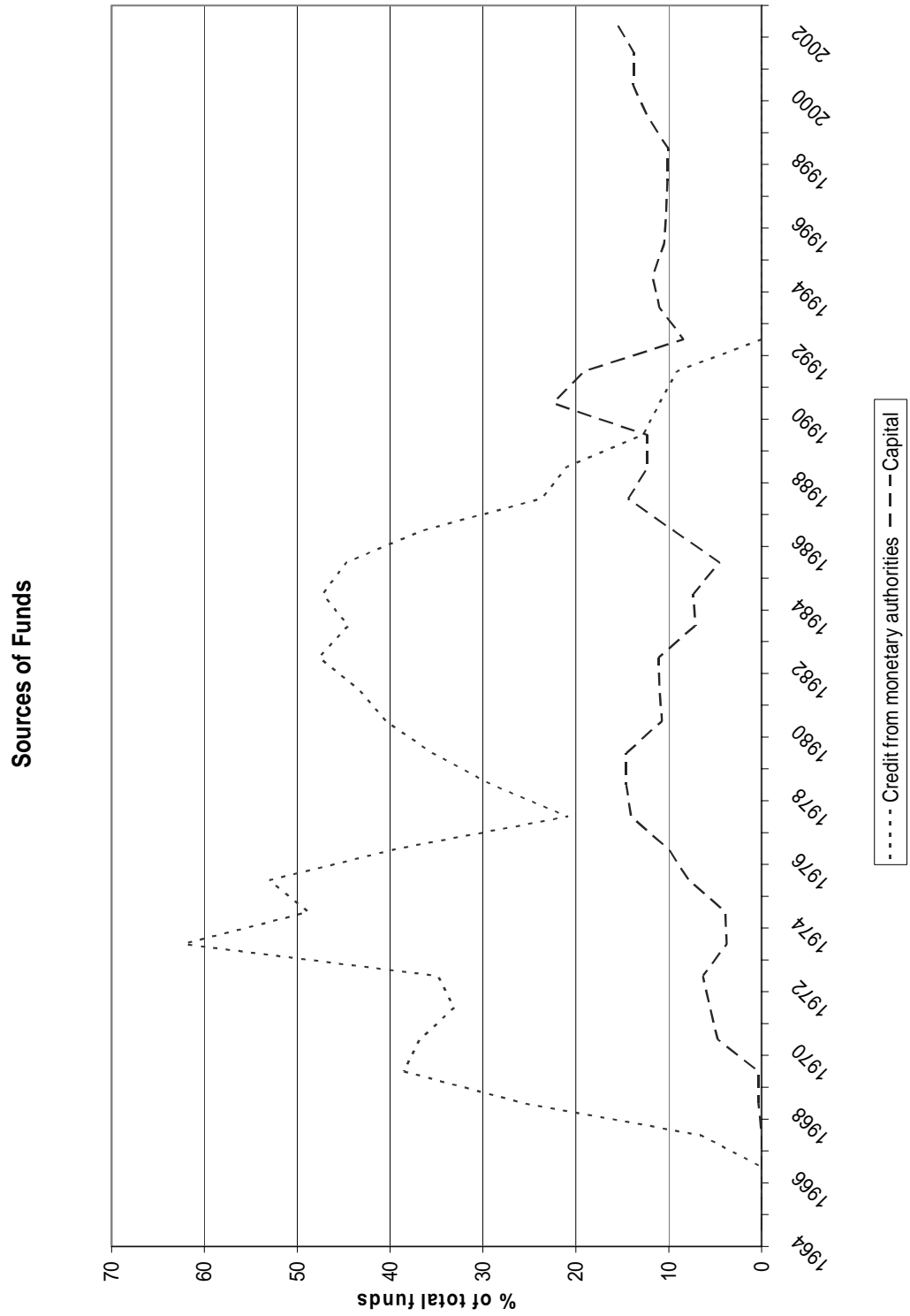


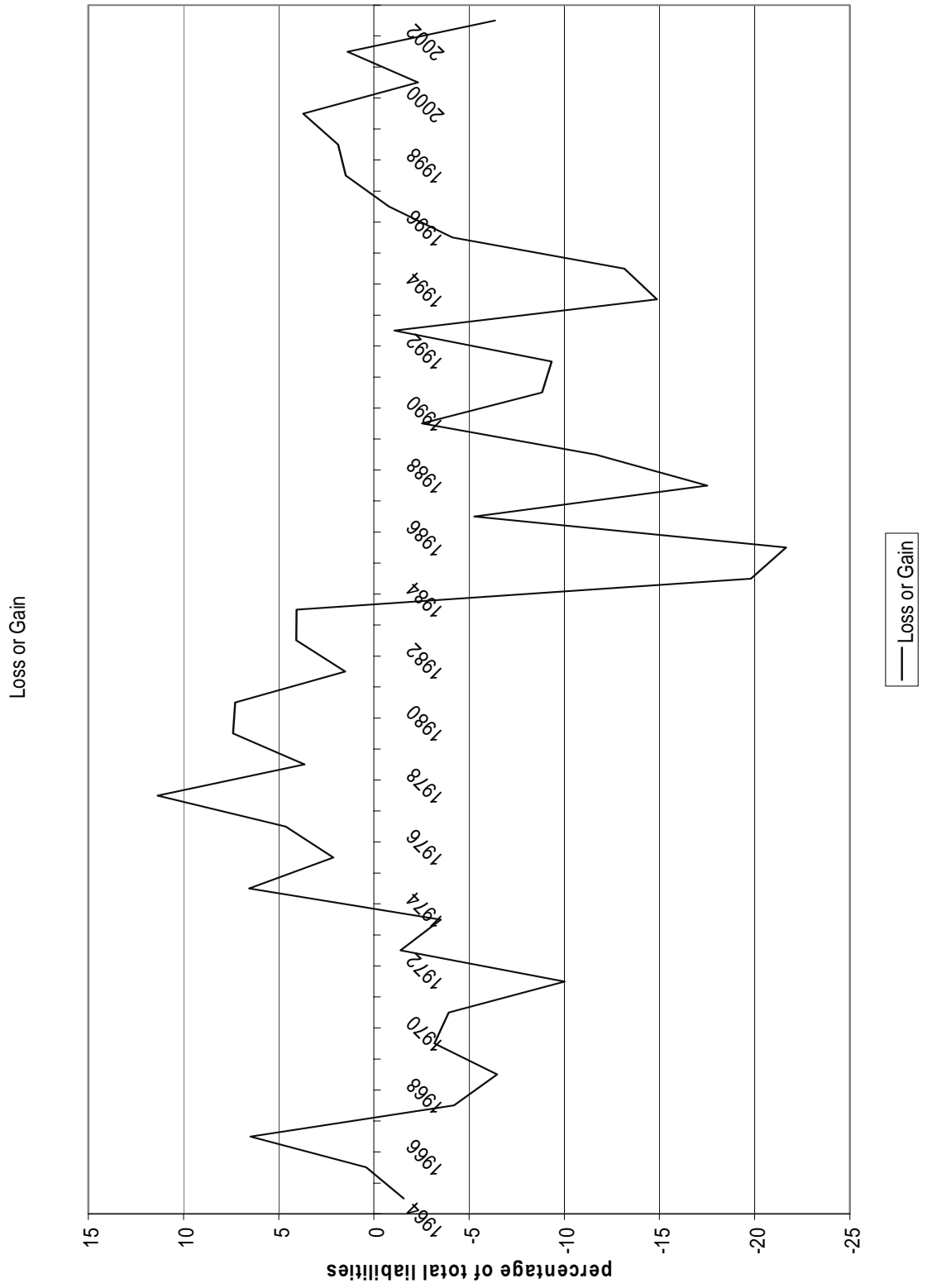
Figure 2.6 (continued)



As I said earlier, the local people know little about the banks until very recently. In the sixties, the banks depended on foreign deposits for funds. From 1964 to 1969, the banks had zero capital, Government deposits, credits from monetary authorities and foreign liabilities were the fund sources of the banks. In 1965, over 60 per cent of the bank liabilities came from foreigners. It fell steadily thereafter, it became 20 per cent by the close of 1970 and zero by 1972. This decline of foreign liabilities was compensated by capital injection and borrowing from the monetary authorities. From 1969, banks started injecting and developing capital, the capital remained below 10 per cent of the total liabilities until 1977, the time it hit 14 per cent. It fell to 5 per cent by 1985, and then it was raised to slightly above 10 per cent to fulfill the Basel Capital Adequacy requirements. Credit from monetary authorities remained a strong source of funds for the banks from 1969 to 1986. It constituted 62 per cent of the funds in 1973 and 47 per cent in 1984. The periods up to 1986, banks obtained their funds largely from foreigners, Government and monetary authorities but with a decreasing rate of change. Meanwhile, little funds were raised from the private sector but with an increasing rate of change. The nature of liabilities banks hold influences the nature of assets they hold. The low level of private funds might not only be due to the lack of sensitization of the private sector, it could also be due to fact that before 1986 the Gambia financial market was distorted. The exchange rates were pegged to the UK pound sterling, and over time the Dalasi was overvalued; and the interest rates were not determined by market forces; the banking operations were also suppressed. Because credits from monetary authorities dominated the funds of the banks, the Government and its monetary advisers in the central bank influenced the allocations of the bank resources. The overvalued currency has also discouraged the private sector and the foreigners from holding deposits in the Dalasi; as a result, banks were in part forced to borrow from the authorities. After 1986, the Government lifted sanctions on many market forces, the currency was floated and interest rates were free. This correction resulted in more than 52 per cent depreciation of the Dalasi against the US Dollars, and the deposit rate jumped from 9.75 per cent to 16.13 per cent. The funds from the private sector in the form of time and savings and demand deposits increased, while Government deposits and credit from the monetary authorities became zero. Time and savings deposits increased from 28 per cent in 1986 to 48 per cent in 1989, an increase of more than 200 per cent in six years. It became the

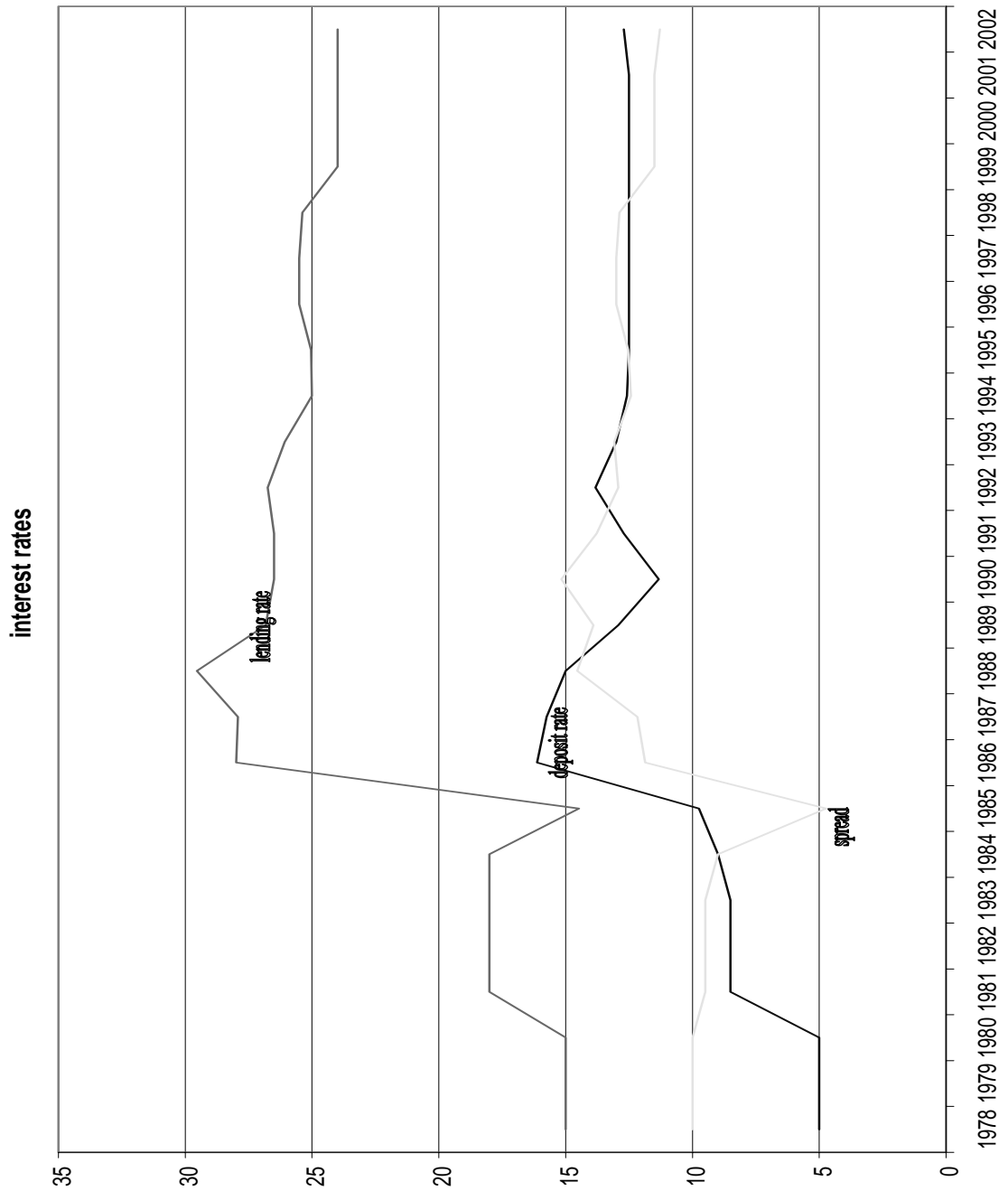
dominant fund source thereafter accounting for 64 per cent of the total bank funds in 1994. The second dominant source was demand deposits, the two sources together constituted 96 per cent of the funds in 1994. This trend was tampered with afterwards, savings and demand deposits declined to 40 and 22 per cents respectively in 1999. The demand deposits edged up a bit, while savings kept falling. The banks responded by accumulating foreign assets and injecting capital to boost their fund base. The decline of private funds was a rational reaction to what was happening to the economy. Deposits with nearly constant deposit interest rates can be maintained only in a stable currency. From 1999 onwards, the Dalasi has become unstable, and has been depreciating rapidly against major trading currencies. The real effective exchange rate depreciated more than 31 per cent within three years from 1999, and the bilateral exchange rate of Dalasis per US Dollar depreciated more than 66 per cent. The inflation was also on the rise; while deposit rates were crawling. These factors combined have discouraged the private sector from depositing funds in the banks. The banking industry has not also exhibited strong performance. Using the “other items” in the liabilities side of banking balance sheet to proxy the profitability of the banks, it shows that banks have been struggling hard to posit any good performance in the entire period of 1964 to 2002. Other items, which can represent foreign exchange activities or non-banking operation and extraordinary activities have in some cases more than wiped out the total capital of the banking industry. 11 per cent of the total liabilities in 1977 is the highest positive value other items have ever accounted for. It always tended to be negative. In 1985, it posited a negative value of 21.6 per cent of the total liabilities, and remained negative until 1997 when it stood at only 1.5 per cent; it then edged up to 4 per cent in 1999 before dropping back to negative. From 1992 to 2002, it averaged at a negative value of 3.12 per cent of the total liabilities. This does not tell well about the performance of the banks in the country. Figure 2.7 below illustrates the behavior of the account of “other items” on the liabilities’ side of the commercial banks’ balance sheet:

Figure 2.7



Another factor is that banks have not changed from their old behavior of maintaining high spreads between the lending rates and the deposit rates, the spread averaged 52 of the lending rate; in some instances, the lending interest rate is twice the deposit interest rate, as we can see in figure 2.8 below. This has been a tradition of the banks, which forced the economy to price everything twice its cost. This is rampant in the Gambian economy; it has actually been developed by the banks, the monetary authorities and the Government finance.

Figure 2.8



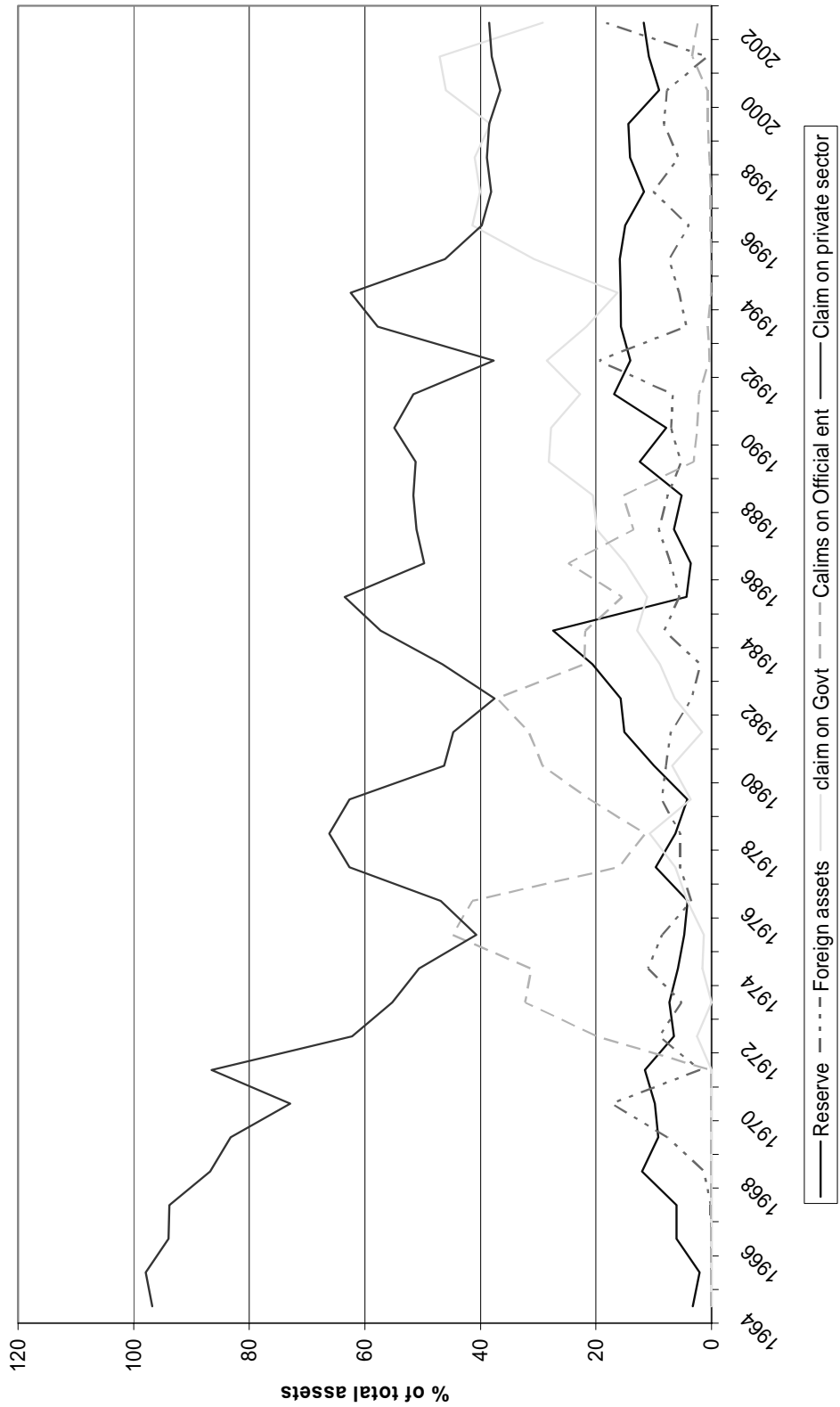
The other factor is the public lack of knowledge about the banking system. Beyond the 40 kilometers around the capital Banjul, people know little or none about the banks. Countrywide, we do not have too many banks; the bank density was 0.18 bank per ten thousand people in 1985, it dropped to 0.15 in 2002. It is only Greater Banjul area that

enjoyed moderate density of around 0.98. Thus, the number of bank branches can still be increased to increase competition and force the banks to go up country. We do not need many banks, but few banks that are well branched and well diversified. This will boost the degree of bank stability, minimize bank failures and prevent banking panics. Unless these factors are addressed, the domestic savings and deposits in the banks will continue to constitute low source of the bank funds, the banks will be under-funded, the money will be expensive and development projects will hardly take off.

The other reason why development projects do not qualify for the bank funds is due to the inefficiency of the banks. The commercial banks have been reducing their claims on the private sector and replacing it with foreign assets and claims on Government and official entities. From 1964 to 1973, commercial banks' claims on the private sector accounted for more than 60 per cent of the bank total assets. It kept fluctuating between 60 and 40 per cent from 1973 to 1996; then it remained below 40 per cent. This is because the Government and its extensions compete with private sector for the under-funded bank funds. In 1975, the banks withheld funds from the private sector and gave it to the official entities. In 1978, the private sector was given and the official entities were denied, and the opposite occurred in 1983. That is, the fund is not sufficient for the two sectors, if one gets, the other will be denied. Figure 2.9 illustrates the distribution of the commercial banks' assets.

Figure 2.9

Distribution of Banks' Assets



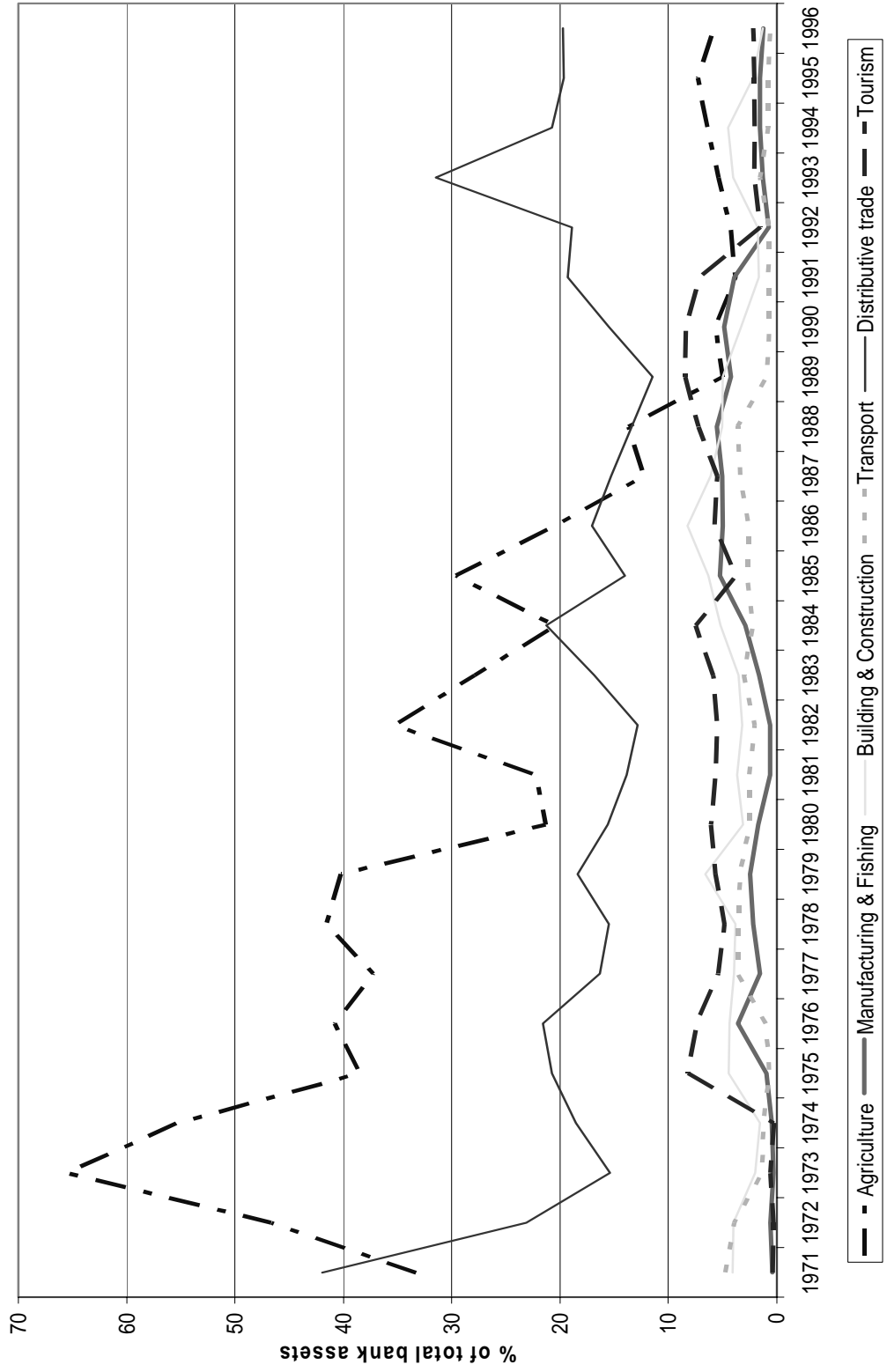
Later, banks became very inefficient and complacent; they found it more convenient to deal with Government and official entities, where monitoring and researching are less required than in the private sector where bankers must be well trained and monitoring and researching are costly. Thus, the bank claims on the official entities rose from 11.12 per cent of the total bank assets in 1978 to 38 per cent in 1982; the claims on the private sector dropped from 66 per cent in 1978 to 38 per cent in 1982. From 1992 to 2000, banks wound up their claims on the official entities and concentrated on the Government and the foreign assets. By 2001, the banks' claims on the Government stood at 47 per cent of their total assets.

In all, the private sector stands to lose. Its savings and deposits have an upward trend, while its share of the banks' assets kept declining. It could be that the borrowing behavior of the Government has crowded out the private sector; or the increasing debt of the Government has increased the country risk, and as a result the private sector activity declined. The country risk factor could be deduced from the foreign asset behavior of the banks. Banks have increased their foreign asset holdings from 0.67 per cent in 2001 to 18 per cent in 2002, the second highest foreign assets holding in the entire period of 1964 to 2002. The inefficiency to develop entrepreneurs and lead the market has also led to falling claims on the private sector. The shrinking claims indicate that the economy is nurturing inefficiency in ballooning public debt and increasing foreign assets. This was a pre-independence phenomenon, when the banks exported funds to foreign lands and the Government held its account in foreign assets, the domestic economy was left to starve. Today, the public debt has jacked up the country risk, and the transaction costs of the banks have gone up with lending interest rate almost twice the deposit interest rate; the private sector is left to starve for funds. With this phenomenon, the financing of development projects especially the private sector projects may remain a dream.

A micro-view of banks' claims on the private sector can tell us exactly what happened. Figure 2.10 below indicates clearly that the major economic sectors have been over time losing the commercial banks' support.

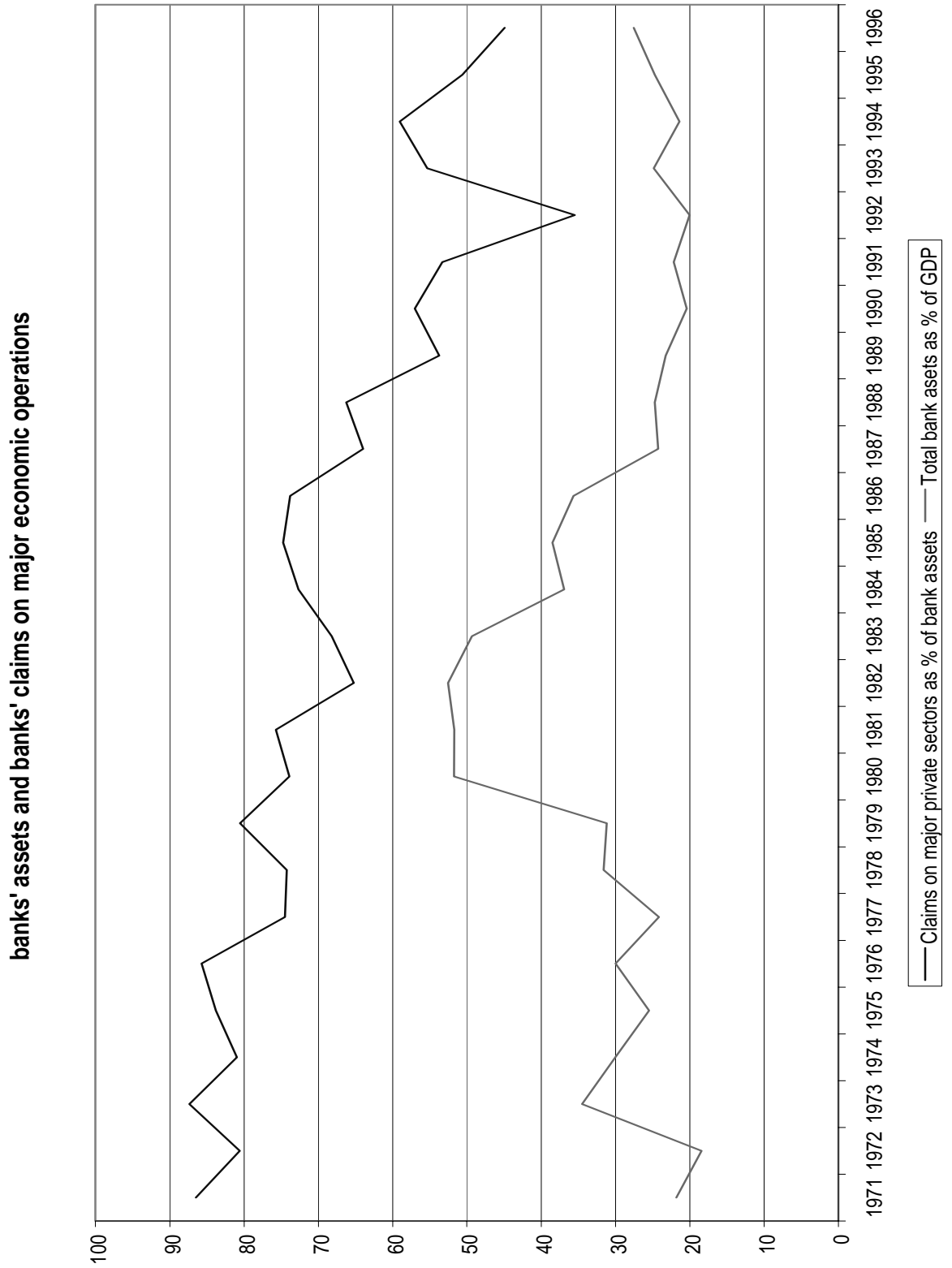
Figure 2.10

Banks' Claims on Major Economic Sectors



The groundnut production which dominates the agricultural sector has been losing dramatically its share in the total bank assets. Its share has fallen from 66 per cent in 1973 to 4 per cent in 1991. Agriculture is the mainstay of the economy, it employs more than 70 per cent of the population, but has in recent years almost nothing to do with the banks. Have the banks found a better economic sector for their money? Looking at figure 2.10, it is difficult to tell where the banks are placing their money. The other major sectors have approximately maintained their shares from 1975 to 1995. The distributive trade, which has the second highest share until 1982, declined only slightly. The individual shares of the other sectors remained below 10 per cent. That is, banks do not improve any other sector as they withdraw funds from the agriculture; they are just increasing foreign assets base and claims on the Government. This investment strategy did not improve the assets of the banks. The total bank assets as percentage of GDP have been falling from 53 per cent in 1982 to 20 per cent in 1992. This confirms our assertion that banks are inefficient and incapable of developing entrepreneurs. Thus, we expect to empirically find that economic activities Granger cause banking activities, contrary to the plausible findings that banking activity Granger causes the economic activity. The latter occurs in an efficient and entrepreneurial banking industry, while the former occurs in an inefficient and lagging banking industry.

Figure 2.10 (continued)



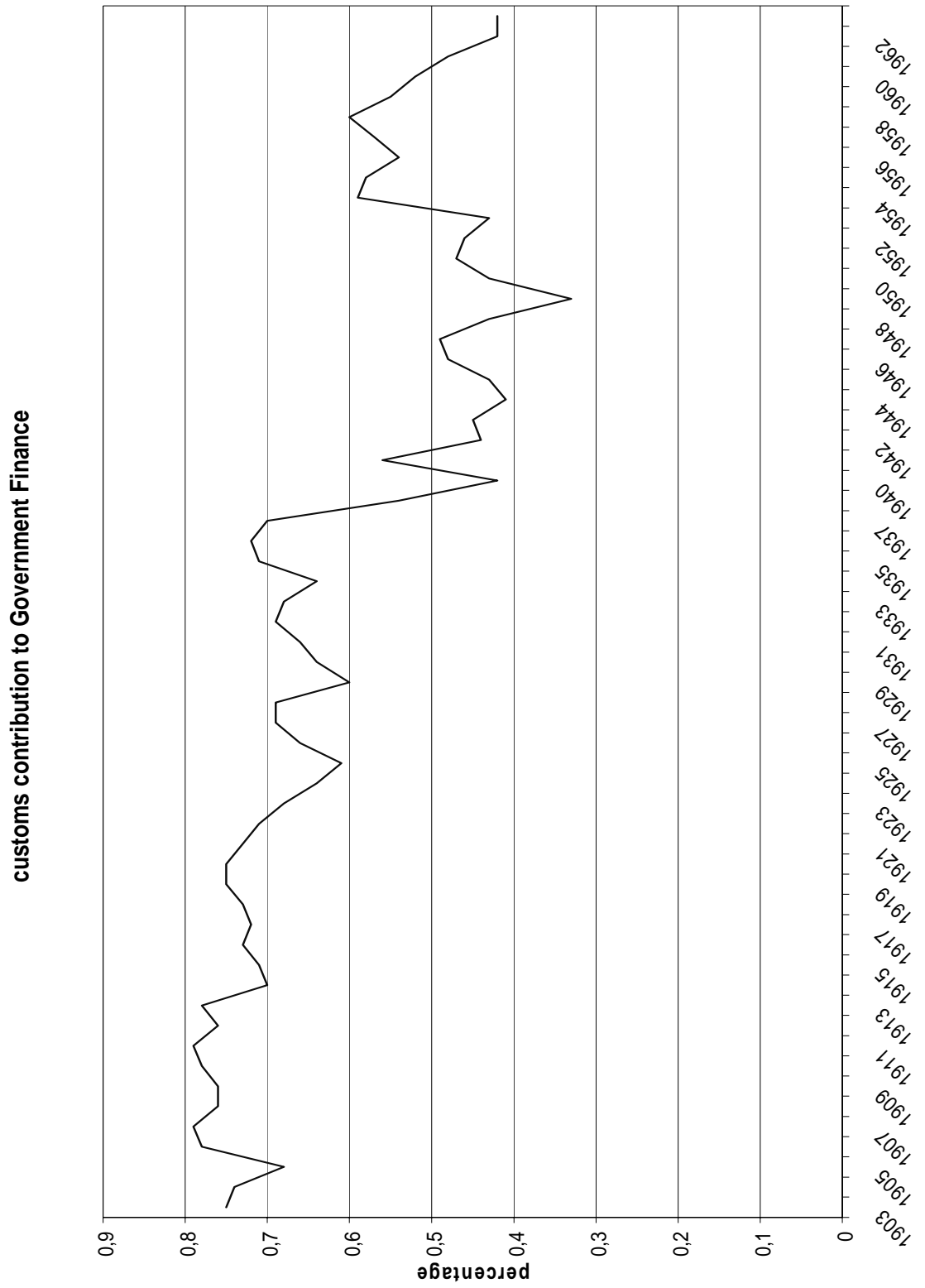
2.5 Government Finance and Taxation

Underlying all the questions of economic progress and capital development in the Gambia is the desperate recurrent financial condition of the Government. Up to 1951, the Government finance was simple but unsatisfactory. The finances were built up, while there were no corresponding expenditures in the development of the resources of the country. The staff of the Government were mostly foreigners, who were not trained by the country's finances; the communications were rudimentary, the groundnuts, the most important export produce of the country, could be easily loaded at wharves along the River Gambia onto the ocean-going vessels; so, there was no acute need to build railways or construct good roads. Little was also spent on education; since no need arose for educating the masses to cultivate groundnuts, tap rubber, crack palm kernels, or collect hides and skins, which were the export goods of the country. When the Government wanted an agricultural expert, it could cheaply get one seconded from India or China; and when it wanted a veterinary, administrator, or educator, Nigeria and Sierra Leone were always there to supply. The whole country could be run by less than one half of the inhabitants of Bathurst (Banjul), who were in the country the educated West Africans known to Europe.

The Government depended for finances on custom duties, land rents, hut taxes, and individual and company taxes. Currency Board Profits and interest incomes from Overseas Government investments also constituted some source of Government revenue. However, in the face of limited or non corresponding expenditures in the development of the country's resources, the revenue sources of Government were bound to dry up. This was acknowledged by the Governor at the Budget Session in December 1951 as he warned the Legislative Council saying: "we have now tapped to the full all available sources of revenue and until we have raised production in this colony we have reached the end of our taxable capacity". It was like the story of rubber plants in the Gambia. Rubber was obtained from wild landolphia vines, and was not cultivated. The vines were tapped all the year around, a most uneconomic method and one which has helped to kill them off. By 1920, the rubber disappeared from the export list of the Gambia. Similarly, the Government continued to tap the country's resources without cultivating them, which has no doubt helped to drain up the taxable capacity of the country.

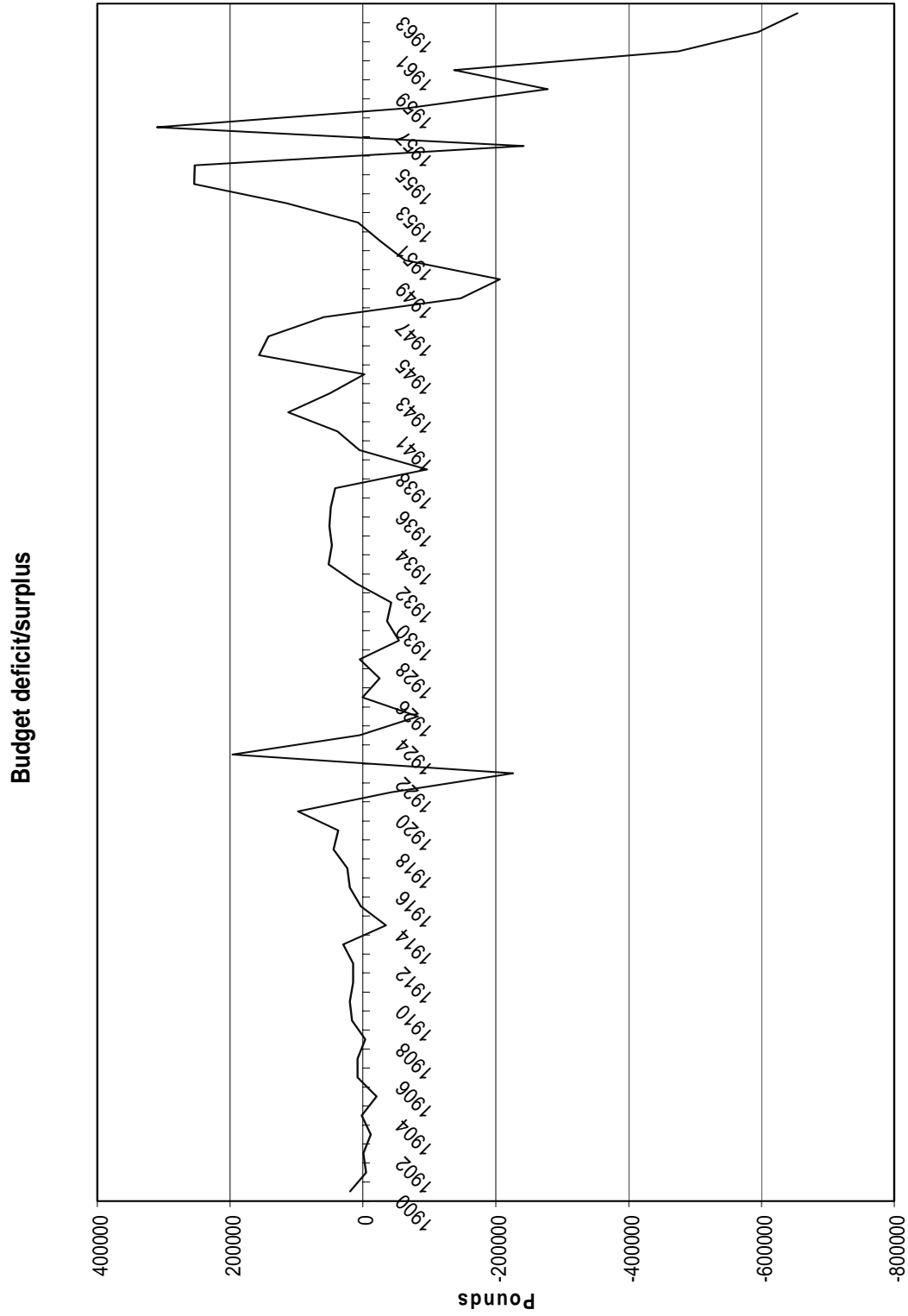
By 1950, groundnut remained the only significant export of the country, and over ninety per cent of the population depended on it for cash to finance their expenditures. Raising export duties would eat away the producer prices and render the ninety percentage of the population poorer than before, and raising import duties would raise the costs of living and the quality of living standards would be compromised. In fact, in 1958, the Government had to reduce the export duty on the groundnuts by £1.5 per ton and pay a subsidy of £2 per ton to the Gambia Oilseeds marketing Board to enable it to pay a fixed producer price of £27 per ton. The government revenue from groundnut export duty later dwindled to nothing as the World prices of groundnuts and groundnut oil kept falling, and the Government was called upon every succeeding year to come and save the Gambia Oilseeds Marketing Board, the sole purchaser of the groundnuts and to subsidize the producer price. Groundnut cultivation was the only industry of the economy, and now no revenue could be tapped from it without holding the farmers at subsistence level or letting them go below it. There were many factors responsible for the collapse of this industry; these factors will be discussed under the section Trade and Industry.

Figure 2.11



The government then turned to other taxes such as individual and company taxes for finances. Individual income tax was introduced in 1940, but did not fetch much revenue; little human capital was developed or generating income. Meanwhile, the companies were infant and required some tax haven and exemption from some set up costs as licenses and fees; levying increasing taxation or license costs and fees would cause them to go out of business or leave the domestic market. Thus, these sources of Government revenues were not sustainable. The other unstable revenue source was import duties. Import duties depend on the volume of imports, which in turn depends on the domestic income. With the collapse of groundnut market, which was the source of income for the ninety per cent of the population, the import dues were certain to fall. For some time, this import market flourished due to demands in the neighbouring countries. The Gambia with no plans of developing domestic industries, its import tariffs were relatively cheaper than its neighbours, who were trying to do something for local industries. The neighbours also had one import source, France; while the Gambia was supplied by more than six western and Asian countries. The Gambian import was swollen by the demands in the neighbouring territories, as traders responded by re-exporting or smuggling the excess imports to the neighbours. The Government finance was precarious and at the mercy of the neighbours; the ordinary revenue hardly met the recurrent expenditures, and that any new capital work, amenities and services required outside help. By 1958, the Government has already given up and separated the ordinary budget from development budget, and the later was almost entirely funded by grants and loans.

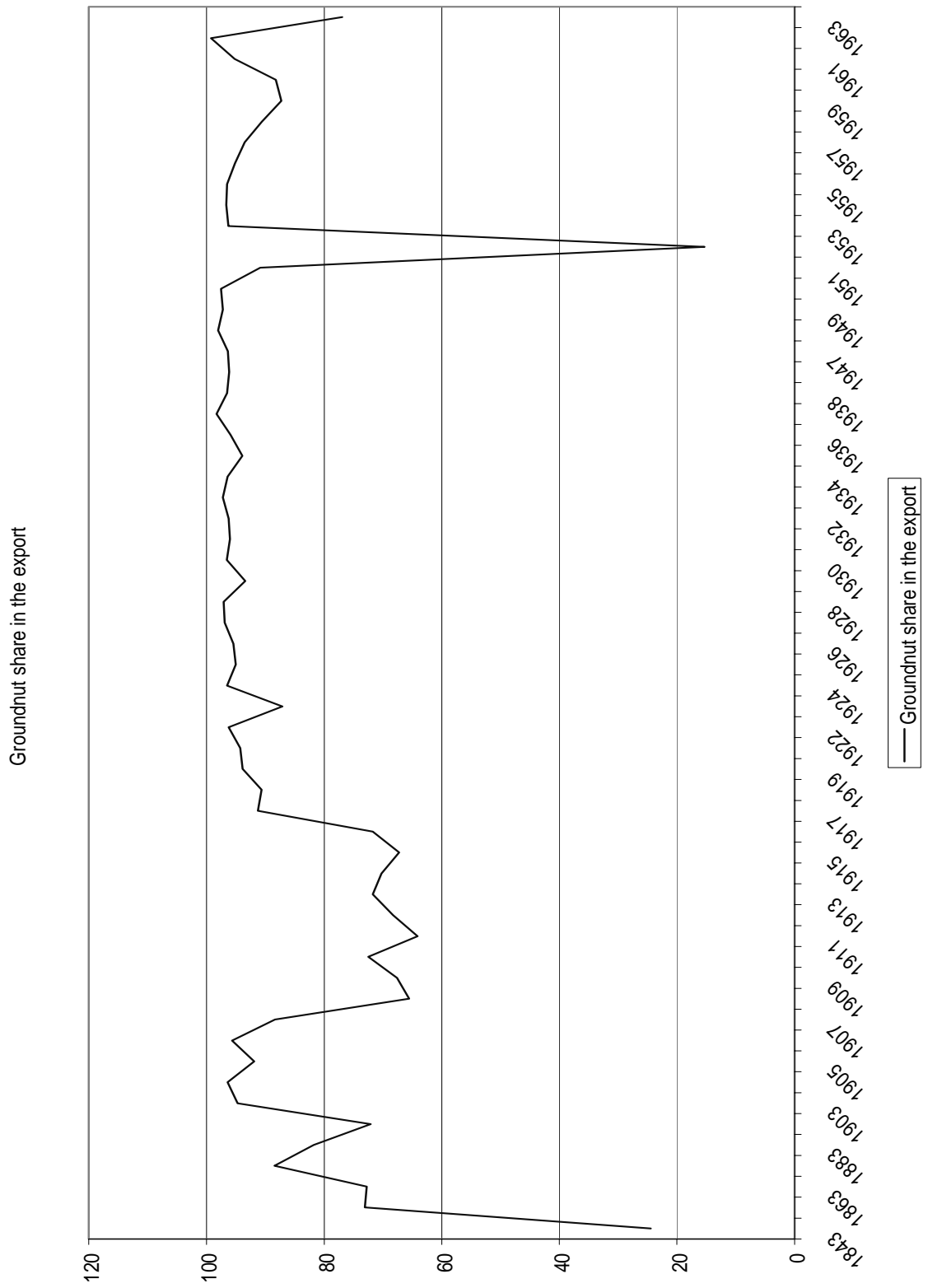
Figure 2.12



2.6 Trade and Industry

The economic activities in the Gambia up to very recently were centred on the production and marketing of groundnuts. No minerals of commercial value existed; no other crops could get the attention of the people because it paid them higher to cultivate groundnuts than other crops. Thus, groundnuts remained the sole important crop and the only industry accounting for over 80% of the national export for over 80 years. Groundnut trade was introduced into the Gambia in 1835 in consequence of demand for nuts in North America and England. Since then until 1950's, the trade prospered progressively; the producer price kept rising along the increased production. Farmers were receiving £4 to £5 per acre in 1908's. This gain progressed well until it hit the peak at £40 per ton in 1951. Thereafter, "trade" as locally referred to broke no good news to the farmers. In addition to external factors, population and finance played important roles in the rise and fall of the groundnut industry; and the fall of the groundnut industry has contributed significantly to the stagnancy and retrogress of the Gambian economy.

Figure 2.13



Groundnut was demanded internationally for its oil; and until 1960, the Gambia exported raw groundnuts to be processed in the importers' lands. After 1960, the Gambia started processing groundnuts and exporting its oils. This project coincided with the advent of new sources of edible oils, whose inputs did not originate from the Gambia. As varieties of edible oils overflow the world market, the local groundnut oil refinery faced a difficulty in giving good prices to the farmers for their groundnuts and the same time sell its oils at profitable prices in the world market. It is a small industry and its output is too small to influence the world prices of the edible oils. Thus, the local refinery loses out any time a better and cheaper edible oil appears in the market, and the only way for it to make profit is to reduce the purchase prices, which means impoverishing the farmers every succeeding trade season. From 1957, the local refinery could purchase groundnuts only at a subsidized price or at a reduced export tax. This was the most important external factor responsible for the fall of the groundnut industry. There are two local factors, population and finance.

Population

There are many other crops such as millet, African Koos, and maize, but they are not cash crops, they are for local consumption. But they compete with the cash-crop groundnut for the land and labour. The high market prices of groundnuts induced the farmers to cultivate more groundnuts, because groundnuts receipts could get them local foodstuffs or imported ones. The farmers concentrated on groundnut cultivation and less attention was given to food crops. In 1904, when the governor asked the people to cultivate foodstuffs and realize self-sufficiency in food, the chief of Tambasansang, Farli Cora responded: "I am ready and willing to take up these things you tell me about, but which of them pays best? As my people are so few and they could not deal with them all". Well, it was only the groundnut that could pay farmers the colonial monies. The colonial monies, which were British silver coins, French five francs, and notes of Bank of England, were imported into the country either for paying the colonial government officers or for paying for groundnut produce. Only in the latter, did the ninety per cent of population, who were the farmers, could see the colonial monies in their hands. Thus, the colonial monies flowed high during the trade season and their circulation fell very low afterwards forcing many farmers to resort to barter trade, or invoke traditional pre-colonial monies. To get more colonial monies was to

produce more groundnuts. With no capital and more lands left uncleared, to increase the production the farmers had to increase the labour. Any additional labour to the land would increase the output. The more numerous the number of the male members of the compound the more groundnuts would be harvested by that compound. As a result, farmers planned for large compounds; and seasonal farmers from the neighbouring territories were welcome to the Gambia to cultivate and sell groundnuts in the Gambia. Over time, small families grew into large compounds and more seasonal farmers preferred to settle and grow groundnuts in the Gambia than going back and coming every groundnut planting season. Thus high amount of labour was added to the land and the production swollen. Then, the diminishing returns quickly set in due to the fact that land is fixed and increasing farming population would definitely after a point cause the output to fall. Furthermore, for high yields per acre the farmer had to alternate the cultivation of millet and groundnut on that acre for five years; after that the acre had to be uncultivated for 15 years for it to revert to bush and for the topsoil to have a complete regeneration. This makes it 20 years of regeneration cycle. With small farming population, this regeneration could complete its cycle; meanwhile, increasing farming population reduces the regeneration cycle. This in fact caused the diminishing returns to quickly set in in the groundnut industry. Also, the large compound initially boosted the groundnut production because of its large members and the harmony of its structure. All the members of the compound worked under one member, who was the head and financier of the compound. The members together could clear more lands and produce more output than doing that individually. From 1960's, the large compound structure started giving way to small family units. This caused changes in the farming methods; instead of all members, even subfamily units, working under one head, now each member or subfamily unit worked alone, and the farming land of the then large compound got divided into small plots. The farming plots became smaller and smaller as the compound structures broke up or sub compounds disintegrated. This disintegration of compound structures contributed to the fall of groundnut output.

Finance

Financial intermediaries, whether via government finance or traditional moneylenders or the banks, all profited from the groundnut farmers. Government reaped a lot of export duties on groundnuts; in 1951, the only way for the Government to balance its budget was to increase export tax on groundnuts. But little did the Government do for the farmers financially until the industry slipped into a crisis of no-way out. The groundnut season runs from June to March of the following year: the seed is planted in June to July, the crop is harvested in October to November, and the nuts are threshed and marketed from December to March. Depending only on the earnings of the groundnuts, which are cash payments in the months of December and February, the farmers run all the cash transactions (no credit for farmers) throughout the off-season trade. Also the same cash receipts of the groundnuts are to be used to finance the working capital of the groundnut production. That is, farmers are producers and financiers. No banks around to keep the money; thus, the farmers keep the cash payments under their pillows and praying mats. In many instances cash balances from the trade season turn to zero or negative in the very months of threshing and marketing of groundnuts. The money received during the trade season quickly finds its way back to Banjul where banks and Government departments are. This occurs through the merchants, who sell imported products and manufactures to the farmers, or through the farmers themselves as they travel to Banjul to do their shopping. The Government did not build money catchments around the farmers, neither the branches of the dead currency board existed and nor that of the current central bank existed anywhere in the country except in Banjul. Because modern banks cannot exist without a central bank, it implied that no branches of commercial banks could also exist anywhere in the country except in Banjul. This is what exactly happened in the Gambia. Farmers have no choice but to take the money to Banjul as they come there to shop or buy goods from trade merchants. This scarcity of money during the off-trade season makes the money very expensive at the time when the farmers are looking for working capital to start the planting season. Thus, those farmers who accept loans from moneylenders pay high prices to the extent that some of them will give all their groundnut earnings as loan repayment to the moneylenders. An outcome of money scarcity is a barter trade to finance a working capital; for example, a farmer would accept 50kg of groundnut seeds from a moneylender on an agreement that he

will give the moneylender 100kg groundnut at the trade season as repayments for the principal and the interest. Also, the farmer barter his labour as he works on others' farms and accepts payments in goods usually foodstuffs. What have the Government done for the farmers? And what should they have done? We start with the first question.

In 1948, the Government instituted a Co-operative department and passed an ordinance creating Gambia Oilseeds Marketing Board and gave the Board (GPMB) the exclusive right to conduct large-scale buying and selling of oilseeds. The department was to help the farmers run the groundnut production; it supplied small agricultural tools and financing facilities to the farmers. In the first experiment, in 1956, the Government provided £1200 at 5 per cent for subsistence loans to farmers, it was fully repaid. In the following year £4200 was advanced to the farmers. By 1964, Co-operative groundnut societies covered the whole nation. A lot of funds were mobilized from these societies; by 1960, farmers' fund stood at £905000 and kept rising; it was not invested in farmers but abroad in the UK assets. Later, when the groundnut prices started falling, farmers' funds were withdrawn to subsidize. Little was actually invested in the farmers. For many years the governments imposed taxes on the produce and fixed the buying price, and then utilized the surplus retained by GPMB. This surplus was known as the farmers' fund “, it was used not to stabilize prices as originally intended, but instead to set up the Fish Marketing Corporation and the Livestock Marketing Board, both of which were put into liquidation only two years after their establishment; in effect wasting the groundnut producers' forced savings”⁷. Funds were originally intended for setting up and financing rural projects that would have direct impact on the farming community; but few of these projects such as mangrove clearance, pest destruction, improving village water supplies and ferries, saw light. The Co-operative Central banking Union afterwards could only purchase groundnuts by borrowing. In a consequence, a pyramid of debt structure was created, where the currency board, later the central bank, or the Bank of British West Africa would lend to the Government, and the Government would re-lend the funds to the Co-operative, which in turn would re-lend to the farmers or use the funds to purchase the produce. The illiquid plight of the farmers got aggravated as the debt pyramid increased the transaction costs of the funds. As the situation

⁷ The marketing of Foodstuffs in the Gambia 1400 – 1980, Hazel R. Barrett, Gower Publishing Company Ltd, 1988, p.44

worsened every succeeding year, good farmers dropped out of the scheme and an adverse selection of farmers swollen the scheme leading to the eventual failure of the co-operative department.

What should the Government have done? First, there should have been branches of the central bank in every provincial capital to facilitate the upkeep of money around the farmers and prevent it from draining down to Banjul. This would encourage the expansion of commercial banks and other financial institutions in the up-country. Second, the co-operative board of the Government should have been in a position to buy and sell the farmers' produce both before and after the harvest. Farmers should have been able and encouraged by the board to enter into futures contracts and sell their produce to the board to ease the illiquidity problem they faced in the planting and harvesting periods. Finally, not all farmers would prefer to run their own farms, they would rather prefer to sell their labour during the farming season. These people should have been able to do so either by being paid to work on other private farms or on state run farms. These three mechanisms could have resolved the financing problems faced by the farmers.

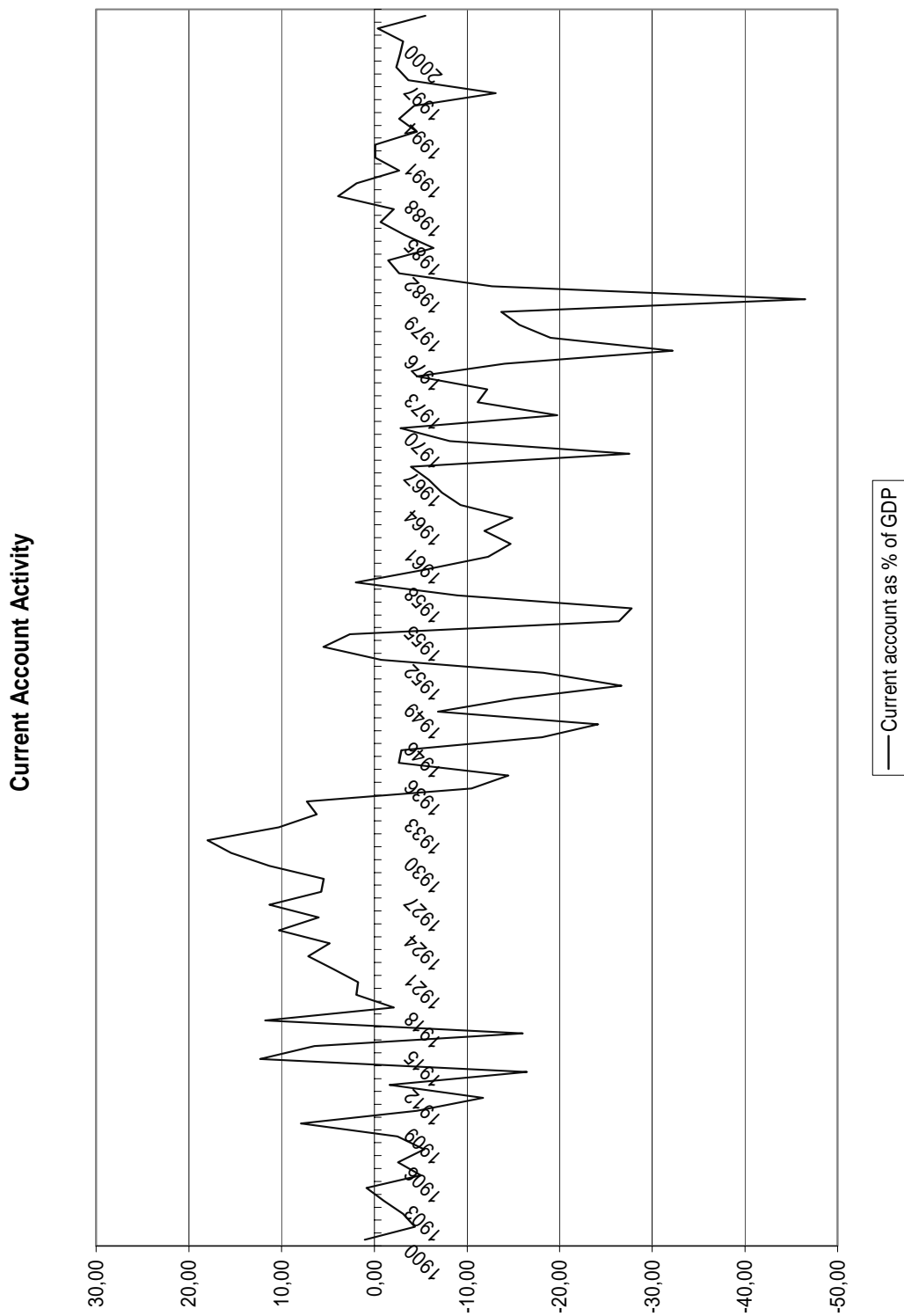
Balance of Trade

One will not be wrong if one says groundnut is the only trade of the Gambia; and when it started collapsing the whole economy started collapsing. High market prices for groundnuts year after year, limited the growing of other crops and gave high returns to farmers and traders that they found hard to take up other industries seriously. Furthermore, until 1951, staple foods, building materials and small items were exempt from import duties. Thus, farmers could afford the imported items with their groundnut money. But farmers could not spend more than the export values of groundnuts; so, what has accounted for trade deficit since 1941. There are five factors that account for sustainable trade deficit in the Gambia; and credits of these factors do not represent significant capital ploughing into the Gambia, and worse still most of them go unrecorded.

The first of these factors is drawing on the wealth and accumulated savings by the farmers. During the hay days of the groundnut industry, some farmers built savings and wealth in businesses and cattle, and at the same time they planned for large expenditures in the form of large families. When the industry started collapsing and current earnings proved

insufficient to finance the recurrent expenditures, farmers drew on their wealth and accumulated savings to balance the budgets. Over time, the wealth and the savings dried up, and the declining groundnut earnings could not be saved or reinvested, the farming community broke up and the able members started travelling abroad. Thus, the second factor for sustained trade deficit is remittances by Gambian nationals. From 1950's, the time groundnut industry began collapsing, until today, large remittances have come to the Gambia unrecorded; and these remittances constitute the most significant income for most of the former farming families. As a result, the families back home can still afford the imported goods including the foodstuffs. At present, any capital expenditure by former farming community is mostly financed by remittances. The third factor is the expenditures by the Government departments and organizations. Pen and paper, which are essential operating expenses of the Government, are not even assembled in the Gambia much more manufactured. You can say similar things for many other operating expenses that constitute the bulk of ordinary operating expenses of the Government. Expenditures by non-governmental organizations (NGO's) also constitute a factor for the sustained trade deficit. Most of the schools in the Gambia are run by the NGO's. Spending by these NGO's is financed in part by overseas donors and sponsors, and the funds normally come unrecorded and then get spent on the imported goods contributing to the adverse trade balance. Finally, demands in Senegal and other neighbouring territories for goods imported into the Gambia plays an important part in increasing trade deficit. Re-exports to Senegal are not recorded, only small re-exports to other neighbours are captured in the trade account. The current account balance as percentage of the GDP has been fluctuating wildly over the 1964 -2002 period. The surplus has in no time reached 20 per cent of the GDP, and it was around 10 per cent of the GDP only for the period 1915 to 1933. In many years deficit has been the mark of the Gambia current account. The deficit has stood around 10 per cent of the GDP for the most part of the period 1964 – 2002, and exceeded 20 per cent of the GDP in six instances. It stood above 30 per cent in 1979 and above 40 per cent in 1982. Thus, the economy has in general bad international trade activities.

Figure 2.14

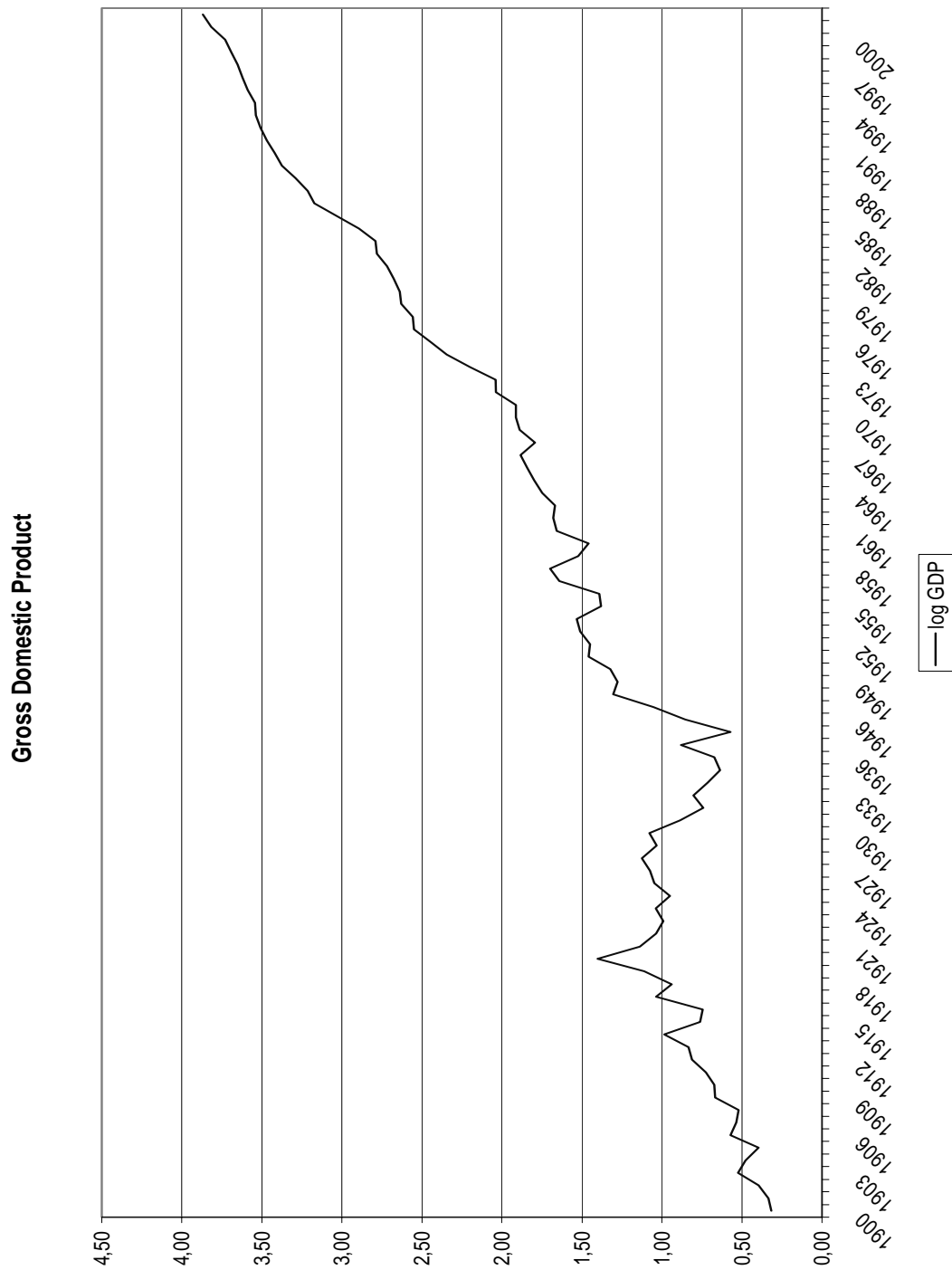


The gross domestic product gives us a summary indicator of the economic health of the Gambia. No compiled GDP data do exist for the period 1900 – 1963, I instead estimate it using the available data on the government expenditures, exports, imports and the groundnut output. I proxy the private investments by the groundnut export value, because groundnut was the most active private industry, around 90 per cent of the population engages in its production. They produce it for the export. I proxy the private consumption by the groundnut output. The percentage they locally consume out of the raw groundnut was very small; they had to sell almost all the groundnut output to buy the consumption including the processed groundnut. But since the accurate data on the groundnut output was available only for the volume brought for trade, which was equal to the groundnut export value, I use the same groundnut export value for the private consumption. This gives us the GDP for the period 1900 -1963 as follows:

$$\text{GDP} = \text{Government Expenditure} + 2 \text{ Groundnut export Value} + \text{Net Export}$$

For the period 1964 – 2002 , I use the available GDP data in the secondary sources. I then take the log of this GDP and that gives us figure 2.15 on the next page. The GDP found an increasing path only from 1948. It was growing at around 1.30 per cent annually around 1948, then at around 1.5 per cent in 1953. It took it 20 years from 1953 to 1972 to reach an annual growth rate of 2.0 per cent , and it was able to double its 1953 growth rate only after 33 years. It went to an annual growth rate of 3.5 per cent in 1993, and it was growing at around 4 per cent in 2002. We measure the performance of the Gambia economy by calculating the number of years the economy takes to achieve an additional 0.5 per cent in growth, we find that the best time was from 1972 to 1977, it took the economy 6 years to achieve an additional 0.5 per cent in growth; while the worst period was 1917 – 1947, during this period the economy stagnated or declined, and the annual growth rate stood around or below 1 per cent. The second worst period was 1953 – 1972, it took the economy 20 years to achieve 0.5 per cent in growth. It took also 15 years from 1903 to 1917 to achieve an increment of 0.5 per cent. The recent years have not either been promising, we are now 10 years from 1993 to 2002, and the economy has not been able to achieve an increment of 0.5 per cent. This is the Gambian economy, it is stagnant or very slow moving because of desperate sole agricultural industry and precarious government expenditure.

Figure 2.15



However, I can give some major reasons for the slow performance of the economy over the periods, 1900 – 1917, 1917 – 1947, 1947 – 1953, 1953 – 1972, 1972 – 1977, 1977 – 1986, 1986 – 1993, and 1993 – 2002. Each period, except 1917 – 1947 and 1993 – 2002,

measures the number of years the economy took to achieve an increment of 0.5 per cent in growth; and I call this number of years the speed of growth. The first period, 1900 – 1917, was the monetization period of the Gambian economy and its ascendancy to the capitalist world; and the economy was experimenting different crop productions for its colonialists until it settled on the groundnut, which was exported to factories in North America and England. The industry then faced logistic problems, the population was under 200,000 and was not willing to learn new methods of production; the total land of the country is about 11,000 squared kilometres and less than 20 % of it could sustain the groundnut produce. The storage and the transport of the crop within the country were also inadequate and rudimentary resulting sometimes in infected nuts. Thus, the supply of the nuts was logistically constrained, and this forced its demanders in America to switch to other alternative sources in their local economies. Then Britain and France became the sole demanders for the Gambia groundnut; French Franc and British pounds started flowing into the Gambia economy, the trade seasons flourished and the farmers had surplus funds. Production of other crops was almost abandoned, and farmers concentrated on producing cash-crop groundnut, the neighbours were attracted into the country and the farming population quickly swollen, and all the untapped arable lands were cleared. This boom of the first period was actually going to burst due to its constrained logistics of swollen population, repeated use of unimproved lands and failure of the farmers to adopt new methods of production. Thus, the second period 1917 – 1947 was a natural burst of the boom of the first period, but the burst or the recession was prolonged due to the additional man-made events. This period witnessed the first bankruptcy of the Gambia government when the French government stopped the importation of the French franc by 1917 and declared it non-legal tender by 1922, the French franc was then constituting around 70 % of the money circulation in the Gambia. In other words, 70% of the Gambia means of payment became null and void; the farmers, the business communities and the government were all 70% bankrupt, the economy was later assisted by a loan from the West African Currency Board. The other man-made event was the world wars that almost zeroed the groundnut exports to France and Britain; and worse still the British established trade boards in its colonies including the Gambia to stop the export supplies from reaching its enemies who were willing to pay more than the British. This period lasted for 31 years, and the

economy could hardly grow above the rate of the first period. It would have been shorter had it not been the man-made events. The economy entered into the third period from 1947 to 1953 with a good start, the world wars ended, the American Reconstruction Aid to France, Britain and Europe in general was causing positive ripples in the Gambia economy, the groundnut export lines were fully restored back, and the British established a colonial development corporation to help rebuild the Gambia economy; in 7 years the economy achieved an increment of 0.5 per cent in growth. But this speed could not be increased or even maintained as the economy entered into the fourth period, 1953 – 1972. This period witnessed independence struggles across Africa, and France and Britain started rethinking their cooperation with or dependency on the colonies in Africa, the rethinking deepened particularly when the first independences were sort of antagonistic and unfriendly divorce. The projects of the colonial development corporation in the Gambia, such as rice farms and poultry farm were left to perish. The French and British factories reduced their dependency on the Gambia groundnut; and worse still the trade boards established during the wars to stop supplies from reaching the British enemies were then used as an attempt to tighten the colonial grip on the colonies as the independence struggles heightened. This cost the Gambia economy 20 years to achieve an increment of 0.5 per cent in growth. The following period, 1972 – 1977, was the best period for the Gambia economy. In this period, confidence was restored into the former colony, the economy enjoyed the highest groundnut production and export value of all the past periods. It is in this period that the Central Bank of the Gambia had to revalue the Gambia currency peg to the British pound because the latter had depreciated significantly against the Dalasi. Also, there was thy-neighbour effect, as the biggest economy in the West Africa, Nigeria, was reaping high oil revenues due to its non-participation in the OPEC oil embargo in 1970's. This effect has spilled over to the Gambia, and trade flourished between the two countries and many Gambians sought works in Nigeria. Thus, the period had the highest speed, in 6 years the economy achieved an increment of 0.5 per cent in growth. This speed then reduced in the sixth period probably due to three events, the shocks of the IMF-structural adjustments, the shocks of the financial liberalization in the Gambia and the shocks of the attempted overthrow of the Government. The economy slowed from six years in the last period to 10 years in this period to achieve an increment of 0.5 per cent. It increased to eight years in the

seventh period, 1986 – 1993, the fruits of the financial liberalization were reaped in this period. The attempted overthrow of the government strengthened the bilateral relationship between the Gambia and Senegal because the latter restored back the Gambia government, and confederation was then signed between the two countries. This helped the Gambia expand its re-export routes across the borders with Senegal. The Gambia sea port became one of the busiest ports in the region as countries neighbouring Senegal and Senegal itself increased their demand for the goods transited via the Gambia sea port. But recently, 1993 – 2002, the growth has slowed, the confederation was abandoned, the Senegalese are no longer overlooking the border crossing of the goods from the Gambia. The groundnut industry could be declared dead, and the labour from the agriculture streamed into the urban places increasing the urban unemployment and pressure on the facilities. The overthrow of the government and the consequent halt of tourism further depressed the economy in this period. The financial mismanagement at the central bank and the desperate government finance are also to blame for the low economic performance in the recent period.

2.7 Conclusions

The Currency Board System succeeded in steering a better economy for the Gambia than the Central Banking System. It enjoyed low inflation, price and exchange rate stability and steady economic performance. It did so until the Government amended the Currency Act; an amendment that effectively disabled the Currency Board and transformed it to more like a Government commercial and development bank than even a central bank. The Central bank came at the time when the sight liabilities of the Currency Board far exceeded its foreign assets; the foreign asset holdings dwindled to an unmanageable level; the Board had to be effectively declared bankrupt and taken over by a central bank. The Central Bank continued the benevolent services effected by the Currency Act Amendment, and it became blind to the market information as prices were controlled, interest rates fixed and currency pegged. The Government found a good source of financing its deficit not only through borrowing from the Central Bank, but also through borrowing from the captive commercial banks, where it could borrow at below market interest rates. Over time, the economy became saddled with inefficiencies due to suppressed market information, Government

deficit financing option and neglected agricultural industry. The Central Bank also lacked innovations in the payment system so much so that a teacher in a far end of the country had to travel all along to Banjul to receive his salary, and a paymaster had to load motor cars with Dalasis to go around the country paying his subjects. The Central Bank did not branch out, and nor did the commercial banks; thus the capitalist property got concentrated in Banjul and its surrounds triggering the urbanization problems. This thing became worse as the neglected agricultural industry crumbled. The produce of the agricultural industry was exported raw from the farm fields to the overseas. No processing industry was installed early to harness the surplus labour that would be produced by the agricultural industry. As we said earlier in section 2.5, in the beginning there was a labour shortage in the agricultural industry, but the bumper harvests, foreign exchange earnings of the groundnut export and wide available untapped land acreages sustained increasing farming population. This process later produced surplus labour; with no other industries to employ them, the surplus had to be redeployed back to the farm resulting in low farm productivity, low per capita farm output, low per capita food consumption and stretched or unbalanced family budgets. The groundnut industry did produce enough savings and foreign exchanges for the economy to kick start the manufacturing stage. But unfortunately the savings forced out of the farmers' purchasing power were wasted on plants set up but only to be liquidated after two years, or wasted on subsidizing unsustainable rice projects. The savings and foreign exchanges of the groundnut produce went almost into all sectors of the economy; early commercial banks were purposely set up to finance the merchant business, which was dominated by groundnut trade; the Government deficit and the Central Bank currency peg were essentially financed by the foreign exchange earnings and savings of the groundnut industry. The funds were not used to cultivate or invest in the farmers, and thus the industry was doomed to collapse. Lack of other industries that should have effectively used the groundnut surplus labour and foreign exchanges to produce the basic consumptions and capital goods for the farmers had caused the economy to be entirely dependent on the imports. Under these situations, suppressed market information and adverse consequences of the neglected groundnut industry, the Government and the Central Bank stroke a reform in 1985/1986. The price controls were lifted, the Government attempted a minimal government by setting up some parastatals; the interest rates and exchange rate were let

afloat. Banks were then able to attract more savings and foreign liabilities than before. This increased bank liability did not sufficiently translate to increased lending to the private sectors or long term commitments. In fact, the banks' commitments in the major economic sectors have been falling. Increased interest rates and unstable prices and exchange rates have increased the transaction costs for both domestic borrowers and lenders. Thus, the banks had to transfer the increased liabilities into Government and Central Bank securities. The Central Bank also in an attempt to curb the currency and price falls has been amassing foreign assets and at the same time sterilizing the national currency through increased Central Bank bills, which are often borrowed at zero costs to finance the government deficits.

This is a summary of the Gambia economy. The solution is economic governance and fiscal discipline are required on the part of the Government. The Central Bank must be allowed to pursue only one single objective, which must be price stability. It should be responsible to the Parliament and periodically report its performance and actions taken to the Parliament. The Central Bank should not act as a lender of last resort, nor a supervisory entity for the commercial banks to avoid conflict of interest. The commercial banks must forge among themselves to set up a lender of last resort and set out the requirements and functions of that body. The Government should borrow from the voluntary lenders in domestic currency market. The Central Bank should periodically report to the Parliament and public the structures of the commercial bank liabilities and assets and highlight the commercial bank commitments in the major economic sectors. The research department of the Central Bank should have, among others, a specialised unit for each and every major economic sector to continuously bring to the light the strengths, opportunities and weaknesses of every sector. Finally, the Central Bank should branch out to increase commercial bank branching and the safety and efficiency of the payment system and nationwide coverage of the financial services.

3 Survey of Theory and Evidence

3.1 Introduction

This section discusses the theories for the emergence of banks and the empirical evidence on the bank-growth or finance-growth relation. Information economics holds that banks emerge as a result of information asymmetry between the deficit agents and the surplus agents. The banks efficiently collect funds from multiple surplus agents to finance one or more deficit agents, who on their own will find it impossible to do so. In this way the transactions costs for both surplus agents and the deficit agents are minimized. The implication of this theory is that the banks enable or facilitate the economic transactions; and if a more efficient intermediation can be found, the role of banks will be eroded if not totally eliminated. The other theory, which we call here evolutionary theory, claims that bankers were actually big merchants or firms. They evolved from loaning their excess funds to other merchants and firms, to discounting bills of exchanges and to issuing their own bills. These merchant bankers relied on their own equity to perform banking operations. The merchant bankers do not only enable the economic transactions but they also anticipate them by creating their own bills for the future economic transactions. We then discuss the four empirical evidence on the finance-growth nexus.

3.2 Existential Theories of Debt- Intermediation

Why does debt – intermediation exist? What factors are responsible for its continuous existence? We explore in this section two theories that claim to have answers for the above questions. One is embodied in the information economics; that is informational asymmetry and transaction costs. This is the most widely held theory; while the other, we term it evolutionary theory of debt –intermediation. Debt – intermediation institutions, here known as banks, research potential investments, exert corporate control, manage risk and mobilize savings. They accept deposits from and lend to large number of agents. They issue liabilities, such as demand deposits, savings, that are more liquid than their primary asset, such as government securities and personal loans. They eliminate or reduce the need for self- financing. Liquidity need may force entrepreneurs to prematurely liquidate their

capital investments; banks intervene to prevent this unnecessary liquidation. In addition to their main functions of interpersonal and inter-firm resource transfer, they also do inter-temporal smoothing. “They acquire a buffer of short – term liquid assets when times are good and run this buffer down when times are hard” (Allen et al., 1993).

The question to discuss in this section is why the intermediation exists in the first place. Why the deficit agents do not engage directly with surplus agents and execute debt contracts and in the process eliminating the role of intermediation. We discuss this under the following two theories, information economics and evolutionary theory.

3.2.1 Information Economics

Debt contracts are hardly free from problem of informational asymmetry, which are adverse selection and moral hazards (Bolton et al., 2005). The creditor may know little or none about the creditworthiness of the borrower or about the safety of the project. This lack of information on the part of the creditor about the borrower type or about the project type may cause the creditor to increasingly charge high interest rates for the funds, which consequently drive away the safe borrowers, and the creditor will then end up having an adverse selection of borrowers. The situation could be improved through screening and signaling (Bolton et al., 2005). The creditor can research and screen the borrowers to determine their eligibility for the credit and also be able to charge a concomitant interest rate. The borrowers can also signal their borrower types to the creditor by presenting researched project proposals and records of previous debt contracts and project performances. This increases the information flow and reduces the adverse selection at signing of the debt contract. But the borrower may after the contract involve in risky actions that will be detrimental to the interest of the creditor, and this constitutes moral hazard. To minimize this problem, the creditor must monitor the actions of the borrower from the signing of the debt contract to the maturity of the debt. It means, without a debt-intermediation institution, every creditor should research and screen every loan applicant and monitor every one of his borrowers. This will entail prohibitive transaction costs for the economic agents (Ruhle, 1994). Thus, banks emerge to minimize these transaction costs by intermediating between the creditors and borrowers and acting as both brokers and dealers in credits. Their total transaction costs of researching, screening and monitoring is lower

than the sum of the transaction costs borne by all individual agents engaged in debt contracts without an intermediation institution. However, the concentration of credit functions in the banks can cause them to grow into monopolist institutions that compromise the efficient allocation of the credit quantities. That is, the debt transaction costs may rise and the safe projects will be insufficiently financed resulting in some credit rationing and some adverse selection. Safe projects could also be credit rationed due to supply constraint – the lending capacity of the banks cannot meet the fund requirements of the safe projects. The emergence of the banks also does not eliminate the moral hazard. If the banks do not perform proper monitoring, the bank borrowers may act contrary to the banks' interest. Similarly, the bankers may act contrarily to the interest of the depositors. In both cases, moral hazard occurs. The central bank can, for the welfare of the depositors and the economy, monitor the bankers, while the bankers must improve their monitoring system and build incentives that deter the bank borrowers from acting injuriously to the banks.

Let us imagine an economy without debt intermediation. An agent with a financing need of say 100 € has to search for another agent who has an excess fund and she is willing to lend out. The first problem for the deficit agent to resolve is to find a surplus agent. This is termed searching; the deficit agent should search for surplus agents who can satisfy his financing needs. Similarly, investors (surplus) agents search for potential entrepreneurs, who can meet the investment requirements of the investors. This search process is duplicating in effort and time consuming. Duplicating in the sense that, each entrepreneur has to search for all the potential investors, and vice versa. It is costly and time consuming, particularly if one investor cannot satisfy the total funds required by an entrepreneur. As the entrepreneur and the investor are brought together, the searching problem is resolved, and the second problem appears. That is, the entrepreneur has to be able to secure the funds from the investor. He has to convince the investor that the project is worth investing in; the flows from the project can sufficiently pay the principal plus the interest. Meanwhile, the investor has to examine this claim made by the entrepreneur. This involves high costs for both the entrepreneur and the investor. The information about the project is asymmetrically distributed, with the entrepreneur having more information than the investor. This gives rise to the final problem, which regards how the two parties resolve the asymmetry of information. It could be that the investor compensates her lack of information about the

project by making her funds highly restrictive and then ends up with only bad entrepreneurs (adverse selection), or the entrepreneur exploits the lack of information on the part of the investor and so behaves injuriously to the interest of the investor.

Researching, selecting and monitoring are required to ameliorate the transaction costs and the consequences of information asymmetry. Because institutions of debt – intermediation exist to offer researching, selection and monitoring services, which are in turn required due to the presence of information asymmetry and that the transaction costs of barter trade are prohibitively costly for both investors and entrepreneurs, then intermediation has to exist. This existential theory of banking industry asserts that banks are delegated institutions by investors. After the delegation, the banks research potential entrepreneurs select the creditworthy ones to minimize the adverse selection, and monitor them to minimize the moral hazard problem. Thus, banks emerge as middlemen between deficit and surplus agents in the economy. The theory predicts that any time there is a better arrangement than banks to ameliorate transaction costs and information asymmetry, the banks will cease to exist, and as banks engage in the process of providing the three services, they generate information, employ and train labour, mobilize savings and diversify risk – and this process is growth promoting.

3.2.2 Evolutionary Theory of Debt – Intermediation

At the early stages of development, financial firms (banks) are not different from non-financial firms. Banks emerge endogenously developing specific skills for managing risk and uncertainty. Winkler (1998) surveys the balance sheets of a sample of firms from 1840 to 1989; he shows that “the ratio of equity to total assets was very high at the beginning of financial system development; and that the assets and liability sides of both financial and non-financial firms were not significantly different”. Increases in banks’ total assets were funded by retained earnings. As more equity capital is built via retained profits, the would-be financial firms begin to lend. The business of lending then caused them to learn the skills of screening, selecting and monitoring. “They start mobilizing deposits and accumulating increasingly diversified loan portfolios as their quality skills and capabilities of screening, selection and monitoring improved” – Winkler (1998). As the process goes over time the would-be firms then develop into full-fledge financial firms. But this

phenomenon has ceased to reappear. Today, we do not witness other non-financial firms being converted to financial firms because they have ample retained earnings and start lending out. Winkler did not refute the information economics theory of debt intermediation, he however argues it precedes the information economics theory. He could have misread the empirical evidence of high equity ratio. High equity ratio on the banks' balance sheets could be due to a fact that banks were each operating as a currency board, holding at least 100% reserve requirements against all their issuances. There was no lender of last resort, and deposits were not guaranteed by a third party. This could force them to hold high equity capital to back up the deposits and loans they issued.

3.3 Empirical Evidence

Finance-Growth nexus is a long standing debate in both theoretical and empirical literature. The debate has not shown any sign of a convergent phenomenon, rather it has grown more diverse and disturbing. Hamilton (1781)⁸ first introduced the debate by asserting that “banks are the engine of growth”. Bagehot (1873)⁹ and Schumpeter (1934)¹⁰ had no problem agreeing with him. The assertion did not run down well with Adams (1819)¹¹, who came up with an opposing view claiming that “banks (in fact) harm the morality, tranquillity, and even the wealth of nations”. His view was later revived by Robinson (1952)¹² and Lucas (1988)¹³ and other post-Keynesian economists, who abstracted their models from all monetary matters; and banking was viewed of as monetary matters. The debate subsequently led to four different versions of finance-growth nexus, namely neutrality of finance, finance retards growth, finance follows growth, and finance causes growth (Graf, 2001).

⁸ A quote from Levine, et al. (2000) “Financial Intermediation and growth: Causality and Cause”, *Journal of Monetary Economics* 46, 2000, 31-77.

⁹ *Ibid.*, ³ *Ibid.*, ⁴ *Ibid.*, ⁵ *Ibid.*, and ⁶ *Ibid.*.

3.3.1 Neutrality of Finance

If finance is money, and money is a veil, it will not affect the real quantities, such as labour, capital, consumption and per capita growth rates. This is a most quoted statement of those who see finance as a neutral factor in real economic development. They measure financial development as monetary aggregates (liquid assets/GDP, Total Loans /GDP); thus, increases in banking operations lead to increases in money supply resulting in inflationary prices. In the long run, financial developments are only inflationary. Fama(1980) applied the Modigliani-Miller(MM) theorem of irrelevance of pure financing decision to banking industry. Banks issue deposits and use the proceeds to purchase securities. That is, they purchase securities (loans) from individuals and firms and then offer them as portfolio holdings (deposits) to other individuals and firms; Fama (1980) argues that this portfolio management activity of banks under strong MM theorem is irrelevant to prices and economic activities. He added; however without proving, that the role of a competitive banking sector in a general equilibrium is passive. Johnson (1986)¹⁴ went the same line of argument, he asserted that “ a competitive banking system would be under constant incentive to expand the nominal money supply and thereby initiating price inflation”. The question to ask is, is finance equivalent to money? Or in other words, is credit equal to money? The arguments in the favour of the neutrality of intermediation imply that finance is money; but inside money. They divide money supply into two, inside and outside money. Money created by central bank is outside money and money created by commercial banks is inside money. Gurley and Shaw (1960) first invented these terms. They term loans issued to government as outside money, and only the central bank is empowered to create the outside money (Bossone and Sarr, 2002). Then, total money supply in an economy should be the sum of outside and inside money. Nay, this has never been used as total money supply. Debt-intermediation growth is not synonymous to money supply growth; otherwise, Japan and Germany with high debt-intermediation shares in the national output should have experienced inflationary situations over time. To the contrary, these countries have had stable prices or falling prices as was the case in Japan. Among the tiger economies in Asia, such as Singapore, South Korea and Malaysia, debt-intermediation has grown substantially and its share in the output has increased tremendously. But these intermediation

¹⁴ A quote from Fama (1980).

developments have no telling effects on the inflation. Thus, if money is neutral and inflationary, then it is the outside money created by the central banking system not the inside money created by the commercial banking sector. Banks do not create the inside money because they want to stimulate the aggregate demand, rather the creation of inside money is driven by profitability of business projects. This distinction between outside and inside money can be understood also as primary and secondary credits of Geoffrey Gardiner¹⁵. He made not difference between money and credits; ‘primary credit is newly created credit and secondary credit is the loans made through the use of assignable debts’. He argued that ‘ the level of economic activity is determined by three factors, the amount of new credit created; the speed with which newly created credit circulates, by being spent or lent; and the rate at which credit is destroyed by the repayment of debt’. In this way, he sees the trade cycle to be essentially a credit cycle since the credit cannot be expanded unlimitedly, a boom occurs when the “prudential limit on the creation of new credit is reached, at that point savers are encouraged to spend so that workers can earn the money they need to make their desired purchases, otherwise their savings should be allowed to diminish through inflation”¹⁶. As savers spend their savings they monetize the excessive build up of debt into means of final payments. Thus, if money is credit and credit cycle constitutes trade cycle, money cannot be viewed neutral in the process of economic growth and development.

3.3.2 Debt-Intermediation Retards Growth

A close view on neutrality of debt-intermediation gives us an implication that intermediation retards growth. If neutrality holds, then intermediation will result in inflationary phenomena and consequently high uncertainty in the economy. High uncertainty caused by increased inflation increases investment costs causing many projects to shut down and go out of business due to eroded profits. This will definitely retards growth. In addition, the proponents of this view argue that the higher the returns debt-intermediation derives from increasingly better resource allocation depresses saving rates such that overall growth rates slow down with enhanced debt-intermediation development

¹⁵ Credit and state theories of Money, The Contributions of A. Mitchell Innes, edited by L. Randall Wray, University of Missouri , Kansas City, USA, Edward Elgar Publishing Ltd 2004, pp. 157 – 169.

¹⁶Ibid pp. 10 – 12.

(Levine et al., 2000). This argument is off the road, efficient intermediation in fact enhances growth. The intermediations are expected to allocate the society's scarce resource (savings) efficiently and competitively such that the loan rate is held at exactly the level required to equate total loan revenue and total deposit interest costs (Broadus, 1973), where the transaction costs are minimum. This activity enhances the saving rates; as resource allocation becomes more efficient and competitive, banks will be under pressure to compensate their depositors more handsomely lest they lose them to other debt-intermediations. Therefore, the argument that high returns from better resource allocation by banks depress saving rates has no solid ground; because it is only under competition that banks will undertake better resource allocation and the same competition will force them to compensate the depositors with higher returns. Winkler (1998) shows that it is only via efficient allocation of savings that banks can promote growth. For Galetovic (1994) "intermediation tends to foster the accumulation of physical capital, and doing so it retards the long run growth and reduces welfare because diminishing returns will eventually set in". In other words, the debt-intermediation retards the economic growth through increased inflation and capital accumulation.

3.3.3 Finance Follows growth

This view has no empirical support. There is evidence of contemporaneous correlation, which, of course, does not indicate causation. In a response to the question "does financial activity cause economic growth?" Graf (2001) finds that "causation runs from finance to real development with no evidence at all for reverse causation". That is, economic growth is not exogenous to the debt-intermediation. However, the proponents of the view that finance follows growth hold that evolution of intermediation is part and parcel of the evolution and competition that are accelerating in the markets they serve (Allen et al., 1993). This implies that debt intermediation is endogenous to the nature of growth process of the economy. In other words, the level of the intermediation development depends on the level of economic development. Finance may not lag behind and follows economic growth if it grows faster than income. Galetovic (1994) finds that "financial systems grow much faster than income". This does not convince the opponents, who see the findings of causations somewhat misleading. That is, most causation evidence was found in already

developed countries with little findings for developing economies. Thus, if finance does not follow growth but rather leads it, then the causation evidence from developed countries should be replicable in the developing economies. This has led Leahy et al. (2001) to conclude that “banks are important at the early stages of the development.” In their research, they find that adding more recent observations shows that the importance of banks diminishes.” As the economy develops the role of banks vanishes; they initiate and foster the economic growth, but their role diminishes as income levels rise and the economy becomes more efficient and better arrangements of financial intermediation emerge. This somewhat runs contrary to the empirical evidence that show some degree of causation running from finance to real sector development in developed economies such as USA, Germany and Japan with no evidence yet from developing economies.

3.3.4 Finance Causes Growth

Bencivenga and Smith (1991) assert that “the introduction of intermediation in an economy shifts the composition of savings towards capital, causing intermediation to be growth promoting”. King and Levine (1993) explore the Schumpeter’s statement that “banker authorizes people in the name of society as it were to innovate”. This was later augmented by Taylor (1977)¹⁷, who said “the power to allocate capital is one of the most significant powers in any economic system. It is the power to determine which enterprise will prosper and which will not”. King and Levine using various measures of financial development in 12 regression equations find that all the indicators of intermediation development are strongly associated with real per capita GDP growth, the rate of physical capital accumulation and improvements in the efficiency with which economies employ physical capital. They hold that association remains economically important and statistically significant even after controlling for trade, fiscal and monetary policies; and that several intermediation indicators are good predictors of subsequent growth. They also show that commercial banks allocate resources better than the central banks, and this is due to the risk sharing and information services provided by commercial banks. However, the paper’s assertion that financial indicators can predict economic growth, does not tantamount to the

¹⁷ A quote from Ruhle, Ilonka; 1994, “Why Banks? Microeconomic Foundations of Financial Intermediaries”, Frankfurt University Dissertation, Peter Lang GHBH, Europaischer Verlag der Wissenschaften, Frankfurt am Main 1997

conclusion that finance causes growth; it may be that finance is only a leading indicator. In explaining the causality and evidence whether finance is an engine of growth, Jayaratne and Strahan (1996) observe that rates of real per capita growth in income and output increased significantly following interstate branch reform in USA. They also note that improvements in the quality of bank lending not increased volume of bank lending are responsible for growth changes. Their evidence about bank lending quality relies on bank balance sheet, the evidence would have been complete and robust had it used the data on bank borrowers, such as productivity and longevity of the typical bank borrowers. Nevertheless, the finding was a step forward in ascertaining the causality issue. Rousseau et al. (1998) examine the intensity of financial intermediation and economic performance in USA, UK, Canada, Norway, and Sweden over 1870 – 1929, using Vector Error Correction Method, VECM. They establish a quantitative importance of long – run relationship between intermediation measures and per capita level of output. They also attempt the causality and conclude that “output does not feed back directly into intermediation”. Levine and others (2000) later strengthen the findings of King and others (1993), using a dynamic panel data econometrics. They show that “exogenous components, such as liquid liabilities and total assets, of financial intermediation are positively associated with economic growth”. The exogeneity implies that those components of intermediation, which are exogenous, can cause economic growth. But the paper does not explain whether the components are weakly or strongly exogenous; the weak exogeneity may have bidirectional causality. Graf and others (2001) may also fall into the same trap. They used LISEL method and conclude that “causation runs from finance to real development, with no evidence for reverse”.

3.4 Conclusions

The survey of theory and evidence shows that there are no conclusive framework of theory or evidence on the bank-growth interaction. This could be because most theoretical frameworks hold the Walras’ Law of full information assumption; banks exist because there exist transaction costs that prevent deficit and surplus agents to communicate and strike contracts. The assumption of full information practically renders the banks irrelevant in any theoretical modelling. Also, the formulation of the models and the empirical results are influenced by the conceptualizations of the developed economies, where the importance

and the role of banks can be assumed away due to the presence of bank-like financial institutions and high information dissemination level. The situation will be different in developing economies, where banks are practically the only financial institutions, and they play a big role in the transmission of monetary policies. Thus, banks are essential in the early stages of development for both growth financing and the development of other financial institutions. Banks cannot retard growth unless they refuse competition and efficiency. Banking development reduces transaction costs and increases competition and efficiency; a process that works towards near full information. They become irrelevant only if the full information situation prevails.

4 Theoretical Framework

4.1 Introduction

In this section, we attempt to present some analytical models, without trying to be exhaustive, that highlight the impact of banking on the national output, price level and interest. We construct four models that analyze the relationships between the banking industry and the macroeconomic activities. The first model is the Schumpeter's circular flow of creditary production, section 4.2. It discusses how the banks can start the economic activity. Section 4.3 constructs an econometric analysis for Broaddus (1973)'s competitive banking industry. It derives some parameters for assessing the competitiveness and efficiency of the banking industry. Section 4.4 discusses a Keynesian model of small economy with credit market. It analyzes the interactive impacts between fiscal and monetary policies and between monetary and creditary policies on the endogenous macroeconomic variables of output, interest rate, price level and the transaction costs. It also models a credit constraint and analyzes its impact on the endogenous economic variables. We define the behavioural relationships based on sections 4.2, 4.3 and 4.4. in section 4.5. Section 4.6 presents Tsurus' (2000) model and then attempts a modification of it, and section 4.7 concludes.

4.2 Schumpeterian model

Schumpeter believes that banks create entrepreneurs who carry out new combinations of productions that lead to economic growth. He said "the structure of modern industry could not have been erected without it (credit)"¹⁸, and in carrying out new combinations, "financing' as a special act is fundamentally necessary in theory as in practice"¹⁹. "An entrepreneur can only become an entrepreneur by previously becoming a debtor"²⁰ to banks. By not only transferring the existing purchasing power to the fund users but also creating new purchasing power for financing production, banks act as starters of economic

¹⁸ Schumpeter, J. A., 1989(English Translation) "Economic Development: An Inquiry into Profits, Capital, Credit, Interest and the Business Cycles", Transaction Publishers, p. 70.

¹⁹ Ibid

²⁰ibid, p. 102.

growth. This argument then led to development of circular flow of monetary production. This monetary circuit systematically links the bank money to the production. Banks start the circuit; however, according to Schumpeter, the money in the circular flow only facilitates the circulation of the commodities, for the productive investments to be undertaken banks should create new purchasing power out of nothing - “out of nothing even if the credit contract by which the new purchasing power is created is supported by securities which are themselves not circulating media, which is added to the existing circulation. And this is the source from which new combinations are often financed, and from which they would have to be financed always, if results of previous development did not actually exist at any moment”²¹. This has come to make distinction between banking and financial markets, banking creates new and additional liquidity to finance carrying out of production, while financial markets allocate the existing liquidity from investors to fund users. If additional purchasing power is not created, no change will be effected in the economy, because in principle, workers and landlords will not loan the services of labour and land to the entrepreneur. Credit makes it possible for the entrepreneur to buy the services of labour and land. Thus, banks originate financing, which is fundamentally necessary for carrying out production. In the Gambia, banking is almost the sole financial intermediation that together with government appropriation and self finance channels the national savings to the domestic investments. Then it will be interesting to know how the disturbances to the banking lending capacity get transmitted to innovations in the private sector investments. That is, innovations in the private investments should be fully explained by lending capacity of the banks, the bank credit and the self finance. But self finance is a privilege that many entrepreneurs will not have. Thus lending capacity of the banking system and the bank credit must explain significant variations in the private sector investments; and if the Schumpeter’s credit that finances new combinations exists, the bank credit will act as an exogenous variable for the private sector investments. Since from the traditional models, interest rate is an explanatory variable for the investments, I can write the Schumpeter’s model as follows:

²¹Ibid., p. 73.

$$PI_t = f(DCP_t, LC_t, \bar{i}_t)$$

where, PI = private sector investment, DCP = Bank credit to the private sector, LC = lending capacity of the banking system, and i = interest rate.

The role of banks in financing entrepreneurs is crucial especially when examining monetary production of developing countries like the Gambia, where equities markets are almost nonexistent. If banks cut their supply lines of credits to the entrepreneurs, the production activities will not be carried out; because no alternative sources of financing such as equities markets exist. You may ask about self finance or traditional markets. For the case of self finance, Schumpeter argues that “the possessor of wealth, even if it were the greatest combine, must resort to credit if he wishes to carry out a new combination, which cannot, like an established business, be financed by returns from previous production”²². The individual can achieve the privilege of self finance through savings, not through property because it cannot be employable either immediately for carrying out new combination or in exchange for the necessary goods and services. The latter case is not possible in the Gambia where, most properties are in terms of real estates and livestock, which cannot be immediately employed in the production and cannot be exchanged for the goods and services the entrepreneurs wish to produce. Meanwhile, self financing through savings may not be practical given the levels of income and the low real deposit rates; with rising inflation rates and the depreciating currencies, the entrepreneurs may not be able to buy the productive means through savings. Traditional markets, represented by moneylenders, mostly finance consumption not production goods and services. Thus, bank credit is essential for production in a developing country; however, the lending capacity of the bank may be misdirected towards consumption goods and services rather than to productive investments, and banks can act like moneylenders rather than professional bankers, giving credits to a clique of friends and high personalities rather to depersonalized and well appraised projects.

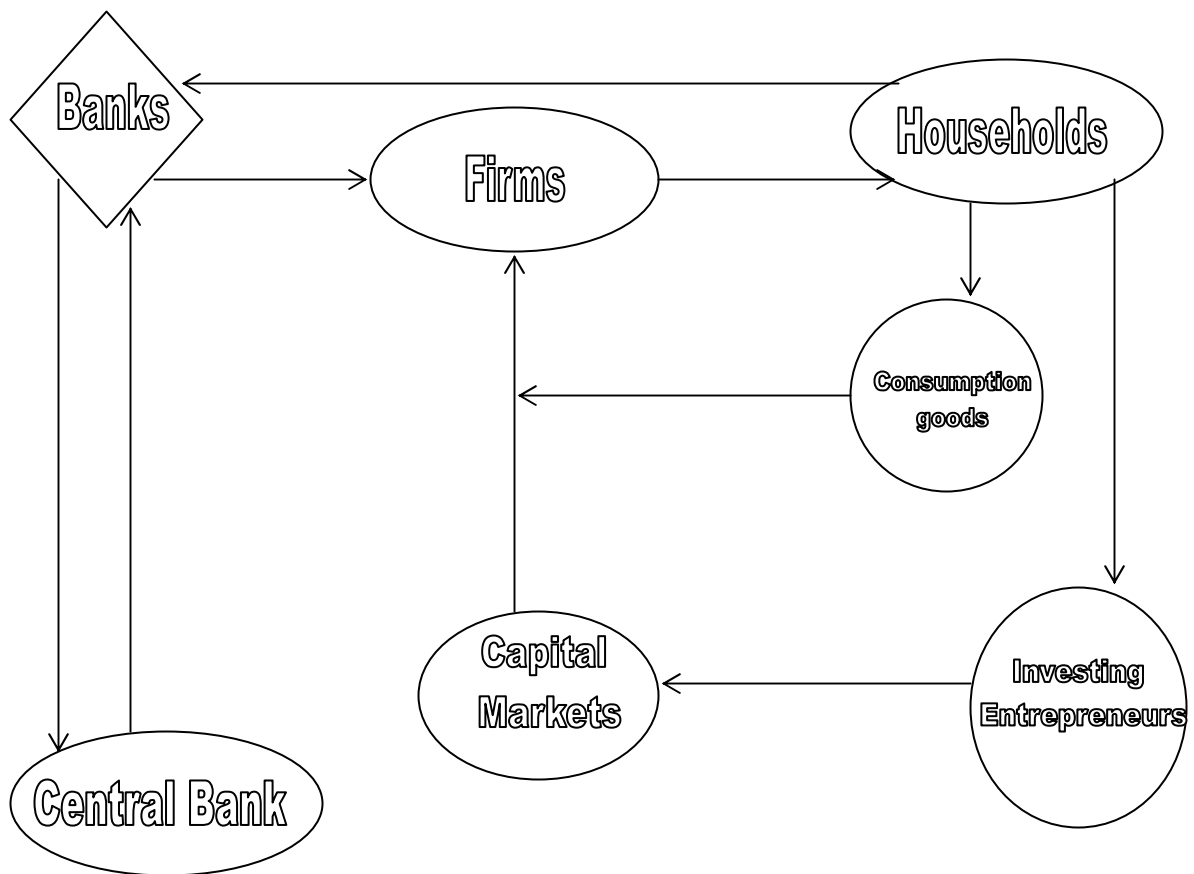
²² Ibid, p. 69.

Schumpeter's Bank Credit

What determines the credit demand of the entrepreneur given the profit maximizing principle? For Schumpeter, an entrepreneur demands credit to buy labour hours and capital. She blends these two inputs using her entrepreneurial skills and produces the output.

To Schumpeter, banks are the circuit starters in the economy; they switch on the engine of production in the economy as the diagram below illustrates

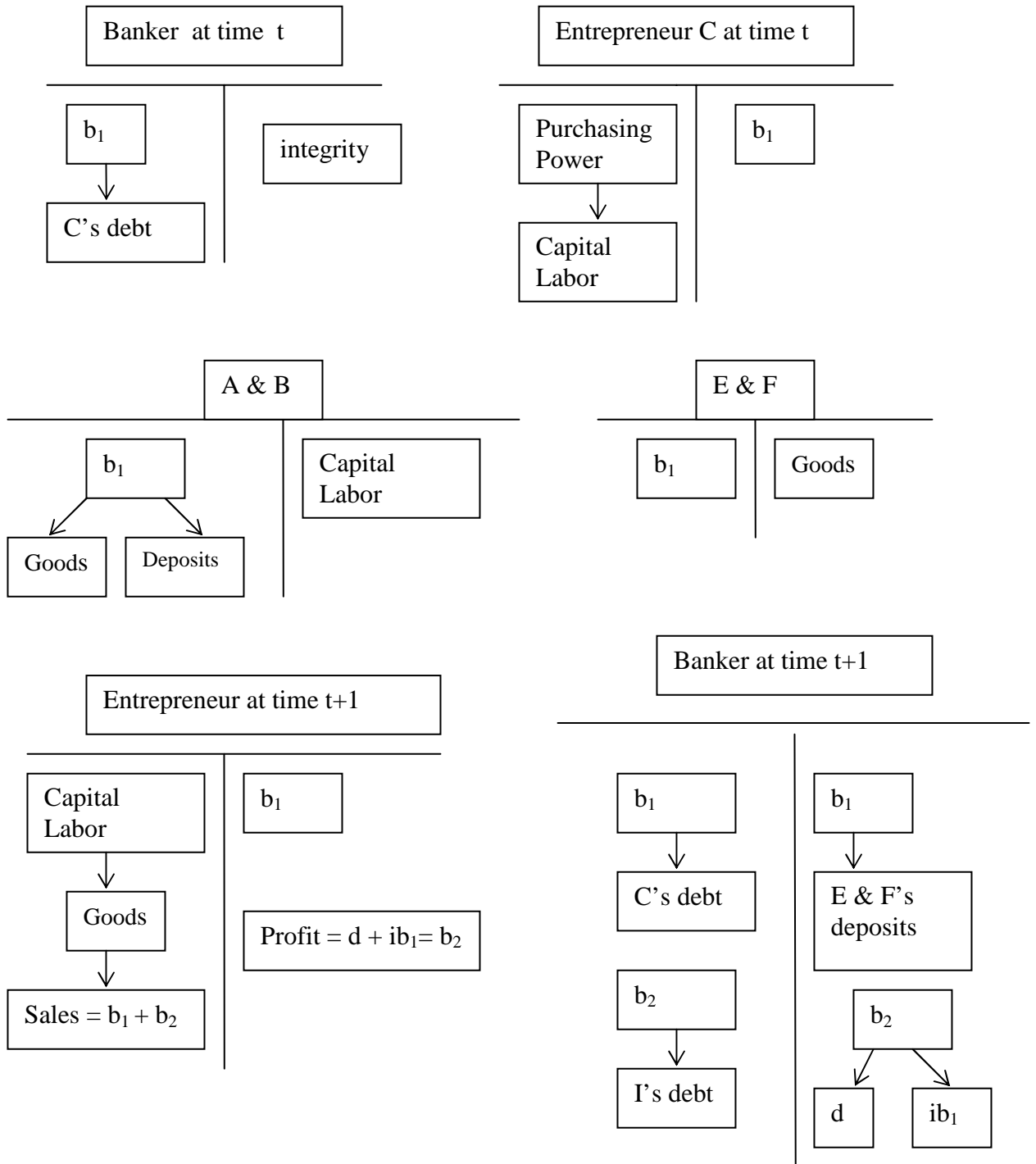
Schumpeter's Circular flow of Creditary Production



Source: Bossone and Sarr (2002), WP/02/178.

Banks start the circuit of creditary production by creating credit out of nothing as Schumpeter has claimed. For example (see the next page for the circular flow balance sheets), an entrepreneur C, has no finance of his own to buy capital and labor to start production, can approach the banker to write acknowledgements (bills) to pay for the labor

Balance Sheets of the Creditary Production



and capital. The integrity of the banker is accepted by all the market participants. The banker writes bills, say b_1 , at time t for C to purchase capital and labor from A and B and start the production cycle that will end at time $t+1$. C gives the bills to A and B in payment and undertakes the production. C becomes a debtor to the banker, and A and B are the corresponding creditors to the banker. If A and B do not in turn spend the bills but deposit them in the bank, then A and B are financing the purchases of C . If they spend the bills and buy goods from E and F , A and B will drop from the bank's book entry leaving C as the debtor and E and F as the corresponding creditors. If C at time $t+1$ can sell his output to E and F , he will get hold of the b_1 and give them back to the banker to cancel his debt, and correspondingly the credits of E and F are cancelled. This completes the cycle. The entrepreneur makes zero profit, he spends b_1 to finance the production, and sells his output for b_1 , which he gives back to the banker to cancel his debt. Also, the banker makes no interest income, he issues b_1 at time t and gets back the same bills at time $t+1$. If we assume profit maximization is the objective of the players in this system, then the banker wants the future value of the b_1 at time $t+1$ charging an interest rate of i , and the entrepreneur must sell his output at a value higher than b_1 at time $t+1$ at least to break even. Thus, E and F 's purchases will not clear C 's output, another buyer, say I , is needed to clear the output balance. I goes to the banker and signs an acknowledgement, say b_2 to purchase the output balance of C . Now, at time $t+1$, the total costs and sales of C are $(1+i)b_1$ and $b_1 + b_2$ respectively. C 's output is cleared, b_1 are spent on the output by E and F , and b_2 are spent by I on the output balance; and the total credits created from the beginning of the production cycle to the end of the production cycle is equal to the total sales of the production cycle. If $b_2 > i b_1$, the entrepreneur pays the interest to the banker and makes some dividend, d . E and F will drop from the bank's book entry leaving I as the debtor and C and the banker as the corresponding creditors to the amount of dividend and interest income respectively. If $b_2 = i b_1$, the entrepreneur pays the interest and makes no dividend, $d = 0$. E , F and the entrepreneur will drop from the bank's book entry leaving I as the debtor and the banker as the corresponding creditor. If $b_2 < i b_1$, the entrepreneur makes a loss causing the banker to have a non-performing loan. For I to cancel his debt (principal and interest) with the bank, he must also collect in the course of his business at least the future value

of b_2 at time $t+2$, and this requires that the banker creates new bills, say b_3 , so that at time $t+2$, I's collection is $b_2 + b_3 > (1+i) b_2$ to cancel the debt obligations and make some dividend. That is, for interest and profit making, there must be outstanding debt with corresponding credit at the bank at every production cycle. If the entrepreneur continues making profit, the system will be prosperous. If C's financial need at every production cycle remains at b_1 , he will after some time finance his production from his retained earnings. But this is no good news for C. It means the demand for C's output remains constant, and hence C's production does not grow over the production cycles. If on the other hand, C improves his technology so that his financial need at every production gets less and less than b_1 , then the payments to A and B (the capital and labor owners) will become less than b_1 at every production cycle. Subsequently, A and B will buy less than b_1 from E and F, who in turn will buy less than b_1 from C; thus, the demand for C's output will be lower than before. If b_2 are not sufficient enough to clear the output balance at a profitable level, C must accept price deflation. Similarly, if A and B save some of b_1 , C's output will be cleared only at deflating prices, if b_2 are not sufficient enough to clear the output balance at a profitable level. The prosperity of the system will depend on the bank's credit creation at both the beginning and the end of the production cycle. This depends on the willingness of the entrepreneur to undertake the production, which in turn depends on the willingness of the third parties to purchase the output at profitable prices. The willingness of the players in the system must be realized first, then the bank injects credit that subsequently creates waves of responses in the entire system. Some of these bills become money as they become standard and transferable throughout the system. Non-bank financial inter-mediators, such as stock markets and mutual funds, all deal in already created bills of the banks. The central bank does the same operation the commercial banks do but in the name of the government and with restricted customers that are the government itself and the commercial banks. The government can levy taxes on the citizens and the commercial banks (via the central bank by ways of regulations) and then deposit these tax claims in the central bank. The central bank can, against the tax claims, issue credits to the government. It can also create bills for the government to undertake production. If the government can collect the future value of the bills at the end of the production cycle, it will be able to cancel its debt with the central bank and the economy will expand;

otherwise, the value of the bills will fall by the value of the unsold output of the government production, and the economy will contract. Also, if the commercial banks are faced with immediate payment of their bills in cash and have no sufficient cash, which they get through dealing with the central bank, the central bank can issue them cash on credit. Thus, the ability of the banks to create bills also depends, besides the willingness of the market players, on the willingness of the central bank to issue cash upon demand. This concludes the discussion of Schumpeter's Circular of Creditary Production. We discuss below in some mathematical terms how the banks' credits relate to the output and production.

Assume the technology of production is

$$Y = f(K, L) \tag{1}$$

where Y :output, K : capital, L :labour

The revenue of the entrepreneur will be PY (P is the price). The profit is the difference between the revenue and the costs. The two inputs L and K are paid wage (w) and rental (r) respectively. The only total cost is $wL + rK$; and the credit (C) from the bank is exactly enough to cover this total cost. The entrepreneur has no previous production; and has to borrow the required funds to cover the total cost from the bank. Thus, this can be formulated as

$$C = wL + rK \tag{2}$$

When Y is produced and sold the production process ends, the entrepreneur pays back the credit plus interest of one period, takes her profit and winds up the business. This profit is actually the residual accrued to the owner-entrepreneur of the production. Thus, the objective of the entrepreneur is to maximize this residual, which we denote it here as dividend (D). The total cost at end of the period is $C + iC$, i is the bank's lending rate; and this is $(1+i)C$. The end-of-period costs are

$$TC = (1+i)[wL + rK] \tag{3}$$

The residual D is then

$$D = pf(L, K) - TC = pf(L, K) - (1+i)[wL + rK] \quad (4)$$

Assuming $p=1$ (normalized), the entrepreneur maximizes D with respect to the input values L and K .

Setting $dD/dL=0$, and $dD/dK=0$,
we get

$$\begin{aligned} f_L &= (1+i)w, & w &= \frac{f_L}{(1+i)} \\ f_K &= (1+i)r, & r &= \frac{f_K}{(1+i)} \end{aligned} \quad (5)$$

Substituting the values of w and r in equations (5) into the equation (2), we get the following:

$$C = \frac{Lf_L}{(1+i)} + \frac{Kf_K}{(1+i)} \quad (6)$$

That is, the demand for credit is positively related to marginal productivities of the inputs and negatively related to the costs of credit (i). This (i) is broadly defined here as all the net costs the entrepreneur incurs in obtaining the bank credit. If we replace the Lf_L and Kf_K with shares of inputs, assuming α as the portion of national output Y allocated to the capital; then, $(1 - \alpha)Y = Lf_L$, and $\alpha Y = Kf_K$. This gives us,

$$C = \frac{(1-\alpha)Y}{(1+i)} + \frac{\alpha Y}{(1+i)} = \frac{Y}{(1+i)} \quad (7)$$

$$C = C(Y, i) \quad (8)$$

Increase in the national output increases the demand for the bank's credit, while increasing costs associated with obtaining bank credit depresses the demand for bank credit. Let us define this cost more formally by expanding the Broaddus (1973)'s model.

4.3 Broaddus's Model

Broaddus (1973) proposes that banking industry should be opened up for competition to realize efficient allocation of the scarce resources of the nation. In a competitive banking industry the loan interest rate is held at exactly the level required to equate total revenue and total deposit interest costs. That is,

$$LR = gDR \quad (9)$$

$$\text{Where, } g = \frac{1}{1 - rr_D}$$

rr_D = required reserve ratio.

LR = loan interest rate.

DR = deposit interest rate.

Equation (9) is an identical relationship, which we believe does not hold in the real world. We believe that bank's lending rate does contain more information than just the deposit rate, it includes all the costs associated with obtaining the credit. The identity relationship in equation (9) can be modified to be more representative of the reality in the following way:

$$LR_t = \alpha + \beta DR_t + \varepsilon_t \quad (10)$$

This econometric representation tells us that the lending costs of the banks could be more than the equilibrium value of Broaddus' model. With β as an estimator of g , and ε counting for random factors whose expected value is zero, then α can assume values as follows:

$\alpha < 0$, $\alpha = 0$, and $\alpha > 0$ when the expected lending interest rate is,

$$E(LR_t) = \alpha + \beta E(DR_t) \quad (11)$$

Case 1: $\alpha < 0$, this means the equilibrium deposit costs are higher than the equilibrium lending costs. That is, banks pay their depositors more than what they reap from the borrowers. Is this possible? That the real deposit costs are more than the real lending costs. It also means banks subsidize their borrowers. A monetary policy that suppresses lending costs to achieve a positive shift of the aggregate demand, while attracting savings by promising high returns on them may lead to a situation where real lending rate is lower than the real deposit rate.

Case2: $\alpha = 0$, this is the case of Broaddus' model. It represents the perfect equilibrium situation, where given the high competitiveness of the banking industry the loan interest rate is held at exactly the level required to equate the total revenue and the total deposit interest costs. This is the benchmark case for evaluating other cases. Any other case different from this case is considered a disequilibrium condition, like case1.

Case3: $\alpha > 0$, this is the other disequilibrium case. Here banks reap a monopoly gain; their lending costs far exceed the deposit costs. This is the situation we expect to get in this research; that the banking industry in the Gambia is inefficient, that the costs associated with obtaining loans from the banks far exceed the costs associated with maintaining the deposits, that deposit returns are suppressed and as a result less savings are mobilized than otherwise and in turn resulting in low lending capacity and low loan supply.

Case4: From equation (10), we can derive also an estimate of the required reserve ratio, rr_D . That is, given the lending interest rate and the deposit interest rate, what is the required reserve ratio? If there is a one-to-one relation between the lending interest rate and the deposit interest rate, the estimated required reserve ratio, which I call here the empirical reserve ratio, will be zero. This is the equilibrium point, where the banking efficiency and competitiveness will hold the prices (the lending interest rates) of the banking output and the costs (the deposit interest rates) of the bank inputs together to co-move in a one-to-one relation. Banks will not operate at this point because there is a regulatory required reserve ratio, which is never zero. Nevertheless, they will still operate efficiently and competitively

if the empirical reserve ratio is held equal to the regulatory reserve ratio. This is the equilibrium point the research will investigate. If the empirical reserve ratio is higher than the regulatory reserve ratio, the banking industry will be operating at abnormal profit rate and it will be uncompetitive and inefficient; and the magnitude of the deviation of the empirical reserve ratio from the regulatory reserve ratio tells us the degree of uncompetitiveness and inefficiency. This deviation measures the transaction costs in the bank credit market, zero deviation implies then zero transaction costs in the credit market, and that results in perfect bank credit market, and this motivates us to measure the transaction costs as the spread between the lending interest rate and the deposit interest rate. I combine the implicit outcomes of above two models, Schumpeter's credit and the modified Broadus's model with Keynesian output, money market and aggregate production function in the next sections to find out how banks fit into the process of determining the national income, interest rate, and price level.

4.4 Keynesian Model with Banking Credit

In continuation of the theme developed in the opening section of this chapter, we incorporate Schumpeter's credit in a Keynesian model of fiscal and monetary policy analyses. That is, the Schumpeter's circular flow of production requires the existence of credit market in addition to goods market, money market and aggregate production function. The credit market can be perfect or imperfect, and only bankers are the financial intermediaries in the imperfect credit market. While, in the perfect credit market, financial intermediation does not exist, because every surplus agent can costlessly enter into a credit-debt contract with every deficit agent; the transaction cost is zero. Section 4.4.1 and 4.4.2 introduce the credit market in the Keynesian IS/LM framework. Section 4.4.1 assumes that in a perfect credit market only the demand for credit matters and the bank intermediation is irrelevant. Section 4.4.2 introduces credit market imperfection that brings about transaction costs and consequently the relevance of the bank intermediation. In this section, we find that bank credit promotes output growth through investment and this process works also to reduce the transaction costs. The puzzling result is that as banks develop one reason for their existence in section 3.2. is minimized. Banks exist because transaction costs exist between the deficit agents and the surplus agents; as banks develop and expand through increased credit and involvement in investment promotions they reduce the gap between the two agents by minimizing the transaction costs. This implies that as the economic development climbs high stages the banking role becomes minimized. Section 4.4.2 also treats credit shocks exogenously that can be enhanced or retarded by a central bank policy through monetary expansion or contraction respectively. In this section, we treat private investment as a function of both nominal interest rate and the bank credit. Thus, the impact of a bank credit is channeled to output through the private investment promotion. Sections 4.4.1 and 4.4.2 examine the interactions between the fiscal policy and the monetary on one hand and between the monetary policy and the creditary policy on the other hand. In the final section, section 4.4.3., we introduce the interaction of money and credit in the imperfect credit market model. We define money here as cash money and demand deposits. Cash money is in the hands of the public, and demand deposits are in the commercial banks. Cash money also constitutes part of the bank credit that has been monetized by entrepreneurs. The entrepreneurs monetize the bank credit when they convert it into a final means of payments. We also treat cash money and bank credit as substitutes; thus, high cash money holdings reduces the lending capacity of the banks and consequently the bank credit supply; and reduced bank credit supply will make the bank credit increasingly costly. If credit is costly, the entrepreneurs will like to hold high

cash balances; hence, high transaction costs associated with obtaining and supplying bank credit increase the demand for cash money. The other link we introduce is the central bank money that filters into economy through the bank credit. And the banks convert into credit the part of central bank advances that have been monetized and deposited back into the banks. In this process, the central bank money acts as an explanatory variable for the bank credit supply. Both section 4.4.2 and 4.4.3 assume away the Walras' Law of full or near full information due to the presence of imperfect credit market that "arises in a world of uncertainty, a world with transaction costs and costs of information", (Brunner and Meltzer 1988; Bernanke and Blinder, 1988). The comparative statics analysis in all the following sections are taken from my supervisor's textbook, Wohltmann (2000) and manuscripts of the lectures, Money and Credit, Wohltmann (2005). The model is as follows:

$Y = C^+(Y) + I^-(i) + G$ this is Keynesian aggregate demand, the economic output is distributed among consumption $C(Y)$, Government expenditure G , and the private investment $I(i)$.

$\frac{M}{P} = L^+(Y, i)^-$ money market, demand for real money balance depends on the income and the interest rate.

$D = D^+(Y, r, i)^-$ private demand for credit.

$Y =$ income

$r =$ transaction costs. It is the total transaction cost born by both debtors and creditors in carrying out credit-debt contract.

$i =$ nominal interest rate. In our analysis here, we treat i like nominal discount rate required for the time value of money. In perfect credit markets, i captures only the time value of money, an equilibrium discount rate; while, in imperfect credit markets i is assumed to be higher than the equilibrium discount rate. Both r and i decrease the private demand for credit.

$S = S^+(Y, r, i)^+$, credit supply function. Increases in the nominal discount rate increase the supply of credit; while increases in transaction costs reduce the supply of credit. Y represents the economic activity level, the income level and also the lending capacity from the banker's point

of view. Thus, increases in Y will definitely induce the bankers to increase credit supply.

$r = r(Y, P)$, transaction costs in the credit markets that burden both creditors and debtors. The

costs go down with increasing income and go up with increasing price level

P = price level in the economy. We assume here that this price summarises all the information available in the economy; a high price could result in an inflationary situation and consequently high transaction costs; for simplification we use price level instead of price change which is often used by some researchers (Erhardt, 2002). The difference will be eliminated later when we take the total differentiations of the log-form of our model. High income Y , reduces the transaction costs. High income increases the value of collaterals, assets and profits and signals good news about the economic activities; while, low income signals low value of assets. Agents with high income will encounter less transaction costs than those with low income. The bankers are more likely to bear higher transaction costs when dealing with low-income agents than when dealing with high-income agents. This is why we assume that high Y reduces r , and thus high Y increases the economic agents' demand for credit because it enhances their creditworthiness via reduced transaction costs and their ability to repay the debt extended to them. Similarly, high Y induces the creditors to extend the credits due to reduced transaction costs and improved credit-worthiness of the debtors.

4.4.1 Perfect Credit market

If the credit market is perfect, the total transaction costs will be zero. There will be no friction cost; bankers will have no place, because economic surplus agents can costlessly meet with the economic deficit agents and enter into credit and debt contracts. Only the income, Y , and the nominal discount rate will matter to the contracts; nominal discount rate will be the rate of time value of money enough to equate today's consumption with future's consumption. Under this situation, the surplus agents will have no problem transferring the surplus to the deficit agents. The credit will exist only if deficit occurs, the demand for credit determines the credit market; thus r and S are not required in our perfect credit market model. The banking sector is represented by the demand for credit, which is purely determined by the entrepreneurs' demand for credit, and thus the banking is endogenous when the credit market is perfect. Banking in this section works only as a filter that filters the deposit money into credit, and since not all deposit money will be filtered into credit, changes in money may not necessarily equal changes

in credit. This argument will be treated in detail in section 4.4.3 where the money and credit are linked together via transaction costs and central bank money supply. We construct the relations in this section as follows:

$Y = f(P)$ following the Keynesian aggregate supply function, given that the labour market is in disequilibrium,

$N^d = N^d\left(\frac{\bar{w}}{\bar{P}}\right)$, where, N^d = labour demand. In the short run, when the wage rate, w , is fixed, the output will be determined by price level.

Our model with perfect credit market is as follows:

$$Y = C(\overset{+}{Y}) + I(\overset{-}{i}) + G$$

$$\frac{M}{P} = L(\overset{+}{Y}, \overset{-}{i})$$

$$D = D(\overset{+}{Y}, \overset{-}{i})$$

$$Y = f(\overset{+}{P})$$

In this Model, the credit supply, S , is perfectly elastic and completely determined by the credit demand, D . After taking the total differentiation of the model, we evaluate the effects of fiscal and monetary policies, because financial intermediation does not exist in perfect credit market, we do not have here the effects of credit policy; while demand for credit is assumed to be always endogenous. The effects of credit policy will be analysed under imperfect credit market. We incorporate in our analysis the interaction effect between fiscal policy and monetary policy, and denote that effect as $\frac{dm}{dg}$ under fiscal policy and $\frac{dg}{dm}$ under monetary policy. We further assume that this effect is positive if fiscal policy and monetary policy are accommodating (the two policies take the same direction) to each other, negative if they are opposing (the two policies take opposite directions) to each other and zero if they are independent.

Fiscal Policy

$$dy = C_y dy + I_i di + dg$$

$$dm - dp = L_y dy + L_i di$$

$$dD = D_y dy + D_i di$$

$$dy = f_p dp$$

Case one: Fiscal policy and Monetary Policy are independent, $\frac{dm}{dg} = 0$.

$$dp = \frac{1}{f_p} dy$$

$$\frac{1}{f_p} dy + L_y dy + L_i di = 0$$

$$di = \frac{1}{I_i} (1 - C_y) dy - \frac{1}{I_i} dg$$

$$\frac{1}{f_p} dy + L_y dy + \frac{L_i}{I_i} (1 - C_y) dy - \frac{L_i}{I_i} dg = 0$$

$$\left[\frac{1}{f_p} + L_y + \frac{L_i}{I_i} (1 - C_y) \right] dy = \frac{L_i}{I_i} dg$$

We define $\theta = \frac{1}{f_p} + L_y + \frac{L_i}{I_i} (1 - C_y) > 0$, then

$$\frac{dy}{dg} = \frac{L_i}{I_i \theta} > 0$$

Fiscal expansion induces increases in the income. The degree of the income increase is determined by the terms in θ and the ratio of interest elasticity of money demand to interest elasticity of investment, the higher is this ratio the higher the degree of income increase induced by fiscal expansion. From now on, we denote the ratio, $\frac{L_i}{I_i}$ as ρ . Thus, the impact of fiscal expansion on the output is positive but less one,

$$\frac{dy}{dg} = \frac{\rho}{\theta} \leq 1 \Leftrightarrow \rho \leq \theta$$

$$\frac{dp}{dg} = \frac{\rho}{fp\theta} > 0.$$

Fiscal expansion increases the price level. The higher the ratio ρ the higher the degree of price increase induced by the fiscal expansion.

$$\frac{di}{dg} = \frac{1}{I_i} \left[(1 - C_y) \frac{\rho}{\theta} - 1 \right] > 0$$

The term $(1 - C_y) \frac{\rho}{\theta} < 1$. This holds since $(1 - C_y)\rho < \theta$, where $0 < C_y < 1$ is assumed.

Thus, fiscal expansion increases the nominal interest rate, i , leading to a crowding out effect.

$$\frac{dD}{dg} = D_y \left[\frac{\rho}{\theta} \right] + \frac{D_i}{I_i} \left[(1 - C_y) \frac{\rho}{\theta} - 1 \right] \leq 0.$$

The first term on the right hand side is positive; while the last term on the right hand side is negative, the terms can be viewed as income effect and interest effect induced by fiscal expansion respectively. If the income effect of the fiscal expansion is higher than the interest effect of the fiscal expansion on the private demand for the credit, then the fiscal expansion increases the demand for credit; otherwise, the fiscal expansion will have negative impact on the private demand for the credit. We believe, the fiscal expansion will have negative impact on the demand for credit due to increased nominal interest rate that follows the fiscal expansion. Thus, the fall of private demand for credit will correspond to crowding out effect on the private investments, as government deficit displaces the private deficit agents.

Case Two: Fiscal Policy with Accommodating Monetary Policy, $\frac{dm}{dg} > 0$, or Opposing Monetary Policy, $\frac{dm}{dg} < 0$.

$$\left[\frac{1}{fp} + L_y + \frac{L_i}{I_i} (1 - C_y) \right] dy = \frac{L_i}{I_i} dg + dm$$

$$\theta = \frac{1}{fp} + L_y + \rho(1 - C_y) > 0$$

then,

$\frac{dy}{dg} = \frac{1}{\theta} \left[\rho + \frac{dm}{dg} \right] > 0$: with $\frac{dm}{dg} > 0$, the impact of the fiscal expansion on the output becomes amplified. The impact of the fiscal expansion will be curtailed when the monetary

policy is opposing $\frac{dm}{dg} < 0$.

$$\frac{di}{dg} = \frac{1}{I_i} \left[(1 - C_y) \left[\frac{\rho}{\theta} + \frac{1}{\theta} \frac{dm}{dg} \right] - 1 \right] \leq 0.$$

Accommodating monetary policy with fiscal expansion are likely to reduce the interest rate.

Now the term $(1 - C_y) \left[\frac{\rho}{\theta} + \frac{1}{\theta} \frac{dm}{dg} \right]$ could be greater than one due to the presence of the term $\frac{1}{\theta} \frac{dm}{dg}$. That is, if $\left[\frac{\rho}{\theta} + \frac{1}{\theta} \frac{dm}{dg} \right]$ is large, there is a possibility for the fiscal policy with

accommodating monetary policy to induce some fall in the interest rate; otherwise the interest rate will still rise. More precisely, with accommodating monetary policy, the impact of fiscal expansion on the interest rate is given by this relationship,

$$\frac{di}{dg} \leq 0 \Leftrightarrow \frac{dm}{dg} \geq \frac{1}{1 - C_y} \left[\frac{1}{fp} + Ly \right].$$

With opposing monetary policy, $\frac{dm}{dg} < 0$, the fiscal expansion will always result in an increased interest rate and higher than that prevailing in case one.

$$\frac{di}{dg} = \frac{1}{I_i} \left[(1 - C_y) \left[\frac{\rho}{\theta} + \frac{1}{\theta} \frac{dm}{dg} \right] - 1 \right] > 0 \quad \left(\frac{dm}{dg} < 0 \right)$$

Accommodating monetary policy amplifies the impact of the fiscal expansion on the price level; while opposing monetary policy curtails the impact of fiscal expansion on the price level.

$$\frac{dp}{dg} = \frac{1}{fp\theta} \left[\rho + \frac{dm}{dg} \right] > 0.$$

The fiscal expansion with accommodating monetary policy tends to increase the private demand for bank credit, and it tends to reduce it with opposing monetary policy.

$$\frac{dD}{dg} = \frac{Dy}{\theta} \left[\rho + \frac{dm}{dg} \right] + \frac{D_i}{I_i} \left[(1 - C_y) \frac{1}{\theta} \left[\rho + \frac{dm}{dg} \right] - 1 \right] \leq 0.$$

If the monetary policy accommodates the fiscal expansion to the extent that the interest rate falls, then the private demand for credit will increase. The private investment will be attracted by the nominal interest rate fall. Otherwise, if the accommodation of monetary policy fails to reduce the nominal interest rate, the private demand for credit will fall.

Opposing monetary policy can more than reverse or neutralize the effects of fiscal expansion

on both the output and the price level if and only if, $\frac{dm}{dg} < -\rho$, or $\frac{dm}{dg} = -\rho$ respectively.

Thus, it is very important for the policy makers to know the value of the rho, because monetary tightening during fiscal expansion can cause the price deflation and the output fall. But, what is known is that ρ is often greater than one (in particular if $|L_i| \rightarrow \infty$,and $|I_i| \rightarrow 0$) and this minimizes the probability that a monetary opposition can offset or reverse totally the effects of a fiscal policy; while, as we will find later under monetary policy, small fiscal opposition can reverse totally the effects of monetary policy.

Monetary Policy

$$dy = C_y dy + I_i di + dg$$

$$dm - dp = L_y dy + L_i di$$

$$dD = D_y dy + D_i di$$

$$dy = f_p dp$$

Then,

$$dp = \frac{1}{f_p} dy$$

$$\frac{1}{f_p} dy + L_y dy + L_i di = dm$$

$$di = \frac{1}{I_i} (1 - C_y) dy - \frac{1}{I_i} dg$$

$$\frac{1}{f_p} dy + L_y dy + \frac{L_i}{I_i} (1 - C_y) dy - \frac{L_i}{I_i} dg = dm$$

$$\left[\frac{1}{f_p} + L_y + \frac{L_i}{I_i} (1 - C_y) \right] dy = \frac{L_i}{I_i} dg + dm$$

$$\theta = \frac{1}{f_p} + L_y + \rho(1 - C_y) > 0$$

Then,

$$\frac{dy}{dm} = \frac{1}{\theta} \left[1 + \rho \frac{dg}{dm} \right],$$

$$\frac{dp}{dm} = \frac{1}{f_p \theta} \left[1 + \rho \frac{dg}{dm} \right]$$

$$\frac{di}{dm} = \frac{1}{I_i} \left[(1 - C_y) \frac{1}{\theta} \left[1 + \rho \frac{dg}{dm} \right] - \frac{dg}{dm} \right]$$

$$\frac{dD}{dm} = \frac{D_y}{\theta} \left[1 + \rho \frac{dg}{dm} \right] + \frac{D_i}{I_i} \left[(1 - C_y) \frac{1}{\theta} \left[1 + \rho \frac{dg}{dm} \right] - \frac{dg}{dm} \right]$$

Case Three: Monetary policy and Fiscal policy are independent, $\frac{dg}{dm} = 0$.

Monetary expansion will induce an output increase, $\frac{dy}{dm} = \frac{1}{\theta} > 0$ assuming that rho does not go to infinity. In comparison to case one, the impact of fiscal expansion on the output is higher than that of the monetary expansion, if and only if rho, the ratio of interest elasticity of money demand to interest elasticity of investment demand, is greater than one. That is, in comparison to case one,

$$\frac{dy}{dg} = \frac{\rho}{\theta} > \frac{dy}{dm} = \frac{1}{\theta} \Leftrightarrow \rho > 1$$

Similarly, monetary expansion increases price level, $\frac{dp}{dm} = \frac{1}{fp\theta} > 0$ but less than that generated by the fiscal expansion in case one, $\frac{dp}{dg} = \frac{\rho}{fp\theta}$, if the condition $\rho > 1$ holds. On the other hand, the effects of monetary expansion on both the output and the price level will be greater than that of the fiscal expansion if the condition $\rho > 1$ does not hold.

The monetary expansion reduces the interest rate, $\frac{di}{dm} = \frac{1}{I_i} (1 - C_y) \frac{1}{\theta} < 0$. Unlike the fiscal expansion, the monetary expansion induces positive results in the credit market; the credit demand increases following a monetary expansion, $\frac{dD}{dm} = D_y \frac{1}{\theta} + \frac{D_i}{I_i} (1 - C_y) \frac{1}{\theta} > 0$. This is due to the reduced interest rate and increased income effect on the credit market following the monetary expansion.

Case Four: Monetary expansion with accommodating fiscal policy, $\frac{dg}{dm} > 0$, or opposing fiscal policy, $\frac{dg}{dm} < 0$.

The impact of monetary expansion with accommodating fiscal policy becomes amplified on

both output and price level,

$$\frac{dy}{dm} = \frac{1}{\theta} \left[1 + \rho \frac{dg}{dm} \right] > 0,$$

$$\frac{dp}{dm} = \frac{1}{fp\theta} \left[1 + \rho \frac{dg}{dm} \right] > 0$$

In a one-to-one accommodating relation, $\frac{dg}{dm} = 1$, the maximum impact on the output becomes $\frac{dy}{dm} = \frac{1}{\theta} [1 + \rho]$. The impact of monetary expansion becomes unclear when it comes to the interest rate and the credit market. The interest rate may rise in the presence of accommodating fiscal policy; that is when fiscal policy expands following a monetary expansion, $\frac{di}{dm} = \frac{1}{I_i} \left[(1 - C_y) \frac{1}{\theta} \left[1 + \rho \frac{dg}{dm} \right] - \frac{dg}{dm} \right] > 0$

$$\text{if and only if } \frac{dg}{dm} > \frac{(1-C_y)}{\theta - \rho(1-C_y)}, \text{ or } \frac{dg}{dm} > \frac{(1-C_y)}{\frac{1}{fp} + Ly}.$$

The interest rate will fall in the presence of accommodating fiscal policy if the condition $\frac{dg}{dm} > \frac{(1-C_y)}{\theta - \rho(1-C_y)}$ does not hold. Also, if the fiscal policy contracts during the monetary expansion, the interest rate will fall,

$$\frac{di}{dm} = \frac{1}{I_i} \left[(1 - C_y) \frac{1}{\theta} \left[1 + \rho \frac{dg}{dm} \right] - \frac{dg}{dm} \right] < 0 \iff \frac{dg}{dm} < \frac{(1-C_y)}{\theta - \rho(1-C_y)}$$

This fall in the interest rate will further improve the effects of monetary expansion on the credit market and hence increases the private demand for credit.

On the other hand, with opposing fiscal policy, the positive effects of monetary expansion on the output and the price level are curtailed. These effects are directly determined,

$$\frac{dy}{dm} = \frac{1}{\theta} \left[1 + \rho \frac{dg}{dm} \right] \geq 0, \iff \frac{1}{\rho} \geq -\frac{dg}{dm}$$

$$\frac{dp}{dm} = \frac{1}{fp\theta} \left[1 + \rho \frac{dg}{dm} \right] \geq 0, \iff \frac{1}{\rho} \geq -\frac{dg}{dm}$$

An opposing fiscal policy can more than reverse the effects of a monetary expansion in a one-to-one relation, $\frac{dg}{dm} = -1$, given that the rho is greater than one. The private demand for credit will increase because fiscal contraction during the monetary expansion has further reduced the interest rate. However, if the fiscal contraction during the monetary expansion has

resulted in the reversal of the effects of the monetary expansion on the output, for example, $\frac{dy}{dm} < 0$, then the private demand for credit may fall.

$$\frac{dD}{dm} = \frac{Dy}{\theta} \left[1 + \rho \frac{dg}{dm} \right] + \frac{Di}{I_i} \left[(1 - C_y) \frac{1}{\theta} \left[1 + \rho \frac{dg}{dm} \right] - \frac{dg}{dm} \right] \geq 0.$$

In the special case where $\frac{dg}{dm} = -1$, our reduced solutions become as follows:

$$\frac{dy}{dm} = \frac{1}{\theta} [1 - \rho]$$

$$\frac{dp}{dm} = \frac{1}{fp\theta} [1 - \rho]$$

$$\frac{di}{dm} = \frac{1}{I_i} \left[(1 - C_y) \frac{1}{\theta} [1 - \rho] + 1 \right]$$

$$\frac{dD}{dm} = \frac{Dy}{\theta} [1 - \rho] + \frac{Di}{I_i} \left[(1 - C_y) \frac{1}{\theta} [1 - \rho] + 1 \right]$$

Assume that $1 - \rho < 0$, (i.e. $\rho = \frac{L_i}{I_i} > 1$) then the impacts of the monetary expansion become ineffective, the output and the price will fall, the interest rate and the credit demand may fall too. Whereas, if we assume that $1 - \rho = 0$, the monetary expansion will have zero effects on the output and the price, while its effects on the interest rate and the private demand for credit will be reduced to the following:

$$\frac{di}{dm} = \frac{1}{I_i} < 0$$

$$\frac{dD}{dm} = \frac{Di}{I_i} > 0$$

Thus, the policy makers should determine the interaction of monetary policy and fiscal policy, particularly if the two policies are opposing to each other. This happens often when the two policies pursue different objectives at a given time period. To minimize the adverse effects of the opposing fiscal policy, the monetary authorities should make sure that $\frac{1}{\rho} > -\frac{dg}{dm}$, and the adverse effects of opposing monetary policy is reduced if the condition $\frac{dg}{dm} > \frac{(1-C_y)}{\theta-\rho(1-C_y)}$ holds for the cases of the interest rate the private demand for credit, or $\rho > -\frac{dm}{dg}$ holds for the

cases of the output and the price level.

4.4.2 Imperfect Credit Market

$$D = D(\overset{+}{Y} , \bar{r} , \bar{i})$$

$$S = S(\overset{+}{Y} , \bar{r} , \overset{+}{i})$$

$$r = r(\bar{Y} , \overset{+}{P})$$

r is the transaction cost that falls with increased level of income, profit, asset value, collateral value and development level of the economy. We assume all these factors to be captured by Y . While, we reduce factors such as information uncertainty, country risk, red tape, bribes, side charges, travel expenses to and fro finance centers and searching and monitoring costs into P , price. Price in economics, is the summary of market information. Stable prices reduce the transaction costs for both the borrower and the lender; while unstable prices increase the transaction costs.

If the banker is able to totally transfer all the transaction costs to the borrower, the credit supply will not be affected by r . r will drop from the credit supply function, $S = S(Y, i)$, and the banker's decision on how much credit to supply will be influenced by only the income and the nominal interest rate or time value of money. Nevertheless, we will not drop the transaction cost from the credit supply, we derive the reduced solutions and then in the analysis we extract the consequences of dropping the transaction cost from the lender's side.

Under imperfect credit market, we have, in addition to fiscal policy and monetary policy, a credit policy of the bankers. This is because a fiscal policy that affects transaction costs, interest rate, price level and income level is bound to influence the decision of the bankers on how much credit to supply. Likewise, a monetary policy that affects the interest rate, transaction costs, the price level and the income is bound to affect the credit supply decision.

On the other hand, according to Schumpeter (1934) and Cameron et al (1967), a banker that searches for entrepreneurs, organizes them and supplies credit lines to them, has a capacity to influence the economic activity, transaction costs and prices. This leads us to analyze the situation where bank credit becomes exogenous opposite to the view that banks follow the economic development and cannot initiate it. In analyzing the credit policy we include the position of the monetary policy that is an essential component of our monetary circular flow in the opening section of this chapter. That is, monetary policy can be accommodating to the

banks' credit supply or opposing to it. Thus, in this section, we have three policies, fiscal, monetary and creditary policies. The interaction between the fiscal policy and the monetary policy is as before, while we further assume here that monetary policy interacts with the creditary policy. We first assume that credit supply, S , is an endogenous variable, depending on income, transaction costs and interest rate, but that there is, unlike the money market, no equilibrium on the credit market. Thereafter, we assume that S is exogenous, which directly influences the private sector investments (see subsection 4.4.3).

Fiscal Policy

$$Y = C(Y) + I(i) + G$$

$$\frac{M}{P} = L(Y, i)$$

$$D = D(Y, r, i)$$

$$S = S(Y, r, i)$$

$$r = r(Y, P)$$

$$Y = f(P)$$

Taking the total differentiation of the model:

$$dy = C_y dy + I_i di + dg$$

$$dm - dp = L_y dy + L_i di$$

$$dD = D_y dy + D_r dr + D_i di$$

$$dS = S_y dy + S_r dr + S_i di$$

$$dr = r_y dy + r_p dp$$

$$dy = f_p dp$$

Then,

$$dp = \frac{1}{f_p} dy$$

$$\frac{1}{fp} dy + L_y dy + L_i di = dm$$

$$di = \frac{1}{I_i} (1 - C_y) dy - \frac{1}{I_i} dg$$

$$\frac{1}{fp} dy + L_y dy + \frac{L_i}{I_i} (1 - C_y) dy - \frac{L_i}{I_i} dg = dm$$

$$\left[\frac{1}{fp} + L_y + \frac{L_i}{I_i} (1 - C_y) \right] dy = \frac{L_i}{I_i} dg + dm$$

$$\theta = \frac{1}{fp} + L_y + \rho(1 - C_y) > 0$$

Then, as before

$$\frac{dy}{dg} = \frac{1}{\theta} \left[\rho + \frac{dm}{dg} \right]$$

$$\frac{dp}{dg} = \frac{1}{fp\theta} \left[\rho + \frac{dm}{dg} \right]$$

$$\frac{di}{dg} = \frac{1}{I_i} \left[(1 - C_y) \frac{1}{\theta} \left[\rho + \frac{dm}{dg} \right] - 1 \right]$$

and therefore,

$$\frac{dr}{dg} = \frac{ry}{\theta} \left[\rho + \frac{dm}{dg} \right] + \frac{rp}{fp\theta} \left[\rho + \frac{dm}{dg} \right] = \frac{1}{\theta} \left[\rho + \frac{dm}{dg} \right] \left[ry + \frac{rp}{fp} \right]$$

$$\begin{aligned} \frac{dS}{dg} &= \frac{S_y}{\theta} \left[\rho + \frac{dm}{dg} \right] + \frac{S_r}{\theta} \left[\rho + \frac{dm}{dg} \right] \left[ry + \frac{rp}{fp} \right] + \frac{S_i}{I_i} \left[(1 - C_y) \frac{1}{\theta} \left[\rho + \frac{dm}{dg} \right] - 1 \right] \\ &= \frac{1}{\theta} \left[\rho + \frac{dm}{dg} \right] \left[S_y + S_r ry + \frac{S_r rp}{fp} + \frac{S_i}{I_i} (1 - C_y) \right] - \frac{S_i}{I_i} \end{aligned}$$

$$\begin{aligned} \frac{dD}{dg} &= \frac{D_y}{\theta} \left[\rho + \frac{dm}{dg} \right] + \frac{D_r}{\theta} \left[\rho + \frac{dm}{dg} \right] \left[ry + \frac{rp}{fp} \right] + \frac{D_i}{I_i} \left[(1 - C_y) \frac{1}{\theta} \left[\rho + \frac{dm}{dg} \right] - 1 \right] \\ &= \frac{1}{\theta} \left[\rho + \frac{dm}{dg} \right] \left[D_y + D_r ry + \frac{D_r rp}{fp} + \frac{D_i}{I_i} (1 - C_y) \right] - \frac{D_i}{I_i} \end{aligned}$$

Case Five: Fiscal policy and Monetary policy are independent, $\frac{dm}{dg} = 0$

Fiscal expansion increases output and price level as in case one,

$$\frac{dy}{dg} = \frac{\rho}{\theta} > 0$$

$$\frac{dp}{dg} = \frac{\rho}{fp\theta} > 0$$

It also increases the interest rate

$$\frac{di}{dg} = \frac{1}{I_i} \left[(1 - C_y) \frac{\rho}{\theta} - 1 \right] > 0$$

Also the fiscal expansion may reduce the transaction costs due to the increased impact the fiscal expansion has on the output,

$$\frac{dr}{dg} = \frac{\rho}{\theta} \left[r_y + \frac{rp}{fp} \right]$$

If $|r_y| > \left| \frac{rp}{fp} \right|$, fiscal expansion will lead to reduced transaction costs. This is possible if the increase in the output induced by the fiscal policy has resulted in reduced transaction costs dramatically. That could be a situation where the transaction costs are highly sensitive to the income changes and less sensitive to the price changes, so that the net result of the fiscal expansion on the output and the price level will produce a reduced transaction cost. Similarly, the impact of fiscal expansion on the credit supply is not directly identifiable,

$$\frac{dS}{dg} = \frac{\rho}{\theta} \left[S_y + S_r r_y + \frac{S_r r p}{fp} + \frac{S_i}{I_i} (1 - C_y) \right] - \frac{S_i}{I_i}$$

The impact depends on the transaction costs and the nominal interest rate. If the credit supply is highly sensitive to transaction costs and insensitive to the nominal interest rate, then the increased fiscal policy that induces increased transaction costs will cause the credit supply to fall. The credit supplied may rise if the credit supply is interest elastic and the transaction costs fall following the fiscal expansion.

Similarly, the fiscal expansion that increases both interest rate and transaction costs can cause the credit demand to fall,

$$\frac{dD}{dg} = \frac{\rho}{\theta} \left[D_y + D_r r_y + \frac{D_r r p}{fp} + \frac{D_i}{I_i} (1 - C_y) \right] - \frac{D_i}{I_i}, \quad [D_y > 0, dD > 0, \text{ in isolation}]$$

The private demand for credit may rise if the transaction costs fall following the fiscal expansion, and that has been able to more than offset the interest rate effects on the private demand for credit.

Case Six: Fiscal expansion with accommodating Monetary Policy, $\frac{dm}{dg} > 0$, or opposing Monetary Policy, $\frac{dm}{dg} < 0$,

Accommodating monetary policy will amplify the effects of fiscal expansion on all the quantities. While, opposing monetary policy will curtail the impacts of the fiscal expansion on the output and the price level. Opposing monetary policy will also cause the interest rate to go further up than the isolated impact of fiscal policy. This increased interest rate can cause the private demand for credit to fall, while the credit supply may rise. If $\rho < -\frac{dm}{dg}$ holds, then monetary tightening will reverse the positive effects of the fiscal expansion on the output and the price level; while its adverse impacts on the credit market variables will be worsened further.

Monetary Policy

$$Y = C(Y) + I(i) + G$$

$$\frac{M}{P} = L(Y, i)$$

$$D = D(Y, r, i)$$

$$S = S(Y, r, i)$$

$$r = r(Y, P)$$

$$Y = f(P)$$

Taking the total differentiation of the model:

$$dy = C_y dy + I_i di + dg$$

$$dm - dp = L_y dy + L_i di$$

$$dD = D_y dy + D_r dr + D_i di$$

$$dS = S_y dy + S_r dr + S_i di$$

$$dr = r_y dy + r_p dp$$

$$dy = f_p dp$$

Then,

$$dp = \frac{1}{f_p} dy$$

$$\frac{1}{f_p} dy + L_y dy + L_i di = dm$$

$$di = \frac{1}{I_i} (1 - C_y) dy - \frac{1}{I_i} dg$$

$$\frac{1}{f_p} dy + L_y dy + \frac{L_i}{I_i} (1 - C_y) dy - \frac{L_i}{I_i} dg = dm$$

$$\left[\frac{1}{f_p} + L_y + \frac{L_i}{I_i} (1 - C_y) \right] dy = \frac{L_i}{I_i} dg + dm$$

$$\theta = \frac{1}{f_p} + L_y + \rho(1 - C_y) > 0$$

Then, as before,

$$\frac{dy}{dm} = \frac{1}{\theta} \left[1 + \rho \frac{dg}{dm} \right]$$

$$\frac{dp}{dm} = \frac{1}{f_p \theta} \left[1 + \rho \frac{dg}{dm} \right]$$

$$\frac{di}{dm} = \frac{1}{I_i} \left[(1 - C_y) \frac{1}{\theta} \left[1 + \rho \frac{dg}{dm} \right] - \frac{dg}{dm} \right]$$

and therefore,

$$\frac{dr}{dm} = \frac{r_y}{\theta} \left[1 + \rho \frac{dg}{dm} \right] + \frac{r_p}{f_p \theta} \left[1 + \rho \frac{dg}{dm} \right] = \frac{1}{\theta} \left[1 + \rho \frac{dg}{dm} \right] \left[r_y + \frac{r_p}{f_p} \right]$$

$$\begin{aligned} \frac{dS}{dm} &= \frac{S_y}{\theta} \left[1 + \rho \frac{dg}{dm} \right] + \frac{S_r}{\theta} \left[1 + \rho \frac{dg}{dm} \right] \left[r_y + \frac{r_p}{f_p} \right] \\ &\quad + \frac{S_i}{I_i} \left[(1 - C_y) \frac{1}{\theta} \left[1 + \rho \frac{dg}{dm} \right] - \frac{dg}{dm} \right] \\ &= \frac{1}{\theta} \left[1 + \rho \frac{dg}{dm} \right] \left[S_y + S_r r_y + \frac{S_r r_p}{f_p} + \frac{S_i}{I_i} (1 - C_y) \right] - \frac{S_i}{I_i} \frac{dg}{dm} \end{aligned}$$

$$\frac{dD}{dm} = \frac{D_y}{\theta} \left[1 + \rho \frac{dg}{dm} \right] + \frac{D_r}{\theta} \left[1 + \rho \frac{dg}{dm} \right] \left[r_y + \frac{r_p}{f_p} \right]$$

$$\begin{aligned}
 & + \frac{D_i}{I_i} \left[(1 - C_y) \frac{1}{\theta} \left[1 + \rho \frac{dg}{dm} \right] - \frac{dg}{dm} \right] \\
 & = \frac{1}{\theta} \left[1 + \rho \frac{dg}{dm} \right] \left[D_y + D_{rry} + \frac{D_{rrp}}{f_p} + \frac{D_i}{I_i} (1 - C_y) \right] - \frac{D_i}{I_i} \frac{dg}{dm}
 \end{aligned}$$

Case Seven: Monetary Policy and Fiscal Policy are independent, $\frac{dg}{dm} = 0$.

$$\frac{dy}{dm} = \frac{1}{\theta} > 0$$

$$\frac{di}{dm} = \frac{1}{I_i \theta} (1 - C_y) < 0$$

$$\frac{dp}{dm} = \frac{1}{f_p \theta} > 0$$

The impacts of monetary expansion on the output, the nominal interest rate and the price level do not differ from its impacts on the same variables under case one, where the credit market is perfect and fiscal and monetary policies are independent.

$$\frac{dr}{dm} = \frac{1}{\theta} \left[r_y + \frac{r_p}{f_p} \right]$$

If $\left[r_y + \frac{r_p}{f_p} \right] < 0$, the monetary expansion will reduce the transaction costs; otherwise, the monetary expansion will increase the transaction costs.

$$\frac{dD}{dm} = \frac{1}{\theta} \left[D_y + D_{rry} + \frac{D_{rrp}}{f_p} + \frac{D_i}{I_i} (1 - C_y) \right]$$

The monetary expansion that reduces the transaction costs, and the nominal interest rate, will increase the private demand for credit. Only the term $\frac{D_{rrp}}{f_p}$ is a negative value inside the bracket, the rest are positive, this makes us believe that credit demand will increase following a monetary expansion. But increased prices that follow monetary expansion can distort the information content of the price level, and as a result the transaction costs may rise leading to reduced credit demand. Similarly, monetary expansion may or may not increase credit supply,

$$\frac{dS}{dm} = \frac{1}{\theta} \left[S_y + S_{rry} + \frac{S_{rrp}}{f_p} + \frac{S_i}{I_i} (1 - C_y) \right]$$

Inside the brackets above, two terms are positive, S_y and S_{rry} , and the other two terms are negative, $\frac{S_{rrp}}{f_P}$ and $\frac{S_i}{I_i}(1 - C_y)$, the net sum of these four terms determine whether or not the monetary expansion increases the credit supply. Monetary policy, like the fiscal policy, has no directly identifiable effects on the credit market variables.

Will the situation change if the fiscal policy is accommodating or opposing? With accommodating fiscal policy, the positive impacts of monetary expansion are amplified, like the impacts on the output and price level, and the negative impacts are worsened, like the impacts on the interest rate; while the ambiguity of its impacts on transaction costs, credit demand and credit supply will still remain. On the other hand, with opposing fiscal policy, monetary expansion impacts are curtailed, and if $\frac{1}{\rho} < -\frac{dg}{dm}$ holds, the opposing fiscal policy will reverse the impacts of the monetary expansion.

From the analysis so far, it is clear that both fiscal and monetary policies have no meaningful effect on the credit market variables. The situation becomes worse when the credit market is imperfect. The monetary expansion tends to increase the credit demand and decrease the credit supply; while the fiscal expansion tends to reduce the credit demand and increase credit supply. This ambiguous results tend to support the Schumpeter's view that bank's credit is an exogenous variable that explains other variables such as private investment and consequently the economic activity. Thus, a monetary policy or fiscal policy may not induce a bank credit supply.

Banker's Credit

Looking at our monetary production circular flow at the opening section of this chapter, we see that actually it is not how much money the central bank releases in the economy, but how much of that money has been converted by the banks into credit, that matters to the economy. Thus, the investments (I) in the economy is not only reducedly determined by the nominal interest rate but also by the bank credit, $I = I(i, S)$, where S = bank credit. In this section, following the Schumpeter's circular flow, we investigate the credit impacts on the output, the price level, the nominal interest rate, the transaction costs and the credit demand. Here we treat the bank credit as an exogenous policy variable, its value is determined outside the model. In the next

section, we treat it both as a policy variable, and an endogenous variable the value of which can be determined within the model. We also assume that $dg = 0$, and it is the monetary policy that reacts to the creditary policy, and hence $\frac{dm}{ds} \neq 0$. The model thus looks as follows:

$$Y = C(Y) + I(i, S) + G \quad (S \text{ is now exogenous})$$

$$\frac{M}{P} = L(Y, i)$$

$$D = D(Y, r, i)$$

$$r = r(Y, P)$$

$$Y = f(P)$$

Total differentiation of the model,

$$dy = C_y dy + I_i di + I_s ds + dg$$

$$dm - dp = L_y dy + L_i di$$

$$dD = D_y dy + D_r dr + D_i di$$

$$dr = r_y dr + r_p dp$$

$$dy = f_p dp, \quad dp = \frac{1}{f_p} dy$$

$$(1 - C_y) dy = I_i di + I_s ds$$

$$di = \frac{1}{I_i} (1 - C_y) dy - \frac{I_s}{I_i} ds \quad (\text{now } dg = 0)$$

$$\frac{1}{f_p} dy + L_y dy + \frac{L_i}{I_i} (1 - C_y) dy - \frac{L_i I_s}{I_i} ds = dm$$

$$\left[\frac{1}{f_p} + L_y + \frac{L_i}{I_i} (1 - C_y) \right] dy = \frac{L_i I_s}{I_i} ds + dm$$

$$\theta = \frac{1}{f_p} + L_y + \rho(1 - C_y) > 0$$

Then

$$\frac{dy}{ds} = \frac{1}{\theta} \left[\rho I_s + \frac{dm}{ds} \right]$$

$$\frac{dp}{dS} = \frac{1}{fp\theta} \left[\rho I_s + \frac{dm}{dS} \right]$$

and therefore,

$$\begin{aligned} \frac{dr}{dS} &= \frac{r_y}{\theta} \left[\rho I_s + \frac{dm}{dS} \right] + \frac{r_p}{fp\theta} \left[\rho I_s + \frac{dm}{dS} \right] = \frac{1}{\theta} \left[\rho I_s + \frac{dm}{dS} \right] \left[r_y + \frac{r_p}{fp} \right] \\ \frac{di}{dS} &= \frac{1}{I_i} (1 - C_y) \frac{1}{\theta} \left[\rho I_s + \frac{dm}{dS} \right] - \frac{I_s}{I_i} = \frac{1}{I_i} \left[(1 - C_y) \frac{1}{\theta} \left[\rho I_s + \frac{dm}{dS} \right] - I_s \right] \\ \frac{dD}{dS} &= \frac{D_y}{\theta} \left[\rho I_s + \frac{dm}{dS} \right] + \frac{D_r}{\theta} \left[\rho I_s + \frac{dm}{dS} \right] \left[r_y + \frac{r_p}{fp} \right] \\ &\quad + \frac{D_i}{I_i} \left[(1 - C_y) \frac{1}{\theta} \left[\rho I_s + \frac{dm}{dS} \right] - I_s \right] \\ &= \frac{1}{\theta} \left[\rho I_s + \frac{dm}{dS} \right] \left[D_y + D_r r_y + \frac{D_r r_p}{fp} + \frac{D_i (1 - C_y)}{I_i} \right] - \frac{D_i}{I_i} I_s \end{aligned}$$

Case Eight: Credit Policy and Monetary Policy are independent, $\frac{dm}{dS} = 0$

$$\frac{dy}{dS} = \frac{\rho I_s}{\theta} > 0$$

The credit expansion has a positive impact on the output; and this impact is channeled through the investments financed by the banks.

$$\frac{dp}{dS} = \frac{\rho I_s}{fp\theta} > 0$$

The price level rises as the banks expand credits. This is a natural phenomenon, the creditors will be able to give increasingly more credits if those taking the credits to finance their investments expect to receive higher prices for their output. This point will be clear when we find that expansionary credit will generally increase demand for credit,

$$\frac{dD}{dS} = \frac{\rho I_s}{\theta} \left[D_y + D_r r_y + \frac{D_r r_p}{fp} + \frac{D_i (1 - C_y)}{I_i} \right] - \frac{D_i}{I_i} I_s > 0, \text{ if } \frac{D_i}{I_i} I_s \text{ is sufficiently small.}$$

Expansionary credit policy increases the private demand for credit. If the bankers become entrepreneurs, or promote entrepreneurs, the demand for bank credit will increase. This will be due to increased information flow about the bank credit that results from reduced transaction

costs particularly on the part of the borrowers.

$$\frac{dr}{dS} = \frac{\rho I_s}{\theta} \left[r_y + \frac{r_p}{f_p} \right] \leq 0 \Leftrightarrow \left[r_y + \frac{r_p}{f_p} \right] \leq 0$$

The credit impact on the transaction costs is indirect, it comes from its impact on the output and the price level. It also depends on the sensitivity of the transaction costs to the output and to the price level. Thus, we have to know the magnitudes by which the output and the price level change given a certain magnitude change in the credit supply and know too the sensitivity of the transaction costs to both the output and the price level for us to precisely determine the value of $\frac{dr}{dS}$. We resolve this problem in the next section by making an assumption, and later test the assumption empirically in chapter six. However, we can see today that a banking system that eliminates minimum balance requirements, or that sends out letters and information bulletins to their customers and the general public about credit facilities available in the banking system creates more demand for bank credit than a banking system that does not do that. As banks take the initiative to create demand and then take measures to meet that demand, they, in the process, maximize the information flow and minimize the transaction costs; as a result, allocative efficiency of the credit increases and the credit market works towards perfection. But increased credit supply does not imply falling interest rates. In fact, the interest rate will rise following the creditary expansion. Thus, banks move along their supply curve of credit and increase the supply resulting in an increased interest rate.

$$\frac{di}{dS} = \frac{I_s}{I_i} \left[(1 - C_y) \frac{\rho}{\theta} - 1 \right] > 0$$

Case Nine: Credit Policy and Monetary Policy are accommodating, $\frac{dm}{dS} > 0$ or opposing $\frac{dm}{dS} < 0$

If the monetary authorities respond positively to the banker's initiative by easing the money towards the banker's credit expansion, $\frac{dm}{dS} > 0$, the impacts of the credit expansion will be amplified; while opposing monetary policy will curtail the impacts of the credit expansion. It is analogous to the case of fiscal policy with accommodating or opposing monetary policy. The opposing monetary policy reduces the effects of creditary expansion on the output and the price level,

$$\frac{dy}{dS} = \frac{1}{\theta} \left[\rho I_s + \frac{dm}{dS} \right] \quad \left(\frac{dm}{dS} < 0 \right)$$

$$\frac{dp}{dS} = \frac{1}{f\rho\theta} \left[\rho I_s + \frac{dm}{dS} \right] \quad \left(\frac{dm}{dS} < 0 \right)$$

The opposing monetary policy will reverse the effects of the creditary expansion only if $|\rho I_s| < \left| \frac{dm}{dS} \right|$. The interest rate will further go up, and the private demand for credit may fall. Also the opposing monetary policy reduces the effects of the credit supply on the transaction costs. If the effects of the creditary expansion on the output are reversed by the opposing monetary policy, then the transaction costs will go up; the interest rate will still rise, while the private demand for credit will definitely fall. Unlike the monetary policy, the credit policy will still have a meaningful impact on the output even if the rho goes to infinity, ($\rho \rightarrow \infty$), its impact on the output will be reduced to ,

$$\frac{dy}{dS} = \frac{I_s}{(1-C_y)}$$

Thus significance of the credit policy depends on the relationship between the credit quantity and the private investment. If the private investment does significantly reacts to the credit quantity, then the credit policy will have significant effects on the economic activities. The next section explores this point further by invoking a neo-keynesian analogy for the modelling of credit constraint.

4.4.3 Imperfect Credit Market, Money and Credit are Interlinked

In this section, we introduce changes to our money demand function and the credit supply function in an attempt to explore the interaction of money and credit in our model. The transaction costs function and aggregate supply function remain as before, while we maintain our investment to be a function of both nominal interest rate and bank credit. We analyze the balance sheets of the economy and construct the policy relation that connect money supply, base money and the banks' credit supply. An analogy to the Neo-Keynesian theory is used to explain the modelling of credit constraint.

The Balance Sheets in the Closed Economy

Following Korteweg and Van Loo (1977, pp. 7 - 9), we present all the balance sheets in our economy. From the balance sheet identities, we derive the relationship between money and credit and their relation to the base money.

Government

Deposits with the central bank	S^{cd}	Advances from the Central Bank	S^{cl}
Deposits with the banking system	S^{bd}	Advances from the banking system	S^{bl}
		Loans from the non-bank public	S^p
		Net worth	W^g

The identity of this balance sheet is $S^{cd} + S^{bd} = S^{cl} + S^{bl} + S^p + W^g$

Total debt of the Government is $S^{cl} + S^{bl} + S^p$, and its total deposits are $S^{cd} + S^{bd}$; the net debt of the government is thus, $(S^{cl} + S^{bl} + S^p) - (S^{cd} + S^{bd}) = S^t$. Adding the net debt to the net worth of the government, as it can be seen from the balance sheet, gives us zero: $S^t + W^g = 0$, or $S^t = -W^g$. We explain the government behaviour later.

Central Bank

Net government deposits	S^{cb}	Currency outside the banking system	C
Advances to the banking system	RL	Banking system Reserves	R

The balance sheet identity: $S^{cb} + RL = C + R$

The liabilities of the central bank constitute the base money in the economy. It is the currency outside the banking system plus the reserves of the banking system. Thus, $B = C + R$. or $S^{cb} + RL = B$

It means the monetary base is used to finance the net government deposits with central bank and the central bank's advances to the banking system. We can write this as,

$S^{cb} = \gamma B$, where γ is the proportion of the base money funding the net government deposits with the central bank, and

$RL = (1 - \gamma)B$, $(1 - \gamma)$, is the balance funding the central bank advances to the banking system.

It is the legal money or the high powered money. It has direct link with the government finance. If the government revenues and expenditures are balanced, the net change of the monetary base will be zero. For example, when the government makes purchases and issues a cheque, if the holder of the cheque deposits it in the bank, the reserve of the bank increases by the amount of the cheque; and if in return the government levies a tax in the amount of the cheque previously issued, the payer of the tax will withdraw from the banking system the equivalent amount of the cheque and the reserve of the bank will subsequently fall by the amount of the cheque, and net change in the monetary base will be zero. That is, the government has withdrawn from the economy exactly the amount of money it has issued for the purchases, what has taken place is that some amount of goods and services has changed hands from the public to the government. On the other hand, if the government purchases (issues) are higher than its receipts, there will be a net increase in the monetary base. If the holder of the cheque (assuming now the cheque issues are higher than the cheque receipts of the government) chooses to hold cash, the currency holdings will increase by the amount of the cheque. If he instead deposits it in the bank, the reserve of the bank will increase by the amount of the cheque; and the banking system will end up with excess reserve unless the central bank cooperates with the government and increases the reserve requirements of the banking system by the equivalent amount of the government cheque issue, or the banking system offers the excess reserves in the money market and buys the central bank securities or the government securities. Also, if it coincides with the situation when the banking system needs reserves to increase its loans to the private sector, it can then offer the excess reserve as loans to the private sector. But due to the problem of information, the banking system may not offer excess reserves completely to the private sector as the government continues running deficits, the banking system will give back the excess reserves to those who cause it, the central bank and the government.

Banking System

Bank Reserves	R	Demand Deposits	D
Net government deposits	S^b	Time and saving deposits	T
Loans to the private sector	L	Advances from the central bank	RL

The identity: $R + S^b + L = D + T + RL$

Or , $S^b + L = D + T + RL - R$: The banking system's earning assets, which here are loans to the private sector and loans to the government, are funded by demand deposits, time and savings deposits and advances from the central bank less the reserves. The earning assets, denoted here EA , are also the credit supply of the banking system. Thus, the bank credit supply is $EA = S^b + L = D + T + RL - R$.

From the balance sheet identity of the central bank, $RL - R = C - S^{cb}$, substituting this in the earning asset equation of the banking system we get, $EA = D + T + C - S^{cb}$.

The bank reserves R consist of required reserves the banks must hold against the demand deposits and time and savings deposits, and the excess reserves the banks wish to hold in excess of the required reserves. Thus, R is a proportion of $D + T$, which can be written as

$R = k(D + T)$, where k is proportional rate.

Non-Bank Public

Currency	C	Bank Loans	L
Demand deposits	D	wealth	WP
Time and savings Deposits	T		
Loans to the Government	SP		
capital stock	K		

The identity: $C + D + T + SP + K = L + WP$, the assets of the private sector is funded by loans from the banks and the own wealth. The private sector holds its assets partly as money (final means of payment) and partly as investments in capital stock, loans to the government and time and savings deposits. Money as final means of payment gives us the narrow definition of money. From the balance sheet of the non-bank public, the only assets that can be offered as final means of payment are currency and demand deposits; and therefore,

$M = C + D$. Let $C = cM$ be the proportion of money held as currency; then $D = (1 - c)M$, (Korteweg and Van Loo, 1977, p.8).

The non-public sector investments are the time and savings deposits, the loans to the government and the capital assets. We denote these investments as I , then the balance sheet identity of the non-public sector can be written as money ($M = C + D$) plus investments ($I = T + S^P + K$) on the asset side of non-bank public, which are identical to loans plus wealth on the liabilities side of the non-bank public,

$$M + I = L + W^P,$$

Investments give a rate of return, while money does not give a rate of return. Loans from the bank have an interest obligation, and the private sector has to pay that interest obligation plus the loan principal. The entrepreneur, who takes the bank loans, cannot afford to hold the loans as money, he will rather place them in investments that will give him a rate of return at most higher than the loan interest rate. Thus, changes in the bank loans will be channelled to the investments of the entrepreneurs more likely than to his money holdings. If there is credit rationing, the entrepreneurs will take that into account when deciding how much investments to undertake not when deciding how much money to hold; thus, credit rationing will spill over to the investments not to the money market; we will come to this when discussing the Neo-Keynesian Analogy. Thus, demand for money will follow the Keynesian money demand function except that we include among prices a price of the transaction costs r , $\frac{M}{P} = L(Y, i, r)$.

On the other hand, the own wealth can be used to fund any of the assets on the balance sheet of the non-bank public, they can fund with it the loans to the government, loans to the banking system as time and savings deposits, or finance the capital acquisition or the need for money. If the need for money arises, the immediate assets that can be liquidated with the minimum costs are the time and the savings deposits, T ; and similarly, if the non-bank public has excess money, it can easily transfer the excess into time and savings deposits safely with some rate of return. This gives us the following relation:

$T = tM$, where t is the proportion of the money kept as time and savings deposits (Korteweg and Van Loo, 1977, p.8).

From the monetary base through the banking system and to non-bank public we trace the money supply process as follows:

$$B = C + R$$

substituting the value for R from the banking system, we get,

$$B = C + k(D + T)$$

Substituting the values for $C = cM$, $D = (1 - c)M$, and $T = tM$ from the non-bank public balance sheets, we get,

$$B = cM + k[(1 - c)M + tM] = [c + k(1 - c + t)]M, \text{ or Money supply is,}$$

$$M = [c + k(1 - c + t)]^{-1}B = mB, \text{ where } m = [c + k(1 - c + t)]^{-1} > 1$$

On the other hand, the credit supply process is determined from the earning assets of the banking system as follows:

$$EA = D + C + T - S^{cb}$$

$$D + C = M, \text{ and therefore,}$$

$$EA = M + T - S^{cb}$$

substituting the value for S^{cb} from the central bank balance sheet we get,

$$EA = M + T - \gamma B$$

Substituting the value for T from the non-bank public balance sheet, we get,

$$EA = M + tM - \gamma B$$

Substituting the value for M from money supply process, we get,

$$EA = mB + tmB - \gamma B = [(1 + t)m - \gamma]B = aB, \text{ where } a = [(1 + t)m - \gamma].$$

Let a be determined by the interest rate, i , the income level, Y , and the transaction costs, r . The reserve requirement also determines a , but we assume here that it is constant and hence $dk = 0$, and we can leave it out without changing the outcome of the model. Then,

$EA = a(Y, i, r)B$ or an implicit function of $EA = S = S(Y, i, r, B)$, where S denotes the bank credit supply.

The money supply process and the credit supply process produce two different multipliers (Korteweg and Van Loo 1977), which are m and a respectively. The difference occurs because some money is kept as time and savings deposits, and also because of the central bank behaviour of allocating the base money between banking system and the government. If the central bank behaviour is such that $\gamma = 1$; in other words, the central bank does not give advances and discounts to the banking system, and $t = 0$, no amount of money is transferred to

time and savings deposits, or bank intermediation does not exist, then,

$M = B + EA$, the money supply will be equal to sum of base money and the credit supply of the banking system. Here, we do not hold this view, we assume that $\gamma \neq 1$ and $t \neq 0$ and hence money supply is

$$M = \mu\gamma B + \mu EA, \text{ where } \mu = \frac{1}{(1+t)} < 1, \text{ or,}$$

$$M = \mu\gamma B + \mu S, \text{ where } S = EA = L + S^b$$

From the balance sheet analysis we have the following relations:

$$M = D + C$$

$$\frac{M}{P} = L(Y, i, r)$$

$$S = S(Y, i, r, B)$$

$$M = \mu\gamma B + \mu S$$

Neo-Keynesian Analogy

Neo-Keynesian theory assumes away the imaginary Walrasian auctioneer, who sets a vector of prices and wages and takes the resultant demands and supplies and allows no trading until equilibrium prices and wages are established. When the auctioneer is removed, the agents can start trading from the onset, as a result the agents will face constraints on their demands and supplies, because the initial demands and supplies will not match, and thus the quantities offered or ordered have to be revised to match the actual available ones. Two steps are taken to reach a state of "rest" and that is the Dual Decision hypothesis. It states that "first the agents form their plans according to the price signals, in the second step if they are confronted with quantity constraints they must revise their plans to take into account the quantity signals as well", Felderer and Homburg (1992). For example, the entrepreneur will first plan his investment according to the interest rate signals, but when faced in the second step with credit constraints, he must take that too into account. Thus, the effective investment function of the entrepreneur will depend on both the interest rate and the credit quantity analogous to the effective consumption function of the Neo-Keynesian theory when the labour faces constraint in the labour market. The labourer first forms his consumption plan according to the price signals, but when he finds out that his labour supply cannot be fully employed, he will consider

that fact into his plan because he cannot consume what he has not sold. That is, his consumption plan cannot exceed his labour sales, the effective consumption plan is that which takes into account the actual income earned from the labour sales. Similarly, if the entrepreneur's investment cannot exceed the credit supply, then there is a credit constraint, and he can only invest up to the constraint; and thus he must take that constraint into account. According to Neo-Keynesian theory, if the constrained labourer reduces his labour supply to the constraint, because the constraint is known with certainty, the constraint is not manipulable (for example, maintaining higher labour supply than the constraint increases the chances of getting employment) and there are costs associated with maintaining higher labour supply than the constraint, a Dreze-demand emerges. That is, the labourer will stop searching for employment, and his consumption plan will fall to the actual labour sales. The Dreze-demand has no signal, the labourer has to submit to the situation. On the contrary, a Clower-demand emerges when the constraint does not stop the labourer from maintaining higher labour supply than the constraint, because he does not know the constraint for certainty, he believes to get employment by being optimistic and maintaining higher labour supply than the constraint and no costs are associated with maintaining higher supply than the constraint (Felderer and Homburg, 1992, p.215 -216). We assume our entrepreneur is optimistic, he takes the credit constraint into account when planning his investment. Thus, in the goods market, the effective aggregate demand consists of effective consumption, $C(Y)$, effective investment, $I(i,S)$, and government consumption, G . But, at the same time, he maintains a credit demand higher than the constraint in the credit market. The notional credit demand of the entrepreneurs will be higher than the realized credit supply. Nevertheless, the entrepreneurs will maintain their notional demand because they do not know the credit constraints for certainty, and maintaining the notional demand gives signals to the bankers to increase the credit supply. They do not have to observe the credit constraint in the credit market, as a result the credit demand will depend on the level of the economic activity and the prices, $D = D(Y, i, r)$. The effect of the credit constraint is reflected only in the effective investment function. Thus, from the Neo-Keynesian analogy we have,

$$I = I(i, S)$$

$$D = D(Y, i, r)$$

The model is now complete as follows:

$$Y = C(Y) + I(i, S) + G : \text{effective aggregate demand}$$

$$\frac{M}{P} = L(Y, i, r) : \quad \text{money demand}$$

$$D = D(Y, i, r) : \quad \text{notional credit demand}$$

$$S = S(Y, i, r, B) : \quad \text{Credit supply, which is equal to the constraint}$$

$$r = r(Y, P) : \quad \text{transactions costs}$$

$M = \mu\gamma B + \mu S$: Policy variables (M and B are exogenous, and S could also be viewed as exogenous)

$$Y = f(p) : \quad \text{Aggregate output}$$

Taking the total differentiation of the model we get,

$$dy = C_y dy + I_i di + I_s dS + dg \quad (1)$$

$$dm - dp = L_y dy + L_i di + L_r dr \quad (2)$$

$$dD = D_y dy + D_i di + D_r dr \quad (3)$$

$$dS = S_y dy + S_i di + S_r dr + S_b db \quad (4)$$

$$dr = r_y dy + r_p dp \quad (5)$$

$$dm = \mu\gamma db + \mu ds \quad (6)$$

$$dy = f_p dp \quad (7)$$

then, from equation (7),

$$dp = \frac{1}{f_p} dy \quad (8)$$

and substituting (8) in (5) gives us ,

$$dr = r_y dy + \frac{r_p}{f_p} dy = (r_y + \frac{r_p}{f_p}) dy \quad (9)$$

or, $\frac{dr}{dy} = (r_y + \frac{r_p}{f_p}) < 0$, from the outset, we assume that income increase should lead to reduced transaction costs, and therefore as an assumption which is close to the reality, we will hold from now on that $(r_y + \frac{r_p}{f_p}) < 0$. Thus, policy impacts on the transaction costs are indirect, the policies must affect either output or price level to an impact on the transaction

costs. di can be derived from equation (1),

$$di = \frac{1}{I_i}(1 - C_y)dy - \frac{I_s}{I_i}ds - \frac{1}{I_i}dg \quad (10)$$

Substituting the values for dr and dp in equation (2), we get,

$$\frac{1}{f_p}dy + L_y dy + L_i di + L_r \left(r_y + \frac{r_p}{f_p} \right) dy = dm$$

And substituting (10) in the above equation, we get,

$$\begin{aligned} & \frac{1}{f_p}dy + L_y dy + L_i \left[\frac{1}{I_i}(1 - C_y)dy - \frac{I_s}{I_i}ds - \frac{1}{I_i}dg \right] + L_r \left(r_y + \frac{r_p}{f_p} \right) dy = dm \\ & = \frac{1}{f_p}dy + L_y dy + \rho(1 - C_y)dy - \rho I_s ds - \rho dg + L_r \left(r_y + \frac{r_p}{f_p} \right) dy = dm \\ & = \left[\frac{1}{f_p} + L_y + \rho(1 - C_y) + L_r \left(r_y + \frac{r_p}{f_p} \right) \right] dy = \rho I_s ds + \rho dg + dm \end{aligned}$$

And let $\beta = \left[\frac{1}{f_p} + L_y + \rho(1 - C_y) + L_r \left(r_y + \frac{r_p}{f_p} \right) \right] > 0$, then,

$$\beta dy = \rho I_s ds + \rho dg + dm, \text{ where } \rho = \frac{L_i}{I_i}$$

And substituting the value for dm from equation (6) in the above relation,

$$\beta dy = (\rho I_s + \mu)ds + \rho dg + \mu \gamma db, \text{ or ,}$$

$$dy = \frac{(\rho I_s + \mu)}{\beta} ds + \frac{\rho}{\beta} dg + \frac{\mu \gamma}{\beta} db \quad (11)$$

Substituting (11) in (10) we get,

$$\begin{aligned} di &= \frac{1}{I_i}(1 - C_y) \left[\frac{(\rho I_s + \mu)}{\beta} ds + \frac{\rho}{\beta} dg + \frac{\mu \gamma}{\beta} db \right] - \frac{I_s}{I_i} ds - \frac{1}{I_i} dg \\ &= \frac{1}{I_i} \left[\frac{(1 - C_y)(\rho I_s + \mu)}{\beta} - I_s \right] ds + \frac{1}{I_i} \left[\frac{(1 - C_y)\rho}{\beta} - 1 \right] dg + \frac{(1 - C_y)\mu \gamma}{\beta I_i} db \end{aligned}$$

Let $\alpha = \left[\frac{(1 - C_y)(\rho I_s + \mu)}{\beta} - I_s \right] \geq 0$, and $\psi = \left[\frac{(1 - C_y)\rho}{\beta} - 1 \right] < 0$, then

$$di = \frac{\alpha}{I_i} ds + \frac{\psi}{I_i} dg + \frac{(1 - C_y)\mu \gamma}{\beta I_i} db \quad (12)$$

Substituting (9) in (3) we get,

$$dD = D_y dy + D_i di + D_r \left(r_y + \frac{r_p}{f_p} \right) dy = \left[D_y + D_r \left(r_y + \frac{r_p}{f_p} \right) \right] dy + D_i di$$

Let $x = \left[D_y + D_r \left(r_y + \frac{r_p}{f_p} \right) \right] > 0$, then

$$dD = x dy + D_i di$$

And substituting (11) and (12) in the above equation we get,

$$\begin{aligned} dD &= x \left[\frac{(\rho I_s + \mu)}{\beta} ds + \frac{\rho}{\beta} dg + \frac{\mu \gamma}{\beta} db \right] + D_i \left[\frac{\alpha}{I_i} ds + \frac{\psi}{I_i} dg + \frac{(1-C_y)\mu \gamma}{\beta I_i} db \right] \\ &= \left[\frac{x(\rho I_s + \mu)}{\beta} + \frac{D_i \alpha}{I_i} \right] ds + \left[\frac{x\rho}{\beta} + \frac{D_i \psi}{I_i} \right] dg + \left[\frac{x\mu \gamma}{\beta} + \frac{D_i(1-C_y)\mu \gamma}{\beta I_i} \right] db \quad (13) \end{aligned}$$

Substituting (9) in (4) we get,

$$ds = S_y dy + S_i di + S_r \left(r_y + \frac{r_p}{f_p} \right) dy = \left[S_y + S_r \left(r_y + \frac{r_p}{f_p} \right) \right] dy + S_i di$$

And let $\omega = \left[S_y + S_r \left(r_y + \frac{r_p}{f_p} \right) \right] > 0$, then,

$$ds = \omega dy + S_i di$$

Substituting (11) and (12) in the above equation, we get,

$$\begin{aligned} ds &= \omega \left[\frac{(\rho I_s + \mu)}{\beta} ds + \frac{\rho}{\beta} dg + \frac{\mu \gamma}{\beta} db \right] + S_i \left[\frac{\alpha}{I_i} ds + \frac{\psi}{I_i} dg + \frac{(1-C_y)\mu \gamma}{\beta I_i} db \right] \\ &= \left[\frac{\omega(\rho I_s + \mu)}{\beta} + \frac{S_i \alpha}{I_i} \right] ds + \left[\frac{\omega \rho}{\beta} + \frac{S_i \psi}{I_i} \right] dg + \left[\frac{\omega \mu \gamma}{\beta} + \frac{(1-C_y)S_i \mu \gamma}{\beta I_i} \right] db, \text{ or,} \\ &= \left[1 - \frac{\omega(\rho I_s + \mu)}{\beta} - \frac{S_i \alpha}{I_i} \right] ds = \left[\frac{\omega \rho}{\beta} + \frac{S_i \psi}{I_i} \right] dg + \left[\frac{\omega \mu \gamma}{\beta} + \frac{(1-C_y)S_i \mu \gamma}{\beta I_i} \right] db \end{aligned}$$

And let $\phi = \left[1 - \frac{\omega(\rho I_s + \mu)}{\beta} - \frac{S_i \alpha}{I_i} \right] \geq 0$, then,

$$ds = \frac{1}{\phi} \left[\frac{\omega \rho}{\beta} + \frac{S_i \psi}{I_i} \right] dg + \frac{1}{\phi} \left[\frac{\omega \mu \gamma}{\beta} + \frac{(1-C_y)S_i \mu \gamma}{\beta I_i} \right] db \quad (14)$$

Substituting (11) in (7), we get,

$$dp = \frac{1}{f_p} \left[\frac{(\rho I_s + \mu)}{\beta} ds + \frac{\rho}{\beta} dg + \frac{\mu \gamma}{\beta} db \right], \text{ or}$$

$$dp = \frac{(\rho I_s + \mu)}{f_p \beta} ds + \frac{\rho}{f_p \beta} dg + \frac{\mu \gamma}{f_p \beta} db \quad (15)$$

And finally substituting (11) in (9) we get,

$$dr = \left(r_y + \frac{r_p}{f_p} \right) \left[\frac{(\rho I_s + \mu)}{\beta} ds + \frac{\rho}{\beta} dg + \frac{\mu \gamma}{\beta} db \right], \text{ or}$$

$$dr = \frac{1}{\beta} \left(r_y + \frac{r_p}{f_p} \right) (\rho I_s + \mu) ds + \frac{\rho}{\beta} \left(r_y + \frac{r_p}{f_p} \right) dg + \frac{\mu \gamma}{\beta} \left(r_y + \frac{r_p}{f_p} \right) db \quad (16)$$

Policy Impacts on the Output

$$\frac{dy}{ds} = \frac{\rho I_s + \mu}{\beta} > 0$$

$$\frac{dy}{dg} = \frac{\rho}{\beta} > 0$$

$$\frac{dy}{db} = \frac{\mu \gamma}{\beta} > 0$$

Increased bank credit boosts the output expansion through the intermediation effect (μ), where the banks mobilize the savings and reduce the money holdings, and through the allocation of the savings to the private sector investments (I_i). If the private sector investments are very sensitive to the bank credit, or similarly if the credit constraint is very strong ($I_s > 1$), then both liquidity trap ($L_i = -\infty$) and investment trap ($I_i = 0$), (*i.e.*, $\rho \rightarrow \infty$) will not totally neutralize the effects of increased bank credit on the output. In this case the credit effect on the output will be reduced to,

$$\frac{dy}{ds} = \frac{I_s}{1 - C_y}$$

If ($I_s > 1$), the effect of bank credit on the output is greater than that of the fiscal policy on the output. This could be due to the fact that the bank credit promotes the development of the private sector where profitability and efficiency are the driving forces, whereas the fiscal policy could pursue political priorities. The fiscal policy has also significant effect on the output even if either liquidity or investment trap exists ($\rho \rightarrow \infty$). In this case, the fiscal policy effect becomes,

$$\frac{dy}{dg} = \frac{1}{1 - C_y}$$

Changes in the monetary base are transmitted to the output through the central bank advances to the government, which will end up in the hands of the public as money payments for the supply of goods and services to the government. The public could later deposit this money as time and savings deposits increasing the lending capacity of the banking system, or they could place the money in other investments such as loans to the government or acquisition of capital. But if there is liquidity trap or investments trap where the public prefers to hold the money payments as cash and do not place in the investments, then increases in the monetary base will not have any direct impact on the output,

$$\frac{dy}{db} = 0, (\rho = \infty)$$

Policy Impacts on the Interest Rate

$$\frac{di}{ds} = \frac{\alpha}{I_i} \geq 0$$

$$\frac{di}{dg} = \frac{\Psi}{I_i} > 0$$

$$\frac{di}{db} = \frac{(1-C_y)\mu\gamma}{\beta I_i} < 0$$

If there is a strong credit constraint, then any one percentage change in the constraint will be associated with more than one percentage change in the private sector investments ($I_S > 1$). I_S must be sufficiently large in order for $\alpha < 0$. That is, the entrepreneurs will react very sensitively to any small relaxation in the constraint, and if $I_S > 1$ holds, then $\alpha < 0$ is possible, and hence a positive change in the constraint will be accepted with increased interest rate,

$$\frac{di}{ds} = \frac{\alpha}{I_i} > 0$$

On the other hand, if the constraint is weak $I_S < 1$ (I_S is sufficiently small), or the constraint is not binding, it does not require the entrepreneurs to adjust the investment plans to suit the constraint ($I_S = 0$), then, $\alpha > 0$ and hence increased bank credit will be accepted only with reduced interest rate,

$$\frac{di}{ds} = \frac{\alpha}{I_i} < 0$$

We can reduce the above two inequalities as follows:

$\frac{di}{ds} = \frac{\alpha}{I_i} \geq 0 \Leftrightarrow \alpha \leq 0 \Leftrightarrow \left[(1 - C_y)\mu - \left[\frac{1}{fp} + L_y + L_r \left(r_y + \frac{rp}{fp} \right) \right] I_s \right] \leq 0$, thus, α can be positive if and only if I_s is sufficiently small or zero, which means no credit constraint.

Fiscal policy, as in other cases before, increases the interest rate; while increases in the monetary base reduces the interest rate. If the increase of the monetary base consists of only advances to the banking systems ($\gamma = 0$), the interest rate may not change. Whereas, if the increase consists of only advances to the government, the interest rate will fall; the fall could be curtailed if the banking system could attract later those advances as savings from the third parties ($\mu < 1$).

Policy Impacts on the Demand for Bank Credit

$$\frac{dD}{ds} = \left[\frac{x(\rho I_s + \mu)}{\beta} + \frac{D_i \alpha}{I_i} \right] > 0$$

$$\frac{dD}{dg} = \left[\frac{x\rho}{\beta} + \frac{D_i \Psi}{I_i} \right] \geq 0$$

$$\frac{dD}{db} = \frac{\mu\gamma}{\beta} \left[x + \frac{(1 - C_y)D_i}{I_i} \right] > 0$$

Increased bank credit create demand for the bank credit. With credit constraint, any triggered relaxation of the constraint will cause the entrepreneurs to put up higher demand signal to increase the chances of their demands being met. Fiscal policy could crowd out the entrepreneurs due to the increased interest rate that follows a fiscal expansion. There is however a possibility for crowding-in effect, where $\left| \frac{x\rho}{\beta} \right| > \left| \frac{D_i \Psi}{I_i} \right|$, which means the income effect following the fiscal expansion is higher than the interest rate effect on the private sector's demand for the bank credit. The increase in the monetary base also increases the demand for bank credit due to the reduced interest rate and the output expansion that follow increased monetary base.

Policy Impacts on the Bank Credit Supply

$$\frac{ds}{dg} = \frac{1}{\phi} \left[\frac{\omega\rho}{\beta} + \frac{S_i \Psi}{I_i} \right] \leq 0$$

$$\frac{ds}{db} = \frac{\mu\gamma}{\phi\beta} \left[\omega + \frac{(1-Cy)S_i}{I_i} \right] \geq 0$$

Increased government spending could reduce the bank credit supply to the private sector due to the crowding out effect, where the government pays higher and higher interest rates for the bank credit. The situation will be worse if there is already a strong credit constraint, the lending rate will soar up and the credit supply to private sector will drastically drop, because the government cannot be rationed; this could result in total crowding out of the private sector. A possibility for crowding in effect on the credit supply of the banking system will only exist if the credit constraint is very weak. Under strong credit constraint, the monetary policy expansion will promote credit supply expansion, while under weak credit constraint, monetary policy expansion may not change the bank credit supply. The banking system may reduce its credit supply to the private sector following a monetary policy expansion, if the credit constraint is very weak and the resultant price level increases obscure the credit market information. But the impact of monetary policy (here monetary base changes) depends very much on the intermediation (μ) and the proportion of the monetary base that is held as advances to the government (γ). If the changes in the monetary base are mere advances and discounts to the banking system ($\gamma = 0$), the bank credit supply may not necessarily change. The changes in the monetary base will be effective if they are advances to the government, and the banking system later attract those advances from the third parties as savings and deposits.

Policy Impacts on the Price Level

$$\frac{dp}{ds} = \frac{(\rho I_S + \mu)}{fp\beta} > 0$$

$$\frac{dp}{dg} = \frac{\rho}{fp\beta} > 0, \quad \text{and} \quad \frac{dp}{db} = \frac{\mu\gamma}{fp\beta} > 0$$

Credit expansion, fiscal expansion and monetary expansion all lead to price level increases. In the presence of strong credit constraint ($I_S > 1$), credit expansion will generate higher price level increase than the fiscal policy can generate, or the monetary expansion can generate. Whereas, if the credit constraint is very weak ($I_S = 0$), fiscal expansion will generate higher price level increase than the credit expansion or the monetary expansion can generate. The impacts of credit expansion and monetary expansion on the output will coincide, if the credit constraint is very weak ($I_S = 0$) and the central bank does not give advances and discounts to

the banking system ($\gamma = 1$),

$$\frac{dy}{ds} = \frac{\mu}{\beta} = \frac{dy}{db}, \text{ and } \frac{dp}{ds} = \frac{\mu}{fp\beta} = \frac{dp}{db}$$

The results above will never hold if either $I_S > 0$ or $0 < \gamma < 1$

The impact of credit policy is optimal if $ds = dD$. Generally, credit supply is constrained, the quantity of credit the banks offer is often below what the entrepreneurs demand. This can force the entrepreneurs to scale down their investment options leading to a situation of underinvestment, and hence $ds < dD$; the credit impact on the output will be subsequently suboptimal. The credit could be also demand constrained that the entrepreneurs have no additional profitable investments, or they have excessive debts that prevent them from taking all the debts the banks are willing to offer. This situation is rare in developing economies where the investments options are yet to be fully utilized. It will be often a supply constraint, low lending capacity and the problems of asymmetry of information that hold the credit supply below the optimal level of the economy's demand. Therefore, investments here react to both interest rate and the quantity of credit, if the investment elasticity of credit is greater than zero. If the credit constraint is very strong, ($I_S > 1$), an increased credit supply may be associated with increased interest rate. If the assumption $|D_i| > |S_i|$ holds and the investment elasticity of credit is between zero and one, $0 \leq I_S < 1$, increased credit quantity may be followed by a fall in the interest rate, and this also means the credit constraint is weak. Thus, if credit constraint is weak, or not binding, banks can increase their credit supply to the private sector only by reducing the interest rate. In chapter 6, we examine empirically whether these models, assumptions and hypothetical relationships hold in the case of the Gambia. The derived hypothetical relations that ensure significant impacts of bank credit on the economic activities from this section are,

$0 < I_S$: Credit constraint exists

$0 < I_S < 1$: Weak credit constraint

$I_S > 1$: strong credit constraint

$L_r > 0$

$r_y < 0$

$r_p > 0$

$$|D_i| > |S_i|$$

The relationship between credit and investment will be examined in the context of Schumpeter's credit, where bank credit is claimed to be causal for the entrepreneurial investments. In analyzing the bank's credit market, and if the credit demand and supply functions are identified, we will know whether or not the demand curve is flatter than the supply curve. Also in estimating the function of real money demand, we can examine the relation between the real money demand and the transactions costs; and the assumptions that increased real income reduces the transactions costs and increased price level increases the transactions costs can be tested if an equilibrium relation exists for the linear combination of transactions costs, real income and the price level. Meanwhile, the total credit of the banks, the total liquid liabilities and the total assets of the banks will be taken as measures for the roles of banks as engines of growth. They provide credit for the economy to finance investments and purchases of goods and services. Their liquid liabilities function as an efficient payment system for the economy, and their asset accumulation over time promote the capital formation. The ability of the banks to operate these functions sustainably and efficiently over time should expand the national output, create and promote investments, increase the capital formation and induce improvements in the economic efficiency. Thus, the roles of banks will be empirically examined with respect to the national output, GDP, the domestic investments, the capital stock and the improvements in the economic efficiency. We present and discuss these behavioral relationships in the next subsection.

4.5 The Behavioral Relationships

The relationships in this research are analyzed using Vector Error Correction Method (VECM) of Johansen(1995) procedure. The four information criteria of Final Prediction Error, Akaike Information Criterion, Schwarz Criterion and Hannan and Quinn Criterion are used to choose the optimal lag length for the VECM. That is, we first run an autoregressive model for each relationship and compute its optimal lag length of say (q), and then the optimal lag length for the VECM will be automatically (q-1), see Luetkepohl(1991). The unit root test for each variable is conducted using the Augmented Dickey-Fuller method; see Gujarati (1995) . The behavioral relationship will be presented and discussed if there exists a co-integration relation; that is, we are concerned here with the long run interactions among the variables. If two variables are co-integrated, the economic forces will not allow them to wander apart

permanently. These economic forces are thought of as implying long run equilibrium relations. Thus, there would be only temporary deviations from the long run equilibrium, despite the tendency for each variable to individually follow a random walk. With cointegration vectors, we can analyze the responses of the variables to a shock to one variable in the system. This shock is analyzed in the impulse-responses. With a "cointegrating relation, a shock to one variable will not affect only that particular variable but also the entire system of the variables" (Luetkepohl, 1991, p.133). I use the Granger causality results to evaluate the impulse responses because " an innovation in the variable k has no effect on the other variables if the k variable does not Granger cause the set of the remaining variables" in the system (Luetkepohl, 1991, p.45). The data are collected from various sources, and we use annual data throughout the econometric estimations. The data come from World Development Indicators 2003 /World Bank, International Financial Statistics 2003/IMF, World Statistics/UN , Balance of Payments 2003/IMF and various publications of the Gambia Central Bank . The sample size is 1964 -2002, and it is applicable to all our econometric estimations. We use E-Viwes 4 to produce the econometric outputs.

The VAR models, Z_{it} ($i = 1, 2, \dots, 12$) of the research that form the relationships are as follows:

1. Gross Domestic Product and the Banking

$$Z_{1t} = (LRY_t, LRPDCP_t, LRPLL_t, LRPCBA_t)$$

where,

LRY = log real per capita output /GDP.

$LRPDCP$ = log real per capita banks' credit to the private sector.

$LRPLL$ = log real per capita liquid liabilities.

$LRPCBA$ = log real per capita commercial banks' assets.

2. Private Investment and the Banking

$$Z_{2t} = (LRPPI_t, LRPDCP_t, LRPLL_t, LRPCBA_t).$$

$LRPPI$ = log real per capita private investments.

3. Gross Domestic Investment and The Banking

$$Z_{3t} = (LRPGDI_t, LRPDCP_t, LRPLL_t, LRPCBA_t).$$

$LRPGDI = \log$ real per capita gross domestic investments.

4. Physical Capital Stock and the Banking

$$Z_{4t} = (LRPK_t, LRPDCP_t, LRPLL_t, LRPCBA_t).$$

$LRPK = \log$ real per capita physical capital.

5. Economic Efficiency and the Banking

$$Z_{5t} = (EF_t, LRDCP_t, LRLL_t, LRCBA_t).$$

$EF = \log$ growth rate of improvements in efficiency. This is here the residuals from aggregate production function. King and Levine (August, 1993) decomposed the sources of economic growth into two components, physical capital accumulation and everything else. They define the production technology as follows:

$$Y_t = K_t^\alpha X_t$$

$Y = \text{output}$

$t = \text{time}$

$K = \text{Physical capital accumulation}$

$X = \text{Everything else.}$

$\alpha = \text{capital share}$

X are other sources of growth, such as human capital, technology and improvements in the use of factor inputs. They used real per capita values. If y , k and x are growth rates of real per capita output, real per capita physical capital accumulation and real per capita everything else respectively, then taking logarithms of equation (1) and differentiating, according to King and Levine, we get $y = \alpha k + x$. x was defined in their paper as improvements in efficiency, because it measures the residuals of real per capita GDP growth after accounting for the growth rate of physical capital accumulation. Thus, if α is known, x could be calculated, and depending on transformation of GDP and K , X also will be automatically transformed accordingly. For the calculation of the efficiency, I use the real per capita values and the real per labour values of equation (1). α of 0.3 is used in all the calculations, and the technology is assumed to be 1. Thus, if $rpef$ and $refl$ are log real per capita value and log real per labour value of X respectively, we can calculate them as follows:

$$Lry = \alpha LRPK + rpef$$

$$Lryl = \alpha LRKl + refl$$

where, Lry = log real per capita output, $LRPK$ = log real per capita physical capital, $Lryl$ = log real output per labour, $LRKl$ = log real capital per labour

$LRDCP$ = log real banks' credit to the private sector.

$LRLL$ = log real liquid liabilities.

$LRCBA$ = log real commercial banks' assets.

6. Economic Activities and the Banking

$$Z_{6t} = (LRY_t, LRPPI_t, LRPK_t, EF_t, LRPDCP_t, LRPLL_t, LRPCBA_t)$$

From VAR 1 to 5, three banking factors are analyzed with respect to individual economic variables. In these VARs we expect to have one cointegration relation, which corresponds to the long run equilibrium relation that connect an individual economic variable with the linear combination of the banking factors. VAR 6 groups the economic variables together with the banking factors in an ad hoc ordering manner. That is, the economic variables are ordered first followed by the banking factors; and we expect to have four cointegrating relations. With four relations, it means each cointegrating row represents an equilibrium relation between the respective economic variable with the linear combination of the banking variables. The VAR 1 to 4 and VAR 6 are estimated using log real per capita values, and VAR 5 is estimated using log real values.

7. Commercial Banks' Credit Market

$$Z_{7t} = (LDCP_t, LR_t, DR_t, LLC_t, LGDS_t, LGDP_t)$$

$LDCP$ = log banks' credit to the private sector.

LR = lending interest rate.

DR = deposit interest rate.

LLC = log lending capacity of the commercial banks, which is here the total liabilities of the banks

$LGDS$ = log squared quantity of the banking sector's claims
on the government.

$LGDP$ = log Gross Domestic Product.

$$Z_{8t} = (LRM_t, LRGDP_t, LR_t, ID_t)$$

LRM = log real money supply, M1.

$LRGDP = \log$ real GDP.

ID = the spread between the lending interest rate and the deposit interest rate.

$$Z_{9t} = (ID_t, LRGDP_t, LCPI_t)$$

$LCPI$ = log consumer price index.

VAR 7 represents the supply and demand functions of the commercial banks' credit. After the determination of the cointegration rank, we will introduce restrictions on the cointegrating vectors and the loading coefficients to identify the two functions. VAR 8 is used to analyse the relationship between real money balance and the transaction costs. We have it in the theory that the entrepreneurs will demand higher real money balances the higher the transactions costs associated with bank credit. VAR 9 is employed to examine our assumptions in Chapter 4 that the higher the income level the lower the transactions costs, and the higher the price level the higher the transaction cost.

8. Competence of the Central Bank Monetary Policy

Does the central bank sterilize inflows of net foreign assets to achieve its monetary target? Does it withhold or reduce domestic credit when domestic inflation exceeds world inflation? For example, squeeze money supply through open market operations, and other means, to keep in line of its target. The importance of the role of the central bank in the economy depends on the effectiveness of its monetary policy. The research on banking-growth nexus will be incomplete unless the role of the central bank is examined. This role is theoretically explained in chapter 4. We use Cumby and Obstfeld(1981) model in the following VAR and then estimate the vector error correction method:

$$Z_{10t} = (LDC_t, LNFA_t, LCA_t, LEX_t, INGAP_t, LDCG_t, LOIP_t, LGD_t, LGDS_t),$$

LDC = log domestic credit.

$LNFA$ = log net foreign assets.

LCA = log current account balance.

LEX = log exchange rate index.

$INGAP$ = inflation gap between the Gambia and the UK inflation rates

$LDCG$ = log domestic credit to the government.

$LOIP$ = log Dubai crude oil price index.

LGD = log government debt.

$LGDS$ = log government debt squared.

A complete sterilization of net foreign assets implies a negative one-to-one relation between the log domestic credit and the log net foreign assets, Frankel (1994). Thus, if there exists a long run relation, then making the restriction that the summation of the respective long run coefficients of log domestic credit and the log net foreign assets must equal to zero for the complete sterilization of net foreign assets or total ineffectiveness of the monetary policy. The variables, DC_t , NFA_t , and CA_t will be transformed as percentages of GDP to avoid encountering log of negative values and also to take account the effects of the national output on the these variables. furthermore, our data insufficiency does not allow us to estimate the above system with all the variables, and we therefore estimate only a bivariate co-integration between domestic credit and net foreign assets.

9. Schumpeter's Credit

$$Z_{11t} = (LRPI_t, LRDCP_t, LRLC_t, LR_t)$$

$LRPI$ = log real private investments

$LRDCP$ = log real banks' credit to the private sector.

$LRLC$ = log real lending capacity of the commercial banks.

LR = lending interest rate.

Schumpeter has made direct link between the entrepreneur's activity and the bank credit. We present this VAR and estimate the VECM to test the link between the private investment and the bank credit. If banks do anticipate the entrepreneurial activity, there will be feedback effect from the bank credit to the private investment. While, if banks follow the entrepreneurs, the private investment will feed back to the bank credit. The lending capacity, controls for the willingness of the banks to supply the credit, and lending rate captures the price for supplying the credit.

10. Broadus's Efficient Allocation of Resources by Banks

$$Z_{12t} = (LR_t, DR_t)$$

LR = lending interest rate.

DR = deposit interest rate.

The details of this model are presented in section 4.3.

4.6 Tsuru's(2001) Model of Financial Intermediation

Tsuru links the financial intermediation to economic growth using AK (A is the productivity of capital and K is the physical capital stock) endogenous growth model. His model has left many unanswered questions. We first present his model and then introduce the unanswered questions.

He assumes a typical AK model, where the technology of production is

$$Y = AK$$

Y = the output

A = productivity of capital

K = capital stock

After his mathematical derivations, the growth rate of capital is given by the following:

$$\dot{q} = A\theta s - \delta$$

where

\dot{q} = growth rate of capital per worker

A = productivity of capital

s = saving rate

δ = depreciation rate

θ = portion of savings used for investments, $0 < \theta < 1$

The model argues that banks influence the portion of savings used for investments. That is, savings are filtered through the banks to become investments. The quality and efficiency of banks determine how much savings can be processed into investments output. Before discussing the model, let us construct the model using both AK model and neoclassical Cobb-Douglas model taking into account the labor growth which is left out in the Tsuru's construction:

AK model

$$Y = AK = f(K, L) \tag{1}$$

$$\dot{K} = I = sf(K, L) - \delta K \tag{2}$$

L = labor

\dot{K} = change in the capital stock

I = investment

Tsuru asserts that without financial intermediation, $\dot{K} = I = sf(K, L) - \delta K$; while in the presence of financial intermediation, it is a portion (θ) of $sf(K, L)$ that is channeled to investments. That is, $\theta sf(K, L)$ is the investment, and $(1 - \theta)sf(K, L)$ is absorbed by the intermediation as information and transaction costs, spread between lending and deposit rates, commission and transaction fees and operating expenses. Thus,

$$\dot{K} = I = \theta sf(K, L) - \delta K \quad (3)$$

Let r be capital labor ratio. Then we have the following to complete the dynamics of the AK model:

$$q = \frac{K}{L} \quad (4)$$

Then, the intensive production function is,

$$y = \frac{Y}{L} = f\left(\frac{K}{L}, 1\right) = f(q) = Aq \quad (5)$$

If the labor population grows according to the exponential function of,

$$L = e^{nt} \quad (6)$$

where, n = population growth rate, and t = time; and assuming $L_0 = 1$. Then the growth rate of labor, L , is,

$$\frac{\dot{L}}{L} = n \quad (7)$$

Differentiating equation (4) with respect to time we get,

$$\dot{q} = \frac{L\dot{K}}{L^2} - \frac{K\dot{L}}{L^2} = \frac{\dot{K}}{L} - nq, \quad \text{or} \quad \frac{\dot{K}}{L} = \dot{q} + nq \quad (8)$$

From equation (3),

$$\frac{\dot{K}}{L} = \frac{I}{L} = \theta s f(q) - \delta q \quad (9)$$

From equations (8) and (9): left-sides are equal, then the right-sides are equal; thus,

$$\dot{q} + nq = \theta s f(q) - \delta q, \quad \text{or } \dot{q} = \theta s f(q) - (n + \delta)q \quad (10)$$

From equation (5): $f(q) = Aq$

Then,

$$\dot{q} = \theta s Aq - (n + \delta)q, \quad \text{or } \frac{\dot{q}}{q} = \theta s A - (n + \delta) \quad (11)$$

This is graphically presented in figure 4.2,

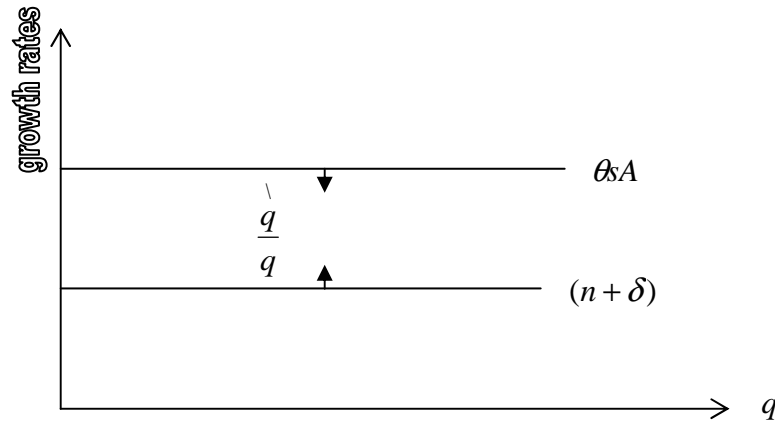


Figure 4.2

That is, as long as $\theta s A > (n + \delta)$ the growth rate of capital will be positive. In fact, banks can increase the magnitude of this growth rate by filtering more savings into investments than any time before. They also hinder and reduce this growth rate by withholding high portion of savings and spending them on the operations and maintenance of the banks. Since this behavior of the banks are directly linked to the growth rate of capital, which in turn is equal to the growth rate of per capita output of the economy, then their behavior is important to the economy, and any fluctuation in their behavior of filtering the savings will cause fluctuations in the entire economy.

We can also present Tsuru's model in a neoclassical production function that exhibits a constant returns to scale, with positive inputs, $K > 0$, $L > 0$, it exhibits positive and diminishing marginal product with respect to each input, and it fulfils the Inada conditions that marginal product of K (L) approaches infinity as K (L) approaches zero and approaches zero as K (L) approaches infinity (Barro and Sala-I-Martin, 1995). Thus, unlike the AK model, the neoclassical production function does not have a constant growth rate of capital per labor. Equation (11) becomes,

$$\dot{q} = \theta s f(q) - (n + \delta)q \quad (12)$$

while $f(q)$ is the intensive form of the production function.

Then growth rate of capital per worker is,

$$\frac{\dot{q}}{q} = \theta s \frac{f(q)}{q} - (n + \delta) \quad (13)$$

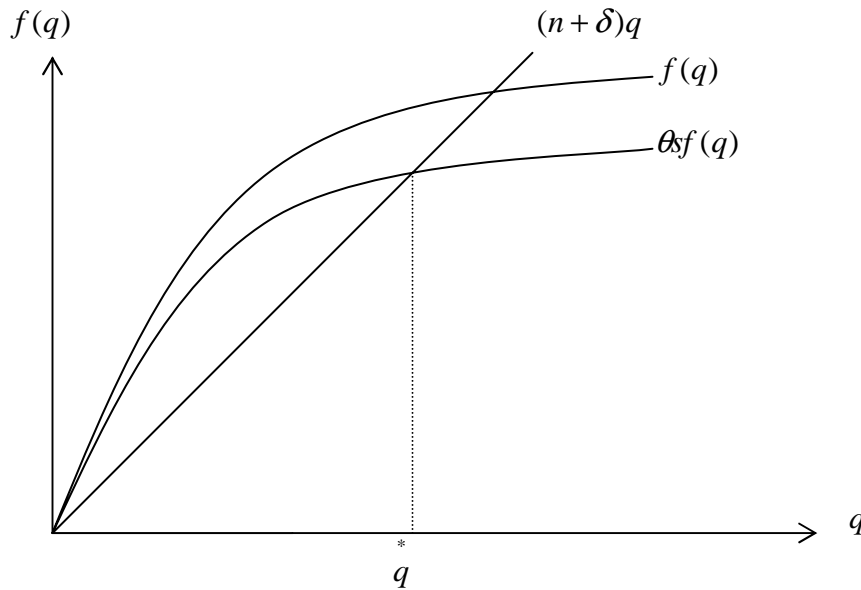


Figure 4.3

The fraction of resources $(1 - \theta)$ absorbed by the financial intermediation is indispensable for the system to operate. But according to Tsuru, this fraction could be set at inefficiently high levels due to monopoly power, regulation or other reasons. If these quasi-rents extracted by the financial intermediation are spent on private consumption or inefficient

investments, the loss of resources $(1-\theta)$ depresses the economic growth; otherwise the growth is promoted and enhanced by the presence of financial intermediation.

Tsuru's explanation failed to relate the presence of financial intermediation to saving rate and output; is the saving rate the same before and after the presence of financial intermediation? Or does the output function shifts as the intermediation emerges in the economy? And how does the fraction absorbed by the intermediation behaves over time?

Without elaborating on these unanswered questions, Tsuru's introduction of intermediation makes the economy worse off, no matter how efficient is the financial intermediation. See the graphs below:

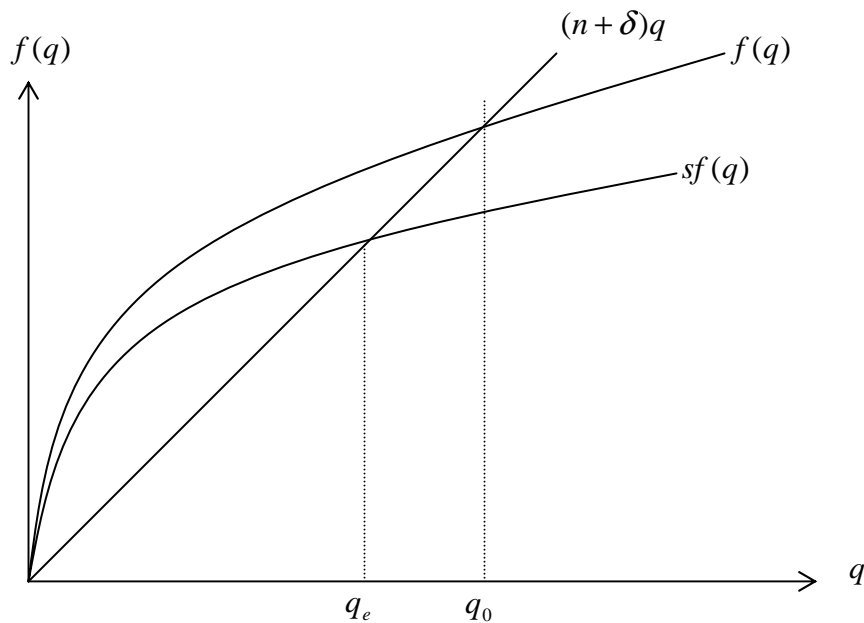


Figure 4.4: An economy without financial intermediation

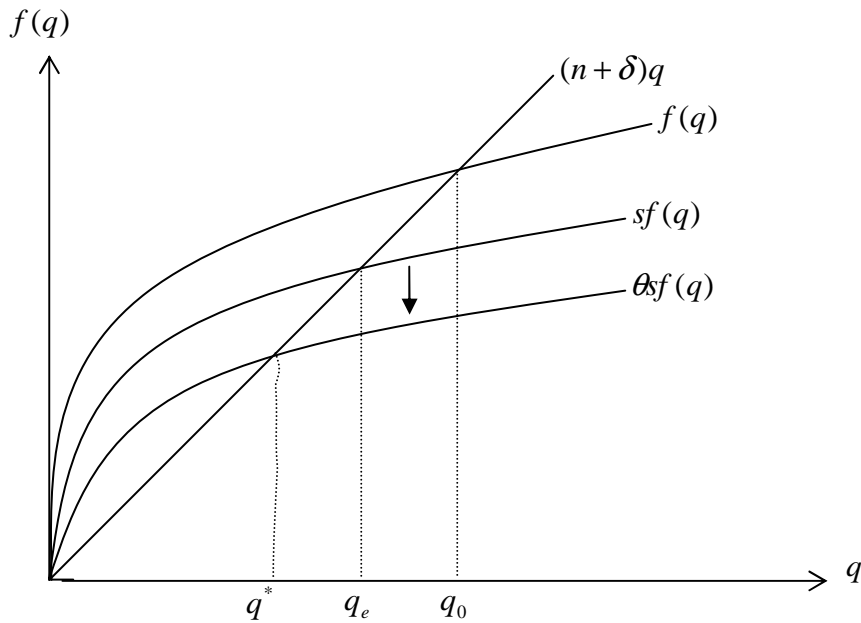


Figure 4.5 : The economy with financial intermediation

Comparing figure 4.4 and figure 4.5, we can see that the equilibrium capital per worker is lower in the presence of financial intermediation than that without the financial intermediation given that $f(q)$ and s do not change as the intermediation is introduced. Since θ cannot be greater than one, the presence of intermediation makes the economy worse off; the absorption of savings by the intermediation reduces the investments. The intermediation can achieve the equilibrium point of figure 4.4 only by channeling all the savings into investments, ($\theta = 1$). The other way to achieve figure 4.4 equilibrium point is to consider any absorption by the intermediation to be productive investments; so that what are actually saved, S , through the banks are all invested, $S = \theta sf(q) + (1 - \theta)sf(q) = sf(q)$, which is exactly the same like that prevailing in the absence of intermediation. The model has posited interesting questions, and the importance of the model lies in elaborating those questions. This is possible through small modifications of it.

Modifications to the Tsuru's Model:

In the presence of banks, or a bank-based economy, the national savings are channeled to investments through two ways, bank and non-bank intermediations. The non-bank intermediations are direct lending to the entrepreneurs, the funds are channeled directly from savers to the entrepreneurs. This saving will be relatively small in the presence of

banks, it will be high in the absence of banks, because in that case all surplus agents must invest their funds directly or do no investments. Thus in the presence of banks the investments in the economy becomes $S = s_1 f(q) + s_2(\theta) f(q)$, with $s_1 f(q)$ as the investments through non-bank intermediation and $s_2(\theta) f(q)$ as the investments through bank intermediation. The rate of savings channeled via the banks to investments is dependent on the efficiency of the banks; $s_2(0) = 0$ means the banks are completely inefficient, and all that is saved through banks never makes to productive investments; while $s_2(1) = 1$ means the banks are perfectly efficient, all that is saved through the banks is being channeled to productive investments.

In the case of financial autarky, total savings is $S = sf(q)$. We assume that these savings are greater than $s_1 f(q)$, the savings or investments by the non-bank sector in a bank-based economy. Thus, the total savings in a bank-based economy, $S = s_1 f(q) + s_2(\theta) f(q)$, can be less than, equal to or greater than the total savings in a non-bank-based economy, $S = sf(q)$, depending on how efficient are the banks in financing the productive investments. The graphs below illustrate these cases.

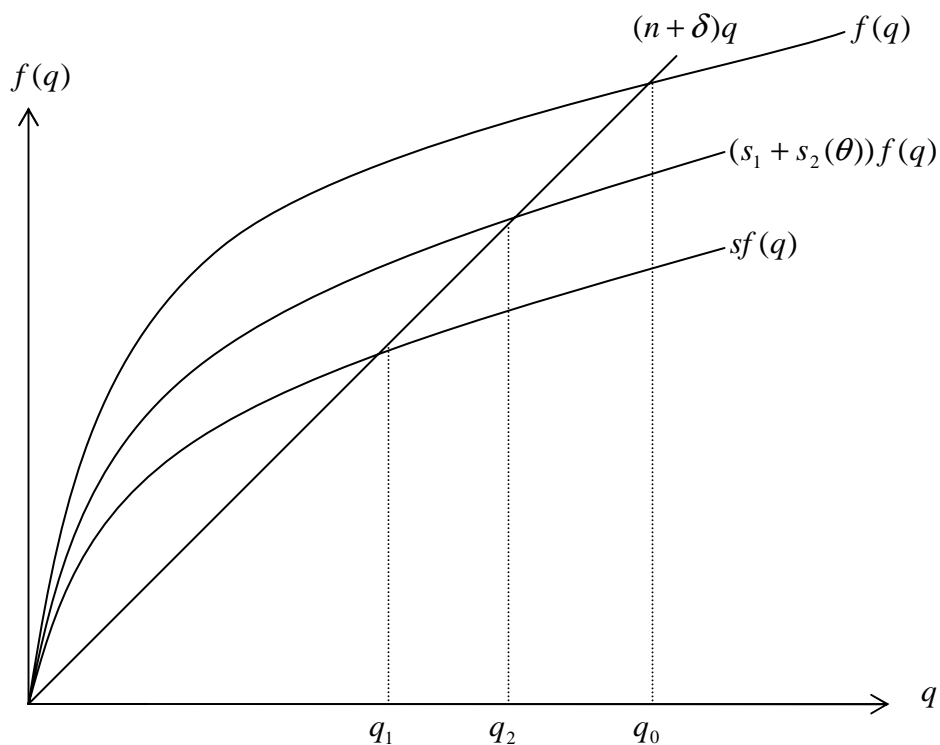


Figure 4.6: Case 1

Case 1: $(s_1 + s_2(\theta)) > s$

The graph above shows a case where banks are efficient at both mobilizing and directing savings to productive investments. This has resulted in a higher equilibrium capital per worker, q_2 , than that prevailing in the non-bank-based economy. The production technology, $f(q)$, in both economies is the same; but banks' intermediation has raised savings rate, and the mobilized savings by banks are not wasted on the absorption.

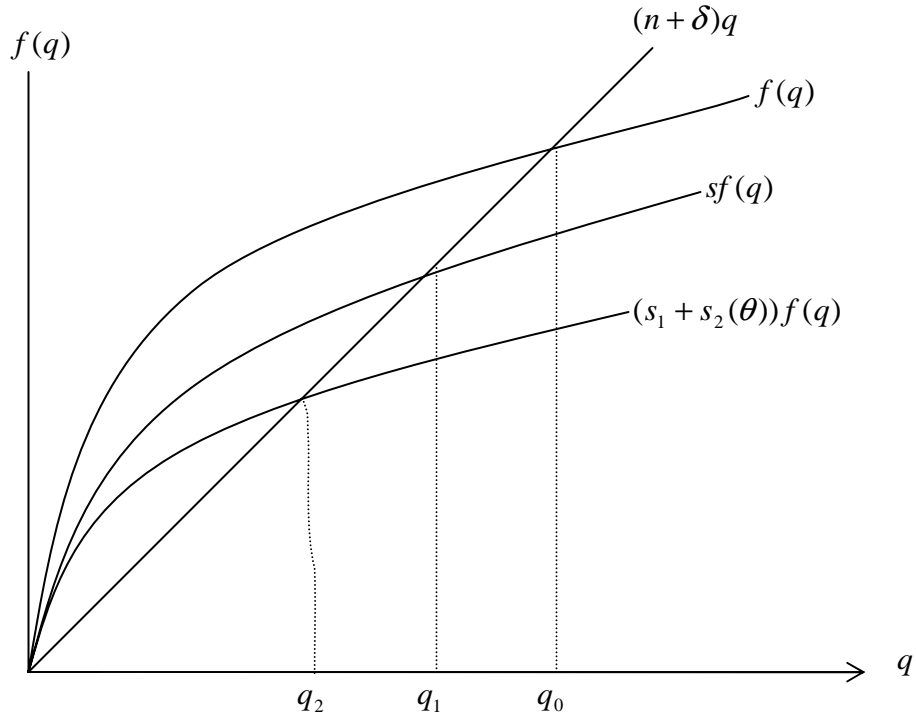


Figure 4.6: Case 2

Case 2: $(s_1 + s_2(\theta)) < s$

We have already assumed from the outset that $s_1 < s$ when the production technology is the same in both economies. Therefore, the possibility for the total saving rate in a bank-based economy to be higher than that of the non-bank-based economy is determined by the level of banks' mobilization and efficiency. The case above illustrates a situation where banks release only small amount of liabilities into investments; that is, the θ is low, or their mobilization of liabilities, s_2 , is low. In both situations, the equilibrium capital per worker in the bank-based economy will be lower than that of the non-bank-based economy.

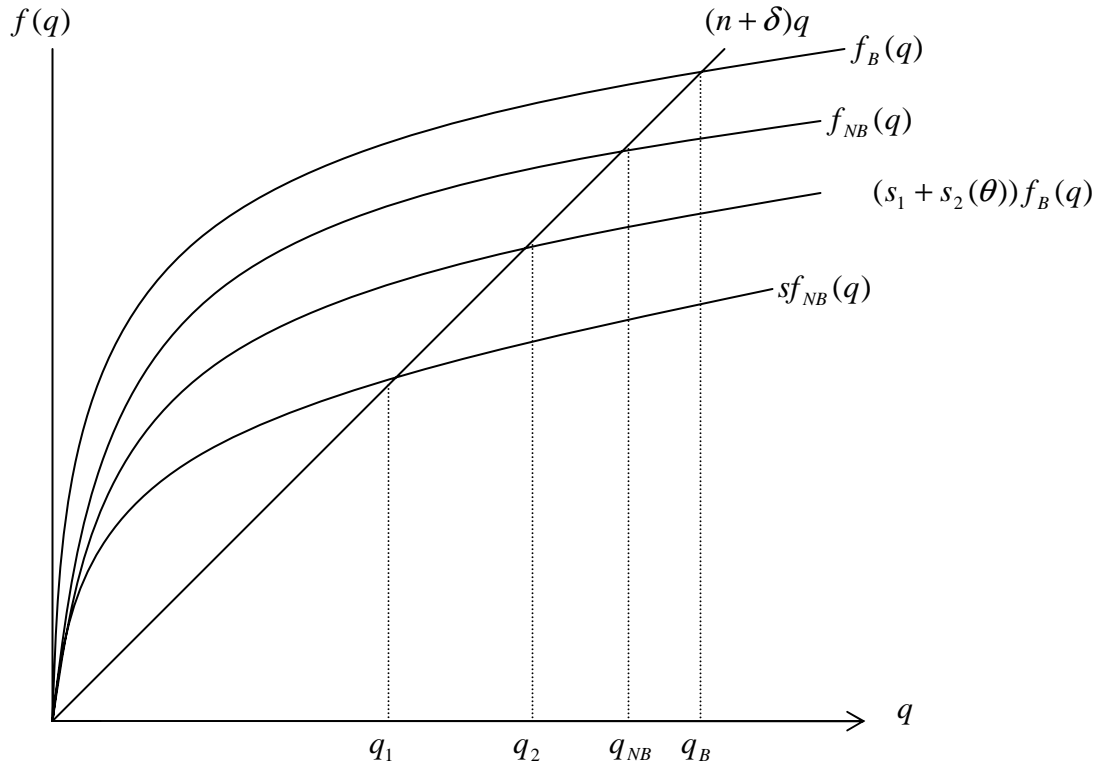


Figure 4.7 : Different production functions

f_B = production function in the bank-based economy

f_{NB} = production function in nonbank-based economy

Case 3: the production technologies are different and bank-based economy has higher production technology, $f_B(q)$, than non-bank-based economy $f_{NB}(q)$. Thus, even if the rates of savings are the same, $(s_1 + s_2(\theta)) = s$, in both economies, the total per capita saving in the bank-based economy will be higher than that in the non-bank-based economy resulting in a higher equilibrium capital per worker in the former than in the latter. This is possible according to Joseph Schumpeter if the banks finance not only the existing lines of production but also create new lines of production by selecting and sponsoring entrepreneurs.

But can this portion, $s_2(\theta)$, be allocated to another type of financial intermediation that can do better than the banks, because it has lower absorption costs, $(1 - \theta)$, than the banks? The natural answer is yes, stock exchange has lower absorption, it is an intermediation where funds from investors are directly channeled to the users with minimal absorption.

But do stock exchange mobilize savings or sponsor entrepreneurs? This is where the banks make difference. Banks create the liquidity in which the stock exchange operates, by either underwriting stock issues of companies or by sponsoring the stock dealers and stock buyers. Stock exchange is a complement to the banks. Stock exchanges bring about fund managers and investment analysts, who monitor and evaluate the industries including the banking industry. These by-products of stock exchanges provide networking of the economic sectors and create knowledge and information for the efficient operations of the markets.

4.7 Conclusions

In an attempt to locate and highlight the role of banking in the economic development, we discussed in this chapter four models. The first model, section 4.2 forms a basis for the other models. It takes the bank credit as the banking output that goes into financing the entrepreneurs' purchases of capital and labor. It directly links the banking output to the economic output and productivity. The model does not tell whether or not the banking output drives the economic output and productivity, but establishes a strong relationship between the two in the operation of the circular flow of the creditary production. The second model, section 4.3, is an econometric formulation of Broadus' Postulate on banking efficiency and competition. The banking output that goes into economic production, as in model one, is a portion of the economy's savings the banks have been able to convert to banking output. This process can be inefficient and uncompetitive due to regulations and banking incompetence. Our econometric formulation takes the regulation as given and examines the banking competitiveness. Model three, section 4.4, analyzes, in a comparative static method, the fiscal and monetary policy impacts and the interactive impacts of the two policies on the output, price level, interest rate, transaction costs and banking credit. This is done in a Keynesian IS/LM framework with a credit market assumption that rules out the full information assumption under imperfect credit market conditions. We also examine the effects of bank credit supply on the other endogenous variables. The fiscal and monetary policies are found to have no meaningful or definite impacts on the credit market variables of credit supply, credit demand and the transaction costs, subsections 4.4.1 and 4.4.2. Subsection 4.4.3 constructs a relationship between

credit supply and money supply based on the narrow definition of the money. This relationship shows that money supply is different from the credit supply due to the banking intermediation and the behavior of the central bank that offers advances to both the government and the banking industry. This section also models the credit constraint based on the neo-Keynesian theory of quantity constraint. Credit policy affects the endogenous variables through the sensitivity of the private investments to the credit quantity and the banking intermediation factor. If the private investments are insensitive or weakly sensitive to the bank credit quantity, a situation we denote as non or weak credit constraint respectively, the credit policy will have smaller impacts on the endogenous variables than when the credit constraint is strong. With strong credit constraint, increased credit supply will be followed by increased interest rate; while with weak credit constraint, increased credit supply will tend to reduce the interest rate. Similarly, under strong credit constraint, increased credit tends to induce an increase in the demand for credit; while under weak credit constraint, increased credit supply tends to induce a fall in the demand for the credit. Fiscal expansion during strong credit constraint will reduce the bank credit supply and leads to crowding out of the entrepreneurs. A crowding-in effect will be possible if the credit constraint is very weak. On the contrary, monetary expansion tends to reduce the bank credit supply during weak credit constraint and tends to increase it during strong credit constraint. The impact of credit policy and the monetary policy on the output and the price level are found to coincide if the credit constraint is very weak and the central bank does not give advances or discounts to the banking system. From section 4.4, we cannot say for certain that bank credit causes the economic growth or vice versa; this answer will be attempted in chapter six. Nevertheless, the banking sector cannot be left out in the analysis of economic growth. In fact, our models have shown that the bank credit stands out among the other policy variables, its impact on the output is greater than that of the other policy variables; while its resultant price increase is lower in subsections 4.4.1 and 4.4.2, but higher in subsection 4.4.3 than that of the other policy variables. This importance of banking role in the economy is graphically sketched in our modification of Tsuru's model. In a model of two economies, bank-based and nonbank-based, the bank-based economy is found to have higher capital and output levels than the nonbank-based economy. The presence of banks increases the savings mobilization and specializes savings allocation to

the private sectors. This activity is absent in a nonbank-based economy. However, in the process of converting the mobilized savings into investments, the banks absorb some portion of the savings for their own maintenance. High bank absorption means few bank credit quantities for the economic investments. Thus, the banks become inefficient and incompetent; the transaction costs of the bank credit will be high resulting in low credit supply and consequently low investments. In this situation, the banks can retard the economic growth; the output and capital levels under the bank-based economy could then be lower than that of the nonbank-based economy. We do not test models for this comparative analysis in section 4.6. But Schumpeter's credit in subsection 4.2.1 and section 4.3 model are tested in chapter 5. We also estimate the credit market functions and the relations between the bank credit and economic activities as modeled in section 4.5. The four frameworks of theory in this chapter show how complex and ambiguous is the banking role in the economy. It can be that the bank credit goes directly into the economic production function, as in model one, section 4.2, or that process is saddled with regulations and bank incompetence, as in model two, section 4.3, or that with the credit market imperfections, money-credit relations and the policy shocks, the process can be promoted or retarded as in model three, section 4.4; or finally that the credit that goes into the production is actually small fraction of the savings the banks have raised, and the large fraction is wasted on the maintenance of the banks themselves, as the final model graphically illustrates, section 4.6. Chapter 5 provides some clues or answers to these complexities and ambiguities.

5 Analysis of Survey and Empirical Results

5.1 Introduction

In this chapter we analyze the results from the survey and the econometric estimations. The survey is intended to solicit public views about the banking industry in the Gambia. Its results will be indicators for the types of conclusions that could be drawn by the econometric results. The empirical estimations are based on the hypothesized relationships constructed in the theoretical framework. They will indicate to us the type of hypothetical relation the banking industry in the Gambia has with the economic activities. We begin with the survey.

5.2 Survey

In the survey, we attempt to inquire into the following questions:

1. The distribution of account types
2. The reasons for holding a bank account
3. The chance of obtaining a bank facility
4. The reasons for the application being approved
5. The attitude of the public about the banking services

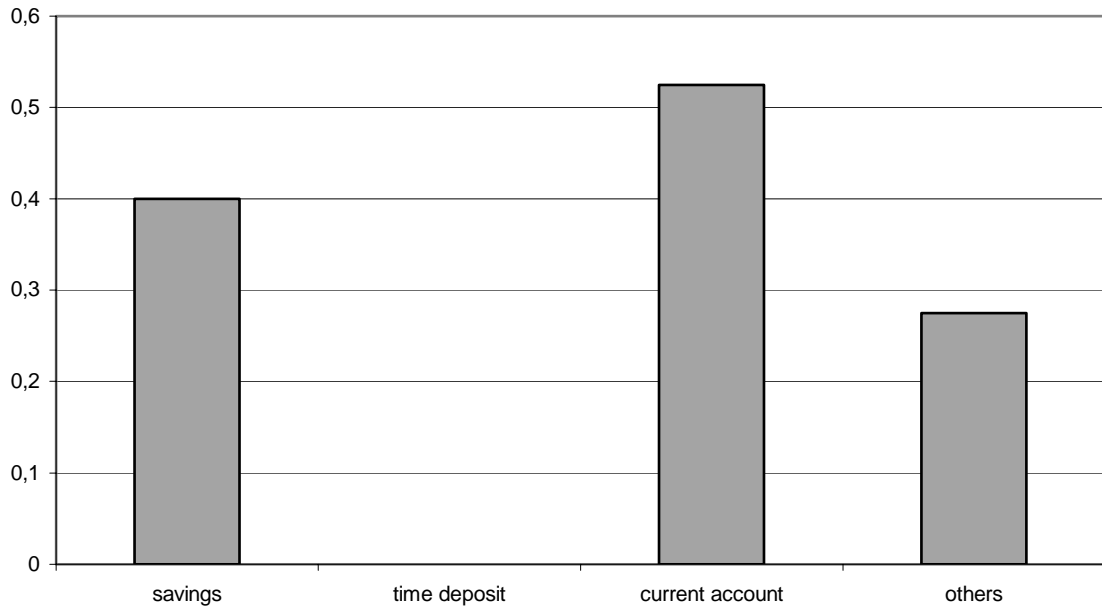
I distributed 150 questionnaires to the public targeting bank customers and the university students to get informed judgments. The response was 60 % after screening out incomplete answers. It is hard to retrieve data and information from Gambians. They generally do not like to accept a responsibility for a source of data or information, and thus they shy away from any who seeks data and information. Nevertheless, the responses, I have, can mirror to a certain degree the population's views. The responses to the five questions hint that banking industry is not up to the expectations of the public, and that banks give more weight to consumption financing than to production and entrepreneurial financing. A Chi squared statistic is computed to test the agreement between the observed distribution and the theoretical distribution of the responses under each question. The null hypothesis is that the two distribution are in agreement, and if it is rejected then the two distributions are significantly divergent. In each of the question above, we take uniform distribution to be

our theoretical distribution, and it means that the responses are uniformly distributed among the classes in each question; see Yule and Kendall (1950) for details of the test.

5.2.1 Bank Account Distribution

I asked the respondents to list the types of bank accounts they hold. It is important to know what types of accounts people hold; this explains the bank deposit and credit activities. If banks can mobilize long time deposits, they will be able to engage in long time credit commitments to the public. Long time deposit holdings can also indicate the public confidence in the banks and the national currency. According to our sample, the public tends to hold current accounts the most followed by savings accounts. Over 50 % of the respondents hold current accounts compared to just under 40 % of them who hold savings accounts. None of them holds a time deposit account, and around 28 % of them hold no bank account. These observed distribution is found to be significantly not in agreement with the hypothetical uniform distribution, the test-statistic is 20.15. This implies either our sampling technique is at fault, it does not capture the population correctly, or the theoretical distribution is at fault. We suspect that the distribution of the observed data closely represents the population. The distribution of account holdings is not uniformly distributed; savings and demand deposits account constitute on average more than 60% of the total funds of the commercial banks, figure 2.6, section 2.4. But Current accounts cannot be used to mobilize money for project and capital financing. They are only a payment system for transaction purposes. Thus, high current account holdings signal that the Gambian banks strive on fees and commissions and short term treasury bills not on dividends and interest income from project and capital investments. High current account activities are unlikely to translate into high credit activities for entrepreneurs and project managers.

Figure 5.1 : Account holdings



5.2.2 Reasons for Placing Money in the Banks

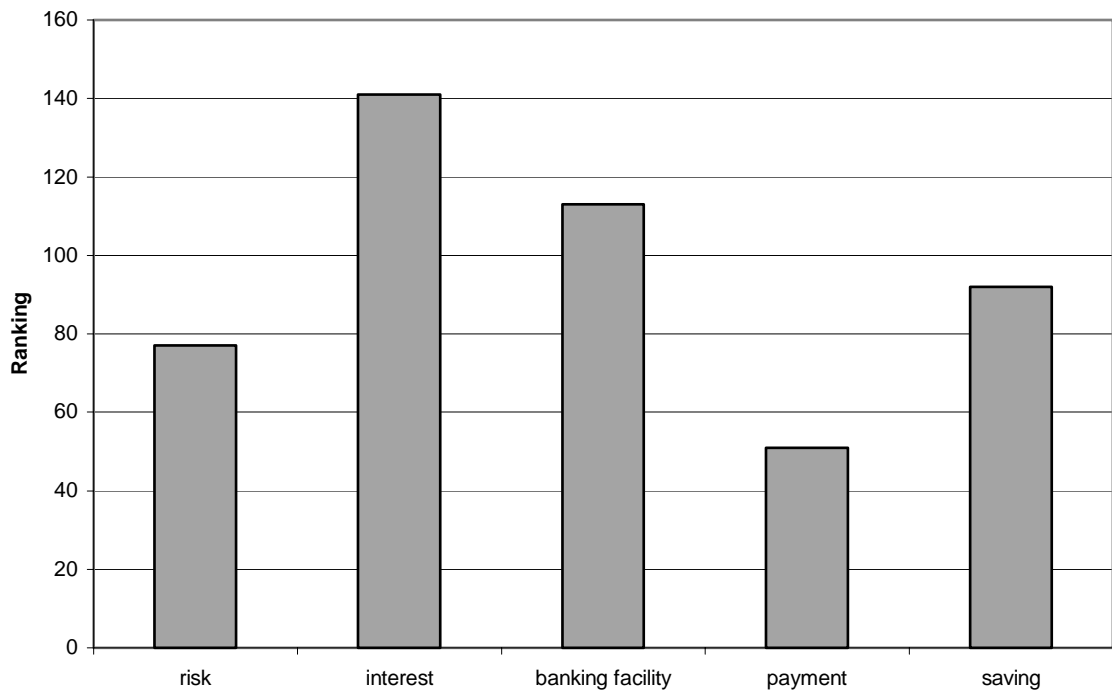
We ask our respondents to rank on the order of importance from 1 to 5, with 1 the most important and 5 the least important, the following reasons for placing money in the banks:

1. To avoid the risk of theft, loss and destruction
2. To earn interest income
3. To qualify for bank facility
4. To make easy payment
5. To save for the future

The higher the number attached to a reason the lesser the importance of that particular reason. The results show that the Gambian public are concerned first with the easy payment system they get when they place their money in the banks. The second most important reason is the safety of money in the banks; that is, they believe that keeping money in the banks reduce the risk of theft, loss and destruction. The third important reason is to save for the future. But it is precautionary saving with complete freedom of withdrawal at all times with minimum loss. Thus, none of them hold time deposits. The other reason for not holding time deposits is because interest income is the least important reason for the

Gambian people to place their money in the banks. Banks cannot attract the public with interest rates to mobilize savings, and likewise they cannot attract them with interest rates to engage in economic activities. In this case, the banks should embark on the universal banking system, where banks directly undertake economic activities to create entrepreneurs and companies that will depend on the banks for credit, and the banks will depend on them for dividends and interest incomes. These conclusions are drawn from the observed distribution in figure 5.2. The test-statistic is 49.65 and at 1% significance level, it is found that the observed distribution is divergent from its uniform distribution. Thus, the reasons for placing money in the banks are significantly different.

Figure 5.2: Reasons for Placing Money in the Banks



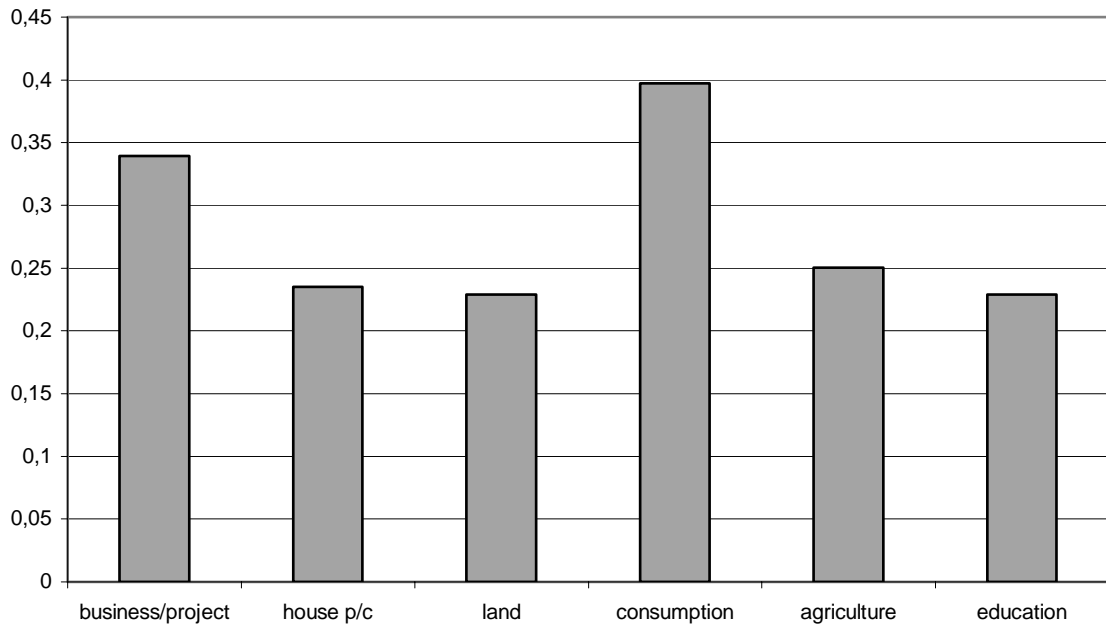
5.2.3 Chance of Obtaining a Bank Facility

We list six financing needs and ask our respondents to rate their chance of obtaining a bank facility for those needs. The financing needs are,

1. Business/project
2. House purchase/construction
3. Land purchase/development
4. Consumption
5. Agriculture
6. Education

When we exclude consumption from the list above, the other financing needs can be categorized under investments, and hence comparison can be made between consumption financing and investment financing. The results show that the consumption has a higher chance of getting bank facility than the investment. There is 39% chance the respondent's application of bank loan for the consumption purpose will be approved. The second highest chance is for the business/project, while an application of bank loan for land has the lowest chance of being approved. Thus, the banks tend to favor consumption financing, which requires only standard operating procedures, than investment financing, which requires rigorous searching and monitoring. We however find that at 5% significance level the observed distribution in figure 5.3 is in agreement with its theoretical distribution. The test statistic is 3.517. This implies that the different purposes / classes in figure 5.3 have equal chances for the bank loan; for example, consumption financing and capital financing have equal chances for getting a bank loan.

Figure 5.3: Chance of obtaining bank facility for



5.2.4 The Reasons for the Credit Application Being Approved

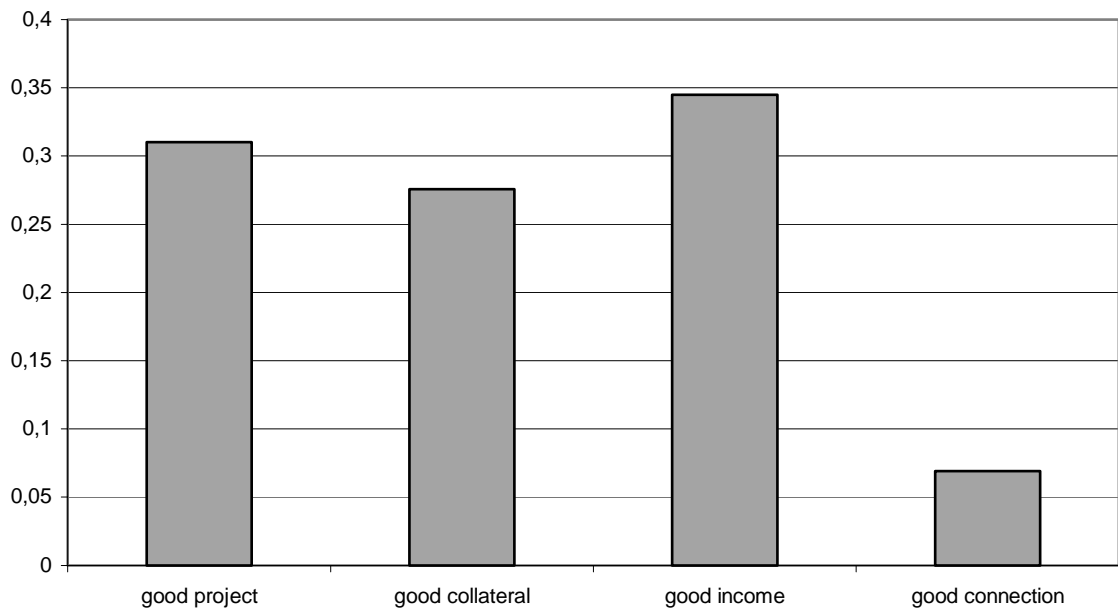
We asked our respondents to tick one of the following securities they thought was the most relevant in the approval of their credit application:

1. Good Business/project
2. Good collateral
3. Good income flow
4. Good connection in the bank

The respondents indicate that income flow is the most important guarantee for obtaining a bank credit in the Gambia. Around 34 % of the respondents thought they obtained bank credits because of their good income flows, which periodically stream into their current accounts with the banks. 32 % of them thought it was because of the business/project they had, and 28 % thought it was because of the collaterals they had. Connections and personal relationships in the banks also play as a factor in obtaining a bank credit. The chi squared statistic is 7.37 and at 10% significance level, we find that the observed distribution is divergent from its hypothetical uniform distribution; thus, the differing conclusions from

the observed distribution are significant. It is obvious from the results that people with good income flows stand a better chance than the rest for getting bank help. These people are not entrepreneurs, who often do not have steady income flows but ideas and business proposals that need to be strategically analyzed by the bank management to determine their viability and profitability. In contrast, to determine one's eligibility for a bank loan, particularly for consumption purpose, while one has a steady income streaming into one's current account, is a matter of basic financial management for the bank and consumption smoothing for the applicant. Thus, if this consumption smoothing, which the Gambia banks often do for their salary accounts and current account holders, can significantly in part insulate the consumption patterns against adverse shocks, then that practice of banks should show up in gross domestic product of the country, and the banks shall be counted among the shock absorbers of the economic growth. This will be ascertained in the empirical estimation.

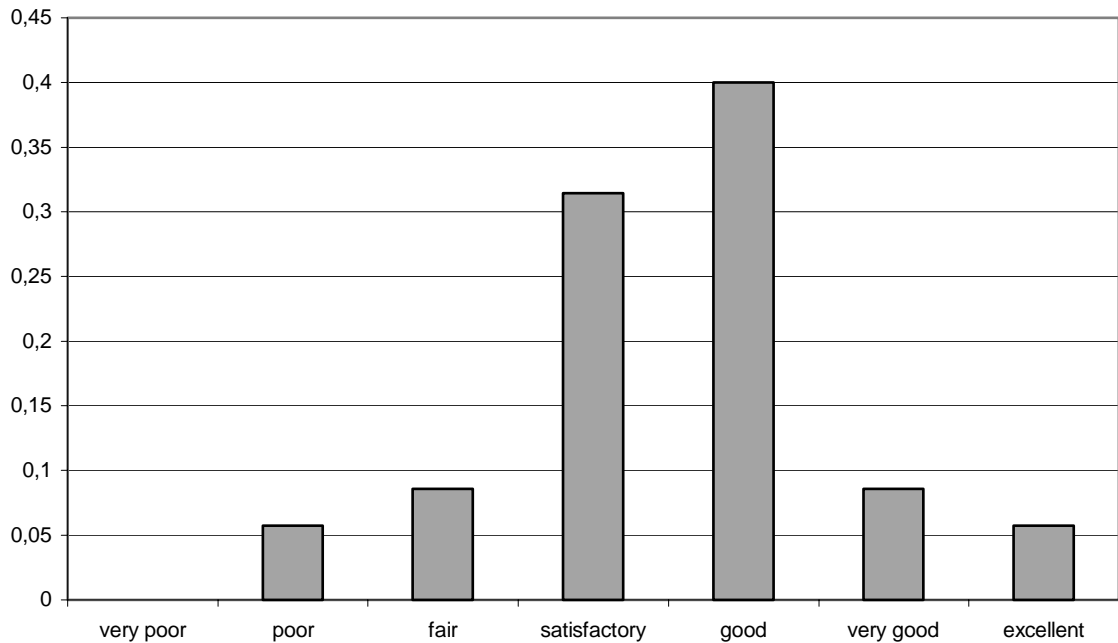
Figure 5.4: I have obtained bank facility because I have



5.2.5 Public Attitude about the Banking Services

On the Likert scale from 1 to 7, we asked our respondents to rate the banking services in the Gambia. It appears that the Gambia public are not impressed by the bank performances. They see the banks as not doing very well as expected. 40 % of the respondents rate the banking services as just good. 32 % rate the services as satisfactory, and less than 10 % rate the service as very good. In chapter 2, we explained how the banks operate in the Gambia, the high clustering of the banks in one area, their tendency of financing few repeated clients, who are mostly engaged in oligopolistic markets of distributive trades, and hardly venturing beyond , can explain to some degree why the public have not given the banks a very good rating, figure 5.5. From the distribution in figure 5.5 we compute a chi squared statistic of 38.41, and at 1% significance level we find that the observed distribution in Figure 5.5 is significantly divergent from its uniform distribution. Thus, the sample classes have significant differences.

Figure 5.5: Ratings of the Banks



5.3 Econometric Analysis

In this section, I present and analyze the econometric findings. I first analyze the relations between the commercial banks and the economic activities; and this covers the goods and the production markets of our Keynesian model; the empirical results are found in sections 5.3.2, 5.3.3, 5.3.4 and 5.3.5. The economic activities are measured by gross domestic product, private investments, gross domestic investments, physical capital and economic efficiency. The banking activities are measured by the liquid liabilities of the banking industry, the credit volume of the banks to the private sector and the banks' total assets. I present the empirical evidence of Broaddus's model, section 5.3.6, and the analysis of the commercial bank credits, section 5.3.7, by constructing the supply and demand functions of the bank credit. The money demand function and the transaction cost function are estimated to test the hypotheses constructed in chapter 4, section 4.4.3. The analysis of the bank credit market that includes the money demand function and the transaction costs function covers the money and credit markets of the Keynesian Model, Chapter 4, section 4.4. I then investigate the performance of the central bank in terms of the monetary policy competence as explained in subsection 4.4.4. I have no econometric analysis for Tsuru's Model, Chapter 4, section 4.6, due to inaccessible data to make comparison between bank-based and nonbank-based economy. I begin the analysis with the unit root tests to identify the integration order of each variable, the test models include intercept and trend. The lag order is automatic based on Schwarz information criteria, and the maximum lag order is nine. The VAR order selection test and co-integration rank test results are provided in the Appendix A. We use Eview 4 software for all the econometric computations.

5.3.1 Unit Root Tests

I use the Dickey-Fuller methods to obtain the test results. All the variables in this research are found to be first difference stationary except the log real liquid liabilities of the commercial banks, LRLI and the consumer price index, LCPI. These two variables are found to be second difference stationary. The level variables are not stationary. This implies that the level regressions may have spurious relations, they reflect coincidental trending effects of the variables without any economic meaning. Thus, in this research I do

not use the level regressions. I base the analysis on the long run relations estimated using the Johansen's co-integration method. This method also gives me an opportunity to analyze the feed back effects and the weak exogeneity of the variables in the system. The unit root test reveals that banking variables, liquid liabilities and the bank assets have no significant trend, while the log credit volume of the banks to the private sector, LDCP, has a trend. In contrast, all the economic variables exhibit trends. The intercept term is also found significant in some variables and insignificant in the others. This result motives us to assume linear deterministic trend in the data and include intercept in the vector auto regressions. The co-integration tests include intercept and no trend .The table 1 presents the unit root tests:

Table 1: Unit Root Test

Variable		Level	Fst Difference
LGDP	T-statistic	-1.904638	-5.983184 ^{***}
	P-value	0.6325	0.0001
LRM	T-statistic	-1.599	-7.155 ^{***}
	P-value	0.7746	0.0000
LRPI	T-statistic	-2.680	-6.759 ^{***}
	P-value	0.2499	0.0000
LDCP	T-statistic	-2.036580	-6.478888 ^{***}
	P-value	0.5632	0.0000
LLC	T-statistic	-1.501444	-5.373815 ^{***}
	P-value	0.8116	0.0005
LGDS	T-statistic	-3.232053 [*]	-4.405894 ^{***}
	P-value	0.0944	0.0069
LRPK	T-statistic	-1.800	-7.019 ^{***}
	P-value	0.6842	0.0000
REFL	T-statistic	-2.041	-5.391 ^{***}
	P-value	0.5603	0.000
LCPI			

	T-statistic	-2.482	-2.529
	P-value	0.334	0.313
CDC	T-statistic	-1.4178	-4.774 ^{***}
	P-value	0.8395	0.002
CNFA	T-statistic	-2.015	-3.933 ^{**}
	P-value	0.574	0.020
LRGDP	T-statistic	-1.964	-6.872 ^{***}
	P-value	0.602	0.000
LRY	T-statistic	-1.937	-6.776 ^{***}
	P-value	0.6157	0.000
LRPLL	T-statistic	-2.040	-2.809 ^{***}
	P-value	0.5609	0.000
LRL	T-statistic	-2.024	-2.853
	P-value	0.5698	0.1890
LRPDCP	T-statistic	-1.765	-6.030 ^{***}
	P-value	0.7013	0.0001
LRDCP	T-statistic	-1.756	-6.006 ^{***}
	P-value	0.7057	0.0001
LRPCBA	T-statistic	-1.411	-4.692 ^{***}
	P-value	0.8415	0.0030
LRPPI	T-statistic	-2.649	-6.819 ^{***}
	P-value	0.2620	0.0000
LRPGDI	T-statistic	-1.713	-5.683 ^{***}
	P-value	0.7258	0.0002
RPEF	T-statistic	-2.135	-7.145 ^{***}
	P-value	0.5103	0.0000
LRLC	T-statistic	-1.385	-4.709 ^{***}
	P-value	0.8492	0.0029
LR/Li	T-statistic	-2.682	-7.373 ^{***}
	P-value	0.2490	0.0000

DR	T-statistic	-3.236*	-7.940***
	P-value	0.0928	0.0000
LRCBA	T-statistic	-1.386	-4.710***
	P-value	0.8488	0.0029
<p>*** = significant at 1 %, ** = significant at 5 % * = significant at 10 % Significant: the variable has no unit root or random walk and thus it is stationary</p>			

5.3.2 Gross Domestic Product and the Banking

One co-integration relation exists for the linear combination of GDP and the banking indicators. We use co-integration lag order of one because its VAR order is two, Appendix A 1. We also assume a deterministic linear trend in the data, which is an obvious assumption for the economic variables. This gives us the following unrestricted Vector Error Correction model in table 2:

Table 2: Output versus Banking (unrestricted model)

1 Cointegrating Equation(s):				Log likelihood	97.87161
Normalized cointegrating coefficients (std.err. in parentheses)					
LRY	LRPDCP	LRPLL	LRPCBA		
1.000000	4.824430	-2.493148	-0.722662		
	(0.78209)	(0.55990)	(0.76913)		
Adjustment coefficients (std.err. in parentheses)					
D(LRY)	-0.025125				
	(0.01586)				
D(LRPDCP)	-0.036978				
	(0.03386)				
D(LRPLL)	0.120245				
	(0.03796)				
D(LRPCBA)	0.007695				
	(0.02649)				
LRY = log real per capita output.					
LRPDCP = log real per capita banks' credit to the private sector.					
LRPLL = log real per capita liquid liabilities of the banks.					
LRPCBA = log real per capita commercial banks' assets.					

The unrestricted co-integration relation has a significant convergence towards the equilibrium. If the log real per capita GDP increases 1 per cent in the current period above its equilibrium level, it will subsequently fall by 0.025 per cent in the next period, indicating that the relation does not have a tendency to explode. Also, the increase in GDP in the current period spills over to the liquid liabilities of the banks; the liquid liabilities will increase by 0.12 per cent in the following period following a 1 per cent increase in the GDP. The bank credit and total asset seem not to receive feedbacks from the level GDP. In the long run relation, the banks' assets are found insignificant; while bank credit and liquid liabilities are significant. Restricting all the adjustment coefficients of the banking indicators to zero is rejected at 1 per cent significance level. This implies that not all the banking factors are weakly exogenous. The unrestricted co-integration relation reveals that bank liabilities are not weakly exogenous; thus we restrict the adjustment coefficients of bank credit and bank assets to zero, and we get a final reduced model as in table 3.

Table 3: Output versus Banking (restricted model)

Standard errors in () & t-statistics in []				
Cointegrating Eq:	CointEq1			
LR(-1)	1.000000			
LRPDCP(-1)	2.290955 (0.39884) [5.74409]			
LRPLL(-1)	-1.305122 (0.28553) [-4.57084]			
LRPCBA(-1)	-0.334451 (0.39223) [-0.85269]			
C	-9.270157			
Error Correction:	D(LRY)	D(LRPDCP)	D(LRPLL)	D(LRPCBA)
CointEq1	-0.063405 (0.03153) [-2.01071]		0.229706 (0.04131) [5.56004]	
Diagnosis Results:				
LR Test for the Restrictions $\chi^2(2) = 2.73$, Prob. = 0.2556				
Autocorrelation Test $\chi^2(32) = 42.78$, Prob. = 0.0964				
Serial Correlation Test $\chi^2(16) = 21.357$, Prob. = 0.165				
Normality JB Test $\chi^2(8) = 4.01$, Prob. = 0.856				
Heterokedasticity Test $\chi^2(200) = 208.158$, Prob. = 0.3315				

We describe this long run relation as output-banking nexus. It is the national output as a function of the banking development:

$$lry_t = 9.27 - 2.29lrpdcpt + 1.31lrpll_t + 0.33lrpcdb_t + z_t \quad (1)$$

Liquid liabilities, LRPLL, promote the output expansion, LRY, while an increase in the bank credit supply, LRPDCP *contracts* the output. This contradicts the hypothesis that bank credit promotes the output. It means over the period studied, the bank credits in the Gambia did not go into areas that can promote and expand the national output. The credit activities were in fact counter productive as the final model indicates. This evidence confirms what we have earlier noted in the graphical analysis of the banks' credits versus the major economic sectors, chapter 2, figure 2.10; there we found that the banks' credits to the major

economic activities have been falling. From equation one above, *ceteris paribus*, 1 per cent increase in the banks' credit leads to 2.29 per cent fall in the output. The opposite occurs in section 5.3.4, equation (7), where bank credit is found to boost the output, we will come to this later in section 5.3.5. Equation (1) shows that the output will increase by 1.31 per cent following 1 per cent increase in the liquid liabilities. On the other hand, an increase in the output causes the economic agents to increase their demand for liquid liabilities to facilitate the economic transactions that result from the increased output, and thus the liquid liabilities are endogenous in the model. There is no feedback to the banks' credit. Banks create credit to enable the production and in an anticipation of the output sales. This is in line with the theory of creditary production, chapter 4, section 4.2, where credit is for the entrepreneur to start the production, and liquid liabilities are the credits of the third parties to the bank. They demand the liquid liabilities to purchase the output of the entrepreneur. Thus, banks' credit to private sector is found to be weakly exogenous with respect to this equilibrium system, while liquid liabilities are not. Also, pair wise Granger causality has found that banks' credit is Granger causal for the gross domestic product, while gross domestic product is Granger causal for the liquid liabilities, Appendix A 2. Banks' assets are found to be Granger non-causal for any variable in the system, and hence its impulses generate no significant responses from the other variables in the system. A shock to the banks' credit creates a significant response from the gross domestic product, and the response persists on for eight periods, this is found in figure 5.6. Figure 5.6 gives the impulse responses in the VAR system, where the responses are expected to die out as the time span increases. Figure 5.7 gives the co-integrated impulse responses, where the response of a variable to a unit shock is given in the light of the dynamic interaction among the variables in the system; if the variable has a significant long run coefficient in the concerned long run equation, its response will be permanent. The responses correspond closely to the long run coefficients of the variables in the system after taking into account the dynamic interaction among the variables after a unit shock to one variable. Figure 5.7 gives us further insights about responses of the output to shocks to the banking variables. Equation (1) shows that a unit shock to the bank credit will result in 2.3 per cent fall in the output, this is correct assuming that the other variables including the bank credit itself do not react to the shock. If the other variables, including the bank credit itself, are allowed to

react, then the net response of the output to the unit shock to the bank credit is approximately 0.03 per cent fall. Similarly, the output will respond by 0.07 per cent increase to a unit shock to the liquid liabilities; compared to equation (1) that shows that ceteris paribus the output will increase by 1.3 per cent following a unit shock to the liquid liabilities. The bank asset has zero impact on the output

Figure 5.6: Impulse-responses of LRY in the VAR System

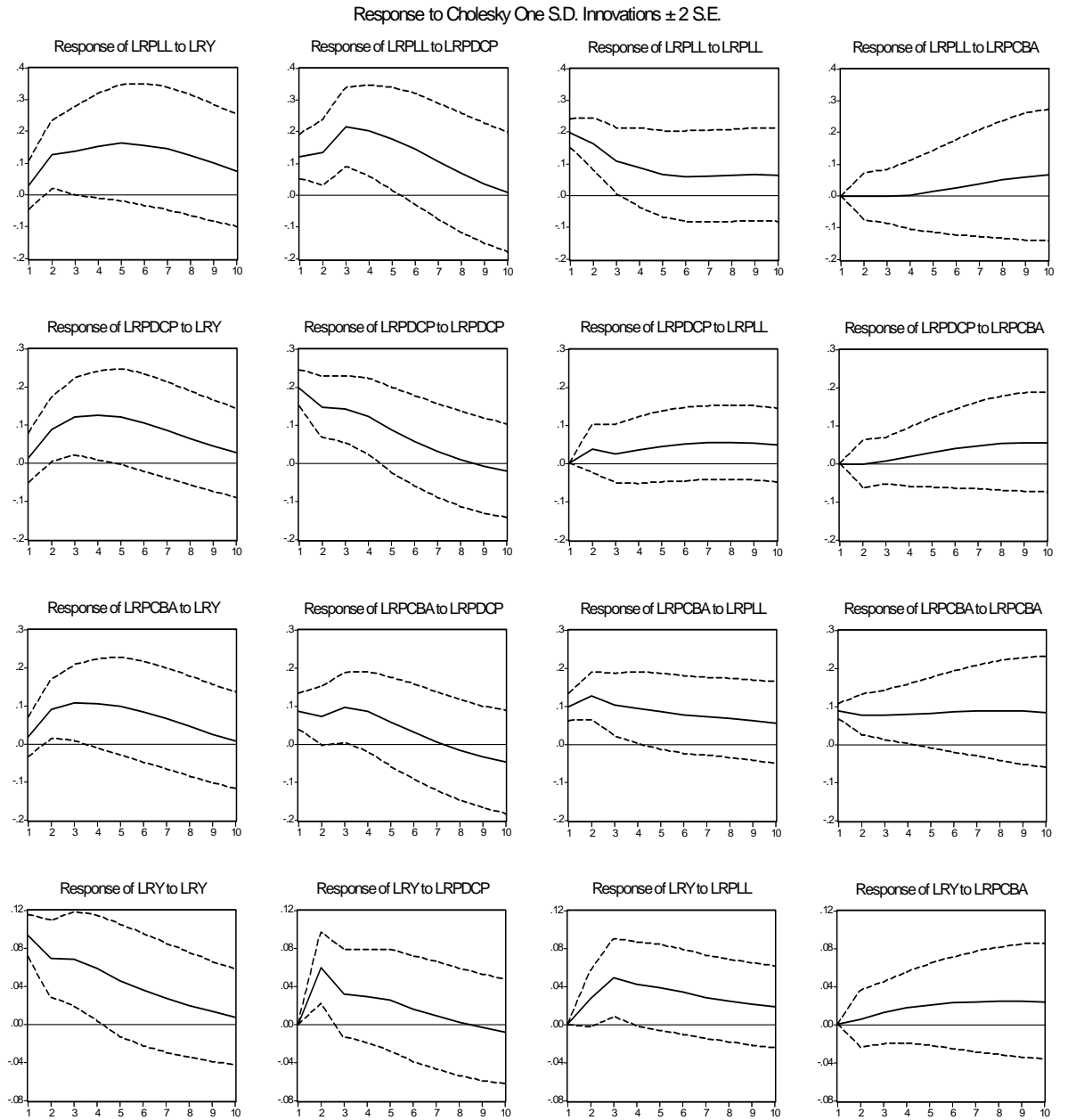
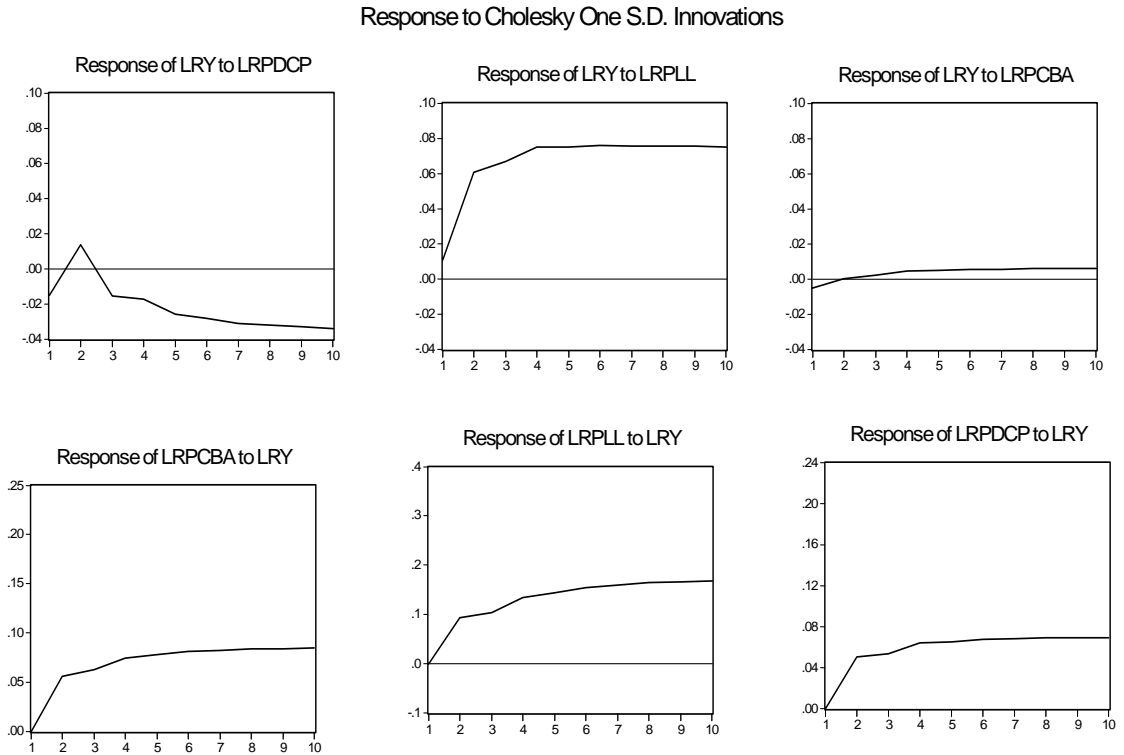


Figure 5.7: Impulse-Responses of LRY in the VECM



5.3.3 Physical Capital Stock and the Banking

There exists one co-integration relation between the physical capital and the linear combination of the banking factors, Appendix A3. Liquid liabilities appear irrelevant in this relation. It is banks' credit and assets that have significant long run coefficients. The convergence towards the equilibrium is also significant, indicating that the model is not explosive. The adjustment coefficients of the banking variables all appear insignificant, indicating that the banking factors could be weakly exogenous to the equilibrium system. Table 4 presents the unrestricted co-integration relation.

Table 4: Physical Capital versus Banking (unrestricted model)

1 Cointegrating Equation(s):		Log likelihood	80.96239
Normalized cointegrating coefficients (std.err. in parentheses)			
LRPK	LRPDCP	LRPLL	LRPCBA
1.000000	-0.104135 (0.09157)	-0.001226 (0.06713)	-0.206137 (0.09639)
Adjustment coefficients (std.err. in parentheses)			
D(LRPK)	-0.624580 (0.11539)		
D(LRPDCP)	0.125029 (0.23543)		
D(LRPLL)	0.371900 (0.30726)		
D(LRPCBA)	0.099545 (0.19603)		
LRPK = log real per capita physical capital. The other variables are as defined in section 5.3.2			

It shows that banks' credit and assets positively improve the capital accumulation in the economy. Physical capital does not feed back to both banks' credit and assets, and hence they are weakly exogenous to the estimation of physical capital. This is revealed in the following restrictions tests:

Table 5: Physical capital versus Banking (restricted model)

Standard errors in () & t-statistics in []				
Cointegrating Eq:	CointEq1			
LRPK(-1)	1.000000			
LRPDCP(-1)	-0.194496 (0.09882) [-1.96811]			
LRPLL(-1)	0.065601 (0.07245) [0.90545]			
LRPCBA(-1)	-0.217745 (0.10402) [-2.09333]			
C	-1.135941			
Error Correction:	D(LRPK)	D(LRPDCP)	D(LRPLL)	D(LRPCBA)
CointEq1	-0.601610 (0.09103) [-6.60913]			
Diagnosis Results:				
LR Test for the Restrictions $\chi^2(3) = 1.343$, Prob. = 0.7189				
Autocorrelation Test $\chi^2(16) = 16.887$, Prob. = 0.393				
Serial Correlation Test $\chi^2(16) = 11.67$, Prob. = 0.767				
Normality JB Test $\chi^2(8) = 5.00$, Prob. = 0.757				
Heterokedasticity Test $\chi^2(20) = 30.86$, Prob. = 0.057				

Ceteris paribus, the contribution of banking development to the capital accumulation is described by this long run relation,

$$lrpk_t = 1.14 + 0.19lrpdcp_t - 0.07lrpll_t + 0.22lrpcba_t + v_t \quad (2)$$

This model supports the claim that banking development increases capital stock accumulation. Banks like to finance assets that cannot be consumed entirely in one production cycle in order to provide banks with a sort of collateral. The collaterals are capital stock for the borrowers; thus, those with high collaterals could expect to have more bank financing than those with low collaterals. However, the weak exogeneity of the banking variables implies that it is banking factors that explain changes in the capital stock. The bank credit and asset go into increasing capital stock. Thus, increased banking

development could cause the diminishing returns to quickly set in due to the resultant increased capital accumulation. This will take a long time to occur. Our model shows that banking contribution to the capital accumulation is very small; for the capital stock to increase by approximately 20 per cent the bank credit or the bank asset has to increase by 100 per cent. This indicates that in the case of the Gambia, the increased banking development would not cause the diminishing returns to quickly set in. The impulse responses in figure 5.8 show how long the impacts of banking variables on the physical capital persist. The physical capital has approximately zero responses to the shocks to the banking variables; Whereas, the banking variables respond to the shock to the physical capital. The co-integrated impulse responses in figure 5.9, which correspond to the long run relation, the physical capital responds significantly to the shocks to the banking variables, and the banking variables do not respond significantly to the shocks to the physical capital. A shock to the bank credit will generate 0.035 per cent response from the capital stock, and similar response will be generated given a shock to the liquid liabilities; this dynamic interaction shows that the shock to the liquid liabilities causes a positive response from the physical capital contrary to the result in equation (2), where 1 per cent shock to the liquid liabilities lead to 0.07 per cent fall in the capital stock. The dynamic interaction in figure 5.9 gives the net effects of the shock, while the long run relation in equation (2) gives the gross effect of the shock assuming other variables remaining constant.

Figure 5.8: Impulse-Responses of LRPK in VAR

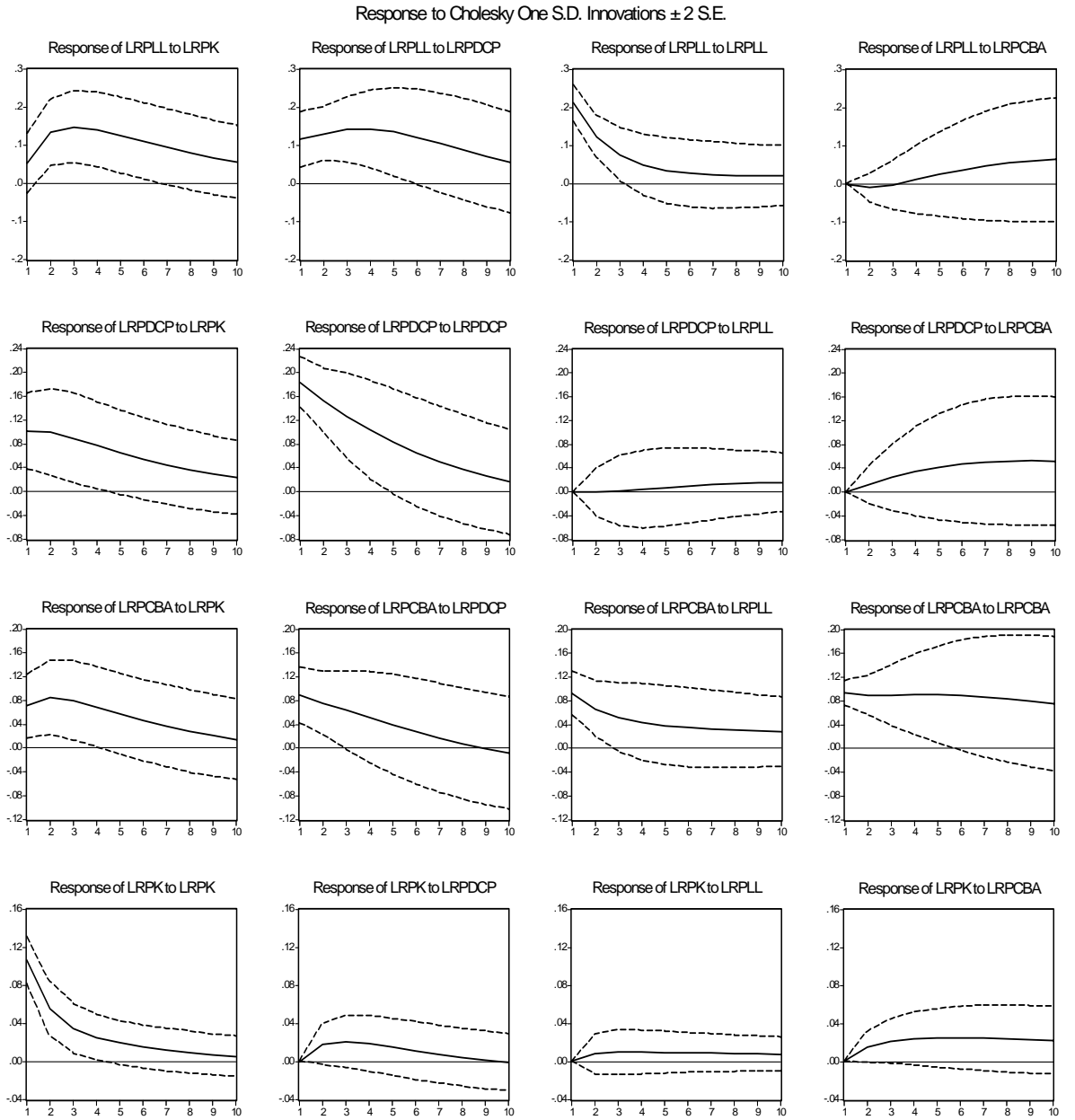
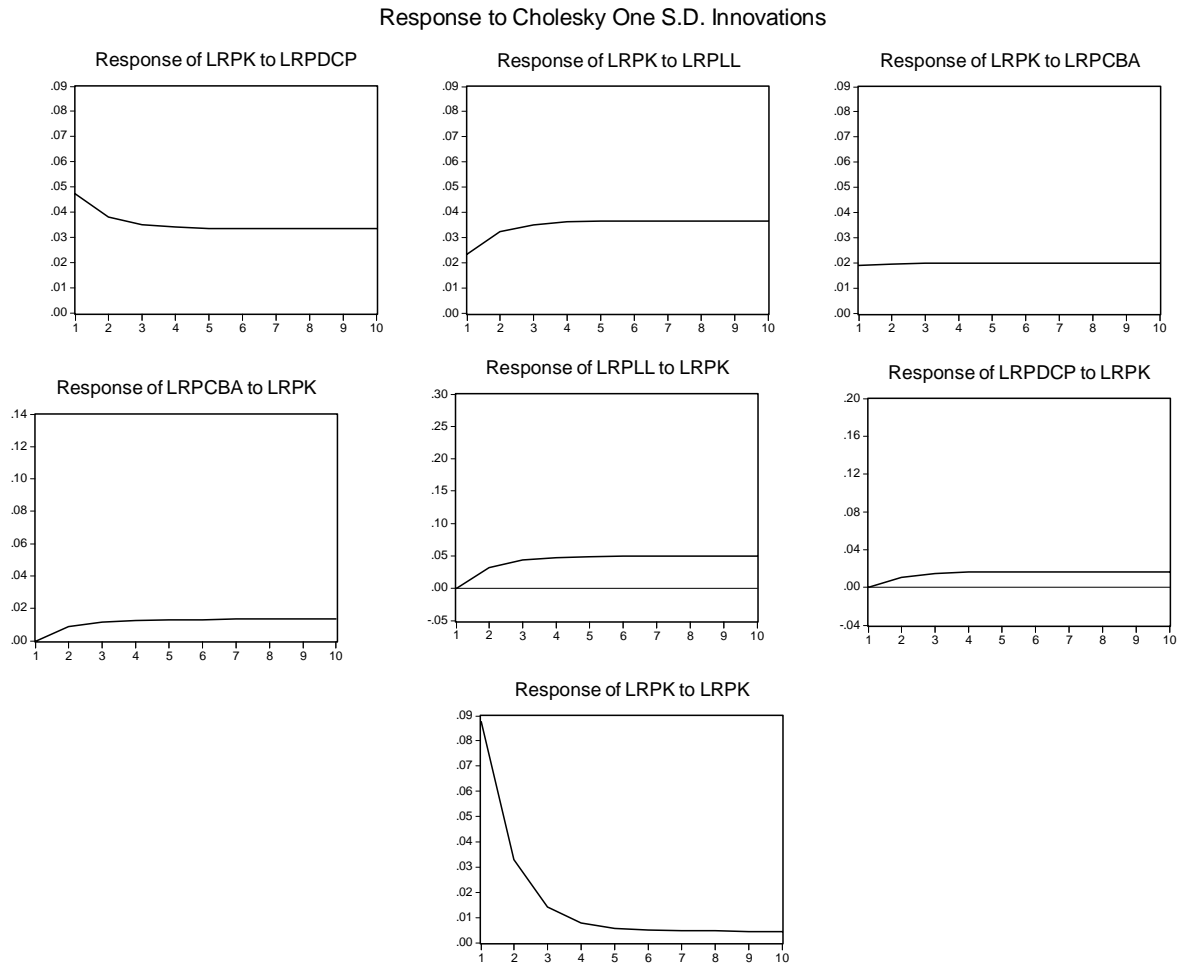


Figure 5.9: Impulse-Responses of LRPK in a VECM



5.3.4 Economic Efficiency and the Banking

We find one co-integration relation between the economic efficiency variable and the linear combination of the banking factors, Appendix A6. It is unexpected to find banks' credit irrelevant in this system. Credit activities of banks are expected to co-move with the economic efficiency. If bank credit activity is associated with reduced transactions costs and improved information flow, it should have a significant long run coefficient in this system. But as both the unrestricted relation in table 6 and the restricted relation in table 7 show the log real per capita banks' credit to the private sector is irrelevant in this system :

Table 6: Economic Efficiency versus Banking (unrestricted model)

1 Cointegrating Equation(s):		Log likelihood	145.3177
Normalized cointegrating coefficients (std.err. in parentheses)			
REFL	LRDCP	LRLI	LRCBA
1.000000	0.034525 (0.04649)	-0.052716 (0.02090)	0.110678 (0.03237)
Adjustment coefficients (std.err. in parentheses)			
D(REFL)	-0.339193 (0.03059)		
D(LRDCP)	0.142378 (0.32398)		
D(LRLI)	0.322561 (0.43058)		
D(LRCBA)	0.136503 (0.27081)		
REFL = log real economic efficiency per labor force			
LRDCP = log banks' credit to the private sector.			
LRLI = log real liquid liabilities of the banks.			
LRCBA = log real commercial banks' assets.			

The evidence here indicates that the credit activities of the banks in the Gambia do not contribute significantly to reduced transactions costs and improvements in the information flow. This is augmented by another evidence that no long run relation exists between the investments, either private or gross domestic investment, and the linear combination of the banking factors alone. The total banks' credit to the major economic activities have been declining, and the average lending rate has been soaring up with the spread between lending rates and the deposit rates ever widening, and this spread proxies for the transaction

costs; and this implies the lending activity has been the transaction costs. We will come to this point in Broaddus' model, section 5.3.6.

Table 7: Economic Efficiency versus Banking (restricted model)

Standard errors in () & t-statistics in []				
Cointegrating Eq:	CointEq1			
REFL(-1)	1.000000			
LRDCP(-1)	0.030123 (0.04587) [0.65676]			
LRL(-1)	-0.048164 (0.02062) [-2.33546]			
LRCBA(-1)	0.111297 (0.03194) [3.48435]			
C	-3.048514			
Error Correction:	D(REFL)	D(LRDCP)	D(LRL)	D(LRCBA)
CointEq1	-0.337932 (0.02506)	0.000000 (0.00000)	0.000000 (0.00000)	0.000000 (0.00000)
Diagnosis results:				
LR Test for Restriction $\chi^2(3) = 0.619$, Prob. = 0.892				
Autocorrelation Test $\chi^2(80) = 76.389$, Prob. = 0.594				
Serial Correlation Test $\chi^2(16) = 11.67$, Prob. = 0.766				
Normality JB Test $\chi^2(8) = 36.174$, Prob. = 0.000				
Heterokedasticity Test $\chi^2(20) = 37.70$, Prob. = 0.01				

The economic efficiency as a function of the banking development,

$$refl_t = 3.05 - 0.03lrscp_t + 0.05lrll_t - 0.11lrcba_t + u_t \quad (3)$$

The evidence in section is in contrast with the increasing number of banks in the country; increasing number of banks should have induced competition, and as a result the gap between the lending rates and the deposit rates would have been dwindling, and the information flow should have been increasing and promoting efficiency. The fact that banks' credit to the major economic sectors have been shrinking indicates that the nation's scarce savings resources have been inefficiently allocated. Therefore, the credit activities of

the banks are irrelevant for the efficiency estimation. The banks' liquid liabilities and assets are significant in the long run. The use of liabilities as means of payment promote efficiency in the economy. The banks' assets are inefficiently allocated, and as a result increased holding of misallocated assets can only reduce the economic efficiency.

The restrictions, in table 7, that the banking variables are weakly exogenous with respect to the equilibrium system, which is normalized by the long run coefficient of the economic efficiency, cannot be rejected. This presents another evidence that banking development is not endogenous to the economic development. Changes in the banking activities significantly lead changes in the economic factors. The impulse responses in figure 5.10 show that the economic efficiency does not react to the shocks to the bank liquid liabilities but negatively react to the shock to bank assets. It responds positively to the shock to the bank credit. The responses do die out quickly. The banking variables respond insignificantly to the shocks to the economic efficiency. These results confirm that of equation (3), where the banking variables are found not receiving feedbacks from the economic efficiency, and that the bank asset has a negative association with the economic efficiency. The effects of shocks on the economic efficiency to the banking variables in figure 5.11 are negative. That is, in a dynamic interaction among the variables in the system, the economic efficiency will fall following a shock to any banking variable in the system. On the other hand, a shock to the economic efficiency has zero impacts on the banking variables, further strengthening the weak exogeneity of these variables in the system.

In the next section, we expand our model to consists of four economic factors and the three banking variables. This gives us an opportunity to analyze the importance of the banking activities in the presence of other economic variables that can operate in the system as control variables.

Figure 5.10: Impulse-Responses of REFL in the VAR system

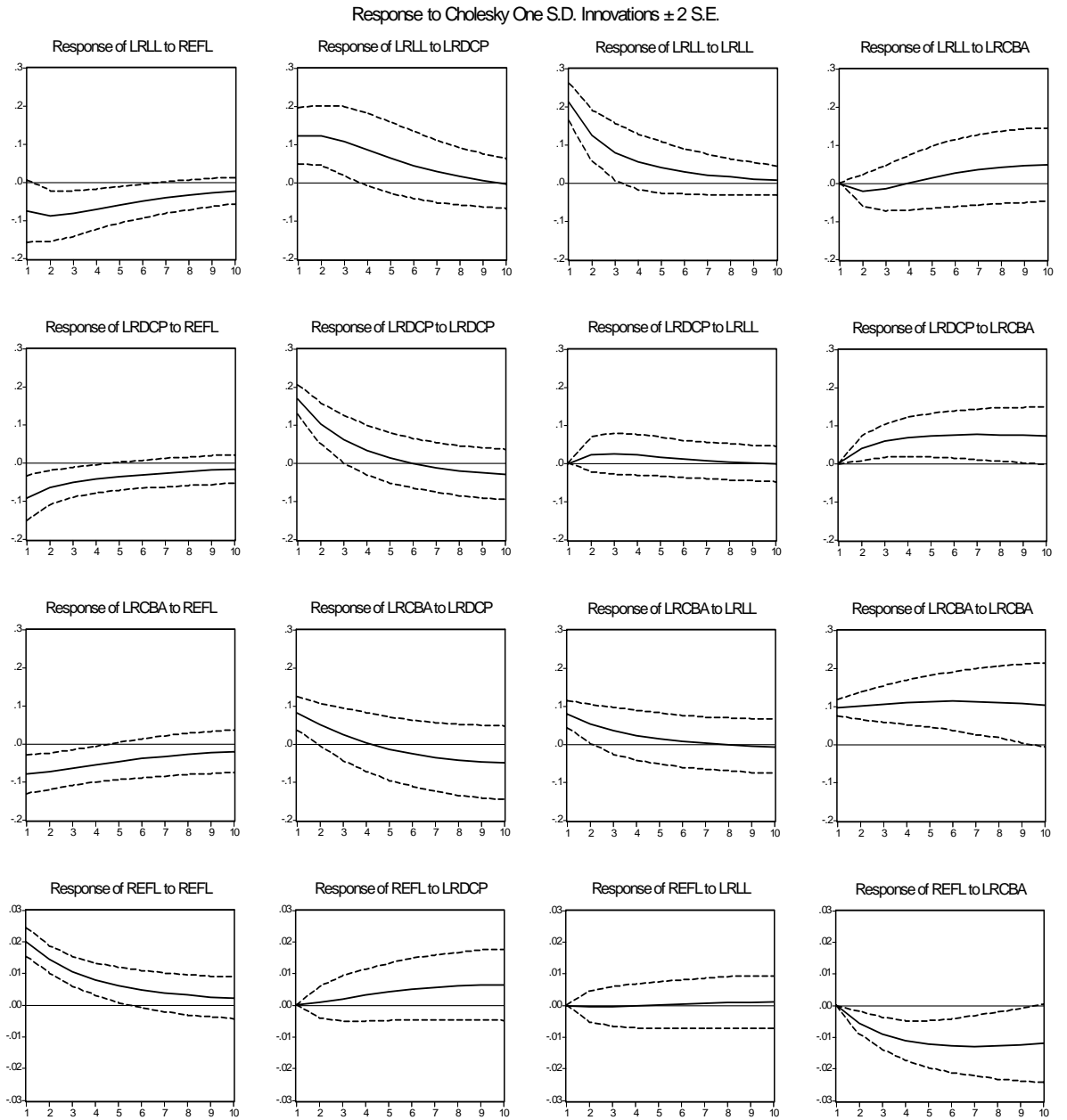
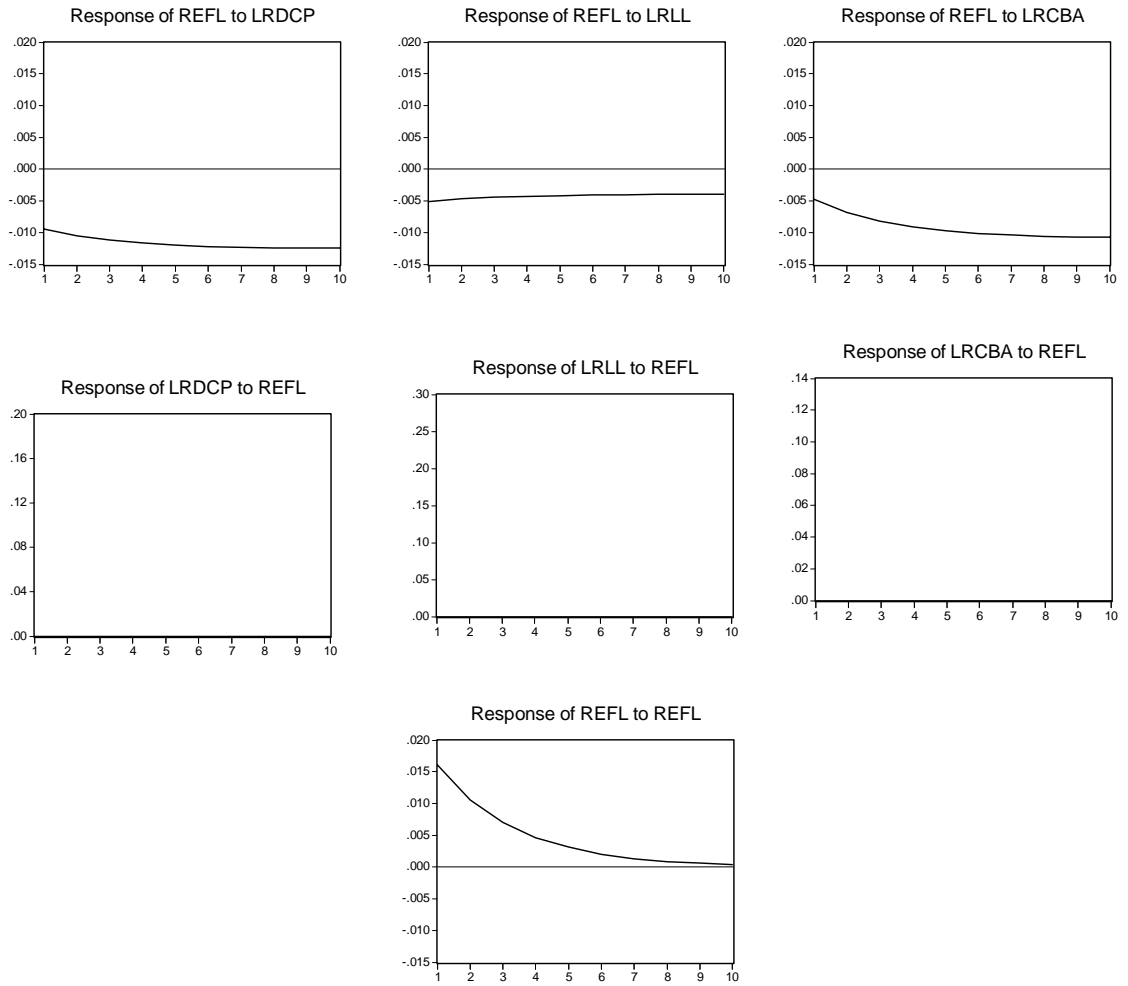


Figure 5.11: Impulse-Responses of REFL in VECM

Response to Cholesky One S.D. Innovations



5.3.5 Economic Activities and the Banking

We place all the economic variables, except the gross domestic investments, with the banking variables in one vector error correction model. We exclude the gross domestic investments to reduce the dimension of the system and economize the degrees of freedom of the system. Also, the gross domestic investments and private investments are each separately not found to be co-integrating with the linear combination of the banking variables, Appendices A4 and A5. The banks' credit to the private sector is expected to co-integrate with the private investments than with the gross domestic investments that include government investments; and hence we maintain the private investments and exclude the gross domestic investments from the system in this section. The economic variables are log real per capita GDP, log real per capita private investments, log real per capita physical capital and the economic efficiency. These variables are then followed in an ad hoc ordering by log real per capita banks' credit to the private sector, log real per capita liquid liabilities of the banks and log real per capita banks' assets. We find three co-integration relations in this system, appendix A7. Table 8 presents the unrestricted systems, the automatic restrictions there on the long run coefficients are needed to make the system just identified we perform the economic restrictions in table 9. The automatic restrictions however shows that each co-integrating row is normalized by an economic variable. Row one is the co-integration relation between the log real per capita GDP and the linear combination of the other variables in the system, row two is the co-integration relation between the log real per capita private investments and the linear combination of other variables in the system excluding the log real per capita GDP and the log real per capita capital; and row three is the co-integration relation between the log real per capita physical capital and other variables in the system excluding log real per capita GDP and log real per capita private investments. Banks' credit is significant only in the second and the third co-integrating rows; it is irrelevant in the estimation of log real per capita GDP. Also, the log real per capita liquid liabilities are irrelevant in the estimation of log real per capita GDP. Banks' assets are irrelevant in the second co-integration row but relevant in the first and the third co-integration rows. Improvements in the real per capita economic efficiency has almost one-to-one relation with the log real per capita GDP, the log real per capita private investments and the log real per capita physical capital. Efficiency substantially contributes

to the economic growth. Banks' credit and liquid liabilities have insignificant contributions to the real per capita GDP in the presence of economic efficiency and bank assets. Furthermore, an increase in the banks' credit constitutes falls in both log real per capita private investments and log real per capita physical capital. That is, banks' credits in the Gambia do not promote entrepreneurs or capital formation. They are directed to personal loans of consumptions and distributive trades of import and export. Project and development financings are seldom undertaken by the Gambian banks. We notice this fact in chapter 2, figure 2.10, where their portfolios in the distributive trades and foreign assets have been expanding. Liquid liabilities are relevant in the second and the third co-integration equations, and they positively contribute to the log real per capita private investments and the log real per capita physical capital. This could be accrued to the payment facility the liquid liabilities provide for the economic agents. In the survey, we found that easy payment is one of the most important reasons why the economic agents place their money in the banks. The unrestricted findings of the system are presented in table 8.

Table 8: Economic Activities versus Banking (unrestricted model)

3 Cointegrating Equation(s):		Log likelihood	296.8835			
Normalized cointegrating coefficients (std.err. in parentheses)						
LRY	LRPPI	LRPK	RPEF	LRPDCP	LRPLL	LRPCBA
1.000000	0.000000	0.000000	-1.030812 (0.05303)	-0.001150 (0.03075)	0.007162 (0.02056)	-0.084116 (0.02965)
0.000000	1.000000	0.000000	-0.945896 (0.21030)	0.317793 (0.12193)	-0.104399 (0.08153)	-0.156870 (0.11757)
0.000000	0.000000	1.000000	-0.670520 (0.15457)	0.407573 (0.08962)	-0.139964 (0.05993)	-0.292735 (0.08641)
Adjustment coefficients (std.err. in parentheses)						
D(LRY)	-0.180450 (0.24986)	-0.002536 (0.12696)	-0.021854 (0.12702)			
D(LRPPI)	0.113953 (0.38757)	-0.607388 (0.19692)	-0.105502 (0.19702)			
D(LRPK)	-0.769334 (0.16874)	0.292427 (0.08574)	-0.455704 (0.08578)			
D(RPEF)	0.280502 (0.23538)	-0.069222 (0.11960)	-0.026430 (0.11966)			
D(LRPDCP)	-0.074186 (0.46295)	0.190855 (0.23522)	-0.293877 (0.23533)			
D(LRPLL)	-0.928054 (0.57838)	0.372881 (0.29388)	0.539988 (0.29401)			
D(LRPCBA)	-0.250150 (0.39313)	0.132268 (0.19975)	0.026395 (0.19985)			
<p>LRY = log real per capita GDP. LRPPI = log real per capita private investments. LRPK = log real per capita physical capital. RPEF = log real per capita economic efficiency. LRPDCP = log real per capita banks' credit to the private sector. LRPLL = log real per capita liquid liabilities of the commercial banks. LRPCBA = log real per capita commercial banks' assets.</p>						

If one has demand deposit accounts with banks one will be able to make easy payments through the banks to purchase capital and investment goods; but one cannot rely on the bank credits to finance the purchases of capital and investment goods. The other reason for the negative contribution of banks' credit to both private investments and physical capital accumulation could be due to the evidence derived in section 5.3.4, where we find that banks' credit does not induce efficiency. The credits are not efficiently allocated, and hence they cannot promote investments and capital formation. Table 8 has an assumption that each co-integration equation represents a behavioral relationship between one economic

factor and the linear combination of the banking variables including the economic efficiency. For example, equation four assumes that in the long run output co-move only with economic efficiency and the banking variables, the private investment and the capital are set to zero. The assumption though unrealistic helps us examine the behavior of banking in the presence and in the absence of relevant economic factors. In table 9, we relax this assumption and test also the weak exogeneity of the banking variables. We normalize equation four by the long run coefficient of the output and set long run coefficient of bank asset to zero. The bank asset was found insignificant in the individual model of the output, section 5.3.2. We assume that goods market (here output model) does not require bank assets but bank credit and liquid liabilities to facilitate the transactions of the goods; we also set the long run coefficient of the economic efficiency to zero in equation four. In subsection 4.4.4, we derived the economic efficiency from a production function using the output and the capital variables, and thus the presence of the output and the capital in equation four motivates us to remove the economic efficiency variable to improve over a possible problem of autocorrelation. Similarly, the same reason motivates us to remove economic efficiency variable from equation six because both the output and the capital are present there. Equation five is normalized by the long run coefficient of private investment. In this equation we set both the long run coefficients of the output and the capital to zero on the assumption that the economic efficiency variable sufficiently represents both the output and the capital. We restrict the long run coefficient of liquid liabilities to zero in equation six; in the individual model of capital accumulation, the liquid liabilities are found insignificant and this motivates us to set it zero in equation six. Finally, we set the adjustment coefficients of the economic efficiency and banking variables to zero to test their weak exogeneity in the system. Table 9 presents the results.

Table 9: Economic Activities versus Banking (restricted model)

Standard errors in () & t-statistics in []							
Cointegrating Eq:	CointEq1	CointEq2	CointEq3				
LRY(-1)	1	-	0.365549 (0.09010) [4.05699]				
LRPPI(-1)	-1.238554 (0.06468) [-19.1477]	1	-1.001170 (0.10676) [-9.37748]				
LRPK(-1)	0.446325 (0.02342) [19.0568]	-	1				
RPEF(-1)	-	-1.114093 (0.08100) [-13.7545]	-				
LRPDCP(-1)	-0.194588 (0.08475) [-2.29614]	0.143844 (0.10602) [1.35682]	-0.054208 (0.07201) [-0.75280]				
LRPLL(-1)	0.011465 (0.03550) [0.32298]	0.036810 (0.06515) [0.56504]	-				
LRPCBA(-1)	-	-0.137280 (0.05361) [-2.56087]	-0.108017 (0.04840) [-2.23181]				
C	3.951162	-3.926807	2.851963				
Error Correction:	D(LRY)	D(LRPPI)	D(LRPK)	D(RPEF)	D(LRPDCP)	D(LRPLL)	D(LRPCBA)
CointEq1	-0.525545 (0.04085) [-12.8649]	0.953305 (0.43347) [2.19923]	-0.340188 (0.22436) [-1.51625]	-	-	-	-
CointEq2	-0.343725 (0.02072) [-16.5851]	-0.276103 (0.21991) [-1.25551]	-0.502873 (0.11382) [-4.41797]	-	-	-	-
CointEq3	0.246183 (0.03209) [7.67150]	-0.786612 (0.34051) [-2.31007]	-0.364047 (0.17625) [-2.06555]	-	-	-	-

Diagnosis results:
 LR Test for the Restrictions $\chi^2(12) = 13.166$, Prob. = 0.357
 Autocorrelation Test $\chi^2(245) = 270.14$, Prob. = 0.130
 Serial Correlation Test $\chi^2(49) = 56.69$, Prob. = 0.21
 Heterokedasticity Test $\chi^2(168) = 178.51$, Prob. = 0.275

The restrictions give the following long run system of equations:

$$lry_t = -3.95 + 1.24lrppi_t - 0.45lrpk_t + 0.19lrpdc_p_t - 0.01lrpll_t + e_t \quad (4)$$

$$lrppi_t = 3.93 + 1.11rpef_t - 0.14lrpdc_p_t - 0.04lrpll_t + 0.14lrpcba_t + v_t \quad (5)$$

$$lrpk_t = -2.85 - 0.37lry_t + 1.00lrppi_t + 0.05lrpdc_p_t + 0.11lrpcba_t + z_t \quad (6)$$

The long run system of equations reveals that the importance of banking erodes in the presence of relevant economic variables. Equation four is the output function that depends on the private investment, capital stock, banks' credit to private sector and the liquid liabilities of the banks. The long run coefficients of the private investment, the capital stock and the bank credit are significantly different from zero, while the liquid liabilities variable has zero impact on the output. The banking variables in this equation have the expected signs, increased bank credit is associated with increased trades, and as a result the output must increase following an increase in the bank credit. In the individual model of output function, section 5.3.2, bank credit has a negative sign indicating that individual models could produce misleading results due to the absence of control variables. Equation five is the private investment function that depends on the economic efficiency, bank credit to the private sector, liquid liabilities and the bank asset. There is approximately one-to-one relation between the economic efficiency and the private investment. Efficiency resulting from reduced transaction costs, increased information flow or improved method of production will definitely increase the private investments. Also, increased bank credit should have a positive impact on the private investment. But the result, though significant only at 10 %, shows that the bank credit increase reduces the private investments. This could be true, if the banks that have the nation's savings choose to place the funds in only distributive trade, import and export, and ignore to incubate financially the local industries, or help develop the local entrepreneurs, then increased bank credit may not have a telling impact on the private sector activities. However, increased bank asset increases the private investments; this could result from the fact that banks' asset trading involves the private sector investments. The private sector also can infer some relevant information from the types of assets the banks hold and hence motivating the private sector to invest in those assets because the banks are believed to have superior information. Equation six is a capital accumulation function that depends on the output, the private investment, the bank credit

and the bank assets. The result shows one-to-one relation between the private investment and the capital accumulation. The bank credit is irrelevant to the capital accumulation, while increased bank asset promotes capital accumulation. The system of equations shows that liabilities side of the bank balance sheet is irrelevant as the economic activities are concerned. The two variables from the asset side of the balance sheet, bank credit and bank asset, are proven relevant. Bank credit positively facilitates the trading of the output; while the bank asset positively promotes the private investments and the capital accumulation. It also shows that bank impact on the economic activities are eroded and in some cases rendered irrelevant in the presence of control variables. The impact of banks is more visible in the individual models, where the control variables are absent. On the exogeneity of the banking factors, the test reveals that all the banking variables are weakly exogenous with respect to the equilibrium system. This means banking factors are explanatory variables for the economic activities; and that the banking factors feed back onto the economic activities, while the economic activities do not feed back onto the banking factors, except in the individual models, where we find that output does feed back onto the liquid liabilities of the banks.

Four long run coefficients are found insignificant in table 9. Among the banking variables it is only the banks' assets that are found relevant in the private investments function. The private investments are the only economic variable in table 9 that are found not co-integrating with the banking variables, appendix A4, then they may not have a long run function as given in equation 5. Also, the presence of the private investments has made the set of the economic variable to have a full rank, Appendix A11. The set that contains only the output, the physical capital and the economic efficiency has no co-integration rank, Appendix A12. Likewise, the set of the banking variables has no co-integration rank, Appendix A13. Thus, the three co-integrating relations in table 9 could be corresponding closely to the combination of output and the banking variables, section 5.3.2, capital and banking variables, section 5.3.3 and economic efficiency and banking variables, section 5.3.4. We therefore remove the private investments and re-estimate section 5.3.5 model. Now both the two sets, the set of the economic variables and the set of the banking variables, have no co-integration relation, Appendices A12 and A13. After combining them into one set we get three co-integrating relations, Appendix A8; and the weak exogeneity of

all the banking variables in the system is rejected, Appendix A9. Table 10 below presents the unrestricted system, and table 11 presents the system with the binding restrictions.

Table 10: Economic Activities versus the Banking (unrestricted system, six variables)

3 Cointegrating Equation(s):		Log likelihood		347.2156	
Normalized cointegrating coefficients (std.err. in parentheses)					
LRY	LRPK	RPEF	LRPDCP	LRPLL	LRPCBA
1.000000	0.000000	0.000000	-0.706894 (0.15668)	0.122242 (0.08359)	0.214646 (0.08417)
0.000000	1.000000	0.000000	0.592911 (0.12961)	-0.371343 (0.06915)	-0.486683 (0.06963)
0.000000	0.000000	1.000000	-1.081611 (0.21368)	0.297787 (0.11400)	0.483034 (0.11479)
Adjustment coefficients (std.err. in parentheses)					
D(LRY)	-0.233874 (0.66036)	-0.404836 (0.22236)	-0.187943 (0.54179)		
D(LRPK)	0.777567 (0.98728)	-0.661730 (0.33244)	-0.655213 (0.81001)		
D(RPEF)	-0.082256 (0.54310)	-0.413138 (0.18288)	-0.309462 (0.44559)		
D(LRPDCP)	1.018557 (2.30845)	0.303126 (0.77731)	-0.083805 (1.89396)		
D(LRPLL)	6.003241 (2.55748)	-0.497402 (0.86116)	-4.757040 (2.09828)		
D(LRPCBA)	2.424696 (1.66786)	0.452361 (0.56161)	-1.895168 (1.36839)		
LRY = log real per capita GDP.					
LRPK = log real per capita physical capital.					
RPEF = log real per capita economic efficiency.					
LRPDCP = log real per capita banks' credit to the private sector.					
LRPLL = log real per capita liquid liabilities of the commercial banks.					
LRPCBA = log real per capita commercial banks' assets					

In the unrestricted system above, many adjustment coefficients of the banking variables appear insignificant, but restricting all of them to zero is rejected at 1 % significance level, Appendix A 9. This forces us to evaluate their weak exogeneity separately, and we then find that only the adjustment coefficients of LRPDCP in columns one and two can be significantly restricted to zero. The rationale for the restrictions on the long run coefficients to make the system just identified are the same like that given for the table 9 restrictions on the long run coefficients. Table 11 below gives the restricted system:

Table 11: Economic Activities versus Banking (restricted system, six variables)

Cointegrating Eq:	CointEq1	CointEq2	CointEq3			
LRY(-1)	1.000000	3.037934 (0.02228) [136.377]	0.000000			
LRPK(-1)	0.441088 (0.00871) [50.6324]	1.000000	0.000000			
RPEF(-1)	0.000000	0.000000	1.000000			
LRPDCP(-1)	-0.440969 (0.04428) [-9.95932]	-1.546167 (0.12880) [-12.0046]	-1.093007 (0.12015) [-9.09670]			
LRPLL(-1)	-0.042043 (0.00757) [-5.55537]	0.000000	0.302554 (0.05699) [5.30910]			
LRPCBA(-1)	0.000000	0.165698 (0.02398) [6.90907]	0.483709 (0.06470) [7.47561]			
C	-1.632926	-3.982628	1.304955			
Error Correction:	D(LRY)	D(LRPK)	D(RPEF)	D(LRPDCP)	D(LRPLL)	D(LRPCBA)
CointEq1	-2.904254 (3.46796) [-0.83745]	-8.111217 (5.19895) [-1.56016]	-3.432263 (2.99072) [-1.14764]	0.000000 (0.00000) [NA]	-21.80063 (11.5746) [-1.88349]	-2.698942 (5.75171) [-0.46924]
CointEq2	0.843579 (1.33422) [0.63227]	2.869998 (2.00018) [1.43487]	1.085166 (1.15061) [0.94312]	0.000000 (0.00000) [NA]	8.926404 (4.45306) [2.00456]	1.477616 (2.21284) [0.66775]
CointEq3	-0.109007 (0.50305) [-0.21669]	-0.530316 (0.75410) [-0.70324]	-0.269712 (0.43333) [-0.62242]	0.651059 (0.28402) [2.29231]	-4.263347 (1.68682) [-2.52744]	-1.434025 (0.84907) [-1.68894]
Diagnosis results:						
LR Test for the Restrictions $\chi^2(2) = 2.973$, Prob. = 0.226						
Serial Correlation Test $\chi^2(36) = 41.683$, Prob. = 0.237						
Heterokedasticity Test $\chi^2(630) = 640.6$, Prob. = 0.371						

All the long run coefficients in table 11 are significantly different from zero, while table 9 has four insignificant long run coefficients. Banking role has dwindled in table 9, while in table 11 the banks' credit has maintained the expected sign in all the three equations, it shows that banks' credit significantly promote output, capital accumulation and economic efficiency.

The long run system of equations of table 11 are,

$$LRY_t = 1.634 - 0.44LRPK_t + 0.441LRPDCP_t + 0.042LRPLL_t + e_t \quad (7)$$

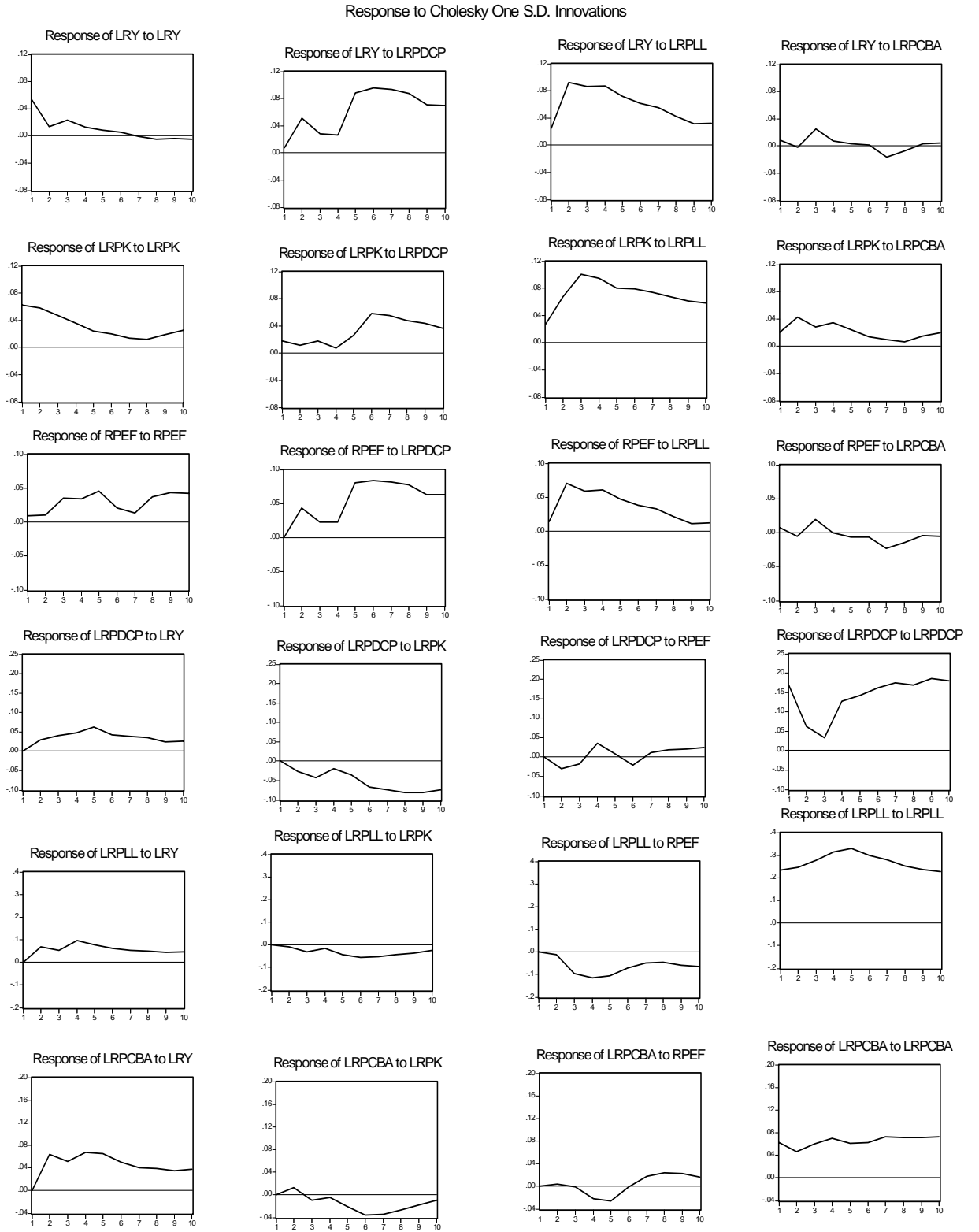
$$LRPK_t = 3.983 - 3.04LRY_t + 1.55LRPDCP_t - 0.166LRPCBA_t + u_t \quad (8)$$

$$RPEF_t = -1.3 + 1.093LRPDCP_t - 0.302LRPLL_t - 0.484LRPCBA_t + v_t \quad (9)$$

Equation (7) shows that log real per capita banks' credit to the private sector, LRPDCP, and the log real per capita banks' liquid liabilities, LRPLL, have positive impacts on the log real per capita GDP, LRY, and the log real per capita physical capital has a negative impact on LRY. Increased physical capital accumulation accelerates the diminishing returns to scale, and hence in the long run capital accumulation will depress the output growth. Section 3.3.4 gives empirical evidence that banks retard the economic growth for the fact that their financing activities tend to promote capital accumulation. Equation (7) does not support this evidence, the banks' credit here promotes the output and does not retard its growth. Equation (8) does provide evidence that banks' credit promotes capital accumulation, ceteris paribus, 1 per cent increase in the banks' credit, LRPDCP, will lead to 1.55 per cent increase in LRPK. If the banks credit retards economic growth by promoting capital accumulation, then the long run coefficient of bank credit in equation (7) should have been negative and positive in equation (8). Banks' credit is also found to improve the economic efficiency, while the banks' assets and liquid liabilities do not, equation (9). The co-integrated impulse responses in figure 6.13 also reveal that LRY reacts positively to LRPDCP shock and LRPLL shock as equation (7) states. A shock to LRPCBA generates almost a zero response from the LRY, LRPK and RPEF. This shows that in a dynamic interaction, the importance of the banks' assets becomes almost negligible; while the banks' credit and liquid liabilities have persistent impacts. This outcome is close to the results of the Granger causality test, Appendix A10. In this test, the banks' credit and liquid liabilities are found to be Granger causal for all the variables in the system except the physical capital, and none of the variables is Granger causal for them. The economic variables are non-Granger causal for the banking variables. Thus banking activity has direct impact on the economy; its increased credit activity and liquid liabilities have positive long run impacts on the output growth. The increased bank credit to the private sector also increases the capital accumulation and improves the economic efficiency. But the increased

total asset activity of the banks tends to reduce both capital accumulation and economic efficiency; similarly the increased liquid liabilities are not efficiency improving.

Figure 5.12: VEC Impulse responses, Economic variables versus banking



5.3.6 Broaddus' Model

Competitive banking industry can efficiently allocate the nation's savings, while a monopolist system will breed inefficiency, and the scarce savings will be inefficiently allocated. The activity of efficient allocation of savings will "hold the loan interest rate at exactly the level required to equate total revenue and total deposit interest costs", Broaddus (1973). As the model is presented in chapter four, the loan interest rate and the deposit interest rate must move in an equilibrium relationship. At 5% significance level under both trace and max-eigenvalue tests we have one co-integration relation, Appendix A14. The loan interest rate and the deposit interest rate are found to co-move in an equilibrium relationship. Thus, the existence of this long run relation rules out the existence of spurious relation between the loan interest rate and the deposit interest rate. The loan interest rate is found to feed back to the deposit interest rate. A 1 per cent increase in the loan interest rate tends to increase the deposit interest rate by 0.3 per cent in the subsequent period. Table 12 gives us the results.

Table 12: Lending and Deposit rates

Standard errors in () & t-statistics in []		
Cointegrating Eq: CointEq1		
LR(-1)	1.000000	
DR(-1)	-3.058189 (0.28625) [-10.6838]	
C	11.98716	
Error Correction:	D(LR)	D(DR)
CointEq1	0.462225 (0.11148) [4.14608]	0.286881 (0.07066) [4.06017]

LR = lending interest rate.
DR = deposit interest rate.
Diagnosis results:
Autocorrelation Test $\chi^2(16) = 17.88$, Prob. = 0.331
Serial Correlation Test $\chi^2(4) = 3.265$, Prob. = 0.514

Broaddus' Model,

$$LR_t = -11.987 + 3.058DR_t + e_t \quad (10)$$

where the estimated parameters are,

$$\alpha = -11.987$$

$$\beta = 3.058 = \frac{1}{1 - rr_D}$$

$$\text{then, } rr_D = 0.67$$

The intercept term is significantly different from zero. This indicates that the banking industry is not operating at an efficient level. The inefficiency represents case one in chapter 4. It is the case where the macroeconomic policies suppress lending rates to achieve a positive shift of aggregate demand, the lending rates are repressed. The negative intercept implies that the lending rate is below its equilibrium level, and the borrowers have been subsidized. Also, the empirical reserve ratio of 67% is substantially larger than our calculated average regulatory reserve ratio of 19.27% over the observation period. This means the banking industry has deviated substantially from the equilibrium point, where the empirical reserve ratio is equal to the regulatory reserve ratio; and it is manifest in the large spread between the lending interest rate and the deposit interest rate, and as a results the banking industry is uncompetitive and inefficient. This empirical evidence is very close to the banking realities in the Gambia in the 1960's, 1970's and early 1980's. In these periods, the dominant banks in the Gambia were Gambia Agricultural Development Bank and Gambia Commerce and Development Bank. The two banks lent huge amounts of loans at below market interest rates resulting in an inefficient allocation of the savings and misuse of the loan facilities. They eventually went bankrupt, and the assets of one of them is still being recovered by Gambia Assets and Management Recovery Corporation, a company that was set up purposely for that. At the time it went bankrupt, the Agricultural Development Bank had 44% of the total liabilities of banking industry. Thus, the evidence here that the lending interest rate has been repressed, the loan takers have been subsidized and that the banking industry is inefficient and uncompetitive given the large empirical reserve ratio cannot be rejected. In the next section, I analyze the loans market of the

banking industry and attempt to identify the credit demand and credit supply functions. This will help us identify the important determinants of the two functions.

5.3.7 Banks' Credit Market

I explore here the demand for and the supply of banks' credit from supply and demand views. In addition to identifying the determinants of the two functions, I can characterize the shapes of the two curves based on the estimated slope coefficients and determine whether or not the bank credit is supply constrained. The functions are taken from Catao (1997) as follows:

$S_t = f(LR_t, LC_t)$: Supply function of banks' credit

$D_t = f\left(LR_t, GDP_t, PD_t, \left(\frac{GD}{GDP}\right)_t\right)$: Demand function of banks' credit

$S_t = D_t$: at the equilibrium

where,

S = credit volume of the banks

D = credit demand

LR = lending rate

LC = lending capacity of the banking: demand deposits + capital

PD = private sector debt.

GD = government current expenditure

GDP = gross domestic product.

The demand for the banks' credit is determined by the costs of borrowing, (LR) and by the economic activity. I drop out the measures of private sector debt and the government expenditure on the assumption that the lending rate has already embodied these variables,. The supply and the demand together determine the equilibrium. Thus my vector auto-regression, z , consists of the variables as below:

$z_t = (DCP_t, LR_t, DR, LC_t, GDP_t)$

The deposit interest rate, DR, measures here the maintenance costs of the deposits, and we use it also to measure the profitability on the demand side. The nominal GDP measures the

products in terms of the nominal prices. Changes in GDP could be due to nominal price changes or real changes in the economic activities or both. Thus, Banks' credit supply depends on the lending interest rate, LR, the cost of deposits, DR, the lending capacity, LC, GDP and the level of economic activities, GDP. Problem loans are important factors in the credit supply of the banks, it is only that no reliable data could be collected on this variable in the Gambia.

Supply and Demand Functions of Bank Credit

Under the assumption of linear deterministic trend in the data, two co-integration relations are estimated at both 1 % and 5 % significance levels by both trace test and the max-eigenvalue test, Appendix A15. To identify these relations as supply and demand functions, I introduce certain restrictions. The first co-integration row in table 13 is taken as the supply curve of bank credits, and it is normalized by the long run coefficient of LDGP. The second co-integration row is taken as the inverse demand function of the bank credits, and it is normalized by the long run coefficient of LR. In the supply function, I restrict the coefficient of the LGDP to be zero, and in the demand function, I restrict the coefficient of the LLC to be zero. In other words, the effect of GDP in the credit supply function is captured by the lending capacity. Similarly, the effect of the lending capacity is captured by the GDP and the profitability measure of DR in the entrepreneurs' demand for bank credit. Deposit interest rates are costs to the bankers but returns on the entrepreneurs' savings. They are relevant in the determination of both demand and supply functions of credit. With these identification restrictions, only the deposit interest rate is found to be weakly exogenous with respect to the co-integration equation one, the supply function. Table 14 gives the restricted results.

Table13: Demand for and Supply of Credit (restrictions not binding)

Restrictions:				
B(1, 1)=1, B(2, 2)=1, B(1, 5)=0, B(2, 4)=0				
Tests of cointegration restrictions:				
Hypothesized No. of CE(s)	Restricted Log-likelihood	LR Statistic	Degrees of Freedom	Probability
2	153.1851	NA	NA	NA
2 Cointegrating Equation(s): Convergence achieved after 1 iterations.				
Restricted cointegrating coefficients (std.err. in parentheses)				
LDCP	LR	DR	LLC	LGDP
1.000000 (0.00000)	-0.057599 (0.00439)	0.110920 (0.00833)	-0.803948 (0.01084)	0.000000 (0.00000)
2.695212 (0.24606)	1.000000 (0.00000)	-1.121912 (0.06638)	0.000000 (0.00000)	-4.837689 (0.23624)
Adjustment coefficients (std.err. in parentheses)				
D(LDCP)	-2.689352 (0.75330)	-0.113378 (0.04559)		
D(LR)	-11.72357 (19.8566)	2.105997 (1.20172)		
D(DR)	-7.377498 (12.6709)	1.077035 (0.76684)		
D(LLC)	-1.963774 (1.20117)	-0.115469 (0.07269)		
D(LGDP)	-0.853926 (0.69096)	0.066335 (0.04182)		
LDCP = log banks' credit to the private sector.				
LR = lending interest rate.				
DR = deposit interest rate.				
LLC = log lending capacity of the commercial banks.				
LGDP = log gross domestic product.				

Table14: Demand for and Supply of Credit (binding restrictions)

Chi-square(1)	0.870511					
Probability	0.350814					
Cointegrating Eq:		CointEq1	CointEq2			
LDCP(-1)	1.000000	2.583479 (0.25265) [10.2256]				
LR(-1)	-0.059108 (0.00458) [-12.8999]	1.000000				
DR(-1)	0.112590 (0.00875) [12.8696]	-1.125129 (0.06875) [-16.3646]				
LLC(-1)	-0.800895 (0.01140) [-70.2735]	0.000000				
LGDP(-1)	0.000000	-4.726127 (0.24175) [-19.5493]				
C	-0.432690	11.03784				
Error Correction:		D(LDCP)	D(LR)	D(DR)	D(LLC)	D(LGDP)
CointEq1	-2.681641 (0.78682) [-3.40822]	-0.796960 (10.6773) [-0.07464]	0.000000 (0.00000) [NA]	-1.309150 (0.44925) [-2.91411]	-0.681326 (0.68084) [-1.00071]	
CointEq2	-0.115688 (0.04931) [-2.34635]	2.309846 (1.28146) [1.80251]	1.232735 (0.80438) [1.53253]	-0.109057 (0.07639) [-1.42762]	0.070887 (0.04533) [1.56388]	
Diagnosis results:						
LR Test for the Restrictions $\chi^2(1) = 0.87$, Prob. = 0.351						
Autocorrelation Test $\chi^2(200) = 275.91$, Prob. = 0.000						
Serial Correlation Test $\chi^2(25) = 36.58$, Prob. = 0.063						

The credit supply function is,

$$ldcp_t = 0.433 + 0.059lr_t - 0.113dr_t + 0.8llc_t + u_t \quad (11)$$

and the inverse credit demand function is ,

$$lr_t = -11.037 - 2.58ldcp_t + 1.125dr_t + 4.726lgdp_t + e_t \quad (12)$$

The lending interest rate is the price of the credit quantity, its long run coefficient is the slope coefficient of the supply function. Thus, in moving along supply curve the credit

quantity supplied will increase as the lending rate increases. Whereas, in moving along the demand curve, the quantity demanded of the credit falls as the lending rate increases. The long run coefficients of the two curves above are fully identified. Deposits interest rate, lending capacity and the nominal GDP are shifting factors of the curves, *ceteris paribus*. An increase in the costs of mobilizing savings will increase the deposit interest rate, which in turn will reduce the banks' supply of credit to the private sector; while an increase in the deposit interest rate shifts the demand curve outward. A positive shock to the lending capacity shifts the supply curve outward, and a positive shock to GDP shifts the demand curve outward. The quantity of credit supplied to the private sector depends substantially on the input costs and the lending capacity. The lending rate has the smallest effect on the credit supply. The lending rate contains small information on how much credit the banks can supply. That is, the credit supplied is very much influenced by the costs of and how much savings can be mobilized and formed into the lending capacity. This evidence tallies well with conclusions made in chapter two, I argued that the banks' credit to the private sector is supply-constrained. The banks have problems of mobilizing enough savings to meet the credit demands of the economy. Repressed interest rates and deliberate suppression of the banking growth and expansion have limited the growth of the lending capacity of the banks. The credit quantity does converge towards the equilibrium. If the credit quantity increases in this period above the equilibrium level, it will fall in the next period. The shifting variables, deposit interest rate, the lending capacity and the GDP seem to receive no feedback effects from the system. The two curves, demand and supply, are identified based on the restrictions made on certain long run coefficients, but the restrictions are found not binding in table 13, they became binding in table 14 after restricting that the deposit interest rate is weakly exogenous with respect to the estimation of the supply function. The deposit interest rate is thus an important explanatory variable for how much credit the bank can supply. Table 14 requires improvements, there is autocorrelation problem up to lag four (the maximum lag used in the diagnosis test) at 1 %. This problem could result from inadequate modeling and omission of relevant variables. For example problem loans are relevant factors in the supply determination, and private sector debt and the business profitability are relevant factors in the demand determination. Therefore, additional information is required to make the model adequate and reduce the

problems of autocorrelation or serial correlation. We do have a data constraint, we have no reliable data on the problem loans of the banks, and similarly no data exist for the private sector debt measures. I use a country risk measure to represent the private sector debt. The squared government debt, GDS, measures the country's risk, and it is expected to influence both the supply and demand functions of the bank credit volume. The vector auto regression now consists of,

$$Z_t = (LDCP_t, LR_t, DR_t, LLC_t, LGDS_t, LGDP_t)$$

The trace co-integration test produces four relations at 5 % significance level and three relations at 1 % significance level; while, the Max-eigenvalue test produces three relations at both 1 % and 5 % significance levels, Appendix A16. We cannot identify the third and fourth relations. We hold the second relation as demand and supply functions and impose the necessary restrictions for their identification. Under the second relation and given our restrictions on the long run coefficients, the first co-integration row is treated as the supply function and the second co-integration row is treated as the demand function, table 15. The variable, LGDS, under the unrestricted co-integration, appears significant in the supply function and insignificant in the demand function, and this motivates us to set its long run coefficient to zero in the demand curve. Its sign however does not conform to our expectation. It is expected to factor the country's risk in the model, and this implies that LGDS should have negative coefficients in both the supply and the demand curves. On the contrary, the run coefficients of LGDS are significantly positive in both functions. We also set to zero all those adjustment coefficients that appear insignificant in the unrestricted co-integration. These restriction results are in the following identified system in table 15:

Table15: Demand for and Supply of Bank Credit (final Model)

Cointegrating Eq:	CointEq1	CointEq2					
LDCP(-1)	1.000000	1.317149 (0.75221) [1.75105]					
LR(-1)	-0.070316 (0.00852) [-8.25216]	1.000000					
DR(-1)	0.113167 (0.01715) [6.59914]	-1.148085 (0.15190) [-7.55832]					
LLC(-1)	-0.735276 (0.02328) [-31.5852]	0.000000					
LGDS(-1)	-0.005706 (0.00214) [-2.66449]	0.000000					
LGDP(-1)	0.000000	-3.462451 (0.75111) [-4.60981]					
C	-0.541409	8.913072					
Error Correction:	D(LDCP)	D(LR)	D(DR)	D(LLC)	D(LGDS)	D(LGDP)	
CointEq1	-1.093519 (0.33173) [-3.29640]	7.982792 (3.02811) [2.63623]	0.000000 (0.00000) [NA]	-0.608879 (0.27855) [-2.18585]	0.000000 (0.00000) [NA]	-0.679223 (0.25221) [-2.69308]	
CointEq2	-0.090675 (0.02764) [-3.28020]	1.166470 (0.51308) [2.27349]	0.732216 (0.36391) [2.01206]	-0.097189 (0.03046) [-3.19070]	0.000000 (0.00000) [NA]	0.000000 (0.00000) [NA]	
LR Test for the Restrictions $\chi^2(5) = 12.825$, Prob. = 0.025							
Autocorrelation Test $\chi^2(288) = 369.945$, Prob. = 0.000							
Serial Correlation Test $\chi^2(36) = 35.658$, Prob. = 0.485							
Heterokedasticity Test $\chi^2(588) = 598.086$, Prob. = 0.378							

The credit supply function is,

$$ldcp_t = 0.541 + 0.07lr_t - 0.113dr_t + 0.735llc_t + 0.006lgds_t + u_t \quad (13)$$

and the inverse credit demand function is ,

$$lr_t = -8.913 - 1.317ldcp_t + 1.148dr_t + 3.462lgdp_t + e_t \quad (14)$$

In table 15, the LM test indicates no serial correlation problem, while the Portmanteau test still rejects the null hypothesis of no serial correlation. It is however better than table 14, where both tests of Portmanteau and LM tests indicate the existence of serial correlation problem. The long run coefficients in the system are identified according to the restrictions we imposed and they are significantly different from zero.

The banks' credit supply to the private sector in the Gambia is determined by three factors namely the interest incomes the banks will earn on the loans, the deposit interest incomes the banks must pay on the deposits and how much demand deposits and capital can be transformed into the lending resources for the banks. Lending rate has smaller magnitude of impact on the credit supply, which means the supply curve is very steep. *Ceteris paribus*, for the quantity of credit supplied to increase by 7 per cent the lending interest rate must go up by almost 100 per cent. Thus, lending rate cannot be a good policy for injecting substantial increases in the banks' credit supply to the private sector. The deposit interest rates are costs to the banks, they reduce the banks profits from the loans; and most importantly they reduce the terms of maturity of the deposits in the banks. Thus, the increased input costs and the reduced terms of maturity limit the banks' ability to supply credit to the private sector. A 10 per cent increase in the deposit interest rates reduces the credit supply by 1.13 per cent. The most important determinant of the credit supply of the banks is the lending capacity; *ceteris paribus*, a 10 per cent increase of the lending capacity will lead to a 7.35 per cent increase in the supply quantity of the credits. The lending capacity is found to be an endogenous variable in the system; it will increase by 0.61 per cent in the next period following a 1 per cent increase in the credit supply. The income level, GDP, is endogenous in the system. Bank 's credit activities feed back to the income; if the credit supply increases 1 per cent in the current period, the income level may increase by 0.68 per cent in the subsequent period. The squared government debt does not act as a risk factor in the supply function, it has a very small impact on the credit supply, but it exposes a reality in the Gambia over this study period. The agricultural sector has been a dominant sector, and the produce purchases were financed by loans guaranteed by the government, while the central bank was a financial arm for the government. This created a situation where the government expenditures could create their supplies of credits from the banking sector, and hence government spending has positive association with the bank

credit supply. The supply curve is very inelastic with respect to the lending rate; that is, other determinants have more influence on the credit supply than the price of credit. The banks cannot respond sufficiently to changes to the lending rate given that the other determinants, such as the lending capacity and the deposit interest rate do not change. The demand for bank credit is determined by the lending rate, the deposit interest rate and the nominal GDP. Changes in the lending rate induce changes in the quantity of bank loans demanded, while changes in the other determinants induce changes in the demand curve itself. The private sector's demand for bank loans depends highly on the level of economic activities, a 1 per cent increase in the income will cause the private sector to increase their demand for bank loans by 2.63 per cent. Also increasing deposit interest rates will encourage the private sector to spare the savings and demand for bank loans. The private sector cares more about the returns on the savings than the lending rate with respect to the demand for bank loans. That is, when they demand for bank loans, they consider first the level of economic activities and the returns on those activities before the interest rates the banks charge on the loans. Similarly, it was found that the banks' credit supply curve is very steep. Comparing the two curves, we find that the demand curve is flatter than the supply curve; which means the bank credit as the lending rate is concerned, is supply constrained. According to our models in chapter 4, the credit policy will be more effective if the demand curve is flatter than the supply curve. In the elasticity terms, this means the interest rate elasticity of demand is absolutely larger than the interest rate elasticity of supply. Next, we examine the assumptions and the hypotheses constructed in chapter 4 about the transaction costs.

Real Money Balance and the Transactions Costs

We maintain in chapter 4 that the entrepreneurs will demand to hold real money balance if the transactions costs associated with obtaining credit goes up. That is, if the transaction costs increase the entrepreneurs will hoard real money balances to provide liquidity and financing for their economic transactions. Thus, in the demand function of the real money balance, I include the transactions costs. I use the spread between the lending interest rate and the deposit interest rate to measure the transaction costs as we have defined it in chapter 4, section 4.4. One co-integration relation exists, Appendix A17, and its long run

coefficients have the correct signs, increased real output, LRGDP, increases the demand for the real money balances, increased interest rate, LI, reduces the demand for the real money balances, and increased transactions costs, ID, increase the demand for the real money balances. The interest rate and the transaction costs are found to be weakly exogenous in the system, they can explain exogenously changes in the real money balances. Table16 presents the results.

Table16: Real Money Demand Function

Standard errors in () & t-statistics in []				
Cointegrating Eq:	CointEq1			
LRM(-1)	1.000000			
LRGDP(-1)	-1.121511 (0.12449) [-9.00868]			
LI(-1)	0.058513 (0.01942) [3.01274]			
ID(-1)	-0.060366 (0.03010) [-2.00555]			
C	6.812340			
Error Correction:	D(LRM)	D(LRGDP)	D(LI)	D(ID)
CointEq1	-0.329738 (0.14678) [-2.24644]	0.305747 (0.07210) [4.24057]	0.000000 (0.00000) [NA]	0.000000 (0.00000) [NA]

LRM = log real money supply, M1.
 LRGDP = log real gross domestic product.
 LI = lending interest rate; it is the same as LR.
 ID = spread between LR and DR, the proxy for the transaction costs

Diagnosis results:
 LR Test for Restriction $\chi^2(2) = 2.184$, Prob. = 0.335
 Autocorrelation Test $\chi^2(80) = 83.176$, Prob. = 0.3819
 Serial Correlation Test $\chi^2(16) = 23.764$, Prob. = 0.095
 Normality JB Test $\chi^2(8) = 110.64$, Prob. = 0.000
 Heterokedasticity Test $\chi^2(20) = 20.88$, Prob. = 0.404

Real Money Demand Function,

$$lrm_t = -6.812 + 1.122lrgdp_t - 0.058li_t + 0.06id_t + z_t \quad (15)$$

We examine the irrelevance of the measure of transactions costs in this model, and the restriction is rejected, and we cannot reject the restriction that the transaction costs are weakly exogenous with respect to this system. Also, the lending interest rate is weakly exogenous, while the real income is endogenous. The money demand depends relatively more on the level of real economic activities than on the interest rate and the transaction costs. In fact, the evidence shows that money demand is interest inelastic, 1 per cent change in the interest rate can induce only 0.06 per change in the demand for money; thus the LI is empirically here a small negative value. This could not be surprising evidence in the case of the Gambia, where the interest rates may not change properly according to the market forces, they are instead managed, this might account for the small value of LI.

Transactions Costs, Income and Price level

The credit models in chapter 4 also maintain that increased income, LGDP, reduces the transactions costs, while increased price level, LCPI, increases the transactions costs. If these hypotheses cannot be rejected plus the previous assumption that increased transactions costs increase the demand for real money balances, then the positive impact of credit on the output, chapter 4, sections 4.4.2 and 4.4.3, will not change. These three conditions form the foundation blocks of our credit models, if they are rejected, the predictions of the models that credit as a policy can promote output expansion will be questionable. The data from the Gambia have proven that the hypotheses cannot be rejected. Both trace and max Eigenvalue tests indicate the existence of one co-integration relation for the set of transaction costs, real income and price level, Appendix A18. In the table below, we find that increased real income reduces the transactions costs, while increased price level increases the transactions costs. The transactions costs are found to feed back onto the price level and not onto the income. Table17 presents the unrestricted results.

Table17: Transaction Costs Function (unrestricted Co-integration)

1 Cointegrating Equation(s):	Log likelihood	41.44228
Normalized cointegrating coefficients (std.err. in parentheses)		
ID	LRGDP	LCPI
1.000000	4.492106 (0.82459)	-4.465253 (0.28713)
Adjustment coefficients (std.err. in parentheses)		
D(ID)	-0.150859 (0.13193)	
D(LRGDP)	-0.008920 (0.00853)	
D(LCPI)	0.034433 (0.00481)	
ID = spread between LR and DR, the proxy for the transaction costs. LRGDP = log real gross domestic product. LCPI = log consumer price index.		

The income is found to be weakly exogenous with respect to the system. Income level explains to a great degree the level of transactions costs in the economy, a 1 per cent increase in the income leads to 4.5 per cent fall in the transactions costs. The price level is not weakly exogenous, and it account for significant changes in the transactions costs; 1 per cent increase in the price level leads to 4.46 per cent increase in the transactions costs. The two long run coefficients are very much close raising the question that the two variables could be offsetting each other. The increase in the income that could lead to reduced transaction costs may be offset by an equivalent increase in the price level if the price level is allowed to change. The test results are found below:

Table18: Transaction Costs Function (restricted co-integration)

Standard errors in () & t-statistics in []			
Cointegrating Eq:	CointEq1		
ID(-1)	1.000000		
LRGDP(-1)	4.386593 (0.82514) [5.31616]		
LCPI(-1)	-4.437308 (0.28733) [-15.4435]		
C	-29.27752		
Error Correction:	D(ID)	D(LRGDP)	D(LCPI)
CointEq1	-0.177528 (0.13035) [-1.36193]	0.000000 (0.00000) [NA]	0.034440 (0.00484) [7.11254]
Diagnosis results:			
LR Test for Restriction $\chi^2(1) = 1.123$, Prob. = 0.289			
Autocorrelation Test $\chi^2(36) = 59.81$, Prob. = 0.007			
Serial Correlation Test $\chi^2(9) = 10.015$, Prob. = 0.349			
Normality JB Test $\chi^2(6) = 116.014$, Prob. = 0.000			
Heterokedasticity Test $\chi^2(36) = 46.74$, Prob. = 0.108			

Transaction Cost Function,

$$id_t = 29.28 - 4.387lrgdp_t + 4.437lcpit + e_t \quad (16)$$

Increased prices obscure the information and increase the uncertainty in the economy, and hence increase the costs of the economic transactions. On the other hand, increased transaction costs also cause the prices to rise. The only control variable in the model is the real income. If the real income can rise high and above any rise in the price level, the economic agents will be better off because the costs of the economic transactions could remain unchanged or decline.

5.3.8 Schumpeter’s Credit

Schumpeter’s credit is the credit the banks provide to the entrepreneurs to enable them to undertake new production activities not those already in the economic circulation. It is created in an anticipation of an economic transaction. Thus, the increase of this credit should feed back to the entrepreneurial investments. We run a co-integration test for the private investment, a proxy for the entrepreneurial investments, and the banking variables of bank credit to the private sector, the lending capacity and the lending interest rate. That is, the entrepreneurial investments are expected to depend on the banks’ credit, the lending capacity of the banks and the interest rate. The co-integration tests, trace and Max-eigenvalue, indicate one co-integration relation in the system, Appendix A19. This relation is normalized by the long run coefficient of the private investments as in Table19.

Table19: Schumpeter’s Credit Function (unrestricted co-integration)

1 Cointegrating Equation(s):		Log likelihood	-40.25640
Normalized cointegrating coefficients (std.err. in parentheses)			
LRPI	LRDCP	LRLC	LI
1.000000	-1.198366 (0.32733)	0.395153 (0.24724)	-0.055560 (0.01005)
Adjustment coefficients (std.err. in parentheses)			
D(LRPI)	-0.182319 (0.10612)		
D(LRDCP)	0.447028 (0.08773)		
D(LRLC)	0.326327 (0.07944)		
D(LI)	0.144441 (1.62713)		
LRPI = log real private investments.			
LRDCP = log real banks’ credit to the private sector.			
LRLC = log real lending capacity of the commercial banks.			
LI = lending interest rate.			

The long run coefficient of lending capacity is not significant, while its adjustment coefficient is significant indicating that the private investments feed back to the lending capacity of the banks. Banks’ lending capacity will be boosted following an increase in the private investments. Also, private investments feeds back to the banks’ credit; banks’ credit to the private sector significantly reacts to the private investments. It implies that bankers

do not anticipate private investments, they lag behind the entrepreneurs, and hence they do not supply Schumpeter's credit. In fact, the restrictions that banks' credit is weakly exogenous is rejected, only the lending interest rate is found to be weakly exogenous with respect to the system as table 20 illustrates.

Table 20: Schumpeter's Credit Function (restricted co-integration)

Standard errors in () & t-statistics in []				
Cointegrating Eq:	CointEq1			
LRPI(-1)	1.000000			
LRDCP(-1)	-0.668573 (0.11209) [-5.96434]			
LRLC(-1)	0.000000			
LI(-1)	-0.043957 (0.00632) [-6.95697]			
C	-0.868227			
Error Correction:	D(LRPI)	D(LRDCP)	D(LRLC)	D(LI)
CointEq1	-0.290492 (0.11897) [-2.44178]	0.468195 (0.10949) [4.27626]	0.372741 (0.09299) [4.00833]	0.000000 (0.00000) [NA]
LR Test for the Restrictions $\chi^2(2) = 0.796$, Prob. = 0.672				
Autocorrelation Test $\chi^2(80) = 77.88$, Prob. = 0.546				
Serial Correlation Test $\chi^2(16) = 14.41$, Prob. = 0.568				
Heterokedasticity Test $\chi^2(20) = 22.967$, Prob. = 0.290				

Private Investment Function,

$$lrpi_t = 0.868 + 0.668lr dcp_t + 0.044li_t + u_t \quad (17)$$

The positive coefficient of the lending rate in this function cannot be accepted theoretically. The private investment cannot be an increasing function of the lending rate, but this is what the evidence here shows. This explains that the lending interest rate of the banks is irrelevant to the amount of the investments the entrepreneurs undertake, it is the quantity of credit that concerns the private sector. They are willing to pay for the increased lending interest rate as long as the banks can deliver the required credit quantity; the entrepreneurs

will incorporate the lending interest rate into their prices of the investment outputs. The other explanation for the positive association between the private investments and the lending interest rate could be that the lending interest rate has been for a long time either fixed or managed, and thus it does not reflect the market interest rate; the positive sign is hence spurious. It is evidence that the banks have lost connection with real activities in the private sector; they do not lead the private sector activities, they instead follow the developments. The banks' credit quantity to the private sector does not also have an elastic impact on the private investments, 1 per cent increase in the banks' credit to the private sector will induce less than 1 per cent increase in the private investments. This implies a credit constraint exists in the Gambia, but it is a weak constraint. The credit quantity of the banks carries better information in the long run for the private sector than the lending interest rate.

5.3.9 Monetary Policy Competence

A negative one-to-one relationship between domestic credit and foreign assets indicates that the domestic monetary policy is incompetent, because a change in the country's credit holdings will be completely offset by an equal change in the foreign assets. I run a bilateral co-integration test between the domestic credit and the foreign assets, and two co-integration relations are found at 5% significance level and one co-integration relation at 1% significance level, Appendix A20. The two variables are found to be I(1) processes, table 1. Thus, we consider only the co-integrating relation at 1% significance level. Table 21 below gives the unrestricted relation, and table 22 gives the restricted one:

Table 21: Domestic Credit versus Foreign assets (unrestricted co-integration)

1 Cointegrating Equation(s):	Log likelihood	-242.8418
Normalized cointegrating coefficients (std.err. in parentheses)		
CDC	CNFA	
1.000000	0.660513 (0.10022)	
Adjustment coefficients (std.err. in parentheses)		
D(CDC)	0.075983 (0.09878)	
D(CNFA)	-0.380996 (0.06388)	
CDC = domestic credit as a percentage of GDP.		
CNFA = net foreign assets as a percentage of GDP		

For a negative one-to-one relation to hold between the domestic credit and the foreign assets in the long run, then the summation of their long run coefficients must equal zero. This restriction result is in table 22. The hypothesis is rejected at 1% significance level; and thus there is no negative one-to-one relation between the foreign assets and the domestic credit of the Gambia. This indicates that the monetary policies of the Central Bank over this sample period were effective and competent. Taking other variables into account, the monetary policy is reactionary with respect to changes to the exchange rate and the foreign assets, it does not anticipate changes in these variables, the monetary authorities act after the fact. The foreign assets here constitute those held by the commercial banks and the central bank, and thus the negative sign between the domestic credit and the foreign assets, table 21, could imply that the monetary authorities care more about the interest rates than about the foreign reserves of the Central Bank (Roubini, 1988).

Table 22: Domestic Credit Versus Foreign Assets (restricted co-integration)

Tests of cointegration restrictions:				
Hypothesized No. of CE(s)	Restricted Log-likelihood	LR Statistic	Degrees of Freedom	Probability
1	-252.4169	19.15026	1	0.000012
1 Cointegrating Equation(s): Convergence achieved after 1 iterations.				
Restricted cointegrating coefficients (not all coefficients are identified)				
CDC	CNFA			
0.005906	-0.005906			
Adjustment coefficients (std.err. in parentheses)				
D(CDC)	-12.76295			
	(5.63947)			
D(CNFA)	-4.067609			
	(5.40875)			
Autocorrelation Test $\chi^2(16) = 9.477$, Prob. = 0.893				
Serial Correlation Test $\chi^2(4) = 0.94$, Prob. = 0.92				
Heterokedasticity Test $\chi^2(12) = 30.54$, Prob. = 0.0024				

The research findings are summarized in chapter 6. Chapter 6 gives the concluding points of the research, make the recommendations and identifies the future research directions.

6 Conclusions and Recommendations

This chapter gives a summary of the main results from chapter 5. Chapter 5 has discussed the survey and the empirical findings with respect to the theoretical models of chapter 4. The conclusion of chapter 2 on the background review has resolved our first research problem, section 1.1.1, and we need not repeat it here. The second research problem, section 1.1.2 is discussed in the survey findings, section 5.2, and we give its main results in this chapter, and the empirical findings with respect to the final research problem, section 1.1.3 is discussed in section 5.3, and we summarize the main conclusions here. We then derive the recommendations and the future directions of the research.

The survey indicates that the banks tend to finance consumption goods more than the capital goods. The public are not attracted by the interest rate to save in the banks; thus, they seldom hold time deposit accounts. They hold current accounts in order to make easy payments through the banking system. The current state of the banking services do not impress the public; banks are not reaching to the wider population of the country.

The empirical results show that the banking activities have no long run relationships with either the private investments or the gross domestic investments, Appendix A4 and Appendix A5. This confirms the evidence from the survey that banking industry tends not to engage in the investment financing. There are long run relationships between the banking activities and the output, section 5.3.2, Appendix A1, between the banking activities and the capital accumulation, section 5.3.3, Appendix A3, and between the banking activities and the economic efficiency, section 5.3.4, Appendix A6. In these relationships banking activities are found to promote output and capital accumulation but decrease the economic efficiency. In section 5.3.5, we allow for control variables so that any economic variable could co-integrate not only with the set of the banking variables but also with the set of other economic variables. In this system, we find that an increase in the banks' credit to the private sector is associated with increases in the output, the physical capital accumulation and the economic efficiency. The liquid liabilities are also found to increase the output; while the banks' assets and the liquid liabilities reduce both the physical capital and the economic efficiency in the long run, table 11. The set of banking variables is found not weakly exogenous, it significantly reacts to the disequilibrium in the system, Appendix A9.

We however find that the causality runs from the banking to the economic variables. The log real per capita of banks' credit to the private sector and the log real per capita of liquid liabilities are found to be Granger causal for both the log real per capita output and the log real per capita economic efficiency, and no other variables in the system is found to be Granger causal for them. Thus, these two banking variables account for significant changes in the real economic activities. Yet, the banks' credit to the private sector does not qualify to be a Schumpeter's credit that starts the circular flow of creditary production and enables the entrepreneurs to carry out new production activities. This credit is expected to be a significant explanatory variable in the investment function of the entrepreneurs as defined in section 4.2, we estimate this function and table 20 presents the results. There is no evidence that the banks in the Gambia supply the Schumpeter's credit, the banks' credit to the private sector is found to be not weakly exogenous. A weak credit constraint as defined in section 4.4.3 also exists, the long run coefficient of the banks' credit quantity is significantly smaller than one. The constraint is due to the inability of the banks to change the credit supply as the interest rate changes. The credit supply is found to be interest rate inelastic, and the lending capacity and the deposit interest rate have relatively larger influences on the credit quantity than the lending interest rate, table 14 and table 15. The weak credit constraint also implies the private sector may accept an increased bank credit supply only with a reduced interest rate, Chapter 4, section 4.4.3. On the other hand, the demand for the bank credit is largely determined by the level of the economic activity. The bank credit market is found to be grossly inefficient, the spread between the lending interest rate and the deposit interest rate, which in this research measures for the transaction costs, tends to grow large. It is found to increase the inflation, table 18, and causes the public to increase their demand for real money balances, table 17. We find that the banking industry is far off the competitive and efficient path; the empirical reserve ratio of 67% is substantially larger than the mean regulatory reserve ratio of 19.27% over the period 1964 – 2002. In a perfectly competitive banking industry, the empirical reserve ratio will equal the regulatory reserve ratio. Perfect competitive banking industry may not exist, but it is a benchmark for evaluation and comparison. Thus, the larger the deviation of the empirical reserve ratio from the regulatory reserve ratio, the less competitive and the less efficient becomes the banking industry. This deviation in the case of the Gambia amounts to 250%

of the regulatory reserve ratio, and hence the banking industry is far off the competitive path. Yet, its credit to the private sector is vital for the economy, it increases and causes the output expansion and improves the efficiency in the long run; it tends to increase the physical capital but not Granger cause it. For the central bank, we find that it has faced difficulties due to its conflicting objectives of simultaneously pursuing price stability, increased employment and supporting the government finance, chapter 2, figure 2.1; but the competence of its monetary policy over the study period cannot be rejected, table 22. From these findings and conclusions the research can derive some recommendations for the authorities.

The declining trend of banks' credit to the private sector is worrisome, since any change in this variable could have a permanent impact on the economic output, the capital stock and the efficiency. The banks should reverse this declining trend, they should reduce the consumption loans and their holdings of the central bank bills and the government treasury bills. The central bank and the commercial banks should work together to reduce the spread between the lending interest rate and the deposit interest rate. This spread reduces the savings in the banking system, encourages the public to hold increasingly high amounts of cash money and increases the inflation. The increased spread also indicates the inability of the banks to search and select profitable projects and monitor their credit portfolios. The banks should increase and improve their personnel to be able to supply credits that depend on the expected profits of the private sector investments not on collaterals and relationships. In the history of the Gambia banking industry, few banks employed just over hundred people, and thus the nature of their inputs of low human resources and low savings reflects to a great extent the nature of their output of low credit quantities to the private sector with high collateral and securities.

The banks have to learn and adopt the norms and values of the society they serve. Their schemes of savings mobilizations or deposit collections should be inclusive and comprehensive not exclusive and selective as some banks currently practice. The banks should learn that interest rate is not a prime objective of the society for placing money in the banks. The society is concerned first with payment system of the banking industry followed by the safety of money in the banks and then the savings for the future. The interest rate is the least reason for placing money in the banks. The banks' provision of the

means of payment is vital for the economic development; and it reduces the risk of theft and corruption associated with carrying cash around to make payments. The society wants their money and savings to be safe in the banks, that they can have their claims back any time they wish. Thus, the banking system should be nationwide; every member of the society should feel the presence of the banks, every member is either to receive bank money, for example bank credit, bank cheques, guarantees and acceptances, or he is to pay in bank money. The trade seasons of the agricultural sector should be 'banknized', the farmers should be paid in banking means of payment that could be converted immediately into cash money any time they wish. The society also wants to save for the future. For the banks to mobilize these savings, they should provide correspondingly long term goods for the society.

The banking industry should embark on the universal banking system to build long term commitments with the society. Also, they should allow the society to share in the profits and dividends of the banks. This could be achieved by setting up a stock market in the country where the shares of the banks could be floated and the ordinary public could be allotted large proportions. The economic development could be further spurred and the wealth of the nation would expand and tend to be distributed evenly if the central bank could have a branch in every administrative division to help the banking services and output get close to the people instead of concentrating the banking industry and consequently the wealth in one area and then as a result implicitly forcing the people to move and migrate close to that particular area.

The banks should do more beyond the standard operating procedures and the existing circular flow. They should create Schumpeter's credit that creates entrepreneurs and enables them to carry out new economic activities. The banks should promote small enterprises that employ large amounts of labor instead of concentrating on financing capital accumulation that could harm the economy in the long run, particularly in the Gambia where a good percentage of the population is illiterate. The goal of making the Gambia a financial center depends not only on having a competitive and efficient banking industry but also on having a large percentage of the population owing to the banks. People will own to the banks if the small enterprises have access to the banking facilities. Our economy is in the early stages of economic development and for the banks to gear up the economic

development and prosperity and be the engines of growth, they should do what banks did in the early stages of today's developed economies. That is, they should be promoters and financiers of the enterprises.

This research is intended to constitute some sections in a book the researcher plans to write on the structures of the Gambian economy. It will be further developed to include the microeconomic analysis of the bank performances and to characterize the projects and the borrowers that qualify for the bank credits; then, we will sample and appraise the past loan decisions of the banks. Broaddus' model in section 4.3 will be estimated, if data are available, for all the sub-Saharan African countries for the comparison analysis. The model in section 4.4.3 that interlinks credit and money will be estimated and calibrated in a small open economy. The interactive relationships between the fiscal policy and the monetary policy in sections 4.4.1 and 4.4.2 will be empirically investigated. By incorporating these developments, a major part of the book, the structures of the Gambian economy, on the financial system will be completed.

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Appendix A: Lag Order Selection, Co-integration Rank tests and some Granger Causality tests

A 1: Output and Banking

VAR Lag Order Selection Criteria						
Endogenous variables: LRY LRPDCP LRPLL LRPCBA						
Included observations: 35						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	5.077493	NA	1.11E-05	-0.061571	0.116183	-0.000210
1	89.69996	145.0671	2.21E-07	-3.982855	-3.094084*	-3.676051*
2	107.4632	26.39104*	2.08E-07*	-4.083609*	-2.483822	-3.531363
3	122.3596	18.72691	2.45E-07	-4.020546	-1.709744	-3.222858
4	136.6568	14.70573	3.32E-07	-3.923245	-0.901426	-2.880114

Series: LRY LRPDCP LRPLL LRPCBA
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5 Percent Critical Value	1 Percent Critical Value
None *	0.575360	52.53511	47.21	54.46
At most 1	0.320375	20.84408	29.68	35.65
At most 2	0.129001	6.554151	15.41	20.04
At most 3	0.038273	1.443915	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Trace test indicates 1 cointegrating equation(s) at the 5% level
Trace test indicates no cointegration at the 1% level

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	5 Percent Critical Value	1 Percent Critical Value
None *	0.575360	31.69103	27.07	32.24
At most 1	0.320375	14.28993	20.97	25.52
At most 2	0.129001	5.110236	14.07	18.63
At most 3	0.038273	1.443915	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Max-eigenvalue test indicates 1 cointegrating equation(s) at the 5% level
Max-eigenvalue test indicates no cointegration at the 1% level

A 2: Granger Causality, Output and Banking,

VEC Pairwise Granger Causality/Block Exogeneity Wald Tests			
Dependent variable: D(LRY)			
Exclude	Chi-sq	df	Prob.
D(LRPDCP)	6.172420	1	0.0130
D(LRPLL)	0.123735	1	0.7250
D(LRPCBA)	0.035706	1	0.8501
All	14.98664	3	0.0018
Dependent variable: D(LRPDCP)			
Exclude	Chi-sq	df	Prob.
D(LRY)	2.603316	1	0.1066
D(LRPLL)	0.363987	1	0.5463
D(LRPCBA)	0.007434	1	0.9313
All	3.518298	3	0.3184
Dependent variable: D(LRPLL)			
Exclude	Chi-sq	df	Prob.
D(LRY)	4.116117	1	0.0425
D(LRPDCP)	1.341135	1	0.2468
D(LRPCBA)	0.207032	1	0.6491
All	6.295531	3	0.0981
Dependent variable: D(LRPCBA)			
Exclude	Chi-sq	df	Prob.
D(LRY)	5.184815	1	0.0228
D(LRPDCP)	0.298594	1	0.5848
D(LRPLL)	2.028542	1	0.1544
All	7.582400	3	0.0555

A 3: Capital Stock and Banking

VAR Lag Order Selection Criteria						
Endogenous variables: LRPK LRPDCP LRPLL LRPCBA						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	8.267953	NA	9.21E-06	-0.243883	-0.066129	-0.182522
1	94.69144	148.1545*	1.66E-07*	-4.268082*	-3.379312*	-3.961279*
2	107.5582	19.11634	2.06E-07	-4.089040	-2.489254	-3.536794
3	120.8693	16.73390	2.67E-07	-3.935387	-1.624584	-3.137698
4	140.0588	19.73785	2.74E-07	-4.117648	-1.095829	-3.074516

Series: LRPK LRPDCP LRPLL LRPCBA
Lags interval (in first differences): No lags

Unrestricted Cointegration Rank Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.558006	55.64172	47.21	54.46
At most 1	0.387041	24.61624	29.68	35.65
At most 2	0.103332	6.016860	15.41	20.04
At most 3	0.048075	1.872219	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Trace test indicates 1 cointegrating equation(s) at both 5% and 1% levels

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	5 Percent Critical Value	1 Percent Critical Value
None *	0.558006	31.02548	27.07	32.24
At most 1	0.387041	18.59938	20.97	25.52
At most 2	0.103332	4.144641	14.07	18.63
At most 3	0.048075	1.872219	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Max-eigenvalue test indicates 1 cointegrating equation(s) at the 5% level
Max-eigenvalue test indicates no cointegration at the 1% level

A 4: Private Investment and Banking

VAR Lag Order Selection Criteria						
Endogenous variables: LRPPI LRPDCP LRPLL LRPCBA						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-14.92392	NA	3.47E-05	1.081367	1.259121	1.142728
1	68.71866	143.3873*	7.32E-07*	-2.783923*	-1.895153*	-2.477120*
2	78.56894	14.63471	1.08E-06	-2.432511	-0.832725	-1.880265
3	87.05792	10.67185	1.84E-06	-2.003310	0.307493	-1.205621
4	105.3674	18.83258	1.99E-06	-2.135278	0.886541	-1.092146

Series: LRPPI LRPDCP LRPLL LRPCBA
Lags interval (in first differences): No lags

Unrestricted Cointegration Rank Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5 Percent Critical Value	1 Percent Critical Value
None	0.386339	37.00521	47.21	54.46
At most 1	0.259270	18.44933	29.68	35.65
At most 2	0.117144	7.044829	15.41	20.04
At most 3	0.058986	2.310277	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Trace test indicates no cointegration at both 5% and 1% levels

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	5 Percent Critical Value	1 Percent Critical Value
None	0.386339	18.55588	27.07	32.24
At most 1	0.259270	11.40450	20.97	25.52
At most 2	0.117144	4.734552	14.07	18.63
At most 3	0.058986	2.310277	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Max-eigenvalue test indicates no cointegration at both 5% and 1% levels

A 5: Gross Domestic Investments and Banking

VAR Lag Order Selection Criteria						
Endogenous variables: LRPDI LRPDCP LRPLL LRPCBA						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-40.58011	NA	0.000150	2.547435	2.725189	2.608795
1	73.32912	195.2730*	5.62E-07*	-3.047378*	-2.158608*	-2.740575*
2	86.34069	19.33147	6.94E-07	-2.876611	-1.276824	-2.324365
3	99.22318	16.19512	9.18E-07	-2.698467	-0.387664	-1.900778
4	115.3974	16.63639	1.12E-06	-2.708425	0.313394	-1.665294

Series: LRPDI LRPDCP LRPLL LRPCBA
Lags interval (in first differences): No lags

Unrestricted Cointegration Rank Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5 Percent Critical Value	1 Percent Critical Value
None	0.448070	39.73705	47.21	54.46
At most 1	0.295809	17.15237	29.68	35.65
At most 2	0.080682	3.825543	15.41	20.04
At most 3	0.016413	0.628854	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Trace test indicates no cointegration at both 5% and 1% levels

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	5 Percent Critical Value	1 Percent Critical Value
None	0.448070	22.58468	27.07	32.24
At most 1	0.295809	13.32682	20.97	25.52
At most 2	0.080682	3.196690	14.07	18.63
At most 3	0.016413	0.628854	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Max-eigenvalue test indicates no cointegration at both 5% and 1% levels

A 6: Economic Efficiency and Banking

VAR Lag Order Selection Criteria						
Endogenous variables: REFL LRDCP LRL LRCBA						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	58.01334	NA	4.90E-07	-3.177255	-2.997683	-3.116016
1	149.1783	155.5167	5.94E-09	-7.598722	-6.700863*	-7.292526
2	170.6511	31.57765*	4.49E-09*	-7.920652	-6.304505	-7.369499*
3	184.7291	17.39045	5.63E-09	-7.807591	-5.473158	-7.011483
4	204.3917	19.66260	5.72E-09	-8.023038*	-4.970317	-6.981973
5	217.9918	10.40009	1.02E-08	-7.881869	-4.110861	-6.595847

Series: REFL LRDCP LRL LRCBA
Lags interval (in first differences): No lags

Unrestricted Cointegration Rank Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.835246	97.08453	47.21	54.46
At most 1	0.420632	28.55897	29.68	35.65
At most 2	0.165970	7.817898	15.41	20.04
At most 3	0.023957	0.921446	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Trace test indicates 1 cointegrating equation(s) at both 5% and 1% levels

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.835246	68.52556	27.07	32.24
At most 1	0.420632	20.74107	20.97	25.52
At most 2	0.165970	6.896452	14.07	18.63
At most 3	0.023957	0.921446	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Max-eigenvalue test indicates 1 cointegrating equation(s) at both 5% and 1% levels

A 7: Economic Activities and Banking (seven variables)

VAR Lag Order Selection Criteria						
Endogenous variables: LRY LRPPi LRPk RPEF LRPDCP LRPLL LRPCBA						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	147.6083	NA	9.55E-13	-7.811573	-7.503667	-7.704106
1	308.1587	249.7450	2.05E-15	-14.00882	-11.54556*	-13.14907
2	372.4916	75.05504	1.21E-15	-14.86064	-10.24205	-13.24863
3	482.2799	85.39089*	1.14E-16*	-18.23777*	-11.46383	-15.87348*

Series: LRY LRPPi LRPk RPEF LRPDCP LRPLL LRPCBA
Lags interval (in first differences): No lags

Unrestricted Cointegration Rank Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.946967	226.7583	124.24	133.57
At most 1 **	0.706317	115.1584	94.15	103.18
At most 2 *	0.490810	68.59865	68.52	76.07
At most 3	0.432922	42.95112	47.21	54.46
At most 4	0.314522	21.39528	29.68	35.65
At most 5	0.110426	7.045023	15.41	20.04
At most 6	0.066097	2.598524	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Trace test indicates 3 cointegrating equation(s) at the 5% level
Trace test indicates 2 cointegrating equation(s) at the 1% level

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.946967	111.5999	45.28	51.57
At most 1 **	0.706317	46.55972	39.37	45.10
At most 2	0.490810	25.64753	33.46	38.77
At most 3	0.432922	21.55584	27.07	32.24
At most 4	0.314522	14.35025	20.97	25.52
At most 5	0.110426	4.446499	14.07	18.63
At most 6	0.066097	2.598524	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Max-eigenvalue test indicates 2 cointegrating equation(s) at both 5% and 1% levels

A 8: Economic Activities versus Banking (six variables)

VAR Lag Order Selection Criteria						
Endogenous variables: LRY LRPK RPEF LRPDCP LRPLL LRPCBA						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	127.6408	NA	4.68E-11	-6.757821	-6.493901	-6.665706
1	269.0880	227.8873	1.38E-13	-12.61600	-10.76856*	-11.97120
2	305.2806	46.24608	1.62E-13	-12.62670	-9.195743	-11.42920
3	361.1080	52.72590*	8.95E-14*	-13.72822*	-8.713748	-11.97804

Series: LRY LRPK RPEF LRPDCP LRPLL LRPCBA
Lags interval (in first differences): 1 to 2

Unrestricted Cointegration Rank Test				
Hypothesized		Trace	5 Percent	1 Percent
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Critical Value
None **	0.770540	151.7764	94.15	103.18
At most 1 **	0.731700	98.78347	68.52	76.07
At most 2 *	0.481354	51.42003	47.21	54.46
At most 3	0.348884	27.78479	29.68	35.65
At most 4	0.265538	12.33839	15.41	20.04
At most 5	0.033540	1.228163	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Trace test indicates 3 cointegrating equation(s) at the 5% level
Trace test indicates 2 cointegrating equation(s) at the 1% level

A 9: Economic Activities and Banking (six variables, weak exogeneity test)

Tests of cointegration restrictions:					
Hypothesized No. of CE(s)	Restricted Log-likelihood	LR Statistic	Degrees of Freedom	Probability	
3	325.5153	43.40068	9	0.000002	
3 Cointegrating Equation(s): Convergence achieved after 29 iterations.					
Restricted cointegrating coefficients (std.err. in parentheses)					
LRY	LRPK	RPEF	LRPDCP	LRPLL	LRPCBA
1.000000 (0.00000)	0.434862 (0.00914)	0.000000 (0.00000)	-0.463129 (0.04601)	-0.018567 (0.00830)	0.000000 (0.00000)
3.033673 (0.02368)	1.000000 (0.00000)	0.000000 (0.00000)	-1.444269 (0.13015)	0.000000 (0.00000)	0.059142 (0.02552)
0.000000 (0.00000)	0.000000 (0.00000)	1.000000 (0.00000)	-0.510096 (0.13601)	0.065623 (0.06847)	0.146774 (0.07474)
Adjustment coefficients (std.err. in parentheses)					
D(LRY)	-3.917719 (3.14400)	1.185396 (1.19344)	-0.088618 (0.46307)		
D(LRPK)	-10.22215 (4.16345)	3.511853 (1.58042)	-0.141025 (0.61323)		
D(RPEF)	-4.604478 (2.76046)	1.516690 (1.04785)	-0.373238 (0.40658)		
D(LRPDCP)	0.000000 (0.00000)	0.000000 (0.00000)	0.000000 (0.00000)		
D(LRPLL)	0.000000 (0.00000)	0.000000 (0.00000)	0.000000 (0.00000)		
D(LRPCBA)	0.000000 (0.00000)	0.000000 (0.00000)	0.000000 (0.00000)		

A 10: Economic Activities versus Banking (six variables, Granger causality test)

VEC Pairwise Granger Causality/Block Exogeneity Wald Tests Included observations: 36				Dependent variable: D(LRPDCP)			
Exclude	Chi-sq	df	Prob.	Exclude	Chi-sq	df	Prob.
Dependent variable: D(LRY)				Dependent variable: D(LRPDCP)			
D(LRPK)	7.134110	2	0.0282	D(LRY)	2.545641	2	0.2800
D(RPEF)	4.150262	2	0.1255	D(LRPK)	2.550384	2	0.2794
D(LRPDCP)	7.876483	2	0.0195	D(RPEF)	1.857810	2	0.3950
D(LRPLL)	14.69964	2	0.0006	D(LRPLL)	1.652477	2	0.4377
D(LRPCBA)	16.36040	2	0.0003	D(LRPCBA)	1.243866	2	0.5369
All	72.45405	10	0.0000	All	8.092034	10	0.6198
Dependent variable: D(LRPK)				Dependent variable: D(LRPLL)			
Exclude	Chi-sq	df	Prob.	Exclude	Chi-sq	df	Prob.
D(LRY)	4.540223	2	0.1033	D(LRY)	0.508142	2	0.7756
D(RPEF)	4.354045	2	0.1134	D(LRPK)	0.198049	2	0.9057
D(LRPDCP)	0.479771	2	0.7867	D(RPEF)	0.609144	2	0.7374
D(LRPLL)	3.249150	2	0.1970	D(LRPDCP)	3.428993	2	0.1801
D(LRPCBA)	1.871744	2	0.3922	D(LRPCBA)	2.901985	2	0.2343
All	10.92980	10	0.3630	All	8.299474	10	0.5996
Dependent variable: D(RPEF)				Dependent variable: D(LRPCBA)			
Exclude	Chi-sq	df	Prob.	Exclude	Chi-sq	df	Prob.
D(LRY)	6.971076	2	0.0306	D(LRY)	2.071361	2	0.3550
D(LRPK)	10.03194	2	0.0066	D(LRPK)	0.278634	2	0.8700
D(LRPDCP)	11.15220	2	0.0038	D(RPEF)	2.150186	2	0.3413
D(LRPLL)	17.10188	2	0.0002	D(LRPDCP)	6.615526	2	0.0366
D(LRPCBA)	20.85605	2	0.0000	D(LRPLL)	8.918884	2	0.0116
All	91.24905	10	0.0000	All	16.79589	10	0.0790

A 11: Co-integration Rank Test Among Economic Variables (4 variables)

VAR Lag Order Selection Criteria						
Endogenous variables: LRY LRPPI LRPK RPEF						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	135.6587	NA	5.09E-09	-7.744631	-7.565059	-7.683391
1	204.3688	117.2113	2.31E-10	-10.84522	-9.947365*	-10.53903
2	220.6325	23.91718	2.38E-10	-10.86073	-9.244588	-10.30958
3	243.1009	27.75510*	1.82E-10	-11.24123	-8.906796	-10.44512
4	261.5533	18.45238	1.98E-10	-11.38549	-8.332766	-10.34442
5	286.4934	19.07181	1.81E-10*	-11.91137*	-8.140365	-10.62535*

Series: LRY LRPPI LRPK RPEF
 Lags interval (in first differences): No lags

Unrestricted Cointegration Rank Test

Hypothesized		Trace	5 Percent	1 Percent
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Critical Value
None **	0.857906	132.4700	47.21	54.46
At most 1 **	0.633710	58.32194	29.68	35.65
At most 2 **	0.348376	20.15737	15.41	20.04
At most 3 *	0.097123	3.882423	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level
 Trace test indicates 4 cointegrating equation(s) at the 5% level
 Trace test indicates 3 cointegrating equation(s) at the 1% level

Hypothesized		Max-Eigen	5 Percent	1 Percent
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Critical Value
None **	0.857906	74.14807	27.07	32.24
At most 1 **	0.633710	38.16456	20.97	25.52
At most 2 *	0.348376	16.27495	14.07	18.63
At most 3 *	0.097123	3.882423	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level
 Max-eigenvalue test indicates 4 cointegrating equation(s) at the 5% level
 Max-eigenvalue test indicates 2 cointegrating equation(s) at the 1% level

A 11(continued): Co-integration Rank Test Among Economic Variables

Series: LRY LRPPI LRPK RPEF
 Lags interval (in first differences): 1 to 4

Unrestricted Cointegration Rank Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.688538	84.10553	47.21	54.46
At most 1 **	0.567962	44.44531	29.68	35.65
At most 2 *	0.287589	15.91111	15.41	20.04
At most 3 *	0.120914	4.381681	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level
 Trace test indicates 4 cointegrating equation(s) at the 5% level
 Trace test indicates 2 cointegrating equation(s) at the 1% level

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.688538	39.66022	27.07	32.24
At most 1 **	0.567962	28.53420	20.97	25.52
At most 2	0.287589	11.52943	14.07	18.63
At most 3 *	0.120914	4.381681	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level
 Max-eigenvalue test indicates 2 cointegrating equation(s) at both 5% and 1% levels

A 12: Co-integration Rank Test Among Economic Variables (3 variables)

VAR Lag Order Selection Criteria						
Endogenous variables: LRY LRPK RPEF						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	118.9879	NA	2.19E-07	-6.822816	-6.688138	-6.776887
1	174.9125	98.69056	1.39E-08	-9.583090	-9.044375*	-9.399373
2	188.4827	21.55254*	1.08E-08*	-9.851921*	-8.909169	-9.530415*
3	192.1032	5.111318	1.53E-08	-9.535480	-8.188692	-9.076187
4	203.7356	14.36949	1.40E-08	-9.690330	-7.939505	-9.093249
5	213.5544	10.39632	1.51E-08	-9.738492	-7.583630	-9.003622

Series: LRY LRPK RPEF
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test				
Hypothesized		Trace	5 Percent	1 Percent
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Critical Value
None	0.309359	23.00830	29.68	35.65
At most 1	0.152819	9.313282	15.41	20.04
At most 2	0.082286	3.177165	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Trace test indicates no cointegration at both 5% and 1% levels

Hypothesized		Max-Eigen	5 Percent	1 Percent
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Critical Value
None	0.309359	13.69501	20.97	25.52
At most 1	0.152819	6.136117	14.07	18.63
At most 2	0.082286	3.177165	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Max-eigenvalue test indicates no cointegration at both 5% and 1% levels

A 13: Co-integration Rank Test Among the Banking Variables

VAR Lag Order Selection Criteria						
Endogenous variables: LRPLL LRPDCP LRPCBA						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-19.91878	NA	0.000773	1.348164	1.482843	1.394093
1	53.28014	129.1746	1.78E-05*	-2.428244*	-1.889528*	-2.244526*
2	58.96423	9.027669	2.19E-05	-2.233190	-1.290438	-1.911685
3	63.36558	6.213673	2.98E-05	-1.962681	-0.615893	-1.503388
4	77.42185	17.36363*	2.37E-05	-2.260109	-0.509284	-1.663027
5	82.81396	5.709294	3.30E-05	-2.047880	0.106982	-1.313011

Series: LRPLL LRPDCP LRPCBA
Lags interval (in first differences): No lags

Unrestricted Cointegration Rank Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5 Percent Critical Value	1 Percent Critical Value
None	0.290831	18.97298	29.68	35.65
At most 1	0.093708	5.913859	15.41	20.04
At most 2	0.055628	2.174916	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Trace test indicates no cointegration at both 5% and 1% levels

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	5 Percent Critical Value	1 Percent Critical Value
None	0.290831	13.05912	20.97	25.52
At most 1	0.093708	3.738943	14.07	18.63
At most 2	0.055628	2.174916	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Max-eigenvalue test indicates no cointegration at both 5% and 1% levels

A 14: Broaddus' Model

VAR Lag Order Selection Criteria						
Endogenous variables: LR DR						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-160.5661	NA	48.76398	9.562712	9.652498	9.593332
1	-116.7499	79.90021	4.691472*	7.220580*	7.489938*	7.312439*
2	-114.0375	4.626984	5.077735	7.296323	7.745253	7.449421
3	-111.8609	3.456990	5.696019	7.403581	8.032082	7.617918
4	-110.7578	1.622100	6.848719	7.573991	8.382064	7.849567
5	-103.1043	10.35486*	5.649338	7.359074	8.346719	7.695889

* indicates lag order selected by the criterion

Series: LR DR
Lags interval (in first differences): No lags

Unrestricted Cointegration Rank Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5 Percent Critical Value	1 Percent Critical Value
None *	0.332763	16.90408	15.41	20.04
At most 1	0.039436	1.528903	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Trace test indicates 1 cointegrating equation(s) at the 5% level
Trace test indicates no cointegration at the 1% level

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	5 Percent Critical Value	1 Percent Critical Value
None *	0.332763	15.37518	14.07	18.63
At most 1	0.039436	1.528903	3.76	6.65

A15: Demand for and Supply of Bank Credit (five variables)

Endogenous variables: LDCP LR DR LLC LGDP						
VAR Lag Order Selection Criteria						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-188.2637	NA	0.043038	11.04364	11.26583	11.12034
1	-28.44384	264.8443	1.97E-05	3.339648	4.672803*	3.799853
2	4.035302	44.54282*	1.41E-05*	2.912268	5.356387	3.755978
3	29.12982	27.24547	1.81E-05	2.906868	6.461949	4.134081
4	67.48059	30.68062	1.49E-05	2.143967*	6.810011	3.754684*

Series: LDCP LR DR LLC LGDP
Lags interval (in first differences): 1 to 3

Unrestricted Cointegration Rank Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.844030	143.6109	68.52	76.07
At most 1 **	0.791747	78.57776	47.21	54.46
At most 2	0.350623	23.66275	29.68	35.65
At most 3	0.210831	8.551785	15.41	20.04
At most 4	0.007533	0.264663	3.76	6.65

(**) denotes rejection of the hypothesis at the 5%(1%) level
Trace test indicates 2 cointegrating equation(s) at both 5% and 1% levels

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.844030	65.03310	33.46	38.77
At most 1 **	0.791747	54.91501	27.07	32.24
At most 2	0.350623	15.11096	20.97	25.52
At most 3	0.210831	8.287123	14.07	18.63
At most 4	0.007533	0.264663	3.76	6.65

(**) denotes rejection of the hypothesis at the 5%(1%) level
Max-eigenvalue test indicates 2 cointegrating equation(s) at both 5% and 1% levels

A 16: Demand for and Supply of Bank Credit (six variables)

VAR Lag Order Selection Criteria						
Endogenous variables: LDCP LR DR LLC LGDS LGDP						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-309.8633	NA	2.779193	18.04933	18.31596	18.14137
1	-138.0913	274.8351	0.001227	10.29093	12.15735*	10.93522
2	-96.85851	51.83553*	0.001101	9.991915	13.45812	11.18845
3	-45.30272	47.13673	0.000793*	9.103012*	14.16900	10.85179*

Series: LDCP LR DR LLC LGDS LGDP
Lags interval (in first differences): 1 to 2

Unrestricted Cointegration Rank Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.776818	157.2689	94.15	103.18
At most 1 **	0.696054	104.7771	68.52	76.07
At most 2 **	0.611682	63.09541	47.21	54.46
At most 3 *	0.425108	29.98780	29.68	35.65
At most 4	0.259140	10.61274	15.41	20.04
At most 5	0.003273	0.114737	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Trace test indicates 4 cointegrating equation(s) at the 5% level
Trace test indicates 3 cointegrating equation(s) at the 1% level

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.776818	52.49184	39.37	45.10
At most 1 **	0.696054	41.68168	33.46	38.77
At most 2 **	0.611682	33.10761	27.07	32.24
At most 3	0.425108	19.37506	20.97	25.52
At most 4	0.259140	10.49800	14.07	18.63
At most 5	0.003273	0.114737	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Max-eigenvalue test indicates 3 cointegrating equation(s) at both 5% and 1% levels

A 17: Money demand Function

VAR Lag Order Selection Criteria						
Endogenous variables: LRM LR GDP LI ID						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-149.7412	NA	0.099476	9.043601	9.223173	9.104841
1	-50.63730	169.0596*	0.000756*	4.155135	5.052995*	4.461331*
2	-37.23285	19.71243	0.000919	4.307815	5.923961	4.858967
3	-27.11021	12.50444	0.001453	4.653542	6.987976	5.449651
4	-2.022319	25.08789	0.001072	4.118960	7.171681	5.160025
5	25.17061	20.79459	0.000857	3.460553*	7.231561	4.746574

Series: LRM LR GDP LI ID
Lags interval (in first differences): No lags

Unrestricted Cointegration Rank Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5 Percent Critical Value	1 Percent Critical Value
None *	0.482521	49.60758	47.21	54.46
At most 1	0.349654	24.57367	29.68	35.65
At most 2	0.187976	8.224160	15.41	20.04
At most 3	0.008166	0.311579	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Trace test indicates 1 cointegrating equation(s) at the 5% level
Trace test indicates no cointegration at the 1% level

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	5 Percent Critical Value	1 Percent Critical Value
None	0.482521	25.03392	27.07	32.24
At most 1	0.349654	16.34951	20.97	25.52
At most 2	0.187976	7.912582	14.07	18.63
At most 3	0.008166	0.311579	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Max-eigenvalue test indicates no cointegration at both 5% and 1% levels

A 18: Transaction Costs Function

VAR Lag Order Selection Criteria						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-106.6102	NA	0.126701	6.447658	6.582337	6.493587
1	41.74884	261.8100*	3.50E-05	-1.749932	-1.211216*	-1.566214*
2	48.48847	10.70411	4.06E-05	-1.616969	-0.674216	-1.295463
3	58.49233	14.12310	3.96E-05	-1.676019	-0.329231	-1.216726
4	71.83597	16.48332	3.29E-05*	-1.931528	-0.180702	-1.334446
5	81.79145	10.54110	3.50E-05	-1.987733*	0.167129	-1.252863

Series: ID LRGDP LCPI
Lags interval (in first differences): No lags

Unrestricted Cointegration Rank Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.765924	59.19774	29.68	35.65
At most 1	0.088514	4.017598	15.41	20.04
At most 2	0.012962	0.495787	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Trace test indicates 1 cointegrating equation(s) at both 5% and 1% levels

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.765924	55.18014	20.97	25.52
At most 1	0.088514	3.521810	14.07	18.63
At most 2	0.012962	0.495787	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Max-eigenvalue test indicates 1 cointegrating equation(s) at both 5% and 1% levels

A 19: Schumpeter's Credit

VAR Lag Order Selection Criteria						
Endogenous variables: LRPI LRDCP LRLC LI						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-112.7726	NA	0.011306	6.868975	7.048547	6.930214
1	-30.97320	139.5401*	0.000238*	2.998424	3.896283*	3.304619*
2	-21.48735	13.94978	0.000364	3.381609	4.997755	3.932761
3	-9.053977	15.35888	0.000502	3.591410	5.925844	4.387519
4	6.507175	15.56115	0.000649	3.617225	6.669946	4.658290
5	33.63637	20.74586	0.000521	2.962566*	6.733575	4.248588

* indicates lag order selected by the criterion

Series: LRPI LRDCP LRLC LI
Lags interval (in first differences): No lags

Unrestricted Cointegration Rank Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5 Percent Critical Value	1 Percent Critical Value
None *	0.523685	50.12725	47.21	54.46
At most 1	0.344404	21.94353	29.68	35.65
At most 2	0.115774	5.899499	15.41	20.04
At most 3	0.031694	1.223877	3.76	6.65

(**) denotes rejection of the hypothesis at the 5%(1%) level
Trace test indicates 1 cointegrating equation(s) at the 5% level
Trace test indicates no cointegration at the 1% level

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	5 Percent Critical Value	1 Percent Critical Value
None *	0.523685	28.18372	27.07	32.24
At most 1	0.344404	16.04403	20.97	25.52
At most 2	0.115774	4.675622	14.07	18.63
At most 3	0.031694	1.223877	3.76	6.65

(**) denotes rejection of the hypothesis at the 5%(1%) level
Max-eigenvalue test indicates 1 cointegrating equation(s) at the 5% level
Max-eigenvalue test indicates no cointegration at the 1% level

A 20: Monetary Competence

VAR Lag Order Selection Criteria						
Endogenous variables: CDC CNFA						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-288.4149	NA	89995.10	17.08323	17.17302	17.11385
1	-216.3807	131.3564*	1646.466*	13.08122*	13.35058*	13.17308*
2	-214.5260	3.163894	1874.236	13.20741	13.65634	13.36051
3	-213.2798	1.979313	2220.722	13.36940	13.99790	13.58374
4	-212.4467	1.225116	2712.866	13.55569	14.36376	13.83127
5	-210.4599	2.688112	3123.079	13.67411	14.66175	14.01093

Series: CDC CNFA
Lags interval (in first differences): No lags

Unrestricted Cointegration Rank Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.498585	32.64607	15.41	20.04
At most 1 *	0.155311	6.413903	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Trace test indicates 2 cointegrating equation(s) at the 5% level
Trace test indicates 1 cointegrating equation(s) at the 1% level

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.498585	26.23217	14.07	18.63
At most 1 *	0.155311	6.413903	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Max-eigenvalue test indicates 2 cointegrating equation(s) at the 5% level
Max-eigenvalue test indicates 1 cointegrating equation(s) at the 1% level

Appendix B: Research Data

year	POP	Labor	GDP	GDI	GI	PI	DC	NFA
1964	0,4	0,227	56,17	10,60	4,12	6,48	5,46	6
1965	0,41	0,229	62,69	11,83	4,60	7,23	5,99	6,79
1966	0,42	0,232	69,70	13,15	5,12	8,04	4,49	11,12
1967	0,43	0,235	76,68	14,47	5,63	8,84	4,46	10,5
1968	0,44	0,238	61,94	11,69	4,55	7,14	7,13	8,96
1969	0,45	0,242	77,36	14,60	5,68	8,92	7,97	10
1970	0,47	0,245	81,85	15,45	6,01	9,44	8,19	16,31
1971	0,48	0,248	81,42	15,36	5,98	9,39	10,83	15,39
1972	0,5	0,248	108,79	20,53	7,99	12,54	12,06	23,68
1973	0,52	0,248	109,77	20,71	8,06	12,66	30,35	28,93
1974	0,54	0,248	158,35	29,88	11,62	18,26	38,26	51,75
1975	0,56	0,248	221,20	41,74	16,24	25,50	45,11	61,07
1976	0,57	0,251	278,33	52,52	20,43	32,09	72,48	49,91
1977	0,59	0,255	355,12	67,01	26,07	40,95	82,69	39,93
1978	0,61	0,258	360,66	68,06	26,47	41,58	117,41	21,72
1979	0,63	0,262	425,00	80,20	31,20	49,00	158,68	-22,71
1980	0,65	0,278	435,00	82,08	31,93	50,16	195,59	-44,96
1981	0,67	0,282	476,00	89,82	34,94	54,88	235,52	-77,72
1982	0,7	0,286	522,00	98,50	38,31	60,19	291,41	-117,69
1983	0,72	0,291	606,00	135,14	56,36	78,78	370,03	-177,79
1984	0,75	0,295	618,00	140,29	59,95	80,34	428,29	-311,77
1985	0,77	0,309	782,00	165,78	93,06	72,73	527,56	-338,05
1986	0,8	0,314	1085,00	167,09	77,04	90,06	363,21	-449,44
1987	0,83	0,319	1486,00	291,26	102,53	188,72	205,7	-338,74
1988	0,87	0,324	1636,00	253,58	109,61	143,97	241,64	-221,13
1989	0,9	0,330	1942,00	341,79	102,93	238,87	216,32	-204,8
1990	0,94	0,342	2367,00	487,60	120,72	366,89	85,14	-13,07
1991	0,97	0,348	2630,00	507,59	134,13	373,46	-0,12	95,4
1992	1,01	0,354	2948,00	560,12	156,24	403,88	278,39	518,83
1993	1,04	0,360	3229,00	629,66	232,49	397,17	230,15	601,79
1994	1,08	0,366	3461,00	553,76	211,12	342,64	199,34	599,37
1995	1,11	0,373	3492,00	817,13	450,47	366,66	281,13	776,05
1996	1,15	0,379	3880,00	787,64	531,56	256,08	305,92	774,28
1997	1,19	0,386	4180,00	618,64	271,70	346,94	413,56	833,7
1998	1,23	0,393	4479,00	824,14	264,26	559,88	484,99	955,55
1999	1,27	0,400	4922,00	876,12	260,87	615,25	637,34	1059,95
2000	1,31	0,426	5382,00	931,09	247,57	683,51	741,32	1351,87
2001	1,35	0,434	6556,00	1166,97	314,69	852,28	1530,96	1194,18
2002	1,39	0,441	7364,00	552,30	1008,87	3127,08	1894,21	1319,55

year	GD	M	LL	CBA	DCP	LC	LR	DR
1964	0	10,2	3,3	10,26	9,93	10,27	7,36	4,61
1965	1,76	10,84	2,76	12,49	12,23	12,49	9,44	5,91
1966	0,76	12,76	5,11	13,58	12,76	13,58	9,74	6,10
1967	0,23	12,7	6,77	15,19	14,26	15,19	9,30	5,82
1968	0,73	13,66	11,42	17,62	15,28	17,62	11,32	7,09
1969	0,3	14,08	13,41	19,49	16,21	19,49	12,20	7,64
1970	0,03	16,46	13,61	20,87	15,22	20,87	11,21	7,02
1971	0,01	16,38	9,53	17,77	15,37	17,77	8,91	5,58
1972	0,5	22,75	14,81	20,08	12,5	20,08	8,79	5,51
1973	0	31,84	30,19	37,87	20,94	37,87	14,84	9,29
1974	1,43	33,04	32,2	47,6	24,08	47,6	18,16	11,37
1975	0,75	37,35	40,1	56,41	22,96	56,41	16,25	10,18
1976	7,14	49,43	49,9	83,53	39,12	83,53	17,82	11,16
1977	25,99	39,8	37,87	85,76	53,74	85,76	12,23	7,66
1978	29,14	57,78	56,14	113,98	75,4	113,98	15,00	10,00
1979	46,67	57,78	67,11	132,53	83,06	132,53	15,00	10,00
1980	29,56	61,28	110,2	212,99	98,46	212,99	15,00	10,00
1981	63,76	76,97	134,87	233,49	104,44	233,49	18,00	9,50
1982	51,22	87,22	161,21	274,32	102,91	274,32	18,00	9,50
1983	106,35	100,32	173,16	295,77	137,59	295,77	18,00	9,50
1984	131,15	99,58	174,14	276,33	158,17	276,33	18,00	9,00
1985	179,41	162,1	228,8	334,67	212,37	334,67	14,48	4,73
1986	81,2	166,49	218,13	386,78	192,34	386,78	28,00	11,87
1987	93,39	197,83	189,67	360,72	184,14	360,72	27,92	12,17
1988	118,22	213,52	186,71	404,45	208,53	404,45	29,54	14,54
1989	128,28	260,25	181,86	452,03	231,31	452,03	26,83	13,91
1990	164,28	296,19	195,07	483,41	265,45	483,41	26,50	15,17
1991	154,4	393,58	268,53	582,81	300,52	582,81	26,50	13,79
1992	427,28	435,17	232,05	590,99	222,85	590,99	26,75	12,92
1993	406,46	461,38	240,85	626,26	361,9	626,26	26,08	13,08
1994	398,43	407,53	204,13	617,54	385,44	617,54	25,00	12,42
1995	481,65	471,47	227,46	742,6	342,35	742,6	25,04	12,54
1996	615,43	453,49	202,42	860,12	341,89	860,12	25,50	13,00
1997	688,09	629,41	272,86	1116	425,26	1116	25,50	13,00
1998	756,52	626,57	282,98	1260,19	489,76	1260,19	25,38	12,88
1999	827,25	716,04	340,28	1536,46	591,41	1536,46	24,00	11,50
2000	1042,93	983,53	447,23	1783,67	652,18	1783,67	24,00	11,50
2001	1329,51	1125,41	528,62	2293,15	873,21	2293,15	24,00	11,50
2002	1756,77	963,36	1203,05	1866,29	3127,08	3127,08	24,00	11,29

year	CA	EX	OIP	CPI
1964	-5,21	533,27	186,64	4,99
1965	-4,57	533,98	206,54	5,06
1966	-4,10	533,4	186,64	5,07
1967	-3,05	524,51	179,28	5,14
1968	-17,04	457,11	166,06	5,35
1969	-6,31	456,47	206,77	5,62
1970	-2,31	457,54	228,18	5,51
1971	-16,09	466,74	250,91	5,68
1972	-12,15	477,76	253,95	6,17
1973	-13,41	566,32	391,31	6,60
1974	-7,33	558,34	739,06	7,21
1975	-31,12	530,35	432,96	9,08
1976	-89,65	431,15	422,99	10,62
1977	-67,52	416,66	546,86	11,94
1978	-56,55	458,19	630,93	13,00
1979	-58,25	506,42	562,74	13,80
1980	-202,28	555,29	1236,58	14,67
1981	-60,45	484,07	1257,42	15,83
1982	-14,09	417,86	827,5	17,14
1983	-9,09	362,11	965,33	18,73
1984	-39,55	272,3	836,58	21,65
1985	-25,81	247,55	675,75	26,37
1986	-7,60	139,82	993,58	35,60
1987	-31,21	135,14	758,5	52,05
1988	63,80	142,62	935,75	58,49
1989	36,90	126,57	817,5	64,81
1990	-63,91	121,49	1325,5	71,42
1991	-2,63	109,37	1237,83	77,92
1992	-2,95	107,15	799,13	87,28
1993	-148,53	104,67	1092,15	92,47
1994	-93,45	99,66	954,8	96,13
1995	-150,16	100	909,92	100,00
1996	-508,28	97,55	962	104,75
1997	-154,66	93,64	988,42	107,99
1998	-107,50	89,72	988,75	109,19
1999	-137,82	83,83	834,74	113,35
2000	-166,84	75,02	843,93	114,31
2001	-26,22	60,96	833,16	119,44
2002	-405,02	48,42	753,29	129,73

The data are in millions of Gambian Dalasis, except of course the LR, DR and CPI; and OIP is an oil price index, and EX is the exchange rate index. The definitions of the variables used in the research are found in section 4.5, Chapter 4.

Appendix C : Survey Questionnaire

I am a PhD student from the University of Kiel, Germany. This questionnaire is part of my dissertation that looks at the relationships between banking and economic growth in the Gambia under the supervision of Professor Dr. H.-W. Wohltmann and Professor Dr. Helmut Herwartz. I would appreciate if you could take some of your precious time and fill in this questionnaire.

1. Sex Male female
2. Education
3. Age 18 - 28 years 29 - 39 years 40 – 50 years above 50 years.
4. Please, tick the bank accounts you hold,
 - i. Savings Account
 - ii. Time Deposits
 - iii. Current Account
 - iv. Others
5. Why do you place your money in the banks? (Please, tick on the order of importance to you from 1 to 5, with 1 indicating the most important and 5 the least important)
 To avoid the risk of theft, loss and destruction
 To earn interest income
 To qualify for loan facility
 To make easy payments
 To save for the future
6. How do you rate your chance of obtaining a bank loan for the following purposes (give percentages from 0% to 100%, with 0% meaning no chance at all and 100% meaning certain).
 - i. Business/ Project%
 - ii. House purchase / construction%
 - iii. Land purchase.....%
 - iv. Consumption.....%
 - v. Agriculture.....%
 - vi. Education.....%
7. I have obtained a bank loan because (please, tick the one most relevant to you)
 I have a good project / business
 I have good collateral
 I have a good income stream
 I have a good connection in the bank
 I have
8. rate the services of your bank on the scale of 1 to 7, with 1 indicating very poor and 7 excellent.
 1 2 3 4 5 6 7

Eidesstattliche Erklarung

Ich versichere hiermit an Eides Statt, dass ich die Dissertation

“Banking and Economic Growth: Case of the Gambia“

selbstaendig angefertigt habe, alle von anderen Autoren woertlich uebernommenen Stellen und sich an die gedankengaenge anderer Autoren eng anlehrende Ausfuehrungen besonders gekennzeichnet und keine anderen als die in der Dissertationsschrift angegebenen Hilfsmittel benutzt habe.

Kiel, den 20. Juli 2005

Bukhari M. S. Sillah

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Signature:.....